The response of

the private sector

to competitive contracting:

a case study of a private health

provider network

in Thailand

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To my parents

Abstract

Social health insurance in developed countries is facing problems concerning cost control. In developing countries, problems are of low coverage, the provision of care to include access to the private sector, equity in access to services, as well as cost control. In Thailand, the recently introduced social insurance scheme requires the insured or their employer to select a main contractor to provide care - a general hospital with ≥ 100 beds - which is paid on a capitation basis. In response the private sector is developing provider networks to ensure health services to be more accessible and to attract insured workers to enroll with the network. The primary concern of the research is to evaluate MEDSEC, the biggest private network in terms of the number of facilities and insured covered. Nopparat, the biggest publicly-organized network, was selected for comparison with MEDSEC. The aim is to identify policy recommendations regarding networks and their internal payment mechanisms. The objectives are to examine: how MEDSEC is organized and how it has grown over time; the health seeking behaviour of the insured of MEDSEC; and the utilization rate, payment system, and quality of care of MEDSEC. Four substudies were done: the MEDSEC operating and financial system; the health seeking behaviour of the insured, their utilization rate, knowledge, and satisfaction; the providers' knowledge and attitudes; and evaluation of quality of care concerning four aspects: infrastructure, patient satisfaction, outpatient drug treatment, and inpatient care. The study identifies policy implications concerning the functions of a good network office, the monitoring of a network's quality of care, the payment system of networks, and improving the knowledge of the insured concerning the regulation on access to care.

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Abbreviations Used in the Text

CBG	Central Bangkok group of MEDSEC
CPMs	Competitive Medical Plans
DRG	Diagnosis related group
EBG	Eastern Bangkok group of MEDSEC
FFS	Fee-for-service payment method
GPs	General practitioners
HMOs	Health Maintenance Organizations
ICD10	International Classification of Diseases, the tenth
IPAs	Independent Practice Associations
LOS	Length of stay
MEDSEC	Medical Social Security Centre
MOPH	The Ministry of Public Health
PHC	Primary Health Care
PPGPs	Pre-paid Group practices
PPOs	Preferred Provider Organizations revision
RIG	Ram-Inthra Group of MEDSEC
RSG	Rama-Suksawat Group of MEDSEC
SSA	Social Security Act
SSF	Social Security Fund
SSO	Social Security Office
WHO	World Health Organisation

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Chapter 1

Introduction

1.1 Background

Social, compulsory insurance, is operated in >83 countries in the world (US Department of Health and Human Services 1986). Countries have developed social insurance systems suited to their traditional values, health services, and favourite social beliefs. Many options for health care provision and financing have been chosen for implementation in social insurance. Provision of services can either be through the direct or the indirect method. For the direct method, health insurance institutions such as the Social Security Fund (SSF) builds its own physical facilities for both hospital and ambulatory care for insured persons. For the indirect method, facilities do not belong to the health insurance institute and the medical care is purchased from existing public or private facilities and practitioners (Zschock, 1982). The direct method is an option when there is adequate volume of beneficiaries in a geographical area. The indirect method is applied where there is small volume (Ron et al, 1990) and a substantial infrastructure of services exists (Mills, 1983).

A common trend of social insurance is comprehensive coverage, and equity in access to services. The historical experience in social insurance in developed countries has shown that universal coverage with efficiency and equity in health care is the ultimate aim. Developed countries are facing problems concerning cost control. Both single-payers as in Canada and multiple-sponsors as in the US are confronted with the problem of cost escalating faster than the growth of GDP. Countries have experienced increasing health care costs that have strained their payroll taxes, government budgets, and premiums. The causes of cost-inflation are: payment systems that encourage cost inflation, general level of inflation in prices and wages, extra price increases charged by providers, larger demand due to the growth and aging of populations, greater utilization/capita, the greater intensity of services/contact, and high and costly technology used. Measure have been taken to counteract these problems such as managed care approaches in the USA. In managed care approaches, a sponsor is introduced to structure and adjust the market for competing between health plans, establishing equitable rules, managing the enrolment process, creating price-elastic demand to ensure competition, and avoiding uncompensated risk selection (Enthoven, 1993). The success of managed care approaches is based on the achievement and capability of a number of high quality, cost effective services, and presence of well organized systems of care (Enthoven, 1988, 1993).

Social insurance in developing countries is typically under reported. In Asia, North Africa, and the Middle East there are few reference documents available. In Latin American countries where social insurance has been in operation for 50 years, it is relatively well documented (Ron et al. 1990). At the same period, similar schemes developed elsewhere such as in Egypt, The Libyan Arab Jamahiriya, and Turkey. Before 1950, in Latin America there was basically no tradition of voluntary health insurance. Social insurance legislation and institutions took shape in developing countries and reflected the social policies which had gained acceptance in Europe.

The coverage was limited according to criteria such as geographical area, size of population covered, and category of dependant. Employees in urban areas working in large enterprises were first covered, then gradually the type of persons protected expanded, to include more categories of employees, their dependants and eventually also groups of self employed (Leal de Araujo 1973). In Latin American countries as in Chile (100%) and Costa Rica (82%), the coverage of social insurance is better than developing countries in other continents (Roemer 1987). In Argentina where social insurance covers 75% of the population, private providers exist only for those of high income (Tollman, et al, 1990). However in some countries of Latin America like Columbia and Ecuador, the coverage is low (Ron, et al, 1990). In Ecuador social insurance covers only 10% of the population and dependants of beneficiaries receive inadequate protection. In Columbia, the private sector has been well established to cover about 15% of the population. Alongside it is an inefficient and costly public sector comprising an urban-based Social Security Institute, and a highly inefficient ministry of health. Since 1940, the health care delivery system of Latin American countries, except Chile, has followed the direct method (Roemer, 1987; Tollman et al, 1990). The facilities and personnel are under the social security organization. The emerging trends of social insurance systems in Latin America are: to include the private sector in the provision of services for the insured; to assign the state a subsidiary role as demonstrated by the experience of changing the health system and financing in Chile (Viveros-Long, 1986); and to expand coverage and to widen the scope of services (Roemer, 1987).

In Thailand, the Social Security Act (SSA) was enacted in September 1990 after efforts lasting 26 years. The insured are obliged to contribute 1.5% of their salary to the SSF, while employers and the government both contribute the same amount to SSF. The capitation payment method has been chosen to pay the hospitals to avoid welfare losses from a fee-for-service (FFS) payment basis and because of the limited income contribution from the responsible parties. During the first 3 years of implementation, working establishments with >19 employees were covered and after that working establishments with >9 employees have been covered by this scheme. The

scheme allows them to use public and private facilities which sign a contract with the SSF. The Fund allocated 700 Baht/capita/year to the main contractor for each registered worker. In 1993, about 3 million workers (5.2% of the total population) were covered by the SSF and a budget of about 2,100 million Baht was allocated. The main contractor is a hospital, with ≥100 beds, which has facilities according to Social Security Office (SSO) regulations. The SSO is a department under the Ministry of Labour and Social Welfare. Its other role is to coordinate and regulate for workers and providers to participate with each other, to operate the enrolment process and management, to collect contributions from the insured and employers, to manage the payment system to providers, and to develop mechanisms to improve services to the insured.

Apart from capitation payment, the SSO also pays some money to providers for some diseases which have high cost. The items, rules, and subsidized rates change at least once a year so it is difficult for some providers to get used to it. For the insured, of whom the majority are poorly educated workers, it is more difficult to understand the regulations. This leads to misunderstanding for the providers and the insured and may initiate some conflict between them.

In case of emergencies and accidents there is a regulation allowing the insured to receive care from any facilities within 72 hours after getting ill and then they can be reimbursed some money from the SSO. After 72 hours the insured have to receive care from their main contractors. The reimbursement rate and rules change at least once a year. Moreover there are 15 diseases/conditions which are not covered by the scheme. These also lead to misunderstanding for both the insured and the providers.

Since under SSA, the only provider who may offer services is the selected main contractor, there are a lot of problems about access to care. To satisfy the insured by increasing accessibility to facilities, some main contractors have established groups of facilities to provide care. These groups of facilities are called provider networks. In 1991, the first year of the programme, there were no provider networks. In 1992, there was 1 network under the MOPH (671 facilities) and 1 private network (69 facilities). Unfortunately it is difficult to classify the number of networks during 1992-1995 since a lot of facilities were connected to >1 network. However the number of network facilities are increasing every year in both public and private sectors. The total number of facilities in networks has increased by 153.6% (table 1.1). The number of networked facilities in the public sector increased by 87.3% but in the private sector increased by 798.6% during 1992-1995. The total number of main

contractors involved in social insurance increased by 30.3%, those in the public sector increased by only 6.8% while those in the private sector increased by 133.3% during 1992-1995.

Table 1.1 Number of main contractors involved in social insurance and facilities in networks by private/public sectors, 1992-1995

	1991	1992	1993	1994	1995	Increase(%) 1992-1995
1. Main contractor	137	145	156	177	189	30.3
-Public	119	118	119	122	126	6.8
-Private	18	27	37	55	63	133.3
2. Facilities in networks	-	740	760	1,320	1,877	153.6
-Public	-	671	674	1,035	1,257	87.3
-Private	-	69	86	285	620	798.6

NOTE: * By 1 January 1995

The trend of increasing numbers of private main contractors and the number of the facilities in private networks presumably influenced the market share of private sector to increase more than the public sector. Since 1991, the first year of implementing social insurance, the balance of the public and private market share has been changing over time, as shown in table 1.2. The market share of the private sector has increased >3 times during these first 4 years. In 1991 the private sector shared only 16 % while in 1992, 1993 and 1994 it shared 41%, 53%, and 59% respectively.

Table 1.2 Market share of public/private provision concerning social insurance

Hospital category	Dec 1991 No*	%	Mar 1992 No*	%	Aug 1993 No*	%	Jul 1994 No*	%
MOPH	1.2	48	0.8	33	0.9	30	0.9	26
University	0.4	17	0.3	13	0.3	10	0.3	9
Private	0.4	16	1.0	41	1.6	53	2.0	59
Others	0.5	19	0.3	13	0.2	7	0.2	6
Total	2.5	100	2.4	100	3.0	100	3.4	100

Note: -* = Number of workers in million.
       -MOPH, 1992, 1993, 1994

The first private network was the Medical Social Security Centre (MEDSEC) Network. In 1992, 1993, 1994, and 1995 there were 70,000, 110,000, 150,000, and 280,000 workers respectively included in this network. It is considered the biggest private provider network in terms of coverage of the insured and facilities involved. It is now (1995) composed of 3 main contractors: Pattaya Memorial, Parkket, and Veteran hospitals, which are ≥100 bed hospitals. Pattaya Memorial hospital is located at Pattaya. Veteran hospital is in Bangkok, and Parkket hospital is in Pathumthani

province which is a suburb of Bangkok. Besides these 3 main contractors there are >10 small hospitals, 70 clinics and polyclinics which act as subcontractors, and 10 general and specialized hospitals which act as supracontractors. Legally all subcontractors and supracontractors have to sign a contract with the main contractors. The main contractors also have to sign a contract with MEDSEC.

