EQUITY IN HEALTH:

THE NEED FOR AND THE USE OF

PUBLIC AND PRIVATE HEALTH SERVICES

IN AN URBAN AREA

IN THAILAND

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To my parents

Abstract

The 'sun-rise' industry of private health care, especially private hospitals, in Thailand throws many questions to the health policy forum. Will the growth of the private health sector reduce public health expenditure, or will it increase total expenditure on health? The focus of this study is on equity in health and health care: in a country where private expenditure dominates total health expenditure and the government lets the private health sector flourish, in this scenario, are the poor or the underprivileged the victims of this limited privatisation policy?

The main research objective was to assess the equity of coverage of public and private health in an urban area in order to identify policies of promotion and regulation which would lead to an equitable and efficient health service system. The study used Phitsanulok municipal area as a model to develop policy recommendations for other urban areas. There were three main methods of data collection: general household survey, health diary plus household health interview and a one-day bed census of patients in public and private hospitals in the municipality. The first two methods employed multi-stage random sampling with clusters of 12 and 3 households, respectively, as smallest sampling units and these neighbourhood households were divided into three groups to represent each season in a year.

The main findings were that inequalities in health existed among different household income, education and occupational groups, including these attributes of the education and occupational groups adjusted according to the household head. Unequal accessibility to health care seemed to affect both reported rates of illness within the past two weeks and hospitalisation during the past 12 months. Inequity of health care financing was obvious in that the underprivileged (the poor, the uninsured and underinsured) paid out of pocket as a percentage of their household income higher sums than the privileged groups.

The private health sector (private clinics and private hospitals) was the major provider of health care to urban dwellers for both outpatient and inpatient services. Users of public facilities were the lower income groups and civil servants, while users of the private health sector were the higher income groups, the higher occupational groups and the younger age groups. Inpatients of private hospitals were more likely to be covered by health benefit schemes (civil servant benefit, private insurance, etc.) than inpatients of public hospitals. Information on the utilisation and financing pattern of private health services reconfirmed inequity of health care financing.

It is obvious that the Thai health care system needs changes to reduce inequity in health and health care. Universal coverage is a way towards more equitable health care financing. While Thai citizens (in urban areas) have enjoyed a wide choice of health utilisation, a public competition model could be applied to the public health sector to make public services more competitive and more efficient.

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Phitsanulok was used as the study site not only for the reasons described in the text, but it is the place I had been working for almost 11 years. So I had plenty of support from valuable local resources. Kanikar Banterngjit, at the Northern Health College, Phitsanulok, gave ideas on and also helped implement the field data collection. Three colleges in Phitsanulok, namely, the Northern Region Public Health College, Buddhachinaraj Nursing College and Pibulsongkram Teachers College, supplied three groups of interviewers. Phitsanulok municipal office, the Northern Region Public Health College and Buddhachinaraj Nursing College released their staff for field supervision. Two public hospitals, Buddhachinaraj Hospital and Naresuan Military Hospitals, and four private hospitals, Pitsanuvej, Ruam Pat, Ratanavej and Eye hospitals, cooperated in the bed census survey and health resources survey. Wanna Lekchuensakul edited the data. Chuenjit Handamrongsak helped organise and analysed data. Above all, Buddhachinaraj hospital provided a very good shelter and efficient equipment for field work.

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Abbreviations Used in the Text

DHSS	Department of Health and Social Security (UK)
DRG	Diagnosis related group
HMSO	Her Majesty's Stationery Office (UK)
ICD9	International Classification of Diseases, the ninth revision
IMR	Infant mortality rate
IPSR	Institute of Population and Social Research (Thailand)
K-W	Kruskal-Wallis test of significant
MMD	The Morbidity and Mortality Differentials study
MOPH	The Ministry of Public Health (Thailand)
NESDB	The National Economic and Social Development Board (Thailand)
OPCS	The Office of Population Census and Survey (UK)
SMR	Standardised mortality ratio
SPC	Survey of Population Change
WHO	World Health Organisation

Currency exchange rate £1 = 40 Baht (1992)

1. INTRODUCTION

Health is a prerequisite for economic development, and better economic status of the population in turn leads to better health as well (Maxwell 1981). Though health services may have made fewer contributions to health as compared to broad social policies, its substantial expenditure in terms of money cannot be overlooked. The imbalance in economic growth without social development has resulted in underprivileged, underserved people suffering from poor health conditions, and, at the same time, has prevented them from being able to access health care (O'Neill 1983).

Different political economies result in a diversity of health service systems, from highly competitive market systems to highly socialised health care. Egalitarian systems, like that of the National Health Service of the United Kingdom, were thought to provide for equity in health, but evidence from the UK, e.g. the Black Report (DHSS 1980) and the White Paper (HMSO 1989), have shown that the achievement of equity in a nationalised system has been less successful than expected.

In the 1980s, the New Right's ideas of advocating market mechanisms has invaded the health care environment. A Conservative Minister of Health in the UK aimed at a 25% share for the private health sector rather than the 5% in 1980 (Bosanquet 1983). Arguments have arisen over that what should be the aims of a health care system. The National Audit Office (1989) advocated that inequality in health among different social classes could be overcome through collaboration between government bodies and the independent health sector. When the Conservative government moved to reform health care, there emerged three important principles for reforming the British National Health Service: efficiency, equity and choice (Ham et al 1990).

In the 1970s and 1980s, many other developed countries made a transition from health insurance to universal services so as to reduce inequity (Abel-Smith 1985). But in the late 1980s, when those countries realised the escalating costs of health care to government budgets, they thought of changing the methods of financing health services by creating competition on the demand side (amongst financing agents) and on the

supply side (competition amongst health care providers). The main reasons were political as well as financial pressures (Donaldson and Gerard 1993).

Health care reforms in developed countries also highlight the concept of 'public competition' which remedies restricted choice within the public system and is argued to increase efficiency of the system and patient care (Saltman and Von Otter 1992). Wider choices are also provided to consumers to exit to private health services. Hard efforts have to be put into the management process of the public health sector to be competitive and responsive to consumer needs (Harrison et al 1992).

Developing countries find it difficult to finance health care totally out of tax revenue. Community financing and user charges have been the two main sources of enhanced funding (Donaldson and Gerard 1993). However, many countries are considering the possibility of introducing compulsory insurance schemes. The reasons are to find more resources for the health sector and to remedy dissatisfaction with the existing inefficient health services (Abel-Smith 1992).

The Thai health care system is a mixed system. Westernised medicine has dominated both public and private health services for almost one hundred years. There has never been any written statement that says health services are covered by the government. The first government hospital to be built was for merit making by King Rama V for the loss of his son. Independent nonprofit-making (mission) hospitals were widely distributed long before the establishment of government provincial hospitals. And no more than 16 years ago, in the fourth National Health Plan (1977-1981), the government proposed that district hospitals should cover the whole country. In the meantime, the government health budget has been shifted to primary health care activities. The two shifts of budget, to some extent, have given rise to the growing economy of the private health sector especially in Bangkok and big cities where government hospitals have been underfunded.

Seventy percent of health expenditures in Thailand come from the pocket of consumers. This pattern of health care financing has not been

drastically changed even since the Social Security Act has been in effect in June 1991. The high burden of health expenditure continues. Even the low income card scheme, which has given free care for the poor for 16 years, does not ensure that the right people get free treatment because of mismanagement and abuse in the distribution of the cards (Mills 1991).

The Thai economy in the seventh National Socioeconomic Development Plan (1992-1996) is expected to grow at a sustainable rate of 7% per year. Rapid urbanisation with migration of workers, dependents included, to 5 industrialised zones, namely: peri-metropolitan, eastern sea coast, southern sea coast, big cities throughout, and border towns, is anticipated. The corollary is how to plan for the most expensive health care, ie. hospital services, in those areas. Should the government strongly encourage the private sector to be a partner in health care provision, and, should more capital funds be raised from private finance for private hospitals? Or should the government be the major provider of hospital care in these urbanised areas?

The art of balancing the growth of public and private health sectors in Thailand is an emerging important issue. In planning and financing the public health sector, complementary information from the private sector cannot be neglected. In Thailand, information on the private health sector is badly needed, otherwise the policy issues on the public and private mix will be weakly postulated, or biased to one or another extreme.

The research objectives were to assess equity in health in terms of the morbidity and mortality of different socioeconomic groups, to assess the equity of the health services in terms of accessibility and utilisation and to determine factors influencing utilisation patterns for public and private health services. It reviews general arguments on the merits of public and private health care. Major issues of concern are equity, efficiency and choice of provider. The research focused on these issues in an urban area of one province. An in-depth study illustrates the pattern of financing health services in both sectors. Equity is extensively considered through household level data to make sure that

the policies to be proposed have taken into account all relevant aspects of health, both economic and social dimensions.

As the family is the smallest unit with a close tie, household demand for health care is a fundamental concept to approach the issue of equity in health. There have been a number of household surveys on health and economic aspects, but their integration to explore issues on equity in health and the public and private mix has never been attempted. It is worthwhile to develop this untapped use of household information, so that a longitudinal monitoring system of equity can be set up for the whole country.

This thesis contains 10 chapters. Chapter 2 reviews literature on equity, efficiency and choice from an international perspectives. It begins with theoretical debates on the theories of society, implications of the theories for health care and the specific characteristics of health care. Then, a section on the public and private mix in health care reflects how each country lays out its health care system. The chapter extensively reviews theoretical and practical definitions of equity but the researcher is inclined to adopt three practical definitions: equity in health care delivery, equity of financing health care and equity in health. Efficiency in health care is concerned about information to measure efficiency and experiences of market efficiency. Consumer choice and satisfaction are gaining more attention from many countries as an important component to reform. Finally some examples of health care reforms in both developed and developing countries are drawn to provide a basis for considering Thai health care reform.

Chapter 3 discusses details on the Thai health care system in relation to the framework of chapter 2. It explains the trends of health care financing and health care provision in Thailand where the private sector has become dominant in financing and more important in provision. Previous studies on equity, efficiency and consumer satisfaction in Thailand and particularly in the study site are reviewed. Interactions and recent policies influencing relationships between the public and private sectors are discussed. The chapter ends with the provincial background of the study site.

Chapter 4 describes how this study was done. There were three main methods employed: a general household survey of 890 households, a health diary plus interview of 117 households and a one-day bed census in two public and three private hospitals. Reinterviews were undertaken for the general household survey to ascertain the reliability of obtained data. There is a short discussion on the grouping of socio-economic variables used in this study.

The results of this study are presented in three chapters. Chapter 5 compares the results between the general household survey and the health diary plus interview. Household characteristics - household income, social characteristics, housing and overcrowding index, household durables and family wealth index - and morbidity and mortality from the two surveys are compared. The chapter discusses potential variations caused by methods, interviewers and seasons.

Chapter 6 provides the main presentation on equity. Data from the general household survey are used to demonstrate three main aspects of equity. Equity in health is explored through differentials of mortality and morbidity amongst different socio-economic groups. Equity in health care delivery includes access as a prerequisite to health care, utilisation when ill, hospitalisation, and use of preventive and promotive services. Equity of financing health care stresses costs of care, payers of health services and the burden of health service costs in relation to household income. The scope of this chapter covers all public and private health services in this urban area, and the calculation of household health expenditures adjusted for all reimbursable expenditures.

Chapter 7 is complementary to Chapter 6, especially in terms of hospitalisation. However, its strengths are more than complementary. It gives more detail on behaviours of the public and private hospitals. The input mixes (especially manpower and hospital facilities) and outputs (throughputs and patterns of diseases with average lengths of stay) of both types of hospitals are compared. User characteristics of and consumer views towards both public and private health services are also presented.

Chapter 8 is a discussion chapter drawing all findings in the previous three chapters together as the basis for policy recommendations. The chapter estimates sources of finance (including the share of total expenditure) of each public and private health service in this urban area. Furthermore, utilisation data of all health services and costs to users are worked up in terms of an estimated matrix of the public and private mix in health care financing and provision in an urban area. Clearer policies can be drawn from this matrix. The chapter further discusses the interface between the public and private sectors in terms of referrals of patients, sharing of personnel and medical technology. Finally three aspects of equity are discussed; the worst is inequity in financing heath services.

Chapter 9 explores policy implications for long term health care reform in Thailand. The philosophy of the Thai health care system provides a fundamental ideology for reform. The chapter discusses policy recommendations on increasing the role of public financing to control total health expenditure, and how to achieve that role. Privatisation policies are debated, for example contracting services from competing public and private sectors to increase efficiency. How the public sector adjusts itself to be more efficient and to safeguard equity and quality of care is also discussed. Quality assurance and regulations are recommended. And finally phasing for long term health care reform is suggested. The thesis ends with a discussion on the strengths and weaknesses of the research methodology and suggestions for further research.

2. EQUITY, EFFICIENCY AND CHOICE: AN INTERNATIONAL OVERVIEW

This chapter reviews the literature related to recent concepts, developments and reforms in health care provision in the international arena. The central arguments are focused on three basic concerns: equity, efficiency and choice. The first part will discuss the theoretical debate of these issues, followed by a substantial review on equity both in terms of definition and in practice. The chapter will proceed further to issues on efficiency in health care and consumer choice and satisfaction. Examples of health care reforms will highlight the arguments on balancing these three principles.

2.1 Theoretical debate

In the international arena of health care reform in the 1990s, the most prominent arguments are on equity, efficiency and choice (Ham et al 1990). The concepts underlying these arguments are linked to theories of society. Barr (1987) explained that '[A] society is a co-operative venture for the mutual advantage of its members. It generally contains both an identity of interests and conflicts of interest between individuals and groups'. Three broad types of theories of society that explain these conflicts in relation to the level of state intervention are libertarian, liberal and collectivist.

Apart from the discussion on the theories of society, the discussion on the specific characteristics of health care will give details on why equity, efficiency and consumer choice in health care have become very important in recent years.

The theories of society

History tells that human society has evolved from a laissez-faire society without state intervention to a stronger state controlled society. The first ideology was that of the libertarians. When society developed, more problems emerged, and at the same time the ideologies of liberals and collectivists developed to direct social changes.

The ideology of libertarianism is laissez-faire. Libertarians respect individual members of society and protect individual freedom. They advocate free markets and private property as they will increase productivity and the distribution of goods. These means are considered to lead to maximisation of total welfare (Barr 1987). Libertarians regard government control as harmful (reduces welfare) and regard taxation as a form of theft (Nozick 1974). However, they accept some form of taxation, eg. taxes for poverty relief as a means of government intervention (Hayek 1960).

The liberal philosophy goes beyond that of libertarians as it embraces economic security or need (Gilson 1988). It accepts a greater state distributional role as the free market is not the best mechanism for production and distribution of all goods. The variants of this philosophy are utilitarianism and Rawlsianism.

The utilitarian aim is a good example of the trade-off between efficiency and equity. '[Its] aim is to distribute goods (including rights, freedoms and political power) so as to maximise the total utility (welfare) of the members of society' (Gilson 1988). Utilitarians welcome the role of the state to redistribute goods to ensure maximum utility to the point where no one can be made better off without anyone becoming worse off (Paretian allocation). Rawlsianism is also concerned with the distribution of liberty but has a second principle in favour of the least well-off. An allocation that makes the rich better off even without jeopardising the poor is unacceptable.

The three main aims of collectivists are equality, freedom and fraternity. Collectivists analyse society as groups of social classes and conflicts between social classes lead to exploitation. Co-operation rather than competition is the goal of society to achieve fraternity. Free markets will never work well unless there is equality in terms of power and wealth. Government control is a means to redistribute rights and wealth to achieve social justice.

The welfare state came to prominence when the ideologies of the liberals were dominant, ie. around the Second World War (Barr 1987). Social

security and social services became state concerns so as to achieve social justice. However, collectivists argue that the welfare state is a strategy to support inequalities rather than to remedy them (Barr 1987).

Deep recession in the West with declining productivity in nationalised industries encouraged a new ideology of the New Right. The Chicago Neoclassical School and the Austrian School are examples (Bennett 1991). They advocate the libertarians' ideology, the role of free markets to achieve efficient distribution of goods and retain public choice.

Implications of the theories of society for health care

The health care system is by no means outside the framework of society. The logic of the government to provide health care is the same as the government's political economy. As politics changes over time, so the health care system keeps on changing accordingly, ie. the government attitude to the health care system reflects the prevailing ideology.

De Jong and Rutten (1983) discussed four distribution principles in relation to promoting health and removing inequalities in general and in health. Each of their distribution principles is derived from a broader theory. The four principles are: utilitarianism (derived from utilitarian theory), egalitarianism (from egalitarian theory), libertarianism (from entitlement theory) and equal access (from theory of the welfare state). These distribution principles operate at different levels; structural (how society functions), process (method of distribution) and outcome levels (effectiveness, health status). The collectivist philosophy (egalitarianism) requires structural re-arrangements as a prerequisite condition. The equal access principle has an advantage of being practical,ie. no social reform is necessary, but it neglects the effectiveness (outcome) of the system. Utilitarianism makes the most efficient use of scarce resources (it is process-oriented) but egalitarianism aims to equalise health status output.

The authors further discussed policy options relating to the four distribution principles in relation to the health care system. Libertarians do not believe in the right to health care but worship

freedom. Then there will be a wide range of services for the rich but limited acute services for the poor. Public health activities are strictly limited to necessary measures. Utilitarians give high priority to public health and health education activities; considerable priority to screening, curative and rehabilitative services; but low priority to care. The equal access principle is very expensive because it guarantees an equal access right, so health services are under pressures from both professionals and consumers. The egalitarian principle is advocated by the authors as the best choice for achieving Health for All. Individuals are guaranteed the right to a minimum health level and minimum health care. It goes further than the utilitarian policies in that care for the chronically ill and handicapped is also given a priority. To cope with high demand for health and health care in a welfare state, recent health policy developments have focused on competition, cost-sharing, cost-effectiveness and individual responsibility. The implications of these policies for the welfare state are to increase the role of the market, increase individual responsibility, improve budgeting and evaluation techniques, and reduce the guaranteed service levels. In sum, an equal access principle should be replaced by libertarian, utilitarian and egalitarian principles, the authors concluded.

The British health care system is an example of governments' changing attitudes. In 1948, the Labour government applied the collectivist's view (egalitarian) to nationalise the health services. The National Health Service has been financed through taxation and redistributed for equal access. The strength of the system is the equity principle. The system has been criticised for inefficiency and limited choices (Enthoven 1985). In the 1980s, the Conservative governments have applied the libertarian principle to reform the National Health Service. In the White Paper 'Working for Patients', separation of purchaser and provider, self-governing hospital trusts and internal markets are created to increase system efficiency; and contracting for clinical services is considered to increase patient choice. But the equity principle is still influential, as can be seen from the fact that the NHS is mainly financed by general taxation (HMSO 1989).

Despite egalitarian and libertarian principles, the NHS has tried to deploy the utilitarian principle in prioritising health programmes so as to maximise the utility of limited resources. The quality-adjusted life year (QALY) is a utility unit developed by combining number of years gained from an intervention and quality of life during that time gained. Costs per QALY of different treatments are compared for various disease conditions. For example it was suggested that high priority should be given to the insertion of pacemakers for heart block (condition with irregular heart beats) because the cost per QALY was less than that for other treatments (Williams 1985).

> "The utilitarian basis of this approach to rationing has great appeal. Do we want to obtain the most health care possible from our given resources? Is it not fairer to spend £100 000 on treatments yielding benefit to more people than wasting it on one fancy technological treatment? Plausible enough sentiments, even having an appealing distributional equity perhaps in a closed collectively-oriented society. But in a society such as that of the United Kingdom may they not have the effect of precipitating a two-tier system of care with the rich going elsewhere for care and the poor relying on charity?" (Roberts 1989)

The transition of the British NHS reflects a mix of distribution principles. However, a strong commitment to equity has been given a top priority since its foundation.

> ". . . fundamental rationale from a free-at-the point-of-service national health service is that the type and quality of service offered shall not be related to willingness-and-ability to pay, and that it shall be provided according to nationally determined criteria of eligibility as uniformly as possible over the country at large, and financed according to ability to pay, not according to benefit received, out of centrally administered taxes. To the extent that the system departs from these principles, it is because of concessions to human frailty: either to reduce abuse or because of inability to control the system financially or managerially without decentralisation, which in turn has generated unwanted variations in provision. In other words, the basic principle is a centralising, egalitarian one, and all departures from it are to be regarded as blemishes or imperfections, to be minimised if they cannot be expunged." (Williams 1980)

The implications of theories of society for Thai health care have not been dramatic. The Thai culture favours freedom while the political system has been under military power since the institution of a democratic monarchy in 1932. The collectivist philosophy has been

regarded as against the monarchy system. Health policies have been based on libertarianism. An obvious example is that fees have been charged for a long time at government hospitals.

The development of Thai governments' health policies can be grouped into three periods. The earliest period (from 1942 to 1946) emphasised the prevention and control of communicable diseases. The second period (from 1946 to 1976) saw the expansion of health infrastructure at the provincial level. The third period (from 1976 till now) is concerned more with accessibility and equity in health care. Physical access is ensured by complete coverage of district hospitals. It was in 1976 that the government issued a policy on free medical care for those on low incomes to remove economic barriers to health care. Even though these health policies were addressed to Parliament by the Cabinet, they were meant for the Ministry of Public Health rather than for other ministries.

At the end of the second period, in 1974, the Board of Investment (BOI) of the Prime Minister's Office gave incentives to investors of private health care as one area of the country's industrial development. This policy has triggered the expansion of private for profit hospitals. The share of private hospital beds to total beds in Bangkok has increased rapidly. Ten years later, incentives for private hospitals in Bangkok were upheld. Details of the Thai health care system will be discussed in chapter 3.

The specific characteristics of health care

Having discussed the theories of society in relation to distribution principles, this section will discuss the specific characteristics of health care to consider in more detail whether health care is the same as or different from other commodities. Two main arguments are considered: the marketability of health care and the moral issue of health care.

Libertarians regard the market as the best mechanism to distribute goods. However, only when the standard assumptions hold, will the market mechanism be perfect. The standard assumptions include (Barr 1987):

- Perfect information;
- Perfect competition;
- Absence of market failure.

On the contrary, if these assumptions do not hold, the market will not work as efficiently as expected. This warrants some form of state intervention to redistribute resources efficiently and equitably (the aims of most governments). The state can intervene either directly; through methods of finance, public production and regulation; or indirectly through cash transfers (Barr 1987). Strong state intervention reflects the views of collectivists.

However, in the 1980s, the emergence of the New Right loosened the conditions in standard assumptions as preconditions for marketability. Friedman and Friedman (1980) of the Chicago Neoclassical School argued against state intervention:

> "Perfection is not of this world. There will always be shoddy products, quacks and con artists. But on the whole, market competition, when it is permitted to work, protects the consumer better than do the alternative government mechanisms that have increasingly been superimposed on the market."

The Austrian School is more specific on imperfect information. Existing information is far from perfect, it tends to be localised and inaccessible to the government. Market mechanisms will create more information that is useful for consumers and providers.

In discussing the marketability of health care in relation to the standard assumptions, the following arguments prevail. Information in the health care environment tends to be asymmetrical (imperfect). The major cause is the uncertainty characteristic of health care. Doctors, to a certain extent, know the consequences of the diseases more than their patients. The standard theory of demand and supply in determining the quantity and quality of care needed is not applicable. Supplier-induced demand is the phenomenon observed. The second argument is that

competition in health care tends to be imperfect. There are limitations to entry as well as exit from the market. Professional bodies regulate the number of providers and control the standards of practice. This monopolistic characteristic limits competition. The third argument is that of market failures because health care possesses externalities, moreover it can be a public good and a merit want (Barr 1987, Cullis and West 1979).

Externalities of health services are the external effects to people other than consumers, eg. immunisation against infectious diseases provides protection to those not immunised as well. However, it is difficult to exclude them from having this benefit (non-excludability), though it is undesirable to exclude. To some extent, certain health services are non-rival, ie. one consumer does not inhibit others from using them, as in the case of vector control through environmental management. Non-rivalness and non-excludability properties make some health services public goods, which are difficult to market because there will be a lot of free riders (who can benefit without paying).

Again the argument arises, not all health services are public goods. Curative and rehabilitative services are the target for transferring to markets. They are patient-related. For example, only victims of cancer get the benefits from chemotherapy. Drug supplies may be used up by cancer cases and nothing is left for other diseases (eg. communicable diseases). Then there has to be a rationing system to allocate limited resources to other needy cases. User charges may be collected from treatments of cancer cases. It would be unethical if the needy did not receive appropriate treatment. In other words, it would be ethical for those who benefit to bear some costs.

The argument on merit wants is broad and vague; examples are treatments for the unconscious and the mentally-ill. In this case, they are merit goods because the unconscious and the mentally-ill cannot themselves decide what is good for them; hence the state should make these decisions. The merit goods label can be attached to the treatments given to children, the aged, and the poor, etc. These merit wants need some

form of state intervention to ensure that the needy get appropriate health services, eg. cash transfer in a voucher, public provision.

Marketability and ethical issues of health care are interrelated. The debate on these issues has been on the agenda since the 1960s. Some authors said that because of the specific characteristics of health care, the market in health care tends to fail. But many authors argue that the market has an important role in the allocation of health care. The main concern of these arguments is the trade-off between equity and efficiency.

The market is believed to be a good mechanism for determining the quantity and quality of commodities needed in society. Price is a valuable signal, ensuring equilibrium between demand and supply and resulting in efficiency in production and consumption. In the health care environment, user charges and copayments are suggested as a market mechanism to allocate limited resources to achieve maximum efficiency. This triggers debates on equity issues if demand is price-elastic for the poor (Gilson 1988, Yoder 1989).

Arrow (1963) pointed out that uncertainties of medical care: the uncertainty of contracting diseases and the uncertainty of effects of treatment, were the most common cause of market failure. "Uncertainty as to the quality of the product is perhaps more intense here than in any other important commodity". This imperfect or asymmetrical information warranted state intervention, eg. state funding of services through compulsory health insurance, licensing of the occupation, etc.

Lindsay (1973) discussed the theory of sharing the uncertainty and government intervention. Tax-supported subsidies to the poor would reduce inequality of health care consumption between the rich and the poor. The egalitarian attitude holds that health care should be made available to anyone in medical need, not determined by economic status. Government intervention is justified because the administrative cost is cheap.

Lees (1976) argued against the concern with imperfect information. Lack of knowledge in health care does not prevent the market from working properly. The substitution of socialised medicine for private medicine has not led to more medical care, to better medical care, or to a more equal distribution of medical care. Free markets are remarkably useful institutions but are not applicable for environmental health, infectious diseases, chronically sick and mentally ill.

The ideas of the New Right have influenced the reform of the British National Health Services which has involved introducing an 'internal market' within the public sector and between public and private sectors by contracting out supporting services or even sophisticated clinical services (HMSO 1989). 'Managed competition' is the means used to increase market efficiency while maintaining the equity principle by financing through general taxation.

The concerns of health care characteristics, market efficiency and state interventions have formed the frontier of the 'public and private mix' in health care (McLachlan and Maynard 1982). The frontier moves along the public or private axis within two dimensions: financing and provision of health care. This is relevant to both developed and developing countries. The next section will discuss these issues in detail.

2.2 The public and private mix in health care

Because of the special characteristics of health care and the different views of theorists on society, a prototype of state intervention in health services has never been agreed upon. There are three major aspects to consider in terms of the degree of state intervention: financing, provision and regulation. The higher the proportion belonging to the public, the stronger is state intervention.

Health care financing

Total health expenditure is the sum of public and private health expenditures. The public sources of finance are mainly from taxation and

partly from government revenues raised from assets. Government taxes are redistributed in the form of budgets to various ministries. Private health expenditure makes up for the inadequacy of public expenditure and responds to a high demand for private health care. Examples of private financing are user charges at the point of service delivery, premiums for private health insurance, payments by private employers for their employees, and donations, etc.

In countries with an egalitarian philosophy, public health expenditure accounts for the majority of total health expenditure. In 1987, public expenditure was 90% of total expenditure in Sweden, 87% in the UK, 78% in Holland, 77% in West Germany and 75% in Canada. But in the countries with a libertarian orientation, private expenditure is the major part of total expenditure, eg. in the US, private expenditure was about 59% of total expenditure in 1987 (Ham et al 1990). Nonetheless, public expenditure was still high.

In developing countries, in an egalitarian country like Malaysia in 1987, public expenditure was 77% of total expenditure. A collectivist country like China spent nearly 70% of total expenditure from public sources (taxes and social security) (Griffin 1990). In libertarian countries, eg. South Korea, Indonesia, government expenditures were 33% and 35% of total health expenditure respectively (Ron et al 1990).

Health care provision

Having controlled the financing of health care, the state may intervene further by direct provision. Collectivist states usually play a major role in both financing and provision, eg. in China before the recent economic reforms. Libertarian states, on the other hand, take less responsibility for direct provision as well as a smaller share in financing. However, it is not always the case that a high share in public financing goes together with a high proportion in public provision. Many governments finance private health services which compete with public health services, eg. private health services predominate and are reimbursed from public finance in Holland.

The share of public expenditure and share of public provision have significant effects on total health expenditure. It is likely that the countries with high shares of public finance and provision can control the growth of total health expenditure. And in the countries that let private sectors play a major role, total health expenditure is difficult to control.

Regulation

In countries where the majority of health care is provided by the private sector, the state can intervene by controlling quality, quantity and distribution, and prices of the services. Apart from direct control from the state, other agencies, eg. professional bodies, financial agencies etc., including the public at large, ie. consumers, can in many ways control quality, quantity and prices of the services (WHO 1991a). However, this framework of control is also applicable to countries with a prominent state role in health care provision.

Quality assurance has become a mechanism to control quality of care in Europe because traditional professional self-regulation has proved ineffective for removing incompetents from the medical professions (Jost 1992). In the UK, internal markets and self-governing hospital trusts are the mechanisms for increasing efficiency and liberalising bureaucratic management. It is foreseen that the government's role of protecting the competitive process would be extensive and would involve some top-down control (Hughes and McGuire 1992). Complaints by consumers are another source of information on quality of care and should be encouraged (Mulcahy and Lloyd-Bostock 1992). Law suits are prevalent and costly in the US (Fenn and Dingwall 1992).

In developing countries, it is foreseen that greater emphasis is given to private health sector. It is the government's role to strengthen state regulation to ensure quality of services given in private sector (at the same time, public services need to emphasise on quality assurance).

2.3 The definition of equity

Though equity is frequently claimed as an objective of every society, the definition has never been simple. This section reviews different definitions of equity relating to health and health care with arguments for and against each definition. Examples of inequities in health and health care are demonstrated.

> ". . . equity, like beauty, is in the mind of the beholder." McLachlan and Maynard (1982).

The above quote reflects the difficulties in defining equity. However, it is necessary to convert qualitative data into quantitatively measurable figures to evaluate how well an equity objective is met. A good working definition is therefore sought.

Equity implies that economic and social goods should be distributed fairly across individuals (Pereira 1989). This is still far from being a good working definition. The word 'fairly' needs further clarification. Nonetheless, it is apparent that equity is not the same as equality. Mooney (1986) gave a good set of seven working definitions of equity in relation to health. They are:

1. Equality of expenditure per capita;
2. Equality of inputs per capita;
3. Equality of inputs for equal need;
4. Equality of access for equal need;
5. Equality of utilisation for equal need;
6. Equality of marginal met need;
7. Equality of health.

The first two definitions are simple arithmetic. The distinction between them is that expenditures are estimated in monetary terms inclusive of public and private spending (but mostly considered only public spending); whereas inputs can be described in terms of manpower and other health resources, eg. number of hospitals, beds, etc. The former allows for standardising for the different prices of the same health resources at different places. The third definition links inputs to need, so this is better than the second definition. The problem is how

to define and judge equal need. The fourth and fifth definitions both have 'need' as a base of comparison, but utilisation is better than access because utilisation is the interaction of demand and supply. Equality of marginal met need, eg. by regions, is defined as the "marginal impact on health status per pound be equalised for all. . . regions" (Culyer 1976). It is advocated by economists because it concentrates on an extra unit of need at the margin which is more relevant to decisions than the total need of each group. Priorities are given to marginal unmet needs of different groups under different resource requirements. Decisions are made to allocate resources to the highest priority of each group. So far, few studies employ this definition (eg. Steele 1982). The final definition (equality of health) is frequently used as an outcome variable of the health system. The most authoritative study is the Black report (DHSS 1980).

Mooney advocated the complementary use of the third and the fourth definitions (equality of inputs and equality of access for equal need) as the second best definitions:

> " . . . in practice it appears that faced with the choice between the seven definitions presented above, most opt for a mix of equal inputs for equal need and equal access for equal need, the mix to be determined empirically by examining the trade-off between access and health. I would support that view, if equating marginal met need cannot be made a practical alternative." (Mooney 1986)

Three definitions above, the third to the fifth definition, require further clarification for the term 'equal need'. Need can be defined as private or social need. Private need is an individual's concern while social need concerns the public at large. It is difficult when private needs of comparison groups differ, and also differ from social need. Culyer (1991a) took account only of need that would yield benefit after treatment, even if it is to the benefit of only one individual:

> " . . . the need for health care embodies an opinion of the difference that medicine can make. It is not a before and after comparison but a with and without comparison. It may be described as *capacity to benefit* and is a kind of differential prognosis. If there is no effective care it cannot be held to be needed. But if there is, and it can benefit a particular individual, then that individual is in need (of health care)". (emphasis original) (Culyer 1991a)

Recent contributions to equity definitions are the 'equity as choice', the 'health maximisation account' and the 'basic capability approach' (Pereira 1989). Most of them are at the development stage.

Le Grand's approach of 'equity as choice' is libertarian: "if an individual's ill health results from factors beyond his or her control then the situation is inequitable; if it results from factors within his or her control then it is equitable" (Le Grand 1987). The health status of individuals is a function of health harming activities. The advantage of this approach is to provide information on how the distribution of health comes about. Its implicit application is at the process of making choices in health care consumption rather than its output.

The equity as choice approach is different from Mooney's definitions. It resembles the Grossman model on human capital. Individuals invest or disinvest in their health stock by trading off between competitive commodities. Much more groundwork is needed to define 'choices' and 'constraints' in making choices. The policy implication for state intervention from this approach is to equalise the constraints people face so that they can make equitable choices.

The maximisation of health approach has been developed at York University based on the quality-adjusted-life-year (QALY) measure of health. It is believed to be equitable if the overall health of the community is maximised. This utilitarian approach can be compared with the equality of marginal met need criterion of Mooney. But it is not clear whether the QALY gained is equitably distributed among individuals, as pointed out by Sen (1973):

> "maximising the sum of individual utilities is supremely unconcerned with the interpersonal distribution of the sum." (Sen 1973)

So far, this approach has been criticised by health professionals, social scientists and economists. The strongest objection is "that a unit of health is treated as being of equal value no matter who gets it" (Pereira 1989), or, 100 units of health gained to one person are equal to each unit gained to 100 people. Adjustment to give different weighting to different groups of people is needed to achieve an equity

element, though in practice this is very difficult and depends on different value judgements. Policies to reduce inequity based on this approach require great information.

Sen's basic capability approach takes account of Le Grand's equity as choice, that people make choices relating to their health. The distinction is that Sen's approach emphasises the capabilities of individuals to produce good health. The focus on capabilities ensures that individuals have capabilities to function well, eg. they are continuously able to use medical services when they choose to do so, not just having accessibility. Health status is the end product of capabilities to functioning, in turn capabilities are influenced by goods (eg. health care) or the characteristics of goods (eg. clinical efficacy). In summary, equality of capabilities gives a better prospect than equal access for good health (Pereira 1989).

Philosophical arguments on equity date back to Aristotle's horizontal and vertical equity. The distinctions between horizontal and vertical equity have never been agreed. However, they can be applied to health as illustrated by Culyer's (1991b) definitions. He clearly outlined the definitions of horizontal and vertical equity as follows:

Horizontal equity
H1 Equal treatment of those with equal initial health
H2 Equal treatment for equal need
H3 Equal treatment for those with equal expected final health.

Vertical equity
V1 More favourable treatment for those with worse initial health
V2 More favourable treatment for those with greater need
V3 More favourable treatment for those with worse expected final health.

Culyer's first two steps of horizontal equity are similar to some of Mooney's definitions, but further interpretation of 'treatment' has to be made. It could be expenditure, input, access or utilisation, depending on the provider's or consumer's framework. The third step that emphasises outcome is the most crucial.

Pereira (1989) summarised that a good definition of equity should meet these requirements: easily comprehensible, specific and rigorous, in the

standard language of normative economics, not requiring excessive information and widely acceptable as policy statements on health-equity.

Different policy implications result from using alternative equity definitions. Equality of input and equality of expenditure per capita assume that the initial state of health and commodities' prices are the same. They have gained some popularity in spite of limited policy implications because of ease of use. Equity as choice has become more popular for libertarians. It is because people want more freedom and have more information on the trade-off between risk and benefit. Marginal met need, and QALY maximisation, are of use for egalitarian allocation of resources. Inequity in health status indicates that problems exist but does not guide the process of achieving equity.

Inequity in practice

The topic of inequity in health has been researched in the UK since the 1920s (Stevenson 1928). It is only recently after the Black report (DHSS 1980) that the issue has been recapitulated all over the world. This section will review some of the studies to highlight inequalities in many respects; inequity in health status (inequity by social classes, geographical inequities, inter-generational inequities), inequity in health care delivery (eg. inequity of access, geographical inequities) and inequity in the financing of health care.

Inequity in health status

The concept of social class has been dated back to the 1910s, when the Registrar General tried to summarise meaningful vital statistics (Mascie-Taylor 1990). Social classes have been developed to be a composite indicator of occupation, economic activity status, status in employment and type of industry (OPCS 1990). Therefore, they are a good proxy for income level, education level and lifestyle.

In 1980, the Black Report proved that there was unequal distribution of deaths across the social classes. The gradient was regressive, ie. the lower social classes experienced higher deaths than the higher classes

when standardised for age and sex (DHSS 1980). The gap had widened when the same methods were used to follow up the changes 10 years later (Davey Smith et al 1990).

Illsley and Le Grand (1987) argued that social class is an imperfect tool for measuring changes over long periods, due to changes in the size, composition and status of classes.

> "There are other factors which make us distrust occupational class except as a simple descriptive label. Its inevitable past neglect of women's occupations- although over time their greater inclusion in the labour market has radically altered male occupations. In the 1950s the skilled non-manual class was full of male clerical workers- they barely exist nowadays.... There are many other examples. The exclusion of the unemployed, those in full-time education, person over 65, distort trends substantially. In the 1971 Census of England and Wales the number of persons with not-stated occupations was greater than that of class V and its mortality was greater than that of class V. This implies enormous margins of errors." (Illsley and Baker 1991)

An alternative method of measuring inequality in health was suggested, based on differences in the age-at-death for every member of the population. The results suggest that since 1921, all individuals have lived longer. A preliminary analysis of changes in specific diseases shows that there may have been a decline in health inequality between the poor and the rich (Illsley and Le Grand 1987).

However, social class is still a good, simple indicator that has been little used in other countries. The best parameters for comparison in other countries are either socio-economic groups (SEGs as used in OPCS), income groups (decile or quintile groups) or occupational groups. But they do not show as strong a gradient as social class disparities in the UK.

Studying the trends of inequities in health by social class has an implication for policy formulation that the problems have not yet been solved or even need greater attention. Trends in the distribution of income may be helpful in predicting changes in health inequalities.

Inequities in health status by geographical area have been established in the North-South divide in England (Townsend et al 1988). The dividing line is drawn from the Wash to the Bristol channel. Standardised mortality ratios (SMRs) of the people above the line were higher than those in the South.

Geographical inequities can be studied in the UK down to the level of an electoral ward. Many scoring systems of deprivation have been developed to establish statistical correlation with health outcomes to try to explain health differences and guide resource allocation. Jarman's underprivileged score is derived from 8 components, eg. composition of social classes IV and V, composition of the aged in the community, housing, etc (Jarman 1984). Townsend's deprivation index is another composite indicator of social deprivation: unemployment, car ownership, non-owner-occupiers, and overcrowded households, which correlates with a final health index (Townsend et al 1988). This index has implications for prioritising community action, targeting resources, monitoring the impact of changes and providing a framework to evaluate the models towards healthy cities (Flynn 1992).

Age is a strong confounder of mortality and morbidity of populations. It is not possible to correct many inequalities of health among different age groups. But the unfairness between different age groups, inter-generational inequities, has become an important issue in the US because there are limited resources for health care. The child programmes are vulnerable to cutbacks in financing. Benjamin et al (1991) showed that the growing number of the ageing population and faster growth in budget are at the expense of resources for children.

Minkler and Robertson (1991) made the statement that inter-generational inequity in the US is an "age/race war". The aged populations are composed of White people more than the younger age group. Politicians who are White rather than Black would prefer to finance health programmes for the aged than programmes for children. This may be called inequities among racial groups or the underprivileged, in a broader context.

Identifying this type of inequity has a complex implication for financing policy. It should not be so simple that those who benefit are those who pay. Because of caring externalities for health care, equity in financing health programmes for specific groups is an important issue.

Inequity in health care delivery

American health care commentators identify inequity of access as one of the most urgent problems. Between 30 and 40 million Americans lack any health insurance and another 50 million are inadequately covered (Greenberger et al 1991). For those who are inadequately, or not insured, they delay their care seeking resulting in longer hospital stays (Weissman et al 1991). It is the general consensus that the US health care needs reform.

> "The challenge for proponents of equity in the health arena is to avoid the eternal temptation to seize the high ground of "rights" to health care (or whatever), thereby entrusting the debate to philosophers, theologians, lawyers, constitutional scholars, and ideologues, who are rarely much concerned with the construction of political coalitions. What is needed is not a learned exegesis or spirited defense of rights but rather convincing arguments that new policies for the uninsured are the right thing for society to do." (Brown 1991)

In developing countries, physical distance and economic barriers may be the main causes of inequity of access. Gilson (1988) identified additional costs of poor physical access: transport costs, time costs including opportunity costs from a loss of income when seeking health care. Seasonality of disease patterns may increase need at a time of lowest mobility. These cause problems to the least advantaged groups of people.

After the colonial period, most government health services in developing countries were provided free of charge at the point of service. Faced with the problem of financing government services, the World Bank (1987) recommended that countries impose user charges to reduce wastage and increase equity. This recommendation has been criticised as it will create problems of access.

> "The demand-diversionary effect of charges, thus appears to be having important effects: it is not simply 'frivolous' utilisation that is being diverted. Although the evidence on health status is difficult to document with precision, and will remain so for some time, it seems clear that a trade-off between health status and revenue-generation is being implemented, often unwittingly. Equity in health care is thus deteriorating - already measurably, in terms of access to care, and probably also in health status differentials between socio-economic groups." (Creese 1991)

Policy implications for achieving equality of access in developed and developing countries may be different. In the US, the policy is to increase elegibility to health care via insurance schemes or other means. In developing countries, other social and economic developments together with health policy are needed.

Urban-rural inequalities have been shown everywhere in the world, particularly unequal inputs of health resources. Even in a country with strong state control like China, the distribution of doctors could not be corrected:

> "Economic factors are crucial determinants of the unequal distribution of physicians between rural and urban areas. Few physicians really want to stay in rural areas because of the relatively poor working and living conditions. Even the strong policies pursued during the Cultural Revolution could not eliminate inequality, when economic inequalities remained largely unchanged" (Lampton 1977, quoted by Song et al 1991).

Inequity in health care delivery in terms of distribution of health resources is not difficult to demonstrate. In the UK where primary care is well developed, regional variations in numbers of general practitioners in England in 1987 were low, but if all doctors in hospital and community health services were taken into account, regional variations were higher (Isaacs 1990). Similarly, numbers of available beds per 1,000 resident population in inner deprived areas of London in 1989/90 were higher than in other areas of London, but when only primary care providers (GPs and district nurses) were compared, the providers to population ratios in inner deprived areas were no better, or even worse than in other areas of London (King's Fund 1992).

Inequity in the financing of health care

Establishing inequalities in health and health care delivery by various parameters is not sufficient for corrective action. Studies on inequities in financing indicate the direction and level of resource allocation.

Basic arguments in the financing of health care are who pays for and who benefits from the health care system. Further questions asked are whether payments should be made before or at the time of service, and how much consumers should pay, at a flat rate or according to actual use. In a country where health services are made available to all, ie most of health expenditures are financed by general taxation, an important question to ask is whether the taxes are progressive or regressive. If regressive, ie taxes make up a higher proportion of the income of the poor than the rich, the health system is said to be inequitable.

Out-of-pocket expenditure is another source of health financing which puts a heavy burden on consumers. Percentage of out-of-pocket expense to household income is one indicator of equality of health expenditure. In Canada where access to health care is total, inequity of health expenditure still exists, though the gap has diminished:

> "In terms of the share of total family income spent directly on out-of-pocket expenses, while the gap between income groups narrowed during this period, the relative burden remain consistently higher for the poor than for the rich. These proportions were, respectively, 6.0 and 3.1 percent in 1964, 2.8 and 2.3 percent in 1972, and 2.5 and 2.1 percent in 1982." (Badgley 1991)

Health care financing policy can have a great impact on achieving equity of household health expenditure as in the case of Canada, where after the reform of health care financing in the 1970s, inequity of health expenditure diminished.

2.4 Efficiency in health care

Efficiency is of high concern because in any society there are limited resources. Maximisation of the welfare function is constrained by limited resources but it is also a function of technology and taste (Barr 1987). When health care technology evolves and consumer tastes vary, the state is faced with problems of underfunding. Increasing efficiency will reduce wastage and leave more resources for further use. Efficiency is maximised when three conditions hold simultaneously: efficiency in production (technical efficiency), efficiency in production mix (mix of inputs) and efficiency in consumption (meet consumer desires) (Barr 1987).

Applying these conditions to the health care environment, the production of health care must reach its highest outputs by using a good mix of inputs: doctors, nurses, other personnel, technology. At the same time, health care products must be well balanced to provide an appropriate level of utilisation without wastage. However, the production and consumption of health care are complex. Some products are more cost-effective than others. Culyer (1991a) gave four definitions of efficiency in health care:

> "Efficiency can be defined into four kinds. The first is providing only services that are effective in the sense that there is believable evidence that patients will enjoy better health with the interventions than without them. . . The second kind of efficiency is providing whatever effective services are provided at least resource cost. . . The third kind of efficiency is concentrating resources on those effective services, provided at least cost, that offer the biggest payoff in terms of health. . . The fourth kind of efficiency is providing such a mix of effective services at the least resource cost, and on such a scale, that the benefit from having more resources is no larger than their cost." (Culyer 1991a)

A framework for evaluating the 'efficiency' of the British NHS reform has been put forward by Brazier et al (1990). There are three levels of efficiency: technical efficiency, cost-effectiveness and social efficiency. The technical efficiency is concerned with the physical relationships between outputs and inputs. Cost-effectiveness here covers all kinds of economic evaluation of health programmes. Social

efficiency, in other words, global or high level or allocative efficiency, may involve social judgements about the benefits and costs of health programmes as compared to others; e.g. education, leisure, transport, housing, etc.

What are the barriers to health care becoming more efficient? Some argue, as discussed earlier, that it is because the specific characteristics of health care are not compatible with market mechanisms. Imperfect information puts the providers in a superior position and governs the agency relationship with consumers. In insurance and NHS models, both providers and consumers are not conscious of the costs of health care and may exhibit 'moral hazard' that increases total cost. The following part will discuss more on the experiences of market efficiency.

Culyer (1980) believed that health care services are public goods and should be provided collectively by the state. The market, though responsive to individuals' decision making, makes the price higher and is a less efficient way to respond to social preferences. But in 1989, when the NHS introduced market mechanisms in health care to increase efficiency, he and his colleagues supported the view that a competitive market in the form of an 'internal market' is better than a regulated system. A competitive market creates more information for monitoring and evaluation than a centralised system (Culyer et al 1990).

> "Collective interests of a whole country-such as law and order, the health and education of the nation-are plausibly most efficiently implemented by a national collectivity (ie. the central government). Clearly, depending on the nature and scope of the public good in question, there is a large variety of collective institutions that will be appropriate for different decisions. In every case, the delegation of decision making can be seen as a rational response of private individuals to the high costs of reaching agreements on every single issue involving public goods. In short, they are 'market type' reactions." (Culyer 1980)

> "Given an appropriate environment that rewards and punishes as it should, . . . there is every reason to expect that the provider market in the NHS will contribute much to improved performance, choice and value for money. The need, we suggest, is less for regulation than for ensuring an environment that is as competitive (or contestable) and open as it can be made and for the provision of central and regional support services that require and enable purchasers

> to seek out and scrutinise bids in the most searching way possible." (Culyer et al 1990)

Le Grand and Robinson (1984) also stressed bureaucratic inefficiency. Subsidies that arise when the government intervenes in the market to make a zero price to users are a cause of inefficiency. Price has merit in setting how many extra services are demanded.

> "The inefficiency associated with state "subsidies" arises because their existence encourages users to demand more of the services concerned than they would if they were charged the true cost. The value of the extra services demanded (as measured by the amount that people are willing to pay for them) must be less than their social cost. Hence, if the extra services are actually provided, there will be inefficiency, with services being provided that cost more than they benefit. If the extra services are not provided, then some arbitrary rationing method must be used to cope with excess demand (such as queues or waiting lists). This will inevitably result in some people with high valuations of the service not receiving it, while others with much lower valuations do; hence again there will be inefficiency." (Le Grand and Robinson 1984)

Viewed from the provider's side, Green (1985) argued that the market is more efficient than the centrally planned National Health Service. Doctors as providers of health care will choose the most cost-effective treatments for their patients. However, this is under the assumption that the majority of doctors are not under economic pressure.

> ". . . the factual evidence supports the conclusion that the market can supply more cost-effective health care than the NHS. Efforts to put NHS doctors under particular constraints, or to offer incentives intended to channel their efforts in a planned direction, will often be ineffective (if they are not counter- productive) because the decision-maker who devises the incentive (or penalty) does not, and 'cannot', possess the knowledge of all doctors who will be affected." (Green 1985)

As discussed before, the market is more or less appropriate for different health services. Pharmaceuticals are close in nature to goods for private consumption, hence some would argue that the private market can run efficiently. The market does not only operate at lower cost but guarantees distribution of drugs (availability) in the time of use.

> "Private enterprise functions most efficiently if market forces are allowed to operate independently and completely unfettered. Nonetheless, some government involvement is

> necessary to ensure the availability and proper use of affordable pharmaceuticals." (Vogel and Stephens 1989)

Encouraging efficiency through pricing is increasingly advocated in developing countries. However excessive concern about cost to achieve high cost recovery will create a problem of equity. A trade-off between efficiency and equity is often observed.

> "There may be a conflict between the goal of economic efficiency and social equity. A project that meets a cost-benefit criterion may also make the poor worse off." (Mishan 1977)

However, Giraldes (1990) argued that efficiency and equity need not contradict each other. In Portugal, financing hospital services was previously based on a technical efficiency principle, and later was combined with an equity principle which was already applied to primary health care. Three criteria were introduced: demand/utilisation, health situation and coverage by health services, to give different weights to achieve more equitable resource allocation. There was a great shift of resources to needy areas. Consequences of the transfers have yet to be evaluated.

2.5 Consumer choice and satisfaction

Libertarians respect individual 'freedom'; even egalitarians also count 'freedom' as one of their aims. When health care was regarded as a merit good, there were few complaints. In countries where health care is financed and provided by governments, complaints are also few. This does not imply that the services are good, but rather that people have limited choice.

> "There is a variety of ways in which the welfare state is said to be illiberal or coercive. Individual preferences for diverse services are overruled; the taxation necessary to fund the welfare state's activities is coercive; recipients of welfare benefits have to conform to specific regulations and conditions; the welfare state creates a psychological condition of 'dependence', thus reducing people's ability to make their own choices; producers' interests predominate at the expense of consumers' liberties." (Le Grand and Robinson 1984)

In the US, freedom is a basic philosophy in every walk of life. Health care also provides freedom for consumer and provider alike.

> "Many Americans instinctively reject any system they think would be bureaucratic, inconvenient, impersonal, or unresponsive to patients' needs and preferences . . . American physicians fear a system in which their professional judgements about patients' needs would be subordinated to political considerations." (Enthoven and Kronick 1989)

It is not clear whether freedom does good or bad to health care systems. Does consumer choice contribute to cost escalation in the US health care, or is it just a coincidence? The culprit may be the financing or delivery system. However, the world trend is for increased consumer choice.

> "The patient is to be better informed, probably via commercial marketing techniques, about factors affecting health and the relative merits of alternative providers of services and so better able to judge whether the services are worth the fee and which provider to seek out." (Roberts 1989)

When health care has become commercialised, consumers are more concerned about its quality and quantity. Dissatisfaction towards the health care system has been observed. The opinions varied from mildly dissatisfied to strongly dissatisfied with an expressed need for radical changes in the US (Blendon et al 1990). The issue has been at or close to the top of the political agenda in many countries.

In Britain, there have been a lot of surveys on attitudes towards the NHS. The level of dissatisfaction accumulated from 25% to 47% from 1983 to 1990 as measured by the British social attitudes surveys. Somehow, the proportion had dropped significantly from August 1991 to November 1991 as found by another set of surveys. It is believed that mass media communication played a role in 'floating' attitudinal changes (Judge et al 1992). The pre-election period provided the opportunity to discuss the immediate evaluation of the reforms rather than the issue of lengthy waiting lists.

Many health systems are now concerned to increase consumer choice. One aim is that when consumers gain more information about health care, the

health care system will be more accountable to the community. In the UK, where consumer choice in health care is limited, the NHS has issued the 'Patient's Charter' to make public health services more accountable to the consumer. It is assumed that consumers are in a better position to bargain for good health care.

> "On this point the Welsh charter is more innovative: "Try to be well informed about your health or condition. Ask questions so you can make decisions based on a better knowledge and understanding." That begins to sound much more like a partnership between patients and professionals and acknowledges that people have responsibilities for their health care too. At present the charter concentrates on what the NHS should be doing for the patient, but this is only one side of the bargain." (Stocking 1991)

When consumer choice cannot operate properly, there is another mechanism for making their voice heard by the provider. A collective voice of consumers will be louder and will be a powerful mechanism of control in health care:

> ". . . the increase in the numbers and type of providing agencies will make the monitoring and regulation of services more difficult. More than ever, health service users will have to rely on active pressure groups to campaign on their behalf and to keep health issues on the agenda." (Allsop 1992)

Consumer choice has an important implication for health care reform. It is easier for a country with limited choice to increase freedom, while it is harder for the US to change to a system that interferes with choice. This may be a reason why the US health system reform to contain high costs has not yet been consolidated.

> "Our strategy would be to encourage the spread of HMOs and other efficient delivery arrangements by giving all consumers a choice of plans that requires a consideration of costs. Those who prefer to keep traditional "free choice of provider" arrangements and are willing to pay the extra costs associated with them would be free to do so." (Enthoven and Kronick 1989)

2.6 Reforms of health care systems

Having reviewed three basic arguments of health care reforms separately in an earlier part, this section will discuss some examples of health care reforms in developed and developing countries to highlight how they

come together. It starts with examples in European countries which are far ahead in making reform a coordinated task (Schneider et al 1992). The section ends with examples from developing countries.

Health care reforms in European nations

There has been concern about the inequities of access for certain groups of populations and distribution of services by geographical areas across European countries in the last decade (Smith 1991). Health care costs in many countries have increased faster than the growth in GDP (the elasticities of health spending to GDP in the UK is 1.1, in Belgium it is 1.3, the same as in the US). There were clear signs of inefficiency in over-consultations, overuse of high technology equipment, etc. Associations between financing systems, health delivery systems, equity and efficiency in these countries have been established. Public payment by a contract model has been argued to be both equitable and efficient (Hurst 1991).

The share of public expenditure as a percentage of total health spending in Europe ranged from 62% in Portugal to 95% in Norway in 1989. Total health expenditure as a percentage of gross domestic product varied from 5.1% in Greece to 8.8% in Sweden. It has been shown that per capita health expenditure is positively correlated with per capita gross domestic product (Schieber et al 1991). Provision of health services shows greater variations from publicly dominated systems in Scandinavian countries (Sweden, Norway, etc.) to privately dominated in France, Germany, the Netherlands, etc. It has been observed that countries with compulsory health insurance schemes and applying cost containment measures (Germany and the Netherlands) successfully controlled growth in expenditure in the 1980s (Hurst 1991).

The objectives for reforms in the 1990s are as follow: equity in access, income protection, macroeconomic efficiency, microeconomic efficiency, freedom of choice for consumers, and appropriate autonomy for providers. All people should have access to a basic minimum of care, and have equal treatment for equal need. People should be protected from catastrophic threats of paying a high proportion of their income or wealth on health

care. Health expenditure should consume an appropriate fraction of gross domestic product. Health outcomes should be maximised while costs minimised for an appropriate mix of health care activities. Consumers should be able to exercise some choice over their treatment. And, lastly, doctors and other providers should have freedom to give treatment according to all of the above objectives (Hurst 1991).