In 1992 the MOPH initiated provider networks. They were not working well because the facilities were confined to MOPH facilities. Since 1994 the policy about networks of the MOPH was changed to include private clinics and private hospitals in MOPH networks. This changed the structure of public networks and the number of the insured selecting public provider networks. Since then, the publicly organised networks are composed of both public and private providers but are managed by public main contractors. In 1995 the biggest publicly organised network in terms of number of the insured covered (80,005) and number of facilities involved (50) is Nopparat network followed by Lertsin, Samutsakorn, Sawanpracharak, and Ayuttaya networks (table 1.3). Nopparat network has been established since May 1993. In 1993 there were only 35 facilities involved and 39,690 workers selecting the network.

Table 1.3 Number of the insured and facilities in MOPH provider network, February 1995

	Number of the insured	Number of facilities			
		Public	Private clinic	Private hospital	Total
Nopparat	80,000	10	39	1	50
Lertsin	51,000	9	26	1	36
Samutsakorn	36,000	4	27	0	31
Sawanpracharak	11,000	12	16	3	31
Ayuttaya	6,400	15	5	0	20

The organization of provider networks in social insurance in Thailand is very similar to the Health Maintenance Organizations (HMOs) that were originally developed in USA. This is because they share some similar characteristics: prepayment, method of selecting HMOs or network, capitation based payment, group of providers to provide care, and operation in a competitive environment.

There are advantages and disadvantages in a capitation payment system. The provider-patient relationship is likely to be maintained due to the financial incentive and services less abused through overtreatment. The advantages for the sponsor is that administration is simple and easy to handle. However the most serious disadvantage is the risk of poor quality

services rendered by some providers due to too few laboratory investigations, undertreatment, and overused deputising services (Ron et al 1990). There is possibly a shorter medical consultation time because main contractors have an incentive to cut their costs and no additional incentives to provide treatment. Experience from the past found that HMOs which use the same payment system tend to minimize hospitalizations (Wyszewianski 1988).

The illness rate of all age groups of Thai people from the morbidity and mortality differential survey in 1988 was 2.1 episodes/person/year (Mahidol University 1988). The rate varied by age group. The rate for the age-group of the insured, 15-60 years old, was 2.2 episodes. Tangcharoensathien et al. (1993) found that the illness rate of insured workers in Samutprakarn in 1992 was 2.88 episodes/person/year. The proportion of insured workers when ill using outpatient (OP) services at registered hospitals was 0.22 with a 0.78 probability of seeking care from other facilities. The utilization rate for outpatients was 0.63/worker/year (2.88 x 0.22). There was a 0.64 probability of using inpatient (IP) care at registered hospitals, and a 0.36 probability of using other facilities. In this situation, hospitals could make quite remarkable profits out of the 700 baht/capita/year. Tangcharoensathien et al. (1993) also stated that the utilization rate by the insured under the SSA was very low due to the method of choosing 1 main contractor or due to the method of choosing registered hospitals by the employer on behalf of the employees which leads to the problem of inaccessibility if care can only be sought from 1 facility. Nitayarumpong (MOPH 1992) stated that provider networks for the insured need to be created and expanded to provide higher quality and more efficient care. The Director of SSO (MOPH 1992) also stated that networks should be initiated amongst both public and private providers, because there would be more facilities for the insured to seek care when they are ill. It is likely that the health seeking behaviour of the insured belonging to a network provider would be different when compared to other providers without a network especially the proportion of insured workers when ill using outpatient services at registered hospitals. Since 1992 networks have been established, but the network itself is not officially recognized by the SSO as a provider or purchaser due to lack of information to initiate an appropriate rule and due to questions about quality of care of small hospitals and clinics in the networks. The unrecognized network also causes problems of how to monitor and control the provider networks for effective care of the insured.

1.2 Study aims and objectives

The method of choosing 1 main contractor and the trend of increasing provider networks generates questions concerning how to organize the provision of care under the SSA, and the relative advantages and disadvantages of providing care for the insured through a private network versus a publicly-organised network.

On the issue of capitation payment and services offered by clinics and small hospitals in the networks, there are questions to be investigated: what is the quality of care offered by networks, do private or publicly organised networks provide a more effective quality of care, is the quality of care of the insured (paid by capitation) less effective than the quality of care of the noninsured (paid by FFS).

To address the problem of low utilization rate due to few facilities providing care, poor understanding of SSO regulations, and lower satisfaction with medical care; it is necessary to study the knowledge, health seeking behaviour, utilization rate, and satisfaction of the insured using a network.

The aim of this study is thus to identify health policy recommendations regarding health care provider networks which would improve the physical accessibility of the insured, patient's satisfaction, quality of care, and the payment mechanism within a network. This is to accelerate the welfare gain from proper management of provision of social insurance. In order to develop policy recommendations, a tracer provider network operating with a high level of satisfaction as suggested by the increasing number of facilities and number of the insured should be selected to be evaluated.

As MEDSEC is the biggest network and has grown over time in terms of the number of the insured covered and the number of facilities in the network, selecting the MEDSEC network as a tracer network to evaluate, to draw on its experience for the policy recommendations is valuable. Moreover to develop more policy implications from evaluating the MEDSEC network, a comparison group is needed. There are no other networks with characteristics like the MEDSEC network. The Nopparat network was selected as a comparison group because it is the biggest publicly organised network in terms of number of providers and the insured covered, and because both networks face the same payment system (capitation based) and the same types of facilities (clinics and small hospitals).

The main, general objective of this study is to evaluate the MEDSEC network in terms of organization, payment system, quality of care, behaviour and

utilization rate of the insured, and to compare selected aspects with the Nopparat network. The specific objectives are:

- To describe how MEDSEC was set up and how it has grown over time i.e. historical development, contractual relationships, people and groups involved, and marketing system of MEDSEC
- To examine the utilization rate of MEDSEC/Nopparat networks
- To examine the health seeking behaviour of the insured of MEDSEC
- To evaluate satisfaction and dissatisfaction with the services of the insured of MEDSEC
- To investigate the payment system to MEDSEC providers
- To evaluate the quality of care in 4 aspects:
  - the infrastructure of MEDSEC/Nopparat networks
  - inpatient satisfaction with the MEDSEC/Nopparat networks
  - outpatient prescriptions of the insured/noninsured of the MEDSEC network
  - inpatient medical records of the insured/noninsured of the MEDSEC network.

1.3 Content of thesis

This thesis contains 8 chapters. Chapter 2 reviews literature in 2 parts: provision of health services under social insurance and payment systems between SSF and providers. This chapter extensively reviews theoretical and practical explanations of HMOs and related topics, and payment systems and associated issues which provide experiences from which policy recommendations can be developed concerning provision of care and payment systems.

Chapter 3 describes how this study was done. There were 4 main substudies: the operating and financial system of MEDSEC and utilization rate of MEDSEC/Nopparat networks; MEDSEC provider's knowledge and attitude; health seeking behaviour, utilization rate, knowledge, and satisfaction of the insured of MEDSEC network; and evaluation of quality of MEDSEC/Nopparat networks' care concerning 4 aspects: infrastructure of MEDSEC/Nopparat networks, patient satisfaction of MEDSEC/Nopparat networks, outpatient drug treatment of the insured/noninsured of MEDSEC network, and inpatient care of the insured/noninsured of MEDSEC network. The main focus is on the evaluation of the MEDSEC network. The methodologies used were varied: secondary data collection, prescription and medical records collection, postal questionnaire, structured questionnaire interview, and in depth interview.

The results of this study are presented in 3 chapters. Chapter 4 presents the payment mechanism and charge rates of MEDSEC network, and the utilization rates for MEDSEC/Nopparat networks. This chapter looks at the

effect of the payment mechanism on the charge rate and utilization. Chapter 5 presents the knowledge, health seeking behaviour, utilization rate, and satisfaction of insured workers with MEDSEC facilities. This chapter addresses the lack of knowledge of the insured and the crucial need to educate them. Chapter 6 presents the evaluation of quality of care concerning 4 aspects: structure of MEDSEC/Nopparat facilities, satisfaction of inpatients using MEDSEC/Nopparat facilities, prescribing analysis of the insured/noninsured of the MEDSEC network, and inpatient medical treatments of the insured/noninsured of the MEDSEC network. The results from this chapter leads to policy recommendations in terms of organization of networks and payment mechanisms.

Chapter 7 discusses the methodology and draws together all main findings from the previous 3 chapters and then presents the policy recommendations. The policy implications identified involve the function of good network offices, monitoring of a network's quality of care, the payment system of networks, and improving the knowledge of the insured concerning the regulations on access to care.

Chapter 8 presents the conclusions and further research needed. This chapter confirms that the main objective of evaluating the MEDSEC network in terms of organization, payment system, quality of care, and behaviour and utilization rate of the insured was achieved. Furthermore generalization of the results, and further research, are discussed.

Chapter 2
LITERATURE REVIEW

Common concerns about social insurance funding in developing countries are over mechanisms to control overall expenditure (Ron et al, 1990): organising a suitable pattern of provision to deliver better care at less cost and to meet the equity objectives of countries (Mills, 1983). In Thailand, where the capitation payment is applied and networks are established, the problem of cost-control is diminished but the difficulty of how to initiate an appropriate, cost effective, and equitable provider network organisation remains. Hence the interesting issues to be explored are: what is the best way of providing access to care in social insurance, how should providers be paid, what is the proper network provider organization, what is the suitable payment system within the network, and what are the incentives relating to quality of care of facilities of networks. To study these topics, 2 issues concerning provision of health services and the effects of the payment system under social insurance are reviewed and presented in this chapter.

2.1 Provision of health service under social insurance

2.1.1 Organization pattern

Medical care under social insurance is usually described by either the direct or the indirect pattern. In the direct pattern, the health insurance organization builds its own physical facilities; in the indirect pattern medical care is purchased from existing public or private providers (Roemer, 1969; Zschock, 1982). The indirect pattern usually developed in the older industrialised countries where private facilities already existed, and when social insurance was first established as in Belgium and Germany. The direct pattern is more usual in developing countries where the basic medical resources are relatively scarce, and where centrally planned political structures have existed as in Tunisia and in India. These 2 patterns of care are not only applied to general practitioners (GPs) but also to specialist care, hospitalisation, drug, dental care, and other segments of health care (Roemer, 1969).

Since a country's option of health care provision pattern explicitly depends on the existing pattern of services, their ownership, and payment systems, 2 main factors that should be considered are: the presence of actual private systems and the sufficiency of public health care (Mills, 1983). However, coordination among the major existing institutional providers of medical care in developing countries could be promoted to improve efficiency and accomplish equity in allocation of medical resources

(Zschock, 1982). Some coordination has occurred in Chile where HMOs and privatization of health services have been implemented (Scarpaci, 1987), and in Costa Rica and Panama where public and social security medical services have been integrated (Zschock, 1982). Although the integration between institutes has been promoted, if the referral mechanisms are poor, high cost and inefficient utilisation of health services remains. To increase the efficiency in provision of care, primary health care(PHC) ideas have been proposed in social insurance schemes. These involve greater emphasis on ambulatory service, greater restriction on the construction of new hospitals, expansion of coverage to wider groups of population, and more services in disease prevention. Often, in many social insurance situations, the charges to patients have been increased and attempts made to reduce excessive utilization of services. To decrease the cost of medical care of the individual and promote necessary accessibility to care, financing through third-party channels is suitable (Zschock, 1982).