The similarities in reforms are the equity, efficiency and choice issues. All countries were successful in increasing health care coverage especially through compulsory health insurance schemes. Detailed differences are observed from country to country. Many methods of cost containment, the most popular being global budgets, were implemented. Competition is being applied either to the side of third party payers (competition between public and private insurance companies as in the Netherlands) or the supply side (competition among public and private providers as in Germany, Britain). Purchasers of health care can be individuals (as in Sweden) or general practitioner fund holders and health authorities as agents (in the UK).

The WHO Task Force on Health Development for Countries of Central and Eastern Europe (WHO 1991b) supported the arguments of Hurst (1991) that public payment by a contract model is equitable and efficient. The reforms in Western European countries have spilt over to Eastern Europe. The "managed market" is seen to be a mechanism to revitalise public services to be competitive with the private sector and to be accountable to the public at large.

> "The new paradigm of intervention is not simply that of market-based liberalism nor one based on a model of technocratic control. Its principles centre on a decentralisation of responsibility, a new accountability for health outcomes, and a reconsidered role for the medical professions." (WHO 1991b)
>
> "Convergence of western Europe health systems upon a public contract or "managed market" model of financing and organisation reflects a recognition that privatising the provision of health care services will not, in itself, create a flexible and responsive environment. The public sector is being revitalised by creating a competitive internal environment, or through encouraging competition between public and private providers and insurers." (WHO 1991b)

Health care reforms in North America

The health care system in the United States provides a high degree of choice between alternative insurance schemes and health care providers. It has a plentiful supply of hospital beds, medical staff and the most up-to-date medical technology. The system is flexible and open to innovative experiments (Ham et al 1990). Health care financing is dominated by the private health insurance industry - large employer group plans and small individual group plans (Bodenheimer 1992). The government provides public assistance in the form of Medicaid and Medicare schemes for the disabled, the poor and the elderly. Government sources of health expenditure amounted to only 42% of total health expenditure in 1989, with the highest total per capita health spending among the OECD countries (Schieber et al 1991). The major providers are in the private sector, eg. 58% of short stay hospitals in 1987 were private not-for-profit, 27% for-profit and only 25% public hospitals (Ham et al 1990).

The American health system is now facing many problems as viewed by different authors. Aaron (1991) addressed three major problems: the rising cost of health care; lack of and inadequate insurance and increasing use of advanced technology without rigorous evaluation. The American College of Physicians (1990) focused on four problems faced by patients and physicians: inadequate access to health care; inadequate health insurance protection; costs continuing to rise, and a burdensome system for patients, their families and physicians. However, there is general consensus between these different viewpoints.

'The uninsured and underinsured' is the term used as a target group to campaign for health care reform. The uninsured are the group that lacks any insurance scheme and is estimated to be about one in eight to one out of four Americans depending on the period of the study (Aaron 1991). The underinsured are those who have inadequate insurance protection for major hospital and medical expenses and are estimated at about 50 million Americans (American College of Physician 1990). Altogether, both groups are currently as many as 70 million people (Brown 1992).

In brief, the dissatisfaction level of the Americans, especially those who are uninsured and underinsured, towards their health care system is remarkably high for it is inequitable, very expensive, and with less achievement in terms of health status. Many authors have proposed universal coverage of the system to reduce inequity (American College of Physician 1990, Bodenheimer 1992, Fein 1992). Previous reforms of the public reimbursement model (Medicaid, Medicare) have failed to contain the cost. Radical changes are needed. But above all, leadership in the reform is urgently needed (Thier 1991).

In 1945, about the same period as the foundation of the British NHS, President Truman first proposed a universal health plan for all Americans. Two more Republican presidents, Nixon and Ford supported universal, employer-based health insurance in the 1970s. With a massive lobbying effort by the American Medical Association and insurers, the plan has never passed through the Congress (Dukakis 1992). In the 1992 presidential election, health care was at the top of the election campaign (Cotton 1992). President Clinton's policies were strong in the areas of access, cost control and physician autonomy while the former president Bush's were strong on quality, liability and patient autonomy (Lundberg 1992a). However, a good proposal requires more than 5 years to see the impact of cost control (Fein 1992). The proposal should last longer than 5, 10 or 20 years before the system melt-down or collapse because no impact has occurred (Lundberg 1992b).

In contrast, the Canadian health care system is claimed to be the best in the world (Lalonde 1988, Badgley 1991). It provides comprehensive services to the whole population on the basis of need with a wide choice between doctors and hospitals (Ham et al 1990). Health expenditure was 8.7% of GDP and public spending was 75% of total health expenditure in 1989 (Schieber et al 1991). The introduction of universal, comprehensive and public financing in the 1970s and control of health expenditure in Canada has been contrasted with US health expenditure (Evans 1986).

Moving in the opposite direction to the US, the Canadian system prefers paying doctors by salary rather than paying by fee-for-service. A survey in 1989 revealed that 41% of Saskatchewan residents voted for salaried

doctors even though a few had experienced a salary system. Despite saving 15-20% of the costs of fee-for-service doctors, there was longer consultation time and more advice and counselling for patients (York 1992).

Nonetheless, Canada is faced with the problem of costs escalating faster than the growth of GDP (Deber et al 1991), and the gap of life expectancy between the rich and the poor is widening (Badgley 1991). Options for reforms are 1) Laissez faire, leave market mechanisms to resolve the problem; 2) Business as usual, intervene only as forced to; 3) Managed care, put controls on consumers and providers within the current system; 4) Manpower regulation, reduce physician numbers, switch reimbursement further away from fee-for-service; 5) System change, encourage fundamental changes in the system (Deber et al 1991). But the country cannot afford to go for a laissez-faire system. Other social change is needed to alleviate inequity in health.

Health care reforms in developing countries

In 1987, the World Bank recommended developing countries should increase the efficiency of the public health sector by imposing user charges. This in turn would increase the equity of access to people in rural areas as resources would be channelled from urban to rural areas (World Bank 1987). However, developing countries are at different stages of health system development. A few countries have for a long time imposed user charges as a normal means of financing service delivery while others provide total health coverage free at the point of use to their populations. This section reviews health care reforms in developing countries that have well developed private health sectors and that are, like Thailand, in South East Asia (or nearby).

China is a communist country moving towards a free market economy. The government views the private sector as a complement in providing health care in economic zones. South Korea and Singapore are the earlier newly industrialised countries (NICs). Their economic developments are of interest to Thailand as well as their health care systems, because Thailand is aiming to be an industrialised country. Malaysia is a

competitor to Thailand's economic growth, with a UK prototype health care system.

In the People's Republic of China, the Communist Party's resolutions in 1978 provided guidelines for private economic activities. In 1981, the Guangdong Provincial Government in the new economic zone issued a set of regulations for private practitioners (Yeun 1992). However, the latest figures in Griffin (1990) show that 100% of hospital beds were government owned. Health financing was dominated by insurance (50% of total expenditure), followed by private payment (31%) and public expenditure (19%). Total health expenditure was 4.0% of GDP.

The main objective of reform in China is to reduce inefficient management. After the Cultural revolution, hospital care and modern technology became the topic of reform at the same time that primary health care activities had to be maintained. By the early 1990s the private sector had grown substantially. This reform was initiated by bold local hospital administrators and was later approved by the Chinese State Council. The key features of the reform were (Yang et al 1991):

1. Decentralizing management responsibilities and local development;
2. Expanding existing facilities while introducing a range of financial incentives to medical staff to improve productivity and pay level;
3. Encouraging development of private practitioners and family hospital beds (a family hospital bed is a bed in a domestic residence serviced by health professionals); military hospitals to be made available to the public.
4. City hospitals to support rural and smaller hospitals by exchanges of staff, and to accept responsibility for patient care; contracts and programme funding have been developed to facilitate these arrangements;
5. Developing a system of health legislation;
6. Reforming the health insurance system.

The Chinese government now recognises the role of the private health sector in filling the gaps left by the public sector. A survey of consumers and providers of private health care in 1990 in Guangzhou Metropolitan, a pioneer in China's economic reforms, revealed that private medicine was too small as compared to its counterparts in commerce and industries. Even though the doctor to population and the

hospital beds to population ratios in this urban area were not low, the demand gaps left by the public sector seemed to be high. A set of policies encouraging greater competitiveness of the private health sector was recommended by Yuen (1992) to improve the quality and quantity of health services available and to minimise the side-effects of private medicine. However, Yu (1992) addressed that the reform in favour of economic zones would bring back high inequality in health care delivery and health status.

South Korea is remarkable for its economic development. The private sector dominates the country's economy. In 1987, government health expenditure was only 12% of total health expenditure, private health expenditure accounted for 67% and the rest 21% from insurance. Government hospital beds were 18% of total beds and total health expenditure accounted for 5.1% of GDP (Griffin 1990).

The health care system in Korea has achieved universal health insurance coverage within a short period. But the administrative cost of the system is higher as a percentage of total expenditure than in the US. It absorbed over 10% ranging up to 22% of operating expenses due to the verticalisation of the programmes (De Geyndt 1991). A great deal of effort was put into collecting premiums from farmers (15% of the population), reaching 90-94% collection rates in most villages, resulting in high administrative costs (Yu and Anderson 1992). Furthermore, extending coverage to the uninsured urban population (29% of the total population) aroused a very hot political debate because it is difficult to explain why other people should pay for the uninsured urban population (Abel-Smith 1992). The movements towards universal coverage are to ensure economic growth within a limited democratic system.

> "Unilateral government policies toward economic growth during the period of 1960-76, resulted in an unequal distribution of wealth among classes, and raised the issue of social equity. To avoid class conflict, the government had to introduce the concept of social welfare onto its policy agenda. The first result of such change was the introduction of a health insurance scheme. The government and the ruling political party encouraged the idea with the hope that it could somehow solve the inequities, injustices and ill-health inherent in the process of rapid industrialization." (Yang 1991)

Total expenditure on health is growing rapidly. The fragmented health insurance system and health provision which are in many respects similar to the US system caused a more rapid increase in cost than the US system. The elasticity of health spending to GDP of Korea was 1.6 whereas of the US it was 1.3 during the same period. The Korean health care system needs reform to increase efficiency.

> "Korea is now heir to the waste, costs, and maldistribution of free-market medical provision. Ironically, she has also inherited the least desirable features of administrative decentralisation in the face of limited democratic traditions." (Flynn and Chung 1990)

Decentralised health insurance management and private health providers are the causes of high costs in health care and inequities among different insurance schemes. To correct structural sector deficiencies, the following policy decisions are called for: 1) equity of access to services for all citizens, 2) cost containment to ensure reimbursement for most services provided to an insured population, 3) quality assurance of medical care in a financial environment where incentives are usually provided for more services (De Geyndt 1991).

Singapore is another country of the newly industrialised countries (NICs) with a growing private health sector. The government subsidised curative services for the poor treated in government hospitals but charged a high rate to the rich. The poor have less freedom of choice of doctor while the rich can choose their doctors when treated in government hospitals. This has caused an escalation of health care expenditure that the government did not wish to bear.

Based on the experience of the Central Provident Fund, which removes from the government the burden of providing housing, the Medisave programme was introduced to make employees able to pay copayments when they were ill. However, payments from Medisave went to public hospitals rather than the private sector because the public sector is still predominant in providing health care.

> In effect, the pre-plan hope of the Ministry of Health to transfer more of the health care cost burden from the Ministry budget to the patients by favouring the creation of additional proprietary institutions as *providers* of health care was not realised, but Medisave provided a means to

> shift expenditure away from the Ministry of Health budget to employers and workers as *consumers* by a form of prepayment without putting a strain on consumer income at the time of service. (Ruderman 1988)

Results from the 1987/88 Household Expenditure survey in Singapore show that monthly health expenditures were more or less progressive to household monthly income. Households in the lowest category of income (less than S$500 a month) paid 1.8% of their monthly income on health, and the second lowest (S$500-999 a month) paid 2.3%. Households in the band of S$2,000-3,999 a month paid the highest, 3.0% of monthly income. The second highest group (S$4,000-5,999 a month) paid 2.8% of monthly income on health, but the highest group (S$6,000 and over) paid only 1.9% of monthly income (Department of Statistic, Singapore 1990).

In Malaysia, the government health sector has been a major provider since British colonisation. Public expenditure is the major source of total health expenditure. Information in 1987 showed that 86% of hospital beds were owned by the government, 77% of total health expenditure was from taxation, and total health expenditure was 3.5% of GDP (Griffin 1990). In the 1980s, the government adopted strongly pro-private sector economic policies and the government also had to consider a policy on the public and private mix in health care delivery.

> "The government currently takes a flexible approach concerning the private sector in health care provision in the country guided by its policy of a free market system. The government views the private sector as playing a complementary role. However, since the private sector is mainly curative concentrated in urban areas and accessible to those who can afford it, the government's role is to:
> - provide care for all strata of society, both urban and rural, and free to those who cannot afford it.
> - be completely responsible for preventive health."
> (Ministry of Health, Malaysia 1991)

Several measures of promoting private sectors have been implemented in Malaysia. Private health insurance is encouraged to reach rural people by a tax relief policy. Contracting out has been implemented for non-clinical (eg. laundry, catering, security) and clinical services (eg. radiotherapy, computerised tomography). At the same time, the government

is considering legislation to control distribution of equipment and buildings (WHO 1991a).

2.7 Conclusions

Though health care reforms in many countries claim that the ultimate goals are equity, efficiency and choice, the most important motive seems to be efficiency. Market mechanisms are being extensively used to achieve efficiency and choice. Increasing efficiency through market mechanisms may jeopardise an equity principle. This research stresses three definitions of equity: equity in health, equity of utilisation and equity of financing.

Practical examples of health care reforms in developed and developing countries provide a good framework for this study. The public and private mix in financing and provision of health care plays a fundamental role in determining overall health expenditure. Payment mechanisms: out of pocket, third party payers, means of paying hospitals and doctors; are related to the cost of health care and equity of financing.

The British reform sheds light on how to increase public sector efficiency through competition, internal markets and maintaining equity through a tax-financed health system. The German system of global budget control effectively contains health care cost. The Canadian system is an example of a total public insurance model (without private health insurance), while the US has not yet developed a good proposal for reform.

In developing countries, China is an example of a communist country with privatisation policies both in the general economy and in health. South Korea has achieved total coverage for all groups but with very high costs. Singapore's Medisave programme is a good example of achieving equity of health financing. And Malaysia spells out strong policies on private health care and the government's responsibility.

2.8 Summary remarks of the chapter

The theories of society imply different distributional principles. The state through its political framework applies the principles to achieve social justice (equity). Strong state controlled countries with a collectivist's view may achieve equity to some extent but often are inefficient in production. Libertarians in laissez-faire countries use markets as a mechanism for increasing efficiency and consumer choice but at the expense of social fairness.

Equity, efficiency and choice have been the central issues of recent health care reform in many countries. They are basic aims of every society. The libertarian is concerned more about freedom or choice, the utilitarian maximises efficiency, and the egalitarian protects equity. The theories of society influence health care system variations. The specific characteristics of health care, to some extent, limit the role of the market in achieving efficiency.

Health care is a commodity that can be marketed. However the specific characteristics of health care make it difficult to go to entirely free markets. Most countries apply some form of state intervention to health care so as to guarantee social equity. However, the emergence of the New Right has revitalised ideas of the usefulness of the market so as to increase efficiency and choice. The internal market and managed competition are some of the new ideas.

Equity, the objective of state intervention, has many interpretations. The commonly used definition is Mooney's definition. Equity in health is the ultimate goal of health care in every country, even though health is influenced by many other socio-economic policies. Equity of input, equity of access, equity of expenditure are the intermediate steps for achieving equity in health.

Equity is defined as the fair distribution of economic and social goods across individuals. By Mooney's definition of equity, inputs, processes, outputs and outcomes of health care and health are treated as social

goods to be distributed fairly. The most powerful parameters for comparing this distribution are social class and geographical area.

Inequities in health and health care are demonstrable in all countries regardless of political economy. An egalitarian approach alone cannot either safeguard equity or completely remedy inequity. Improving efficiency can increase the resources available for redistribution and therefore increase equity. It is not always the case that efficiency is increased at the expense of equity.

Health care resources are limited in spite of increasing demand and escalating health expenditures in almost all countries. The government cannot cope with the demand for budget increases. The market approach is seen as one mechanism for distribution of health care to achieve efficiency, choice and equity in the end. Private sectors are given a role in most recent health care reforms.

3. THE PUBLIC AND PRIVATE MIX OF HEALTH SERVICES IN THAILAND

This chapter reviews the Thai health care system which has its own particular characteristics. The absence of overt colonisation has encouraged a mix of public and private health services. The chapter begins with descriptions on health care financing and provision. It then explores the issues of equity, efficiency and choice in relation to the present public and private mix. It further reviews some remedies in terms of regulations that have been introduced into the system.

3.1 Health care financing

Westernised health care entered into Thailand (formerly called Siam) in the 1860s (Singkaew 1991). Previously, traditional medicine was provided to clients free of charge at the point of service, but clients paid the doctors when treatments had been successful. The culture of paying a hospital and paying a doctor has continued for modern health care: clients have to pay for treatments even in public hospitals. This history has influenced the pattern of health care financing. Household expenditure has been a major source of finance (see table 3.1).

Myers et al (1985) were the first group to present the distribution of health expenditure by sources of finance. They found that household expenditure was consistently high at about two thirds of total health expenditure (data of 1978 and 1981). Public sources of finance were the next major payer, at about 30% of total expenditure. The striking rise of foreign aid in 1981 compared to 1978 was probably due to the capital costs of expanding the coverage of community hospitals to rural areas according to primary health care policy (Tangcharoensathien 1990).

The National Economic and Social Development Board (NESDB) applied the same method as Myers et al to study the health care financing patterns of 1984 and 1987 (see table 3.1) (Thai Government 1988). A longitudinal trend can be seen, with the public share of finance decreasing and that of household expenditure rising. A big warning in the interpretation of table 3.1 is that household expenditure was overestimated because no allowance was made for reimbursable expenses (Tangcharoensathien 1990).

Table 3.1 Percentage distribution of health expenditure by sources of finance

Sources of finance	1978	1981	1984	1987
1. Public				
Ministry of Public Health	20.0	17.9	17.4	14.1
Other ministries	8.5	8.1	6.9	6.0
Government employees	2.0	3.2	3.6	4.1
2. Workmen Compensation Fund	0.4	0.5	0.5	0.4
3. State enterprises	0.4	0.3	0.8	0.8
4. Private insurance	1.3	0.9	0.8	0.7
5. Foreign aid	1.0	2.6	0.8	0.7
6. Household expenditure	66.5	66.6	69.3	73.2

Source: Myers et al (1985) for 1978, 1981 data
The Thai Government (1988) for 1984, 1987 data

Though the overall share of public sources of finance has been decreasing, the expenditure for government employees has been increasing, ie. from 2% in 1978 to 4% of total health expenditure in 1987 (table 3.1). Table 3.2 shows a clearer picture of this rise. The public expenditure for government employees is a kind of fringe benefit given to government employees (civil servants, comprising permanent employees and their dependents and temporary employees) to cover hospital care in public and private hospitals and ambulatory care in public hospitals only. The health benefits have increased more rapidly than total fringe benefits and the government payroll. Finally, the share of health benefits for government employees in the total government budget has increased from 0.4% in 1978 to 1.5% in 1990.

Table 3.2 Trends of public expenditure for government employees

	1978	1981	1984	1987	1990
Health benefits (mil. baht)	595.2	988.0	1,774.9	2,801.1	4,315.5
% of total fringe benefits	na.	8.4	9.9	12.9	17.5
% of government payroll	3.1	2.9	3.1	4.1	4.2
% of government budget	0.4	0.8	1.1	1.4	1.5

Note: na. = not available
Source: Central Comptroller Department

Total government expenditure on health has been consistently at about 7-8% of the total government budget (Thai Government 1988). Table 3.3 shows the changing patterns of government revenue which make up the

government budget. The major sources of government revenue in 1977 were import and export taxes (27.8%). By 1987, the specific sales taxes (29.6%) provided the largest share. However, the share of direct taxation from income has changed only slightly (from 15.7% in 1977 to 18.7% in 1987).

Table 3.3 Percentage distribution of government income by sources of revenue

Sources of revenue	1977	1987
Direct taxes	15.7	18.7
General sales taxes	21.5	17.6
Specific sales taxes	21.5	29.6
Import/export taxes	27.8	19.7
Fees and permits	0.8	2.7
Other duties	5.4	0.3
Sales of goods and services	2.1	3.0
State enterprises	3.1	5.0
Others	3.8	3.5
Total income (million Bahts)	52,104	191,621

Source: National Statistical Office 1988

Table 3.4 shows the trend of total health expenditure since 1978. During the past decade, health expenditure, including both public and private spending, has increased from 3.4% of GNP in 1978 to 5.7% of GNP in 1987. From 1981, the increases in health expenditure have been faster than the increases in GDP. This rapid increase is due to the growth in private expenditure rather than public expenditure. The projection to the year 2000 by the NESDB shows the spiralling rise in health expenditure. Total health expenditure is projected to reach 8.1% of GNP which is the level of spending in developed countries.

As household expenditure is the major source of health care financing, further details are given here. In 1988, about 3.4% of total household expenditure was allocated to medical care. Of this, 22% was for drugs, 36% for medical services in public hospitals, another 36% for medical services in private clinics and hospitals and 6% for other medical services (NSO 1990). The share of expenditure on drugs in monthly household health expenses has been decreasing (from 32% in 1981 to 22% in 1988) while the share of expenditure on institutional medical

services has been increasing. Moreover, the share of expenditure on medical services for public hospitals has been decreasing (from 50% of monthly expenses on institutional medical care in 1986 to 46% in 1988) while the share of expenditure on medical services for private clinics and hospitals has been increasing (from 40% of institutional medical care in 1986 to 46% in 1988) (Tangcharoensathien 1990). This corresponds with the studies on income elasticities of demand for drugs and medical services by Myers et al (1985) and Tangcharoensathien (1990). Table 3.5 shows that a 1% increase in household income (national average household income), decreases expenditure on drugs by 0.69%, but increases expenditure on medical services by 1.62%. However, the overall expenditure on medical care increases as household income increases: this corresponds with the projection in table 3.4.

Table 3.4 Trend of total per capita health expenditure (public and private spending) in the past decade and the projection to the year 2000 (1987 prices)

Year	% of GNP on health	Per capita expenditure (Baht)	% increase health expenditure	% growth of GDP
1978	3.4	680	-	-
1979	3.6	710	4.4	5.05
1980	3.9	738	3.9	4.57
1981	4.2	798	8.1	5.96
1982	4.6	864	8.3	3.90
1983	4.8	939	8.7	6.76
1984	5.2	1,052	12.0	6.65
1985	5.6	1,132	7.6	3.40
1986	5.6	1,192	5.3	4.30
1987	5.7	1,282	7.6	7.74
Projected				
1988	5.8	1,389	8.4	5.5
1989	6.0	1,506	8.4	5.5
1990	6.1	1,634	8.5	5.6
1991	6.3	1,774	8.6	5.6
2000	8.1	3,718		

Source: Social Development Project Division, NESDB 1990
Note: The projected growth of GDP in 1988 to 1990 was under-estimated. It was actually 12.0% in 1988 and 10.8% in 1989 (The Bank of Thailand 1990 quoted by Tangcharoensathien 1990).

Table 3.5 Income elasticity of demand for medical care, 1981 and 1986/88

Income elasticity of demand for	1981 (1)	1986/88 (2)
Drugs	-0.69	-2.6
Medical services	1.62	1.7
Medical care	0.25	0.57

Note: (1) Myers et al 1985
(2) Tangcharoensathien 1990

Thus Thai health care financing is dominated by private household expenditure, though the public hospitals claim that they cater for poor patients. The pluralistic characteristics of the Thai health care - public and private, formal and informal sectors - absorb a large portion of private expenditure, especially expenses for drugs. Hospital care was a cause of escalation in health expenditure. The share of public spending of total health expenditure in the 1980s was decreasing (from 18% of total health expenditure in 1981 to 14% in 1987), but expenses for the privileged group 'civil servants' were increasing. Private health insurance's share of total health expenditure was minimal and decreasing. It is expected that some changes in the financing pattern will become obvious in the 1990s, because of the implementation of the Social Security Act from 1991 onwards.

Health insurance and health benefit schemes

Table 3.6 shows the different schemes of health benefits and health insurance in 1991. Sources of finance and beneficiaries for different schemes are discussed briefly.

Civil servants and employees, their spouses, children and parents are entitled to use free care at public health facilities and limited services, eg. inpatient care and special investigations, at private health facilities. Funds for these fringe benefits come from general taxation without any contributions from civil servants or employees and are controlled by the Central Comptroller Department, Ministry of Finance. It was estimated that in 1991, 5.6 million people (9.8% of

total population) were covered and used up 4,315.5 million Baht. Health expenditure from this scheme was about 770 Baht per person per year.

State enterprise employees acquire health benefits very similar to the civil servant health benefits. Deductions from their incomes are not made for these benefits. The benefits are financed by corporate revenue. There are great variations among state enterprises in whether they provide coverage to their employees only or extend coverage to their dependents. Big and financially secure state enterprises tend to reimburse health expenditures for both outpatient and inpatient care at public and private hospitals. In 1991, 0.8 million people (1.5% of total population) were covered by state employee benefit. Expenditure per person per year was 733 Baht, very similar to expenditure for civil servant health benefits.

Table 3.6 Health benefit and health insurance scheme in Thailand 1991

Schemes	Target population million	% of total population	Expenditure million baht	per capita	Source of finance
Civil servant and employee	5.6	9.8	4,315.5	770	General tax
State enterprise employee	0.8	1.5	564.1	733	Corporate finance
Free medical care	10.7	19.0	2,500.0	233	General tax
Workmen Compensation Fund	1.7	3.3	396.9	233	Employer liability
Social Security Scheme	2.2	3.8	1,540.0	700	Tripartite contributions
Health card project	2.7	5.1	183.0	68	Community finance
Free medical care for the elderly	3.5	6.2	267.5	81	General tax
School health insurance	6.7	12.2	180.9	27	General tax
Private insurance	0.2	0.5	445.2	1,855	Private payment

Source: Health Planning Division 1992

In 1975, the Parliament granted a specific budget for the low income group to entitle them to free medical care at public health facilities. It was intended to create equity in receiving medical care among the people. Families with income less than 2,000 Baht a month or individuals with income less than 1,500 Baht a month apply for a low income card in order to get access to free medical care at public health facilities. Because the cards are issued and renewed once every three years, many poor families are not given low income cards. However, public health facilities have provided more free medical care to the poor without a

low income card than to the poor with low income cards. In 1991, 10.7 million people (19.0% of the total population) were low income card holders and a budget of 2,500 million Baht was allocated to the free medical care to the poor scheme. It is estimated that 233 Baht was allocated for one person per year.

Because Thai politics is very averse to socialism and communism, the schemes for social security have been introduced slowly. In 1974, the Workmen Compensation Fund was founded by order of the Military Government. Employers of establishments with more than 19 employees are liable to pay contributions to the fund. The Fund provides benefits to employees to cover the cost of treatment and to compensate for income loss from injuries and illnesses related to work. The Workmen Compensation Fund reimburses expenses at both public and private health facilities with an upper limit of 30,000 Baht per episode of illness. In 1991 there were 1.7 million workers (3.3% of total population) under this scheme and the Fund reimbursed 396.9 million Baht to health facilities. Expenditure for work related illnesses was estimated to be 233 Baht per worker per year.

The Social Security Scheme is the result of the Social Security Act passed by Parliament in 1990 after efforts lasting 26 years. During the first three years of implementation, working establishments with more than 19 employees are covered by this scheme. Employees are obliged to contribute 1.5% of their salary to the fund, while employers and the government both contribute the same amount to the fund. Target groups of the Social Security Scheme include workers (at that period the same group as covered by the Workmen Compensation Fund) and also their dependents. The scheme allows them to use public and private health facilities which sign a contract with the Social Security Fund. The Fund allocated 700 Baht per capita per year to the main contractor according to the number of registered workers and dependents. In 1991, 2.2 million workers and their dependents (or 3.8% of the total population) were covered by the Social Security Fund and a budget of 1,540 million Baht was allocated.

The health card project was initiated by the Ministry of Public Health in 1984 as a form of community financing. The idea was to develop voluntary health insurance in rural and urban areas at a time when there was little hope of compulsory health insurance. Clients bought health cards (family/ individual cards, mother and child cards) through village health volunteers to cover expenses at health facilities of the Ministry of Public Health. Health card funds or multipurpose community development funds were established at village level to pay health facilities a fixed percentage of the card price according to the level of health facilities. The government allocated a minimal budget for operating this project. However, cost recovery of the health card scheme at district and provincial hospitals was lower than 50%, that means another government budget was used to subsidise the health card scheme. In 1991, 2.7 million people (5.1% of total population) were covered by the health card project and 183 million Baht was raised through the community financing mechanism.

In 1989, the Ministry of Public Health proposed a new budget line shared with the Ministry of Education for a school health insurance scheme. It was intended to provide all primary school students with free medical care at public health facilities as these students are in school and the teachers were responsible for care. In 1991, there were 6.7 million students, making up 12.2% of total population. A capitation rate of 27 Baht per student was calculated for this programme.

The issue of the inadequate health budget for low income groups was raised in the Parliament in 1989, and many Members of Parliament (MPs) expressed their sympathy with free medical care for the poor. A new budget line for free medical care for the elderly was explicitly specified, despite the fact that a policy of giving free care to the elderly had been publicised since 1981. It was estimated that there were 3.5 million elderly people (6.2% of the total population) in 1991 and the Parliament managed to allocate 267.5 million Baht under this budget line.

The private health insurance market is still limited in Thailand. It was estimated by Kolakul (1989) that there were 236,100 people covered by

various policies of private health insurance. The most common policies were life insurance with health benefits and group health insurance purchased by private firms or state enterprises. The minority was individual health insurance. There are great variations in the premium rates and health benefits provided by different policies. In 1991, private health insurance paid 445.2 million Baht for health expenditure, which was about 1,855 Baht per person per year, the highest expenditure per capita among all health benefit schemes.

The health benefits and health insurance as shown in table 3.6 are not mutually exclusive, eg. those who are covered by civil servant benefit may buy a private health insurance policy or buy a health card. There is no information on the extent of multiple health benefits so it is not possible to estimate clearly how many were left uncovered. However, in a study of a rural area, Hongvivatana and Manopimoke (1991) estimated that 1.6% of rural people were covered by multiple health benefit schemes and 56% of rural people were left uncovered. In urban slum areas of Chiangmai, where the health project was implemented, Tangcharoensathien (1990) estimated that 15% of urban slum people were covered by family health cards, 20% by low income cards, 10% by civil servant benefit, 6% by other schemes, another 6% were covered by multiple schemes and 43% were uncovered.

3.2 Health care provision

At the time of feudalism, Thai health care was provided by the private traditional health sector. The earliest western medicine entered with the French imperialists during King Narai of Ayudhya reign (around 1460). It was reinstated again in the reign of King Rama III (1844) by Dr Bradley, an American missionary doctor. In the period of King Rama V, the first government hospital was built in 1888 to commemorate the loss of his son. But actually the first private hospital was founded in Petchaburi province by a group of missionary doctors in 1883, five years earlier (Singkaew 1991).

Not until the reign of King Rama V did western medicine gain its popularity. Western medicine has become indigenous because the first

medical school was established with royal permission in 1890. King Rama V foresaw that Thai traditional medicine would become obsolete.

> "(The plan of setting up a medical school is) approved. But I warn that, foreign doctors are good, should they disappear or not? Thai doctors will not exist in the future, will they? I, myself, still prefer Thai medicine, and feel safe with Thai doctors. If Thai doctors behave like foreign doctors, every thing will be cold. No regards are given to monks and the respectable. However, I am too old to live to the time that all Thai doctors do not exist. Younger generations will be pleased with foreign medicine. No one would be worried as I do. This is just a warning from a conservative man" (quoted in Siriraj Medical School 1990)

The earliest household survey of health seeking behaviour was carried out by the Health Planning Division in 1970. Later surveys by the Health Planning Division and the Institute of Population and Social Research (IPSR) in 1979 and 1985 show that self-care as a means of acute illness alleviation (including self-prescribed drugs) has decreased from 54.1% of total acute illness to 46.5% and 28.6% respectively (Thai Government 1988). Table 3.7 compares the changing patterns of health seeking behaviour in 1979 and 1985 between urban and rural populations. Traditional medicine was the least consulted means of care in both urban and rural populations, and it decreased in popularity. Self-prescription, which included self care, was more prominent in rural areas than in urban areas. It has given way to formal health care; government hospitals and the private health sector. The private sector slightly increased its share in rural areas but had a decreased share in urban area. During the 6 years (1979 to 1985), government hospitals became very popular in both rural and urban populations.

Table 3.7 Percent distribution of health seeking behaviours of urban and rural people in 1979 and 1985

Pattern of behaviours	Urban 1979	Urban 1985	% change	Rural 1979	Rural 1985	% change
Self-prescribed	36.4	13.6	-62.6	44.0	24.6	-78.9
Health centre	4.9	0.7	-85.7	20.0	16.6	-17.0
Government hospital	14.1	41.2	+192.2	8.8	29.5	+235.2
Private health sector	41.6	38.3	-7.9	14.5	16.3	+12.4
Traditional medicine	3.0	1.0	-66.7	7.1	2.8	-60.6
Others	0	5.3		5.5	10.2	

Source: Thai Government 1988

The changing patterns in table 3.7 can be partly explained by an increase in supply apart from the implications of income elasticity of demand for medical care as shown in table 3.5. Furthermore, it is not clear that the methodology of the two surveys by the Health Planning Division and the IPSR were the same (Thai Government 1988). The history of Thai westernised health services is dominated by the state-owned hospitals. The first group of private hospitals were not-for-profit hospitals in urban areas. During the fourth and the fifth National Health Development Plans (1977 to 1981 and 1982 to 1986), there were policies to expand regional and general hospitals in provincial districts and to build new community hospitals to cover all districts. The growth of government hospital beds is shown in table 3.8. The share in total utilisation of public hospitals then rose.

Table 3.8 The trends of growth of public hospitals outside Bangkok

Hospital beds	1977	1982	1987	1990	1996*
Regional	8,216	10,286	11,190	11,339	14,625
%increase/yr	-	5.0	1.8	0.4	4.8
General	14,991	18,615	20,261	20,063	25,575
% increase/yr	-	4.8	1.8	0.6	4.0
Community	3,412	6,765	11,430	na	20,800
% increase/yr	-	19.8	13.8	-	9.1

* Expected from the seventh National Health Plan (1992-1996)
Source: Pannarunothai et al 1992

Besides the growth of public hospitals, the private for-profit health sector has grown rapidly from 1970 onwards: it has tripled in the number of hospitals and quadrupled in the number of beds (Thai Government 1988). By 1989, private one-man-solo clinics and polyclinics were the major provider of out-patient care (though bear in mind that hospitals provide out-patient care as well) and private hospitals have expanded to 31% in number and 14% in bed capacity of total facilities (see table 3.9).

The growth of private hospitals was faster than that of public hospitals. Table 3.10 shows that the growth rate of private hospitals was nearly ten times that of public hospitals during 1967 to 1978 (bearing in mind the denominator of private hospital beds was far smaller than that of public hospitals), and it was about twice the rate

during 1978 to 1990. This made the share of private hospital beds to total beds rise from 2% in 1967 to 10% in 1978 and 14% in 1990.

Table 3.9 Percent distribution of health infrastructures between public and private sectors, 1989

Health Infrastructures	Public		Private	Total	(Number)
	MOPH	Other ministries			
Hospitals	61.4	6.2	31.4	100	(1,127)
Beds	63.2	23.1	13.7	100	(93,154)
OP clinics	0.5	3.1	96.4	99	(7,716)
Health centres	100	0	0	100	(7,880)

Source: Health resource survey, Health Statistics Division, MOPH

Table 3.10 The growth of private hospital beds compared to public hospital beds

	Private hospitals beds	Private hospitals %increase*	Public hospitals beds	Public hospitals %increase*	%private beds of total beds
1967	1,017	-	44,227	-	2.2
1978	5,528	40.3	52,014	4.4	9.6
1990	13,316	11.7	80,377	4.5	14.2

* Average increase per year

Source: Health Statistic Division and Medical Licensing Division

The growth of private hospitals was widespread. Table 3.11 shows that the growth of private hospitals outside Bangkok has been more dramatic than in Bangkok. In 1988, 1990 (and in the projection for 1994). This causes the share of total private hospital beds outside Bangkok to exceed that of Bangkok by 1994. The slow-down in Bangkok may be a sign of saturation, whereas the hectic booms outside Bangkok were the result of the promotion by the Board of Investment which stimulated capital investment in health care, and by the banks in giving loans for investment outside Bangkok (Ngarmwuthiporn 1992). Moreover an increase in consumer demand was met by a good supply of doctors who joined private hospitals as doctors' income was four to eight times higher than in the public sector (Chunharas et al 1992).

Table 3.11 The growth of private hospitals in and outside Bangkok

	In Bangkok		Other than Bangkok		
	beds	%increase*	beds	%increase*	% of total private beds
1978	3,041	-	2,487	-	44.9
1987	5,935	10.6	4,390	8.5	42.5
1988	6,322	6.5	5,166	17.7	45.0
1989	6,726	6.4	5,224	1.1	43.7
1990	6,994	4.0	6,322	21.0	47.5
1994	10,959	14.2	11,082	18.8	50.3**

* Average increase per year
** Expected figure from Board of Investment
Source: Medical Licensing Division and Board of Investment

The private hospitals provide almost the same hospital care as government hospitals do, ie. ambulatory, accident and emergency, inpatient care and also preventive and promotive services. Both of them target the same group of people with health benefit coverage. The government employees are one group. Table 3.12 shows the trend of government expenditure to cover the health benefits of its employees together with the percentages of these benefits that were given to private hospitals. In 1988, about 8% of the government budget for health benefits went to private hospitals. It increased to 12.8% in 1990; if the increasing trend of the total budget were taken into account (rates increased by 12% in 1989 and 23% in 1990), the rate of increase would be even higher.

Table 3.12 The trends of government employee health benefit and reimbursement to private hospitals

	Total (mil baht)	% increase	Reimbursed to private hospitals mil baht	% of total
1981	988	-	na	na
1982	1,213	22.8	na	na
1983	1,482	22.2	na	na
1984	1,775	19.8	na	na
1985	2,128	19.9	na	na
1986	2,589	21.6	na	na
1987	2,801	8.2	na	na
1988	3,156	11.7	248.7	7.9
1989	3,521	11.6	400.6	11.4
1990	4,316	22.6	551.6	12.8

na not available
Source: Central Comptroller Department

3.3 Equity in health

In a limited information environment as in Thailand, few studies can prove inequity by the definitions in chapter 2. Evidence produced by the Thai Government (1988) shows differences in health expenditures per capita by occupational groups and health benefit groups. Distribution of hospital beds in relation to population shows the lowest ratios in the Northeast region, the poorest part of the country (Provincial Hospital Division 1987). Furthermore, the government health budget allocated to the health infrastructure, when calculated in terms of inputs per capita, shows disparities among regions. However, this evidence is subject to the error of not including private health expenditures or inputs from other sectors.

In highlighting the health needs of the population, it is unfortunate that no comprehensive summary indicators, such as standardised mortality ratios (SMRs) by social class, are available. Apart from SMR, social class which has long been developed in the UK has yet to be studied in Thailand. The study of Mortality and Morbidity Differentials (MMD) in Thailand in 1986 (IPSR 1988) attempted to present inequities in health. Urban-rural, regional, occupational (according to the National Statistical Office's classification) and educational differentials were used as the characteristics for comparison.

The first indicator used was infant mortality rate (IMR). The data from the 1980 census and 1984-86 Survey of Population Change (SPC) at the mid census period established prominent differences in infant deaths in different occupational groups. Furthermore, urban/rural differentials were marked especially in administrative and service worker groups (see table 3.13).

Table 3.13 Indirect estimate of IMR from 1980 census and SPC 1984-1986 by occupation of mother

Occupation	1980 Total	1980 Urban	1980 Rural	1984-1986 Total
Administrative, executive, managerial and government official	22.4	12.7	27.8	16.7
Sales	34.7	33.5	34.8	27.8
Agricultural/farmer	47.8	49.4	45.6	38.9
Service worker	33.9	33.4	41.6	27.3

Source: adapted from IPSR 1988

Table 3.14 Major causes of death between urban and rural population, 1985 (Rate per 100 000)

Urban population Causes of death	Rate	Rural population Causes of deaths	Rate
Accident, suicide, homicide	58.4	Senility without psychosis	98.0
Senility without psychosis	42.1	Accident, suicide,homicide	78.6
Heart diseases	40.7	Malignancy	54.2
Malignancy	36.0	Pneumonia, bronchitis	42.1
CVA	27.8	Heart diseases	37.3
Pneumonia, bronchitis	17.7	Conditions originating during perinatal period	35.2

Source: IPSR 1988

Mortality data from the Survey of Population Change further established differential mortality experiences for children and adult groups. Deaths in most age groups were more prevalent amongst rural people (crude death rate 5.7/1,000) than urban dwellers (3.3/1,000) and Bangkok dwellers (3.0/1,000). The Central region, the most affluent, had a crude death rate of 4.3/1,000 while the Northeast, the poorest, had a crude death rate of 5.9/1,000. Almost all disease categories hit harder on rural than urban populations, except for heart diseases (see table 3.14). When limited information on occupation is analysed, farmers were more prone to premature death than labourers and clerical/sales workers (see table 3.15), and the uneducated had the worst rural and urban death rate (see table 3.16). The major weakness in these rates is that they are not standardised for either age or sex. These important confounding factors would be distributed differently between the rural and urban dwellers, and among different occupational groups. Rural-urban migration of the

working population tends to leave their children and parents in rural areas. And the large group of 'did not work' should be reallocated to the same occupational group as the head of household.

Table 3.15 Death rate per 100 000 population aged 11 years and over by occupation, 1985/86

Occupation	Rate
Administrative, executive, managerial and government official	170.8
Sales	262.1
Agricultural/farmer	399.9
Service worker	184.2
Transport worker	629.5
Labourer	318.1
Did not work	855.9

Source: IPSR 1988

It is interesting when data on attendant at death or before death are presented. If a death event attended by a medical doctor is used as an indicator of access to medical care, then the urban population had greater access to medical care than the rural population (60% as opposed to 40%, IPSR 1988).

Table 3.16 Death rate per 100 000 population age 6 and over by education level, 1985

Education level	Rate
None	1,533.6
Primary	338.5
Secondary	167.6
Tertiary	168.9

Source: IPSR 1988

Morbidity and utilisation of health services are better illustrated by data from the quinquennial National Health and Welfare Survey (HWS). In 1986 (NSO 1986), the prevalence rate of acute illness in the past 2 weeks for the rural population was 7.3% while for the urban population it was 5.0%. In contrast, the admission rate of maternity during the past 12 months for the rural population was 33% of total deliveries and urban population 49%. The results of the 1985 survey by the Morbidity

and Mortality Differentials (MMD) (IPSR 1988) were twice as high as the rates of 1986 HWS (because the MMD asked for acute illness during the past 30 days), but urban-rural differentials persisted. Use of drug stores and self prescribed treatments were higher in rural than urban areas (32% of total illness and 17% respectively). The prevalence rate of illness in urban slum areas was even worse when compared with the rate of urban areas found by HWS. Tangcharoensathien (1990) found a rate for acute illness and injury in last two weeks of 22.6% of the total population in Chiangmai urban slums. Drug store use including self-prescribed treatment was as high as 28% of total illness episodes (Tangcharoensathien employed both participant-observation and quantitative techniques in data collection).

From table 3.6 describing the financing of different health benefit schemes, it was apparent that there were inequities of expenditure per capita among different schemes of health benefits. In interpreting the expenditure figures, it has to be clarified that the figures for the Workmen Compensation Fund, private insurance, government employee and state enterprise employee were the actual amounts spent, while the figures for the rest were allocated budgets. The per capita expenditures that were calculated from actual expenditure were higher than those estimated from allocated budgets. It is more often the case than not that allocated budgets are used up and the beneficiaries of that scheme have to be transferred (in terms of the account books) to other schemes (finally the general budget of the health institution covers the deficit of allocated budgets for special programmes). This underestimation therefore explains to some extent the inequalities of expenditure per capita. Nonetheless, the inequities amongst schemes that are financed by general tax revenues show clearly that government and state enterprise employees were the most privileged groups. Private insurance schemes gave the highest benefits of all groups.

The scarce data presented here are not strictly comparable. However, they reflect inequities of health in Thailand, regarding urban-rural, regional, occupational and education differentials with respect to expenditures, inputs, health needs and utilisation.

3.4 Efficiency in the Thai health system

The available data presenting the efficiency of the Thai health system can be classified into three aspects of efficiency. Firstly, efficiency in production is reflected by studies on hospital costs. Secondly, efficiency in terms of income generation is reflected by information on cost recovery. And thirdly, efficiency in terms of productivity of health resources is reflected by workload studies.

The first study on hospital costs in Thailand was done by Vasuprasart (1979). He constructed costing models to identify significant variables that explained cost variations in 11 hospitals in Bangkok. All of them were public hospitals belonging to medical schools, Ministry of Public Health, Ministry of Defence, local government and state enterprises. He found that inpatient cost per case was lowest in a hospital of 542 beds with around 29-33 cases per bed per year, though the sample was small.

In 1980, the Ministry of Public Health studied the unit costs of provincial hospitals compared to community hospitals and health centres. Using cost accounting techniques, it was found that the cost of treatment for both outpatient visits and inpatients in provincial hospitals were the highest, whereas the costs in health centres were the lowest (Kanjanakul et al 1984a and b). There was no information explaining the quality of treatments in those health institutions.

In 1988, there were at least four published papers on unit cost studies in public hospitals (Tangcharoensathien et al 1988, Rungthanapirom et al 1988, Supachutikul 1988 and Pongprasert 1988). All of them employed cost accounting techniques to analyse each individual hospital. The results of these studies, especially on the allocation of labour and operating costs to patient service departments, were used as a basis for resource allocation criteria in a hospital cost function study. The Health Planning Division (1991) analysed routinely reported data from 17 regional hospitals and 72 general hospitals from 1988 to 1990 to construct models to explain hospital costs. It was found that low unit costs were associated with high throughput, low staff to bed ratios,

shorter lengths of stay, fewer beds, not acting as a regional hospital, low surgical rates and absence of teaching activities in the hospital.

The published studies on hospital costs in Thailand have studied public hospitals only, not private hospitals. Indirect studies on the hospital charges of private hospitals were done by Siripanich (1979) and Phijaisanit et al (1984a). Seventy one percent of users at private hospitals in Siripanich's study commented that the charges were too expensive. Phijaisanit et al documented that doctor fees in private hospitals were the major cause of high charges.

Higher prices for private hospital care cannot be interpreted as low efficiency in economic terms. Further analysis of Phijaisanit et al (1984a) showed that lengths of stay of patients in private hospitals were usually a day shorter than in public hospitals. Quality assessment by independent groups of medical experts admitted that the outcomes of both for-profit and not-for-profit private hospitals were kept within good standards.

The second efficiency indicator, cost recovery, is also available for public hospitals. The Health Planning Division (1989) estimated that cost recovery rates in community hospital and provincial hospital were 36% and 40% of total costs (capital and recurrent costs) respectively. In 1991, Tangcharoensathien and Supachutikul (1991) recalculated the cost recovery of community and provincial hospitals. This time, real cost recovery of both types of hospitals was about 50% of recurrent costs; and accrual cost recovery[1] was about 72% of recurrent costs for community hospitals and 64% for provincial hospitals.

A study on the cost recovery of a municipal health centre was done in Phitsanulok (Pannarunothai and Ajyutpokin 1991). Though the centre is intended to be the first level of medical treatment for low income card holders, the centre could raise revenue from other clients. In 1990, the cost recovery of the centre was about 73% of non-labour recurrent costs.

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[1] Accrual cost recovery is calculated from hospital revenue plus revenue which would have been paid by low income patients, divided by operating costs (including labour costs but excluding capital costs).

There have been no published studies on the cost recovery of private hospitals, but the 'debt-equity ratio' is an indicator used by commercial banks in giving loans to private hospitals. The debt-equity ratio should be equal to one to reach a break-even point, ie. debt from capital investments equates with profit given back to investors. Debt-equity ratio of a large private hospital is usually larger than one because capital investment is high. One way of reaching the break even point is to increase the bed occupancy rate to at least 50-60% (Ngarmwuthiporn 1990a). This is not a problem in private hospitals in Bangkok where the occupancy rates were already 70-80% in 1990. There are good opportunities for investing in private hospitals both in Bangkok and upcountry. Private hospitals are viewed as a sunrise industry (Ngarmwuthiporn 1990a and b).

The last efficiency indicator is workload data. Wibulpolprasert (1991) analysed the responses to the Health Resource Survey 1989 from 913 hospitals. Table 3.17 summarises the results. The hospitals of the Ministry of Public Health had 62.6% of beds, and 42.4% of doctors working, but provided ambulatory treatments to 71.7% of all outpatient visits and inpatient care to 71.1% of total inpatient days. It seems that MOPH doctors were more productive than others in providing both outpatient and inpatient care. The second most productive doctors were private hospital doctors. This interpretation is subject to the errors that the severity of cases was not taken into account and the number of private hospital doctors included full-time staff only.

Productivity in terms of workload may be influenced by the number of working hours: the longer the hours, the more patients can be seen. However, the number of working hours may be influenced by the desired target income as earned in public and private sectors. A survey of members of the Thai Medical Council in 1990 (Chunharas et al 1992) revealed that doctors working in the private sector only worked shorter hours than doctors working in the public sector. Table 3.18 shows the number of hours doctors worked at their full-time workplace and the extra hours they worked other than at their full-time workplace to make up their expected income level. It is very common that doctors working full-time in the public sector also work after office hours at private

clinics or private hospitals. In spite of working shorter hours, doctors in the private sector reached a monthly income of around 50,000 baht while doctors in the public sector doing extra work could earn around 30,000 baht. This was because the payment per hour in the private sector was ten times higher than in the public sector.

Table 3.17 Health services provided by public and private hospitals, 1989

Institutions	Beds %	Doctors %	Outpatient visits %	Inpatient days %	%Bed occupied	OP/Dr* /yr	IP/Dr* /yr
Public	85.5	82.2	87.1	88.3	77.7	5,425	1,711
MOPH	62.6	42.4	71.7	71.1	85.4	8,692	2,670
Other ministries	19.3	34.6	12.3	9.8	34.5-81.2	1,819	650
State enterprise	0.8	1.4	0.5	4.8	47.0	2,039	554
Local government	2.8	3.8	2.6	2.6	69.7	3,560	1,084
Private	14.5	17.8	12.9	11.8	60.8	3,720	1,054
For-profit	12.1	14.1	10.0	9.9	61.2	3,683	1,114
Not-for-profit	2.4	3.6	2.9	1.9	59.3	4,079	820
Total (thousand)	73.836	12.713	65,393	20,271	-	5,144	1,595

* Assuming that all doctors see both outpatients and inpatients
Source: Health Resource Survey 1989, Division of Health Statistics
From Wibulpolprasert (1991)

Table 3.18 Average working hours per week of doctor by full-time workplace

	Medical school	Public hospital	Government institution	State enterprise	Private hospital	Private clinic
Full-time	51.7	58.6	43.7	38.2	47.4	41.5
extra-time	18.0	25.6	22.1	20.3	17.0	15.0
Total hours*	62.5	76.8	56.4	48.8	54.3	43.9

* Total hours are the average hours, and not necessary the addition of extra-time to full-time because some doctors do not work extra-time
Source: Chunharas et al 1992

3.5 Consumer satisfaction

It is only recently that public services have become interested in the consumers' viewpoint. Long queues and lengthy waiting times at public hospitals imply that services provided are not satisfactory. Kunaratanapruk and Boonpadung (1989) asked people in urban and rural areas of 30 provinces about their satisfaction toward curative services

in general hospitals. Only 0.2% of them were perfectly satisfied with the services and 65% were not satisfied at all. They criticised long waiting times, unaesthetic hospital environments, unfriendly reception, unconcerned doctors and out-of-date equipment. The authors further analysed whether the choice of services between public and private hospitals was determined by household income. The poorer groups in provincial districts (household income less than 2,000 baht a month) were more likely to use government hospitals than the richer. Moreover, low satisfaction with public hospitals was found amongst the poorer and the less educated groups, and those who were employees and self-employed, despite being frequent users of public hospitals.

Further studies have been done on the characteristics of consumers of private health services. The Department of Medical Services (1979) carried out a postal questionnaire survey using the telephone directory as the sampling frame. The result was biased since the sample was of the better-off. The users' average monthly income was 12,000 Baht (about US$ 600), and educational levels secondary and vocational education. Most were traders and employees. Though they commented that the prices at private hospitals were expensive, 63% of them accepted the trade-off between high price and good service. Phijaisanit et al (1984b) surveyed the clientele at 8 private hospitals (both for-profit and not-for-profit) in Bangkok during 1981 and highlighted that less than 1% of clients had a monthly income higher than 10,000 Baht (US$ 500, a monthly salary of a government doctor 10 years after graduation!). Education levels were mostly under university level with 16% no schooling. Occupation was dominated by those not employed (students 25% and housewives 20%) and traders (19%).

Recent policy changes on consumer choice of workers covered by the Social Security Scheme have proved that when the choice was given, people tended to choose private rather than public health services. In 1991, the first year of implementing the 700 Baht capitation payment to health facilities that contracted with the Social Security Fund, not many private hospitals joined the programme. In 1992, when it was realised that the insured were under-utilising the services, more private hospitals joined in, hence, more choice was given to insured

workers. The share of public hospitals as main contractors at 84% of all employees in 1991 reduced to 58% in 1992 (Health Planning Division 1992).

3.6 Interactions between the public and private health sectors

Interaction between the public and private health sectors can be described as relationships between public and private sectors and regulation.

Relationships between public and private sectors

Thai modern health care started with a private not-for-profit hospital in 1883 and since then has been dominated by public services. In the 1970s, the for-profit private health sector started to grow. The government viewed private hospitals as a complementary health service that took a heavy burden away from the government sector: both budgetary and service burdens. The Board of Investment has been one mechanism used to stimulate the growth of private hospitals since 1972.

Private health services have never been independent from the public health sector in terms of manpower, though some private not-for-profit hospitals have trained nurses primarily to serve their own manpower needs and a few others have trained pharmacists, medical scientists and physical therapists. A proposal for the first private medical school has been opposed by the Thai Medical Council on the grounds that it will lower medical ethics. High health manpower needs in the private health sector have attracted doctors, nurses, dentists and others, to work full-time in the private sector. However, the majority of them work in both sectors. Health Ministers repeatedly say that doctors are allowed to work in the private sector provided that they spend their office hours in the public sector.

Unfortunately, there are no data on the flow of patients between public and private health services. Referrals seem to be a practice not widely performed. Informal referrals, without referral letters, may be higher than formal referrals. It seems that the most common cause of referrals

is financial problems after being hospitalised in private hospitals for the first few days. Referral rates within the public sector varied from 4% to 25% depending on level and department of services (Pannarunothai et al 1988).

Collaboration between the public and private health sectors was not proposed until the sixth National Health Plan (1987-1991). The aim was to maximise the benefits of existing resources through the sharing of medical equipment, ambulances, medical personnel, and information. But the success of the collaboration seems to depend on personal relationships rather than formal structures because there were no financial incentives for the collaboration (Medical Licensing Division 1988).

Regulation

A positive framework for looking at regulatory mechanisms includes price, quantity and quality elements (WHO 1991a). In Thailand, there are no regulations to control prices in private hospital services but there is a price list guideline in MOPH hospitals. Indirect price control has been applied through the reimbursement rate for civil servants and their dependents using services in private hospitals. Under the reimbursement scheme, inpatient care at private hospitals is reimbursable up to 3,000 Baht within a month or not more than 100 Baht a day if staying longer than 30 days, plus many other items on the reimbursement schedule. The civil servant health benefit decree has been amended many times, for example in 1980, it was amended to reduce fraud in the reimbursement of private hospital care, and the forthcoming amendment will increase the benefit to cover outpatient care at private health facilities with a ceiling for reimbursement of 500 Baht per episode of illness.

Regulating the quantity of private services has been an important issue in controlling the number of drug stores in urban areas. In 1991, the government lifted controls by allowing pharmacists to set up their own drug stores provided that they advertised time schedules when consumers could obtain advice on appropriate drug use. There are no regulations to control the distribution of higher level private health facilities, eg.

high technology diagnostic machines, private hospitals. Setting up a new private hospital has more to do with the Board of Investment than the Ministry of Public Health.

Increasing remuneration in the public sector is being used as a mechanism for influencing the distribution of health manpower between urban and rural areas, primary physicians and specialists, and the public and private sectors. The Civil Servants Office is implementing 3 new payroll schemes for administrators, academics and the general workforce. Doctors, nurses, dentists and pharmacists are classified as academics. Furthermore, within the Ministry of Public Health, there is a subsidy of 10,000 Baht a month for clinicians who do not work in addition in the private health sector, in the expectation that they will devote their time to providing better quality of care in public hospitals. There is another extra payment system for clinicians which is based on workload and will be implemented very soon.

Medical practice in Thailand is controlled by the Thai Medical Council. The council has the right to suspend medical licensure to doctors who practise unacceptably. During the growth period of the private health sector, there have been many complaints filed to the Council for the investigation of individual doctors for professional misconduct, negligence of patients in the public sector and over-prescription of diagnostic tests in order to get financial incentives from laboratory centres.

The roles of the Thai Medical Council and the Medical Licensing Division are not clear cut. Many complaints on unacceptable practice in private hospitals and clinics are made to the Council instead of the Division because the Council is responsible for physician's misconduct not the behaviour of the institution as a whole. This is because the Hospital Act of 1961 which is still used for the control of private hospitals is somewhat outdated. There have been some efforts in the Ministry of Public Health either to amend the Hospital Act or to set up a new division to take responsibility for the private health sector. But those efforts have been unfruitful.

The Social Security Act has brought the issue of regulating quality of care in public and private hospitals into focus. The accreditation process for hospitals applying to be main contractors to the Social Security Fund is one positive approach to control the standards of hospital care. It is unclear whether private hospitals in general are better than public hospitals or vice versa. Quality assurance will be an important aspect of regulating private health care in the future.

3.7 Provincial background

The research on the public and private mix in health care in this thesis was designed for a confined urban area in Phitsanulok province. Information on this area is therefore given here. Phitsanulok is a big province in the north of Thailand (see map in Annex 3). The city has an ancient past and attracts inflows of people and cash including health service users from nearby provinces. In 1987, the net flow ratio for the regional hospital (situated in municipal area of Muang district of Phitsanulok province) was 0.06 (Pannarunothai et al 1988). This implies that for every 100 outpatients that crossed the district administrative boundary to utilise services at the regional hospital, there were 6 patients from Muang district seeking services elsewhere in that region.

A study of the health seeking behaviour of municipal dwellers (Muangman et al 1988) revealed that within the previous 12 months, about two-thirds of total households had ever used drug stores, 48% had ever used private clinics, at least 43% had ever used public hospitals and at least 18% had ever used private hospitals. Estimation of the share of total visits within a year was as follows: 41% to drug stores, 16% self-care and traditional medicine, 14% private clinics, 19% public hospitals, 6% private hospitals and the rest others. At the time of Muangman et al's study, there were only two private hospitals, 57 clinics and 58 drug stores.

In 1991, three years later, the growth of the private health sector has been considerable while population growth in the municipality (according to official statistics) has been low. Two new private hospitals have been established, making 6 hospitals in the municipal district (two

public and four private hospitals). There are 79 private clinics and 78 drug stores distributed throughout the municipality (see also map in Annex 3). So it is a good site to carry out this study.

In generalising the results of the study, cautious interpretation is necessary. Table 3.19 shows public and private hospital beds to population ratios by selected provinces. In 1989 Phitsanulok was ninth in terms of number of private hospital beds by province. The share of private hospital beds was 17% of total beds while the country average was 16.5%. But when looking by province, wide variations in the share of private hospital beds are apparent. Total private hospital beds in these 15 provinces accounted for 82% of the country's private hospital beds (this implies that these provinces were the better off in terms of private health services). Nine provinces were better than the country average in ratios of public and total hospital beds to population. Four provinces had lower than average public hospital beds to population ratios, and a high compensation of private hospital beds (as in Samutprakan, Nakornsawan and Trang), but had not yet achieved average total bed to population ratios. Phitsanulok had a slightly higher than average private hospital bed to population ratio.

Table 3.19 Ranking of private hospital beds by selected province, 1989

Province	Population in 1990	Private hospital beds		Beds/10,000 pop		
		Beds	% of total	Private	Public	Total
Bangkok	5,546,937	6,994	33.6	1.3	2.5	3.8
Chiangmai	1,376,120	795	15.0	0.6	3.2	3.8
Nakornrajsima	2,384,252	435	18.0	0.2	0.8	1.0
Samutprakarn	854,883	411	54.9	0.5	0.4	0.9
Rajburi	720,157	345	16.8	0.5	2.3	2.8
Nakornsawan	1,088,213	333	23.8	0.3	1.0	1.3
Songkla	1,090,083	285	12.1	0.3	1.9	2.2
Trang	519,155	255	40.2	0.5	0.7	1.2
*Phitsanulok	786,509	206	17.0	0.3	1.2	1.5*
Suratthani	738,350	201	18.0	0.3	1.2	1.5
Singhburi	230,913	158	22.6	0.7	2.3	3.0
Phuket	168,429	149	41.0	0.9	1.3	2.2
Lampang	772,635	132	11.4	0.2	1.3	1.5
Saraburi	535,160	128	9.0	0.2	2.4	2.6
Chantaburi	439,273	119	13.3	0.3	1.7	2.0
Total (country)	56,303,273	13,316	16.5	0.2	1.2	1.4

Source: Health Resource Survey, Health Statistic Division

3.8 Summary remarks of the chapter

During its history as an independent nation, the Thai political system has evolved from an absolute monarchy to a democratic monarchy. The ruling classes have been sensitive to collectivist ideas of socialism, so the Thai modern health system has developed incrementally from traditional private care.

The Thai health system is notable for its public and private mix. Private expenditure forms a major part of total health expenditure. In contrast, government health services are the major providers of modern health care. However, recent data show that the growth of private hospitals has been faster than the growth of the public health sector.

Scanty data indicate that inequalities in health exist between rural and urban populations, and among different occupational groups. About half of the population is not covered by any health benefit scheme. The public schemes for poor or needy groups receive lower per capita budgets. There are inequities among different benefit schemes.

There is no solid evidence that the public health sector is less efficient than the private health sector. The public sector is overcrowded and there is evidence that consumer satisfaction towards public services is poor. Little attention has been given to the quality of services of the private sector as compared to the public sector.

Trends toward an increasing share of private expenditure and increasing share of private providers are foreseeable. These trends will inevitably widen the inequity gap. Research on the appropriate mix of public and private health sectors in Thailand is urgently needed.

4. MEASURING NEED AND USE: OBJECTIVES AND METHODS

This chapter describes the research methodology of how to measure the need for and use of health services in the study area. The chapter begins with objectives and conceptual framework of the study. A substantial part of this chapter describes the methods for measuring need and use. The chapter ends with information on how the socio-economic grouping was applied for data analysis.

4.1 Objectives of the study

The general objective of the study is to assess the equity of coverage of public and private health services in Phitsanulok municipal area in order to identify policies of promotion and regulation which would lead to an equitable and efficient health service system.

The specific objectives are focused under the following headings:

1. To assess equity in health in terms of the morbidity and mortality of different socioeconomic groups in the municipality.
2. To assess the equity of the health services in terms of accessibility and utilisation of both public and private health services for equal need, and the cost to users.
3. To determine factors influencing utilisation patterns for public and private health services by different socioeconomic groups.

4.2 Conceptual framework for analysis

The logic of privatisation and state intervention in health care plays around important factors as summarised in figure 4.1 (adapted from Hollingsworth et al 1990). Financing and revenue raising patterns affect the availability of health personnel, medical facilities and medical technology including the way these resources are distributed. Equality of distribution affects equality of access. Further, cost control mechanisms can reduce wastage and make available more resources for more people (i.e. increase accessibility). Full privatisation may hamper the geographical distribution of resources, and produce less concern about

cost containment of care, so fewer people can get access. Both sides of the logic, privatisation and state intervention, aim at high quality medical care and high efficiency. A full state logic describes efficiency in terms of social efficiency (to the population at large) rather than the technical efficiency of the privatisation logic. However, the state has a mix of objectives- efficiency and equity. Under certain conditions, a private market can achieve social efficiency- but in practice will satisfy its own objectives- which may not be the same as those of the state.

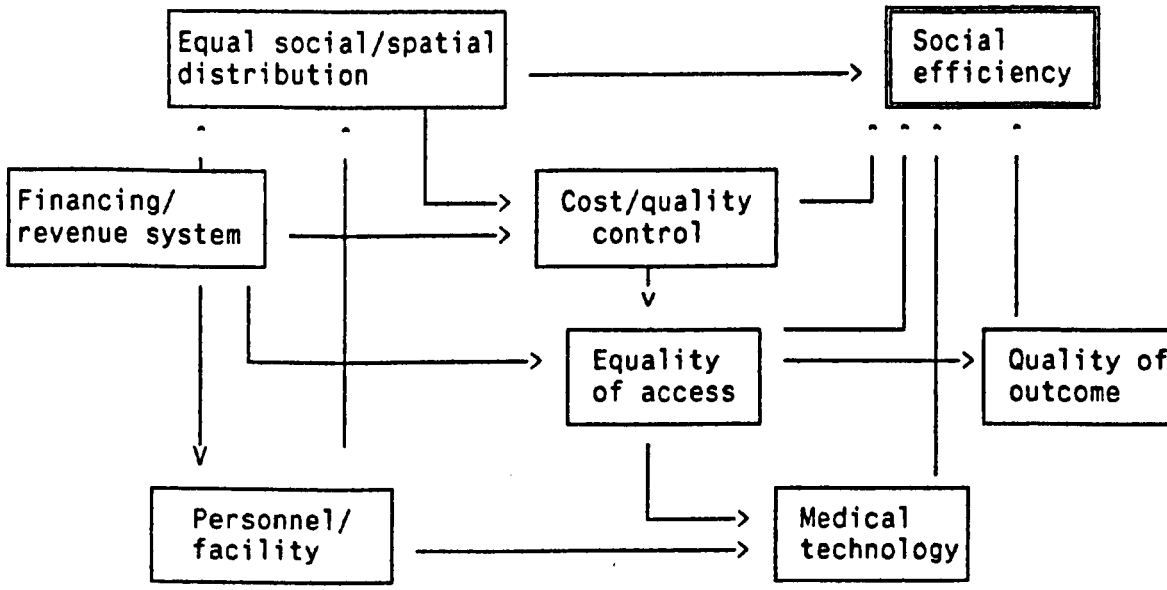


Figure 4.1 Conceptual framework of the study (adapted from Hollingsworth et al 1990)

4.3 Methods

There are four methods employed in this study. The general household survey is the main source of information to analyse equity in health status including vertical equity in utilisation. The health diary and interview technique are used to compare the sensitivity of information gathering, especially on the past two weeks' morbidity. A bed census survey is another method used to supplement information on hospitalisation. Finally, a health resource survey addressed to the

hospital administrator is used to collect information on hospital inputs and outputs to describe better providers' behaviour.

The general household survey

In most cases, a general household survey is the best technique to study the morbidity and mortality of populations. In a single interview, many variables can be collected such as socioeconomic characteristics, illness experiences and health service use, and also consumer attitudes towards different health institutions.

Questionnaire design

The questionnaire for the general household survey is based on the questionnaire for the Health and Welfare Survey of the National Statistical Office. Details on health expenditure, consumer satisfaction and mortality were added. Table 4.1 summarises key questions that were asked to a household respondent.

Table 4.1 Summary questions of the general household survey

SECTION	TYPE	TOPICS AND QUESTIONS	TECHNICAL REMARKS
1	INDIVIDUAL	HOUSEHOLD ROSTER Name, age, sex, marital status, relationship to head of household, education.	Age in years, head of household as the first member of the family, family members include all persons living under the same roof more than 3 months in the last 12 months.
2	INDIVIDUAL	COVERAGE OF HEALTH BENEFITS Specify any scheme(s) of health benefits covered.	Different schemes are: government employee, state enterprise employee, veteran, village headman, health volunteer, free medical card for low income, social security scheme, private employee, private insurance.
3	INDIVIDUAL	ACUTE ILLNESS AND INJURY Acute illness and injury within two week recall period, severity and days absent from normal activity, whom and where consulted, costs of care and transport, travel time, waiting time, reimbursement.	Self reporting of illness, key respondent is a proxy for all members in the household. Severity of illness is probed by four grades.
4	INDIVIDUAL	CHRONIC ILLNESS Describe chronic illness with onset, severity, days absent from activity.	Probe chronic illness and severity by tracer cards.

SECTION	TYPE	TOPICS AND QUESTIONS	TECHNICAL REMARKS
5	INDIVIDUAL	DISABILITY Describe disability with onset, severity and days absent from activity.	Probe disability and severity by tracer cards.
6	INDIVIDUAL	HEALTH PROMOTION AND PREVENTION Antenatal care, delivery, postnatal care, family planning, immunisation, other services attended, where attended, costs and reimbursement.	Recall period is one year.
7	INDIVIDUAL	HOSPITALISATION Number of admissions, days, diseases, where admitted, costs of care and reimbursement.	Recall period is one year.
8	INDIVIDUAL	INDIVIDUAL INCOME FROM MAIN SOURCE AND SECONDARY SOURCE Type of work, work status, payment basis, last month earnings, bonus, overtime and other allowances e.g. food, clothing, house rent, travel. Type of second job and pay.	Assess each member's income to make up household income.
9	HOUSEHOLD	HOUSEHOLD AGGREGATE ANNUAL INCOME FROM OTHER SOURCES Other sources of income e.g. pension, insurance claim, interest, dividend, scholarship, gift, inheritance, lottery, property sale and leasing and transfer of income.	Assess the sources of income and amount.
10	HOUSEHOLD	HOUSING AND OWNERSHIP OF DURABLES Housing condition, number of rooms, ownership of house and other durables e.g. gas stove, microwave/oven, refrigerator, electric fan, radio, television, videotape, washing machine, motorcycle, car, bicycle, tricycle.	Interview and observation.
11	HOUSEHOLD	CONSUMER SATISFACTION Level of satisfaction concerning quality of care, cost and inter-relationship with doctor and other health personnel. Attitude towards existing health system: public and private.	Respondent's attitude towards each health institutions.
12	INDIVIDUAL	DEATH(S) IN FAMILY Number of family members who died during the past 5 years, age at death, sex, cause of death, medical treatment and place of death.	Recall period is 5 years.

Definitions used

Since a large number of interviewers were recruited for this study, definitions of technical terms are important for the validity of data collection. Table 4.2 summarises the definitions of the terms.

Table 4.2 Definitions of terms used in general household questionnaire.

Terms	Definitions
Household member	This includes everyone who has slept and taken meals at least three months in the previous year.
Household head	He or she who is the leader of the household either in social matters or economic contribution.
Health benefit	The coverage of payment for health services for each member of the family. The benefit may be full cost coverage or partial, or may be retrospectively by reimbursement or prospectively without any cash payment at the point of service.
Government employee	Government employee with his/her dependents, ie. spouse, parents, and the first three children are covered by this benefit.
State enterprise employee	Employee of state enterprise with his/her dependents are covered by the organisation's fund.
Veteran	The veteran and his dependents are covered by a fund with a limited number of visits or hospitalisation.
Village headman	The village headman and his/her dependents are entitled to health services at government outlets at half price.
Health volunteer	A health volunteer is entitled to free medical services at government outlets.
Free medical card	Card holders of the free medical card are entitled to free medical care at government health facilities. The card is issued to a person or a family with low income.
Social security scheme	Workers at establishments with more than 19 workers are required by the Social Security Act to contribute a monthly income to the Social Security Fund to cover free medical services at contracted health institutions.
Private employee	An employee in a small business may be covered by his/her employer when he/she gets ill.
Private insurance	One who pays a premium from one's own pocket to cover unexpected accident or illness.
Acute illness	Self reported illness or illness reported by proxy. Conditions that prevent normal daily activities for at least 24 hours.
Injury	Any accident that injures any parts of the body.
Chronic illness	Any condition of chronic medically defined illness as listed in the tracer card for chronic illness.
Recall period	The recall period for acute illness and consultation is within two weeks prior to the date of interview. The recall period for hospitalisation and health promotive and preventive services is the previous twelve months. And the recall period for a death is the previous five years.
Occupation	Details of the work performed by each member are asked. It is then coded to the classification of the Health Statistics Division.

Questionnaire testing

The questionnaire was tested for wording and content. The first test was scheduled about two weeks before fieldwork. Four field-supervisors conducted household interviews and suggested better ways of questioning. The second test was performed a week later. This time four junior sanitarian students conducted interviews. A few changes were made to improve precoding and record entry for interviewers.

Sampling technique

Previous studies on morbidity using household survey techniques reveal that the morbidity rates over the past two weeks varied between 7% to 22% of the total population (National Statistical Office 1988, Tangcharoensathien 1990). Five percent of households targeted for this study would give an ample number of cases (acute illness) for comparison. The general household survey was split into 3 periods to cover 3 seasons in Thailand. The first round was in the rainy season (September). The second round was in winter (December) and the third round was in summer (March). Three hundred and twenty households were the maximum number to interview at each round.

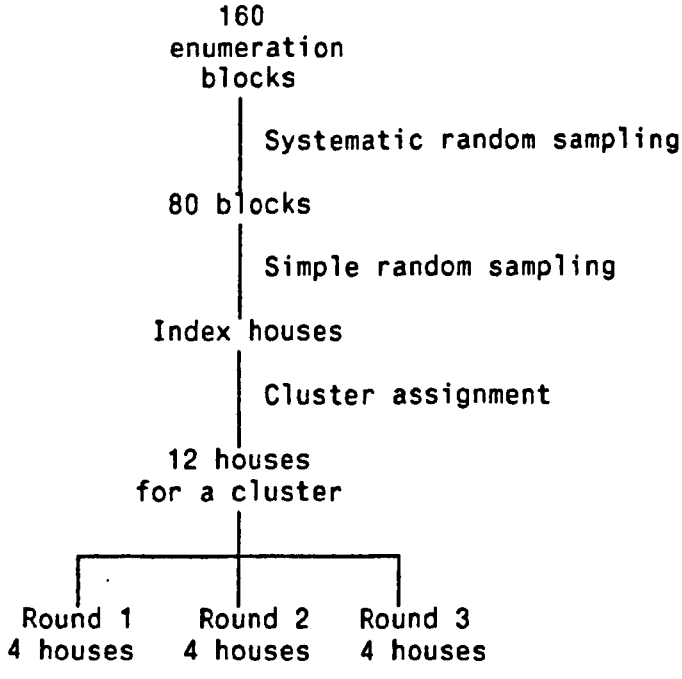


Figure 4.2 Schematic summary of sampling techniques for the general household survey

The sampling frame was derived from the 1990 National Census done by the National Statistical Office. There are 160 enumeration blocks in Phitsanulok municipal area. Each block contains approximately 100 houses. A systematic random sampling method was applied at the first stage to select 80 blocks for the survey. The second stage of sampling was simple random sampling to find out an index house for interview. The last stage was to select another eleven neighbouring houses from the map. All these procedures were performed by a statistician. Figure 4.2 summarises the sampling technique.

Fieldwork

Forty junior sanitarian students were recruited as interviewers for the first round. A training session was held a week before the actual survey. There were eight field-supervisors so that the ratio of interviewer to supervisor was about 5 to 1. Four neighbouring households were interviewed by one interviewer in a day. The interviews took place only on Saturday and Sunday.

The second and the third rounds were assigned to pick up the next 8 households in the same clusters as the first round. Interviewers of the second round were nurse students and field supervisors were nurse teachers. The third round was carried out by non-health students- i.e. students in mathematics and statistics from a teacher training college. The field supervisors were the same group as the first round.

Reinterviews

A week after the third round of the household survey, a 5% sample of households (from the third round only) was reinterviewed to test the reliability of data collection. The samples were drawn by a simple random technique. Four interviewers were teachers of the Nursing College who had been field supervisors.

Sixteen households were targeted for repeat interviews but only fourteen were used for comparison. The other two households were different from

those that had been interviewed a week earlier. Tables 4.3 and 4.4 present the results from the two sets of interviews.

Reinterviews skipped the questions on acute illnesses in the family, because the time reference for acute illness questions had changed, hence no use for comparison. It was also anticipated that respondents of reinterviews might not be the same persons as the first interviews, so questions on attitudes towards the health care system were not asked. However, reinterviews found almost the same respondents as the first (93%). The most repeatable responses were found in the question on the number of deaths in the family. The least repeatable responses were the number of years lived in the municipality. Less reliable responses (about 74% repeatability) were found in the questions on age and last month earnings. If the acceptable variation for age was a year lower or higher, the reliability for age would increase to 93% (see table 4.3). Level of income is more complicated than age. Frequently used income indicators are annual household income and per capita income. Though some responses from the questions on income were more reliable than others (as shown in table 4.3), annual household income was the most unrepeatable (see table 4.4). If a 5% cut of point is applied for an acceptable variation, only 4 out of 14 families (28.6%) would give reliable responses on annual household income. If the cut of point is increased to 10%, the reliability would be only 50%.

Table 4.3 Reliability test by reinterview as compared against the second interviewers

Contents	Degree of agreement
Respondents	The same respondents 93% (13 out of 14)
Family roster	
Number of family members	The same 93% under enumerated 7% (1 member fewer, not a relative)
Age of each member	Exactly agree 74% younger 19% (most members a year younger, only 1 member 7 years younger) older 7% of cases (a year older)
Education level	Exactly agree 95% lower education 5% of cases
Health benefits	
Type of coverage	Exactly agree 96% fewer benefit schemes 4% (for state enterprise benefit)
Chronic illness	
Items of illness	Exactly agree 91% higher morbidith 2% (heart diseases) lower morbidity 5% (asthma, peptic ulcer, diabetes, heart diseases)
Hospitalisation	
Number of admission	Exactly agree 95% more hospitalisation 2% (2 admissions) less hospitalisation 3% (for diarrhoeal diseases)

Contents	Degree of agreement
Individual income	
Occupation title	Exactly agree 89% mismatch 11% (7% within the same civil servant heading, 4% in major grouping, ie labourers instead of traders)
Last month earnings	Exactly agree 74% higher earnings 12% lower earnings 14%
Other income (in cash)	Fewer positive items: bonus 2%, overtime payments 5%, others 4%
Other income (in kind)	Fewer positive items: food 4%, clothing 4%, accommodation 2%, travel 5%
Secondary occupation	Fewer job titles 2%
Household aggregate annual income	
Sources of income	Exactly agree 93% more sources 2% (bank interest, insurance claim, present) fewer sources 5% (bank interest, insurance claim, dividend, scholarship, lottery and money transfer from relatives)
Level of income	Higher income 4% lower income 8% (see also table 4.5 for details on household income)
Death in family	
Number of years lived in the municipality	Exactly agree 50% live longer 21% live shorter 29%
Number of death(s)	Exactly agree 100%

Table 4.4 Differences in annual household incomes estimated by two interviewers

Household	First interviewer	Second interviewer	Difference	% difference from the second interviewer
1	16,200	43,000	26,800	62.3
2	190,840	204,840	14,000	6.8
3	162,000	230,000	68,000	29.6
4	47,480	61,600	14,120	22.9
5	196,800	196,800	0	0.0
6	38,000	41,500	3,500	8.4
7	99,000	116,040	17,040	14.7
8	42,000	100,800	58,800	58.3
9	147,400	151,700	4,300	2.8
10	38,000	39,360	1,360	3.5
11	198,000	238,000	40,000	16.8
12	624,000	830,100	206,100	24.8
13	21,600	24,000	2,400	10.0
14	116,300	116,800	500	0.4

paired t-test = 2.24, $p<0.025$

Data processing

Data from the general household survey were coded for education levels, diseases and occupation by coders of the regional hospital. They were then organised into 5 files. An individual file contained

characteristics of each family member. A family file contained household characteristics and respondent's attitudes. A consultation file and an admission file were designed to capture information on previous consultations and hospitalisation. Lastly, a deaths file was for the family experiencing a death(s) in the previous five years.

The above files were handled by the dBase programme. Linkages between each file were made with the help of the statistician. Data formats were converted and exported or imported through various programmes, e.g. FoxPro, EPIINFO. Statistical analyses were mainly derived from SPSSPC+ and EPIINFO programmes.

Problems encountered

The general household survey is subject to biases and errors. Sampling techniques were a compromise between practicality and randomness. On some occasions the targeted households were not willing to respond, or they were not present during the daytime or weekends or even houses had been pulled down to build new houses. Hence, replacements were inevitable. Replacements will bias the study results to the characteristics of high participative families. Table 4.5 shows replacements made up 26.6% of the total sample, the rate was highest (30.9%) in the city centre. There were no data to show the differences between the drop-outs and the replacements. However, interviewers noted that they were likely to select poorer houses instead of the richer because the poorer are more willing to participate than the rich. Having forty interviewers and eight field supervisors for each round can be another cause of error in data collection.

Table 4.5 Response and replacement rates of the sampled households

Area	Households within boundary	No of replacements	% Replacement
West	142	47	24.9
North & east	211	69	24.6
City centre	199	89	30.9
South	145	47	24.5
Total	697	252	26.6

Health diary and interview

The questionnaire of the general household survey was applied again to a sub-sample of households in the municipality. This time, the interview took place after two weeks of diary keeping. The household respondent was instructed to record the illness of all family members and the action taken. An appointment in two weeks' time was made to collect the diary and to interview the respondent. This method was designed to increase the reliability of collected data.

Diary design and testing

A health diary was designed to provide information on illness over a two week period in the family and actions undertaken. The first draft was tested with a family who participated in a trial of the general household questionnaire. This family was selected purposively because one family member was undergoing active treatment for her chronic illness. The format of the diary was changed to increase simplicity in writing each family member's information.

Recruitment of interviewer

A girl with a certificate in accountancy was recruited as an interviewer. She was trained at the same time as the first batch of interviewers (in September 1991). Her job was spread over three seasons as was the major survey. She made a first visit to selected households, instructed a family member (preferably head of household) on filling in the health diary. Two weeks later, she made a second visit and interviewed the household respondent.

Sampling technique

The health diary plus interview technique is aimed to be comparable with the general household survey. Due to the time consuming process, a sample size of 10% of the general household survey was targeted. The unselected blocks from the general household survey were the sampling frame for this method. Because each round of the survey required only

forty sampled households, one in two of the unselected blocks were picked up by systematic random sampling. The second stage was to select an index house in each block, so a simple random sampling technique was applied. The third step was to select a cluster of three houses, including the index house. One house was used for each round of the survey (see figure 4.3).

Data processing

Data from the health diary and general household interview were compared qualitatively and quantitatively. Information from the general household questionnaire was handled in the same way as for the main survey.

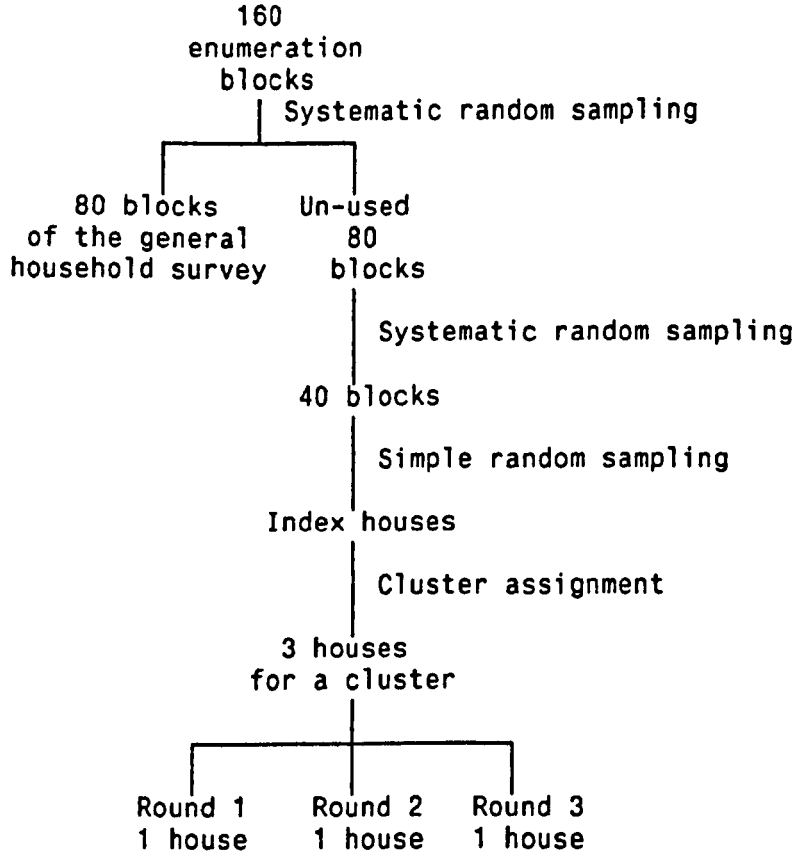


Figure 4.3 Schematic summary of sampling techniques in the health diary plus interview

Problems encountered

A temporal bias was very prominent in health diaries. About 10% of diaries provided more information on the first few days and less or no information during the later period. Again, selection bias was encountered as the interviewer noted that she was more likely to choose the poor families for replacements even though diary keeping required writing ability.

Bed census survey

The third method used in this study was a bed census survey. This method increased the number of hospitalised cases for analysis. A one day census was designed to reduce the burden on private hospitals, so that high cooperation would be obtained. The data were collected by direct interview with the patient and some more data, especially the service charges, were provided by hospital accountants.

Objectives of bed census survey

A bed census survey complements the information on who needs hospitalisation, what conditions lead to hospitalisation and how much is charged for hospitalisation. Furthermore, it provides indirect information on how accessible or how popular a hospital is when the place of residence of the patients is examined.

Questionnaire design

The content of this questionnaire was similar to the part on previous hospitalisation in the general household questionnaire. A patient identification number was added to retrieve information on service charges after the patient had been discharged.

Questionnaire testing

The questionnaire was tried out on patients admitted in the regional hospital. The identification number was suggested for linkage of useful information, ie. charges and length of hospital stay.

Recruitment of interviewers and training

In a day there are about a thousand patients staying in hospitals in the municipal area. The ratio of one interviewer to inpatients was around 1 to 20. The private hospitals were concerned about the waiting time for interviewing discharged cases, so the ratio was reduced to 1 to 10. There were 32 interviewers for the regional hospital, 5 interviewers for the military hospital, 10 interviewers for one private hospital and another 5 interviewers for another private hospital.

Interviewers for the two public hospitals were student nurses at the third and fourth year levels. Interviewers for private hospitals were recruited from nurses and non-health personnel within the hospital. Training sessions were provided for small groups of interviewers for the convenience of private hospitals.

Problems encountered

Despite the design of the one day bed census, one private hospital was reluctant to participate at first and eventually dropped out. About 80% of inpatients were interviewed in the remaining hospitals: the movements of the discharged cases on the interview date made 100% coverage impossible.

Health resource survey

The health resource survey was designed to collect data on hospital inputs and outputs. This is to give a complete picture of what a hospital had done in a year. The household survey provides information on household health seeking behaviour. A one day bed census survey gives

a snap shot of inpatients' characteristics. The health resource survey reflects more providers' behaviour and achievements.

Questionnaire design

The questionnaire used in the health resource survey was adapted from the questionnaire of the same survey done nationally by the Health Statistics Division. A major revision was the addition of entries for the number of part-time personnel working in private hospitals. This was originally designed to record the number of working hours by part-time staff in order to calculate the number of full time equivalents, but this gave great difficulty to private hospitals because different doctors were employed on different bases.

Data collection

The questionnaire was sent to the hospital administrators at the end of calendar year to collect the data as of the 31st of December 1991. The researcher himself followed and collected the completed questionnaires.

Problems encountered

Though private hospitals have to report to the Ministry of Public Health in the annual health resource survey, the hospital administrators were reluctant to cooperate with this survey. But finally, the survey forms were returned by all hospitals. Some hospital administrators disclosed that the reported figures may not be real, in particular the total number of outpatients and inpatients.

4.4 Definition of socio-economic variables

The four important socio-economic variables used in the analysis presented in chapters 5 to 7 are occupation, income quintile, education level and family wealth. Responses from the surveys were coded by hospital coders and keyed in to database files. These responses were recoded again for analysis and clearer presentation. This section describes how these socio-economic characteristics were grouped.

Occupational group

From occupation titles that enumerators recorded in interview forms, the coders allocated numbers for each occupational title using the coding of the Health Statistics Division. These numeric codes were recoded again when analysed by SPSSPC+ and EPIINFO programmes. Table 4.6 shows a short list of occupation groups.

All individuals were given two types of occupational group. The first is their own occupation and the second is their household heads' occupation. The second occupational group is very useful when the health seeking behaviour of the 'no-job' group, especially children, is compared. The age and sex structures of sampled populations by their own occupation and their household heads' occupation are presented in Annex 2.

Table 4.6 Occupation grouping

Occupation group	Occupation titles
Civil servant	Civil servant, soldier
Professionals and administrators	Engineer, scientist, doctor, nurse, health-related professional, teacher, lawyer, director, manager
Traders	Accountant, cashier, broker, shop-owner, shop assistant
Semi-skilled workers	Tailor, dress-maker, jeweller, plumber, electrician, carpenter, painter, brick-layer, rice mill
Service workers	Singer, farmer, driver, labourer, guard, policeman, household worker, waiter, housekeeper, hair-dresser
No job	Unemployed, child, student, housewife, the aged

The drawbacks of using occupational grouping as discussed above were anticipated. The grouping in table 4.6 is arbitrary in the absence of Thai social research evidence. The philosophy behind this grouping is the British Registrar General's classification of occupation. The broad groups in table 4.6 obscure endless disputes on the occupations included

in each. Furthermore, the use of the household head's occupation may not be appropriate for those family members who have their own occupation.

Income quintiles

Household income is calculated by summing individuals' incomes and household aggregate income. Table 4.7 summarises the sources of household income. Nearly 90% of household income originated from individuals' earnings. Household incomes were ranked into five groups (quintiles), or ten groups (deciles). The lower the rank, the lower the income. Every member in the same household has the same quintile or the same decile regardless of the relationship to the household head.

The ranking of households by household income regardless of household size is debatable. Large families were more likely to be given high rank as they have more earning members (see table 4.8). Moreover, every member in the same household may not share the same household income. Housekeepers who were counted as family members of high rank households were treated as if they belonged to that economic class.

Table 4.7 Sources of household income

Quintile	% individual earning	% aggregate income
1	80.0	20.0
2	92.9	7.1
3	91.9	8.1
4	92.8	7.2
5	87.0	13.0
Average	88.9	11.1

Table 4.8 Household size and earning family members by household income

Quintile	No of households	Household size	% earning members
1	199	3.5	33.4
2	200	4.0	39.4
3	200	4.2	45.9
4	201	4.3	50.4
5	197	4.7	53.5
Total	997	4.2	45.2

The other ranking of household income is to take account of the numbers of family members. The annual household income was divided by the number of family members to give per capita income. This was further ranked into five quintiles. The denominators employed were straight forward family members (ie. giving equal weight for each family member) rather than proportional weighting for each family member, because, in many families, there were family members with an unclear relationship to household heads.

Education level

Two different educational variables were assigned to all individuals; their own education level and their household head's education level. The advantages and disadvantages of doing so were the same as discussed for occupation variables.

4.5 Summary remarks of the chapter

To assess equity in health in an urban area, four surveys were designed to collect data at community and health service levels. Two household surveys were compared: the general household survey and a heath diary plus interview survey. The other two surveys of hospitals were a one-day bed census and a health resource survey.

The household surveys were the main source of information to assess the need for and the use of health services. Need was classified as acute, chronic illness and disability of each family member. And information on use was asked about for each illness episode. A health diary was applied to 10% of sampled households to compare between the two household survey techniques. These households were asked to record every illness episode of family members and their actions for those illnesses for two weeks prior to the interview.

A one-day bed census was designed to complement hospitalisation data in the household surveys. Patients' characteristics including hospitalisation details were studied. The patients were followed up till

they were discharged to complete hospitalisation details. This one-day information was supplemented by an annual hospital resource survey.

Important socio-economic variables to explore equality between groups are occupation, income and educational levels. A new grouping of occupations was employed. The household head's occupation and education were used as proxies for the whole family in addition to similar data for each family member in the analysis of data.

5. RESULTS OF THE STUDY 1: COMPARISON OF DIFFERENT METHODS

This chapter presents socioeconomic characteristics, morbidity and mortality levels of the sampled populations from both the general household survey and the health diary plus interview technique. Its aim is to highlight the variations in the results obtained from different methods. Furthermore, a seasonal effect is explored to see whether it is a potential source of variation because both techniques were employed over three periods of the year. The first part of this chapter describes household socioeconomic characteristics. The second and third parts are concerned with mortality and morbidity variations by each household survey technique. The fourth part discusses the effects of different methods on the results.

5.1 Household characteristics

The following results are presented by two broad groups: general household survey and diary plus interview. Each group is further broken down to present seasonal variations. The general household survey took sampled households from 80 clusters scattered over the municipality with 12 neighbouring households in each cluster. The diary plus interview took another set of 40 clusters with 3 households in each cluster. Details of sampling techniques were shown in chapter 4.

The household socioeconomic characteristics cover household income, occupation and education of head of household, type of housing and ownership and household wealth.

Household income

As presented in chapter 4, reinterviews to test the reliability of data indicated that annual household income is the most unreliable parameter. The data presented throughout this thesis are in their original values without any correction, therefore cautious interpretation of income data is necessary.

Table 5.1 shows the distribution of annual household income by general household survey and diary plus interview technique, and also by seasons. In the general household survey, the means and medians of household income were higher than the means and median by diary plus interview technique. However, there were no significant differences between these parameters of both techniques by season. It was noted that coefficients of variation (the ratios of standard deviation to the mean) in the general household survey were larger than those of the diary plus interview technique. This may be due to the higher number of interviewers (120 interviewers) employed in the general household survey whereas only one interviewer was used in the diary plus interview technique. Another possible explanation is that the sample size of the general household survey was nearly 8 times higher than the sample size of the diary plus interview.

Table 5.1 Distribution of annual household income by techniques and seasons

	General household survey			Diary plus interview		
	Rainy	Winter	Summer	Rainy	Winter	Summer
Number of households	284	306	300	35	38	34
Mean	167,923	158,350	146,117	99,918	106,588	114,026
Standard deviation	305,714	177,811	176,795	78,438	75,975	81,368
p value (ANOVA test)		0.51			0.76	
Coefficient of variation	1.82	1.12	1.21	0.79	0.71	0.71
Median	103,150	109,250	102,300	84,000	88,980	78,000
25 percentile	56,000	60,740	54,000	49,200	48,000	60,000
75 percentile	178,800	180,000	173,400	126,000	134,700	168,000
p value (Kruskal-Wallis test)		0.44			0.79	

Source: General household survey and diary plus interview

Table 5.2 shows the distribution of per capita income by survey techniques and seasons. Per capita income is the result of dividing annual household income by the number of household members. Again the general household survey gave higher per capita income than the health diary plus interview technique. There were no significant differences between seasons. The variations within each round of the general household survey were higher than those of the health diary and interview. And the variations of per capita income were slightly higher

than those of annual household income. This is because variations of numbers of family members were added to the variations of total income.

Table 5.2 Distribution of per capita income by techniques and seasons

	General household survey			Diary plus interview		
	Rainy	Winter	Summer	Rainy	Winter	Summer
Number of households	284	306	300	35	38	34
Mean	46,226	43,446	41,004	27,268	28,510	30,550
Standard deviation	96,604	55,820	50,891	24,780	26,259	29,554
p value (ANOVA test)		0.67			0.88	
Coefficient of variation	2.09	1.28	1.24	0.91	0.92	0.97
Median	24,300	29,284	28,784	20,880	21,206	20,600
25 percentile	14,100	17,250	13,650	12,000	12,000	12,000
75 percentile	46,040	48,560	48,005	32,000	30,920	42,000
p value (Kruskal-Wallis test)		0.16			0.89	

Source: General household survey and diary plus interview

Social characteristics

The next household characteristics to look at are the educational level and occupational group of heads of households. These parameters were highly repeatable (95% for education level and 89% for occupation title, see chapter 4). No statistical differences would be expected by season because samples were taken from the same neighbourhood.

Table 5.3 shows no seasonal variation of education levels of household heads among samples in the general household survey. Heads of households had predominately primary schooling. The distribution of education level of household head participating in the health diary and interview technique is also presented. There seems to be an over-representation of the primary level group in the diary and interview technique. One possible reason is that the general household survey took place only on weekends while health diaries were administered on weekdays and weekends. The lower educated were more likely to be picked up during weekdays.

Table 5.3 Distribution of education of household head by techniques and seasons (%)

Education	General household survey Rainy	Winter	Summer	Total	Diary plus interview Rainy	Winter	Summer	Total
No education	7.1	7.7	4.9	6.6	8.6	2.6	5.6	5.5
Primary	33.4	31.3	30.0	31.6	42.9	38.5	38.9	40.0
Secondary	22.7	21.9	20.2	21.6	11.4	25.6	22.2	20.0
Vocational	13.6	11.6	15.3	13.5	8.6	5.1	13.9	9.1
University	20.1	23.2	22.5	21.9	28.6	23.1	11.1	20.9
Unknown	2.9	4.2	6.2	4.4	0.0	5.1	8.3	4.5
n	308	310	307	925	35	39	36	110
p value (Chi square)	0.23					0.40		

Source: General household survey and diary plus interview

Occupational groups are believed to correlate with education levels. Then there should not be seasonal variation of occupational groups of household heads. However, table 5.4 shows that there were significant differences between occupational groups of household heads by season in the general household survey. There were more in the administrative and professional groups in the second and third rounds, but less traders in the third round. This was probably due to the fact that traders lived in open-door premises and were more likely to be picked up during the first round, leaving the closed-door premises to be picked up later. In the diary plus interview technique, there was no significant differences between occupational groups by season.

Table 5.4 Distribution of occupation of household head by techniques and seasons (%)

Occupation	General household survey Rainy	Winter	Summer	Total	Diary plus interview Rainy	Winter	Summer	Total
Civil servants	21.1	19.4	23.1	21.2	25.7	23.1	33.3	27.3
Admin & prof	5.5	10.6	11.7	9.3	5.7	10.3	2.8	6.4
Traders	25.0	26.1	18.6	23.2	22.9	28.2	13.9	21.8
Semi-skilled	6.2	2.9	2.9	4.0	2.9	5.1	11.1	6.4
Service workers	26.3	26.8	25.4	26.2	22.9	20.5	19.4	20.9
No job	15.9	14.2	18.2	16.1	20.0	12.8	19.4	17.3
n	308	310	307	925	35	39	36	110
p value (Chi square)	0.03					0.88		

Source: General household survey and diary plus interview

In comparing distribution of occupational groups between the survey techniques, there were more service workers in the general household survey, but a higher proportion of civil servants in the health diary plus interview. This is because the occupational groups used here (see annex) are not mutually exclusive and coding could depend on the interviewer. 'Civil servant' describes the employer rather than the job: civil servants can be service workers or professionals and administrators. Interviewers in the general household survey recorded a variety of occupational titles whereas the interviewer in the diary plus interview stopped asking further details after the answer 'civil servant' turned up.

Housing and overcrowding index

Type of housing, home ownership and an overcrowding index are important parameters for comparison. Materials used in building the house were not asked, instead interviewers had to judge whether the house was permanent or temporary. A permanent house would last longer than five years, otherwise would be temporary. The differences in the type of housing between the two techniques in table 5.5 were due to the recording error of an interviewer rather than true differences (because of the high percentage of 'do not know').

Table 5.5 Type of housing and overcrowding index by survey techniques and seasons

	General household survey				Diary plus interview			
	Rainy	Winter	Summer	Total	Rainy	Winter	Summer	Total
Housing (%)								
Permanent	93.0	92.5	95.0	93.5	82.9	84.6	91.7	86.4
Temporary	6.7	6.5	5.0	6.1	5.7	2.6	5.6	4.5
Do not know	0.4	1.0	0.0	0.2	11.4	12.8	2.8	9.1
Ownership (%)								
Owner	58.1	65.7	60.3	61.5	40.0	59.0	69.4	56.4
Rent	33.1	26.5	27.3	28.9	37.1	25.6	25.0	29.1
Others/not spec	8.8	7.8	12.3	9.6	22.9	15.4	5.6	14.6
Number of bed room	2.4	2.3	2.3	2.3	2.4	2.0	2.0	2.1
Household member	4.3	4.2	4.0	4.1	3.9	4.3	4.4	4.2
Overcrowding index	1.8	1.8	1.7	1.8	1.6	2.2	2.2	2.0

Source: General household survey and diary plus interview

The overcrowding index tells how many people, on average, share a bedroom in the house. It is calculated by dividing the number of household members by the number of bedrooms. The households picked up by the diary and interview technique were slightly more overcrowded than those picked up by the general household survey.

Household durables

Family wealth may be reflected in the possession of household durables to make life more pleasant. Table 5.6 presents eight items of common and uncommon durables. It supports, to some extent the previous suggestions that households in the general household survey were better off than households in the diary plus interview sample. They owned more cars, bicycles, video players and washing machines than the diary group.

Table 5.6 Household durables by survey techniques and seasons (%)

Ownership	General household survey				Diary plus interview
	Rainy	Winter	Summer	Total	
Microwave/oven	13.3	13.2	12.7	13.1	2.7
Washing machine	35.4	36.1	39.7	37.0	15.6
Refrigerator	82.1	88.1	84.4	84.9	79.8
Television	95.1	93.4	93.5	94.0	89.9
Video player	42.2	45.5	49.8	45.8	22.0
Car	28.9	30.1	28.3	29.1	21.1
Motorcycle	70.1	84.3	75.6	76.8	78.9
Tricycle	9.7	10.0	7.5	8.9	20.0

Source: General household survey and diary plus interview

When household durables were compared with household income and per capita income as shown in figure 5.1, it was clearly seen that there were two sets of durables: high prevalent (television, refrigerator and motorcycle) and low prevalent (video player, washing machine, car, microwave/oven and tricycle). In the general household survey, all high and low prevalent durables, except a tricycle, were significantly associated with household income quintiles; but all, including a tricycle, were significantly associated with per capita income quintiles. It is surprising that tricycle ownership could be regarded as an underprivileged indicator. The lower the per capita income quintile, the higher the percentage of households that owned a tricycle. However,

only 9% of total households in the general household survey had a tricycle.

In the health diary plus interview survey, the general pictures were similar to those of the general household survey, except the gap between high and low prevalent durables was wider. Due to the smaller sample size in the health diary plus interview survey, the variables significantly associated with household income quintiles included refrigerator, video player, motorcycle and car ownership. Per capita income quintile performed better than household income quintile in increasing statistical significance level for washing machine and tricycle ownership apart from the above durables.

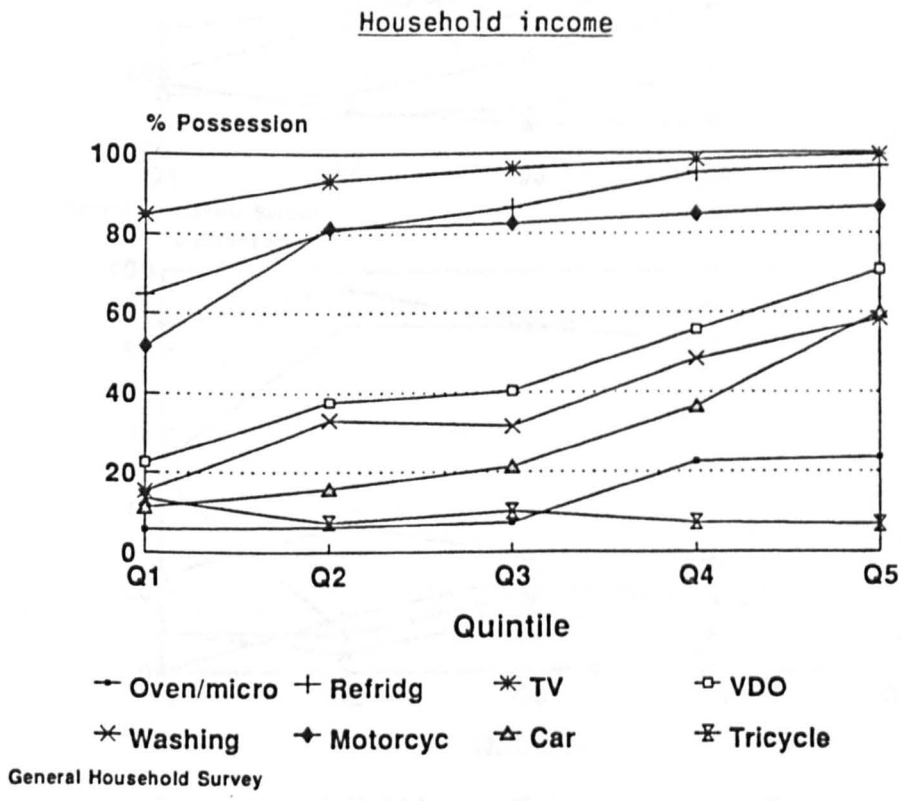
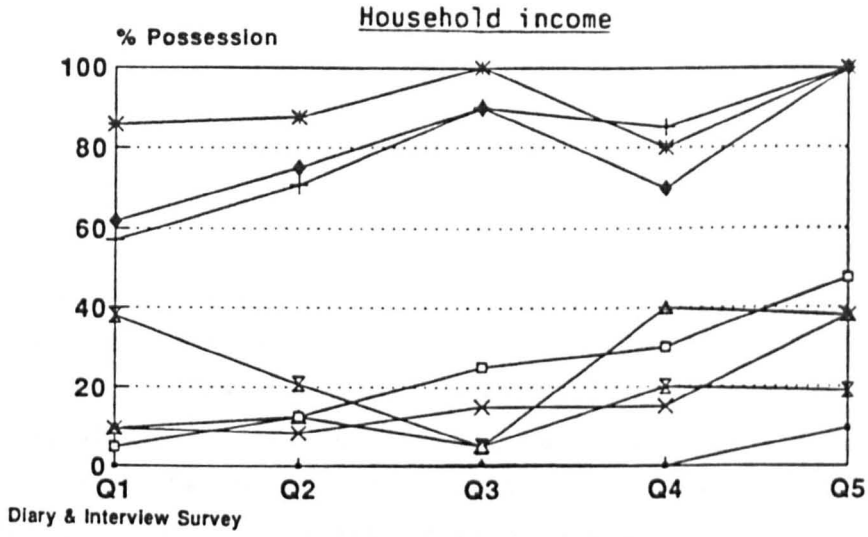
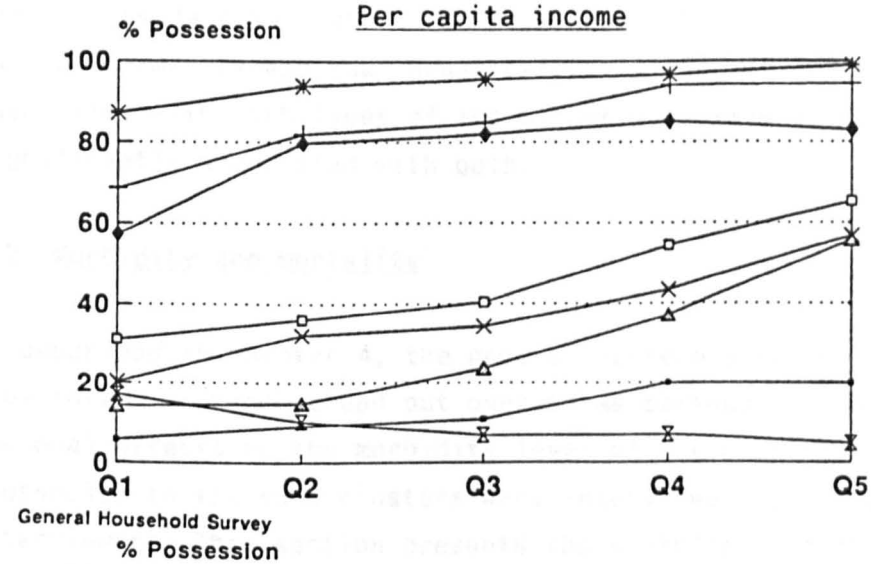


Figure 5.1 Household durables and income groups





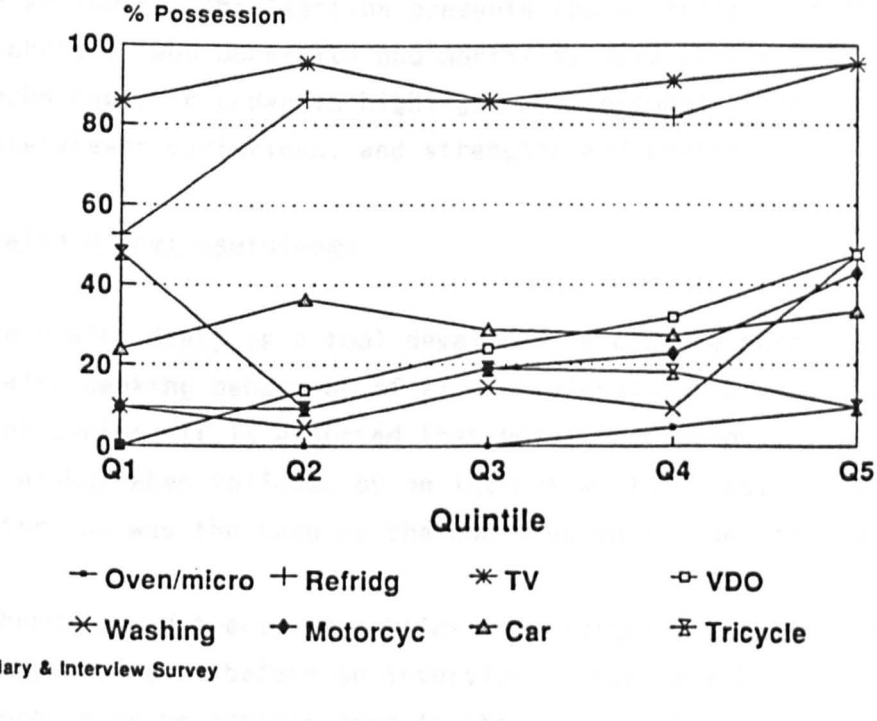


Figure 5.1 (continued)

Family wealth index

A composite family wealth indicator was constructed by looking at the associations of household income or per capita income and housing characteristics including household durables. In the general household survey, the parameters that were significantly associated with annual household income were house ownership, microwave/oven, refrigerator, video player, washing machine and car ownership. However, house and microwave/ oven ownership were not significantly associated with per capita income. In the diary plus interview survey, the associations were the same as described above for both annual household income and per capita income, except that house ownership was not significantly associated with both types of income but microwave/oven was significantly associated with both.

5.2 Morbidity and mortality

As described in chapter 4, the general household survey and health diary plus interview were spread out over three periods of the year to detect seasonal effects on the morbidity level of the population. Neighbouring households in the same clusters were interviewed by different groups of interviewers. This section presents the usefulness of the health diary technique, and morbidity and mortality data obtained from both survey techniques, in order to highlight any seasonal effects, inter-interviewer variations, and strengths and weaknesses of each technique.

Health diary: usefulness

The health diary is a tool developed to capture morbidity events and health seeking behaviour of all individuals in a family within a two week period. It is expected that positive findings of acute illness will be higher when followed by an interview. The questionnaire used in this interview was the same as the one used in the general household survey.

A hundred and twenty households were targeted for delivering the health diary two weeks before an interview. These households were divided into 3 groups to be administered in the same months as those of the general

household surveys. After the third round, 110 households had completed the diaries (92% response rate).

The usefulness of health diaries was judged by two important criteria, content and consistency of recording. Content depended on giving sufficient details on illnesses, service use, costs, travel time and waiting time. Consistency was judged by the regularity of diary keeping. These criteria were scored by a rating scale with 4 grades, namely, 1 was poor, 2 was fair, 3 was good and 4 was very good. Table 5.7 presents the usefulness of the health diary technique.

Table 5.7 The usefulness of health diaries

Round	No. of households	% of diary recording no illness	Content					Consistency
			Illness	Service	Cost	Travel	Waiting	
1	35	41.0	2.65	2.52	2.39	2.35	1.96	2.43
2	39	31.4	2.46	2.08	2.21	1.83	1.63	2.29
3	36	18.2	2.41	2.41	2.44	2.00	1.63	2.11

Source: Health diary
Note: Rating scales; 1=poor, 2=fair, 3=good, 4=very good

The health diaries gave fair to good information on illness descriptions, service use and costs. Information on waiting time was frequently neglected. Forty percent of diary keepers were household heads, 23% were spouses, 26% were sons or daughters and 7% were relatives. They were fairly consistent in keeping the diaries. However, about 31% of households were in good health within these two weeks. Some of them wrote remarks such as:

> "We are all in good health. That happened after a doctor disappointed me by saying that I was an allergic. In fact, I was very sure, it was only a cold. That made us rely on ourselves. We take good food, some vitamin from Australia and some exercises. Then everything clears out. For the whole year we never go to see any doctor. I would like to give a plea to all doctors. Please be more careful in this profession to gain back good attitudes and create better image of hospitals."