2.1.2 Health Maintenance Organizations

HMOs are 1 possibility for the provision of health care in the context of social insurance. Although in the USA, HMOs are part of private insurance, their experience can be applied to the context of social insurance because they combine the insurance and provision functions and hold the best purchaser characteristics compared to other health insurers. As in Chile, consumers could decide which HMOs they want to enrol with; then the SSF pays the HMO. HMOs combine a prepaid risk-sharing role with health service provision, have shown their capability to lower costs and improve efficiency in the USA, and have been suggested as a means of delivering health services in developing countries (Tollman et al. 1990, Abel-Smith 1988, Akin et al. 1987).

In 1929, the Community Hospital Association of Elk City, Oklahoma became the first prepaid medical scheme. After that the term 'HMOs' was initiated in the USA in 1970 and legislation was enacted to promote their development in 1973. Marrison and Luft (1990) note that HMOs initially developed as staff or group model HMOs (pre-1975), followed by the speedy development of independent practice associations (IPAs, 1975-1985), and most recently by the even faster development of Preferred Provider Organizations (PPOs) and 'hybrid' HMOs which combine various models and offer consumers choices amongst them.

Definitions and models of HMOs

Though HMOs may vary in detail, there are some elements that are typical. These are prepayment, capitation fees and risk-bearing by providers. Other

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components are more varied such as: the type of provider structure (staff prototype, group practice paradigm, independent provider organization); the definition of the enroled population (group/individual enrolments); operation in a competitive environment; the pattern of HMO coverage (copayments, deductibles, maximum limits); and operating in a referral system. However, Tollman et al. (1990) mentions 5 comprehensive characteristics of HMOs: a defined range of health services provided by a contractor, provision of services to a specified population, voluntary enrolment of subscribers, fixed and regular payment by enrollees, and an assumption of financial risk in the provision of services.

The major models of HMOs consist of prepaid group practices (PPGPs) and IPAs. Functionally, HMOs are defined in 2 panels: closed panel and open panel. In a closed panel, the PPGP renders services to enrollees through a limited group of medical practitioners whose principal practice activity commonly includes the provision of care to HMO members. This model of HMOs is health centre based and can be categorised as either a 'staff model', meaning that the doctors are personally employed by the HMO; or as a 'group practice model', meaning that the HMOs contracts with a medical group to render services to its members. In an open panel plan, an HMO contracts with an IPA to provide services to the HMO's members through arrangements with medical practitioners engaged in private practice throughout the community. The IPAs generally have no actual facilities of their own, and survive only as financial entities which acquire prepayments from subscribers and then reimburse independent medical practitioners and hospitals on a fee basis.

Recently, other 'hybrid types' of HMOs and prepaid plans have evolved. Such plans include Competitive Medical Plans (CMPs), Gatekeeper Plans, and PPOs. In Medicare's HMOs/CPMs option in USA, Medicare contracts with HMOs, and the government pays HMOs. In this option, the largest system of risk rating is operated (Enthoven 1988). This system, risk rating, identifies persons or groups by certain characteristics such as by age, sex, and area of residence; by welfare, institutional, and disability status; and by presence of end stage renal disease. Participating HMOs/CMPs must charge all the beneficiaries under FFS system the same price for the same benefits. This risk rating system was established to protect the government from adverse risk selection, and to give health plans an incentive to help older and sicker beneficiaries.

Managed competition and HMOs

The ultimate aim of managed competition is to accomplish equity and efficiency. It has had mixed results in improving access to care, assuring the quality of services, and saving money (US GOA 1993a). The existence

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of cost-conscious consumer choice is necessary to create incentives for health plans to develop and demonstrate less costly alternative ways of organizing care of acceptable quality (Enthoven 1988).

Risk rating is a tool for managed competition. Managed competition is a concept that has been developed >20 years of research and refinement (Enthoven 1993). It is defined as a purchasing approach to acquire maximum benefit for consumers and employers, using regulations for competition originated from microeconomic principles. A sponsor is either an employer, a governmental entity, or a purchasing cooperative. It is performing on behalf of a large group of subscribers, and formulates and regulates the market to overcome attempts by insurers to avoid price competition. The sponsor initiates rules of equity, selects participating plans, manages the enrolment process, creates price-elastic demand, and manages risk selection. Managed competition is based on comprehensive service organizations that combine financing and delivery systems. Prospects for its achievement are based on the accomplishment and potential of a number of high-quality, cost-effective, and successfully organized systems of service such as PPGPs in the USA (Enthoven 1993).

In managed competition, it is important to consider 3 groups: consumers, health plans, and sponsors (Enthoven 1988). In a free market, health plans are considered as the supply side and individuals the demand side. Without carefully drawn rules and active management by sponsors, health plans would be free to pursue profits or survival that would destroy efficiency and equity. Individual consumers would be powerless to counteract this.

In successful models of managed competition, sponsors are active collective agents on the demand side who contract with competing health plans and continuously structure and adjust the market to overcome its tendency toward failure and inequity (Enthoven 1988). The sponsor assures each eligible beneficiary of financial coverage of health expenses at a reasonable price. In a competitive model the sponsor serves as the broker who structures the coverage, contracts with beneficiaries and health plans regarding the rules of participation, manages the enrolment process, collects premium contributions from beneficiaries, pays the premium to health plans, and administers cross-subsidies among beneficiaries and subsidies available to the whole group. Other tools used for managed competition to counteract market failure are: standardized benefit packages, annual enrolment process, continuity of coverage, surveillance by sponsors in terms of performance of health plans and risk-selecting behaviour, quality assurance, procompetitive action by sponsors, and sponsor management of subsidies.

It is too complicated for either the public or the private health care sectors to carry out this managed competition on their own. Sponsor and purchaser agencies are needed. To manage competition effectively, a suitably motivated sponsor should attempt to combine many best aspects of prospective experiences such as payment systems, Medicare's HMO/CPM option, California's Public Employees' retirement System, the Federal Employees' Health Benefits Programme, and practices of some of the best private employers (Enthoven 1988).

HMOs plans have had managed care aims, especially a high priority to control hospital costs. Sheils et al. (1993) studied group-model HMOs in the USA to estimate the lowest-cost plan. They found that there was attainable saving. Managed competition enhances incentives to contain costs even for HMOs by increasing consumers' price sensitivity and managing risk selection as a means of maximizing insurer profits. In the group-model HMOs, consumers select from among various approved health plans. Insurers are required to propose a uniform benefit package covering a standard category of care, with uniform patient cost-sharing conditions. For cost-sharing, $10 copayment/outpatient visit with no deductible is required for a low cost-sharing scenario, and a $250 deductible/person ($250 deductible/family) with coinsurance is applied to high cost-sharing scenario. This cost-sharing reduces the problems of facing the high costs of high risk patients to some degree. Insurers are also requested to admit all applicants and are not allowed to vary contributions with health status. This market restricts insurers' capability to target healthier people through medical underwriting and benefit plan. With risk selection operations nearly abolished, insurers are pushing to compete for market share absolutely on the principle of price, provider network, and quality of care given.

In the private sector where purchasers are employers, there is an obstacle concerning selectivity bias in managed competition. There was tendency of HMO plans to attract more the healthiest members of an employee group. This is aggravated by price competition between HMOs and indemnity plans (Kane, 1995). In HMO plans, all employee groups in the geographic community are charged the equivalent of an average price. But in indemnity plans, the charged price varies according to the actual costs or experience of the enrollee. Consequently employers with multiple plans usually pay more than they should for the healthier people and lose their opportunity to pool the healthier worker in the same pool with the iller people. This shows that the employers pay above the average costs in indemnity plans.

Empirical studies concerning the advantages of HMOs

Issues such as quality, cost, and access to health care are crucial to consumers; the managed care business provides care at a significantly more affordable cost than traditional FFS care. Luft (1978) demonstrated that total costs for HMOs members were 10-40% lower for PPGP members as compared to other health insurance schemes. Manning et al. (1984) showed that HMO care cost 25% less than FFS care for comparable groups. Ware et al. (1986) found that there were better health outcomes in HMOs compared with FFS for both high and low income groups.

Luft (1987) demonstrated that HMO patients have lower hospitalization rates than patients in traditional insurance programmes, although much less is known about differences in resource use in hospitalized patients. Studies of Medicare financed HMOs found the same general result (Langwell et al. 1987, Langwell 1990). Compared to traditional insurance programmes, IPAs demonstrated less ability to control hospital admissions than group or staff model HMOs, but more ability to control length of stay (LOS) for their inpatients (Luft 1987). Bradbury et al. (1991) showed that IPA patients had shorter stays than traditional insurance patients in a study of the 10 most frequently occurring medical service Diagnosis Related Groups (DRGs) for patients aged $\geq$65. Bradbury et al. (1993) examined the effect of IPA-HMO membership on hospital total charges, ancillary charges and LOS for surgical patients. IPA patients exhibited adjusted total charges that were 6% lower than traditional insurance, ancillary charges that were 4.3% lower, and LOS that was 10% shorter.

Johnson et al. (1989) stated that approximately 50% of the yearly increase in hospital costs comes from increased resource use/admission. Network HMO patients in several diagnostic categories used significantly fewer resources, once hospitalized, than patients in either IPAs or FFS plans. This difference gives network HMOs a competitive advantage in the market for health plans.

Morrisey (1993) stated that cost shifting was approximately $21.5 billion in 1991. Hospitals set different prices for different payers. The evidence on hospitals' ability to raise prices to 1 payer to make up for unsponsored care or lower payments by other payers is mixed at best. Cost shifting is not as easy as it may have been in the past because the nature of hospital and insurer competition has changed radically in the last decade. While hospital quality, services, and amenities still matter, some buyers are increasingly concerned about the price they pay. Evidence from studies of PPO and HMO negotiations with hospitals suggests that hospitals' market power is being disintegrated, at least in some areas. In a competitive market, a hospital that traditionally cared for the uninsured

by spending some of its profits on them is not able to do so, at least to the same extent as it did in the past. Increased competition in health care without consideration of the uninsured will decrease the uninsured's access to care.

Moore et al. (1992) reported that treatment outcome in mental health was rated as "very satisfactory" or "satisfactory" in 82% of the cases. They illustrated that a hospital provider and its managed care system can provide satisfactory care, but also revealed the need to constantly review treatment programmes to reduce treatment barriers.

Callahan and Bertakis (1993) and Hastings (1973) showed that there was significantly more patient information provided, more preventive services, greater disease prevention, more treatment planning, and more choice of medical supplies used for the HMO patients than for those of FFS group.