> "I would like to know who designed this diary. I wonder whose family will have such a high number of family members and experience many disease episodes. It is a waste of paper. The diary could be redesigned just using a piece of paper which could contain all information within 2 weeks. Surely!"

Morbidity

The questionnaire of the household survey asked for four types of morbidity: acute illness within the past two weeks, chronic illness, disability, and hospitalisation within the past twelve months. There were a maximum of two entries for acute illness that occurred during the two weeks including detailed descriptions of treatments for each individual. Chronic illness and disability were limited to only a single most important illness. In contrast, hospitalisation took account of *all* events during the year. The same questions were asked to respondents in the health diary and interview technique.

Table 5.8 shows the incidence rates of acute illness within two weeks by the general household survey and health diary plus interview. The rates by the general household survey in each round were not significantly different from each other whereas they were significantly different in the health diary plus interview. The incidence rates of acute illness as detected by the health diary plus interview increased from 24% to 47% from rainy season to summer. This trend is also evident in table 5.9 where the number of respiratory cases was highest in the third round and lowest in the first (in the columns of the health diary). This was probably the effect of the interviewer having more experience in administering the diary and interview. However, comparing the rates of acute illness between the two surveys, the diary increased the rates of reported illness.

Table 5.8 Incidence rates of acute illness

Round	Season	General household survey		Diary plus interview	
		Individuals	Rate(%)	Individuals	Rate(%)
1	Rainy	1,332	13.7	138	23.9
2	Winter	1,294	12.2	168	32.1
3	Summer	1,223	11.1	168	47.0
Total	-	3,849	12.4	474	35.0
p value (Chi square test)			0.12		0.00

Source: General household survey and health diary plus interview

The patterns of illness from the general household survey by broad groups presented in table 5.9 showed no effects of seasonal variation except in the case of the incidence of circulatory and respiratory diseases. The third round reported a higher incidence of circulatory diseases (9.0 per 1,000 population in the third round, but only about 3.0 and 3.9 per 1,000 population in the first and second rounds), but fewer respiratory illness than the first two rounds (46.6 per 1,000 population in summer compared to 68.8 and 74.6 per 1,000 population in winter and rainy seasons respectively). The incidence of respiratory diseases could be easily explained by the seasonal fluctuations. The high incidence of circulatory diseases in the third round may be explained by the higher proportion of household heads in the administrative and professional groups than in the other rounds. Another possible explanation is the unmasking effect: the overall incidence rate of the third round was the lowest, so there was more chance of picking up chronic diseases as symptoms within the past two weeks.

Table 5.9 Classification of acute illnesses (%)

Grouping	Descriptions	General household survey Round 1 Rainy	Round 2 Winter	Round 3 Summer	Diary plus interview Round 1 Rainy	Round 2 Winter	Round3 Summer
1	Infectious and parasitic diseases	5.5	12.0	13.2	6.1	5.6	7.6
2	Benign and malignant tumours	0.5	1.3	0.0	0.0	1.9	0.0
3	Endocrine, nutrition & metabolic diseases	1.1	0.6	4.4	0.0	3.7	0.0
4	Haematologic diseases	0.0	0.0	0.0	0.0	0.0	0.0
5	Psychologic and emotional disturbances	0.5	0.0	0.0	0.0	0.0	0.0
6	Diseases of neurological system	1.1	1.3	2.9	3.0	0.0	1.3
7	Diseases of circulatory system	2.2	3.2	8.1	0.0	3.7	2.5
8	Diseases of respiratory system	53.2	56.3	41.9	36.4	46.3	48.1
9	Diseases of digestive system	3.3	0.6	2.9	6.1	5.6	3.8
10	Diseases of genito-urinary system	1.1	3.2	2.9	0.0	1.9	2.5
11	Diseases of skin & subcutaneous tissue	1.6	2.5	0.7	12.1	3.7	0.0
12	Diseases of skeletal system	4.4	4.4	8.1	21.2	7.4	8.9
13	Accidents, poisoning and violence	4.9	4.4	3.7	0.0	0.0	6.3
14	Other diseases	20.2	10.1	11.0	15.2	20.4	20.0
	Total	183	158	136	33	54	79

Source: General household survey and health diary plus interview

The patterns of disease in acute illness according to the health diary plus interview were not very different from that of the general surveys. One possible explanation is that the numbers in the diary survey were too small to see any significant difference. The percentage distribution of acute illness in table 5.9 gives the impression that diseases of the skin and subcutaneous tissue and skeletal system were high in the first

round. But the differences are not significant because the real numbers were small.

Tables 5.10 and 5.11 present the patterns of diseases for hospitalisations and chronic illness by the three rounds of the general household survey and total cases of the health diary plus interview survey. The season should have no effect on the patterns of hospitalisation and chronic illness because the recall periods were within the past 12 months. However, in the first round survey, there were more cases of haemorrhagic fever admitted to the hospitals. This could have been the effects of the rainy season and recent recall as haemorrhagic fever is an epidemic disease of the rainy season. In the second round survey, there were more hospitalised cases of motor vehicle accidents and 'symptoms and ill-defined conditions', but fewer cases of peptic ulcers. The third round recorded more cases of hypertensive diseases in the hospitalised cases (table 5.10) but not among the chronic diseases (table 5.11). However, these variations were not statistically significant.

Table 5.10 Leading causes of hospitalisation (%)

ICD9 codes	Descriptions	General household Round 1 Rainy	Round 2 Winter	Round 3 Summer	Health diary Total
008,009	Enteritis and other diarrhoea	7.1	9.2	11.5	6.1
010-012	Tuberculosis of respiratory system	0.0	0.0	0.0	3.0
065	Haemorrhagic fever	8.8	0.9	2.5	3.0
084	Malaria	0.0	0.9	1.6	0.0
001-136	Other infectious & parasitic diseases	0.0	0.9	0.0	3.0
140-208	Malignant neoplasms	0.0	0.0	0.8	0.0
210-229	Benign neoplasms & unspecified nature	0.9	0.0	0.0	0.0
242	Thyrotoxicosis & goitre	0.0	0.0	1.6	0.0
250	Diabetes mellitus	0.9	0.0	1.6	0.0
280-285	Anaemia	0.0	0.0	0.8	0.0
401-405	Hypertensive diseases	1.8	1.8	6.6	3.0
420-429	Other forms of heart diseases	0.0	0.0	0.8	0.0
480-486	Pneumonia	0.9	0.9	3.3	9.1
487	Influenza	0.9	1.8	0.0	0.0
490-493	Bronchitis, emphysema, asthma	7.1	1.8	4.9	6.1
531-534	Peptic ulcer	6.2	0.9	7.4	0.0
540-543	Appendicitis	2.7	1.8	1.6	0.0
550-553	Intestinal obstruction and hernia	1.8	0.0	0.0	0.0
573	Hepatitis	0.9	0.0	0.0	0.0
580-587	Nephritis and nephrosis	0.9	0.0	0.8	0.0
630-639	Abortion	0.9	0.0	0.0	0.0
680-709	Diseases of skin & subcutaneous	2.7	0.9	0.0	0.0

ICD9 codes	Descriptions	General household Round 1 Rainy	Round 2 Winter	Round 3 Summer	Health diary Total
760-762	Other causes of perinatal mortality	0.0	0.0	0.8	0.0
780.6	Pyrexia of unknown origin	5.3	8.3	1.6	6.1
780-789	Symptoms & ill-defined conditions	9.7	9.3	10.7	15.2
240-739	All other diseases	27.7	33.0	31.1	27.3
E810-E825	Motor vehicle accidents	2.7	7.3	0.8	9.1
E800-E949	All other accidents	7.1	8.3	9.0	3.0
E863	Accidental poisoning by pesticides	0.9	0.0	0.0	0.0
E950-E959	Suicide & self inflicting injuries	0.0	0.9	0.0	0.0
E960-E999	All other external causes	2.7	0.9	0.0	0.0
	Total	113	109	122	33

Source: General household survey and health diary plus interview

It is difficult though to distinguish between the effect of season and the effect of different interviewers on the morbidity data of the three surveys. If season alone influenced the incidence rates of illness within the past two weeks, the different rates in hospitalisation and chronic disease would be the effects of different interviewers and memory of respondents. Interviewers of the third round (non-health related students) picked up the highest rate of hospitalisation and interviewers of the first round (junior sanitarian students) picked up the lowest rate of chronic disease (again the variations were not significant). Non-health related students consistently recorded circulatory diseases as important cause of illness within the past two weeks and of hospitalisation. Patterns of disease also reflect to some degree, memory.

Table 5.11 Classification of chronic diseases (%)

ICD9 codes	Descriptions	General household Round 1 Rainy	Round 2 Winter	Round 3 Summer	Health diary Total
008,009	Enteritis and other diarrhoea	0.0	0.6	0.0	0.0
010-012	Tuberculosis of respiratory system	1.3	0.6	0.0	1.4
090-097	Syphilis and its sequelae	0.0	0.0	0.0	1.4
001-136	Other infectious & parasitic diseases	1.3	0.6	0.6	0.0
140-208	Malignant neoplasms	0.0	1.2	0.6	0.0
210-229	Benign neoplasms & unspecified nature	0.6	0.0	0.0	1.4
242	Thyrotoxicosis & goitre	0.6	0.6	0.0	0.0
250	Diabetes mellitus	10.1	12.0	8.4	10.0
260-269	Avitaminosis & other nutritional def.	0.6	0.6	0.0	0.0
280-285	Anaemia	1.3	0.0	1.3	0.0

ICD9 codes	Descriptions	General household Round 1 Rainy	Round 2 Winter	Round 3 Summer	Health diary Total
300-303	Neurosis & other non-psychotic dis.	0.0	0.0	0.6	1.4
401-405	Hypertensive diseases	10.0	13.3	9.7	5.7
410-414	Ischaemic heart diseases	0.0	0.6	0.0	0.0
420-429	Other forms of heart diseases	3.8	3.6	8.4	8.6
480-486	Pneumonia	0.0	1.8	1.3	0.0
490-493	Bronchitis, emphysema, asthma	8.2	6.0	8.4	5.7
531-534	Peptic ulcer	15.7	9.0	14.9	11.4
550-553	Intestinal obstruction and hernia	0.6	0.0	0.0	0.0
571	Cirrhosis of liver	0.0	0.6	0.0	0.0
573	Hepatitis	0.0	0.0	1.3	0.0
680-709	Diseases of skin & subcutaneous	1.9	0.6	2.6	7.1
740-759	Congenital anomalies	0.0	0.6	0.0	0.0
780-789	Symptoms & ill-defined conditions	8.2	1.8	4.5	7.1
240-739	All other diseases	35.8	45.8	36.4	38.6
	Total	159	166	154	70

Source: General Household survey and health diary plus interview

Mortality

Responses to the question of how many deaths in family members had occurred within the past five years gave 94 deaths among 3,931 individuals of the general household survey. The crude death rate was estimated at 4.8 per 1,000 per year (94 divided by 3,931 and by 5 and multiplied by 1,000). A seasonal breakdown is not shown in table 5.11 because of the small number of deaths. However, the causes of death shown here were similar to those of the general population (Health Statistic Division 1992). The first three important killers were heart diseases, malignant neoplasms and accidents.

Interviews on death tolls at the second visit to the families participating in keeping the health diary gave 17 deaths over a 5 year period. The crude death rate was estimated at 6.8 per 1,000 per year (17 deaths divided by 497 individuals and by 5 years and multiplied by 1,000 population). Table 5.12 gives a short account of the causes of deaths.

Table 5.12 Leading causes of deaths

ICD9 codes	Descriptions	General household	Health diary
010-012	Tuberculosis of respiratory system	5	0
001-136	Other infectious & parasitic diseases	1	0
140-208	Malignant neoplasms	10	3
250	Diabetes mellitus	2	0
280-285	Anaemia	2	0
401-405	Hypertensive diseases	3	2
420-429	Other forms of heart diseases	10	2
490-493	Bronchitis, emphysema, asthma	3	0
571	Cirrhosis of liver	1	0
580-587	Nephritis and nephrosis	1	1
740-759	Congenital anomalies	1	0
765.1	Preterm infant	1	0
780.6	Pyrexia of unknown origin	2	0
240-739	All other diseases	38	6
E810-E825	Motor vehicle accidents	3	2
E800-E949	All other accidents	9	1
E960-E999	All other external causes	2	0
	Total	94	17

Source: General household survey and health diary plus interview

5.3 The effect of different survey methods

This section discusses the comparison of the results from the general household survey and the health diary plus interview survey. Both surveys employed almost the same sampling technique, ie. multi-stage cluster sampling. The only differences were the number of clusters and the size of each cluster. The general household survey used twice the number of clusters, and four times the size of each cluster as the diary plus interview. The general household survey also employed higher number of interviewers (120 interviewers), while the diary plus interview employed only one interviewer. Both surveys were scheduled at the same periods of the year from rainy season to summer. Therefore, there are four kinds of biases and errors to consider: sampling bias, interviewer bias, seasonal variation and non-sampling error.

Since education and occupational groups do not vary by season, they can be used to compare sampling bias between the two surveys. Table 5.18 shows that the samples of both surveys were not significantly different in education and occupation characteristics of household heads, though

there were some variations as discussed in 5.1. Therefore, the selection of sampled households with replacements for non-cooperative households was comparable between the two surveys.

However, the average annual household income and per capita income in the two surveys were significantly different from each other. The general household survey gave higher household income than the diary technique. The interviewer for the diary technique consistently recorded lower income. The reinterviews show that non-sampling error was very high for annual household income of the general household survey (see table 4.4). Unfortunately, no reinterviews were carried out in the diary plus interview subsample.

Table 5.13 also compares morbidity rates and hospitalisation rates by both surveys. It shows that the health diary technique significantly increased the incidence rates of reported acute illness during the past two weeks ($p=0.00$). The average rate in the health diary technique was 2.8 times higher than in the general household survey. Interviewer experience played some part in this wide difference as the rates increased in subsequent rounds of the diary plus interview survey but not in the general household survey.

Seasonality had some effects on incidence rates in the general household survey, ie. higher incidence rates were found in the rainy season and in winter than in summer, but the differences were not significant. Thus, it could not be concluded that junior sanitarians and nurse students had done better than non-health related students. Evidence that all of them had done reasonably well is provided by the patterns of illness. Haemorrhagic fever was high in the rainy season and respiratory diseases were high in the rainy season and winter. Non-health related students were more likely to record the episodes of chronic diseases as there was low incidence of acute diseases in summer.

Table 5.13 Comparison of results between different survey methods

Characteristics	Without diary	With diary	p value (Statistical test)
Education of household heads (%)			
n	925	110	
No education	6.6	5.5	
Primary	31.9	40.0	
Secondary	21.6	20.0	0.63
Vocational	13.5	9.1	(Chi square)
University	21.9	20.9	
Unknown	4.4	4.5	
Occupation of household heads (%)			
n	925	110	
Civil servant	21.2	27.3	
Prof and admin	9.3	6.4	
Trade	23.2	21.8	0.40
Semi-skill	4.0	6.4	(Chi square)
Service	26.2	20.9	
No job	16.1	17.3	
Annual household income (baht/year)			
n	890	107	
Mean	157,281.2	103,900.0	0.02 (ANOVA)
Median	106,769.7	84,000.0	
Per capita income (baht/person/year)			
Mean	43,509.8	28,752.1	0.03 (ANOVA)
Median	27,094.5	20,800.0	
Morbidity and use of health service (%)			
n	3,849	474	
Acute illness	12.4	35.0	0.00 (Chi square)
Chronic illness	12.2	14.8	0.12 (Chi square)
Disability	1.0	0.6	0.62 (Chi square)
Hospitalisation	9.0	7.4	0.27 (Chi square)
Charges of consultation within 2 weeks (Baht/visit)			
Drug store (n)	96	53	
Mean	44.5	30.2	0.02 (ANOVA)
Median	30.0	25.0	0.00 (Kruskal-Wallis)
Private clinic (n)	123	49	
Mean	167.1	125.0	0.06 (ANOVA)
Median	100.0	110.0	0.40 (Kruskal-Wallis)
Public hospital (n)	61	14	
Mean	377.6	368.2	0.95 (ANOVA)
Median	200.0	210.0	0.69 (Kruskal-Wallis)
Private hospital (n)	53	10	
Mean	574.2	527.2	0.90 (ANOVA)
Median	200.0	195.0	0.98 (Kruskal-Wallis)
Charges for hospitalisation (Baht/case)			
Public hospital (n)	85	10	
Mean	6,304.6	2,400.0	0.50 (ANOVA)
Median	1,500.0	2,150.0	0.75 (Kruskal-Wallis)
Private hospital (n)	205	13	
Mean	4,208.4	4,219.1	0.99 (ANOVA)
Median	3,000.0	3,250.0	0.51 (Kruskal-Wallis)

Source: General household survey and diary plus interview

The other response variables: prevalence rates of chronic illness and disability and hospitalisation rates show no significant differences by technique. This is because the health diary was kept for only two weeks to ensure a high cooperation rate, but chronic diseases and hospitalisation were asked over the past twelve months.

Charges per consultation and hospitalisation from the two techniques show two striking variations. First, the diary plus interview technique showed a statistical difference in expenditure as compared to the general household survey only on drug store expenditure for illness within the past two weeks. Second, in general, the means of charges from the general household survey were higher than the diary plus interview, but the medians of charges from the general household survey were lower. The higher mean but lower median is observed because the sample size in the general household survey was bigger than the diary and interview survey. Diary keeping, though it increased the incidence rate of illness within the past two weeks, did not increase the expenditure per visit and per hospitalisation.

5.4 Conclusions

A good research methodology gives a reliable result. The same sampling technique was used in both the general household survey and the health diary plus interview survey. There was a high replacement rate (27%) in the general household survey (the rate was not recorded for the health diary plus interview group). Sampled households in both surveys were comparable in occupation and education level of household heads, and household durables, but annual household income in the general household survey was higher. There were no seasonal variations in income in either survey method. It is concluded that differences in income resulted from the practice of the interviewer in the diary plus interview, rather than from variation in the 120 interviewers or from real differences in income.

The health diary had a significant effect on reporting illness during the previous two weeks, but not on reporting chronic illness, disability and hospitalisation, because the diary was kept only during two weeks.

The acute illness rate in the diary plus interview was 2.8 times higher than the general household survey. The wide gap between the two techniques could have been the effect of interviewer experience in the diary plus interview as well of the diary itself. The rate of acute illness at 35% of total population by the diary plus interview is remarkably higher than other national household surveys.

Expenditures per visit and per case at public and private facilities according to both techniques were not significantly different, except expenditure per visit at drug stores by the general household survey was higher than that of the diary plus interview. The significant difference in drug store expenditure may be the result of a larger sample size, but the gap between the two techniques was not wide.

Given the above conclusions, it was considered inappropriate to simply pool all the data, and weighting to correct for biases in a pooled data set would have been complex. The general household survey was therefore used as the main source of data for analysis, and at intervals compared with important variations from the health diary plus interview.

5.5 Summary remarks of the chapter

This study employed four main methods; general household survey, health diary and interview, a bed census survey and health resources survey. This chapter compares the results from the two household surveys. Three important effects were explored: different survey methods, seasonal fluctuation and interviewer variation.

The acute illness rate in the diary plus interview was higher than in the general household survey. Season did not have significant effect on the incidence of acute illness, but affected the distribution of the pattern of illness. The interviewer's practices and experience influenced the wide difference in acute illness rates between the two techniques and the rising rates of later rounds in the diary plus interview as well as the difference in household income between the two techniques. Expenditures on health care utilisation by the two

techniques were not significantly different except expenditures on visits to drug stores.

In short, survey methods had an effect on the acute illness rate; seasonality had an effect on disease patterns but not on the morbidity rates. Interviewer biases and errors were predominant in the estimation of household income.

It was concluded that the health diary plus interview technique gave a remarkably high incidence rate of acute illness but the interviewer's practice produced a lower level of income. Hence, it would be better if separate sets of data were analysed and compared with caution. Chapter 6 will present the main analysis from the general household survey and draw in important differences from the health diary plus interview survey.

6. RESULTS OF THE STUDY 2: EQUITY IN HEALTH AND HEALTH CARE

The central concern of this thesis is presented in this chapter. It is the application of the theoretical issues reviewed in chapter 2 to the real situation of an urban area in the North of Thailand. The framework for presentation adheres to Mooney's definitions of equity. The first part attempts to lay out the state of health, and morbidity and mortality patterns of different groups of people. It proceeds on to the issues of equity in health care: access, utilisation and expenditure; in other terms: in health delivery and financing of health care. Details on public and private health care will be presented in chapter 7, and overall discussion in chapter 8.

Having described the variations in the reliability of data obtained from different methods in chapter 5, the results presented in this chapter are mainly derived from the general household survey. Some figures are drawn from the health diary plus interview survey to illustrate important differences. This means that the health diary plus interview survey which was about 10% of the total sample was used as for comparison and not as an integral part of the data set.

6.1 Equity in health status

Health status here is judged on the basis of the mortality and morbidity experiences of each individual or a household unit. The use of negative health status indicators was a limitation of this study. Furthermore, employing self-reporting techniques and allowing a proxy respondent to give details of other family members will have contributed to further errors.

Health status is the product of various factors: the previous level of his or her own health including genetic make-up (human biology), socioeconomic factors including housing and workplace (environment), lifestyle, and the use of health services when in need (Lalonde 1973). Before jumping to the end product (health status), some related parameters will be presented.

Equality in income distribution

Disposable income is a necessity to survive in an urban environment as it is a means to obtain food and shelter to maintain health. In the Thai health care system, income (ie. absolute income) is also important to purchase health care when in need. It is the government's aim to achieve more equitable distribution of income among its population (relative income) and not only to increase gross national product (Wibulswasdi 1987). But the former objective is harder than the latter.

Figure 6.1 shows an uneven income distribution in the study area. The Lorenz curve, plotted from cumulative income for each income group, departs from the diagonal line of equal distribution; in other words, there was a high degree of income inequality. Numerical details are shown in table 6.1.

Household annual income was estimated from the individual income of all members of the family plus household aggregate annual income. Columns 2 and 3 in table 6.1 show the range of annual household income in each decile group. Column 4 shows the share of each decile in total earnings. The Gini coefficient, an indicator of distribution, from this survey was 0.49 as compared to 0.37 for the Northern municipal area found by the National Statistical Office (1990). The methodology employed was different from that of the National Statistical Office, which asked for household annual income at one visit but cross-checked this with daily expenditure for seven successive days. This makes household expenditure slightly higher than household income in all regions.

A higher Gini coefficient means that income was more unequally distributed in this municipality than in other northern municipal areas. This might be the result of the high degree of urbanisation of this city as compared to the country average. A study in the urban slums of Chiangmai in 1989 by Tangcharoensathien (1990), which employed the same methodology as this study, found the Gini coefficient for income distribution to be 0.305, more equally distributed than found by this study. This was because the Chiangmai study was confined to a more homogeneous area, ie. the urban slums.

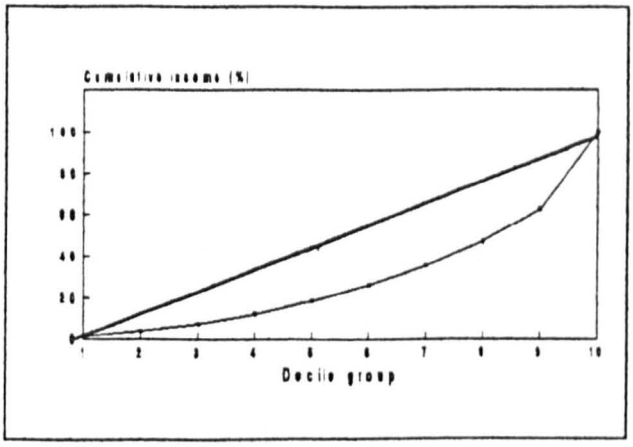


Fig 6.1 Lorenz curve shows distribution of the income of the sampled households

The ranking of household annual income has considerable uses in this study, as well as in many others. It shows the gradient from the worst off to the better off. More detailed grouping is arranged into 10 groups called 'deciles', but more frequently used is a more concise grouping called 'quintiles' with 5 categories.

Table 6.1 Income distribution of the sampled households

Decile group (1)	Annual household income Lower (2)	Upper (3)	% share of total income (4)	Cumulative share (%) (5)	% share in Northern Municipality (6)*
1	1,000	31,025	1.08	1.08	2.6
2	31,200	49,000	2.58	3.66	3.7
3	49,600	66,100	3.65	7.31	5.4
4	66,700	85,000	4.83	12.14	5.9
5	85,400	103,800	6.03	18.17	6.7
6	104,000	127,100	7.39	25.56	7.9
7	127,340	155,800	8.87	34.43	9.9
8	156,000	204,800	11.36	45.79	13.6
9	205,000	291,840	15.76	61.55	18.0
10	291,900	4,174,000	38.45	100.00	26.3
	Gini coefficient		0.49	-	0.37

Source: General household survey
* From the National Statistical Office (1990)

Limitations in using the ranking of household income should be acknowledged at the beginning. Because the unit for calculating total

income is a household, then larger households with more earning members will be of higher rank (see table 4.7). To minimise this effect, per capita income is used also. The Gini coefficient for per capita income distribution was 0.52, higher than for the distribution of household income. It implies that taking account of the number of family members, income was more unequally distributed.

Equity of mortality

Death is commonly used as a health status indicator because of its high specificity, though many diseases now cause discomfort and disability rather than death. To follow the Black report (DHSS 1980), mortality data are presented first.

There were 112 deaths occurring over the past 5 year period (pooled data from the general household survey and health diary plus interview because the number was small and the repeatability of response was 100%). Almost half of them (49%) were deaths in those over 70 years of age (see table 6.2). This was an obstacle for further analysis because the number of preventable deaths or deaths in younger age groups (less than 65 years) were too small. However, the data showed that there were differential death rates among household income quintile groups, education and occupational groups of household heads.

Table 6.2 Age at death

Age group	n	%
0-9	6	5.4
10-19	2	1.8
20-29	9	8.0
30-39	4	3.6
40-49	4	3.6
50-59	12	10.7
60-69	20	17.9
70-79	26	23.2
80-89	23	20.5
90+	6	5.4
Total	112	100.0

Source: General household survey and diary plus interview

To remove the effect of age structure that was unevenly distributed among different household income, education and occupational groups of household heads, standardised mortality ratios (SMRs) were calculated and shown in table 6.3 (see population pyramids of different groups in Annex 1). Due to the small sample size, the only significantly different SMRs were those of the university level and the administrative and professional groups. Questions arise whether these differences are plausible. A possible explanation is that the more educated and professional household heads had better memory and were more willing to report deaths than the lower groups.

Table 6.3 Standardised mortality ratios by various characteristics

Characteristics	Deaths	SMR
Household income		
Quintile 1	21	91.3
Quintile 2	22	121.2
Quintile 3	19	92.8
Quintile 4	20	97.5
Quintile 5	28	129.0
Education of head of household		
No education	10	63.7
Primary	48	107.6
Secondary	21	93.6
Vocational	5	66.4
University	23	158.1*
Occupation of head of household		
Civil servant	9	56.1
Admin & profess	13	211.4**
Trade	32	133.6
Semi-skill	3	113.2
Service	21	100.9
Not working	34	84.2

Note: * p<0.05, ** p<0.01
Source: General household survey and diary plus interview

There are many difficulties in collecting data on mortality. The most obvious difficulty is that deaths are rare events. They are also a sensitive issue so that the questions about death were put at the end of the questionnaire. These limitations were anticipated at the design stage but there were practical limits to sample size. However, this study has found that the deficiencies of a small sample size cannot be overcome by lengthening the recall period to 5 years. A longer recall period may reduce reliability of mortality data. Another problem arises

because some families recently moved into the study area, and so did not share the same urban environment or may have regarded deaths before migration as occurring in another family. Moreover, in designing the questionnaires, the specific characteristics of the dead persons themselves - eg. occupation, education - were overlooked. Indirect parameters - education and occupation of household head - were used as substitutes. The failure to explore inequity in mortality necessitates reliance on morbidity statistics.

Equity of morbidity

The morbidity statistics used are of four types: acute illness within the past two weeks, chronic diseases, disability and hospitalisation within an annual period. All of them were self-reported by a proxy respondent for the whole family. There were nearly 500 spells of acute illness, nearly 500 chronic diseases and more than 350 hospital admissions reported. Less than 40 cases of the disabled were recorded. Some of the significant inequities of acute illness, chronic diseases and disability are presented. Inequity of hospitalisation will be presented later when discussing inequity of health care delivery.

Acute illness

The incidence of acute illness within the past two weeks as reported by household respondents is shown in tables 6.4 to 6.7. The variables which were significant in determining different incidence rates were household income group, education level, occupational group of each individual and age group.

Per capita income ranking had no significant effect on the incidence of acute illness (see table 6.4), the same was found when substituting the occupation of the household head for the occupation of all other family members (table 6.6). However, age was the most prominent confounding variable which was unevenly distributed by education level and occupation group. The incidence rate in the 80 to 89 years old was the highest (25%), followed by children under 10 years (22%, see table 6.7).

Taking account only of those who were 20 years and older to remove the effect of younger age, the only significant variables were education level and household income quintile. The least educated people (without formal education) experienced the highest incidence rate and the higher educated reported the lower rates (see table 6.5). If a more limited age band was analysed, ie. 20 to 49 years old, to remove the effects of both younger and older age groups, only household income quintile determined differential incidence rates (see table 6.4). The lowest income quintile had the highest incidence rate. The higher rates in household income quintiles 3 and 5 as compared to those of income quintiles 2 and 4 still exists.

Table 6.4 Acute illness by income group

Quintile group	Household income		Per capita income		Age 20-49 years Household income	
	n	% Ill	n	% Ill	n	% Ill
1	625	15.2	841	13.4	289	13.5
2	707	9.8	794	10.1	336	6.5
3	749	12.7	752	10.6	360	10.6
4	761	8.7	708	13.6	381	6.8
5	862	14.6	609	13.5	428	10.5
Total	3,704	12.2	3,704	12.2	1,794	9.5
p value (Chi square)		0.01		0.08		0.01

Source: General household survey

Table 6.5 Acute illness by education level

Education level	n	% Ill	Age 20 years up n	% Ill	Age 20-49 years n	% Ill
No education	443	23.3	176	15.3	58	12.1
Primary	1,086	13.6	715	12.7	395	11.4
Secondary	858	8.7	475	10.3	386	8.8
Vocational	481	8.7	378	8.7	355	8.7
University	873	9.0	660	9.2	601	8.7
Total	3,741	11.9	2,404	10.9	1,795	9.4
p value (Chi square)		0.00		0.04		0.55

Source: General household survey

Table 6.6 Acute illness by occupation group

Occupation group	All ages n	All ages % Ill	Own occupation Age 20-49 years n	Own occupation Age 20-49 years % Ill	Household head's n	Household head's % Ill
Civil servant	349	10.0	280	9.3	764	14.0
Admin & professional	240	13.3	213	13.1	353	13.9
Traders	595	11.4	436	10.1	918	11.9
Skilled workers	93	9.7	78	10.3	149	13.4
Service workers	592	8.8	476	7.8	1,004	10.8
Not working	1,980	13.5	371	8.6	661	10.7
Total	3,849	12.1	1,854	9.4	3,849	12.1
p value (Chi square)		0.00		0.35		0.23

Source: General household survey

Table 6.7 Acute illness by age group

Age group	n	% Ill
0-9	565	21.9
10-19	777	7.9
20-29	634	8.8
30-39	751	9.6
40-49	469	10.0
50-59	317	12.0
60-69	216	19.0
70-79	87	18.4
80-89	28	25.0
90-99	3	0.0
Total	3,847	12.0
p value (Chi square)		0.00

Source: General household survey

Chronic illness

Tables 6.8 shows that the prevalence rates of chronic illness were unevenly distributed among different per capita income quintile groups. The rate in income quintile 5 was the highest at 17%. Education level, occupational group and age group had significant associations with the prevalence rates of chronic diseases (table 6.9 to 6.11). Trends of associations could be observed in education level, occupational group and age group.

When removing the effect of younger age groups, education level and occupational group had significant associations with chronic diseases. The lower the educational level, the higher the rates of chronic illness observed. This gradient was also evident in occupational groups but the reverse trend was observed because the majority of the not working group was the aged. However, when a more limited age band was analysed (20 to 49 years old), all significant associations at the 95% confidence level were removed. Per capita income quintiles and educational levels still showed some differences (though not significant).

Table 6.8 Chronic illness by household income group

Quintile group	Household income		Per capita income			
			All ages		Age 20-49 years	
	n	% ill	n	% ill	n	% Ill
1	625	13.9	841	11.5	373	11.3
2	707	11.5	794	10.8	371	10.2
3	749	12.3	752	11.7	367	11.4
4	761	9.9	708	11.4	363	12.1
5	862	14.0	609	17.1	320	16.3
Total	3,704	12.3	3,704	12.3	1,794	12.2
p value (Chi square)		0.07		0.00		0.15

Source: General household survey

Table 6.9 Chronic illness by education level

Education level	Age 20 years up		Age 20-49 years	
	n	% Ill	n	% Ill
No education	176	25.0	58	19.0
Primary	715	21.5	395	14.7
Secondary	475	14.9	386	11.4
Vocational	378	14.0	355	12.4
University	660	10.6	601	9.7
Total	2,404	16.3	1,795	12.0
p value (Chi square)		0.00		0.07

Source: General household survey

Table 6.10 Chronic illness by occupation group of individuals

Occupation group	n	% Ill	Age 20 years up n	% Ill	Age 20-49 years n	% Ill
Civil servant	349	14.0	348	14.1	280	10.4
Admin & professional	240	15.0	239	15.1	213	14.1
Traders	595	17.1	582	17.4	436	14.2
Skilled workers	93	16.1	90	16.7	78	14.1
Service workers	592	11.7	558	22.3	476	10.3
Not working	1,980	10.0	688	20.2	371	10.5
Total	3,849	12.2	2,505	16.3	1,854	11.9
p value (Chi square)		0.00		0.01		0.30

Source: General household survey

Table 6.11 Chronic illness by age group

Age group	n	% Ill
0-9	565	5.5
10-19	777	3.6
20-29	634	6.8
30-39	751	13.6
40-49	469	16.0
50-59	317	24.3
60-69	216	34.7
70-79	87	31.0
80-89	28	32.1
90-99	3	33.3
Total	3,847	12.2
p value (Chi square)		0.00

Source: General household survey

Disability

Household and per capita income groups had no significant relationship with the prevalence of disability. Age was an important factor in determining disability rates. The aged were found to have higher disability rates (see table 6.14). Education level and occupational group had strong associations with disability, even when removing the effects of younger and older age groups (tables 6.12 to 6.13). Higher rates were found in lower education levels and lower occupational groups.

Table 6.12 Education group and disability

Education group	Age 20 years up n	Age 20 years up % Disabled	Age 20-49 years n	Age 20-49 years % Disabled
No education	176	3.4	58	6.9
Primary	715	1.7	395	1.5
Secondary	475	0.8	386	1.0
Vocational	378	0.0	355	0.0
University	660	0.5	601	0.3
Total	2,404	1.0	1,795	0.9
p value (Chi square)		0.00		0.00

Source: General household survey

Table 6.13 Disability by occupation group

Occupation group	Age 20 years up n	Age 20 years up % Disabled	Age 20-49 years n	Age 20-49 years % Disabled
Civil servant	348	0.3	280	0.0
Admin & professional	239	0.0	213	0.0
Traders	582	0.3	436	0.5
Skilled workers	90	2.2	78	1.3
Service workers	558	1.1	476	1.3
Not working	688	2.3	371	2.2
Total	2,505	1.1	1,854	0.9
p value (Chi square)		0.00		0.03

Source: General household survey

Table 6.14 Disability by age group

Age group	n	% Disabled
0-9	565	0.4
10-19	777	1.0
20-29	634	0.3
30-39	751	0.8
40-49	469	1.9
50-59	317	0.9
60-69	216	1.9
70-79	87	1.1
80-89	28	7.1
90-99	3	0.0
Total	3,847	1.0
p value (Chi square)		0.00

Source: General household survey

6.2 Equity in health care delivery

Having described the need for health services among different socio-economic groups in terms of their mortality and morbidity experience, this section will discuss the use of health services. First, access to health services by health benefit schemes is presented, followed by the use of services for those who were ill in the two week period. Then, the use of inpatient care in public and private hospitals is discussed.

Equity of access

Urban dwellers have little difficulty in physical access to health facilities. Therefore, more attention was given to the health benefits of each household member which might prevent one from using a health facility. Tables 6.15 presents coverage levels of the health benefit schemes. Nearly half of the population was not covered by any benefit scheme at all. Thirty six percent of the population was covered by the civil servant benefit, either they were civil servants themselves or the dependents of civil servants. About six percent purchased private insurance policies that covered health benefits. Another five percent were covered by state enterprise employee benefit. About three percent had low income cards. Other categories of government health benefits - veteran, village headman and health volunteer - covered only 2% of the population. The new Social Security Scheme covered about 1% of the population.

As shown in table 6.15, some individuals (1% of total) were covered by more than one health benefit scheme. The most common schemes found with others were civil servant benefit (19 cases), private insurance (18 cases) and state employee benefit (17 cases). To simplify further analyses related to types of health benefit, a single benefit per person was used selecting the highest benefit given as a proxy.

Table 6.15 Health benefits of all individuals

Type of health benefits	Percent
None	47.6
Civil servant benefit	35.6
State enterprise employee benefit	4.7
Veteran, village headmen, volunteer	1.7
Low income card	2.7
Social security scheme	1.2
Private employee	1.7
Private insurance	5.6
Others	0.2

Source: General household survey
Note: Total percentage is 101.0 because some individuals are covered by more than one scheme

Table 6.16 indicates that household income was significantly associated with the distribution of health benefits of household members. The lower income quintile were more likely to be uncovered than the higher quintiles. Government and state enterprise employee benefits were more likely to cover the higher income quintiles than the lower quintiles. The low income card was an important resort for members of quintile 1. However, some members of the income quintiles 3, 4 and 5 had low income cards. They were the poor family members (single adults earning a small income, or house-servants) in households with high income. Interestingly, there were quite a number of people in the lower income quintiles who were covered by private insurance schemes. When per capita income quintile was used instead of household income quintile, the same trend was observed with a stronger gradient. About 29% of income quintile 5 was uncovered.

Occupation had strong associations with health benefits as shown in table 6.17. All members of the first occupation group, civil servants, should have been covered by either government or state enterprise employee scheme. Possible errors were that interviewers recorded loose occupation titles and coders gave the code of civil servant to temporary government employees. A high percentage of traders and semi-skilled workers were left uncovered. Private insurance was their only alternative. Almost 40% of the not working group were dependents of civil servants or state enterprise employees.

Table 6.16 Health benefits by household income group

Quintile group	Not covered	Civil servant	State ent	Veteran volunteer	Low income	Social security	Private employer	Private insurance
1	67.4	16.0	0.8	1.9	7.7	0.5	1.4	4.2
2	55.7	31.8	0.1	2.1	3.0	1.6	1.1	4.2
3	44.1	37.0	4.7	2.3	3.3	0.7	1.6	6.3
4	34.0	50.5	6.4	1.6	0.7	1.4	1.7	3.7
5	38.1	42.0	8.8	0.7	0.3	1.6	1.6	6.5
Total	46.8	36.4	4.5	1.7	2.8	1.2	1.5	5.0

p value 0.00, Chi square test
Source: General household survey

Table 6.17 Health benefits by occupation group

Occupation group	Not covered	Civil servant	State ent	Veteran volunteer	Low income	Social security	Private employer	Private insurance
Civil	3.2	79.1	15.8	1.4	0.0	0.3	0.0	0.3
Adm & prof	8.3	85.0	0.4	0.0	0.0	0.8	1.3	3.8
Trader	63.5	13.9	4.4	0.8	2.2	1.3	0.5	13.1
Semi-skill	67.7	7.5	5.4	5.4	3.2	0.0	1.1	9.7
Service	57.6	16.0	2.4	2.9	4.6	5.2	5.9	5.1
Not work	51.5	35.6	3.7	1.6	3.0	0.1	0.7	3.7
Total	47.6	35.6	4.5	1.6	2.7	1.1	1.5	5.2

p value 0.00, Chi square test
Source: General household survey

When the household head's occupation was taken as a proxy for all family members, there were some shifts of health benefit coverage (see table 6.18). More family members of civil servants and administrative and professional groups were uncovered. Only service worker families had more covered members though this was very little different. The same shifts were also observed when education level of household head was substituted for all family members. Families with a better educated household head were more likely to be covered by civil servant health benefits. Table 6.19 shows health benefits by education level of individuals. The gradient was stronger when household head's education level was used. The uncovered in the no education group increased to 57% while the university level was 33%.

It is unfortunate that the real figures of dependents covered by each scheme cannot be presented because the coding schedule did not distinguish main beneficiaries and dependents. However, an indirect estimate, assuming that dependents were those younger than 20 years and older than 60 years of age could be compared as a percentage of the total covered by each scheme. Fifty eight percent of those who were covered by low income cards were the young and the aged. Forty five percent of civil servant beneficiaries were 'dependents' as compared to 37% of state enterprise beneficiaries. Private insurance and private employee schemes had about 26% and 28% respectively as 'dependents'. Interpreting these figures should be cautioned. The real figures of dependents must be higher, since spouses who acquired health benefits by virtue of their partner's job would be about the same age as their partner.

Table 6.18 Health benefits by occupation of head of household

Occupation group	Not covered	Civil servant	State ent	Veteran volunteer	Low income	Social security	Private employer	Private insurance
Civil	15.6	67.9	12.6	0.9	0.4	0.5	0.7	1.0
Adm & prof	22.9	68.8	0.3	0.3	0.0	1.1	1.1	5.1
Trader	67.4	12.5	3.2	0.4	2.8	1.0	1.4	11.1
Semi-skill	71.1	6.7	2.7	3.4	4.0	0.0	4.0	8.1
Service	56.8	23.5	2.9	3.8	4.2	2.1	2.1	4.6
Not work	51.3	37.2	2.3	1.2	3.8	0.9	1.1	2.1
Total	47.6	35.6	4.5	1.6	2.7	1.1	1.5	5.2

p value 0.00, Chi square
Source: General household survey

Table 6.19 Health benefits by education level of individuals

Education group	Not covered	Civil servant	State ent	Veteran volunteer	Low income	Social security	Private employer	Private insurance
No ed	53.0	29.3	3.4	2.0	5.9	0.0	0.5	5.6
Primary	53.8	28.6	3.6	2.0	4.6	0.8	0.9	5.5
Secondary	49.0	36.9	4.3	2.1	1.4	0.7	1.4	4.1
Vocation	37.2	40.1	7.5	1.2	0.4	3.7	2.7	7.1
University	41.6	43.9	4.8	0.8	0.0	1.3	1.8	4.4
Total	47.6	35.7	4.5	1.7	2.7	1.2	1.4	5.1

p value 0.00, Chi square test
Source: General household survey

Access to health services by entitlement to health benefit schemes proved to be significantly associated with morbidity and use of health services. Table 6.20 shows that the self-reported rates of acute and chronic illnesses of the covered group were significantly higher than the uncovered group. Further breakdown by types of health benefit (table 6.21) reveals that veteran and volunteer benefits reported highest rates of acute and chronic illnesses but the rates greatly decreased when an age band of 20 to 49 years old was used in the analysis. This is because the veteran benefit provided coverage to older age groups rather than younger. Civil servant benefit and private insurance reported more or less the same rates of acute and chronic illnesses. When an age band of 20 to 49 years old was used in the analysis, there were no significant associations between health benefit scheme and acute or chronic illness. It is interesting that all the rates for the restricted age band were lower except that the rates of chronic illness in not covered and private insurance group were slightly increased.

Table 6.20 Morbidity by health benefit coverage

Illness	Covered n=2,017	Not covered n=1,832	p value
Acute illness	13.9	10.0	0.00
Chronic illness	14.8	9.4	0.00
Disability	0.8	1.1	0.41

Source: General household survey

Table 6.21 Health benefits by acute and chronic illnesses

Health benefit	All ages n	All ages Acute %	All ages Chronic %	Age 20-49 years n	Age 20-49 years Acute %	Age 20-49 years Chronic %
Not covered	1,834	10.0	9.4	867	8.4	10.8
Civil	1,369	13.2	15.3	622	9.6	14.0
State ent	174	17.2	9.8	91	11.0	6.6
Vet & vol	63	20.6	23.8	29	10.3	13.8
Low income	102	12.7	14.7	29	10.3	13.8
Social sec	44	9.1	13.6	38	7.9	13.2
Private emp	56	12.5	3.6	40	10.0	2.5
Private ins	200	15.0	14.0	133	13.5	14.3
Others	7	28.6	14.3	5	20.0	0.0
Total	3,849	12.1	12.2	1,854	9.4	11.9
p value (Chi square)		0.01	0.00		0.78	0.20

Source: General household survey

Consultations within two weeks

As has been discussed in the section on equity in morbidity, age is the strongest confounding variable influencing most response variables. There was also evidence that age was associated with the choice of treatment between public and private sectors as shown in chapter 7. In this section, removing the effects of age by trimming the younger (less than 20 years) and the older age (more than 50 years) groups gave no statistically different results. The data presented here are therefore for all age groups, so caution is advised for direct interpretation.

To assess the equity of utilisation for equal need, cases with an acute illness within the past two weeks were selected for analysis. Tables 6.22 to 6.23 show the proportion using health services by different household income quintiles and health benefit schemes. The only variable among socio-economic characteristics which was significantly associated with use was health benefit of each individual.

It has been shown in table 6.4 that the rate of acute illness was associated with household income quintile. This section further explores how those reporting illness seek health care. Some may 'wait and see' or treat themselves with drugs available in the household. This was classified as not treated. Public services included visits to the municipal clinic and both public hospitals. Table 6.22 shows that there were no significant differences in health seeking behaviour of those who were ill in the past two weeks by household income quintile. Regrouping into either treat and not treat or public, private and no treat gave no significant differences. The figures in table 6.22 suggest that the lower quintiles used drug stores and public services more often than higher quintiles. Household income quintile 4, which reported the lowest acute illness rate, had the highest rate of private hospital use. Per capita income quintiles also suggested that the lower quintiles also used drug stores and public services more often than higher quintiles. Almost one fourth of those reporting illness used private hospitals.

Table 6.22 Acute illness and use of health services by household income group

Quintile group	Person ill	Not treat	Drug store	Clinic	Public service	Private hospital	Others
1	95	12.6	25.3	23.2	22.1	12.6	4.2
2	69	18.8	29.0	21.7	14.5	10.1	5.8
3	95	20.0	22.1	14.7	23.2	13.7	6.3
4	66	16.7	18.2	19.7	15.2	22.7	7.6
5	126	19.0	18.3	24.6	15.1	16.7	6.3
Total	451	17.5	22.2	21.1	18.2	15.1	6.0
p value (Chi square) 0.67							

Source: General household survey

Occupational group and occupation of household head both had no significant association with use. Regrouping sources of treatment made no improvement to the statistical analysis. Table 6.23 suggests that civil servants made high use of public service for outpatient care. The administrative and professional group had high rates of no treatment or self treatment and private hospital use, but the lowest rate of private clinics. Traders made more use of drug stores, clinics and public services and had a low rate of no treatment. Service workers used drug stores and private clinics more. The not working group used private clinics more.

Table 6.23 Acute illness and use of health services by occupation group

Occupation group	Person ill	Not treat	Drug store	Clinic	Public service	Private hospital	Others
Civil	35	14.3	22.9	14.3	28.6	5.7	14.3
Adm & prof	32	25.0	21.9	6.3	15.6	21.9	9.4
Trade	68	11.8	27.9	25.0	22.1	10.3	2.9
Semi-skill	9	33.3	22.2	22.2	22.2	0.0	0.0
Service	52	17.3	28.8	21.2	13.5	15.4	3.8
Not work	268	19.1	19.1	23.2	16.1	16.5	6.0
Total	464	18.1	22.0	21.3	17.7	14.9	6.0
p value (Chi square) 0.15							

Source: General household survey

When the occupation of household head was used in the analysis, the number of illnesses was more evenly distributed amongst occupational groups because of the reallocation of the not working individuals to

other occupational groups (see table 6.24). Dependents of civil servants made more use of private hospitals and much less use of public services, but had a higher number of not treated. The administrative and professional group still showed high rates of no treatment and private hospital use. Traders' dependents made higher use of private clinics, as did the not working families.

Table 6.24 Acute illness and use of health services by occupational group of head of household

Occupation group	Person ill	Not treat	Drug store	Clinic	Public service	Private hospital	Others
Civil	107	23.4	21.5	10.3	18.7	15.9	10.3
Adm & prof	49	22.4	18.4	14.3	18.4	18.4	8.2
Trade	109	12.8	23.9	31.2	20.2	11.0	0.9
Semi-skill	20	20.0	30.0	15.0	15.0	15.0	5.0
Service	106	14.8	25.9	21.3	16.7	15.7	5.6
Not working	71	19.7	14.1	29.6	14.1	15.5	7.0
Total	464	18.1	22.0	21.3	17.7	14.9	6.0
p value (Chi square) 0.10							

Source: General household survey

Table 6.25 Acute illness and use of health services by type of health benefit

Health benefit	Person ill	Not treat	Drug store	Clinic	Public service	Private hospital	Others
Not covered	184	15.8	27.7	25.5	16.3	10.9	3.8
Civil	181	22.1	14.4	13.3	20.4	18.8	11.0
State ent	30	26.7	23.3	30.0	10.0	10.0	0.0
Vet & vol	13	23.1	7.7	23.1	46.2	0.0	0.0
Low income	13	0.0	15.4	46.2	23.1	7.7	7.7
Social sec	4	0.0	0.0	50.0	25.0	25.0	0.0
Private emp	7	14.3	14.3	14.3	28.6	28.6	0.0
Private ins	30	6.7	46.7	23.3	0.0	23.3	0.0
Total	464	18.1	22.0	21.3	17.7	14.9	6.0
p value 0.00, Chi square test							

Source: General household survey

Health benefit was shown to be associated with morbidity of acute and chronic illnesses in table 6.20. Table 6.25 further shows that health benefit was significantly associated with use in acute illness. The uncovered used drug stores and clinics more. Civil servants and dependents used public services and private hospitals more. Nearly half

of those who had private insurance made use of drug stores, and the rest went to private clinics and private hospitals.

Hospitalisation during the past year

Hospitalisation rates were influenced by age as shown in table 6.26. The rate was as high as 11% in the under ten years and started to rise from 40 years of age and above. The rates in females aged under ten, 20 to 39 and 70 to 89 years old were higher than those of males but none were significantly different from each other at the 95% confidence level. Tables 6.27 to 6.30 further show hospitalisation rates by socio-economic characteristics. There were no significant differences in hospitalisation rates by household income, occupation and household head's occupation. The only significant factor was health benefit (which is confounded by age, see population pyramids in Annex 1). The uncovered had a lower hospitalisation rate compared to those covered by private insurance and civil servant and state enterprise benefits. The significantly different hospitalisation rates between males and females were shown only in those with a household head in the civil servant group (male 6.8% and female 12.6%) and those with state enterprise health benefit (male 4.9%, female 20.7%). Moreover, table 6.31 indicates that whether the initial visit was to a public or private hospital had a significant effect on whether or not patients would be hospitalised. Private hospitals were more likely than public hospitals to admit cases of acute illness.

Table 6.26 Hospitalisation by age group

Age group	Number of person		% Hospitalised		
	Male	Female	Male	Female	Total
0-9	293	270	9.9	11.5	10.6
10-19	374	401	7.0	3.5	5.1
20-29	286	347	5.6	7.8	6.8
30-39	317	434	6.0	9.7	8.1
40-49	224	245	11.2	10.6	10.9
50-59	115	162	13.5	14.8	14.2
60-69	87	129	13.8	12.4	13.0
70-79	36	51	8.3	19.6	14.9
80-89	8	20	12.5	30.0	25.0
90-99	1	2	0.0	0.0	0.0
Total	1,781	2,061	8.5	9.5	9.0

Source: General household survey

Tables 6.27 to 6.30 also give details on the choice of public and private hospital care in the municipal area. Household income (including per capita income), own and household head's occupational group and health benefit had a significant association with choice of public or private hospital. The lower income quintile disproportionately went to public hospitals, and the higher quintile went to private (see table 6.27). The same trend was observed for per capita income.

Table 6.27 Hospitalisation by household income group

Quintile	n	% admission	Share of hospitals Public	Private
1	62	9.9	59.3	37.0
2	58	8.2	44.1	50.8
3	67	8.9	26.7	68.0
4	70	9.2	16.9	80.3
5	84	9.7	18.6	75.6
Total	341	9.0	30.7	64.6
p value (Chi sq)		0.81	0.00	

Source: General household survey

Table 6.28 Hospitalisation by occupational group

Occupation group	n	% admission	Share of hospital Public	Private
Civil servant	33	9.5	35.5	54.8
Admin & professional	18	7.5	10.5	84.2
Trade	53	8.9	20.0	74.8
Semi-skill	8	8.6	60.0	40.0
Service	49	8.3	46.3	53.7
Not working	187	9.4	29.4	66.0
Total	348	9.0	30.5	64.9
p value (Chi square)		0.94	0.04	

Source: General household survey

Administrative and professional groups made more use of private hospitals. The use of public hospitals by civil servants and service workers was greater than the average. After substituting the household head's occupation, those not working disproportionately went to public hospitals. Interestingly, about equal numbers of the uncovered went to public and private hospitals. Civil servant and state enterprise covered patients went to private hospitals compared to public hospitals in a

ratio of 2:1. Few (5%) of those who had private insurance were admitted to public hospitals (see table 6.30).

Table 6.29 Hospitalisation by occupational group of head of household

Occupation group	n	% admission	Share of hospitals Public	Private
Civil servant	75	9.8	23.0	67.6
Admin & professional	43	12.2	18.8	79.2
Trade	65	7.1	24.6	71.0
Semi-skill	10	6.7	45.5	54.5
Service	92	9.2	37.0	60.5
Not working	63	9.5	43.9	51.5
Total	348	9.0	30.5	64.9
p value (Chi square)		0.07	0.03	

Source: General household survey

Table 6.30 Hospitalisation by health benefit schemes

Health benefit	n	% admission	Share of hospitals Public	Private
Not covered	93	5.1	45.5	48.5
Civil	173	12.6	26.3	68.2
State ent	23	13.2	30.4	60.9
Vet & vol	6	9.5	71.4	14.3
Low income	10	9.8	85.7	14.3
Social sec	2	4.5	0.0	100.0
Private employer	5	8.9	33.3	66.7
Private insurance	34	17.0	4.7	90.9
Others	2	28.6	0.0	100.0
Total	348	9.0	30.5	64.9
p value (Chi square)	0.00		0.00	

Source: General household survey and diary plus interview

Table 6.31 Admission rate by place of initial visit from consultation within two weeks

Place	n	% hospitalised
Public hospitals	83	15.7
Private hospitals	84	34.5

p value 0.00, Chi square test
Source: General household survey

Regression models of morbidity and choice of treatment

Logistic regression was then used to analyse morbidity and choice of treatment to control for various confounding variables. Dependent variables were converted into dichotomous responses of 0 and 1. The general model for fitting is as follows:

$$\text{Probability (event)} = \frac{1}{1 + e^{-Z}}$$

where Z is the linear combination of

$$Z = B_0 + B_1X_1 + B_2X_2 + \ldots + B_iX_i$$

and the B_i coefficient is the natural logarithm of the odds of the i-th independent variable when it increases by one unit.

Independent variables to determine the likelihood of morbidity (acute, chronic illness and disability) and choice of treatment (not treat/treat, drug store, private clinic, public facility and private hospital) are listed in table 6.32. Many variables had to be recoded so as to achieve a substantial number for statistical analysis. Occupational groups were recoded into 3 groups: the administrative and professional group was merged with civil servants and was called 'Class1'; traders, semi-skilled and service workers were put into 'Class2', and those not working were 'Class3'. However, during the process of analysis, Class2 was aliased in the model since this corresponds to both variables Class1 and Class3 taking the value 0. So Class2 corresponds to the baseline value. The same process and interpretation were applied to 'Hclass' and 'Tcover' in table 6.32.

A composite family wealth indicator constructed from variables on house ownership, car ownership and crowding index (number of family members divided by number of bedrooms) was tried at earlier stages of logistic regression modeling. Different cut off points for 'over-crowding' index and the family wealth indicator were tested, but none gave impressive results. So, at the final stage, the family wealth indicator was dropped out.

Table 6.33 shows R coefficients for logistic regression models explaining different dependent variables. The R coefficient indicates how closely independent and dependent variables are correlated: the higher the value the better the correlation. Variables explaining the probability of reporting acute illness included own education, education of household head and having no health coverage. The higher education and having no health coverage reduced the probability of reporting whereas the higher the education of the household head, the higher the probability of reporting acute illness for all family members.

Table 6.32 Description of variables used in logistic regression

Variables	Description	Value
Age	Age	Real value
Sex	Sex	0 = female, 1 = male
Ln(Hincome)	Household income	Natural logarithm
Ed	Education of individual	0 = no education and primary, 1 = higher
Hed	Education of household head	The same as Ed
Class1	Occupational group	0 = others, 1 = civil servant, administrative & professional group
Class2	Occupational group	0 = others, 1 = trader
Class3	Occupational group	0 = others, 1 = those not working
Hclass1	Occupation of household head	The same as Class1
Hclass2	Occupation of household head	The same as Class2
Hclass3	Occupation of household head	The same as Class3
Tcover0	Type of health benefit	0 = Others, 1 = not covered
Tcover1	Type of health benefit	0 = Others, 1 = limited coverage schemes, eg. veteran and volunteer, low income card
Tcover2	Type of health benefit	0 = Others, 1 = civil servant benefit, state enterprise and private insurance
Amix	Severity of acute illness	0 = not severe, 1 = severe
Acute	Acute illness	0 = none, 1 = ever had illness within the past 2 weeks
Chronic	Chronic illness	0 = none, 1 = with one or more chronic illnesses
Disable	Disability	0 = none, 1 = with one or more disabilities
Hosp	Hospitalisation	0 = none, 1 = ever been hospitalised
Treat	Treatment	0 = no treatment, 1 = seek some sort of treatment
Drug	Drug store	0 = others, 1 = used drug store for acute illness
Clinic	Private clinic	0 = others, 1 = used private clinic for acute illness
Public	Public service	0 = others, 1 = used public outpatient service or public hospital for acute treatment
Priv	Private hospital	0 = others, 1 = used private hospital for acute illness

There were more variables explaining the probability of reporting chronic illness. Positive associations were found with age and education level of household head. Male, more educated individuals and the lower occupational group had a lower prevalence of chronic disease than female, less educated and the intermediate occupational group.

Table 6.33 R coefficients for logistic regression models

Independent variables	Dependent variables								
	Acute	Chronic	Disable	Hosp	Treat	Drug	Clinic	Public	Priv
Age	.	.23	.10	.	.	.07	-.14	.	.
Sex	.	-.04	.	.	.	.	.	.	.
Ln(Hincome)	.	.	.	.	.	-.09	.	.	.10
Ed	-.14	-.06	.	.	-.16	.	.	.	-.11
Hed	.05	.04	.	.	.	.	.	.	.
Class1	.	.	.	.	.	.	.	.	.
Class3	.	-.03	.07	.	.	.	.	.	.
Hclass1	.	.	.	.	.07	.	-.10	.	.
Hclass3	.	.	.	.	.	-.07	.	.	.
Tcover0	-.03	.	.	.	.	.	.	-.07	.
Tcover2	.	.	.	.04	.	.	.	-.08	.
Amix	*	*	*	*	.	-.09	.	.10	.09
Acute	*	*	*	.12	*	*	*	*	*
Chronic	*	*	*	.16	*	*	*	*	*
Disable	*	*	*	.	*	*	*	*	*
-2 Log likelihood	2483.0	2344.4	335.2	1923.7	422.7	408.2	409.0	366.2	334.2
df	3484	3484	3484	3481	407	407	407	407	407

Source: General household survey
Note: (.) = not significant at $p < 0.05$
(*) = not included in the model

Age and occupational group were correlated with disability: the older and the lower the occupational group the more frequently was disability reported. Having health benefit (civil servant benefit and private insurance) and having acute and chronic illness increased the chance of being hospitalised.

In order to analyse the choice of treatment, only those reporting acute illness within the previous two weeks were included in the analysis. The model determining whether to use any sort of health care or not found individual education level and occupational group of household head to be significant variables. The lower the education of the individual or the higher the occupational group of the household head, the more likely they used some sort of treatment.

There were four significant variables determining the use of drug stores: age, household income, occupation of household head and severity of illness. The older age groups made more use of drug stores than the

younger. Those with more severe illness, and members of higher income households as well as members of households with a not working head, used drug stores less often.

Variables determining the use of private clinics, public services and private hospitals were very different from one another. However, more severe illness increased the chances of going to a public facility as well as a private hospital. Older people and members of families of higher occupational group used private clinics less often. Paradoxically, those who had no health coverage and those who were adequately covered (civil servant benefit and private insurance) were less likely to use public facilities as compared to those with limited coverage. Finally, higher income groups were more likely to go to private hospitals but not the more educated.

Table 6.34 Classification power of logistic regression models

Dependent variables in the models	Observed probability of outcome	Negative results predicted correctly	Positive results predicted correctly	% correct overall
Acute	12.0%	88.0%	0.0%	88.0%
Chronic	12.3%	87.8%	40.0%	87.7%
Disable	0.9%	99.1%	0.0%	99.1%
Hosp	9.2%	91.1%	65.0%	91.0%
Treat/not treat	77.1%	0.0%	77.1%	77.1%
Drug store	21.7%	78.7%	50.0%	78.3%
Private clinic	22.4%	78.0%	36.4%	76.9%
Public service	17.6%	82.7%	50.0%	82.4%
Private hospital	15.5%	85.5%	83.3%	85.5%

It should be noted that the R coefficients in table 6.33 were very low even though they were significantly different from 0. Table 6.34 shows the predictive power of the models. This predictive power is used instead of the R squared in multiple linear regression, but it is influenced by the observed probability of the outcome. A good model should give correct predictive results both for negative and positive outcomes. Hence, the models for choice of private hospital and probability of being hospitalised were better than the other models. In the model explaining the choice of private hospital, the chance of predicting any case correctly is 74% $[(0.155)^2 + (1-0.155)^2]$, so predictive results of the model were better than by chance. (table A.15

in Annex 1 provides a detailed cross tabulation of expected by observed values in the choice of private hospital model).

Promotive and preventive services: maternal and child health

Apart from curative services, both public and private hospitals also provide promotive and preventive services. Activities on maternal and child health are considered here. Females aged 15 to 44 years and children under 6 years were analysed to highlight access to maternity care and child immunisation.

About 5% of reproductive age females (total 1,149) reported use of antenatal, natal and postnatal care, and 10% reported use of family planning services within the past 12 months. Due to the small sample size, significant associations were difficult to prove. The trend only suggests that higher household income quintiles and higher occupational groups made more use of postnatal care in private services.

For children aged less than 6 years (total 329), one-third reported the use of immunisation service within the past 12 months. Significant associations were observed in the choice of use and household income quintile and health benefit coverage. Children in higher income families and with health benefit coverage made more use of private services.

6.3 Equity of financing health care

This section is concerned with who pays for the public and private health services. The first part starts with a description of the costs to users of services. Then different payers for outpatient and inpatient services are discussed. The last part of this section considers the burden of household health expenditure in relation to household income.

The costs to users

Expenditure on visits to public and private health facilities are presented in tables 6.35 and 6.36. In table 6.35, the charges were for the consultations within the past two weeks excluding cases which led to

hospitalisation. Means and medians of the charges are presented to indicate how skewed the charges were. About 6% (7 cases out of 123) of the consultations at private clinics were reimbursable and they were fully reimbursed according to the median, but 93% in terms of the mean. Nearly 60% (41 out of 70 cases) of the consultations at public facilities were reimbursable and the rate of reimbursement was 99% (in terms of the mean). The charges at private hospitals for ambulatory cases were generally 15% higher than those of public facilities. For reimbursable cases the charges were 2 to 4 times higher. Only 23% of the consultations at private hospitals were reimbursable and 88% (by the mean) of full charges were reimbursed (see also figure 6.2).

Table 6.36 contains similar information to table 6.35, but for hospitalisation. Fifty six percent of cases at public hospitals were reimbursable and the reimbursement rate was 97% (by the mean). There was a greater share of reimbursable cases at private hospitals, about 75% of all cases, with a reimbursement rate of 96% in terms of mean but 84% of the charges by median. It is interesting that the charges of public hospitals for reimbursable cases were 2.2 times higher than the charges of private hospitals when their means are compared. Moreover the reimbursable rates as a percentage of each total charge for inpatients in private hospitals were spread more evenly than in public hospitals and of outpatients (see figure 6.3).

Table 6.35 Charges and reimbursement for consultation within two weeks

Place	All cases			Reimbursable cases					
		Charges			Charges		Reimbursement		% Reimburse
	n	Mean	Median	n	Mean	Median	Mean	Median	Mean	Median
Drug store	96	44.5	30.0	0	-	-	-	-	-	-
Clinic	123	167.1	100.0	7	111.4	80.0	105.7	80.0	92.9	100.0
Public serv	70	348.9	177.5	41	388.1	200.0	386.1	180.0	99.1	100.0
Private hosp	53	574.5	200.0	12	1,726.7	425.0	1,592.4	400.0	88.4	100.0
Others	18	205.6	150.0	14	232.9	160.0	232.9	160.0	100.0	100.0
p value		0.00	0.00		0.00	0.00	0.00	0.00		
Test of sig		F test	K-W		F test	K-W	F test	K-W		

Source: General household survey

Table 6.36 Charges and reimbursement for hospitalisation within one year

Hospital	All cases			Reimbursable cases					
		Charges			Charges		Reimbursement		% Reimburse	
	n	Mean	Median	n	Mean	Median	Mean	Median	Mean	Median
Public	85	6,304.6	1,500.0	48	9,517.3	2,484.0	9,211.1	2,434.0	97.0	100.0
Private	205	4,208.4	3,000.0	154	4,185.7	3,000.0	3,061.2	2,600.0	96.1	84.0
Others	10	8,130.0	7,000.0	6	6,916.7	4,300.0	3,250.0	2,300.0	95.7	90.0
p value		0.17	0.00		0.02	0.63	0.00	0.99		
Test of sig		F test	K-W		F test	K-W	F test	K-W		

Source: General household survey

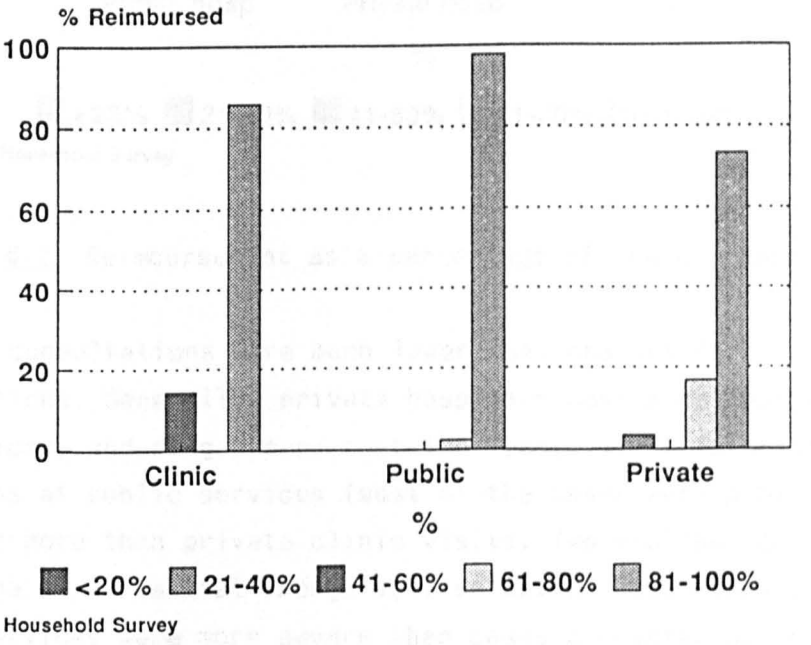


Figure 6.2 Reimbursement as a percentage of charge, acute illness

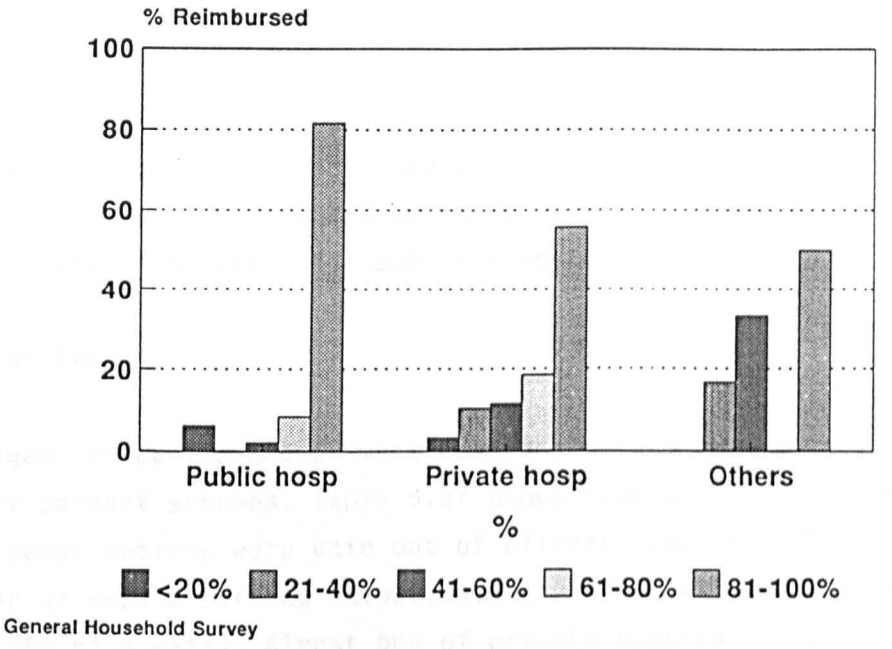


Figure 6.3 Reimbursement as a percentage of charge, hospitalisation

Charges for consultations were much lower than charges for hospitalisations. Generally, private hospitals cost more than any other health services, and drug stores cost the least. It is interesting that consultations at public services (most of the cases were public hospital visits) cost more than private clinic visits. Two explanations are possible. The first is that though self-selection, the cases presented at public services were more severe than cases presented at private clinics (see table A.9 in Annex 1), as is also suggested by logistic regression in table 6.33. The second is that most private clinics had no laboratory investigations, so the charges were only marked up drug prices with a nominal doctor fee. The perceived lower price could be one reason why the poor went to private clinics instead of the public hospital. Also private clinics had a shorter waiting time (see details on waiting time in chapter 7).

Charges for hospitalisations in public hospitals were highly skewed. The mean for public hospitals was higher than that for private hospitals, but the median was lower. This was because some cases in public hospitals stayed a very long time and hence cost a lot. In such a

situation, the median is more appropriate for comparisons than the mean. Strong bias towards longer lengths of stay and higher charges was seen for reimbursable cases than the average in public hospital hospitalisations because they were not under pressure of paying for treatment. The reimbursable cases of public hospitals also stayed longer than in private hospitals, presumably because the level of reimbursement to private hospitals is limited in terms of the rate per day and length of stay. There is no limit for public hospitals.

Sources of finance

The charges for public and private health services were paid for by different payment schemes. Table 6.37 shows that about 37% of public service consultations were paid out of clients' pockets. The major financier of public service outpatients was the civil servant benefit scheme (50% of visits). Almost 60% of private hospital outpatient visits were paid by clients themselves. Other payers of private hospital visits were civil servant benefit scheme (20%), private insurance (10%), state enterprise benefit (6%) and private employers (5%).

Table 6.37 Sources of payments (%)

Sources of payment	Consultation		Hospitalisation	
	Public service	Private hospital	Public hospital	Private hospital
Out of pocket	36.8	58.3	36.4	20.8
Government benefit	49.5	20.2	40.2	47.8
State enterprise	3.2	6.0	7.5	8.0
Veteran & volunteer	3.2	0.0	1.9	0.4
Low income card	1.1	0.0	2.8	0.0
Private employer	0.0	4.8	1.9	1.8
Private insurance	1.1	9.5	1.9	19.0
Others	5.3	1.2	7.5	1.3
Total	100.0	100.0	100.0	100.0
Number of observation	95	84	107	242
p value (Chi square)	0.00		0.00	

Source: General household survey

For inpatient care, out of pocket payments for public hospitals were about the same as outpatient visits (36%). Government sources of finance were from civil servant benefit, veteran and volunteer and low income

card schemes (about 50%). Other private sources were private insurance (2%) and others (about 8%). Forty eight percent of private hospital inpatient care was financed from civil servant benefit schemes, 21% from out of pocket payments and another 22% from other private sources.

Table 6.38 breaks down sources of finance for consultations at all public and private health services by household income quintile. Out of pocket payments disproportionately came from the lower quintile while civil servant benefit schemes paid for a greater proportion of the higher quintiles than the lower quintiles. The low income card scheme paid more frequently for the lower income quintiles and private insurance paid for the higher as well as lower quintiles.

Table 6.38 Payers for acute illness by household income group (%)

Sources of payment	Quintile group 1	2	3	4	5
Out of pocket	81.2	78.4	72.4	55.9	67.7
Government benefit	10.4	9.8	16.1	37.3	19.7
State enterprise	0.0	3.9	2.3	0.0	7.1
Veteran & volunteer	1.0	0.0	3.4	0.0	0.0
Low income card	2.1	3.9	0.0	0.0	0.0
Private employer	1.0	2.0	0.0	1.7	2.4
Private insurance	2.1	2.0	2.3	5.1	2.4
Others	3.1	0.0	3.4	0.0	0.8
Total	100.0	100.0	100.0	100.0	100.0
Number of observation	96	51	87	59	127

p value 0.00, Chi square test

Source: General household survey

Table 6.39 for hospitalisation suggests the same trends of sources of finance as in table 6.38. A higher percentage of the lower quintiles had to pay out of their pocket for inpatient care than the higher quintiles. Most of the government schemes benefited more the higher income quintiles; only low income cards benefited the poor. Private insurance scheme also benefited more the higher income quintiles.

Table 6.39 Payers for hospitalisation by household income group (%)

Sources of payment	Quintile group 1	2	3	4	5
Out of pocket	43.4	36.2	27.0	9.6	20.7
Government benefit	32.1	34.5	43.2	63.0	49.4
State enterprise	5.7	0.0	6.8	12.3	12.6
Veteran & volunteer	1.9	1.7	0.0	1.4	0.0
Low income card	3.8	1.7	0.0	0.0	0.0
Private employer	1.9	1.7	0.0	1.4	2.3
Private insurance	5.7	12.1	17.6	12.3	13.8
Others	5.7	12.1	5.5	0.0	1.1
Total	100.0	100.0	100.0	100.0	100.0
Number of observation	53	58	74	73	87
p value 0.00, Chi square test					

Source: General household survey

The proportions of lower household income quintiles paid by the low income card scheme for their hospitalisations were low as compared with the results of the bed census in chapter 7. The reasons why two different techniques gave a wide gap of results will be discussed in chapters 7 and 8.

The burden of health service costs in relation to household income

It is difficult from the survey to estimate the burden of health expenditure in relation to total household income. The household surveys asked for expenditures incurred for acute illness during the past two weeks and hospitalisation during the past 12 months. An assumption is made here to estimate the burden of health expenditure to household income. Annual expenditures were calculated by multiplying the two-week expenditure by 26 and adding it to hospitalisation expenses. Tables 6.40 demonstrates the burden of health expenditures under this assumption. There are arguments against the above assumption. The strongest is that those households who reported no illness and no expenditure during the household surveys were kept free from illness and expense all the year, which is not plausible. And for households with acute illness, expenditures for the whole year were artificially high for those households since two weeks' expenditure was multiplied by 26.

Table 6.40 shows that about half of the households in each income quintile experienced illness and paid for their health services. The expenses before and after reimbursement were significantly different for different income quintiles. For example, in quintile 1, before reimbursement, 56% of households spent at least 10% of their annual household income on health. After reimbursement, 47% of households still spent at least 10% of their annual income on health. In quintile 5, before reimbursement, 30% of households spent less than 1% of their annual income for health. After reimbursement, more households (57%) spent less than 1% of household income.

Table 6.40 Health expenditure as percentage of household income, weighted

Quintile	No of households			Proportion of households in quintiles with specified % burden to household income							
				Before reimburse				After reimburse			
	Total	With exp	%	<1%	1-4	5-9	=>10%	<1%	1-4	5-9	=>10%
1	178	88	49.4	11.4	21.6	11.4	55.7	21.6	20.5	11.4	46.6
2	178	75	42.1	21.3	32.0	24.0	22.7	40.0	30.7	16.0	13.3
3	178	83	46.6	20.5	41.0	14.5	24.1	37.3	38.6	13.3	10.8
4	178	82	46.1	18.3	52.4	14.6	14.6	47.6	41.5	6.1	4.9
5	178	101	56.7	29.7	45.5	8.9	15.8	57.4	30.7	2.0	9.9
p value (Chi square)				0.00				0.00			

Source: General household survey

Sensitivity testing was used to reduce the high weighting (26 times) given to expenditures within the past two weeks. Taking for example, a weight of 80% (that is, 0.8x26 or 20.8 was used to multiply outpatient expenditure within the past two weeks), the burden to household income both before and after reimbursement did not change much, ie. about 1% to 2% shift from the higher to the lower groups. Until the weight was reduced to 5% (that is, 0.05x26 or only 1.3 was used to multiply outpatient expenditure) at least 20% of households in household income quintile 1 still spent at least 10% of their household income on health care after reimbursement.

To overcome the above problems, the share of health expenditure in household income was analysed at the macro level, by assuming all households in the same quintile bore the total health expenditure, and total income was summed for each quintile.

Tables 6.41 and 6.42 show the percentage of health expenditure to household income and percentage of health expenditure after adjusting for reimbursement to household income by quintiles. Table 6.41 uses household income quintiles while table 6.42 uses per capita income quintiles. Annual health expenditure was estimated from the two-week expenditure on acute illness multiplied by 26, and then added to annual expenditure for hospitalisation.

In table 6.41, health expenditure is 5.3% of household income as an average over all income groups. The lowest quintiles paid most (33%) out of household income, and even this remained the case when reimbursable expenses were subtracted out (21% while the average net expenditure over all income groups was 3%). The same gradient was observed when per capita quintile was used (table 6.42).

Table 6.41 Annual health expenditure by household income group

Quintile group	Total income	Health expenditure	After reimburse	Health expenditure as % of household income: before reimburse	Health expenditure as % of household income: after reimburse
1	5,120,294	1,673,067	1,084,296	32.7	21.2
2	11,867,019	475,353	308,697	4.0	2.6
3	18,792,869	965,828	361,084	5.1	1.9
4	28,523,651	819,954	247,964	2.9	0.9
5	75,676,476	3,538,272	1,586,738	4.7	2.1
Total	139,980,309	7,472,474	3,588,779	5.3	2.6

Source: General household survey

Table 6.42 Annual health expenditure by per capita income group

Quintile group	Total income	Health expenditure	After reimburse	Health expenditure as % of household income: before reimburse	Health expenditure as % of household income: after reimburse
1	6,616,330	1,560,193	1,183,940	23.6	17.9
2	13,789,044	961,347	356,473	7.0	2.6
3	20,128,180	943,498	292,904	4.7	1.5
4	30,318,165	1,031,124	447,004	3.4	1.5
5	69,128,590	2,976,312	1,308,458	4.3	1.9
Total	139,980,309	7,472,474	3,588,779	5.3	2.6

Source: General household survey

Table 6.43 Annual health expenditure by other socioeconomic parameters

Socio-economic group	Total income	Health expenditure	After reimburse	Health expenditure as % of household income before reimburse	Health expenditure as % of household income after reimburse
Household head's education					
No education	10,544,217	270,080	100,750	2.6	1.0
Primary	32,058,244	1,580,842	1,095,606	4.9	3.4
Secondary	29,190,908	1,541,997	857,763	5.3	2.9
Vocational	24,252,237	1,959,974	175,549	8.1	0.7
University	3,907,478	1,573,670	874,790	4.0	2.2
Household head's occupation					
Civil servant	36,966,454	1,357,303	586,942	3.7	1.6
Admin & prof	19,149,888	836,602	279,491	4.4	1.5
Trader	33,568,419	2,638,278	1,031,979	7.9	3.1
Semi-skilled	5,702,078	124,670	109,269	2.2	1.9
Service work	25,738,384	991,462	574,797	3.9	2.2
Not working	18,855,082	1,524,161	1,006,297	8.1	5.3
Household head's health benefit					
Uncovered	37,212,769	2,148,525	1,722,195	5.8	4.6
Civil servant	64,549,857	2,988,605	1,099,378	4.6	1.7
State enterp	13,583,120	426,574	308,400	3.1	2.3
Veteran & vol	3,039,834	91,339	45,310	3.0	1.5
Low income	2,027,820	129,090	124,661	6.4	6.1
Social secur	2,998,700	45,010	18,510	1.5	0.6
Private emp	569,400	7,160	1,960	1.3	0.3
Private insur	16,048,558	1,632,178	268,351	10.2	1.7

When income data are compared against annual health expenditure estimates, it is of concern that the estimation of income especially in income quintile 1 (both household and per capita income) might be the most unreliable. It is more likely that they were under-estimated. Table 6.43 spreads out these underestimates across other socioeconomic parameters of household heads (see tables A.16 and A.17 in Annex 1 that families in household income quintile 1 were redistributed to less privileged groups rather than more privileged). Before reimbursement, household heads with vocational education, with trading occupations and not working, and with private insurance incurred a high percentage of health expenditure to household income. But after reimbursement, relatively high burdens were still imposed on families of household heads with primary education, not working, low income and the uncovered.

6.4 Discussion

Different results of the general household survey from the health diary plus interview survey signalled that the main analyses should rely on the general household survey. Income distribution and Gini coefficient did not change when the data set of the diary plus interview was abandoned (Gini coefficient was also 0.49 when data from both techniques were pooled). This implies that both surveys picked up similar variations of household samples, but the diary plus interview survey systematically reported lower household income.

Household income and per capita income quintiles were simultaneously used to compare the discriminatory power for different response variables. Per capita income takes account of family members, the Gini coefficient of per capita income distribution was higher than that of household income which means that unequal distribution is more prominent when per capita income is used. However, in general, per capita income quintile gave no better results (in terms of providing statistically significant differences) than household income quintile, except in determining the prevalence rate of chronic disease.

To explore equity in health status, analyses were focused on variation in mortality and morbidity by socioeconomic variables. Detailed analyses were possible for morbidity where sample sizes were large enough. Excluding either the young or both the young and the aged showed that acute illness was negatively associated with income and education; and education was negatively associated with chronic illness and disability but occupation was positively associated with chronic illness and negatively associated with disability. However, strong associations of acute and chronic illnesses were also found with the type of health benefit. This suggests the possibility that access to health services (in terms of health benefit coverage), which was proved to be associated with use, may influence recall and reporting of acute and chronic illnesses rather than other socioeconomic factors.

It was not possible to demonstrate any clear gradient of morbidity among apparent gradients of socioeconomic groups. Income quintiles, based on

quantitative data, have the virtue of ordinal ranking, but income estimation was the most unrepeatable. Educational level, though qualitative, correlates with number of years studied, and hence has an acceptable gradient. The gradient for occupational groups and health benefit coverage is the most debatable. The other reason for failing to find a clear gradient of morbidity is that socioeconomic status in Thailand might not behave the same way as in the UK; for example educational status may not be associated with occupation or income.

It was difficult to use data on use of outpatient and inpatient services including maternal and child health activities to show inequity of use for equal need because of lack of data on need and quality of care. Type of benefit was associated with increased use of ambulatory services, hospitalisation and immunisation. It was also associated with choice of public or private outlets, ie. schemes with adequate coverage brought the patients to private more than public facilities. However, a logistic regression on choice of treat or not treat shows that the choice was influenced by education and occupational group of household head, not health benefit coverage. Interestingly, more of the high educated tried 'wait and see' or 'self-treatment', but higher occupation of household head groups were more likely to bring their family members to any sort of treatment. Income had no effect on choice of treat or not treat because there were many health service outlets with low and high charges.

Logistic regression models gave a better understanding of the relationship between dependent and independent variables where univariate analysis had limitations in controlling many confounding variables. Amongst important socio-economic variables, income was only correlated with the choices of drug store (negatively) and private hospital (positively) while education was negatively correlated with more response variables (acute, chronic, treat and private hospital). Health benefit coverage was correlated with acute illness (negatively), hospitalisation (positively) and choice of public facility (negatively). Severity of illness was important in making choices for drug stores (negatively), public facilities (positively) and private hospitals (positively).

Expenditures on health care were estimated. The general household survey gave comparative charges at drug store, clinic, public outpatient service, public hospital and private hospital for outpatient and inpatient services. The responses from household surveys were subject to a recall bias, especially a long recall of admissions within the past 12 months. Furthermore, missing information on total charges were more likely to be those who did not pay out of their own pocket or paid only a certain copayment because health services directly debit third party payers.

For ambulatory cases, charges at drug stores were the lowest. It is interesting that user charges at ambulatory public services (dominated by public hospital cases) were higher than at private clinics. However, the charges at private hospitals were the highest. There were significant differences in self-reported severity of illness among cases at different services. The highest proportions of cases at private hospitals were said to be severe, the second highest was for public services and the least was for drug stores. Charges for reimbursable cases were slightly lower than for non-reimbursable cases in private clinics. There were no significant differences in severity between the reimbursable and non-reimbursable. But charges for reimbursable cases were higher than the average in public services and private hospitals. This could reflect some degree of provider's moral hazard, if differences in outcomes could be ruled out. Private hospitals show a wider gap between reimbursable and non-reimbursable charges. Apart from private third party payers, which reimbursed expenditures in private hospital ambulatory cases, this could reflect provider's moral hazard in recording ambulatory visits as hospitalised cases in order to obtain reimbursement from civil servant benefit inflating total hospital charges to recover the cost of ambulatory visits for civil servant beneficiaries.

For hospitalised cases, average charges (in terms of the means) of public hospitals were higher than charges of private hospitals. Charges (in terms of the median) of public hospitals were lower than private hospitals. This is because the data from public hospitals were more highly skewed than private hospitals, ie. long stay cases were more

likely to be treated in public hospitals or public hospitals tended to keep patients longer (see more details in chapter 7). Unlike ambulatory visits, charges of reimbursable cases in public hospitals were higher than those of non-reimbursable cases, but this was not true for private hospitals. This time, public hospitals may exert moral hazard of admitting reimbursable cases longer or giving intensive treatment to recoup high revenues and provided a chance of cross-subsidising the uncovered. For private hospitals there is a limit of 30 days per admission for reimbursing private hospital inpatients.

Charges, health benefit coverage, severity of illness including time costs of waiting, played important parts in influencing choice of treatment. Public services' share of ambulatory visits was about 22% excluding the 'not treat' and increased to 31% for hospitalisation. A high proportion of users of ambulatory services had to pay out of pocket with few third party payers. However, for higher expenses such as hospitalisation, a higher proportion of cases were covered by some scheme of health benefit. The serious problem fell upon the lower income and the underprivileged households.

The estimation of burden of health expenditure to household income by income quintile groups suffered from the problem of household income estimation. Very low estimates of household incomes in income quintile 1 made the proportion an outlier from the rest. When these underestimates were spread out across other socio-economic parameters of household heads, the proportions looked more realistic.

Underprivileged families (families with household heads in the not working occupational group, the uncovered and low income card holders) had to spend as much as 5-6% of their household income for health. This inequitable pattern of the burden to household income is in contrast to a progressive pattern in the UK and Singapore. In the UK, poor families with an income lower than £80 a week spent 1.3% of their income for health, while the richest group (income higher than £650 a week) spent 4.3% of their income for health. Rather the same pattern is shown for Singapore (see chapter 2).

6.5 Conclusions

The analysis of inequity in terms of individuals' and households' socio-economic variables in this urban area was not very encouraging because of the small sample size and problems of data quality. However, it can be concluded that income, education level, occupational group and health benefit coverage are associated with inequity in health.

Income, although not very reliable, was associated with the incidence of acute illness in those aged 20 to 49 years of age, with chronic illness, type of health benefit and the share of health expenditure to household income. Educational level was negatively associated with acute and chronic illnesses. Occupational group was associated with disability, ie, disability in the not working was more prevalent. Some may argue that disability should not be related to education and occupation as it influences both if it happens at a very young age. The household head's education and occupation was not important in determining the health need of household members.

Type of health benefit is the only variable demonstrating inequity of use for equal need. It is an intermediate variable which was determined by income, education, occupation and household head's occupation group. It was associated with morbidity and use of health services, both ambulatory and hospitalisation.

Inequity in terms of financing health care was clearly established in this study. Third party payers reimbursed the high cost of health care for the privileged group, and the underprivileged were at risk of paying for health care at a higher percentage of their income than the privileged. The underprivileged here included those without health benefit coverage, low income card holders, not working household heads, low educated household heads and households with low income.

6.6 Summary remarks of the chapter

This chapter has tried to demonstrate the degree of inequity in health and health care in the study area. The unequal distribution of household

income was described. The Gini coefficient was 0.49. The ranking of household income was used as an important indicator to compare the degree of inequity in health and health care. Other socio-economic variables used were occupation and education of individuals and of household heads.

Inequities in health status in terms of mortality and morbidity differentials among different socioeconomic groups were difficult to identify. High standardised mortality ratios were found in families with household heads in the administrative and professional group and with university education. Acute and chronic illnesses were unequally distributed among income groups. Occupation and educational groups were associated with the incidence of acute, chronic illnesses and disability. The household head's occupation group was associated with the prevalence of chronic illness. These reflected unequal distribution rather than inequitable distribution, because it is difficult to judge the fairness of disease distribution among different socioeconomic groups.

Inequities of health care delivery were presented in terms of the accessibility to and use of health services. It was obvious that health benefits were unequally distributed among income quintile, occupation, occupation of household head and education groups. The deprived families (the poorer, the lower occupation cadres and lower education levels) were more likely to be uncovered or uninsured. Furthermore, health benefits were associated with higher rates of reported morbidity (acute and chronic illnesses) and use of health services (consultation and hospitalisation).

Inequities of utilisation for equal need were difficult to identify. Unequal use of health services for acute illness were demonstrated by different schemes of health benefits. The uncovered reported a lower rate of acute illness. A smaller percentage sought no treatment and they were more likely to use drug stores and private clinics rather than other public and private health facilities. However, it cannot be shown that they suffered from lower quality of care than the others.

Health benefits further influenced hospitalisation rates and choice of hospitals, public or private. During the past 12 months, the uncovered were less likely to be hospitalised, while those covered by private insurance were most likely to be. Lower income quintiles, low income card holders, the underinsured and the uncovered were more likely to use public hospitals than the others. Differentials in hospitalisation rates are not appropriate for generalising about inequity of use because they are not standardised for equal need. Some admissions may be unnecessary and there was no evidence that patient care in public hospitals was different from care in private hospitals.

Inequities of financing health care were presented in terms of the share of health expenditure in total household income for different income groups. Charges for consultations and hospitalisations at different health services were compared, including copayments of the reimbursable cases. The lower income quintiles were at higher risk of paying for health services out of their pocket than the higher quintiles. In spite of seeking care at lower cost health services, the share of health expenditure in total income in the lower income groups were higher than the share of the higher income group. Even after reimbursement, the private source of finance, out-of-pocket payment, was regressive to household income.

7. RESULTS OF THE STUDY 3: THE PUBLIC AND PRIVATE PROVIDERS

This chapter describes details of the public and private health providers in the study area. It also considers the question of whether there is evidence that either public or private sector is more efficient. It explores further who are the users of the services and what are their attitudes towards the present health system.

The main source of data presented in this chapter is the bed census survey in two public hospitals and three private hospitals. It is complemented by the health resources survey in all six hospitals. Relevant data from the general household survey and health diary plus interview survey are presented for better comprehension and cross-checking.

7.1 Efficiency

This section assesses service providers' behaviours from several perspectives: staffing mix, outputs, patterns of diseases and charges. To explore the efficiency of services was not the prime aim of this study, therefore only a few aspects of efficiency were analysed. Because of the limitations of the approach and access to sensitive data, profitability and competitiveness of health care markets in this urban area cannot be studied. The health resource survey describing inputs and outputs of each hospital provides the basis for comparing technical efficiency. Prices and charging mechanisms are used as indirect indicators of economic efficiency. However, comparing economic efficiency is difficult because the public hospitals are not forced to recover their costs completely.

Outputs and inputs

Table 7.1 compares outputs and inputs of individual public and private hospitals. (In previous chapters and most sections of this chapter the results were grouped into the public and private categories to achieve a large sample. Wherever possible, data from individual hospitals are presented in this chapter to illustrate the different behaviour of each

hospital.) Inputs were defined as number of beds categorised into different types, and number of health personnel. Outputs were the achievements in terms of outpatient visits, inpatient cases and inpatient days, number of surgical operations, deliveries and vaccinations.

The two public hospitals were very different in size. Public hospital 1 was the regional hospital of the lower northern part of Thailand. Public hospital 2 was a military hospital that also provided services for civilians. It was about one fifth the size of the first public hospital and was comparable in size to the private hospitals. Private hospital 1 was the first and largest private hospital. Its bed capacity was more than the registered number of 150. Private hospitals 2 and 3 were both about the same size as each other, but the latter had only been open for a year. Private hospital 4 was an eye hospital and the smallest. It only opened in September 1991.

Table 7.1 Health resources survey

Resources	Public hospitals		Private hospitals			
	1	2	1	2	3	4
Beds	818	150	150	100	100	26
ICU beds	32	0	17	6	8	0
Operating tables	15	3	4	2	2	1
Delivery tables	6	3	2	3	2	0
Private beds[1]	84	28	59	40	31	9
Consultation rooms	16	10	9	6	6	3
Manpower						
Medical doctors	74	10	9+39*	4+30*	2+30*	1+2*
Dentists	7	2	1*	0	0	0
Pharmacists	12	2	1+1*	1*	2*	1
Registered nurses	296	32	7+15*	7+80*	5+20*	1+12*
Technical nurses	193	0	0	4+112*	4+45*	0
Practical nurses	97	61	173	32*	0	12
Medical scientists	6	0	2	1	3*	0
Physiotherapists	4	0	1+1*	1*	0	0
Medical social workers	2	1	0	0	0	0
Medical specialists						
General practitioners	1	1	0	0	8	0
Pathologists	2	0	1*	0	1	0
Internal medicine	10	1	3+2*	1+3*	1+1*	0
Psychiatrists[2]	2	0	1*	1*	1*	0
General surgeon	9	1	1+3*	2+3*	1+2*	0
Obstetrician & gynaeco	7	1	1+2*	1+1*	2*	0
Paediatrician	11	1	1+3*	2*	2*	0
Radiologists[2]	3	1	1+1*	2*	2*	0
Anaesthesiologist[2]	3	0	1+2*	2*	2*	0

Resources	Public hospitals		Private hospitals			
	1	2	1	2	3	4
Neurologist	1	0	0	1*	0	0
Dermatologist	1	0	0	1*	1*	0
Ophthalmologists[2]	4	0	3*	2*	2*	1+2*
ENT[2]	2	0	2*	1*	1*	0
Orthopaedists	6	1	3*	1*	3*	0
Neurosurgeons[2]	2	0	1+2*	2*	2*	0
Urologists[2]	2	1	2*	1*	2*	0
Plastic surgeons[2]	2	1	2*	2*	2*	0
Paediatric surgeon[2]	2	0	1*	1*	1*	0
Heart & chest surgeon[2]	1	0	1*	1*	1*	0
Rehabilitative medicine	1	0	0	0	1*	0
Outputs						
Outpatient visits	297,625	92,579	60,724	54,232	17,251	9,230
Inpatient cases	32,781	3,110	23,263	7,245	5,156	630
Inpatient days	261,680	23,512	69,789	14,774	18,468	**1-3
Operations	13,105	749	2,823	2,184	854	512
Delivery	4,745	232	668	252	210	0
Immunisation						
BCG	4,523	207	656	252	200	0
DPT/OPV	3,930	804	1,780	224	198	0
Measles vaccine	754	182	675	0	8	0
Measles, Mumps, Rubella	0	128	252	24	1	0
Hepatitis B vaccine	1,184	23	1,955	30	26	0
Encephalitis vaccine	330	232	947	212	32	0

* = part-time
** = average per case
[1] = one-bed room for private patient in either public or private hospital
[2] = a public doctor who practises at more than one private hospital
Source: Health resource survey

Hospital facilities varied slightly among those hospitals that provided general services. Public hospital 1 had the highest number of intensive care beds, operating tables and delivery suites. It also employed the highest number and greatest mix of medical specialists and paramedics. Public hospital 2 had no intensive care unit. The severe cases were either looked after in general wards or referred to public hospital 1 or elsewhere. There were quite a number of medical specialists in this military hospital but only one per specialty. Private hospitals 1, 2 and 3 had almost the same facilities as each other: intensive care, surgery and delivery. They made use of part-time medical doctors and paramedics to provide 24-hour services for all specialties. Part-time manpower was mobilised from both public hospitals and a few medical specialists from elsewhere even from Bangkok. It can be seen from table 7.1 that some

medical specialists from the public hospital worked part-time in more than one private hospital.

One-bedded rooms are an important facility to provide privacy to patients and their relatives in both public and private hospitals. One-bedded rooms here are considered as private beds and do not include semi-private beds. Public hospitals had 10 to 19% of their beds as one-bedded rooms. Private hospitals had 31 to 40% of their beds as one-bedded rooms.

Hospital output of each hospital as a percentage of total hospital output is interesting in many respects. Bearing in mind that users of hospitals were not only the municipal residents, some hospitals were more attractive in some services than the others and many services were provided in private clinics for which no data are presented here. Public hospital 1 had a 61% share of total beds, but the share of outpatient visits was 56% of the total and of inpatient cases was 45% of the total. The higher shares of outputs than the share of beds were inpatient days (67% of total inpatient days), operations (65% of total) and deliveries (78% of total). Private hospital 1 had a disproportionately high share of inpatient cases (32% of total) as compared to the bed share (11% of total beds), but the share of inpatient days was not very high (18%). Details will be discussed later when outputs are compared against the input mix.

The Immunisation service in the private sector was also interesting. Vaccinations against tuberculosis (BCG) were very similar to the number of deliveries. This means that all public and private hospitals protected nearly all newborns against this endemic disease. Private hospitals, especially private hospital 1 were actively providing vaccinations against the other infectious diseases. There were at least two important reasons explaining this situation. First, private hospitals provide a more accessible immunisation service in terms of 7 days a week and almost 24 hours a day service, based on individual dosage, while public hospitals operated the service on a rather strict schedule to prevent waste of unused vaccines. Second, there were more initiatives among private hospitals to provide new vaccines not

available in the national expanded programme on immunisation (EPI). Managers in public hospitals limited the vaccines to the EPI list to prevent doctors prescribing expensive vaccines to users without third party payers.

Table 7.2 compares the input and output ratios of each hospital's health resources. Because private hospitals employed part-time staff, assumptions for conversion to full-time equivalent were made. Every part-time worker was taken to be equal to 0.5 of a full-time worker even though some workers may work longer hours than others. This was based on average working hours. It was justified for nurses who worked on a shift basis, but for doctors it was questionable. Conversions for manpower mix were as follows. All medical specialists were treated the same as one another. A registered nurse was taken to be equal to one, a technical nurse equal to 0.67 and a practical nurse equal to 0.33. This weighting was based on years of education rather than wages in the labour market.

The ratios of beds to doctors in public hospitals were about two to three times higher than in private hospitals except for the eye hospital. But ratios of beds to nurse were about the same, ie. two to three beds to a nurse, except for private hospital 2 (about one to one). If no conversion factors were applied for nurse mix, the workload ratios were clearer. Registered nurses in private hospitals 1 and 3 were in charge of higher numbers of beds. Registered nurses in private hospital 2 had the lowest number of beds in charge. This may be because private hospital 2 employed higher numbers of part-time registered nurses and the conversion factor for full-time equivalent of 0.5 was too high. The uses of technical and practical nurses were very different from hospital to hospital, even in the same type of ownership (public or private). Practical nurse was the most confusing terminology. Most private hospitals referred to a category of nurse aid that they themselves trained for their own use with limited theoretical training in a short time period. Whereas practical nurses in public hospitals were a two-year trained paramedic who could later switch to technical nurses after another two-year training.

Doctors in public hospital 2 saw the highest average number of outpatients. Doctors in private hospital 1 treated more inpatients on average in a year than others but doctors in public hospital 1 saw the highest number of inpatients each day because patients stayed in this hospital longer than in any others. The real workload for nurses, taking account of occupied beds, was lowest in private hospital 2. During each shift, a registered nurse looked after only 2.7 inpatients with the help of technical and practical nurses. Again, the interpretation is subject to the conversion factor of part-time to full-time equivalent and also the proportion of inpatient to outpatient loads that competed for nurse time.

Table 7.2 Workload and outputs per unit of health resource by hospital

Outputs	Public hospitals		Private hospitals			
	1	2	1	2	3	4
Bed/doctor[a]	11.5	15.0	5.3	5.3	5.9	13.0
Bed/nurse[b]	2.3	2.9	2.1	0.9	3.1	2.4
Bed/registered nurse	2.8	4.7	10.3	2.1	6.7	3.7
Bed/technical nurse	4.2	na	na	1.6	3.8	0.0
Bed/practical nurse	8.4	2.5	0.9	6.3	na	2.2
OPD/doctor/year	4,022.0	9,257.9	2,130.7	2,854.3	1,014.8	4,615.0
IP cases/doctor/yr	443.0	311.0	816.2	381.3	303.3	315.0*
Inpatients/doctor/day	9.7	6.4	6.7	2.1	9.0	6.9*
Inpatients/nurse/day[c]	6.0	3.6	7.8	1.2	4.5	3.9*
Inpatients/RN/day	7.2	6.0	39.6	2.7	10.2	6.0*
Inpatients/TN/day	11.1	na	na	2.1	5.7	na
Inpatients/PN/day	22.2	3.3	3.3	7.5	na	3.6*
Operation/table/yr	873.7	249.7	705.8	1,092.0	427.0	512.0
Delivery/table/yr	790.8	77.3	334.0	84.0	105.0	0.0
Occupancy rate (%)	87.6	43.9	127.5	40.5	50.6	53.1*
Length of stay (day)	8.0	7.6	3.0	2.0	3.6	1-3

Note: Adjustment for one part-time is 0.5 full-time equivalent
One technical nurse is 2/3 of registered nurse
One practical nurse is 1/3 of registered nurse
[a] refers to all specialty doctors as denominator
[b] refers to all nurse using conversion factors
[c] nurse workload adjusted for 3-shift duty by multiplying with 3
* adjusted for one year by 4 because full scale inpatient care started only in September 1991
Source: Health resource survey

Looking at the level of use of health facilities, private hospital 2 achieved the highest rate of operations per table per year. The rate of deliveries per bed was highest in public hospital 1. The bed occupancy rate was highest in private hospital 1 (127.5%!). If the actual number

of beds is corrected and 200 beds are assumed, the occupancy rate would be 95.6%. Lengths of stay were shorter in private hospitals, around 2.0 to 3.6 days as opposed to 7.6 to 8.0 days in public hospitals.

It is difficult to conclude from the above figures that one hospital was more efficient than the others without considering patient characteristics and costs. However, looking only at input mix and activities, some aspects of efficiency can be considered. The two public hospitals were similar in many respects but differed in many others. The ratios of beds to doctors and lengths of inpatient stay were similar. But the volume of outpatient and inpatient care were different. The military hospital provided more outpatient services but less inpatient care including surgical and obstetric services. The data for the military hospital has to be interpreted cautiously, since it was originally aimed at servicing personnel, but recently had extended hospitality to civilians. However, the military hospital is situated on the other bank of the river and within the army barracks, which might be a disincentive to civilian access (see map in Annex 3).

The three private general hospitals were similar in bed to doctor ratios. But they had their own features. The highest use rate of operating tables in private hospital 2 was due to the high number of full-time surgeons in this hospital, and highest use rate of the delivery suite in private hospital 1 was because there were more full-time equivalent units of obstetricians working here. A reason for decision to specialise in one or two specialities may relate to the specialisation of the founder doctors. Both public hospitals had an agreement with the Social Security Fund to provide care for employees under the Social Security Act. However, employees with injuries and diseases related to work were allowed to go to any public or private hospital because these were covered by the Workmen Compensation Fund (see chapter 3). Some private enterprises had agreements with certain private hospitals to care for their employees. But, the reason why private hospital 1 achieved the highest occupation rate of inpatient beds was hard to explain. Length of existence and reputation: private hospital 1 had been in service for 10 years, private hospital 2 for 5

years and private hospital 3 just one year, would not be sufficient reasons.

It is important to consider differences in the patterns of diseases in public and private hospitals. Table 7.3 shows the patterns of diseases from the one-day bed census. Data from the bed census were biased to the use of public hospitals because cases from outside the study area were included while the household survey data reflected the use of private hospitals more than public hospitals (see chapter 6). However, both surveys show that the public hospitals cared for more severe and chronic cases than the private hospitals. More patients with neoplasms, cerebrovascular diseases, hyperplasia of prostate and other accidents were hospitalised in public hospitals. This could be one reason for the longer hospital stay among patients in public hospitals. Table 7.4 shows the differences in lengths of stay of some comparable diseases from the bed census and the household surveys between public and private hospitals.

Table 7.3 Leading causes of hospitalisation by public and private hospitals (%)

ICD9 codes	Descriptions	Public (n=554)	Private (n=103)
008,009	Enteritis and other diarrhoea	2.0	2.8
065	Haemorrhagic fever	0.2	5.6
001-136	Other infectious & parasitic diseases	0.7	2.8
140-208	Malignant neoplasms	3.8	0.9
250	Diabetes mellitus	0.5	1.9
280-285	Anaemia	1.1	0.0
290-303	Psychosis, neurosis and other diseases	0.4	0.0
401-405	Hypertensive diseases	0.2	4.6
420-429	Other forms of heart diseases	0.9	0.0
430-438	Cerebrovascular diseases	4.2	0.9
480-486	Pneumonia	2.2	6.5
487	Influenza	0.2	0.9
490-493	Bronchitis, emphysema, asthma	0.9	4.6
531-534	Peptic ulcer	0.5	1.9
540-543	Appendicitis	0.7	0.9
580-587	Nephritis and nephrosis	2.5	0.0
600	Hyperplasia of prostate	2.0	0.0
630-639	Abortion	0.5	0.9
640-676	Complications of preg, childbirth	1.6	0.0
650-651	Delivery without mention of comp.	7.0	3.7
680-709	Diseases of skin & subcutaneous	2.7	1.9
740-759	Congenital anomalies	0.9	0.0
780.6	Pyrexia of unknown origin	1.3	2.8

ICD9 codes	Descriptions	Public (n=554)	Private (n=103)
780-789	Symptoms & ill-defined conditions	5.8	11.1
240-739	All other diseases	32.7	33.3
E810-E825	Motor vehicle accidents	0.9	6.5
E800-E999	All other accidents	23.5	5.6
	Total	100%	100%

Source: Bed census survey

Pooling inpatient data from the bed census with the cases reporting use of all public and private hospitals in the municipality from the two household surveys gives the details of length of stay shown in table 7.4. The longest stays in public hospitals were heart diseases and injuries (on average 52 days), whereas the longest stays in private hospitals were heart diseases (average 23 days). It could be argued that length of stay is not a good indicator for disease severity, and may suggest inefficiency. Diarrhoeal cases stayed in public hospitals longer than private hospitals, even though those covered by health benefits (which were over-represented in private hospitals) could have stayed longer and still be reimbursed.

One case in the hypertensive, heart and cerebrovascular disease group in a private hospital was admitted for almost a year (without a third party payer). If the outlier was taken out, private hospitals on average admitted these conditions for 5 days. The longest stays for pneumonia cases were in public hospital 1 and 19% of the cases were the low income. A high percentage of the low income (27% of 44 cases in public hospital 1) were also found among the conditions related to pregnancy and childbirth. Pyrexia of unknown origin, the most precise code with a decimal point (780.6) might have different criteria for diagnosis in different hospitals. Public hospital 1 admitted the patients longer than any other hospitals. There was no information to confirm whether this speculation was true or whether there were more investigations to reach a definite diagnosis in any of these cases.

Table 7.4 Average lengths of stay (days) in public and private hospitals by group of diagnosis

ICD9 codes	Descriptions	Public n	Public days	Private n	Private days	p value
008,009	Enteritis and other diarrhoea	23	4.7	24	2.8	0.03
401-438	Hypertensive, other forms of heart and cerebrovascular diseases	30	52.3	18	23.4	0.09
480-493	Pneumonia, influenza and chronic obstructive pulmonary diseases	30	15.5	31	3.3	0.00
630-651	Complications of pregnancy, childbirth and the puerperium	47	11.6	12	3.8	0.83
780.6	Pyrexia of unknown origin	11	10.4	18	3.3	0.00
E800-E999	Injury and poisoning	156	51.5	47	3.8	0.00

Source: General household survey, health diary plus interview and bed census survey

Big difference in lengths of stay of injuries and poisoning could be influenced by other factors as well as the fact that the more severe cases were more likely to be found in the referral hospital (public hospital 1). Eleven percent of cases in public hospitals had been treated in private hospitals before and 44% were referred from health centres or hospitals outside the municipality. Twenty four percent of cases in the public hospitals were the low income and about 23% of cases in the private hospitals had to pay totally out of their own pocket.

Pricing and collection of revenue

Table 7.5 presents the fee structures in public and private hospitals. The fee structures of the military hospital and private hospital 4 were not presented because the military hospital charges were comparable to the MOPH hospital, and private hospital 4 performed only eye operations. To counter-balance the ceiling for the reimbursable amount for accommodation, private hospitals tended to split the accommodation fee into room charge and medical service charge. The rates for anaesthetic and some surgical procedures in private hospitals were comparable to the public hospitals. It should be noted further that prices set for some types of surgery were quoted differently. The prices quoted in most private hospitals were the doctors' fees which would be transferred to surgeons. But in the public hospital and private hospital 1, the prices were set for collecting revenue from clients and the ranges were higher

than for the other two private hospitals. The prices in the public hospital were lower because there were no doctors' fees for surgeons who operated.

Because of the variations in pricing structure, it is difficult to interpret table 7.5. A few specific diagnoses are therefore taken to compare charges. To take an example of cases with haemorrhagic fever from the bed census, a patient stayed in public hospital 1 for 8 days, and the total charge was 3,682 Baht. Three cases of haemorrhagic fever stayed at private hospital 2 for 3 days each, the charges varied from 1,710 to 4,006 Baht. Another case was admitted in private hospital 3 for 7 days and charged 9,018 Baht. It could be argued that drug costs given to different cases varied according to the severity of illness even among the cases which stayed for the same length of time in the same hospital. Other variations in charges would reflect differing privacy of the bed they were admitted to.

Table 7.5 Fee structure in public and private hospitals (Baht)

Item	Public hospital[1]	Private hospital 1	Private hospital 2	Private hospital 3
Accommodation				
3 or more beds	10	250	240+200*	300+100*
1 bed	200	-	400+400*	500+400*
Special room	300	400-600	500+400*	800+400*
VIP room	500	800	800+500*	
ICU room	-	300	500+400*	300+300*
Meal	special meal 70/day	included in room price	included in room price	included in room price
Operating room	-	800/1st hr 400/subseq hrs	500/1st hr 200/subseq hrs	1,500/1st half hr 500/sub 1/2 hr
Anaesthetic	400/1st hr 150/subseq hrs	600/1st hr 300/subseq hrs	600/1st hr 400/subseq hrs	500/hr
Hysterectomy	1,000-4,000	8,000-10,000	2,000	1,800-2,000
Haemorrhoidectomy	500-1,500	5,000-6,000	1,300	1,000-1,200
Thyroidectomy	1,000-4,000	6,000-8,000	1,800-2,000	1,800
Tonsillectomy	1,000-4,000	4,000-5,000	1,000	1,500

[1] = Price list for the military hospital is not presented, it follows the list of the MOPH hospital
* = Medical service charge
Source: Health resource survey

Another example, of cases with appendicitis, a patient staying 6 days in public hospital 1 was charged 3,420 Baht. Another case staying 8 days in private hospital 2 was charged 20,023 Baht. The charge for appendicectomy is similar to hysterectomy, and would be about 2,000 Baht in the public hospital or 3,100 to 3,700 Baht in private hospital 2. The rest of the wide difference would be the charge for drugs and accommodation.

Table 7.6 (data from the bed census survey) confirms that cases in public hospitals stayed longer than those in private hospitals, ie. about four times as long in terms of the mean and median. These were longer than those presented in table 7.2 because long stay patients are more likely to be present in the bed census survey. The charge per inpatient day in public hospitals was 4 to 5 times less than in private hospitals. However, because of the longer length of stay, the charge per case of public hospitals was slightly lower but not significantly different from that of private hospitals. This result was consistent with the results of the household surveys presented in chapter 6. But the total charges of both public and private hospitals in the bed census were higher than in the household surveys, the reasons could be more long stay cases in the bed census and more accurate charges given by the hospitals in the bed census survey.