Fox et al. (1993) found that HMOs offer several advantages over traditional FFS plans for disabled children who have special health needs such as: ancillary therapies, home care, outpatient mental health care, and medical case management.

Romano (1993) stated that HMO members are extremely satisfied with the level of service and care they receive, and that managed care organizations still strive to demonstrate their commitment to quality.

One of the reasons why HMOs can improve efficiency of health care provided is because of their decentralised characteristics of organization. It has been accepted that the delegation of authority to the local levels of the organization will enhance ability to respond to local needs, and improve cost containment. Gross et al. (1993) showed that in an attempt to provide high quality medical care, despite limited resources, health care providers in various countries have introduced decentralization into their services. They also present a conceptual framework for analyzing possible consequences of decentralization on dimensions of quality of PHC. A framework is defined for decentralization programmes in terms of their key modules, and these frameworks are employed to analyze a specific decentralization programme being implemented in Israel's largest HMOs.

Disadvantages of HMOs

HMOs might reduce cost by lowering the quality of care they provide and by cutting back the number of hospital admissions or the LOS, which in the long run may result in poorer outcomes (Culyer et al. 1988a, 1988b). The other way of reducing costs is by "skimming" off the lower risk groups of young and able. This is inequitable though HMOs may be efficient in

narrower technical and cost-effectiveness senses. HMOs in the USA tend to enrol relative young and healthy groups. There are many means in which discrimination has been done against the elderly or patients from chronic high cost diseases and in favour of younger groups (Tollman, 1990). This selection bias may become inequitable since it may leave the expensive high risk cases without health care cover, or with cover available only at high cost.

In HMOs, consumers are usually able to select their own physicians and hospitals and so have a wide degree of choice to seek care once enroled in the plan. Consequently this may lead one to expect that individuals who had relative high risks of services would prefer to join HMOs. The HMOs themselves, by contrast, will face competitive pressure to risk discriminate, although their members are committed to community rating and community doctoring. Newhouse et al. (1985) stated that although HMO costs are lower than FFS sectors, the rate of increase in costs is not discernibly different between the 2 sectors. Moving over completely to HMO provision may therefore not be so cost-effective in the long run and may also bring serious problems of adequacy of coverage for high-risk groups.

HMOs might develop local monopolies, thereby reducing consumer choice and, in consequence, increasing the chance of inefficiency. In rural areas where there are limited providers, consumer choice is affected. In urban areas, HMOs might seek to combine, thereby producing larger monopolies with greater economic power for the providers. Feldman and Dowd (1986) applied 2 different techniques to estimate the price elasticity of demand in the urban markets for HMO patients. First, a pricing rule was developed from which hospital-specific price elasticities might be inferred. Second, the distribution of each payer's admissions at specific hospitals was examined to determine if low-priced hospitals attracted more patients. Data form 31 hospitals in the Minneapolis-St. Paul metropolitan area showed that hospitals could over-charge HMOs. The price sensitivity was totally lacking for the HMO patients and the market for hospital services was not competitive. However interventions have been proposed. Such interventions are increased cost-sharing in commercial insurance, promoting PPOs, and aggressive negotiations between health plans and hospitals. These interventions may have increased the level of price competition and then the market may be reaching the competitive model in which price equals marginal cost (Feldman and Dowd, 1986).

Some HMOs are predominately serving the middle classes and hence operating in the wealthy areas of the USA. They do not pretend to be generous and seem to have little enthusiasm for enroling Medicaid patients because the state intends only to partially reimburse them for the cost of caring for such patients.

Von-Korff and Marshall (1992) mentioned that patients treated for 12 chronic conditions accounted for almost 66.7% of total costs. Enrollees treated for ≥1 of these 12 conditions accounted for 61% of the high cost enrollees and 63% of total costs. At present, HMOs typically rely on individual providers to manage on a case by case basis, rather than organizing clinic and HMO wide systems of care which are more cost effective (Richards 1986).

Competition and satisfaction for the insured in HMOs

Conflicting evidence examined by McLaughlin (1988) showed the evidence about the competitive response to the growing presence of HMOs in the health care marketplace. Providers are responding not with classical cost-containing price competition but, instead, with cost-increasing nonprice competition, characterized by increased expenditures to promote actual or perceived product differentiation. However a market where providers become price takers is less tolerant of differentiating product strategies (Hilsenrath 1991). Many technologies may not be sufficiently valued in the more price-sensitive marketplace and their costs cannot be passed on. Instead providers will either absorb these costs or drop the use of technologies that cannot be financially justified. He also stated that innovation must increasingly address efficiency and more effort can be expected in the development of cost-saving technologies.

Hiramatsu (1990) showed that comprehensiveness of coverage of HMOs in the USA was the most important factor in selection of a health plan; cost ranked second. Factors related to health-plan satisfaction included quality and quantity of plan physicians, access to specialists, and scope of benefits. Enrollees of HMOs were significantly more satisfied with their health plan overall than were members of PPOs or indemnity health plans. He also concluded that member satisfaction was related to the number of physicians available and the ease of access to a preferred physician. Physician quality appeared to be the prime determinant of member satisfaction.

HMOs in developing countries

Tollman et al. (1990) stated that published papers on HMOs outside the USA are scarce. Only some descriptive information in South America is available. Brazil is said to have the largest HMO in the world: 10 million enrollees in 1982 (Akin 1987). Group practice HMOs and IPAs are predominant. Enrollees are from middle and upper income groups. In Argentina social insurance covers two-thirds of the population, a private sector existing only for high income groups. Even though a few HMOs exist for those of middle income group, the majority are concentrated in the high

income class along with PPOs and traditional indemnity plans (Tollman, 1990). In Uruguay social insurance/HMOs cover 44% of the population. They are heavily regulated and supervised to provide a comprehensive set of standardized benefits. Because benefits expire following 6 months of unemployment and because of the rising of the premium, individuals disenrolment has occurred with a tendency instead towards group enrolment (Tollman, 1990).

The experience of Chile demonstrates that health care delivery options in private HMOs creates the strength to cover nearly 1 in 5 Chileans (Miranda, et al, 1995). Institutors de Salud Provisional (ISAPREs), HMOs, introduced after the coup of 1973, were based on the exclusive medical programmes provided to employees in private firms and to the upper middle income group of the public bureaucracy. HMOs were an optional source of care with other sources such as private medical centres and private insurance. In 1982, >2% of all Chileans belonged to HMOs (Scarpaci, 1987). To improve the problem of low coverage of HMOs, many legal changes in the health care framework have been implemented. The most importance is the increase of compulsory health care withholdings for all nonindigent Chileans in 1986. This change encouraged middle- and upper-income workers to join HMOs. The other actions are: creating a subsidy for low-income workers who wish to join HMOs, allowing them the chance to join HMOs; allowing pensioners to join HMOs; and greater regulatory control and consumer feedback for the HMO market. These actions remarkably increased the coverage to about 22% in 1992 (Miranda, et al, 1995). The experience of Chile shows that well organized and planned actions are needed to accomplish a good outcome for HMOs.

Tollman (1990) suggested that factors informing decision makers whether HMOs should be implemented in a particular country or not are: (1) what is the presence of a defined population? (2) is there any relevance of management control? (3) is there any possibility of developing cost-accounting systems? (4) what is the potential for diminished capital outlay?

2.2. Payment systems between Social Security Fund and providers

2.2.1 Introduction

Incentives for suppliers of goods and services can be introduced by the payment mechanism. Social insurance interferes with the market mechanism by eliminating price as a system of controlling how much the clients want to purchase, and eliminating competition if the insurer provides services itself or uses only 1 provider. However there can still be competition even if the insurer pays all the providers the same prices, as long as they are able to compete for patients or contracts.

The insurer wants to be satisfied that services rendered give value for money (Ron et al, 1990). The services must be acceptable in terms of accessibility, luxury and courtesy, and good technical quality but at the lowest and predictable cost. This low and predictable cost is inevitably at variance with the concerns of both hospitals and doctors. The broadening of the market with the introduction of social insurance should enable patients to be serviced with the same overhead costs. The fees for the insured should be below those previously charged in the private market because the SSF is a bulk purchaser. Ron et al. (1990) also argued that the provider clearly wants a system which will enable him to recapture some of the losses due to lower fees by giving each insured person extra services while the SSF wants a system which will contain costs and not lead to unreasonable services. Different levels of FFS charged present problems and the insurer usually wants to standardise them. However standard charges have posed problems for tertiary hospitals particularly teaching hospitals where teaching criteria impose higher costs.

The German health care system represents an attempt to achieve a universal distribution of health care and control over total health care expenditures without a complete takeover of the health system by the government (Reinhardt 1993). It is considered as a good experience for countries in terms of health care financing management, especially its payment system. The German payment system will therefore be discussed later in this chapter. In addition the advantages and disadvantages of each payment system are also discussed from the point of view of patient, the provider, and the SSF.

2.2.2 Payment methods by SSF

Capitation, FFS, global budget, and DRGs are 4 payment prototypes used by the SSF. A fifth approach, salary payment, is only used in the direct method. In some countries a combination of payment systems has been used.

The common hybrid systems are capitation for GPs and FFS for hospitals, and FFS or capitation for GPs and global budget for hospitals.

Capitation

Capitation is a method of paying by the number of persons "on a list" whether a service is actually done and regardless of the number of units of service rendered. This method is commonly applied to GPs in many countries such as the UK, Denmark, Netherlands, and Italy (Abel-Smith 1984). In Thailand the capitation method is applied for social insurance. In the USA, it operates under some HMOs and Medicaid Managed Care Programmes in many states such as Arizona, Michigan, Minnesota, New York, and Oregon.

In the UK about 45% of the income of GPs is derived from capitation (Culyer et al. 1988a). Doctors have been paid by the capitation method since 1948. In Denmark the health insurance schemes paid GPs mainly by capitation. In general the rate of payment is modified twice yearly according to the retail price index. At the present time, GPs receive payment in 2 ways: capitation for the insured and FFS for private patients.

Capitation can be flat rate or risk-related. In the UK, GP capitation is age-related. In the USA Medicaid programme, a risk-related rate is usually dispersed into age, sex, geographical area, and programme rate categories (US GAO 1993a). The USA Medicaid managed care programme is not a single health delivery plan, but rather a continuum of models that share a common approach. At 1 end of the continuum are prepaid or capitated models that pay organizations a per capita/month to provide or arrange for all covered services. At the other end are primary care case management (PCCM) models, which are similar to traditional FFS arrangements except that providers receive a per capita management fee to coordinate a patient's care in addition to reimbursement for the services they provide.

Arizona's Medicaid programme, a fully capitated programme, has been operating since 1982 as a demonstration project (US GAO 1993a). Risk-related capitation based on eligibility criteria is applied. All health plans are paid a monthly/capita capitation fee. For each service category in a risk pool, health plans accumulate encounter data to calculate the utilization rates, the cost/unit, and copayments. Using these data, the plans determine a gross capitation rate. This rate is subsequently adjusted for items such as reinsurance and deferred liability payments.