Table 7.6 Lengths of stay and charges by type of hospital

Hospital	n	Length of stay		Charge per day		Charge per case	
		Mean	Median	Mean	Median	Mean	Median
Public[1]	554	31.8	14.0	440.4	295.9	12,597.0	4,002.5
Private	108	7.8	4.0	1,739.2	1,552.7	13,421.7	5,840.0
p value		0.00	0.00	0.00	0.00	0.81	0.00
Test of sig		F-test	K-W	F test	K-W	F test	K-W

[1] = included the military hospital
Source: Bed census survey

Looking at the charge structures that made up total charges, three categories of charges were considered; drugs, investigations and others. In both public and private hospitals, the highest proportions of charges came under other charges at 50% and 48% respectively. Drugs were the

second highest, 45% and 47% respectively. Laboratory and other investigations made up to 5% in both public and private hospitals.

7.2 Users of public and private hospitals

To describe who were the users of public and private hospitals, data from the three surveys are presented to complement each other. The bed census survey described characteristics of inpatients only while the general household survey and health diary plus interview survey give more details on outpatients and inpatients. Table 7.7 shows that two-thirds of public hospital inpatients and three quarters of private hospital inpatients were the residents of Phitsanulok province. Furthermore, about one-third of public hospital inpatients and nearly a half of private hospital inpatients were urban dwellers.

Table 7.7 Place of residence of inpatients

Place	Public n=548	Private n=106	p value (Chi square)
Provinces in the same region			
Phitsanulok	66.4	75.4	
Sukhothai	11.3	7.5	
Pichit	5.3	6.6	
Petchaboon	7.3	0.9	
Other regions	9.7	9.4	
Area			
Municipal	31.9	48.0	0.00
Rural	68.1	52.0	

Source: Bed census survey

The bed census survey gives a clearer picture than the household surveys that inpatient users were predominately of working age (20 to 59 years old) in both public and private hospitals. However, private hospitals had a higher proportion of children (less than 10 years old) than public hospitals. Data from household surveys further support the suggestion that children in the urban area were admitted in private hospitals more than in public hospitals. In contrast, the aged were treated in public hospitals rather than in private hospitals (table 7.8).

The occupational group of inpatients are shown in table 7.9. Occupation here used the patient's occupation or for children used their father's

or mother's occupation. Nearly 80% of public hospital users were classified as service workers and not working. Higher proportions of civil servants, administrators and professionals and traders used private hospitals.

Table 7.8 Age structure of inpatients of public and private hospitals

Age group	Bed census survey		Household surveys	
	Public hosp n=554	Private hosp n=108	Public hosp n=107	Private hosp n=172
0-9	8.5	18.5	13.1	22.7
10-19	9.9	8.3	6.5	16.3
20-29	18.8	11.1	9.3	8.1
30-39	12.5	20.4	12.1	16.9
40-49	10.6	11.1	18.7	14.0
50-59	13.2	11.1	18.7	11.0
60-69	12.8	6.5	15.9	5.8
70-79	10.8	10.2	2.8	2.9
80-89	2.2	0.9	2.8	2.3
90+	0.7	1.9	0.0	0.0
Total	100.0%	100.0%	100.0%	100.0%
p value (Chi square)	0.01		0.01	

Source: General household survey and bed census survey

Table 7.9 Occupation of users

Occupation	Public n=525	Private n=106	p value
Civil servant	9.7	17.0	
Adm & professional	2.3	6.6	
Trade	6.1	10.4	0.00
Semi-skill	3.1	1.9	(Chi square)
Service	47.0	27.3	
Not working	31.8	36.8	

Source: Bed census survey

Inpatients of private hospitals were more likely to be the better-off than those in public hospitals. Monthly household incomes in table 7.10 are two to three times higher for private users than public users. Data from the household survey show the same difference, annual household incomes of private hospital users were about two times higher than public hospital users. It is interesting to note that annual household incomes obtained by the household survey, if divided by 12, were about

two times higher than those estimated by the bed census survey. Two explanations are relevant. The first is that the household survey asked more detailed questions than the bed census. Annual household income in the household survey was added up from individual incomes of the family rosters and household aggregate income. In the bed census survey, the questions on income were short and the environment in private hospitals made income questions intrusive. The second explanation is that households with high income could be counted more than once in total users for public or private services if some members of the families were admitted more than once, and if there was more than one hospitalisation in the family.

Table 7.10 Monthly household income for hospitalised cases

	Bed census survey monthly income			Household surveys annual income	
Hospital	n	Mean	Median	n	Mean	Median
Public hosp	496	3,460.6	2,000.0	106	104,493	78,550
Private hosp	93	7,636.6	6,000.0	169	224,889	132,000
p value		0.00	0.00		0.00	0.00
Test of sig		F test	K-W		F test	K-W

Source: General household survey and bed census survey

As shown in table 7.7, users of public hospitals were more likely to come from other provinces than users of private hospitals. Table 7.11 shows that travel time for both groups was significantly different. Public hospital inpatients travelled on average twice as long as private hospital inpatients because one of the public hospitals is a referral centre. But travel fees were not significantly different between the groups because only those who paid out of their own pocket for their travel were taken into account and those who had no expense or came by their own vehicle were left out. Waiting time for both groups was significantly different, public hospital users waited three or four times longer before being seen by the doctors and admitted in the hospitals even though the hospitalised cases seemed to be more severe than general cases (table 7.12).

Table 7.12 shows data from the household survey to describe outpatient users of public and private facilities. All samples in table 7.12 were

taken from the residents of the study site, so figures on travel are much lower than in table 7.11. The travel time of public hospital users was the longest, apart from others which included all facilities outside the municipal area. This can be interpreted to indicate that people in the outer zones of the municipality who were likely to be poorer, and people who travelled by low speed vehicles, used public hospitals more than private hospitals. This is not implied for drug stores and private clinics because these facilities were scattered all over the municipal area.

Table 7.11 Travel and waiting time for inpatients by type of hospitals

Hospital	Travel time minute			Waiting time minute			Travel fee baht		
	n	Mean	Median	n	Mean	Median	n	Mean	Median
Public	531	84.8	60.0	476	53.5	30.0	416	106.9	28.0
Private	103	49.6	30.0	92	12.1	10.0	34	98.0	20.5
p value		0.00	0.00		0.00	0.00		0.80	0.62
Test of sig		F test	K-W		F test	K-W		F test	K-W

Source: Bed census survey

Again, waiting time in public hospitals was the longest, and apparently longer for those patients in the bed census survey. This may be influenced by the fact that general outpatient visits are less severe than those of patients who are admitted (appointment for admission is not very common) so outpatient visits had to wait longer. The household income of those who used drug stores was the lowest, followed by public hospital users. The wealthiest were private hospital users.

Table 7.12 Travel, waiting time and household income for consultations within two weeks by places of use

Place	n	Travel time minute		Waiting time minute		Travel fee baht		Household inc baht	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
Drug store	88	12.9	10.0	7.0	5.0	12.8	10.0	130,725	97,600
Clinic	121	15.0	10.0	23.7	20.0	11.1	9.5	165,569	124,200
Public hosp	95	20.1	15.0	67.1	30.0	13.5	9.0	141,478	108,000
Private hosp	78	13.8	10.0	18.5	10.0	10.8	10.0	247,562	143,000
Others	17	120.6	20.0	27.6	10.0	120.3	20.0	172,285	108,240
p value		0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.01
Test of sig		F test	K-W	F test	K-W	F test	K-W	F test	K-W

Source: General household survey

Table 7.13 shows the differences in sources of payment between public and private hospital users according to the bed census survey. The percentages of those who paid out of their own pocket were slightly higher in public hospitals than in private hospitals. Users covered by government health benefit and private insurance were more prevalent in private hospitals than public hospitals. Low income card holders were more prevalent in public hospitals according to the bed census than in the household survey (see table 6.37). Apart from any bias resulting from the research method, low income patients from other provinces admitted in the public hospitals could be another explanation.

Taking account only of those who were reimbursed for inpatient care in both public and private hospitals (see table 7.14), third party payers paid higher reimbursable amounts and a higher proportion of the cost to public hospitals (95% by median, 80% by mean) than private hospitals (65% by median, 69% by mean) (see also figure 7.1). Though average charges for reimbursable cases were higher than the overall average (table 7.6), the covered cases paid out of their pocket less than the uncovered.

Table 7.13 Sources of payments

Sources of payment	Public	Private
Out of pocket	32.4	29.2
Government benefit	34.2	50.0
State enterprise	1.0	1.9
Veteran & volunteer	2.2	1.9
Low income card	19.1	0.0
Private employer	1.2	0.0
Private insurance	1.4	14.2
Others	8.4	2.8
Number of observation	491	106

Source: Bed census survey

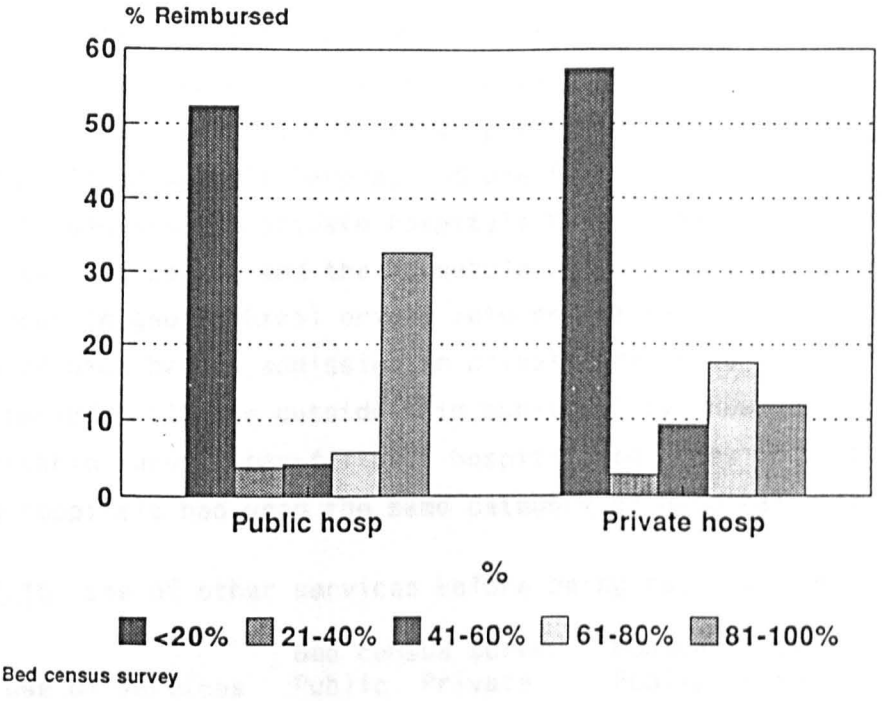


Figure 7.1 Reimbursement as a percentage of charge by hospital

Table 7.14 Charges and reimbursement for hospitalisation

Hospital	Charges			Reimbursement			% Reimbursement[1]	
	n	Mean	Median	n	Mean	Median	Mean	Median
Public	278	17,557.8	5,457.5	278	13,001.1	3,665.5	80.2	94.5
Private	48	9,281.0	6,562.0	48	7,649.5	4,661.5	68.9	65.2
p value test of sig		0.15 F test	0.18 K-W		0.19 F test	0.43 K-W	-	-

[1] calculated by taking percentage of reimbursement by individual cases
Source: Bed census survey

The use of other services for the same episode before being admitted is shown in table 7.15. According to the bed census, 39% of public hospital users and 46% of private hospital users had not visited any other services before. Including only municipal dwellers, the rates increased to 62% and 70% respectively. According to the bed census, 36% of public hospital inpatients had used other health services in their neighbourhood areas for the same episode before, 10% had used public

hospitals, 8% had used private hospitals and 5% had used private clinics in the municipal area before. The rates were the reverse for private hospital inpatients: 16% had used private clinics, 10% had used public hospitals and 9% had used private hospitals before. According to the household survey, about one-fifth of public hospital inpatients had visited public hospitals before, and one-fifth of private hospital inpatients had visited private hospitals before. Vast differences between the bed census and the household surveys were explained by differences in geographical origin between the two surveys. High use of private clinics before admission in private hospitals in the bed census survey included clinics outside this municipality. However, according to the household survey, one-fifth of hospitalised cases in both public and private hospitals had used the same category of hospital before.

Table 7.15 Use of other services before being hospitalised

Prior use of services	Bed census survey		Household surveys	
	Public	Private	Public	Private
None	38.8	46.2	61.7	69.8
Drug store	1.5	2.9	1.9	0.6
Clinic	5.3	16.3	10.3	5.2
Public hospitals	10.3	9.7	20.6	2.9
Private hospitals	8.0	8.7	4.7	20.9
Others	36.0	16.3	0.9	0.6
n	544	104	107	172
p value (Chi square)	0.00		0.00	

Source: General household survey and bed census survey

7.3 Consumer satisfaction

Within the household survey, there was a set of questions on consumer satisfaction and attitudes towards existing health services. Table 7.16 summarises the results from the general household and health diary plus interview surveys. The most common facilities used and appraised were public hospital 1, drug stores and private clinics. Commonly used private hospitals were private hospitals 2 and 1. Respondents with no past experience of using those health facilities were reluctant to criticise them, so the groups of people responding to those facilities were different.

Table 7.16 Consumer satisfaction towards public and private health services

Health facility	Criteria	Very poor	Poor	Good	Very good	n
Public hospital 1	Quality of care	4.8	13.7	68.4	13.1	766
	Cost of care	2.2	9.0	73.9	14.8	
	Doctor's attention	5.5	16.5	62.4	15.6	
	Other personnel	9.8	24.6	55.8	9.4	
Public hospital 2	Quality of care	0.5	4.5	70.1	24.9	221
	Cost of care	0.5	2.7	76.0	19.5	
	Doctor's attention	0.5	5.9	65.6	27.6	
	Other personnel	2.3	9.5	67.9	19.0	
Private hospital 1	Quality of care	0.5	3.6	63.3	32.6	414
	Cost of care	8.7	34.1	47.3	9.7	
	Doctor's attention	0.2	2.7	56.3	40.3	
	Other personnel	0.7	4.1	65.0	29.2	
Private hospital 2	Quality of care	1.1	3.6	64.1	31.2	446
	Cost of care	4.9	28.3	54.7	11.9	
	Doctor's attention	0.4	4.5	57.0	37.9	
	Other personnel	0.4	4.9	64.1	29.4	
Private hospital 3	Quality of care	1.2	3.6	61.1	34.1	167
	Cost of care	5.4	25.1	53.9	15.0	
	Doctor's attention	1.2	3.0	55.1	40.1	
	Other personnel	1.2	2.9	59.8	36.2	
Private hospital 4	Quality of care	1.1	1.1	74.5	23.4	94
	Cost of care	2.1	21.3	67.0	7.4	
	Doctor's attention	1.1	1.1	64.9	30.9	
	Other personnel	1.1	1.1	77.7	17.0	
Municipal clinic	Quality of care	1.0	6.9	72.8	19.3	202
	Cost of care	0.5	3.5	70.8	24.8	
	Doctor's attention	1.5	7.9	69.8	19.8	
	Other personnel	3.0	7.9	71.8	15.8	
Private clinics	Quality of care	0.4	2.7	68.4	28.5	716
	Cost of care	3.2	19.0	66.5	11.2	
	Doctor's attention	0.1	2.2	64.4	33.1	
	Other personnel	0.3	2.8	72.9	23.2	
Drug store	Quality of care	1.1	7.1	81.5	10.3	729
	Cost of care	1.1	9.1	80.9	7.8	
	Other personnel	0.4	6.7	80.8	9.5	

Source: General household survey and diary plus interview

Satisfaction with public hospital 1 was slightly lower than public hospital 2 in most aspects. Private hospitals generally satisfied their

clients better than public hospitals except for the costs of care which were considered too high. Satisfaction with the municipal clinic resembled that of public hospitals, and that for private clinics was the same as for private hospitals. Drug stores satisfied nearly 90% of their clients in all respects including cost.

7.4 Consumer views of the health care system

Questions in the household surveys further asked about attitudes towards doctors' incomes, household payments for health benefit schemes and the present health system. Due to the complexity of the issues, about half or less responded to these questions, except for questions on attitudes towards the present health system. Table 7.17 shows that 43% of household respondents thought that doctors working in government services were underpaid. On the other hand, 97 to 98% of respondents thought that doctors working in private hospitals and clinics were highly paid.

Table 7.17 Attitudes towards incomes of doctors who work in different places

Place of work	n	Too low	Low	High	Too high
Public service	482	5.4	37.6	52.1	5.0
Private hospital	539	0.2	2.6	60.5	36.7
Private clinic	533	0.2	1.7	58.9	39.2

Source: General household survey and diary plus interview

When asked on attitudes towards general tax payments, 75% of respondents complained that taxes were high or too high. Not more than 20% of households responded to questions on the social security scheme and private health insurance. Nearly 60% of respondents commented that their payments for the social security scheme was low or too low. But 60% of respondents said that the payments for private health insurance were high or too high (see table 7.18).

Table 7.18 Attitudes towards payments for tax and health insurance schemes

Payments	n	Too low	Low	High	Too high
General taxation	508	1.6	23.8	56.5	18.1
Social security scheme	178	8.4	48.3	37.1	6.2
Private health insurance	196	2.6	37.8	49.5	10.2

Source: General household survey and diary plus interview

Final questions on attitudes towards the present public and private health systems were widely responded to. Table 7.19 shows attitudes towards the public health system which are significantly different between household income, education and occupation of household heads groups. More than half of income quintiles 4 and 5, secondary and university education levels, civil servants, professionals and administrators and semi-skilled groups wanted some minor or major changes to the present health system. The most common complaints were lengthy waiting time, ill-mannered doctors and health personnel, and neglect.

Table 7.19 Attitudes towards the public services by household income, education and occupation of household head

Household characteristics	n	No change	Minor change	Major change	Radical change	p value
Household income						
Quintile 1	189	61.9	26.4	11.2	0.5	
Quintile 2	189	52.4	38.1	9.5	0.0	
Quintile 3	206	51.5	37.4	10.2	1.0	0.00
Quintile 4	198	42.9	39.9	16.2	1.0	
Quintile 5	192	35.4	45.8	16.7	2.1	
Education of household heads						
No education	58	69.0	24.1	5.2	1.7	
Primary	392	56.9	32.4	9.7	1.0	0.00
Secondary	220	42.3	44.5	12.3	0.9	
University	301	38.2	41.5	19.3	1.0	
Occupation of household heads						
Civil servant	224	39.3	43.3	16.1	1.3	
Prof & admin	92	41.3	33.7	23.9	1.1	
Trader	234	54.7	33.8	9.8	1.7	0.01
Semi-skilled	42	45.2	42.9	9.5	2.4	
Service	260	53.8	35.0	10.8	0.4	
Not working	166	51.8	36.1	11.4	0.6	
Average	1018	49.0	36.9	13.0	1.1	

Source: General household survey and diary plus interview

Table 7.20 presents the attitudes towards the present private health system. The results differed from attitudes towards the public health system. On average, 77% of households were satisfied with the present system. There were no significant differences in attitudes among different groups of households.

Table 7.20 Attitudes towards the private health services by household income, education and occupation of household head

Household characteristics	n	No change	Minor change	Major change	Radical change	p value (Chi square)
Household income						
Quintile 1	190	82.6	15.8	1.6	0.0	
Quintile 2	190	81.6	14.2	3.7	0.5	
Quintile 3	195	79.0	17.9	3.1	0.0	0.07
Quintile 4	197	75.1	20.3	4.6	0.0	
Quintile 5	193	69.4	27.5	2.6	0.5	
Education of household heads						
No education	54	74.1	22.2	3.7	0.0	
Primary	383	81.5	15.1	3.1	0.3	
Secondary	216	80.6	17.1	2.3	0.0	0.05
University	301	69.4	26.2	4.0	0.3	
Occupation of household heads						
Civil servant	221	76.5	19.5	4.1	0.0	
Prof & admin	92	68.5	30.4	1.1	0.0	
Trader	233	78.5	18.5	2.1	0.9	0.16
Semi-skilled	42	73.8	23.8	2.4	0.0	
Service	253	79.1	17.8	3.2	0.0	
Not working	159	79.9	15.1	5.0	0.0	
Average	1000	77.3	19.3	3.2	0.2	

Source: General household survey and diary plus interview

7.5 Discussion

The input mix of public hospitals was very different from that of private hospitals. Most private hospital doctors worked full-time at the public hospitals. From table 3.18, public hospital doctors worked an average of 26 hours per week in the private sector. When a conversion factor for full-time equivalent was applied, the bed to doctor ratios were 5-6 to 1 for private hospitals but twice as high for the public sector. The bed to nurse ratios established more prominent differences. Private hospitals made more use of less skilled nurses than the public hospitals. This might be appropriate, because hospitalised patients in private hospitals were less severe than in the public hospitals. The use

of less skilled professionals in the private sector was also observed by Yuen (1992) in a new economic zone of China where 85% of registered private practitioners had less than university training.

The activities in public and private hospitals varied from hospital to hospital. Considering the ratios of outpatients and inpatients to doctors, the MOPH hospital had high ratios for both inpatients and outpatients while the military hospital had a higher ratio for outpatients but lower for inpatients. Private hospitals had lower outpatient to doctor ratios but rather comparable inpatient to doctor ratios, excluding private hospital 1. These differences reflected the fact that admission rates in public and private hospitals were not the same (see table 6.31). Considering activities on operations and deliveries per table or suite, these depended on the tendency to specialisation of each private hospital. One private hospital achieved the highest use of surgical theatres and the MOPH hospital achieved the highest use of delivery suites.

Users of private hospitals were of younger age groups than users of public hospitals. The bed census survey confirms this observation of the previous chapter. However, this may reflect the fact that illnesses in children are more acute and need fewer days in hospital (giving an affordable total charge) than illnesses in adults. When removing the children's group from the analysis, the average lengths of stay of both public and private hospitals were slightly longer and also charges were higher. Apart from household income, medical benefits also influence the choice of hospitalisation. Those with limited medical coverage, ie. low income card holders, were obliged to use public hospitals; but the good medical benefit schemes, ie. private insurance, civil servant benefit and state employee benefit, provided wider choices and many chose private rather than public hospitals.

Taking account of only those who resided in the municipality from the bed census survey, the majority of the civil servant beneficiaries were admitted in public hospitals (56 cases) as compared to private hospitals (22 cases). There are likely to be many reasons other than medical benefits. The range of services, not only the capacity of beds, in the

public hospitals is wider than in private hospitals. The costs and copayments in the public hospitals were also lower than private hospitals.

7.6 Conclusions

Limited information make it difficult to produce firm conclusions on whether public or private hospitals are more efficient. However, the prime concern of this chapter is not efficiency. Due to great differences even in hospitals under the same type of ownership, more information on the nature of services used is needed and the public or private hospitals have to be compared individually. In this study, it seems that the comparisons were not made 'like with like'. Is it fair to compare the MOPH hospital, a regional hospital, with smaller private hospitals? However, some conclusions can be drawn.

Inpatient cases in the public hospitals were more likely to be severe and chronic diseases (eg. cancer cases) than in private hospitals. However, the comparison of lengths of stay between the two sectors for specific disease groups shows that the public hospitals admitted patients longer than the private hospitals. Possible inefficiency in the public hospitals should be further explored.

Many data suggest that the MOPH hospital is a competitor to private hospitals. The fee structure was quite close to those of private hospitals. It also succeeded in attracting cases with third party payers who would increase hospital revenue. As a regional hospital, it had the advantage of providing a wider range of services by specialists.

Private hospitals were competitors amongst themselves, but saw the MOPH as a good reserve for manpower resources. They mobilised skills and labour from the personnel of public hospitals. People's poor attitudes towards public hospitals moved them to private hospitals. Each hospital tried to establish its area of specialisation to build up a good market share.

Consumer views towards the private health sector were better than those for the public health sector. Nearly half of respondents felt that public doctors were low paid compared with less than 2% for private doctors. However, about three-fourths commented that they already paid high taxes, and 60% of those who had private insurance said that the premium rate was high. About twice as many respondents said that the public sector needed changes. The Social security scheme, a kind of population rated risk insurance, was said to impose a low burden, especially for those in higher quintiles.

7.7 Summary remarks of the chapter

The bed census and health resource surveys shed some light on the production, process, efficiency and user characteristics of public and private hospitals. The household survey provides some missing information, validates the results and further describes consumer views towards the present health system.

Private hospitals have recently expanded their capacity to meet high demand for private health care. They were highly dependent on part-time doctors and nurses. To compare their workload with public hospitals, assumptions had to be made. Doctors at public hospitals worked harder than doctors at private hospitals, in terms of the number of outpatients and inpatients to be seen each day. Other resources of private hospitals were under-used in comparison to those of the public hospital (MOPH hospital), eg. inpatient beds, delivery suites. However, one private hospital achieved a higher rate than public hospitals in the use of operating rooms, but no data were available to justify the use of surgery.

Patients stayed much longer in public hospitals than in private hospitals. Patterns of diseases according to the bed census and household surveys suggested that cases in public hospitals were more severely ill than cases in private hospitals. This is one explanation of a longer stay in public hospitals. Unfortunately, the number of cases in each disease group was too small to check for unnecessary longer stays in public hospitals.

The pricing structures of public and private hospitals suggested competitive behaviours between public and private hospitals and among the private hospitals themselves. Competition between public and private hospitals was obvious in the pricing of private beds. However, when summing up the bill, the charge per day in private hospitals was 4 to 5 times higher than in public hospitals. But the charge per case was only slightly higher.

Users of public hospitals were predominately rural people. The aged and service occupational group were more likely to be admitted in public hospitals, whereas children and civil servants were disproportionately represented in private hospitals. The household income of private hospital users was twice to 3 times higher than the income of public hospital users. However, fewer users of private hospitals paid out of their own pocket.

The lengthy waiting time at public hospitals was one prominent cause of dissatisfaction of consumers towards public health services. The relationships between consumers and doctors and other personnel were perceived to be better in private hospitals than in public hospitals, even though the same doctors worked in both. Strong dissatisfaction against private hospitals concerned the costs of care. Consumer views towards public services were different among different income, household heads' education and household heads' occupational groups. The strongest dissatisfaction was from the higher socio-economic groups.

8. OVERALL ASSESSMENT OF EQUITY IN HEALTH AND THE PUBLIC/PRIVATE MIX

The main objective of this study was to assess the equity of access to public and private health services in Phitsanulok municipal area. This chapter will tie together the three results chapters and discuss the results according to the conceptual framework in chapter 4. It starts with the health financing system. Health provision is discussed in terms of access and use of health services including consumer choice. The interface between the public and private sector is also debated. Finally, equity is discussed as an ultimate goal of the health care system.

8.1 The health financing system

Existing information on the financing pattern of health care in Thailand as discussed in chapter 3 incorporates a big potential error involving overestimating household expenditure because reimbursable expenses are double-counted. This section derives the financing pattern by analysing each sector of health services and third party payers, taking account of reimbursable expenditures. However, it is limited to the financing of health care in the urban area of concern to this study.

In this study, only certain aspects of health care financing were analysed. Household health expenditures of urban dwellers were studied in great detail. Some information from the bed census survey gave an indirect account of the financing of private hospitals. Further literature review can increase the comprehensiveness of this picture.

The health care system covers the whole range of promotive, preventive, curative and rehabilitative services. From what has been presented in chapters 5 to 7, it is clear that this study focused on curative services rather than the others. However, this implies only that curative services were of greater public interest and were more often paid for out of pocket, so more frequently reported on by household informants than other services. In discussing the health financing system, the whole health care system must be considered.

Financing of the public hospitals

Public hospitals in Thailand have raised user charges as an important source of hospital expenditures. Users of various health benefit schemes including the uncovered pay out of their pocket at differing rates to the hospitals (Mongkolsmai et al 1991). This section sums up who are the financiers of the public hospitals and in what proportion.

The two public hospitals provided services for people of Phitsanulok province as well as for others. About 30% of inpatients were people in Phitsanulok municipality (table 7.7). For outpatients, the proportion would be higher. It is not meaningful, as well as being difficult, to tease out only what relates to the municipal inhabitants in terms of financing and expenditure in order to draw policy recommendations for the urban area only. Hence, the total financing patterns of public hospitals are discussed.

Government hospitals receive an annual budget from the central government. The budget is mainly for the payroll, medical equipment and construction. User fees are collected to meet the high expenses on drugs and medical supplies. In 1990, 40% of total (recurrent including capital) expenditures in the provincial hospital were provided by the revenue from user charges (Provincial Hospital Division 1991). The more revenue they collect, the higher chance hospital administrators have of spending for hospital developments: purchase of equipment, building new wards or quarters for personnel and giving higher payments for night shifts.

The regional hospital fell into debt and development plans were suspended by the Ministry of Finance in 1987. The hospital administrators set out an accounting system to increase the efficiency of revenue collection. The principle was to try to sum up all items of services (drugs, operations, dressings, oxygen therapy, etc.) provided to patients and charge them. In 1988, the real cost recovery[1] rate was

[1] Real cost recovery is calculated by dividing hospital revenue by non-salary operating cost, excluding development expenses

89% and the accrual cost recovery[2] rate was 125% excluding labour and capital costs (Provincial Hospital Division 1989). Thus this hospital set a price list high enough to cover non-salary operating cost, but not total recurrent cost.

The bed census survey showed that public hospital revenue could be collected from direct payments (32% of total patients), civil servant benefit scheme (34%), state enterprise benefit scheme (1%), private employers (1%), private insurance (1%) and others (8%). The household surveys estimate sources of payments for public outpatient services by urban dwellers: 37% paid out of their own pocket, 53% from the government benefit scheme (civil servants and veterans and volunteers), and 9% from other third party payers.

If assumptions are made that information from the household survey is representative of all users, and that the share of different payers in total patients were the same for those who were inhabitants of this municipality and those who cross administrative boundaries for services at this public hospital, revenue collected from outpatient services would be almost 99% of total charges made at outpatient services (see table 6.37, excluding low income scheme). This assumption is likely to be true because charges are collected at the point of service delivery. Revenue collected from inpatient services would be 81% of total charges made at inpatient wards (see table 7.13, the bed census survey takes account of all cross boundary flows).

Because there were no figures on the relative share of outpatient and inpatient revenue, more assumptions are made: that revenue from outpatient services was equal to that from inpatient services (for simplicity) and these two sources made up 40% of total public hospital expenditure. By subtracting the reimbursable expenses of the government benefit schemes - which were estimated at 53% of outpatient revenue and 36% of inpatient revenue - the private sources of finance to public hospital can be estimated at 20% of total expenditure [{20% - 53/99x20%}

[2] Accrual cost recovery includes in revenue an estimate of the loss of revenue which could have been raised from services provided to the poor and low income card holders. This is added to hospital revenue and divided by non-salary operating cost, excluding development expenses.

+ {20%- 36/81x20%}]. Taking an example from 1992, the hospital revenue was 100 million Baht, the annual budget from the MOPH was 150 million Baht, revenue from outpatient departments was equal to that from inpatient wards at 50 million Baht. The reimbursable revenue from taxation would be 49.0 million Baht [{50m - 53/99*50m} + {50m - 36/81*50m}]. Then net private finance was 100-49.0 million Baht, which was 20% of total expenditure [51.0m/250m*100]. The biggest share of this 20% would be direct payments with a smaller share from other private third party payments. General taxation thus contributed 80% of total expenditure.

Another set of assumptions can be applied by using workload data and charges: inpatient revenue was 65% of total revenue (as indicated by inpatients and outpatient numbers in table 7.1 and the charges per case); and the copayment rate for inpatients was 5% (using the median in table 7.14). Private sources of finance would then be 22% of total expenditure[3]. Public sources of finance would make up 78%. In terms of Baht, inpatient revenue was 65 million Baht and outpatient revenue 35 million. Reimbursable expenses from general taxation would be 46.1 million Baht[4],leaving 53.9 million Baht from private sources, or 22% of total hospital expenditure.

The above two approaches on the shares of outpatient and inpatient revenues gave similar estimates of the shares of public and private sources of finance: changing the shares of outpatient and inpatient revenue from one half to one-third (about a 17% change) resulted in a 2% change in the shares of sources of finance. At the least, this implies that the estimates are likely to be the right orders of magnitude.

There was no information on cost recovery of the military hospital. The prime objective of the hospital was to serve the military, and cost recovery was expected to be lower than the regional hospital. General

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[3] Under these assumptions, revenue from outpatient services amounted to 14% of total hospital expenditure and inpatient services 26% of total hospital expenditure. Government sources of finance for outpatient services to be subtracted would be 53x14/99%. For inpatient services, a factor of 0.95 was introduced to compensate for copayments, then subtraction was 36x26x0.95/81%.

[4] Reimbursable expenses from outpatient departments were 53/99*35m and from inpatient wards were 36/81*0.95*65m.

taxation support to the military hospital would be higher than 79% of total hospital expenditure.

Financing of private hospitals

All private hospitals in this study are classified as private-for-profit. They were built up by groups of public hospital doctors who saw that demand for private health care was high and people were able to pay. The second private hospital was set up about five years after the first private hospital, and also the third was five years later than the second. Despite the competition, the first and second private hospitals were undergoing further expansion. This implies that the profits of private hospitals was high enough to make further investments or raise further loans.

The bed census survey provides data on which to estimate sources of finance for private hospitals. About half of inpatients in private hospitals were covered by the civil servant benefit scheme. Nearly 30% paid out of their own pocket and the other 20% had some kind of other coverage. The household surveys provide data on the sources of finance for outpatient visits. Nearly 60% of users paid out of their own pocket, 20% had civil servant benefit coverage, and the remaining 22% were from other sources.

The outputs of private hospitals and charges for inpatients in chapter 7 together with charges for outpatients in chapter 6 indicated that two-thirds of hospital revenue was from inpatients and one-third from outpatients. For reimbursable cases, copayments were 35% for inpatients and 22% for outpatients. Putting these conditions together under the assumption that patients under different schemes were charged the same amount (though this assumption may be invalid, the information on type of payment was more complete than information on revenue under the next assumption), the final estimates for sources of finance of private hospitals were as follows: 52% in monetary value were from out of pocket

payments (copayments included), 27% from general taxation and 21% from other sources[5].

Taking another assumption, that the proportions of revenue from all payment schemes were representative of private hospital total revenue, estimates of revenue for outpatient services from only those who were not later hospitalised were as follows: 32% of total outpatient revenue came from direct out of pocket payments, 19% from government benefits (with only 7% copayments) and 49% from other sources. Total revenue of inpatient services was 54% from out of pocket, 32% government benefits (with 36% copayments) and 14% from other sources. This assumption faces the problems of cross boundary flows when estimating outpatient revenue (as described previously) and missing data on charges in both the general household survey and the bed census survey. Furthermore, the bed census survey is more likely to pick up cases with high charges. By this approach, government source of finance of private hospital revenue was reduced to 20%, with 54% out of pocket payments (copayment included) and 26% from other sources.

These two approaches gave wider variations as compared to the estimated shares of public hospital financing. The share of public finance to private hospitals in the second approach is lower (20% of total private hospital expenditure) than that of the first approach (27%). This may imply that the regulations of the civil servant scheme in reimbursing private hospitals could substantially reduce the drainage of government tax revenue to private hospitals.

Financing of private clinics

From table 6.25, it can be estimated that nearly half of private clinic users were uncovered, one-fourth was covered by civil servant benefit but had to pay out of pocket as the expenses would not be reimbursed.

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[5] Sources of revenue were calculated separately for outpatients (33.3%) and inpatient services (66.7% of total revenue).

	Outpatient services	Inpatient services	Total
Out of pocket	33.3 x 0.58	66.7 x 0.30	39.3
Copayments	33.3 x 0.20 x 0.22	66.7 x 0.50 x 0.35	13.1
Government tax	33.3 x 0.20 x 0.78	66.7 x 0.50 x 0.65	26.9
Other sources	33.3 x 0.22	66.7 x 0.20	20.7
		Grand total	100.0

Ten percent of private clinic users were covered by state enterprise benefit of which 25% of the expenses (about 1.7% of total revenue of all private clinics) were reimbursed. Seven percent were covered by private insurance of which 13% of the expenses were reimbursed (about 1.1% of total revenue of all private clinics). Six percent of users were low income card holders who had to pay out of their own pocket. In conclusion, the revenue of private clinics mainly came from out of pocket payment (97%) with only 3% from third party payers.

Financing of other health services

Apart from hospitals, there were many other health institutions in the municipal area providing comprehensive health services. The government health sector included the municipal health centre, the provincial health office and other disease prevention centres. The private health sector included private clinics, drug stores and other traditional or modern healers. The private health sector was most concerned with treatment of disease. The public health sector provided a wider range of health services.

The municipal health centre was financed by the local government. In 1990, the cost recovery of the centre for treatment activities was 73% of operating cost (including salary but not including capital cost). This means that quite a number of patients were able to pay for services at the centre. Most of them were reimbursed from the civil servant benefit scheme. Revenue raised was sent to the municipal treasury.

The total expenditure of local government was 92 million baht in 1991. Health expenditure was about 20% of total expenditure. From health expenditure, about one-third went to curative activities (which could be recovered from user charges and reimbursed by civil servant benefit), and two-thirds were for disease prevention and environmental sanitation. Total expenditure was met by general taxation (85%), local government assets and business (10%) and fees (health fees not included) and permits (5%) (Phitsanulok Municipality 1992). Therefore, the financing of the health services of the Municipality was mainly from taxation.

The provincial health office's main function was the administration of health programmes and personnel in urban and rural areas. However, the office also provided outpatient services for general and specific diseases, eg. sexually transmitted diseases. There were a few other government institutions providing outpatient services, eg. Centre of Disease Control specifically for tuberculosis and leprosy. These services were mainly financed by general taxation.

A few of the visits to private clinics were reimbursable but all visits to drug stores were paid out of household budgets. The reimbursements to private clinics were made by private employers and insurance. In the past, there were government subsidies (from foreign aid) given to private clinics for every vasectomy performed in the clinics, but this later stopped. Therefore, private clinics and drug stores were totally financed by private expenditure.

Third party payers

According to the 1992 estimation of the Health Planning Division, 19% of the total population in Thailand was covered by low income cards, 19% by the civil servant benefit, 5% by the health card project, nearly 4% by the Social Security scheme, 3% by the Workmen Compensation Fund, 1.5% by state enterprise benefit and 0.5% by private health insurance (see table 3.16). This study produced estimates that were different from those of the general population. In this urban area, the coverage of government employee benefit was as high as 36% of the total population, state enterprise benefit was almost 5%, private insurance was 6%, but the low income card was 3% and Social Security scheme was only 1%. The differences were partly explained by the urban setting of this study. The existence of headquarters of government offices and state enterprises in this municipality increased the proportions of those covered by civil servant and state enterprise benefits. In 1990, the municipal office renewed and issued 2,320 low income cards which covered about 7% of the municipal population (Bamrungchart 1992). The low prevalence of low income card holders in the household survey is explained by the sampling frame of the study: temporary houses were not mapped in the National Statistical Office's sampling frame.

The main third party payers in this study were the government employee benefit, private insurance and state employee benefit. The Health Card project, a voluntary health insurance scheme, had never been tried in this urban area. The Social Security scheme will be of growing importance because of its expansion plans and industrialisation.

Table 8.1 summarises the estimates of sources of finance of health providers in this urban area. Different methods of estimation gave different results. The ranges of private hospital estimates were particularly wide. The total revenue approach gave higher estimates for out of pocket and other third party payers because there were few long stay cases under these payment schemes.

Table 8.1 Sources of finance of health facilities in an urban area

Providers	Sources of finance			
	Taxation		Out of pocket payment	Other third party payers
	Direct payment	Indirect payment[6]		
Public hospital	60%	18-20%	20-22%	20%
Private hospital	0%	20-27%	52-54%	21-26%
Private clinic	0%	0%	97%	3%

8.2 The use of health services

This section further discusses how health services were provided and utilised in this urban area. Charges of public and private health services and consumer choices are also discussed to explain the patterns of utilisation. Finally, the matrix of the public and private mix in financing and provision of health services in this urban area is drawn up to compare with the general picture of the whole country.

[6] This is payments to public and private hospitals for giving treatments to those who are covered by civil servant benefit. The money comes from general tax revenue.

Health care provision

An urban area contains a concentration of both public and private health services. These services provide care to not only the urban population but also rural people. In this study area, the bed to population ratio was about 1.7 beds per 1,000 population of the whole province (slightly increased from table 3.19 in chapter 3 because two new private hospitals had opened recently). This does not take account of those who crossed the provincial boundaries for services in both public and private hospitals. The share of private hospital beds had increased from 17% in 1989 to 28% of total beds in 1991, at a faster rate than the whole country.

Other private health services also grew at a rapid rate. Private clinics in the municipality, mostly run by single-handed practitioners, increased from 32 clinics in 1988 to 79 in 1991. Drug stores[7] increased from 58 to 78 in the same period. Though private clinics are run after office hours, the researcher estimated, in terms of doctor-hours of work, that 79 private clinics in total provided 1.3 times more hours of service than the outpatient service in both public hospitals. And, four private hospitals provided about one-third of the outpatient doctor-hours of public hospitals[8]. These sum up to a 38% share of public and 62% share of private outpatient services in terms of doctor-hours available.

Health service utilisation

The health seeking behaviour for acute illness was as follows: 22% used drug stores, 21% went to private clinics, 18% to public health services,

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[7] Drug stores included first class drug stores that dispense drugs as prescribed by a doctor, and drug stores that sell prepacked formula. In 1990, the government allowed pharmacists outside Bangkok to set up new drug stores of their own. This could be a reason for an increase in this urban area.

[8] Various assumptions were made: public hospitals provided 40 hours of outpatient services in a week, with 30 doctors in hospital 1 and 8 doctors in hospital 2; private hospitals worked like public hospitals during office hours with 2 doctors for a hospital; outside office hours they worked like private clinics with 5 doctors per hospital for 3 hospitals and 2 doctors for an eye hospital; private clinics worked 3 hours a day for weekdays and 10 hours during weekends. These assumptions give 1,520 doctor-hours a week for public hospitals, 505 doctor-hours for private hospitals and 1,975 doctor-hours for private clinics.

15% to private hospitals, 6% to other services and 18% reported no treatment. Excluding drug stores, other services and no treatment, the share of private clinics would be 40%, public services 33% and private hospitals 28%. If this pattern is compared to the provision of public and private outpatient services as described above, it can be seen that private clinics were more popular among urban dwellers than public services. The figures on hospitalisation also confirmed the high popularity of private hospitals: 64% of hospitalised cases belonged to private hospitals while private hospitals owned 28% of the beds.

The patterns of utilisation that are the reverse of the patterns of provision do not imply that public services were left under-used. In fact, public services were crowded for both outpatient and inpatient services. This created long waiting times at the public hospital outpatient department. This might have been a reason for choosing private health services. Other possible reasons were that private services provided more courteous care and better quality care as suggested by the consumer satisfaction survey, and private health services were available after office hours which were more convenient to urban dwellers. There is one important reason retaining users within public outpatient services: civil servant benefit reimburses ambulatory visits to public services only.

It is interesting to note that the no treatment group in this study was rather high (18%) as compared to the health seeking behaviour of urban people in table 3.6 (14% of ill people in urban areas sought no treatment and self-prescribe in 1985), and if the choice of drug store is included, self-prescribed care (plus no treatment) would be as high as 40%. However, the non-consultation rate in Chiangmai urban slums was even higher at 29% (Tangcharoensathien 1990). Further scrutiny of the no treatment group revealed that the families with a less educated household head and families with a household head in the administrative and professional group reported more severe illness but sought no treatment.

Charges of public and private health services

For hospitalised cases, average charges per case (in terms of means) of public hospitals were slightly higher than charges of private hospitals from the household survey, but slightly lower from the bed census survey. Charges (in terms of the median) of public hospitals were lower than private hospitals by both methods. This is because the data from public hospitals were more highly skewed than private hospitals, ie. the long stay cases were more likely to be treated in public hospitals or cases were more likely to stay longer. The estimates on charge per case of the bed census survey were two to three times higher than those of household survey. The figures on inpatient charges from the bed census survey should be more reliable: they were not subject to memory bias. But big differences were observed in both public and private hospitals: this was due to bias in picking up long stay cases in the bed census technique.

For the reimbursable cases, charges in public hospitals were higher than for the non-reimbursable in both surveys, but in private hospitals the higher charges for reimbursable cases were found only by the bed census survey (both mean and median). Again, the estimates of the bed census survey were two to three times higher than those of the household surveys. The proportions of the total charges reimbursed are interesting. The rates in private hospitals were 69% (by mean) in the bed census survey but 96% by mean and 84% by median in the general household survey. The share reimbursable in public hospitals was higher in both surveys: the bed census at 95% by median, 80% by mean and nearly fully reimbursed in the household survey. The explanation may be that the recall of copayments in the bed census was more recent than that of the household survey and thus more accurate in addition to the bias towards longer stays in the bed census survey.

The average charge for reimbursable cases in the public hospitals as found by the household survey was comparable to the study on the civil servants' medical benefit scheme done by the Health Planning Division (1992b) observing reimbursement claims in Bangkok. But the average charge for reimbursable cases in private hospitals in the Health

Planning Division's study was three times higher than in this study. This could reflect real differences in pricing structures where private hospitals in Bangkok set higher charges for doctors' fees and surgical procedures. The other reason could be fraud in inflating charges to reach the reimbursable ceiling (Thai Government 1985). The average reimbursable amount was only 1.3 times higher (4,019.8 Baht in the Health Planning Division's study and 3,020.2 baht in household surveys). This implies that the rates of reimbursement of private hospital inpatients in this study were much higher.

Does this suggest that the possibility of fraud from private hospitals raising total charges so as to help their clients claim the highest possible amount was not a problem in Phitsanulok? The answer is not clear. In the household surveys, some household respondents complained about the ethics of some private hospitals in inflating total charges. On the other hand, some hospital administrators revealed to the researcher that they faced the problem of clients bargaining to pay the least copayments.

Figure 8.1 summarises the public and private mix in the financing and provision of health care in this urban area. The figures are derived by multiplying utilisation rates (to be discussed later in section 8.4) by charges for ambulatory services and hospitalisations (in chapter 6), then reallocating health expenditures to different sources of finance (using ranges of proportions in table 8.1)[9]. The estimation of annual per capita health expenditure was 1,086.5 baht, only 61% of the 1991 projected per capita expenditure in table 3.4. Apart from the high

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[9] Table for calculation of annual health expenditure by sources is as follows:

Health facilities	Utilisation /year	Charge baht	Expenditure per year	Taxation Direct	Taxation Indirect	Private Out of pocket	Private Others
Public							
Outpatient	.60	348.9	209.34	60%	18 - 20%	20 - 22%	20%
Inpatient	.03	6,304.6	189.14	60%	18 - 20%	20 - 22%	20%
Private							
Hospital (OP)	.50	574.5	287.25	0%	20 - 27%	52 - 54%	21 - 26%
(IP)	.06	4,208.4	252.50	0%	20 - 27%	52 - 54%	21 - 26%
Clinic	.70	167.1	116.97	0%	0%	97%	3%
Drug store	.70	44.5	31.15	0%	0%	100%	0%
Total	2.59	-	1,086.35	22%	17 - 21%	33 - 48%	18 - 20%

estimation made by the NESDB resulting from double-counting of public expenditure, reasons for very low estimation here are that expenditures of the residents for health services outside this municipality, and expenditures on promotive and preventive services which are given free of charge, are not included.

Figure 8.1 suggests that public financing of health services in this municipality was 39-42% of total health expenditure and 52-67% came from private sources of finance. The public health facilities spent about 44% of total health expenditure while all private health facilities spent 47-65% of total health expenditure. The estimate of public finance was high as compared to national figures (of not more than 30% of total health expenditure in table 3.1) because all reimbursements were adjusted and this study was in an urban area.

For the public health services, 34% of total public health expenditure (or 15% of total health expenditure) came from private sources. And for the private health sector 17-23% of revenues (or 10-13% of total expenditure) were from government taxation. It is speculated here that if the civil servant medical benefit scheme were to reimburse outpatient visits at private hospitals, more taxes would drain to the private sector with the shrinking of indirect taxation revenue to the public services.

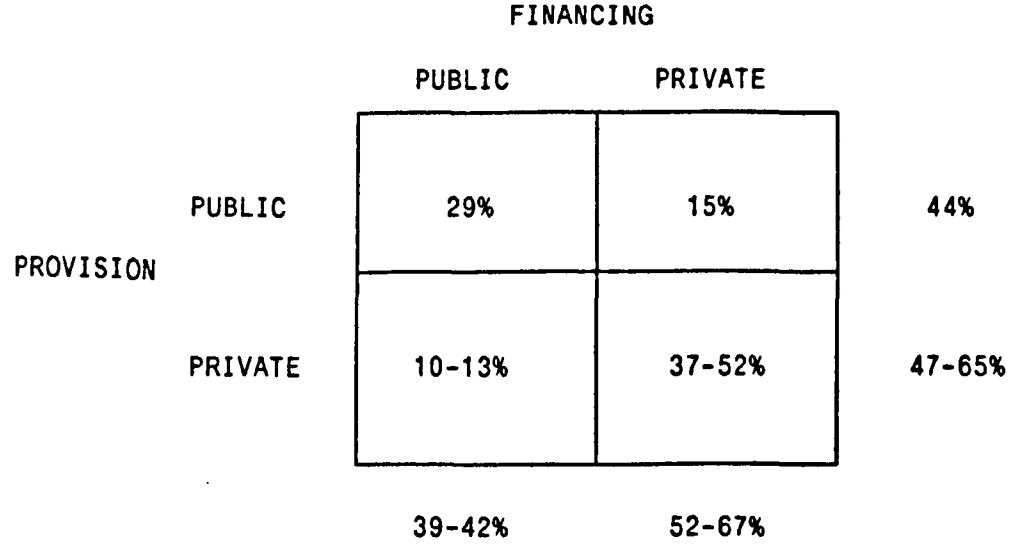

Figure 8.1 The public and private mix of financing and provision of health services in terms of total health expenditure

Consumer choices: determinants of who are the users of public and private health services

The pluralistic characteristics of health care in Thailand allow clients to make choices between health services. People in rural areas have limited choices compared to urban dwellers. Table 3.6 in chapter 3 (comparing health seeking behaviours of urban and rural people at two periods in time) clearly shows that the availability of modern health services (hospitals) influences the choices people make in both rural and urban areas.

Consumer satisfaction is considered to be an important determinant of choice. In the household surveys, respondents were more satisfied with the quality of care in private hospitals than in public hospitals. Furthermore, the consumer-provider relationships in private hospitals were better than in public hospitals. Only in terms of the costs of care in private hospitals and clinics were people the least satisfied. It must be kept in mind that consumer satisfaction is influenced by consumer knowledge. In the health care environment, perceived charges (different total charge bands of public and private health services) tend to be the only information that is shared between provider and consumer. Quality of care is the most difficult area to ascertain. Professional judgements on quality of care have been difficult to obtain because different casemix and severity of cases give different outcomes. Consumer views of quality of care tend to reflect immediate rather than long term outcomes, eg. consumers are concerned with waiting time rather than cure rate.

Waiting time was an important factor influencing the level of satisfaction. Waiting time in public hospitals was the longest: 66 minutes in terms of the mean and 45 in terms of the median. If the whole process of care was included, ie. waiting for laboratory investigations, fee estimation, fee payments and drug collection, total time spent could have been the whole working day. It seems likely that the urban dwellers tried to avoid the public services and visited private services. The no education group (dominated by children) used clinics more than any other groups, presumably so as to save the waiting time of parents (and

clinics were cheaper). Those with vocational and university education tended to use drug stores for their trivial ailments.

Health benefit coverage is another important factor influencing choices of health services. The uninsured, who reported a lower incidence of acute illness, used drug stores and private clinics more. The government schemes providing limited benefits (ie. veteran, volunteer and low income) used public hospitals more, but still used clinics and drug stores as other resorts. The civil servant benefit scheme provides access to private hospitals hence private hospitals were more utilised for inpatient care than public hospitals. Private third party payers (private insurance and private employer benefit) led to higher use of private hospitals.

If consumers had the right to vote for changes in the present health system, they would vote for an improvement in public services rather than private services. Household income, education and occupation of household heads influenced the degree of dissatisfaction. The more privileged expressed stronger desires for change. They were the better informed and had more freedom to choose. However, this does not mean that future changes should confine to the public sector. It implies that the public sector needs more urgent changes to increase consumer satisfaction.

8.3 Interface between the public and private sectors

This section discusses relationship between the public and private sectors in terms of referrals of patients, share of personnel and share of medical technology.

The referrals of patients

Little information was collected on the referral of patients between the two sectors. Table 7.15 suggested that the flow of inpatients from either private to public or public to private was less than 5% of total inpatients according to the household surveys, and less than 10% according to the bed census survey. The formal referrals would be even

lower. There were no obvious benefits from referring patients as the patients would be attended by the same physicians in either public or private hospital. Some doctors in a public hospital revealed that the most common reason for transferring patients from private to public hospitals was the patients' financial problems. Reasons for patients self-referring themselves from public hospital to private hospital were less privacy and greater neglect in public hospitals.

Share of personnel

From table 7.1 of the health resources survey, it is apparent that private hospitals depended on part-time health personnel who worked full time in the public sector. Normally a public hospital doctor is expected to work 40 office hours a week in a public hospital, plus extra hours on call and ward rounds as necessary. Apart from this, he or she is allowed to work freely in private clinics and private hospitals. Working longer hours may cause exhaustion and neglect which were more likely to be expressed as problems for public hospitals than private hospitals. This is because doctors who worked an extra hour in the private sector could earn 4.6 times more than their normal earnings per hour in public hospitals (Chunharas et al 1992), so the majority of public doctors work also in the private sector.

The high pay in the private sector was suspected to be an important cause of the 'brain drain' (public doctors who resigned and worked in the private sector). During 1986-1990, 45% of the newly trained specialists who should work in the 89 provincial hospitals had broken their contracts and worked in the private sector only (Provincial Hospital Division 1991). However, this was not a problem for public hospitals in Phitsanulok. Hospital directors commented that private hospitals created the opportunity for public hospital doctors to work part-time and achieve their expected income. Recent government policies on doctor payment, eg. giving an extra 10,000 Baht a month to a full-time public hospital doctor (not working in the private health sector), will not rapidly change the patterns of doctors working in both sectors. Reasons can be listed as: the extra pay is low, the government has been under pressure not to increase doctor salaries faster than other civil

servants, and the private sector would increase its wages to compete for the time of doctors.

Apart from doctors, private hospitals also shared nurses with the public sector. The public hospitals lost some senior nurses to private hospitals. But the private hospitals do not have as high a nurse to bed ratio as the public hospitals; they tended to train the lower categories of personnel who help nurses give care to patients.

Share of medical technology

In an environment where formal referral is not promoted, sharing medical technology seems unlikely. The regional hospital owned an electro-encephalographer (EEG, a machine to record brain waves), but access by private hospitals was not as easy as it should have been. On the other hand, one lithotripter (a machine to smash kidney stones) and two CT-scanners owned by private enterprises could easily have provided services to all public or private hospital patients. Some financial incentives were given by the enterprises to doctors in both public and private sectors who made referrals. Unfortunately, the competition between the two CT-scanners and the moral hazard of over-utilisation of medical technology could not be explored in this study.

8.4 Equity in health and health care

The final part of this chapter discusses equity in health and health care, or social efficiency in Hollingsworth et al (1990)'s terms.

Equity of health care delivery

The provision of public and private health services in this municipal area was above the average for the country excluding Bangkok. In Phitsanulok, the consultation rate for all health services was 3.1 per person per year, of which 0.9 was for drug stores, another 0.9 for clinics, 0.6 for public hospitals, 0.5 for private clinics and 0.2 for services elsewhere. The hospitalisation rate was 0.09 per person per year, of which 0.03 was for public hospitals and 0.06 for private

hospitals. These rates were slightly higher than the utilisation rates in 1985 found by the national Morbidity and Mortality Differentials survey (IPSR 1988). In 1985, urban people visited the public hospital 0.7 times per person per year and another 0.7 for private facilities (private clinic and private hospital combined), and there were 0.06 admission episodes per person per year. Comparing the two studies, consultations in private facilities are markedly higher in this study.

Private facilities provided more choice for urban dwellers both the rich and the poor. The rich chose to go to private hospitals and the poor to cheaper private clinics. Inequities of utilisation for equal need cannot be clearly demonstrated as there were insufficient data on which health facilities were appropriate for a given illness severity. Working under the assumption that private clinics provide acceptable quality of care, the poor then made use of good care when needed (not considering the burden to household income). But the rich were more privileged and used more expensive treatments for common ailments.

Inequity of access to health care was obvious in this study. Three groups of the population can be identified. First, the insured, constituting about 47% of the total population. This group included people covered by the civil servant benefit, state enterprise employee benefit, social security scheme and private insurance. Second, the uninsured, they constituted about half of the population. And the third group consists of those with limited insurance. This included government schemes with limited benefits; ie. veteran and volunteer benefit and low income card holders; and private employee benefit. The least advantaged group was the uninsured. They used cheaper health facilities and were less likely to be hospitalised.