The main advantages for the clients are free choice of doctor (up to the limits imposed on doctors' list sizes) and continuity of care. Cost is predictable and controllable. Doctors are motivated to practise in a way

to encourage more patients to join their list. The doctor-patient relationship is maintained due to the financial incentive to have a person remain on the list. The income of GPs and hospitals is regular and guaranteed. Services are less abused through overtreatment and are more flexible. Ron et al. (1990) stated that there is some incentive for GPs to encourage preventive activities where they think it will lighten their work load in the long run.

The advantages from the insurer's point of view is that administration is simple and easy to handle. There need be little supervision except of some serious complaints such as breaking the rule about cost shifting from a fund to another which pays more such to a third party payment fund of automobile insurance.

The disadvantages for the patient are that there may be a shorter consultation time because doctors have an incentive to cut their financial and personnel costs, changing doctor is difficult, and there are no additional incentives to provide treatment. Dentists in capitation carried out fewer fillings, fewer extractions, took fewer radiographs and saw their patients less frequently than their FFS colleagues (Holloway et al.1990). Moral hazard may be induced by the patient if there is zero copayment. There is no evidence of the effects of competition for patients to join lists in terms of services provided, or the outcomes of such services, or the characteristics which patients look for in a general practice or GPs (Culyer et al 1988a).

The SSF may be concerned about the quality of service rendered by some GPs. There are questions of poor-quality services due to too few diagnostic tests and overused deputising services. In some countries such as the UK, capitation has been modified to answer some of the disadvantages eg. paying the salary of 2 supporting staff at a rate of 70%. Participation in continuing education is subsidised and extra allowances are paid to GPs when they are older. Financial incentives for GPs to work in some remote areas are provided. However the combination of general practice and hospital practice, particularly surgical practice, is rare because GP capitation leads to a strong dividing line between hospital work and general practice.

In Denmark, the capitation payment for GPs services leads to a low level of provision by GPs and a high level of referrals (Groenewegen, 1991). Increasing the FFS component in the payment of GPs is seen as the remedy. A mixed system of FFS and capitation already exists in Denmark. The FFS part produces administrative data. These data were evaluated at province level to find out whether a greater number of services by GPs in a province corresponds with a lower level of hospital and specialist care. He showed

that in provinces with a greater number of services by GPs, the number of ambulatory hospital visits was smaller.

Another additional innovative payment in capitation system is special payments for 'good practice'. In the UK, for example, GPs would receive a combination of capitation fees, fees for items of service and some allowances (Culyer et al.1988a). Additional payments would be given for 'good practice', for example achieving high coverage of preventive services.

Fee-for-service

This is a payment for each unit of medical procedure, or on a piece of work basis. FFS has dominated the system of payment especially in countries with free market oriented economies like the USA, Switzerland, Japan and Korea. In Germany, the FFS method is the only method used for paying doctors and specialists out of hospital. In Canada, most doctors are paid on FFS basis. Formerly, there was a practice of over- or extra-billing which permitted the doctor to charge the patient over and above the negotiated fee schedule. Today, a doctor's source of income is almost exclusively FFS payments from the provincial public insurer. The patient is not required to pay a fee or make any other financial contribution (Evans 1989).

Paying the doctor under the Australian Medicare scheme is similar to Canada and Germany for there is no copayment from the patients if the doctor selects to bulk-bill (Logan et al. 1989). GPs can choose between bulk-billing and charging the patient according to the full official fees. The official fees are in the Medical Benefit Schedule attached to the Health Insurance Acts which are used to define the Medicare rebate of 85% of the price of the private rate for services performed outside hospital. Most doctors in Australia select to bulk-bill because it simplifies the paper work and eradicates the risk of bad debts.

The advantages for patients are that the doctor has an incentive to render the services he provides acceptable by attractive premises, no excess referrals, no under investigation, high courtesy and prompt service, and well organized and equipped surgeries. There is also less abuse of care by overuse by the patient, if there is free choice to visit a doctor, and morale is good if fees are adequate. The advantages for the GPs are high autonomy and clinical freedom, and higher income for more work done by the doctor (Ron et al, 1990; Singkaew, 1991).

The advantage from the insurer's point of view is the high level of satisfaction. Doctors have no incentive to under provide and some

incentive to keep up to date, particularly an incentive to specialise (Ron et al, 1990).

Shimmura (1988) emphasised that the effects of capitation and FFS methods on general medical practice should be cautiously compared by using factual information, especially numerical data. A FFS system encourages more consultations, more diagnostic tests, higher cost drugs used, higher surgical rates and higher costs than a capitation method. On the other hand, a capitation method may lead doctors to hastier and less courteous care than a FFS system. The geographical distribution of GPs may be more even, and continuity of care may be better maintained, under a capitation system; but there may be excessive referrals from GPs to specialists under this method. There is no evidence for the contention that a capitation system encourages preventive medicine, but the financial coverage for preventive procedures may encourage them.

The disadvantages of FFS for the community as a whole are that there may be supplier-induced demand of health care by the doctor, unpredictable cost, poor geographical distribution of medical services, and high drug use (Donaldson and Gerard 1993, Culyer et al. 1988a). The 'information gap' between physicians and their patients may allow doctors to induce demand for their services. This leads to the potential for physicians to increase the supply of services when they stand to gain financially from doing so, as is the case in the FFS system (Broomberg and Price 1990). There is extensive international confirmation, at both national and micro levels, of the connection between increased utilisation and the FFS payment system. In Germany about 66.7% of the visits in a hospital (where a doctor has a right to admit to hospital and there are financial incentives to do so) are doctor-induced compared with 33.3% in the UK (where capitation payment and global budgeting is used in the British National Health Service, Ron et al., 1990). This is also in contrast with the pattern noted in the salary system, used in some HMOs in the USA. The 'practice setting' in which physicians operate also affects patterns of practice. In the FFS method, 'third-party payment' means that both physicians and patients have little cost-consciousness of the direct costs of services. In some systems, such as HMOs, there is a strong cost consciousness on the part of doctors. These differences in practice affect the different patterns of utilisation in these systems. The FFS system, as it is structured in South Africa, leads to extreme inefficiency, and the development of alternatives is becoming an urgent necessity (Broomberg and Price 1990).

The disadvantages for the patients are that there is delay in seeking care because patients have to collect a large sum of money to pay the doctor if they have not insured, there is no integration of services which provide mainly curative care, there is a lack of continuity of care, and a short

consultation time because rapid work leads to a higher income of the doctor. The disadvantages for doctors are that there is little continuing education and holiday for the doctor, and high administrative costs.

The disadvantages from the insurer's point of view are high administrative cost in processing claims, high, rising and unpredictable costs, and high cost of diagnostic tests. Even for a very straight forward case, the doctor can encourage a patient to make repeat visits and consultations. In specialist out patient care of hospitals in Ireland where such a FFS system applies, the outpatient visiting rate is 11% /year compared with 4.5% in the UK (Ron et al. 1990). Abel-Smith (1984) stated that the high use of diagnostic tests has been identified as a problem in Belgium.

Global budget

Global budget is commonly applied to hospitals. Under global budgeting the hospital receives a block sum of money, normally in advance, for some set period (usually yearly) (Glaser, 1987). Hospital and payer agree on the total foreseen budget. The payer then sends the money in instalments, monthly or once every 2 weeks. In some global budgeting systems no variations occur in the granters' regular payments if the volume of work is higher or lower than estimated. This method is used to cover the whole cost of administering and financing services falling within the compass of the hospital. This method is always used when a government earmarks the budgets of either private or governmental hospitals. It reflects a high degree of commitment of the state to provide health care facilities to its people. It varies from nearly full support from the government to hospitals, to support only for the capital costs of the hospital. This is a reliable approximation to the funding mechanism for Canadian hospitals and NHS hospitals in the UK.

It is normally associated with direct systems in health insurance, as in India and many countries in Latin America (Ron et al. 1990). It is also being applied to non-profit-making organisations as in Canada. This method has more recently been applied to hospitals in Belgium, France, and the Netherlands. Glaser (1987) stated that during the 1980s France adopted global budgeting systems of payment in order to control expenditure; at the same time, it improved the internal management of hospitals and, sequentially, the reporting of information about procedures and costs in each hospital.

The advantage is that there is a built in incentive for hospitals to restrain cost. It can enforce a fair distribution of funding to hospitals and make it more equitable. From the insurer's point of view, it is an accurate and predictable budget. Glaser (1987) stated that the system

should make everyone in the hospital more cost-conscious, since the organization must perform all its work within the prospective budget. It is also administratively simple for both hospital and payer.

The disadvantages are that good reporting and information systems are needed and there is a lack of information on individual patient and procedural costs. Administrative and financial statistics on health care are usually generated from bills. Hence, the drawback of simple payment systems is the loss of information. Hospitals have an incentive to under service, and there is no incentive for individual doctors. There are 2 ways of countering this (Ron et al.1990). One is to negotiate a formula which gives extra payment for productivity improvements or, alternatively, any improvement in productivity can be rewarded in the negotiations for the following year.

Diagnosis Related Groups (DRGs)

DRGs is a method of paying the hospital by a prospective payment system (PPS) according to the diagnosis of the patient at the time of discharge from a general hospital. Firstly, the amount or rate of payment is established in advance for the coming year and secondly, hospitals are paid these amounts or rates regardless of the costs they actually incur (Dowling 1979). The payment clearly shifts some of the risk of costs for the third-party payer to hospitals, in contrast to the retrospective method, where payers assume the risk for whatever a hospital spends. PPS in the USA make particular use of DRG information to categorise inpatient activity and set the price/case (Culyer et al. 1988a).

It is constructed from statistical and clinical inputs and cost information extracted from the individual patient's medical record (Jenkins et al 1990). DRG reimbursement rates are set at average cost (Culyer and Brazier 1988). The system has been used in the USA, since 1983, to pay for all Medicare inpatients, covering about 40% of hospital patients. Beginning in early 1975, 317 DRGs were identified and tested for several years for effectiveness in managing a hospital. DRGs are the groups designed to reflect a similar pattern of resource usage (Bardsley et al. 1987). When a patient is discharged, the records of his clinical and financial information are examined and assigned a computerized code appropriate to a particular diagnostic group.

DRG system may be unsuitable for most developing countries because it is complex to develop and difficult to police (Ron et al 1990). But the general idea can and has been adapted in certain specific areas. For example, rates may be agreed in advance per delivery or for certain specific operations leaving other cases to be paid for on an inclusive day

basis. Or the inclusive day payment may be supplemented by negotiated lump-sum payments for operations classified as major, minor and intermediate. Both of these systems of payment are used in Indonesia (Ron et al, 1990). Research on DRGs has spread to some countries such as France, Belgium, the UK, Portugal, the Netherlands, Italy, Canada, Australia (Rodrigues 1987).

In this method, minimising hospital costs/case in order to maximise hospital net income is encouraged (Donaldson and Gerard, 1993). It may be expected, therefore, that DRGs encourage hospital efficiency by keeping costs as close as possible to, or below, average costs. Minimising costs could, however, be achieved through several routes: shorter LOS, substitution of less expensive inputs for costlier ones, reduction in the quality of hospital care or a combination of all 3.

The advantage for the providers is that there is closer collaboration between managers and doctors. Hospital waste is encouraged to reduce. The DRG system also encourages the hospital to minimize resources used, for example using fewer personnel, fewer tests, shorter stays, and abandoning care of certain conditions that other hospitals can treat more cheaply.

The disadvantage from the provider point of view is that there is underreimbursement. Munoz et al. (1988a, b, c) suggest that federal, state, and private payers may be underreimbursing in the DRG prospective hospital payment scheme. More severely ill patients may be under compensated for the service provided (McMahon et al.1992). There is inadequate reflection of different disease severity (MacKenzie et al. 1991), inadequate payment for the patients who die (Munoz et al. 1991), inadequately reflected disease complication differences (Munoz et al. 1989a), inadequate payment for the elderly patient (Munoz et al. 1989b), and inequitable payment to the hospital between black and white Americans (Munoz et al. 1989c).

The disadvantages from the patient point of view are that discharge may occur too early particularly when there have been complications or the patient is elderly and needs a longer period to recover (Ron et al. 1990). Hospitals tend to discharge and later readmit the same patient in order to collect 2 DRG payments for the same case (Munoz et al. 1990). Some hospitals have denied admission to very serious and high cost patients. The hospital is encouraged to identify the patient as a complex case and may offer surgical procedures to the patient because they result in higher reimbursement. From the insurer point of view, it is necessary to have procedures to detect this manipulation and to monitor quality of care.

2.2.3 Payment system in Germany

In Germany, there are about 1,100 autonomous sickness funds which act as payers (OECD 1993). Sickness funds pay providers by a combination of global budgets and FFS payments. At the federal level, provider and payer groups bargain over yearly expenditure constraints and how they should apply to differing sectors. They also argue overchanges in policies planned to control failures in cost control and ensure equity in financing. State associations of providers and payers explain these goals in their areas and oversee their regional constituents as they implement the policies. Regional negotiations are where most sickness funds negotiate actual yearly budgets with local provider groups.

Paying the doctor in Germany

Office-based doctors are obliged to belong to a regional Association of Sickness Fund Physicians if they want to treat the 88% of the population insured through the statutory sickness funds. The Associations of Sickness Fund Physicians have 2 main functions: to negotiate annually with Sickness Funds over the total amount of payment, and to act as reimbursement intermediaries between Sickness Funds and physicians. They receive quarterly lump-sum payments from the funds based on the negotiated budgets, and pay member doctors.

Paying the doctor is based on quarterly vouchers (Eichhon 1984). Sickness funds provide these vouchers to their members, who hand them over to physicians in exchange for treatment. The patients are supplied with >1 voucher to enable them to see >1 doctor at a time, or to self-refer to specialists. Payment is by FFS according to an aggregated value of points. They itemize the services rendered on each voucher, then submit the collected vouchers to the respective sickness funds. Services are specified in point values set at the federal level and based on the relative time, skill, and resources involved. Doctors may not balance bills or charge sickness fund members extra beyond fund reimbursement (Knox 1993). Private insurers pay doctors nearly twice as much as statutory sickness funds, leading to the extensive belief that private patients enjoy such courtesies as fixed appointment times and greater attention.

Due to the federally decided yearly expenditure cap on ambulatory doctor services, physicians are financially at risk. If they bill for more services than were allowed for in the yearly budget negotiations, the value of each point will be reduced so the overall expenditure cap for that region will not be exceeded. Specific services are exempt from the cap such as: cancer screening, well child visits, and other preventive care.

Paying the hospital in Germany

Payment to the hospitals in Germany is made on a dual basis, with operating costs coming mainly from the sickness funds and private insurers (OECD 1993). The investment expenditure, even in private hospitals, is coming mainly from state governments. Sickness funds are obliged by law to meet hospitals' historical operating costs. Since 1986, payments for operating costs have been governed mainly by prospective global budgets negotiated locally by the representatives of the sickness funds and individual hospitals. The hospital and third-party payers' relationship is regional, but hospital associations do not play a direct role in determining reimbursement levels, budgets, or actual payment. The local sickness funds usually take the lead in the negotiations with the hospitals because they claim the most members and thus contribute the largest share of hospitals' operating revenues. The key budget-setting variables are the historically projected number of patient days, physicians' salaries, and depreciation. Private insurers reimburse more than sickness funds, but their payments are also based on an average daily rate. Knox (1993) described factors estimated in negotiating the budget: staff ratios and compensation, routine depreciation, occupancy, utilization trends, and other inputs. If actual bed days exceed expected bed days during the year, hospitals receive only 25% of the daily rate for extra bed days (Altenstetter 1987). If the actual bed days fall short of expected bed days, the hospital still receives 75% of the daily rate for the missing bed days.

In 1993 the German government began to introduce impressive urgent global budget limits on spending in the physician, hospital, dental services, and prescription drug sectors of its health care system (US GAO 1993b). This imposition deviated from previous methods in 2 ways. First, for the next 3 years, the global budgets for doctors and hospitals are established in law instead of by negotiation among nonprofit associations and the sickness funds. Second, the German reforms establish global budgets for pharmaceutical and dental services for the first time.

2.2.4 Payment System in HMOs

There are 3 prototypes of payment system in HMOs: salary, capitation, and FFS. Salary is applied to staff and PPGP models. Risk adjusted capitation is used to pay providers in IPAs and networks. FFS is added to pay for some activities in IPAs and networks. However some extra payments are also added to physicians in staff and PPGP models to act as financial incentives.

The physician financial incentive compensation programme used in HMOs in the USA continues to develop since 1989 (Lipsitz et al., 1993). This

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financial incentive program has met with overall physician approval with regard to fairness. Furthermore, HMOs are developing measurements of quality that will become an integral part of acceptable agreements for financial incentives in the future. Provider incomes are now stratified by years of continued service, and the practical productive activities and measurable units of cost-effective medical service activities. Payment compensation as a merit bonus is based on outcome of services which meets the agreed objective, and utilization criteria classified by patient's casemix or types of patient visits. For example, patient contact scheduling by physicians could be moderated to meet peak patient needs and not be fixed by weekly institutional requirements as long as total yearly patient-contact expectations according to the agreed objective are met. In addition, decreasing of some unnecessary laboratory and x-ray tests could benefit the HMOs, the medical provider, and the patients. This is because cost-effectiveness is promoted. It is also claimed that this financial incentive programme emphasizes the quality of care rather than economic considerations.

Burkett (1982) described the capitation payment system in the HMO of Pennsylvania which was founded in 1976. In 1979 it was an IPA type of HMOs with 30,000 members, 130 primary care physicians in 62 medical offices, and some extensive panels of specialist physicians. The HMO enrolment in the medical offices ranged from <100 subscribers in 9 offices to >1,000 in 10 offices. IPA physicians continued to see FFS patients, as well as HMO patients. Each of the primary physician offices received a monthly capitation fee as reimbursement for services rended. The rate was determined by actuarial projections of utilization of PHC by subscribers in various age brackets. The amount of the payment did not vary with the extent of services rendered by physicians. HMO members were also responsible for a $2.00 copayment for each primary care visit. Charges for specialist physician services, hospital, and certain other nonprimary care physician services were paid directly on a FFS basis by the HMOs when the subscriber was referred by the primary physicians. Twenty % of total capitation was kept by the IPA in a special account against higher-than-projected utilization of specialists' services. In the event of a surplus in this fund, the balance was to be distributed to the IPA physicians on an office-by-office basis. In the event that it was necessary to draw on this fund to pay specialists, the capitation for all primary physicians was to be reduced up to the 20% that was kept. Another account, equal to 20% of capitation, was set aside by the HMO against higher-than-projected hospitalization experience. Any surplus from this account was to be shared between the HMOs and the IPA primary physicians. The structure of this system is shown in figure 2.1.

Figure 2.1 IPA primary physician payment system in the HMO of Pennsylvania in 1979.
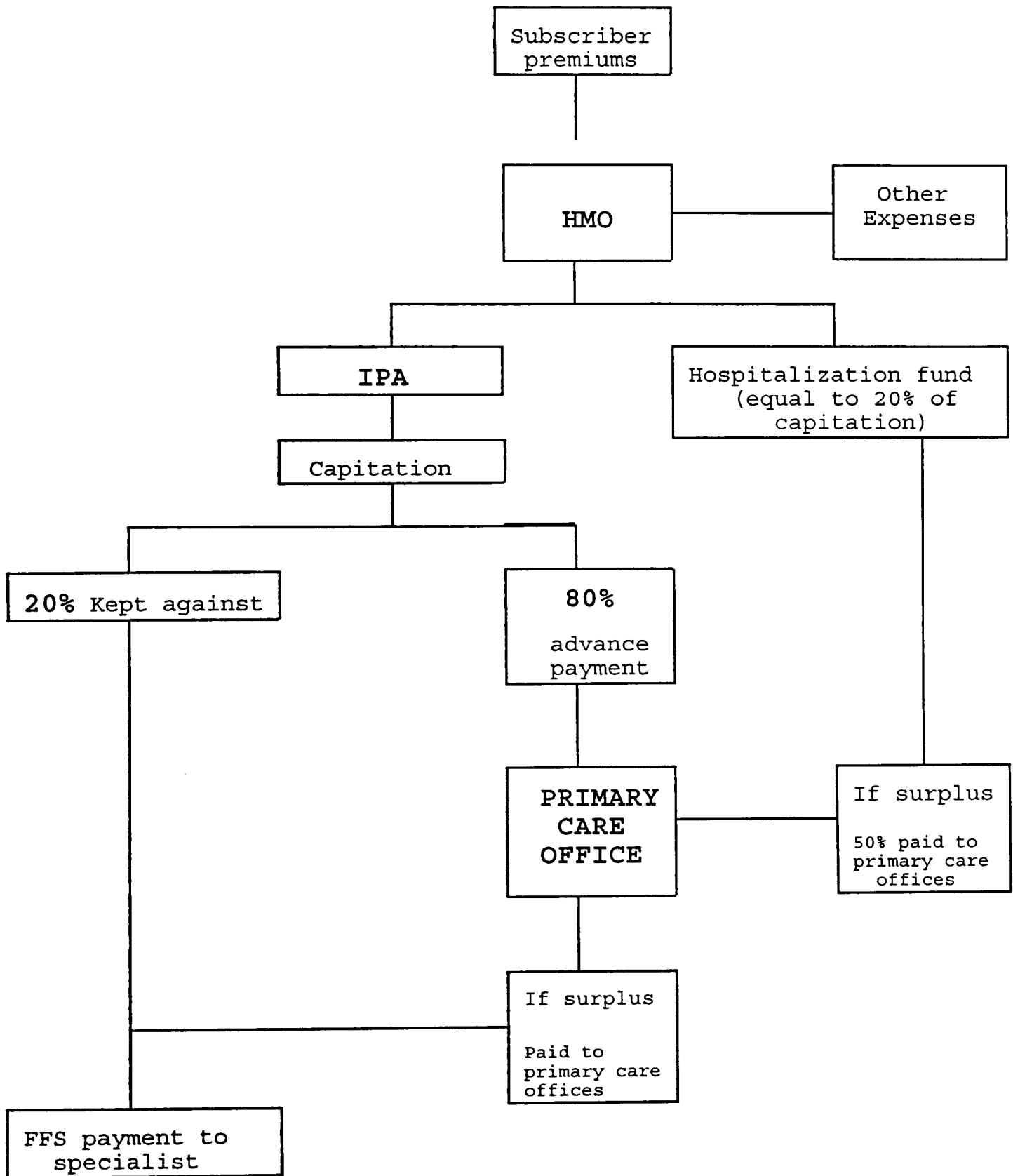
Note: Adapted from Burkett (1982)

2.3 Conclusion

In Thailand, the establishment of provider networks and their organizational characteristics have some similar features to HMOs such as providing care to a specific group by contracting providers, using fixed regular prepayments, having choice of provider, and providing care with financial risk. In contrast, some characteristics of networks that are different from HMOs are: enrolment of the insured is compulsory, and there are no risk-rating mechanisms, no copayment, and no scope for consumers to choose plans on the basis of price. However the main issues arising from this review are the organizational pattern, competition and managed care in HMOs.