Equity of health care financing

Two main financing mechanisms were studied: third party payments and out of pocket payments. As described in chapter 6, there were a higher number of third party payers in the privileged group (the rich, the more educated and higher occupational groups). Out of pocket payments were the differences between charges and reimbursements. It is unfortunate

that premium payments for private insurance were not taken into account. However, those who pay premiums were less than 7% of the total population (table 6.15). User charges in the government health sector which could raise up to 40% of total (recurrent including capital) expenditure in government hospitals put a heavy burden on the uncovered. Out of pocket payments levied from the insured group were not very high compared to their household income, 0.3-2.3% from table 6.43 (compared to the average figure of 3.0% for the UK (Central Statistical Office 1991) and 2.6% for Singapore (Department of Statistics, Singapore 1990)). Inequities of health care financing were clear.

An important concern in equity of health care financing is the channelling of government tax revenues to support private hospitals. About 20-26% of private hospital revenues were siphoned from general taxes under the civil servant benefit scheme. If this mechanism is seen as a cash transfer to entitle people to use private health services to reduce overcrowding at public health services, it should be expanded to cover wider groups not just civil servants and their dependents. Alternatively civil servants should pay some contributions to the fund, so that expenses will not come from general tax only.

Equity in health status

Finally the ultimate goal in health for all, equity in health status, was difficult to explore in this study. This was a problem of research methodology and sample size. Standardised mortality ratios by occupational group of household head showed higher deaths than expected in the privileged group. Morbidity levels were unequally distributed amongst income, occupation and education groups of household heads. But no firm evidence was available on inequitable distribution.

8.5 Conclusions

Making use of information from the general household survey and the bed and census survey, financing patterns of public and private health facilities can be estimated in monetary terms. All approaches tried to subtract reimbursable expenses from total charges to give more accurate

figures. Though there are a lot of assumptions in making estimates, alternative sets of assumptions were made to give a range. It is concluded that the public sources of finance of public hospitals were about four-fifths of total hospital expenditure, and of private hospitals were about one-fourth.

When financing patterns were put into a matrix of public and private mix against utilisation patterns, the shares of publicly-financed public sector, publicly-financed private sector, privately-financed public sector and privately-financed private sector can be estimated. The shares of public financing to private financing (40% to 60%) were different from the country estimates. This matrix can be useful for developing policy recommendations to change the balance of the mix from one cell to others.

Generalisation of the above estimates must be cautious. Rural areas are more likely to have a more prominent public sector but less public finance. These conditions would make the matrix shift towards private finance and public provision.

8.6 Summary remarks of the chapter

This chapter constructs financing patterns of public and private health facilities in the municipal area from the results of the previous two chapters. Different sets of assumptions were made to increase the accuracy of the estimates. Information from the household survey was used to estimate outpatient characteristics, and information from the bed census survey was used as representative of all inpatients.

Provision of health care facilities and utilisation of health services are not the same. The share of public health service provision in total provision was greater than the share of public health service use in total use. Consumer satisfaction plays an important part in choosing between public and private services. The privileged criticised public services more than the underprivileged.

A matrix of the public and private mix in financing and provision of health care was drawn up. The interface between public and private health services in terms of referral of patients, and share of health resources was discussed. And finally, inequity of health care financing was emphasised.

9. POLICY IMPLICATIONS

Having discussed equity issues in relation to the public and private mix of health care, it is obvious that there is inequity in the Thai health care system and the growing private health sector will widen the gap. This chapter will discuss current policies and recommend further policies in the light of the findings of this research.

To consider how to tackle the problems of inequity, cost escalation, the rapid growth in the private health sector and inefficiency in the public health sector, basic ideas on the philosophy of the Thai health care system are discussed first. Financing capacity, especially the transition of public financing from less than one third of total health expenditure to more than a half or higher is the next important issue. The chapter goes on to recommendations on privatising the health service, adjustment of the public health sector and controlling quality of health care. The chapter ends with suggested steps for a long term (10-year) health reform in Thailand.

9.1 The philosophy of the Thai health care system

Disruption in implementing the first social insurance law since 1954 has shown that the Thai bourgeoisie is afraid of socialist philosophy. Later developments of national health insurance and private employment-based health insurance in many countries have brought forward newer concepts of social insurance. With the leadership of the elected Prime Minister in 1990 and for other political and economic reasons, the House of Representatives finally passed the Social Security Act unanimously. This Act will extend coverage to the self-employed and Singkaew (1991) advised that the final goal of national health insurance in Thailand should be for universal and equitable coverage by the year 2000.

Ambitious goals of reaching total coverage have been achievable in South Korea where health care financing and provision is quite similar to that of Thailand. Though South Korea is much richer and more industrialised than Thailand, strong political commitment has been a key for success in South Korea. Strong leadership is needed from the more democratic but

less stable Thai governments in further enacting the laws to reach full health insurance coverage. These sequential steps will change the philosophy of the Thai health care system from "pay according to ability" to "universal access". The universal access philosophy requires continuous political support and a well-managed transition of the financing system.

Professional associations are opponents of health care reforms in many countries, nevertheless in the US, they have changed from being opponents to be supporters and leaders of national reform. Professional associations in Thailand, eg. the Thai Medical Council, the Thai Dentist Council and the Thai Nurse Council, should take part in the foundation of the system reform. The Thai Medical Council has been active in maintaining medical practice and ethics. Neglecting other professional associations may turn allies into opponents, eg. there was a protest from nurses when an increase in payment for professional groups did not include nurses.

Rapid economic growth in Thailand has exacerbated unequal income distribution rather than eliminated it. A recent World Bank (1993) report advocates an income distribution policy for economic development in Thailand. However, it is difficult, even impossible, to achieve equitable income distribution in a short period. In its place, equal access to health care should be regarded as top priority in the social development agenda along with economic development targets, because equal access to health care will ensure that people from different economic groups will equally use health services when needed and will reduce the heavy burden of health expenditure on household income for lower economic groups.

9.2 The transition of financing patterns

In the 1980s, the share of public expenditure as a percentage of total health expenditure was decreasing. This contradicted the governments' policies of providing care to the poor since the financing increment was inadequate. Since 1990, there has been a new source of finance relating

to the Social Security Act. This will slightly increase the share of public financing from 24% in 1987 to 33%.

The research found that patients from lower income quintiles were more likely to pay out of their own pocket and had the lowest coverage of government health benefit schemes. The share of public financing should be increased and directed to poor families and the uncovered group. Under a universal access philosophy, these groups would be universally covered. Since 1990, politicians have supported a vast increase in budget for low income groups. This strategic increase in the share of public financing will last only a few more years. It cannot be seen as an alternative means of achieving universal access. Fundamental reform of health care financing is inevitable to reduce the burden of administrative costs and laborious data collection at the periphery.

A tax-financed universal access system is equitable if the taxation structure is not regressive to income. However, the system would require a huge increase in public spending which the Ministry of Finance would dislike. An alternative is the national health insurance system where premiums offer another source of finance. In Thailand, tax contributes to the fund only half or the same amount as the collected premiums. The administrative costs of premium collection are higher than those of tax collection particularly for collecting from the self-employed and subsistence farmers. Experiences from community financing programmes, eg. the health card project, village crematory fund, etc., together with experiences from other developing countries, can guide design of the mechanisms of premium collection for these hard-to-reach groups.

Neither a national health service (tax-financed) nor national health insurance necessarily leave out copayments at the point of service delivery. Differential copayments can be established at different levels of care and for different socioeconomic groups. Adjusting copayment rates will provide an opportunity for balancing revenues (from copayments) and budget (from general tax) with the required expenditure of health institutions during a transitional period, but the copayment rates should not be too high as they may delay health seeking. Means

tests have to be developed related to income, occupation or household assets to establish differential copayment rates.

One of the government policies recently developed to reduce the brain drain of the scarce categories of manpower (eg. engineers, doctors, etc.) from the public to private health sectors and to increase efficiency in the public service is to reimburse civil servants and their dependents for their ambulatory visits at private hospitals. This policy has not yet been implemented. It is expected that this extension of the fringe benefit may be more costly than increasing the pay scale of these professionals because health care costs especially in private hospitals are high. It can be argued that the benefits for civil servants should be limited or grow at a slower pace compared to other groups, because civil servants and their dependents already enjoy greater health benefits than any other group.

To achieve equity amongst civil servants and between civil servants and other occupational groups, the researcher suggests that those with salaries exceeding a certain level should join in the Social Security Scheme. That is, they should contribute to the fund some percentage of their salaries. This policy will cause strong resistance from civil servants. So a new fund established for civil servants will have to give more benefits than the Social Security Fund, eg. low interest loans for household investment, payments for private health care. An example from Singapore, the Central Provident Fund and Medisave, could be borrowed.

There are no magic figures that total health expenditure should be 5% or 10% of GDP, or that the government should share 30% or 70% of total health expenditure. However, recent international health care reforms show that a larger share of public expenditure with control through contracts or global budgets could contain the country's health expenditure while providing more choice and efficiency. Therefore, with a higher share of total health expenditure, it would provide an opportunity to the Thai government to exercise more effective control measures to reach equity and efficiency goals while maintaining choice within the Thai health culture. The most challenging issue is how well the present bureaucratic administration can cope with a new environment

of management by objectives (backed by a good information system). Liberalising the red tape of the bureaucratic system is needed. It is Thai government policy to trim down the size of civil service in order to increase efficiency in management.

9.3 Privatising the health services

There have been strong arguments put forward by the National Economic and Social Development Board (NESDB) that the government should not increase public health expenditure and should adopt a privatisation policy in health care. This policy would involve freezing big investments and projects of building new public hospitals and letting private hospitals flourish especially in newly industrialised areas. This is a narrow view of privatisation because there are many other ways of privatising, eg. contracting out, joint public-private ventures, liberalisation, etc. (Dhiratayakinant 1990).

In the financing of health care, a higher share of public expenditure is recommended by the researcher through either a national health insurance or national health service system as it will increase public control and contain total health expenditure. Competition of private health insurers is not recommended because it will not achieve universal access and social efficiency principles especially with an aging population. Private contributions - insurance premiums, copayments and user charges in the public health sector - can be seen as transitional steps to an increased role of public financing.

The national health insurance fund would contract with competing health providers, public and private. Recent experiences of the Social Security Scheme show that the private sector is prepared to compete with public hospitals for a higher number of the insured with payment on a capitation basis. It is too soon to observe problems of under-provision because of the capitation system: these are expected to be greater in the private sector than in the public sector.

This contract model could be extended when the scheme reaches national coverage. Basic comprehensive health benefits under national health

insurance should include primary care as well as catastrophic coverage. Experiences from the Social Security Scheme suggest that there should be two schemes of contracting primary and catastrophic care. Contracting for these two services with public and private health sectors requires further reforms on the supply side. The most important changes are linkages between primary care and hospital care and networking between the public and private health sectors.

The research found that private primary care in this urban area - private clinic and private hospital visits - as twice as frequently used as public primary care, ie. hospital ambulatory services and other public health facilities. The average charge for ambulatory care at a private clinic was about a half of the charge at a public facility. The researcher recommends that primary care should be separated from hospital care to contain total health expenditure while maintaining good linkages between both services. This recommendation is likely to encounter great difficulties in implementation. In urban areas where the socioeconomic status of people is better than in rural areas, there is a tendency for the private sector to set up private health facilities as there is demand in excess of supply. Contracting for primary care with public or private services on a capitation basis would limit consumer choice but would provide a better opportunity for developing a good referral system between primary and hospital care (the gate-keeper role of private clinics). Contracting out primary care on a capitation basis may create an opportunity for setting up private clinics in densely populated rural areas. This would improve geographical equity of health resource input. Furthermore, contracting on a capitation basis would promote continuity of care.

Contracting on a per-visit basis with global budget control is an alternative to contracting on a capitation basis. This model would limit the overall budget and pay providers proportionately to total visits at all primary care contractors. This would discourage hospitals from providing primary care because the unit cost of primary care in hospital is higher than in private clinics. Moreover, contracting on a per-visit basis would maintain consumer choice as clients could go to either the public or private sector. However per-visit payment would induce repeat

visits in both sectors and disrupt continuity of care. Equity in health status or outcome should be monitored to reduce inequity between urban and rural areas.

Privatising health care by contracting out primary care to the private sector does not mean that government responsibility would shift to the private sector. The government has to monitor and intervene periodically to achieve equity and efficiency goals. Apart from establishing a referral network of patient care between the public and private health sectors, a network to ensure equity and efficiency is crucial. This will be dealt with in detail in section 9.5.

Contracting for hospital care with public or private hospitals is more complex. Experiences from the early years of the Social Security Scheme, which started from a capitation basis and then added emergency cases, paid on a per visit basis, will shed some light on partitioning primary care, hospital care and extra-contractual referral expenditures in relation to the capitation allowance. Information is also needed to monitor under or over-treatment in relation to outcomes in the public and private hospitals under the capitation system. Furthermore, the capitation system gives an incentive to the hospital to shorten length of stay.

Contracting for hospital care on fee-for-service basis or diagnostic related groups (DRGs) basis has proved elsewhere to be an expensive system. Even the reimbursement scheme limited by maximum reimbursable days as practised in the civil servant benefit scheme for private hospital care is also expensive. The subsidisation of private hospitals by general tax revenues through the civil servant benefit scheme has to be revised. The alternatives are capitation and DRG-based payment. This change will put private hospitals under harder competition with public hospitals. However, private hospitals are allowed to compete amongst themselves for lower copayments from their clients or greater consumer satisfaction. The fee-for-service alternative is generally thought to be undesirable. The DRG system would increase the administrative burden to both financier and providers.

As doctors' salaries and fees in private hospitals are high, they contribute more than a half of total hospital expenses. This labour cost is a major contributor to the rising health care cost. However, it is difficult to control physician income through the private health sector. Increasing salary scales for full-time public doctors, to make them comparable with private doctors' earnings, would counteract the brain drain problem and improve doctor-patient relationships as public doctors would have more time to spend with patients. The latter issue will be dealt with in section 9.4. However, the high cost of care in private hospitals is likely to become even higher because of increased competition in employing doctors, and the gap of earnings between private and public doctors may return.

The Social Security Office has proved to be an important body in influencing the mix of public and private providers in the Social Security Scheme. Bennett and Mills (1993) suggest that insurance schemes may be effective 'disciplinarians' of private providers by restructuring incentives, monitoring performance and ensuring that preventive services are also delivered. The national health insurance body that is recommended here could act as purchaser of health care to regulate payments to and control the distribution of providers.

As long as demand is greater than supply and regulators cannot put a cap on total cost, a high accumulation of public and private health services is likely to happen in privileged areas. Guidelines for the distribution of health resources should be established and reviewed periodically in the five-year National Health Plans. There should be guidelines for the share of public and private health sectors in urban and rural areas in different economic zones. The granting of permission for new health facilities in both public and private sectors should follow these guidelines. This is to ensure equity and efficiency in the public and private mix.

Allowing growth to occur in private health sector would change the role of the public health sector and require good capacity to implement. Strong initiatives have to come from the Ministry of Public Health to influence other ministries to join the reform movement as well as

provincial levels. Provincial health offices would be more involved in planning for curative services than they are at present through contracting or purchasing health care from public and private providers for their resident population. Provincial health offices would oversee standards and balance the mix of public and private health care in their provinces. Public hospitals would have to be more cost-conscious to compete with the private sector.

9.4 Adjustment of the public health sector

During the 1980s there was a rapid growth in private hospital beds, and public hospitals were growing at a slower rate. New community hospitals, 10 to 30 bedded hospitals, have been established in rural areas to cover all districts. Urban public health infrastructure has not been well developed. Public primary care in urban areas is delivered from hospital outpatient services which are already crowded. It was recommended in the previous section that primary care for urban people should be contracted out to private clinics.

The alternative of setting up publicly-owned primary care in urban areas requires investments in physical establishments and manpower. But public clinics would have to compete with the well established hospital outpatient services. Strong incentives would be needed to channel patients to this newly established type of facility, otherwise it would be under-used. Doctors in these establishments would work as general practitioners or gate-keepers of the hospitals. This alternative may not reduce patient choice if more than one of these establishments exist in an area, or if competition between public and private primary care is allowed. There has been a policy in the Ministry of Interior to expand the Municipality's role in providing primary care in urban areas but this policy has failed to attract medical doctors. A recent field trial in Ayudhaya on this alternative, though under Ministry of Public Health management, will throw some light on further possible developments. However, the option of setting up publicly-owned primary care facilities in urban areas is not very attractive. The already existing private clinics are likely to be more economic and culturally acceptable.

This research has found that many private hospitals provided preventive and promotive services with higher achievements than the public hospitals, but private services are scattered and not organised to be community-based institutions. Public services in urban areas should focus on organising preventive and promotive health care so as to evaluate the coverage of the services, and also on providing secondary and tertiary medical care. Preventive and promotive health care including education on self-care will reduce morbidity and the demand for service utilisation. Public hospitals in urban areas should stress secondary and tertiary medical care, and coordinate preventive and promotive health care with other public health facilities, but have a limited role in primary medical care.

Doctors working in a public hospital in an urban area should be given the opportunity to choose between being a full-time or a part-time doctor. A part-time doctor would be allowed to work in private health facilities. A full-time doctor would be given a high salary but would be under a review system (with national standards and locally assessed by a provincial committee) in order to maintain a full-time position. The 'full-time' versus 'part-time' recommendation is expected to increase doctor efficiency, to raise the morale of doctors who devote themselves to public practice only and to improve doctor-patient relationships in public hospitals.

Public hospitals in urban areas are not the sole providers of secondary and tertiary care but rather are competitors of private hospitals. They also act as referral hospitals for community hospitals and more often for private hospitals, and as reference centres for quality assurance. Under the contract model, public hospitals would compete for insured patients with private hospitals. In general, public hospitals outside Bangkok are better equipped than private hospitals, and doctors working in public hospitals are under less financial pressure than doctors working in private hospitals when treating patients. Presumably, practice standards in public hospitals are better and can be taken as quality reference points. However, to achieve this role, public hospitals should be liberalised from inefficient bureaucratic constraints by being given 'self-governing' authority. Self-governing

public hospitals would work with more flexible personnel and financial management to respond quickly to local health needs and to compete better with private hospitals.

Liberalising public hospitals to be self-governing would need fundamental changes in public sector regulations. The prime minister appointed by the military coup leaders almost succeeded in liberalising government universities to be self-governing, but resistance came mainly from inside the universities. Liberalising public hospitals would face resistance from other ministries, especially the Ministry of Finance who strictly controls hospital expenditure. Hospital managers should be rewarded according to their efficiency achievements. Self-governing hospitals would be independent from the provincial and central bureaucracy. However, there should be a national independent body to oversee the management of these self-governing hospitals.

The research found that there were more cases with very long lengths of stay in public hospitals than in private hospitals. These very long lengths of stay of patients treated in public hospitals should be reduced accordingly to reduce total costs of providing care. Self-governing public hospitals would pick up this problem quickly to increase hospital efficiency. Many conditions might be discharged earlier if community care for chronic diseases were available. Patient education may be used to reduce long stays in hospital. And a good referral system would transfer non-acute patients to spend their convalescent period in a local health facility.

The public hospital is the safety valve for the 'pay according to ability' system. Hospital expenditure on care given to the poor who do not have a low income card and are not able to pay high hospital bills is twice as much as expenditure on low income card holders. This implies that the government subsidy for health care to the poor has been inadequate. The poor without a low income card may find administrative procedures too complex to be exempted from medical bills. An increasing role of the public hospital in providing care for the poor is inevitable. In spite of the increase in budget for those on low incomes, the allocation mechanisms of this fund should go in line with the

mainstream of reform, ie. capitation, global budget control or DRG-based.

9.5 Quality assurance versus regulations

Though quality of care was not examined in this research, it is of obvious concern that a quality control system should be applied to health care to solve long term problems. Health care is a complex system where regulations alone can never work, eg. cost containment by price control has never been successful as physicians can increase treatment volume to reach their target income. Quality assurance is a positive approach to ensuring good clinical practice and outcome while maintaining professional freedom. Contracting out primary care to private clinics and hospital care to private hospitals needs quality assurance mechanisms to ensure professional standards.

Quality assurance is not aimed only at the private sector. Public hospitals in urban areas, as they will become self-governing, need to be assessed periodically. This should be applied also to community hospitals and health centres to ensure that rural people also get good quality health care. A national centre for quality assurance should be set up to oversee the standards of both public and private health care, and both urban and rural areas. Guidelines should be drawn up to recommend each health facility to undertake its own quality assurance practice.

As many laws in health care are outdated, especially the Health Premise Act which is concerned with private health facilities, they should be amended accordingly. However, it takes a long time to amend or legislate a law, and it is quicker for the Ministry of Public Health to issue regulations according to the law.

Health care reform will require a series of laws to be legislated. Participation from legislators is needed. The laws on financing health care, eg. the civil servant health benefit act, should be revised or enacted.

9.6 Phasing in the Thai health care reform

Three phases for the Thai health care reform are suggested.

Phase I Philosophy and planning for the changes

The first phase is required to build up consensus for change, in the government ministries, professional groups and the public. Proposals for changes in financing and provision of a future health system would be scrutinised.

Phase II Macroeconomic and microeconomic adjustments

In this phase, movement towards universal access would be implemented. An increasing share of public expenditure for National Health Insurance would be phased within the next national socioeconomic development plan. It is foreseen that subsidies would have to be given to the group of hard-to-reach (the urban and rural poor) to achieve universal coverage. The civil servant benefit scheme would be adapted to be a bipartite fund (with contributions from civil servants and the government budget). Meanwhile, contracting models would be tried out in the public and private sectors. Public hospitals would become self governing.

Phase III Quality assurance

To monitor the equity and efficiency consequences of the changes, including consumers' views on the changes, quality assurance would take an important role as a compulsory process in every health institution. Providers need to pass periodic assessment (and quality assurance is one element) so that they could renew the contract to provide care to clients. Information derived from quality assurance would indicate further directions for changes.

9.7 Conclusions

Universal coverage is proposed to reduce inequity in health care financing in Thailand. It would require great effort to change the

philosophy of "pay according to ability" to universal access. Tax financing and national health insurance should be used in combination to reach universal coverage.

Contracting primary care to the private health sector on a capitation basis is a way to contain costs and restructure primary care and hospital care to achieve continuity of care through a referral network. Public competition is a way to increase efficiency in the public health sector. Public health facilities competing for clients with the private sector should be given self-governing authority.

9.8 Summary remarks of the chapter

A long term health care reform is proposed. The first step is to make the philosophy of the government clear that accessibility to health services is a basic human right. Various ways of financing a national health service or national health insurance are discussed including drawing contributions from civil servants, the most privileged group in the existing health delivery system. The private health sector would contract for primary and hospital care with the Provincial Health Office to provide care to beneficiaries. Public health facilities should compete with the private sector in contracting with the Provincial Health Office. Given their power stemming from financing health care providers, government could regulate the quality of care through quality assurance process.

10. RECOMMENDATIONS FOR FURTHER RESEARCH

Despite data deficiencies, this research has shown that inequity in health unsurprisingly did exist in an urban area in Thailand. Inequity of health care financing amongst household income, health benefit and occupational groups of household heads was the most clearly established, while inequity in health status and inequity of utilisation for equal need were difficult to prove. Public and private health providers reached different groups of consumers and were competitors for the groups with third party cover. However, it was not clear which provider was more efficient than the others. This chapter summarises the strengths and weaknesses of the research methods and suggests further research activities.

10.1 Strengths and weaknesses of the research methodology

This research employed four main methods which complemented each other. The household health interview was complemented by the health diary used by ten percent of the total sampled households for data on morbidity and health seeking behaviours within the period of two weeks. The one-day bed census survey and a quick health resource survey were intended to complement the household survey for information on provider behaviour. The strength of the research methodology was to provide an opportunity to check the reliability of each method.

Unfortunately, the strength in design was counteracted by an ambitious agenda. The household surveys were spaced over three different times of the year to reflect seasonality. Different groups of interviewers were used for each survey round to test Kroeger's observation that interviewers with a non-health background did better than interviewers with a health background (Kroeger 1990). Attempts to explain variations with too many variables varying at one time proved to be a weakness of this approach.

A simple health diary was developed to help respondents remember illnesses and health seeking behaviour of all family members in the past two weeks. It was shown that the health diary increased self-reported

morbidity. However, it put respondents under continuous responsibility, and some respondents asked their neighbours to write down their household events as they were not good at writing. Diary keepers were compensated with one hundred baht at the end of the interview sessions without prior notification that there was a money incentive. Diary keeping is an expensive method so it should be applied only for small scale studies.

This was the first research to be explicitly aimed at describing equity in health in Thailand against a set of variables on socioeconomic status. A new approach for occupational grouping was experimented with, following the Registrar General's classification (OPCS 1980) rather than the National Statistical Office's because the latter classification is not related to social class gradient. There had been no sociological research in Thailand to support the researcher's modification, and the findings related to occupational group were not conclusive.

As summarised by Tangcharoensathien (1990), whose study devised this research's household questionnaire, income estimation was not accurate because it did not impute the rents of owner-occupied households, or include debts. It was clear from the research here that income was the most unrepeatable response. However, no adjustments were made in the analysis of income data because the data set of reinterviews was too small to give a good correction factor, and per capita income estimation did not use an adult equivalent scale as advocated by Atkinson (1984) because no studies have developed this concept for Thailand. The National Statistical Office has yet to apply the adult equivalent scale in its analysis.

This study was also the first attempt to relate health benefit coverage with morbidity, service utilisation, household income and health expenditure. Health benefit coverage was revealed to be a very important factor in determining access to health care and expenditure as a percentage of household income, since the country could not guarantee universal access to health care. This study asked for all the health benefits each individual had, but the scheme providing the highest coverage was used for analysis at the individual level, and the highest

benefit scheme of the household head was used when the household was the unit of analysis.

And it was also the first time in Thailand to compare mortality differentials by standardised mortality ratios. Unfortunately, the summary statistics were not convincing because of the small sample size. Death is a rare event, so a survey of about 1,000 households could not yield a large enough number of deaths to prove significant differentials. Furthermore, data collection for death events did not obtain specific characteristics of the dead individuals. A national survey would provide more powerful data to study differentials.

In a relatively big household survey, it is inevitable to use proxy respondents for important household events like annual experience of hospitalisation and the past two week illnesses, as accepted by Kroeger (1990). However, this study also used proxy respondents for household income and health expenditure, and even for keeping a health diary for all family members for a two week period. The research shows that proxy respondents are useful and cooperative.

The one-day bed census survey provided a snapshot of public and private hospital activities and the annual health resource survey provided further information on the circumstances of hospitals. The one-day bed census proved to be a lengthy method if lengths of stay and total charges are the main aim of the study, because all cases on the survey date have to be followed till discharged from hospital. The results also show considerable bias toward chronic cases. Extrapolation from a one-day census alone has to be done very cautiously.

10.2 Suggestions for further research

Given the concern of how to reform the Thai health care system, many areas of study are suggested.

There should be sociological studies of the relation between socioeconomic status and health status, apart from health care utilisation alone. The ultimate goal of 'well-being not merely the

absence from ailments' should be similar within each of those sensible socioeconomic groups.

The standardised mortality ratio (SMR) is one of the more powerful measures of health status. The Health Statistics Division should explore the possibility of establishing SMRs as a routine statistic, so that the comparison of SMRs amongst different socioeconomic groups can be easily accomplished to explore equity in health.

National surveys, eg. the health and welfare survey of the National Statistical Office, should incorporate useful variables - eg. health benefit coverage, health expenditure - to monitor periodically for equity of access and equity in relation to health care financing.

Further studies on different mixes of financing schemes are recommended to move towards universal coverage with financial feasibility. User charges and copayments would be necessary during the transitional period, and they must not compromise equity of access and equity in health status.

A contracting model with the public and private health sectors on the basis of capitation and global budget control should be piloted to see its financial and cultural feasibility. The Social Security scheme's contracting model on a capitation basis is a good prototype for expansion to other benefit schemes. The model with global budget control has not yet been tried. In long term health care reform, one contracting model may be a transitional step for another model so as to reduce resistance.

As regulations are not successful ways of containing costs and might hamper quality of care, a model for quality assurance has been recommended as an educational process and a way of achieving high quality of care. A case-mix index or severity index must be developed to standardised cases for quality evaluation.

A one day bed census may be used in a process of quality assurance in both public and private health sectors. Individual patient records are another possible tool for quality assurance. An annual health resource survey, with indicators of full-time equivalent staff gives useful information on input mix, and should be applied more widely.

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ANNEX 1

Additional tables and figures

Table A.1 Age and sex distribution by education group

Age group	No ed		Primary		Secondary		Vocational		University		Unknown		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
0-9	156	140	173	169	2	0	0	0	5	2	0	0	336	311
10-19	2	4	50	33	195	220	60	61	106	125	2	5	415	448
20-29	5	9	24	45	81	85	112	101	97	150	3	6	322	396
30-39	7	17	57	141	93	70	62	68	122	178	16	14	357	488
40-49	5	22	72	113	69	43	27	11	58	62	9	19	240	270
50-59	10	22	76	115	40	11	14	5	32	15	7	14	179	182
60-69	8	38	54	74	17	14	3	2	7	5	7	9	96	142
70-79	9	24	14	25	11	2	0	0	2	1	3	4	39	56
80-89	4	14	4	7	2	0	0	0	0	0	0	3	10	24
90-	1	1	1	1	0	0	0	0	0	0	0	1	2	3
Total	207	291	525	723	510	445	278	248	429	538	47	75	1996	2320

Source: General household survey and health diary plus interview

Table A.2 Age and sex distribution by education group of household heads

Age group	No ed		Primary		Secondary		Vocational		University		Unknown		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
0-9	22	15	94	102	77	64	40	51	85	68	18	11	336	311
10-19	16	21	142	151	98	107	47	48	93	97	19	24	415	448
20-29	19	20	105	149	62	98	64	70	58	47	14	12	322	396
30-39	19	33	89	150	81	102	51	53	97	132	20	18	357	488
40-49	9	23	79	95	63	64	24	18	56	53	9	17	240	270
50-59	11	11	78	95	38	31	16	14	29	21	7	10	179	182
60-69	8	20	51	62	18	24	4	8	8	19	7	9	96	142
70-79	7	15	12	24	12	10	1	1	3	5	4	1	39	56
80-89	3	4	5	9	2	4	0	2	0	4	0	1	10	24
90-	0	1	0	2	1	0	0	0	1	0	0	0	2	3
Total	114	163	655	839	452	504	247	265	430	446	98	103	1996	2320

Source: General household survey and health diary plus interview

Table A.3 Age and sex distribution by occupational group

Age group	Civil servant		Prof & admin		Trade		Semi-skilled		Service		No job		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
0-9	0	0	0	0	0	1	0	0	0	0	335	310	336	311
10-19	1	0	1	0	7	5	3	1	16	22	387	420	415	448
20-29	35	23	13	28	60	82	15	13	126	93	73	157	322	396
30-39	100	72	42	90	68	120	18	20	113	82	16	104	357	488
40-49	63	24	24	38	60	87	12	10	75	41	6	70	240	270
50-59	61	9	15	11	36	58	8	5	42	18	17	81	179	182
60-69	4	1	3	1	30	31	1	0	14	11	44	98	96	142
70-79	0	0	0	0	5	7	0	0	1	2	33	47	39	56
80-89	0	0	0	0	0	1	0	0	0	0	10	23	10	24
90-	0	0	0	0	0	0	0	0	0	0	2	3	2	3
Total	264	129	98	168	266	392	57	49	387	269	923	1312	1996	2320

Source: General household survey and health diary plus interview

Table A.4 Age and sex distribution by occupational group of household head

Age group	Civil servant		Prof & admin		Trade		Semi-skilled		Service		No job		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
0-9	75	72	38	31	70	61	11	13	91	88	51	46	336	311
10-19	93	98	40	46	99	115	18	26	116	110	49	53	415	448
20-29	55	67	19	14	81	108	10	10	98	127	59	70	322	396
30-39	84	114	39	57	67	111	18	25	97	107	52	74	357	488
40-49	58	51	23	28	65	76	11	15	69	62	14	38	240	270
50-59	60	36	14	12	36	50	8	5	39	42	22	37	179	182
60-69	7	19	4	10	31	25	1	1	14	22	39	65	96	142
70-79	3	4	0	3	9	11	0	1	6	10	21	27	39	56
80-89	0	5	0	2	0	4	1	0	1	4	8	9	10	24
90-	0	0	0	0	1	1	0	0	1	0	0	2	2	3
Total	435	466	177	203	459	562	78	96	532	572	315	421	1196	2320

Source: General household survey and health diary plus interview

Table A.5 Age and sex distribution by household income quintile group

Age group	Q 1		Q 2		Q 3		Q 4		Q 5				Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
0-9	56	50	61	76	58	63	73	60	74	56	322	305	336	311
10-19	65	64	78	78	97	103	66	92	90	88	396	425	415	448
20-29	64	65	71	83	49	74	66	83	63	80	313	385	322	396
30-39	41	66	66	69	77	102	83	100	81	135	348	472	357	488
40-49	32	48	34	39	58	58	56	57	53	57	233	259	240	270
50-59	28	37	25	31	26	37	39	35	56	36	174	176	179	182
60-69	19	31	17	31	19	24	15	20	21	32	91	138	96	142
70-79	12	20	7	5	6	10	7	11	5	6	37	52	39	56
80-89	2	2	2	4	2	5	3	4	0	8	9	23	10	24
90-	1	1	1	0	0	1	0	0	0	0	2	2	2	3
Total	320	384	362	416	392	477	408	462	443	498	1925	2237	1996	2320

Source: General household survey and health diary plus interview

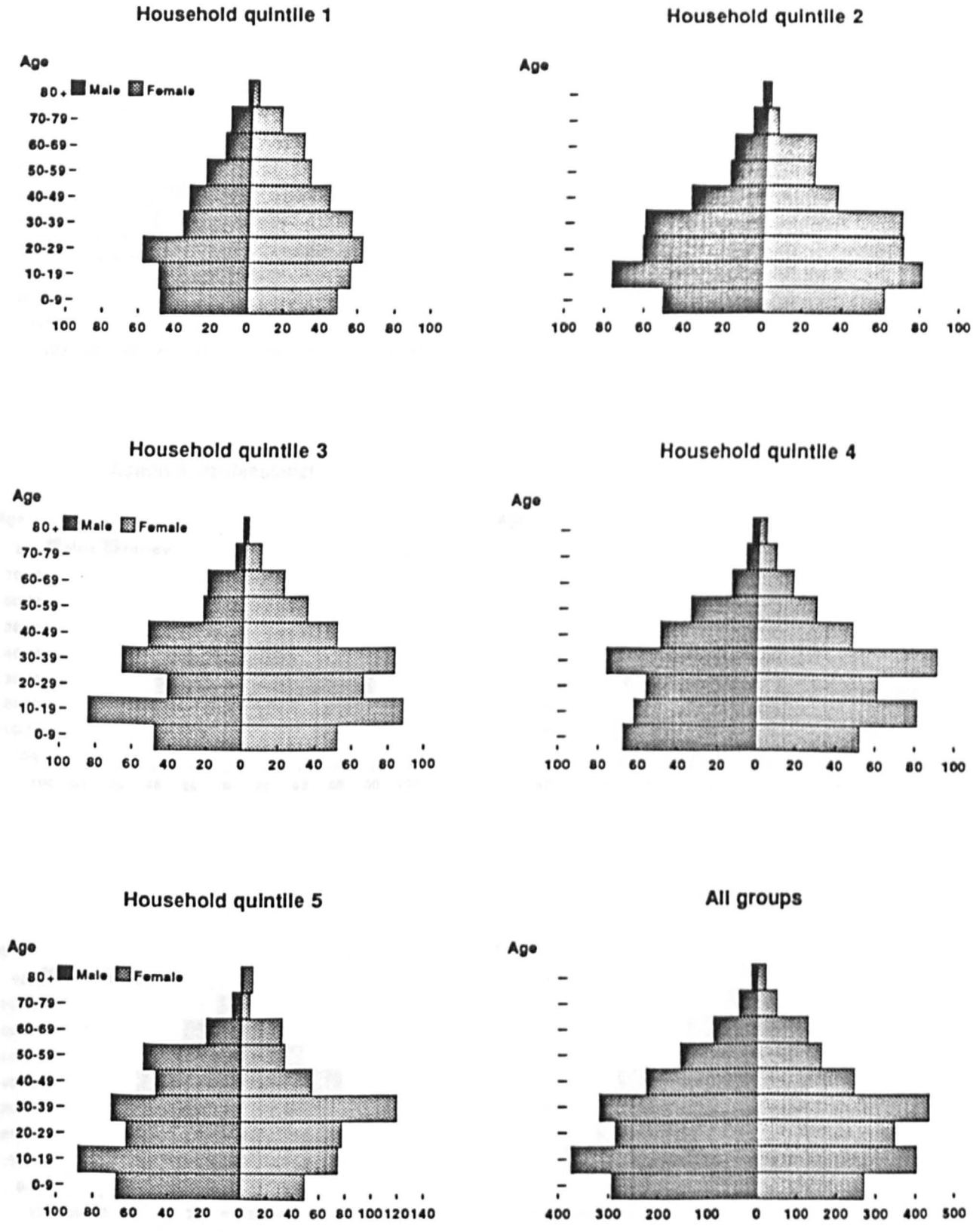


Figure A.1 Population pyramids of different household income quintiles and all samples of the general household survey

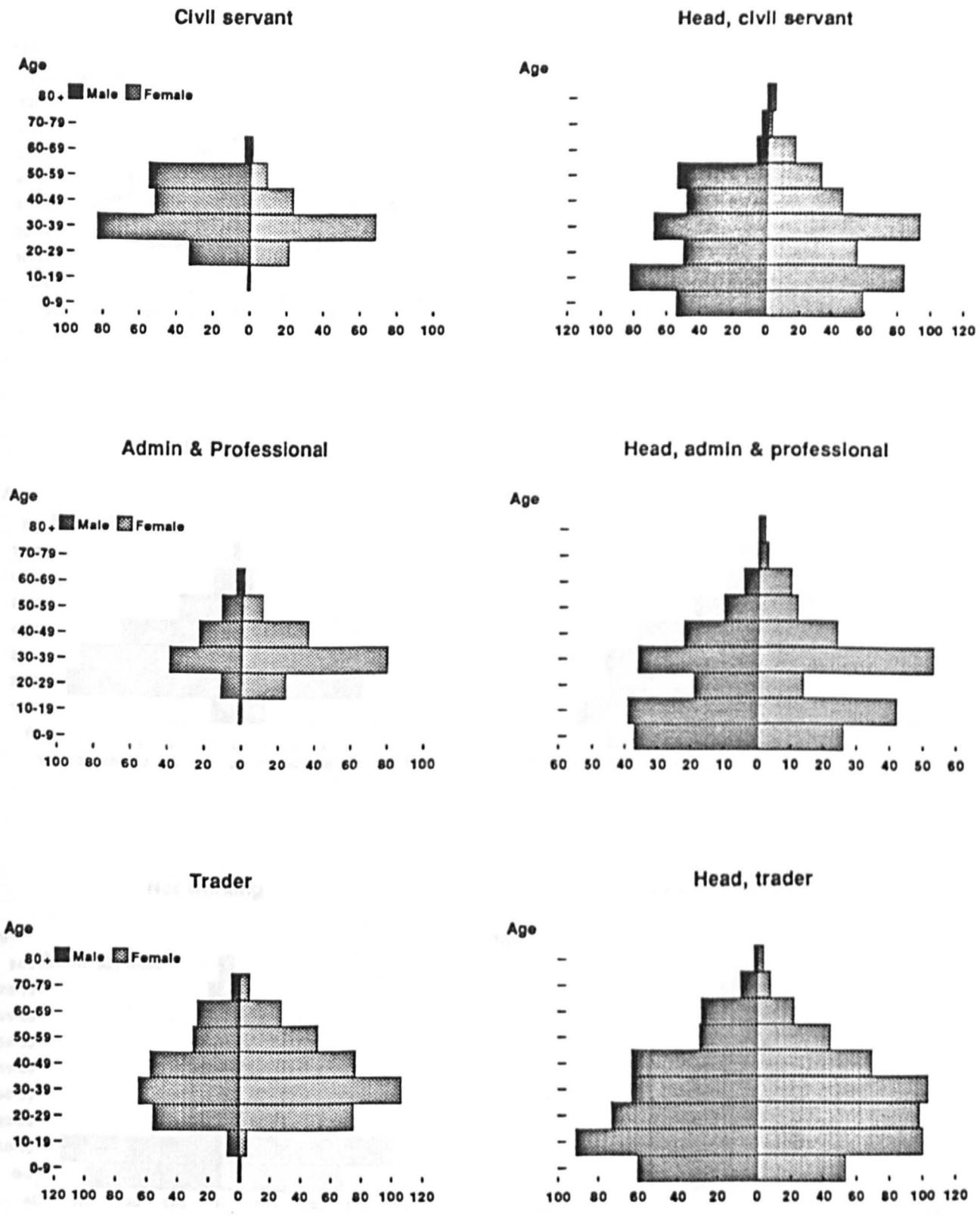
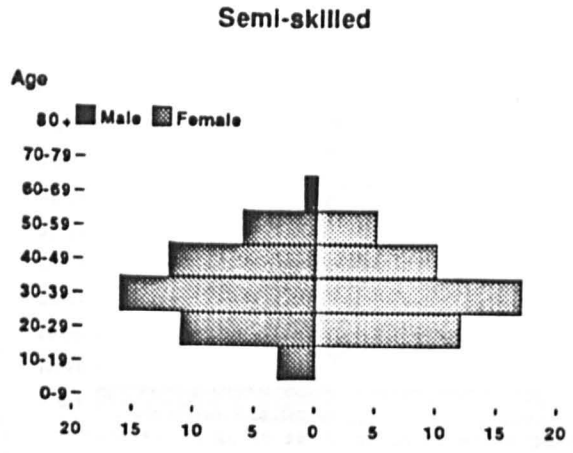
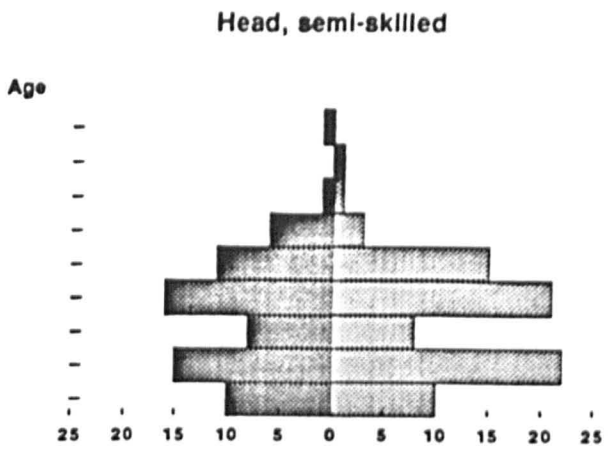
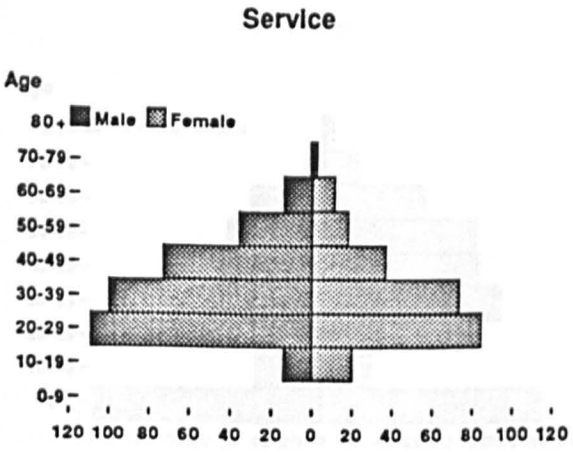
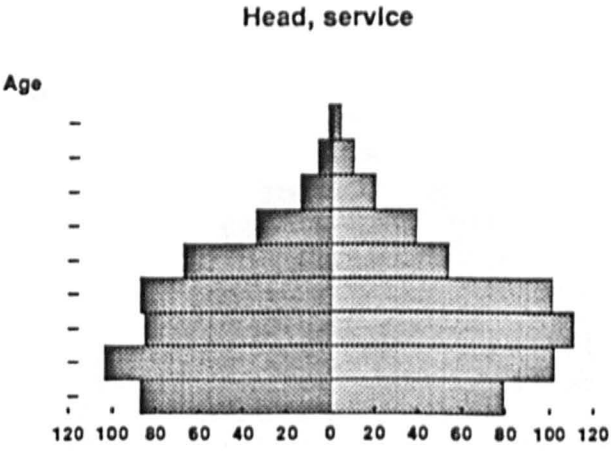


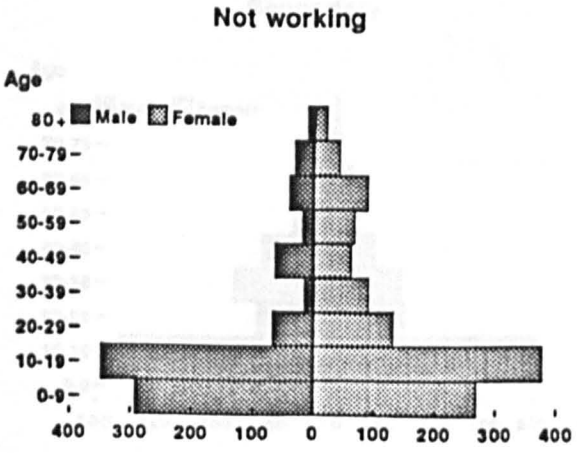
Figure A.2 Population pyramids of different occupational groups by individuals and household heads (General household survey)











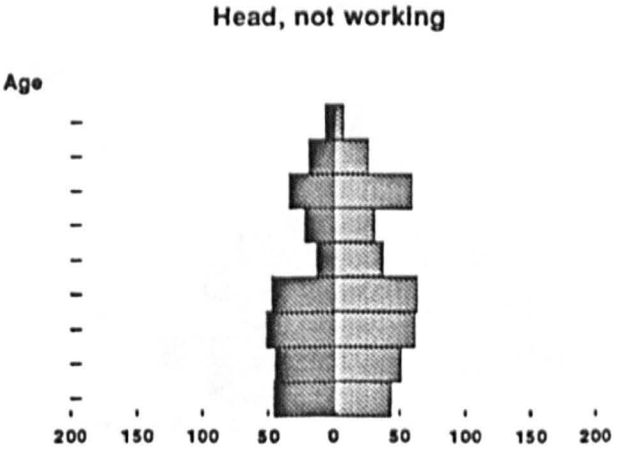


Figure A.2 (continued)

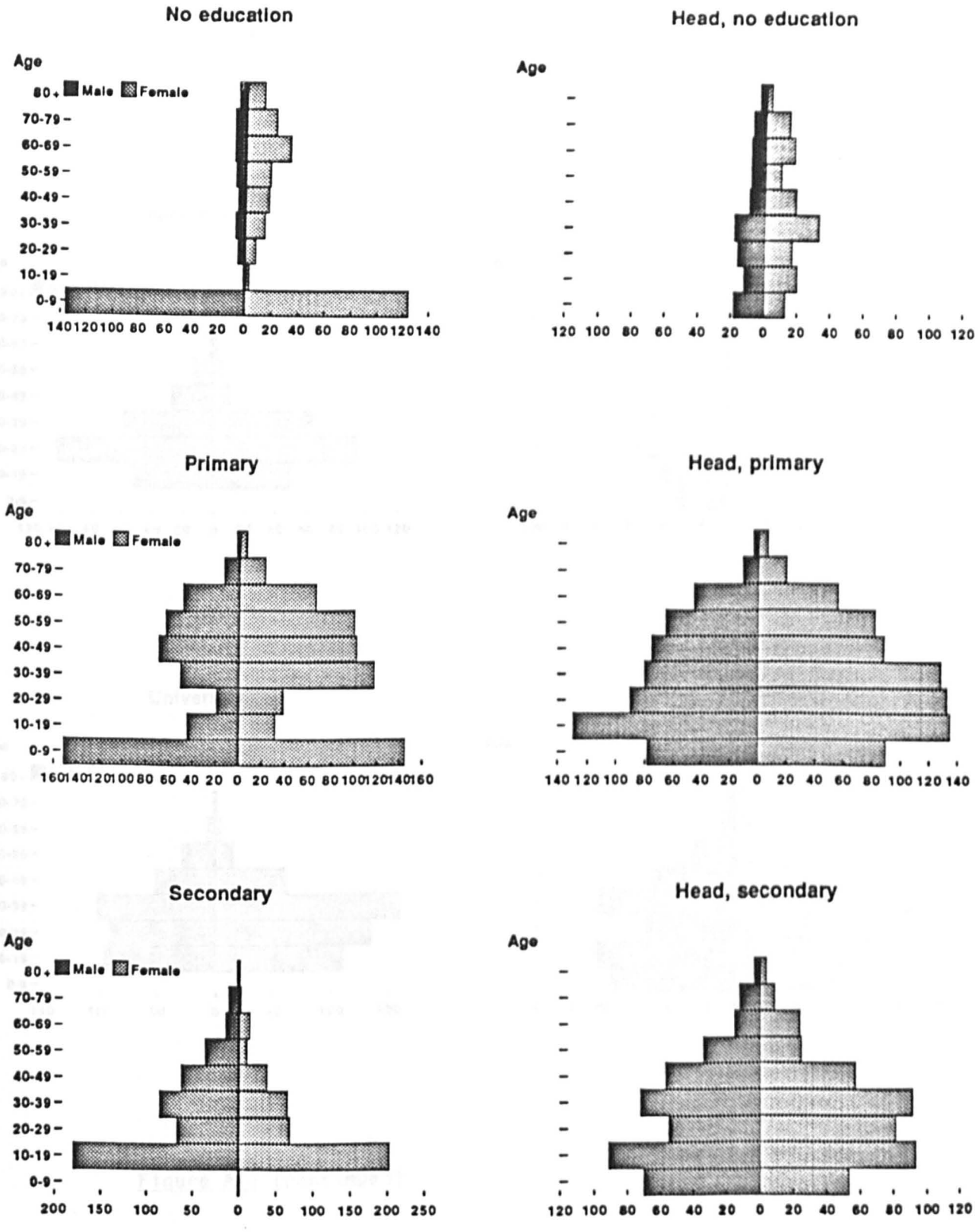
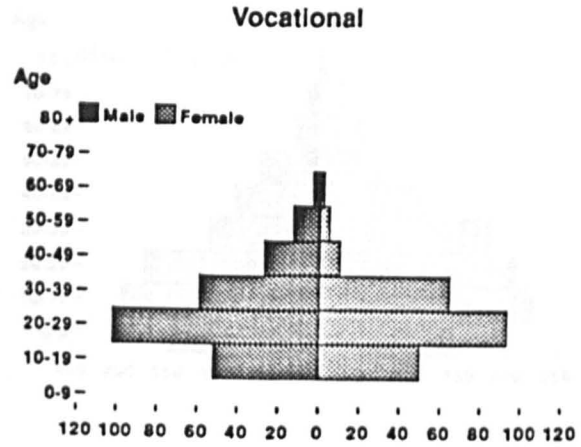
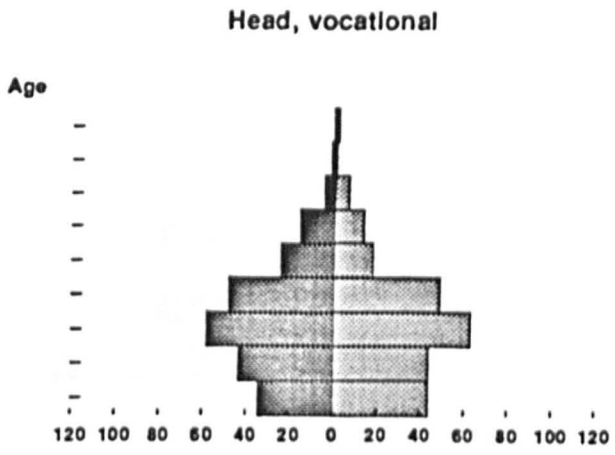
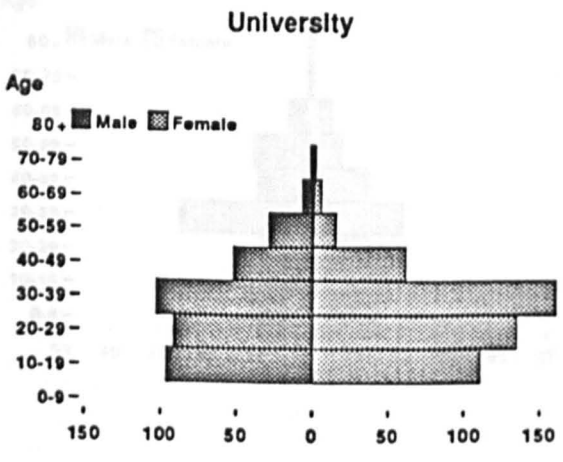


Figure A.3 Population pyramids of different educational groups by individuals and household heads (General household survey)







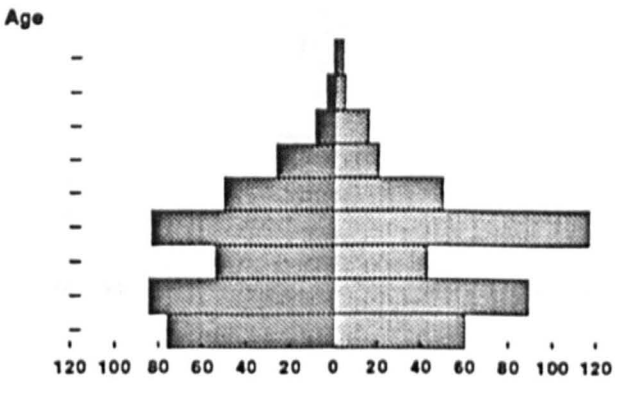


Figure A.3 (continued)

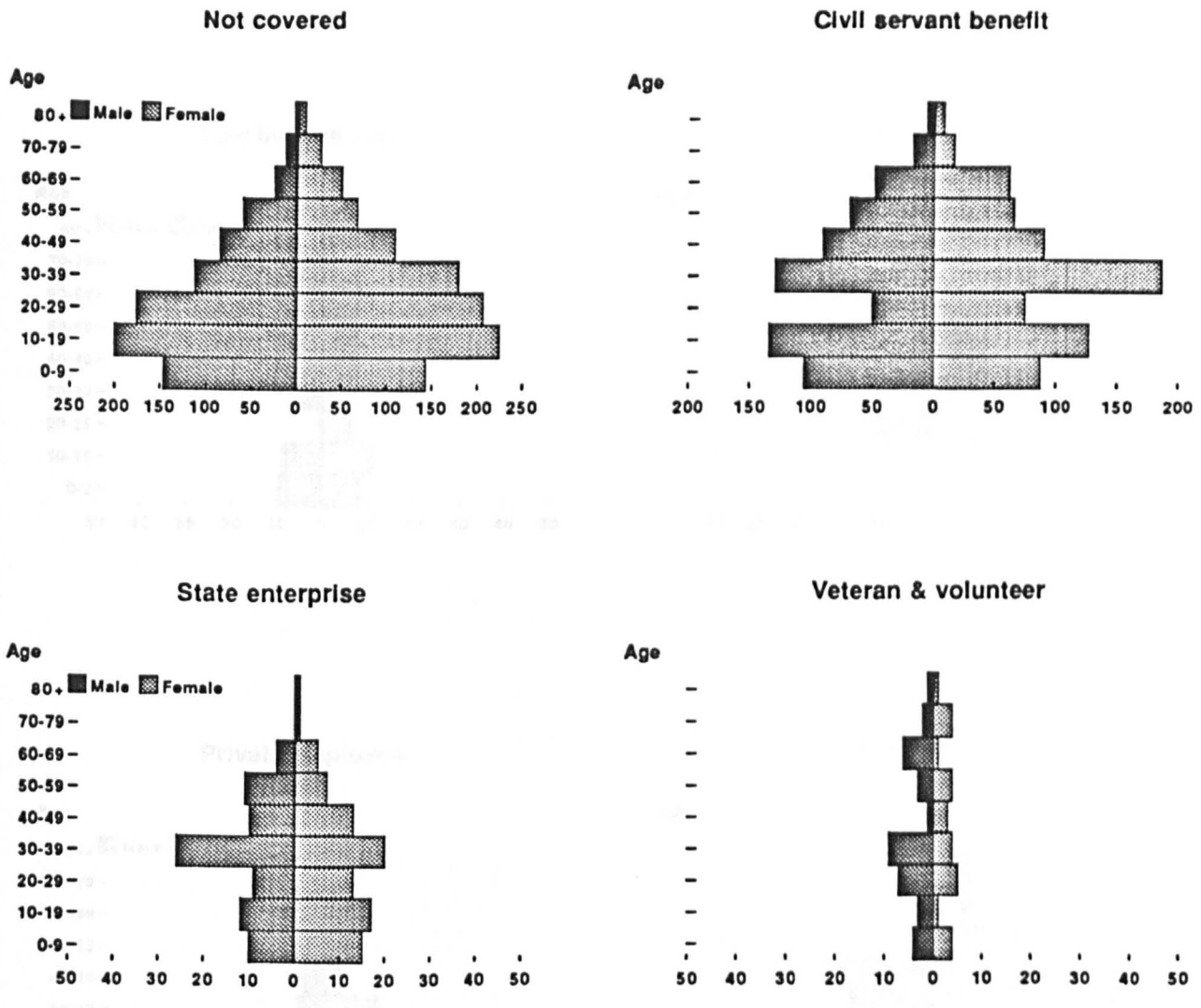


Figure A.4 Population pyramids of different health benefit coverage by individuals (General household survey)