Lessons from international experiences show that to establish an harmonious organization pattern of provider networks, one should consider the existing private facilities and the sufficiency of public health care in a particular area, the current ownership and payment system, and possibility of coordination among the major existing institutional providers of care. Moreover to increase the efficiency, provision of care should be done through a good referral system and PHC concepts which include emphasis on ambulatory services, restriction on new hospital construction, expansion of coverage, functioning preventive activities, a third party financing and administrative body, a managed care principle, and competitive environment.

The experience of HMOs in Chile shows that well planned actions to deal with the low coverage are necessary, especially actions to include more groups in the scheme. The experiences of expansion of coverage are relevant for Thailand which could include more groups to the network such as including indigent populations especially in urban areas where there are limited primary care facilities, or civil servant groups who consume high health care expenditure through FFS payment basis.

Using the experience from successful models of managed care and HMOs, functions of good network offices can be clarified. The main functions of a successful network office in Thailand that should be considered are: contact with the insured and SSO concerning the rules of interaction and responsibilities, paying the medical fee to facilities, managing subsidies available to the insured and facilities, standardizing quality of care of facilities in the network, surveillance of the performance of facilities, initiating risk funds, controlling risk-selecting behaviour of providers, managing quality assurance, and promoting procompetitive actions.

The empirical issues reviewed relevant for evaluating quality of care of provider networks are: the access to health care in a provider network is

likely to be better than without provider network; the insured of the network probably receive satisfactory care; and the insured patients are possibly provided with more information and preventive care than the noninsured. However there are some important dangers: the quality of care of the network might be decreased by cutting hospitals LOS which will affect the outcome of treatment; and a monopoly network is likely to exist in rural areas where there are only 1-2 main contractors.

The methods of payment can significantly influence access and quality of care, and also influence the allocation of resources for medical services. Mixed systems of paying doctors and hospitals are chosen in many countries. These combinations may be the best solution for paying for medical care. A developing country will want to choose a simple payment system. The capitation method is used in social insurance in Thailand; in the MEDSEC network, a capitation with bonus payment mechanism is applied to pay clinics/polyclinics and small hospitals, and FFS with standard minimum-maximum charges is used to pay general and specialized hospitals. The relevant payment system for Thailand derived from the review are capitation and FFS payment systems.

In the capitation payment system, the main issue arising is the question of poor quality of care in social insurance and in networks using a capitation payment method. This is because in capitation payment methods, facilities tend to use fewer diagnostic tests, the patients have shorter consultation times, and higher levels of referrals. In the MEDSEC network, FFS within a total budget is applied to hospitals. This FFS payment system is similar to the payment system in Germany. However, some experiences of advantages and disadvantages of general FFS are relevant for the evaluation of quality of care and for the study of the payment system of networks. The main points are that in general FFS payment systems, the insured perceive a high level of satisfactory care but the technical quality of care especially in terms of cost effectiveness is doubtful. This is because perhaps there is supplier-induced demand for care by the doctor, high cost drugs used, little cost-consciousness, high cost of diagnostic tests, and repeat visits and consultations. In contrast, some advantages in FFS that should be considered in this study are: acceptable attractive premises, no excess referrals, no under investigation, high courtesy and prompt service, and well organized and equipped surgeries.

2.4 Summary

Provision of care under social insurance is characterised by either the direct or indirect pattern. To organise provision of care, coordination among the major existing institutional providers, and presence of actual private sector and the sufficiency of public health care should be considered. Increasing the efficiency in provision of care can be done through third party financing, well organized referral systems and PHC principles. In Thailand, the provision of health care pattern follows the indirect pattern with a system of networks and some organizational characteristics similar to HMOs.

Managed competition, strongly promoted in the USA, enhances financial incentives to control costs even for HMOs. As considering HMO characteristics, HMO plans have had managed competition aims, especially a high priority to control hospital costs. The ultimate aim of managed competition is to accomplish equity and efficiency in health care financing and delivery. The experience from successful models of managed care and HMOs in terms of functions of sponsor/purchaser can be considered for adaptation in Thailand to improve effective functioning of the network offices.

HMOs in the USA have been growing quickly over time since 1970. Traditional insurance programmes are responding to HMO competition by implementing utilization review efforts and introducing financial incentives to reward provider efficiency, especially regarding hospital services. However HMOs have shown their ability to lower cost and increase better health outcomes than FFS care. HMO patients have lower hospitalization rates than patients in traditional insurance programmes. Inpatients of HMO networks use significantly fewer resources than inpatients in either IPA or FFS plans. This difference gives network HMOs a competitive advantage in the market. Other advantages of HMOs are higher patient satisfaction, more patient information provided, more preventive care, greater disease prevention, more treatment planning, and more choice of medical supplies used for the patients.

From the experience of HMOs in developing countries especially in Chile, well organized and planned actions in terms of legal changes in health care framework can improve low coverage of the scheme. This experience can be adapted for other developing countries to expand the social insurance coverage.

In the payment system, 4 standard payment prototypes have been used to pay providers: capitation, FFS, global budget, and DRGs. Mixed systems of payment are selected in many countries to suit their environments. The

relevant experiences from the review of payment systems are capitation and FFS method.

In capitation payment systems, the main advantages are continuity of care, maintaining of the doctor-patient relationship, less abuse of overtreatment, and the administration is uncomplicated to handle. There are some dangers: critical complaints such as cost shifting from SSF to a third party payment fund of automobile insurance which pays more, shorter consultation time, no additional incentives to provide treatment, moral hazard induced by the patient in case of zero copayment, questions of poor-quality services due to too few diagnostic tests and overused deputising services, and high level of referrals. Some interventions proposed to diminish these obstacles are capitation system with special payments for 'good practice' as in the UK, and including some FFS component in the capitation payment as in Denmark. However the main concern over using capitation payment in Thailand is the question about poor quality of care.

Payment to hospitals in the MEDSEC network is FFS within a total budget set by capitation. In general the FFS system offers advantages: doctor's incentive to provide the services, acceptable attractive premises, no excess referrals, no under investigation, high courtesy and prompt service, well organized and equipped surgeries, good morale due to adequate fees, high autonomy and clinical freedom, and high level of satisfaction of the insured. The dangers of FFS are supplier-induced demand by the doctor, unpredictable cost, poor geographical distribution of care, high cost drugs used, little cost-consciousness of the direct costs of services on both patients' and doctors' sides, no integration of services, lack of continuity of care, little continuing education and holiday for the doctor, high administrative costs, high/rising and unpredictable costs, high cost of diagnostic tests, and repeat visits and consultations. However, some of these experiences are applicable for the evaluation of quality of care and for the investigation of payment system of networks.

Chapter 3
Methodology

The overall aim of the study is to present health policy recommendations about health care provider networks in social insurance in Thailand which would improve the accessibility to care of the insured, their satisfaction, quality of care, and the payment system within the network. To achieve the recommendations an appropriate tracer network, the MEDSEC network, was examined. And to derive policy recommendations, a relevant comparison group, Nopparat network, is selected. The main objective of this study is to evaluate the MEDSEC network in terms of organization, payment system, quality of care, behaviour and utilization rate of the insured, and to compare selected aspects with the Nopparat network. The specific objectives are to examine:

> -how MEDSEC network was set up and how it has grown over time
>
> -payment system to MEDSEC providers
>
> -the utilization rate of MEDSEC/Nopparat facilities
>
> -the health seeking behaviour of the insured of MEDSEC network
>
> -satisfaction with the services of the insured of MEDSEC network
>
> -quality of care by comparing the infrastructure and inpatient satisfaction between MEDSEC/Nopparat networks, and analyzing outpatient prescriptions and inpatient medical records between the insured/noninsured in MEDSEC facilities.

3.1 Background

Apart from the capitation payment, the SSO also pays some amount of money to subsidize the high cost of treating certain diseases, and in case of emergencies and accidents there is a reimbursement mechanism for the insured to seek care from any facility. Moreover, as the SSA has brought the issue of regulating quality of care into focus, an additional quality promoting payment mechanism has been proposed to control and encourage quality of care. This additional payment is paid by SSF in 2 ways:

> - Payment for complete report to SSO The SSO will pay 30 Baht/worker/year to any main contractor that has completed the service activities monthly report requested by SSO for ≥ 7 months/year. This report is for calculating the utilization rate of individual main contractors and for assessment of the scheme.
>
> - Payment for more services The SSO will pay some amount of money to encourage the main contractor to provide adequate care such as paying 10, 20, 30, 40, 50, 60, and 70 Baht/worker/year to the main contractor that provides services to the worker at the percentile of utilization rate of 31-40, 41-50, 51-60, 61-70, 71-80, 91-90, and 91-100 respectively.

Main contractors are contracted by the SSO to provide care for the insured. In 1990, the first year of introducing social insurance, the registered hospital, the main contractor, was selected by employers on behalf of their employees. This has probably contributed to the problem of low utilization rate of the insured. To solve this problem, the method of selecting main contractors has been changed to allow the insured to select their main contractors individually, starting from 1992. In 1992 there was only 1 province out of 72 using this method, which increased to 19, 44 and 60 in 1993, 1994 and 1995 respectively. After changing this method, the number of workers selecting main contractors increased from 56,446 (2.0% of the insured) in 1992 to 1.3 million (36.7% of the insured) in 1995.