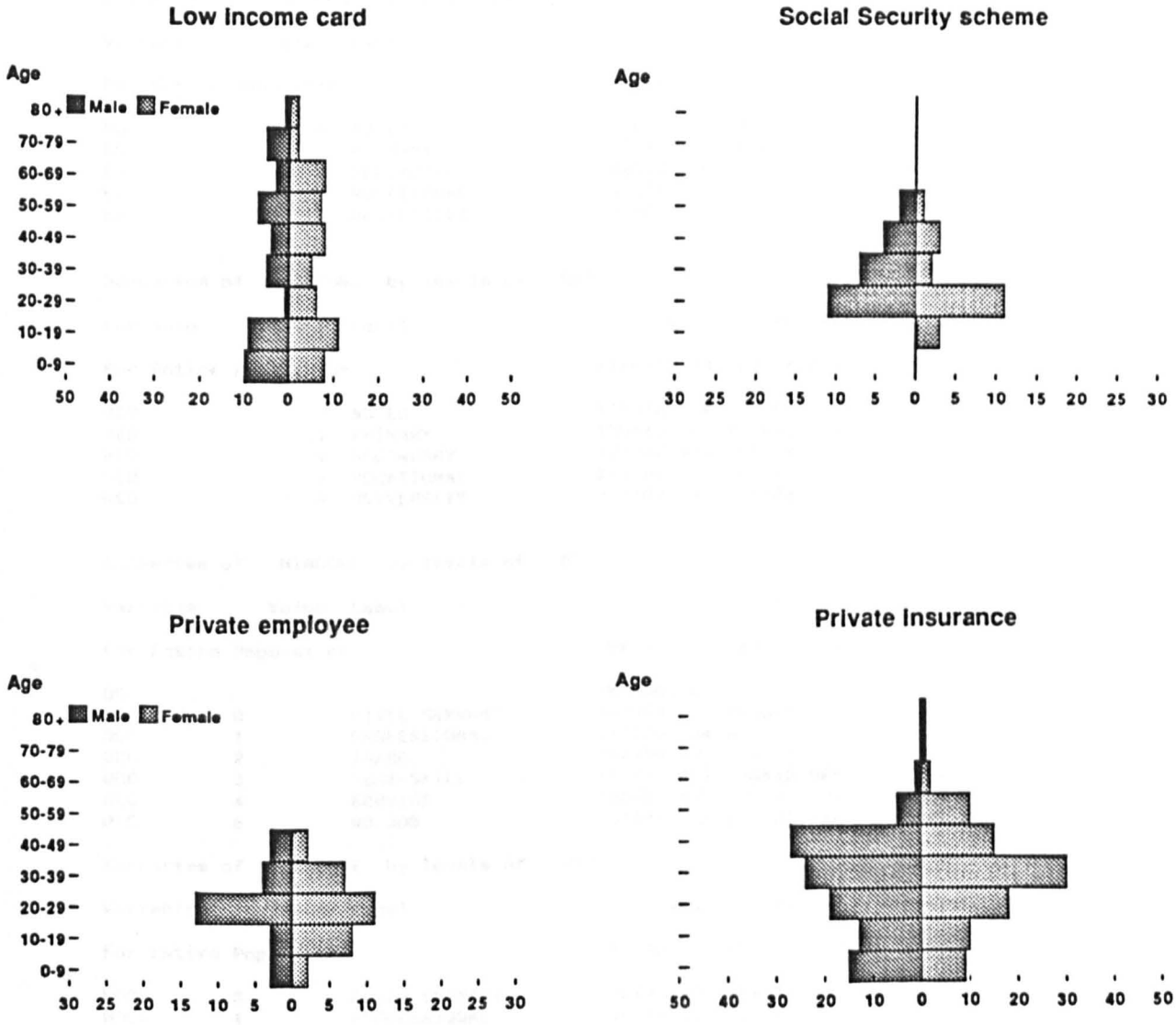


Figure A.4 (continued)

Table A.6 Distribution of household income (HINCOME) and per capita income (HCAP) by educational group of individual (ED) and household head (HED), by occupational group of individual (OCC) and household head (HOCC), and by type of health benefit of individual (CTYPE)

GENERAL HOUSEHOLD SURVEY

Summaries of HINCOME by levels of ED

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			169141.531	224279.028	3603	
ED	0	NO ED	140839.448	240284.647	424	
ED	1	PRIMARY	145191.307	185649.752	1051	
ED	2	SECONDARY	162826.260	184779.702	820	
ED	3	VOCATIONAL	192927.203	265851.242	469	
ED	4	UNIVERSITY	206322.474	261106.553	839	P=0.0

Summaries of HINCOME by levels of HED

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			170401.974	226934.676	3531	
HED	0	NO ED	175312.759	475504.566	232	
HED	1	PRIMARY	129440.848	177438.734	1272	
HED	2	SECONDARY	171332.984	197174.921	820	
HED	3	VOCATIONAL	212460.357	246960.417	457	
HED	4	UNIVERSITY	211707.496	185109.992	750	P=0.0

Summaries of HINCOME by levels of OCC

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			168700.162	223482.152	3704	
OCC			480000.000	0.0	1	
OCC	0	CIVIL SERVANT	207529.775	203897.593	346	
OCC	1	PROFESSIONAL	253029.144	312366.729	236	
OCC	2	TRADE	182996.487	236963.550	552	
OCC	3	SEMI-SKILL	161112.011	195648.865	89	
OCC	4	SERVICE	135621.576	170182.129	583	
OCC	5	NO JOB	157324.624	221722.152	1897	P=.0000

Summaries of HINCOME by levels of HOCC

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			168700.162	223482.152	3704	
HOCC	0	CIVIL SERVANT	199545.135	204634.466	756	
HOCC	1	PROFESSIONAL	238444.587	167164.932	351	
HOCC	2	TRADE	194859.297	256517.796	844	
HOCC	3	SEMI-SKILL	150918.135	197272.041	141	
HOCC	4	SERVICE	115956.048	137382.844	975	
HOCC	5	NO JOB	143669.353	302206.120	637	P=0.0

Summaries of HINCOME by levels of CTYPE

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			168700.162	223482.152	3704	
CTYPE		NOT COVERED	146530.902	227531.469	1732	
CTYPE	1	CIVIL SERVANT BENEFIT	182843.553	197686.615	1348	
CTYPE	2	STATE ENTERPRISE	295950.133	307194.590	166	
CTYPE	3	VETERAN AND VOLUNTEER	109974.516	95243.8527	62	
CTYPE	4	LOW INCOME CARD	70846.8627	54504.5614	102	
CTYPE	5	SOCIAL SECURITY SCHEME	181918.045	136388.322	44	
CTYPE	6	PRIVATE EMPLOYER	181006.071	199593.718	56	
CTYPE	7	PRIVATE INSURANCE	225182.738	307190.239	187	
CTYPE	8	OTHERS	168334.286	134618.229	7	P=.0000

Summaries of HCAP by levels of ED

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			38359.2465	60142.9046	3603	
ED	0	NO ED	29929.9505	71435.6539	424	
ED	1	PRIMARY	31582.6974	41887.3741	1051	
ED	2	SECONDARY	35192.1793	39686.4216	820	
ED	3	VOCATIONAL	46790.5565	78166.1449	469	
ED	4	UNIVERSITY	49490.2181	74530.1617	839	P=0.0

Summaries of HCAP by levels of HED

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			38820.7907	60868.9595	3531	
HED	0	NO ED	45966.9741	157946.346	232	
HED	1	PRIMARY	25608.8113	34836.4043	1272	
HED	2	SECONDARY	36140.0061	41452.5318	820	
HED	3	VOCATIONAL	52620.6236	56831.7936	457	
HED	4	UNIVERSITY	53540.0480	56654.9301	750	P=0.0

Summaries of HCAP by levels of OCC

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			38331.4420	60032.8023	3704	
OCC	0	CIVIL SERVANT	54698.1098	51431.0238	346	
OCC	1	PROFESSIONAL	64052.7119	97992.1305	236	
OCC	2	TRADE	41273.7138	50999.6859	552	
OCC	3	SEMI-SKILL	46417.3258	82128.0928	89	
OCC	4	SERVICE	30804.7530	48867.5879	583	
OCC	5	NO JOB	33208.0659	58174.3177	1898	P=.0000

Summaries of HCAP by levels of HOCC

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			38331.4420	60032.8023	3704	
HOCC	0	CIVIL SERVANT	49344.2870	48081.4356	756	
HOCC	1	PROFESSIONAL	55992.0798	45727.9268	351	
HOCC	2	TRADE	40249.7002	48855.0859	844	
HOCC	3	SEMI-SKILL	40392.8794	77670.5424	141	
HOCC	4	SERVICE	26829.8379	39850.7439	975	
HOCC	5	NO JOB	30136.4600	97838.2464	637	P=0.0

Summaries of HCAP by levels of CTYPE

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			38331.4420	60032.8023	3704	
CTYPE		NOT COVERED	30956.3389	60515.2012	1732	
CTYPE	1	CIVIL SERVANT BENEFIT	44982.2708	58416.1226	1348	
CTYPE	2	STATE ENTERPRISE	70214.8253	80325.8435	166	
CTYPE	3	VETERAN AND VOLUNTEER	27264.8226	25757.1533	62	
CTYPE	4	LOW INCOME CARD	12684.9804	11906.1885	102	
CTYPE	5	SOCIAL SECURITY SCHEME	46150.9091	42206.3593	44	
CTYPE	6	PRIVATE EMPLOYER	34402.3214	36196.2595	56	
CTYPE	7	PRIVATE INSURANCE	47309.6417	62305.7972	187	
CTYPE	8	OTHERS	40451.4286	24827.0870	7	P=.0000

Table A.7 Distribution of household income (HINCOME) and per capita income (HCAP) by occupation of household head (HOCC), type of housing (PERMANEN, OWNER) and household durables (MICROWAV, FRIDGE, VDO, WASHING, CAR, TRICYCLE)

GENERAL HOUSEHOLD SURVEY

Summaries of HINCOME by levels of HOCC

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			157281.246	226252.887	890	
HOCC	0	CIVIL SERVANT	189571.564	187323.396	195	
HOCC	1	PROFESSIONAL	225292.824	158805.627	85	
HOCC	2	TRADE	169537.465	229430.715	198	
HOCC	3	SEMI-SKILL	162916.543	241067.724	35	
HOCC	4	SERVICE	108600.781	138994.549	237	
HOCC	5	NO JOB	134679.157	363998.653	140	P =.0001

Summaries of HCAP by levels of HOCC

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			43509.7663	70109.5261	890	
HOCC	0	CIVIL SERVANT	54844.2718	52459.1041	195	
HOCC	1	PROFESSIONAL	63648.1529	51588.1352	85	
HOCC	2	TRADE	42859.9343	50418.3621	198	
HOCC	3	SEMI-SKILL	51009.6857	99498.1665	35	
HOCC	4	SERVICE	30915.0802	51481.4991	237	
HOCC	5	NO JOB	35860.6143	121207.789	140	P=.0005

Summaries of HINCOME by levels of PERMANEN

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			157281.246	226252.887	890	
PERMANEN	0		334200.000	223162.900	2	
PERMANEN	1	MORE THAN 5 YRS	159780.935	229106.760	832	
PERMANEN	2	LESS THAN 5 YRS	114924.463	176874.325	54	
PERMANEN	3	OTHERS	84125.0000	76544.3091	2	P=.3309

Summaries of HCAP by levels of PERMANEN

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			43509.7663	70109.5261	890	
PERMANEN	0		104050.000	84782.1031	2	
PERMANEN	1		43572.4543	68910.8388	832	
PERMANEN	2		40874.5741	87689.7922	54	
PERMANEN	3		28041.5000	25514.5340	2	P=.6453

Summaries of HINCOME by levels of OWNER

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			157281.246	226252.887	890	
OWNER	0		124160.690	109347.869	30	
OWNER	1	OWNER OCCUPIER	177673.726	257996.210	547	
OWNER	2	RENT	133574.086	175884.123	257	
OWNER	3	OTHERS	85242.5179	62126.0559	56	P=.0083

Summaries of HCAP by levels of OWNER

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			43509.7663	70109.5261	890	
OWNER	0		34438.4138	27089.8008	30	
OWNER	1	OWNER OCCUPIER	46815.0603	78327.7586	547	
OWNER	2	RENT	40825.4864	61082.3098	257	
OWNER	3	OTHERS	28481.9643	19615.6855	56	P=.3212

Summaries of HINCOME by levels of MICROWAV

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			157281.246	226252.887	890	
MICROWAV	0	NO	148891.330	229850.527	773	
MICROWAV	1	YES	213890.612	193137.637	117	P=.0144

Summaries of HCAP by levels of MICROWAV

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			43509.7663	70109.5261	890	
MICROWAV	0		41360.0931	70826.5957	773	
MICROWAV	1		57554.6552	63899.8255	117	P=.0608

Summaries of HINCOME by levels of FRIDG

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			157281.246	226252.887	890	
FRIDG	0		74283.1250	92922.6284	136	
FRIDG	1		172251.729	239623.211	754	P=.0000

Summaries of HCAP by levels of FRIDG

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			43509.7663	70109.5261	890	
FRIDG	0		24722.7794	34033.9389	136	
FRIDG	1		46898.4005	74298.0537	754	P=.0007

Summaries of HINCOME by levels of VDO (Video player)

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			157281.246	226252.887	890	
VDO	0		113062.741	136030.903	486	
VDO	1		210474.795	292334.646	404	P=.0000

Summaries of HCAP by levels of VDO

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			43509.7663	70109.5261	890	
VDO	0		33589.4527	49274.4601	486	
VDO	1		55443.6089	87519.0276	404	P=.0000

Summaries of HINCOME by levels of WASHING

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			157281.246	226252.887	890	
WASHING	0		135359.342	243288.605	558	
WASHING	1		194125.892	188978.134	332	P=.0002

Summaries of HCAP by levels of WASHING

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			43509.7663	70109.5261	890	
WASHING	0		39312.9570	79064.8061	558	
WASHING	1		50563.4398	51015.4594	332	P=.0205

Summaries of HINCOME by levels of CAR

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			157281.246	226252.887	890	
CAR	0		120519.927	207166.560	632	
CAR	1		247332.229	245430.935	258	P=.0000

Summaries of HCAP by levels of CAR

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			43509.7663	70109.5261	890	
CAR	0		34568.8655	66251.4915	632	
CAR	1		65411.5078	74484.9550	258	P=.0000

Summaries of HINCOME by levels of TRICYCLE

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			157281.246	226252.887	890	
TRICYCLE	0		159491.809	228082.255	810	
TRICYCLE	1		133467.646	207730.228	80	P=.5737

Summaries of HCAP by levels of TRICYCLE

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			43509.7663	70109.5261	890	
TRICYCLE	0		44993.7889	72437.4429	810	
TRICYCLE	1		27798.1772	36153.6061	80	P=.0981

Summaries of MEMBER by levels of HOCC

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			3.9901	1.6276	905	
HOCC	0	CIVIL SERVANT	3.8878	1.4807	196	
HOCC	1	PROFESSIONAL	4.0698	1.6577	86	
HOCC	2	TRADE	4.0385	1.6590	208	
HOCC	3	SEMI-SKILL	4.0270	1.6070	37	
HOCC	4	SERVICE	4.0126	1.6187	238	
HOCC	5	NO JOB	3.9643	1.7929	140	P=.9390

Summaries of HINCOME by levels of HOCC

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			106769.720	77986.1854	107	
HOCC	0	CIVIL SERVANT	148020.667	88691.4062	30	
HOCC	1	PROFESSIONAL	161005.714	80424.9727	7	
HOCC	2	TRADE	86660.8696	62031.7348	23	
HOCC	3	SEMI-SKILL	91242.8571	120731.574	7	
HOCC	4	SERVICE	86743.4783	46967.7896	23	
HOCC	5	NO JOB	72335.2941	53089.2284	17	P=.0015

Summaries of HCAP by levels of HOCC

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			28752.0654	26671.1414	107	
HOCC	0	CIVIL SERVANT	39293.1667	32807.4886	30	
HOCC	1	PROFESSIONAL	53847.7143	39313.9530	7	
HOCC	2	TRADE	21734.6522	19506.5964	23	
HOCC	3	SEMI-SKILL	26707.1429	30465.1499	7	
HOCC	4	SERVICE	21150.5217	11850.6978	23	
HOCC	5	NO JOB	20437.2353	20121.7633	17	P=.0049

Summaries of HINCOME by levels of PERMANEN

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			106769.720	77986.1854	107	
PERMANEN	0		100817.778	60768.8518	9	
PERMANEN	1		110350.538	80541.8702	93	
PERMANEN	2		50880.0000	17319.1224	5	P=.2465

Summaries of HCAP by levels of PERMANEN

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			28752.0654	26671.1414	107	
PERMANEN	0		30143.8889	26744.4978	9	
PERMANEN	1		29621.8925	27151.0095	93	
PERMANEN	2		10068.0000	2614.7887	5	P=.2781

Summaries of HINCOME by levels of OWNER

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			106769.720	77986.1854	107	
OWNER	0		118822.857	100895.016	7	
OWNER	1		114343.333	87926.8662	60	
OWNER	2		87170.3226	49587.7770	31	
OWNER	3		114413.333	67822.2471	9	P=.4321

Summaries of HCAP by levels of OWNER

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			28752.0654	26671.1414	107	
OWNER	0		36630.7143	33910.1573	7	
OWNER	1		30153.9667	28700.5768	60	
OWNER	2		22453.0323	13946.4041	31	
OWNER	3		34974.8889	38629.6514	9	P=.3967

Summaries of HINCOME by levels of MICROWAV

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			106769.720	77986.1854	107	
MICROWAV	0	NO	103491.923	74853.6520	104	
MICROWAV	1	YES	220400.000	117699.958	3	P=.0098

Summaries of HCAP by levels of MICROWAV

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			28752.0654	26671.1414	107	
MICROWAV	0	NO	27816.0673	25982.8319	104	
MICROWAV	1	YES	61200.0000	36175.1296	3	P=.0319

Summaries of HINCOME by levels of FRIDG

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			106769.720	77986.1854	107	
FRIDG	0		59895.2381	41915.6233	21	
FRIDG	1		118215.814	80595.4685	86	P=.0018

Summaries of HCAP by levels of FRIDG

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			28752.0654	26671.1414	107	
FRIDG	0		16051.7143	11194.7057	21	
FRIDG	1		31853.3140	28425.8054	86	P=.0142

Summaries of HINCOME by levels of VDO

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			106769.720	77986.1854	107	
VDO	0		90948.7805	67668.3995	82	
VDO	1		158662.400	88017.4122	25	P=.0001

Summaries of HCAP by levels of VDO

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			28752.0654	26671.1414	107	
VDO	0		23608.1707	21200.8638	82	
VDO	1		45624.0400	35183.5605	25	P=.0002

Summaries of HINCOME by levels of WASHING

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			106769.720	77986.1854	107	
WASHING	0		95244.2697	66025.6848	89	
WASHING	1		163756.667	105933.261	18	P=.0005

Summaries of HCAP by levels of WASHING

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			28752.0654	26671.1414	107	
WASHING	0		23980.5281	20020.7920	89	
WASHING	1		52344.6667	40645.1954	18	P=.0000

Summaries of HINCOME by levels of CAR

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			106769.720	77986.1854	107	
CAR	0	NO	93695.7647	67865.2888	85	
CAR	1	YES	157282.727	94398.7708	22	P=.0005

Summaries of HCAP by levels of CAR

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			28752.0654	26671.1414	107	
CAR	0		24768.5882	21703.1759	85	
CAR	1		44142.7727	37338.0472	22	P=.0020

Summaries of HINCOME by levels of TRICYCLE

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			106769.720	77986.1854	107	
TRICYCLE	0		110944.941	78968.6692	85	
TRICYCLE	1		90638.1818	73562.5997	22	P=.2784

Summaries of HCAP by levels of TRICYCLE

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			28752.0654	26671.1414	107	
TRICYCLE	0		30963.3882	27889.6265	85	
TRICYCLE	1		20208.3182	19571.2393	22	P=.0919

Summaries of MEMBER by levels of HOCC

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			4.1376	1.4303	109	
HOCC	0	CIVIL SERVANT	4.2759	1.3065	29	
HOCC	1	PROFESSIONAL	3.8571	1.7728	7	
HOCC	2	TRADE	4.2917	1.3345	24	
HOCC	3	SEMI-SKILL	3.5714	1.3973	7	
HOCC	4	SERVICE	4.3478	1.3007	23	
HOCC	5	NO JOB	3.7895	1.7820	19	P=.6264

Table A.8 Charge and reimbursement by type of health benefit

CONSULTATION WITHIN 2 WEEKS

Summaries of CHARGE by levels of CTYPE

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			482.2443	2108.7827	528	
CTYPE		NOT COVERED	412.6387	1472.6422	238	
CTYPE	1	CIVIL SERVANT BENEFIT	433.0811	956.6522	185	
CTYPE	2	STATE ENTERPRISE	498.0303	1398.0329	33	
CTYPE	3	VETERAN AND VOLUNTEER	138.6667	133.4383	15	
CTYPE	4	LOW INCOME CARD	231.0714	344.4627	14	
CTYPE	5	SOCIAL SECURITY SCHEME	220.0000	180.8084	7	
CTYPE	6	PRIVATE EMPLOYER	198.8571	222.5514	7	
CTYPE	7	PRIVATE INSURANCE	1771.9643	7557.5997	28	
CTYPE	8	OTHERS	2000.0000	0.0	1	P=.1421

Summaries of REIMBURS by levels of CTYPE

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			211.0053	1772.1046	570	
CTYPE		NOT COVERED	43.4308	366.2501	253	
CTYPE	1	CIVIL SERVANT BENEFIT	270.5427	795.8791	199	
CTYPE	2	STATE ENTERPRISE	103.4286	371.8313	35	
CTYPE	3	VETERAN AND VOLUNTEER	48.5294	80.2295	17	
CTYPE	4	LOW INCOME CARD	0.0	0.0	18	
CTYPE	5	SOCIAL SECURITY SCHEME	152.8571	211.8737	7	
CTYPE	6	PRIVATE EMPLOYER	86.8889	142.1869	9	
CTYPE	7	PRIVATE INSURANCE	1537.0968	7203.2470	31	
CTYPE	8	OTHERS	1500.0000	0.0	1	P=.0067

HOSPITALISATION

Summaries of CHARGE by levels of CTYPE

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			4811.1543	9947.9288	324	
CTYPE			3543.8202	3684.3673	89	
CTYPE	1		5341.7563	13267.3061	160	
CTYPE	2		6696.5909	5664.4269	22	
CTYPE	3		3456.6667	5667.3304	3	
CTYPE	4		1068.0000	534.7616	5	
CTYPE	5		4450.0000	5727.5649	2	
CTYPE	6		1836.6667	1428.9973	3	
CTYPE	7		5315.0769	6544.0511	39	
CTYPE	8		4000.0000	0.0	1	P=.8752

Summaries of REIMBURS by levels of CTYPE

Variable	Value	Label	Mean	Std Dev	Cases	
For Entire Population			2544.1737	8750.2102	380	
CTYPE			669.2929	1842.8058	99	
CTYPE	1		3420.5885	11912.4195	192	
CTYPE	2		4103.2609	4562.5595	23	
CTYPE	3		1181.4286	3008.3906	7	
CTYPE	4		0.0	0.0	7	
CTYPE	5		1200.0000	1131.3708	2	
CTYPE	6		488.0000	857.3039	5	
CTYPE	7		3006.5455	3122.7416	44	
CTYPE	8		4000.0000	0.0	1	P=.3936

Table A.9 Severity of cases by place of consultation

PLACE--> / MIX	Count / Col Pct	Not treat 0	Drug store 1	Private clinic 2	Public facility 3	Private hospital 4	Others 10	Row Total
	0	1	10	13	4	5	4	37
		25.0	6.4	7.4	3.5	5.2	17.4	6.5
Severe	1	1	5	24	25	32	5	92
		25.0	3.2	13.6	22.1	33.0	21.7	16.1
Moderate	2		11	17	15	16		59
			7.0	9.7	13.3	16.5		10.4
Mild	3	1	26	39	23	14	4	107
		25.0	16.6	22.2	20.4	14.4	17.4	18.8
Not affected	4	1	105	83	46	30	10	275
		25.0	66.9	47.2	40.7	30.9	43.5	48.2
	Column	4	157	176	113	97	23	570
(Continued)	Total	.7	27.5	30.9	19.8	17.0	4.1	100.0 P=.0000

Table A.10 Severity of cases by admission of consultation

ADMIT→ / MIX	Count / Col Pct	No 0	Yes 1	Row Total
	0	36 6.9	1 2.2	37 6.5
Severe	1	68 13.0	24 52.2	92 16.1
Moderate	2	47 9.0	12 26.1	59 10.4
Mild	3	102 19.5	5 10.9	107 18.8
Not affected	4	271 51.7	4 8.7	275 48.2
	Column Total	524 91.9	46 8.1	570 100.0

P=.0000

Table A.11 Severity of cases by reimbursement of consultation

REIMBURS→ / MIX	Count / Col Pct	No 0	Yes 1	Row Total
	0	28 6.1	9 8.2	37 6.5
	1	68 14.8	24 21.8	92 16.1
	2	44 9.6	15 13.6	59 10.4
	3	91 19.8	16 14.5	107 18.8
	4	229 49.8	46 41.8	275 48.2
	Column Total	460 80.7	110 19.3	570 100.0

P=.1253

Table A.12 Severity of hospitalised cases by type of hospital

SEVERE→ / HOSNAME	Count / Row Pct	0	Emergency 1	Not emergent 2	Others 3	Row Total
	1	1 .8	81 66.9	26 21.5	13 10.7	121 31.8
Public						
	2	3 1.2	200 82.6	21 8.7	18 7.4	242 63.7
Private						
	7		10 58.8	7 41.2		17 4.5
Other provinces						
	Column Total	4 1.1	291 76.6	54 14.2	31 8.2	380 100.0

P=.0020

Table A.13 Severity of hospitalised cases by type of health benefit

SEVERE-> / CTYPE	Count / Row Pct	0	Emergency 1	Not emergent 2	Others 3	Row Total
Not covered		1	75	17	6	99
		1.0	75.8	17.2	6.1	26.1
1 Civil servant		3	144	21	24	192
		1.6	75.0	10.9	12.5	50.5
2 State enterp			14	8	1	23
			60.9	34.8	4.3	6.1
3 Veteran & vol			6	1		7
			85.7	14.3		1.8
4 Low income			5	2		7
			71.4	28.6		1.8
5 Social security			1	1		2
			50.0	50.0		.5
6 Private emp			5			5
			100.0			1.3
7 Private ins			40	4		44
			90.9	9.1		11.6
8 Others			1			1
			100.0			.3
Column Total		4	291	54	31	380
		1.1	76.6	14.2	8.2	100.0

P=.2486

Table A.14 Severity of hospitalised cases by reimbursement

SEVERE-> / REIMBURS	Count / Row Pct	0	Emergency 1	Not emergent 2	Others 3	Row Total
0 Not reimbursable		2	114	28	14	158
		1.3	72.2	17.7	8.9	41.6
1 Reimbursable		2	177	26	17	222
		.9	79.7	11.7	7.7	58.4
Column Total		4	291	54	31	380
		1.1	76.6	14.2	8.2	100.0

P=.3450

Table A.15 An example of logistic regression by SPSSPC+

HOSPITALISATION

```
logistic regression hosp with age,sex,lhincome,ed,hed,tcover0,tcover2
        class1,class3,hclass1,hclass3,acute,chronic,disable
       /method=enter/classplot/external.
     Total number of cases:      3497 (Unweighted)
     Number of selected cases:   3497
     Number of unselected cases: 0
     Number of selected cases:                  3497
     Number rejected because of missing data:   1
     Number of cases included in the analysis:  3496

Dependent Variable..   HOSP  (Hospitalisation)
Beginning Block Number  0.  Initial Log Likelihood Function
-2 Log Likelihood    2140.0468
* Constant is included in the model.
```

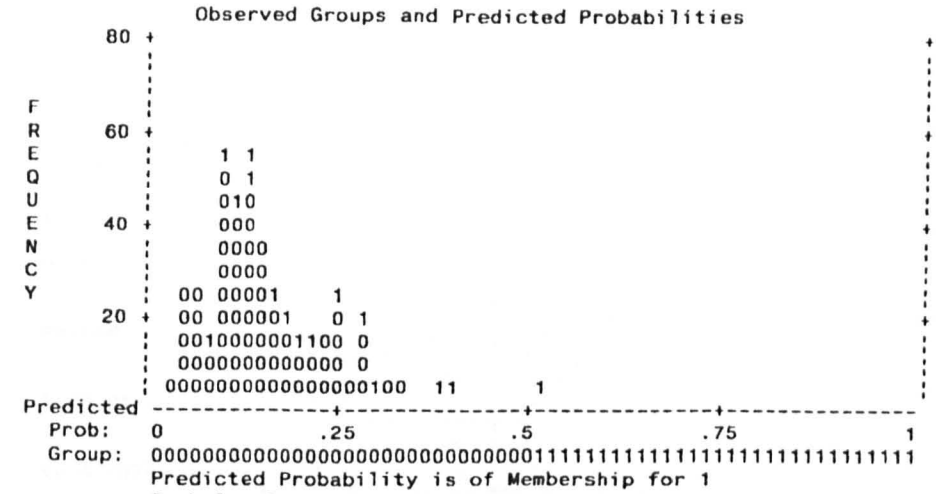
```
Beginning Block Number  1.  Method: Enter
Variable(s) Entered on Step Number
1..        AGE                    CLASS1
           SEX                    CLASS3
           LHINCOME               HCLASS1
           ED                     HCLASS3
           HED                    ACUTE
           TCOVER0                CHRONIC
           TCOVER2                DISABLE

Estimation terminated at iteration number 5 because
Log Likelihood decreased by less than .01 percent.

                     Chi-Square      df Significance
 -2 Log Likelihood     1923.687    3481         .0000
 Model Chi-Square       216.359      14         .0000
 Improvement            216.359      14         .0000
 Goodness of Fit       3411.239    3481         .0000

Classification Table for HOSP
                  Predicted
                  0        1      Percent Correct
                    0  ¦     1
Observed      +-------+-------+
   0      0   ¦  3169 ¦     7 ¦    99.78%
              +-------+-------+
   1      1   ¦   307 ¦    13 ¦     4.06%
              +-------+-------+
                       Overall   91.02%

---------------------- Variables in the Equation -----------------------

Variable            B        S.E.      Wald     df      Sig        R    Exp(B)
AGE                .0040     .0035    1.3102     1     .2524    .0000   1.0040
SEX                -.0170    .1253     .0183     1     .8923    .0000    .9832
LHINCOME           -.0813    .0649    1.5705     1     .2101    .0000    .9219
ED                 -.2697    .1451    3.4533     1     .0631   -.0261    .7636
HED                 .1833    .1605    1.3046     1     .2534    .0000   1.2012
TCOVER0            -.4399    .2720    2.6162     1     .1058   -.0170    .6441
TCOVER2             .6128    .2661    5.3026     1     .0213    .0393   1.8456
CLASS1             -.4159    .2259    3.3887     1     .0656   -.0255    .6597
CLASS3              .0432    .1662     .0677     1     .7948    .0000   1.0442
HCLASS1             .0616    .1739     .1255     1     .7231    .0000   1.0635
HCLASS3            -.0436    .1934     .0508     1     .8216    .0000    .9573
ACUTE               .8788    .1479   35.3168     1     .0000    .1248   2.4080
CHRONIC            1.1440    .1485   59.3427     1     .0000    .1637   3.1393
DISABLE             .8516    .4745    3.2203     1     .0727    .0239   2.3433
Constant          -1.9854    .7843    6.4079     1     .0114

                Observed Groups and Predicted Probabilities
    1600 +                                                             +
         ¦                                                             ¦
         ¦                                                             ¦
F        ¦                                                             ¦
R   1200 +                                                             +
E        ¦                                                             ¦
Q        ¦                                                             ¦
U        ¦                                                             ¦
E    800 +  0                                                          +
N        ¦  0                                                          ¦
C        ¦  0                                                          ¦
Y        ¦ 00  1                                                       ¦
     400 + 000 0                                                       +
         ¦ 000000                                                      ¦
         ¦ 000000                                                      ¦
         ¦ 00000000  0 1                                               ¦
Predicted ---------------+---------------+---------------+---------------
  Prob:   0              .25             .5              .75             1
  Group:  00000000000000000000000000000011111111111111111111111111111111
          Predicted Probability is of Membership for 1
          Symbols: 0 - 0
                   1 - 1
          Each Symbol Represents 100 Cases.
```

USE OF PRIVATE HOSPITAL FOR CONSULTATION

```
logistic regression atreat1 with age,sex,lhincome,amix1,ed,hed,tcover0,tcover2
        class1,class3,hclass1,hclass3/method=enter/classplot/external.

      Total number of cases:        421 (Unweighted)
      Number of selected cases:     421
      Number of unselected cases: 0
      Number of selected cases:                    421
      Number rejected because of missing data:   1
      Number of cases included in the analysis: 420

Dependent Variable Encoding:

Original        Internal
Value           Value
 0              0
 1              1

Dependent Variable..    PRIV

Beginning Block Number  0.  Initial Log Likelihood Function

-2 Log Likelihood   361.93998

* Constant is included in the model.


Beginning Block Number  1.  Method: Enter

Estimation terminated at iteration number 4 because
Log Likelihood decreased by less than .01 percent.

                         Chi-Square     df Significance
 -2 Log Likelihood          338.545    407         .9942
 Model Chi-Square            23.395     12         .0246
 Improvement                 23.395     12         .0246
 Goodness of Fit            428.948    407         .2180

Classification Table for ATREAT1
                    Predicted
                    0         1         Percent Correct
                    0    |    1
Observed          +--------+--------+
   0       0      |  355   |    0   |   100.00%
                  +--------+--------+
   1       1      |   62   |    3   |     4.62%
                  +--------+--------+
                              Overall  85.24%
```

---------------------- Variables in the Equation ----------------------

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
AGE	.0009	.0068	.0185	1	.8919	.0000	1.0009
SEX	-.3174	.2982	1.1330	1	.2871	.0000	.7280
LHINCOME	.3850	.2884	1.7826	1	.1818	.0000	1.4697
AMIX1	.7857	.3309	5.6368	1	.0176	.1002	2.1940
ED	-.9209	.3626	6.4488	1	.0111	-.1109	.3982
HED	.3031	.3904	.6029	1	.4375	.0000	1.3541
TCOVER0	-.0201	.6146	.0011	1	.9739	.0000	.9801
TCOVER2	.4096	.6010	.4645	1	.4955	.0000	1.5062
CLASS1	.1530	.5359	.0815	1	.7753	.0000	1.1653
CLASS3	.0534	.4187	.0163	1	.8985	.0000	1.0548
HCLASS1	.1903	.3803	.2503	1	.6169	.0000	1.2096
HCLASS3	.0923	.4811	.0368	1	.8479	.0000	1.0967
Constant	-2.3881	.7604	9.8645	1	.0017		



COMPUTATION FOR SELECTION OF THE CUT OFF POINT

```
compute Z= - 2.3881 + 0.001*age - 0.317*sex + 0.3850*lhincome + 1.7857*amix1 - 0.921*ed
           + 0.3031*hed - 0.0201*tcover0 + 0.4096*tcover2 + 0.1530*class1 + 0.053*class3
           + 0.1903*hclass1 + 0.0923*hclass3.
compute lZ = ln(Z).
compute invZ = 1/lZ.
compute Y = 1/ (1 + invZ).
```

Y by PRIV

Y	Count	Observed value: Use of private hospitals — No 0	Yes 1	Row Total
Expected value	low - 0	21		21
				5.0
	.001-.10	10	1	11
			9.1	2.6
	.101-.20	16	1	17
			5.9	4.0
	.201-.30	16	1	17
			5.9	4.0
	.301-.40	54	4	58
			6.9	13.8
	.401-.50	137	28	166
			16.9	39.5
	.501-.60	90	19	109
			17.4	26.0
	.601-.70	7	11	18
			61.1	4.3
	>.701	3		3
				.7
	Column Total	354	65	420
		84.3	15.5	100.0

Number of Missing Observations: 1

Table A.16 Cross tabulation of household income quintiles and education levels of household heads (HED)

QUINTILE-> / HED	Count / Row Pct	Q1 (GHS) Q 1	Q 2	Q 3	Q 4	Q 5	Row Total	
0 NO ED		22 39.3	8 14.3	10 17.9	8 14.3	8 14.3	56 6.3	
1 PRIMARY		90 31.6	72 25.3	58 20.4	30 10.5	35 12.3	285 31.7	
2 SECONDARY		23 11.9	44 22.7	53 27.3	44 22.7	30 15.5	194 21.8	
3 VOCATIONAL		16 13.0	16 13.0	27 22.0	31 25.2	33 26.8	123 13.8	
4 UNIVERSITY		17 8.8	31 16.0	21 10.8	59 30.4	66 34.0	194 21.8	
9 UNKNOWN		10 26.3	7 18.4	9 23.7	6 15.8	6 15.8	38 4.3	
	Column Total	178 20.0	178 20.0	178 20.0	178 20.0	178 20.0	890 100.0	P=.0000

Table A.17 Cross tabulation of household income quintiles and occupational groups of household heads

QUINTILE-> / HOCC	Count / Row Pct	Q1 (GHS) Q 1	Q 2	Q 3	Q 4	Q 5	Row Total	
0 CIVIL SERVANT		14 7.2	27 13.8	42 21.5	54 27.7	58 29.7	195 21.9	
1 ADMIN & PROF			6 7.1	16 18.8	27 31.8	36 42.4	85 9.6	
2 TRADER		40 20.2	41 20.7	45 22.7	33 16.7	39 19.7	198 22.2	
3 SEMI-SKILLED		7 20.0	10 28.6	7 20.0	5 14.3	6 17.1	35 3.9	
4 SERVICE		65 27.4	69 29.1	43 18.1	39 16.5	21 8.9	237 26.6	
5 NOT WORKING		52 37.1	25 17.9	25 17.9	20 14.3	18 12.9	140 15.7	
	Column Total	178 20.0	178 20.0	178 20.0	178 20.0	178 20.0	890 100.0	P=.0000

ANNEX 2

Occupational classification

Occupational group

Administrative and professional
- 00 Surveyor, engineer
- 02 Biologist, agriculturist
- 03 Doctor, dentist
- 04 Nurse, midwife
- 05 Other related medical science
- 06 Administrator in school or university
- 08 Lawyer
- 11 Manager

Trader
- 20 Accountant
- 31 Middlemen
- 33 Shopkeeper

Semi-skill
- 71 Tailor, dress maker
- 74 Jeweller, watch mender
- 75 Plumber
- 76 Electronic worker
- 77 Carpenter
- 78 Painter
- 79 Brick layer
- 82 Bakery
- 85 Craftsmen

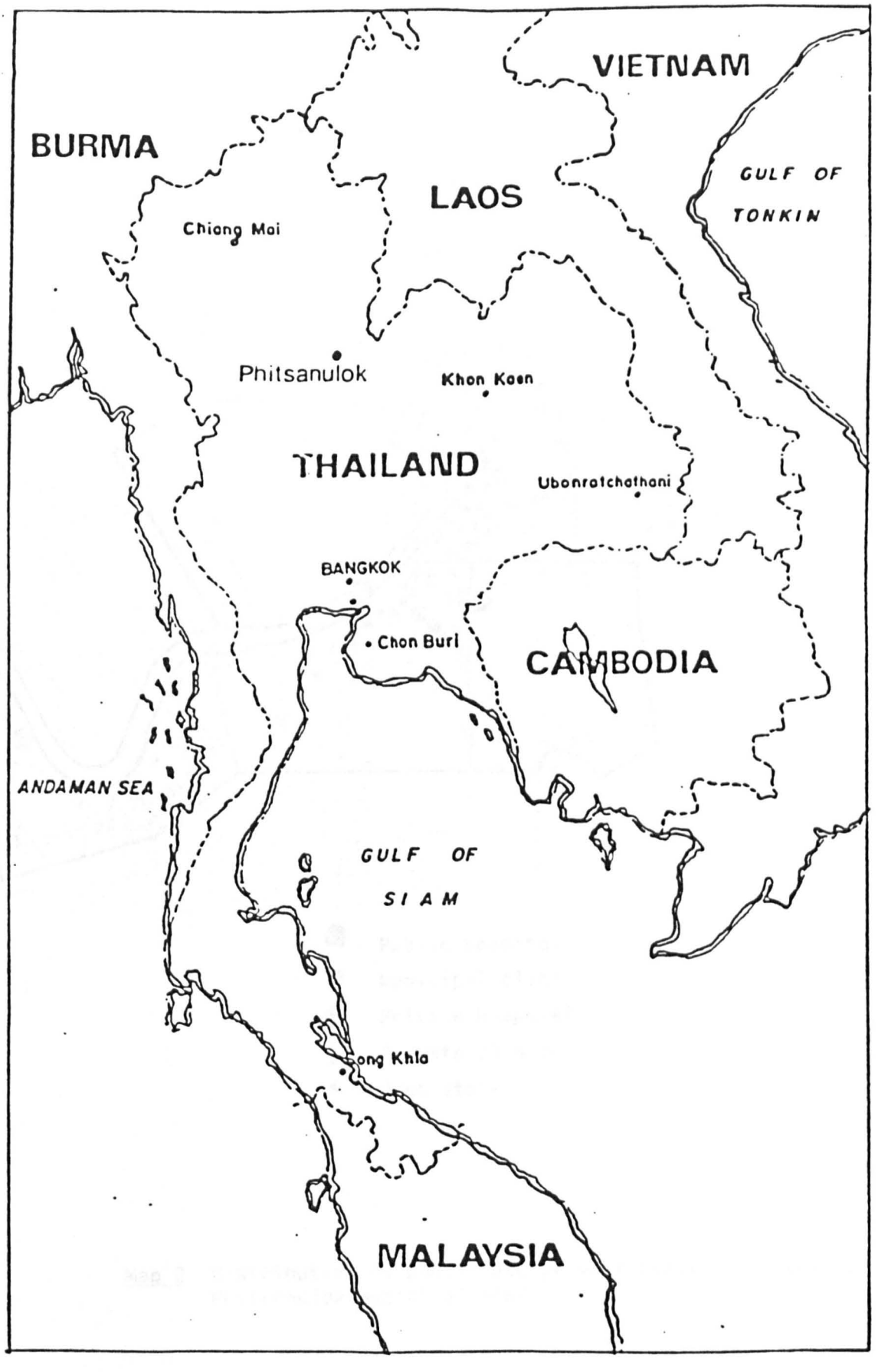
Service
- 09 Author, writer
- 40 Farmer, agricultural management
- 64 Truck driver
- 68 Post-man
- 70 Weaver
- 89 Labourer
- 90 Guard
- 91 Cook
- 92 Waiter
- 93 Care taker
- 94 Barber
- X5 Partner

Not working
- 07 Priest
- X1 Unemployed
- X3 Unemployed
- Y1 Student
- Y2 Children in arms
- Y3 Housewife
- Y4 Retired officer

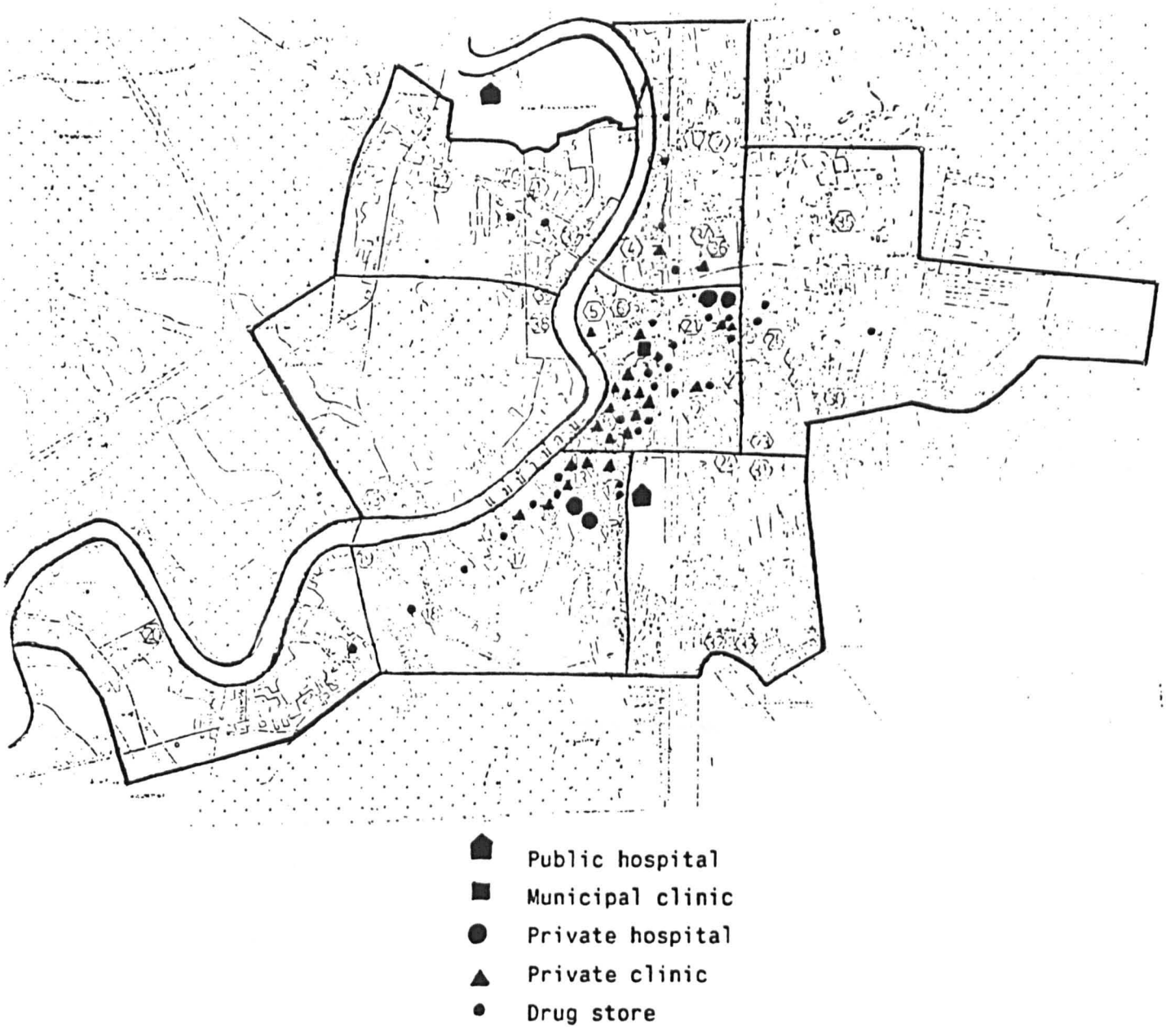
Civil servant
- X4 Civil servant
- X9 Military services

ANNEX 3

Maps



Map 1 The map of Thailand



Map 2 Distribution of public and private health institutions in Phitsanulok municipal area

ANNEX 4

Questionnaires

Questionnaire 1 General household survey

Section 1 Household roster.

Section 2 Health benefit coverage

Please list the name of every one who has been living here at least 3 months in the past 12 months

Member number	Name	Surname	Age	Sex	Marital status	Relationship with household head	For those age between 6-30 years.	The highest education attained	Is .. (name).. covered by any types of health benefits?
				male 1 female 2	single ... 1 married .. 2 widow/ widower . 3 divorced . 4 separate . 5	head ..... 1 spouse ..... 2 son/daughter 3 parent ..... 4 relative ... 5 others 6	Still in school? no .... 0 yes ... 1	Write down degree or certificate and name of school or college. If never attended, write "never"	no 0 yes 1 Write down all benefits: 1. civil servant 2. state enterprise 3. veteran or volunteer 4. low income card 5. Social secur 6. private employee 7. private insurance 8. others

Section 3 Illness and injury within the past two weeks.

Section 4 Chronic illness.

Member number	During last week and the week before last week, was ..(name).. ill or injured? Write down number of illness or injury.	Severity of illness Read card 1	Did ..(name).. exempt from school or normal work? Write down number of days.	Did ..(name).. consult or seek any form of treatment? Write all details and fill in consultation form for each visit.	Does ..(name).. suffer from any chronic illness? Read aloud card 2. no ..... 0 if yes, write number of diseases	Specify the name of chronic diseases.	Specify how long has it been discovered.	Severity of illness Read card 1	Has ..(name). exempted from school or normal work during these 12 months? Write number of days.

Section 5 Disability.

Section 6 Promotive and preventive services (ask for the past 12 months)

Member number	Has ..(name).. suffered from any type of disability? no ..... 0 yes 1	Specify all types of disability	Specify how long has this disability been discovered. Write down no. of years.	Severity of disability Read card 1	Has ..(name).. exempted from school or work because of the disability? Write down no. of day affected during last year.	During the period, has ..(name).. used any promotive and preventive services? ANC Labour PNC Family planning Vaccine Others no ... 0; if yes, specify no. of visit	Specify where most often used. ANC Labour PNC Family plan-ning Vaccine Others

Section 6 (continued)

Section 7 Hospitalisation within the last 12 months

Annual expenditure (in baht)				Specify health benefit coverage used.				How much was reimbursed? (baht).				During the year, has ..(name).. been hospitalised?	Specify no. of days stayed in hospital during the whole year.	Please fill in hospitalisation form for each admission.
ANC	Labour	PNC	Family plan-ning	ANC	Labour	PNC	Family Vaccine	ANC	Labour	PNC	Family plan-ning			
			Others				Others				Others	never ..... 0 if yes, specify no. of admissions.		

Section 8 Income of each family member

Member number	What does ..(name).. work? Describe the job.	Work status. private employee 1, gov employee ... 2, employer ..... 3, self-employed .. 4, household work . 5, state enterprise 6	Basis of income. hourly 1, daily . 2, weekly 3, monthly 4, others 5	Last month total income. (baht)	Are there other types of payments? Bonus baht/year	Over-time baht/month	Others baht/month	Food	Cloth-ing	Hous-ing	Travel no ..... 0, yes 1	Any income from other work? baht/year. Please specify type of job.

Section 9 Household income.

Interviewer asks questions in part A first, then asks the amount of earning in part B.

Part A yes..1 no...2 In the previous 12 months, did any member in this household receive any payment either in cash or in other form:			Part B The annual amount of earning by every member was: (baht)
1. pension	0	1	.....
2. any insurance claims	0	1	.....
3. bank interest	0	1	.....
4. dividends	0	1	.....
5. loan repayment	0	1	.....
6. scholarship and grant	0	1	.....
7. gift	0	1	.....
8. heritage	0	1	.....
9. lottery winning	0	1	.....
10. land rent or house rent	0	1	.....
11. land sale	0	1	.....
12. vehicle sale	0	1	.....
13. house sale	0	1	.....
14. transfer of money by relatives from elsewhere	0	1	.....

Section 10 Housing and ownership of durable.
(Direct observation by the interviewer is needed)

1. How many bedroom do you have? .....
2. Is the house of permanent type (last longer than 5 years)?
   (1) more than 5 years (2) less than 5 years (3) others, specify..
3. Are you an owner-occupier of the house?
   (1) yes (2) a tenant (3) others, specify..
4. Do you have these household durables?

	no	yes
stove, open flam gas	0	1
microwave/oven	0	1
fridge	0	1
electric fan	0	1
radio	0	1
television	0	1
video tape player/recorder	0	1
washing machine	0	1
bicycle	0	1
motor bicycle	0	1
motor car	0	1
tricycle	0	1
other (specify)		

Section 11 Satisfaction.

Part A How do you rate satisfaction level of the following health institutions?

	Strongly dissatisfied	Not		Very satisfied
1. Buddhachinaraj hospital				
a. Quality of clinical care	1	2	3	4
b. Costs of care	1	2	3	4
c. Doctor/patient relationships	1	2	3	4
d. Other personnel attention	1	2	3	4
2. Military hospital				
a. Quality of clinical care	1	2	3	4
b. Costs of care	1	2	3	4
c. Doctor/patient relationships	1	2	3	4
d. Other personnel attention	1	2	3	4
3. Private hospital 1				
a. Quality of clinical care	1	2	3	4
b. Costs of care	1	2	3	4
c. Doctor/patient relationships	1	2	3	4
d. Other personnel attention	1	2	3	4
4. Private hospital 2				
a. Quality of clinical care	1	2	3	4
b. Costs of care	1	2	3	4
c. Doctor/patient relationships	1	2	3	4
d. Other personnel attention	1	2	3	4
5. Private hospital 3				
a. Quality of clinical care	1	2	3	4
b. Costs of care	1	2	3	4
c. Doctor/patient relationships	1	2	3	4
d. Other personnel attention	1	2	3	4
6. Private hospital 4				
a. Quality of clinical care	1	2	3	4
b. Costs of care	1	2	3	4
c. Doctor/patient relationships	1	2	3	4
d. Other personnel attention	1	2	3	4
7. Municipal clinic				
a. Quality of clinical care	1	2	3	4
b. Costs of care	1	2	3	4
c. Doctor/patient relationships	1	2	3	4
d. Other personnel attention	1	2	3	4
8. Private clinic				
a. Quality of clinical care	1	2	3	4
b. Costs of care	1	2	3	4
c. Doctor/patient relationships	1	2	3	4
d. Other personnel attention	1	2	3	4

9. Drug store

a. Quality of clinical care	1	2	3	4
b. Costs of care	1	2	3	4
c. Other personnel attention	1	2	3	4

10. Others, specify.....

a. Quality of clinical care	1	2	3	4
b. Costs of care	1	2	3	4
c. Doctor/patient relationships	1	2	3	4
d. Other personnel attention	1	2	3	4

Part B What is your opinion towards doctors' income in these institutions?

11.	Too little	Little	Much	Too much
a. Doctors in public institutions	1	2	3	4
b. Doctors in private hospitals	1	2	3	4
c. Doctors in private clinics	1	2	3	4

Part C What is your opinion towards your payments?

	Too little	Little	Much	Too much
12. Social Security contribution	1	2	3	4
13. Private insurance premium	1	2	3	4
14. Tax payment	1	2	3	4

Part D What is your opinion towards the existing health institutions?

15. Public health institution.
    a. good, no change is needed
    b. needs some minor changes, eg. .....
    c. needs major changes, eg. .....
    d. needs fundamental changes, eg. .....

16. Private health sector.
    a. good, no change is needed
    b. needs some minor changes, eg. .....
    c. needs major changes, eg. .....
    d. needs fundamental changes, eg. .....

17. Other comments
    .....
    .....
    .....

Section 12 Deaths in household.

1. Your household has been living in this municipal area for .... years.
2. In the past 5 years, are there any deaths in your family?
   (0) no (1) yes, specify

Years (1986-1991)	Age at death	Sex	Cause	Place	Treatment

Tracer card There are three tracer cards read by the interviewer to the respondents:

Tracer card one Severity of illness: It is measured by degree of reduced capacity of daily activity according to age group and occupations.

1. For adults in working age

Grade 1 could not work at all
Grade 2 could do only light work
Grade 3 could work but not so laborious as normal people
Grade 4 active normal performance for all types of work

2. For housewife

Grade 1 could not do the housework at all
Grade 2 could do only some work, limited to some types and quantities of housework
Grade 3 could work but not so laborious as normal housewife
Grade 4 could work normally for all type of housework

3. For student aged 7-16 years.

Grade 1 could not study
Grade 2 could study at a limited level
Grade 3 could study normally but with limited physical exertion
Grade 4 normal ability to study with physical fitness for all activities

4. For children 6 years and under.

Grade 1 could not play with other children
Grade 2 could play but no physical exertion
Grade 3 could play but limited to some activities eg. running
Grade 4 could play normally

Tracer card two Chronic illness is defined as chronic symptom of any illness which lasts more than three months or any diseases below:

asthma
haemorrhoids
skin disease
tuberculosis
allergic diseases
chronic arthritis
chronic bronchitis
tumour (benign)
convulsion
chronic sinusitis
chronic cholecystitis
diabetes mellitus
rheumatic disease
peptic ulcer
thyroid disease/goitre
hypertension
nephritis, renal stone
hernia
heart disease
psychosis/neurosis
disease of prostrate gland
varicose vein
hepatitis
carcinoma

Tracer card three Disability is referred to any of these conditions:

deafness (one or both ears)
blindness (one or both eyes)
cleft palate
abnormalities in speech
amputation of fingers or toes, hand or feet
amputation of leg or arm
paralysis of limb(s)
congenital defects, eg. cerebral palsy etc.