3.2 Conceptual framework of the study

Figure 3.1 shows that the insured, employers and employees, are the consumers. The SSF collects contributions from government taxes, and employees and employers. The SSF shares some similar characteristics with the 'sponsor' in successful models of managed competition (Enthoven 1988). It can be viewed as a broker which structures the coverage, contracts with the consumers and providers regarding the rules of participation, manages the enrolment process, collects contributions from the insured, pays a premium to providers, and organizes the risk sharing fund. After employers or employees choose a main contractor, the sponsor contracts with the main contractor, who is paid by capitation. There are 2 forms of subcontracts between main contractors and providers: direct and indirect subcontracts. Relationship between main contractor and providers is indirect where the main contractor contracts with a network and then the network subcontracts with providers. Some networks are operated as indirect subcontracts such as MEDSEC, Mahachai, and Krungthep networks. The biggest is MEDSEC network. In 1995, the main contractors of MEDSEC network were Pattaya Memorial, Parkket, and Veteran hospitals. MEDSEC who executes a network, can be viewed as a purchaser because the SSO pays main contractors who pass it to MEDSEC, and then MEDSEC manages this budget and contracts with subcontractors. In the MEDSEC network, providers are made up of first level care (clinics/polyclinics), second level care (small hospitals), and third level care (general and/or specialized hospitals). Patients are referred from the first to the second and then to the third level if they need higher level care. In the direct subcontract the main contractor acts as a provider as well as a purchaser. The first and second level providers act the same as in the MEDSEC network but there is no third level care because the main contractor acts as the third level provider itself. There is choice of provider for first and second level care in both direct and indirect subcontracts.

Figure 3.1 the conceptual framework
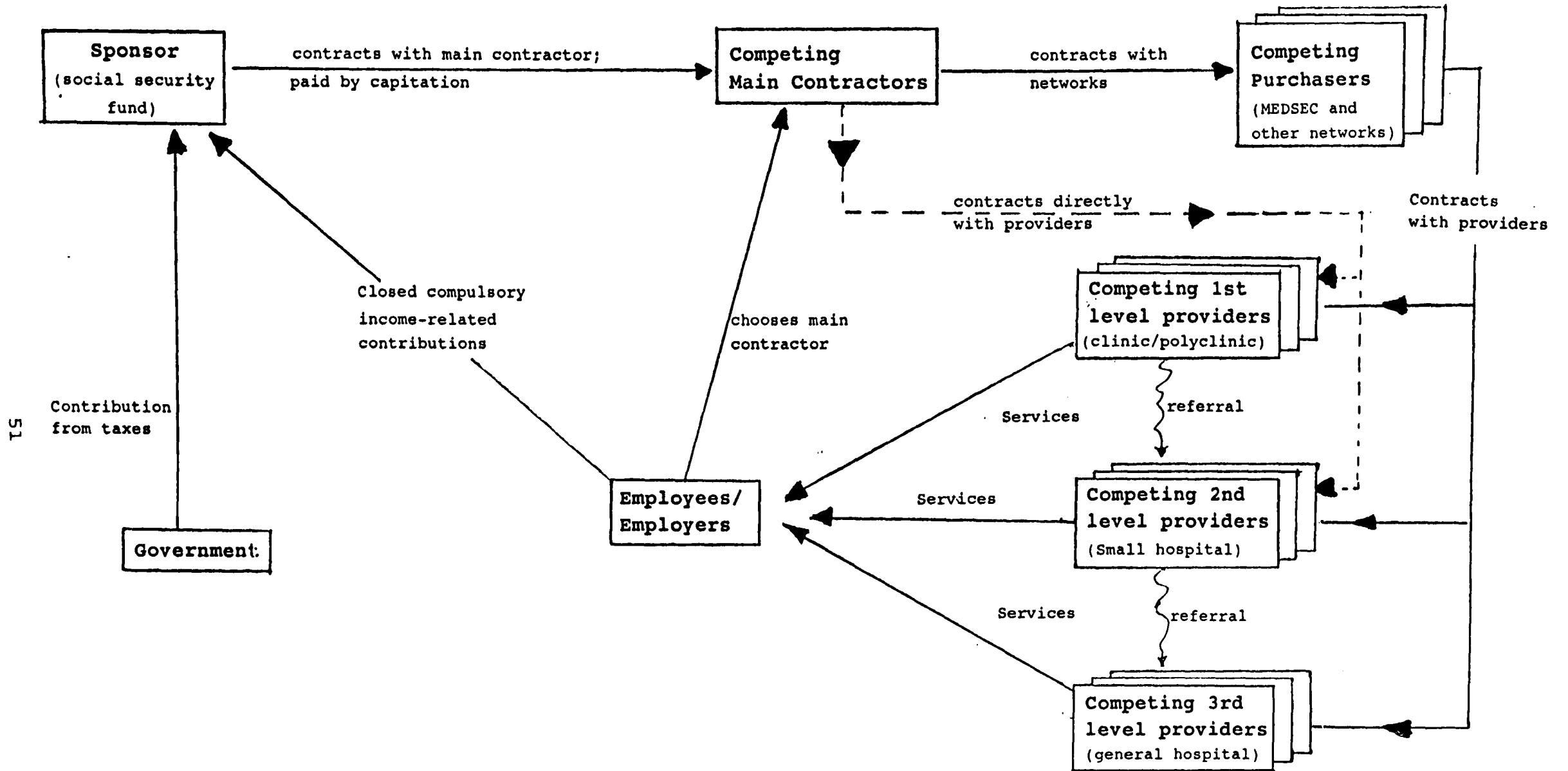
Source: Adapted from OECD, The Reform of Health Care Systems, 1992.

In this study, MEDSEC is selected as a tracer network and Nopparat is selected as a comparative network. They were chosen for comparison because of the differences in the inherent nature of being public/private. The nature of the private sector is to gain their highest profit from the business. But in the public sector, the mandate is to render their services with acceptable quality to all groups of the population. In MEDSEC, there is the characteristic of the profit incentive. To acquire more profit, the networks have to control cost, and ensure quality of products - services - to satisfy and attract more insured to the network. Therefore MEDSEC is likely to operate more cost-consciously to save their business profit than Nopparat network. In Nopparat, the general capital and man-power costs are mainly paid by annual global budget. The capitation budget paid from the SSF to public facilities is considered as running cost while in the private sector there are no other budgets to pay for the capital and man-power cost. These cause a difference in their available resources such as general premises, wards, operating theatre, laboratory equipment, and professional personnel. Moreover they are different in their management by being direct or indirect models of subcontracting, and the payment system within the network. The comparison between these 2 networks is carried out to explore which may be the more effective network in terms of quality of care.

In addition, in the evaluation of outpatient and inpatient treatment, the noninsured in the same selected private network facility were compared with the insured. This was to assess the effects of capitation payment method of the insured which is different from the noninsured (FFS basis). The difference in payment systems may result in differences of quality of care. Moreover as in the MEDSEC network, the providers have profit motives, the comparison between the insured/noninsured is of concern to assess the effect of capitation payment to a private provider.

In terms of the conceptual framework, this study looked at the networks from consumer, provider, and purchaser perspectives. And to meet the objectives of this study, 4 substudies were carried out (table 3.1).

Table 3.1 Summary of substudies by sample size, comparison groups, means of data collection, and study duration

Substudy	Sample size	Comparison groups	Means of data collection	study duration
1 Operating & financial system, and charge rate of MEDSEC; and Utilization rate of MEDSEC/Nopparat networks	-	-between MEDSEC/Nopparat networks (only for utilization rate)	in depth interview with MEDSEC manager/staff, data collection by trained interviewers	Nov 1994
2 Provider's knowledge & attitude	4 clinics, 4 small & 1 general hospitals*	-	in depth interview with manager of MEDSEC facilities by a medical doctor	Mar 1994
3 The insured: health seeking behaviour, utilization rate, knowledge, and satisfaction	750 workers	-	structured questionnaire interview by trained interviewers	Dec 1994 to Feb 1995
4 Service quality evaluation 4.1 infrastructure analysis of MEDSEC/Nopparat networks	61 MEDSEC facilities, 31 Nopparat facilities	-between MEDSEC/Nopparat network	postal questionnaire	Jan-Mar 1995
4.2 inpatient satisfaction of MEDSEC/Nopparat networks	271* inpatients of MEDSEC, 128 of Nopparat hospitals	-between MEDSEC/Nopparat network	structural questionnaire interview by trained nurses	Jan-Feb 1995
4.3 prescription analysis of the insured/noninsured of MEDSEC network	1,000 of the insured, 1,000 of the noninsured	-between the insured/noninsured of MEDSEC facilities	collected from 4** hospitals by trained nurses	Jan-Jun 1994
4.4 medical record analysis of the insured/noninsured of MEDSEC network	800 records from 4** MEDSEC small hospitals	-between the insured/noninsured of MEDSEC facilities	collected from 4** hospitals by trained nurses,	Aug-Oct 1994

Note: * Parkket, Rama-Suksawat, Ram-Intra, Wicharn-Yut, and Wipawadi-Rangsit hospital
      ** Rama-Suksawat, Ram-Intra, Wicharn-Yut, and Wipawadi-Rangsit hospital

3.3 Choice of sample within networks

3.3.1 MEDSEC network The network is divided into 2 areas, the Eastern Group (EG) and the Greater Bangkok Group (GBG). For GBG, it is divided into 4 subnetworks namely: Ram-Inthra Group (RIG), Rama-Suksawat Group (RSG), Eastern Bangkok Group (EBG), and Central Bangkok Group (CBG). In a subnetwork, there are clinics/polyclinics and small hospitals. There is a difference in the number of clinics/polyclinics and small hospitals within the subnetworks. Geographically, the consumers have unequal choices of services from different numbers of facilities in the subnetworks. There are also likely to be differences in quality of care and prices charged between subnetworks. Therefore, for MEDSEC network, subnetworks were considered as a sample group. Simple random selection was applied to select a sample hospital from each subnetwork. The selected sample hospitals were Rama-Suksawat, Ram-Intra, Wicharn-Yut, and Wipawadi-Rangsit hospitals.

3.3.2 Nopparat network There is no subnetwork in the network. Consequently, for the Nopparat network, no sample group was classified.

3.4 Rating scale in questionnaire

Since many attitude questions were asked in substudies, the 5 points scale questionnaire was applied. This is because it is the most frequently used, the easiest to understand, and is generally sufficient for most purposes (Hoinville et al., 1989). The rating scale is not an absolute measure of attitudes but is a way of placing people in a relative position on a dimension.

3.5 Substudy 1; the operating system, financial management, and charge rate for medical care of MEDSEC; and the utilization rate of MEDSEC/Nopparat networks

The objective of this substudy was to identify how the MEDSEC network was set up and how it has grown over time, and the payment system to providers of MEDSEC; and to examine the utilization rate of MEDSEC/Nopparat networks. To collect data for the study, in-depth interviews by trained interviewers with MEDSEC staff and secondary data collection by using a guideline (form No.1, annex 1) from the MEDSEC office were carried out in November 1994 concerning the historical development of the MEDSEC network, current contractual relationships within the network, marketing and propaganda system, quality control mechanisms, incentive payment system to employers and doctors, recent details of the payment system, relationship between facilities, mechanisms to cope with unexpectedly high reimbursement for some diseases, referral system and management system within the network,

price competition of inpatient services between hospitals, reason of the insured to select care from a particular facility, charge rate, and bonus system. For the utilization rate, data were collected from MEDSEC and Nopparat records and then the result was compared to the utilization rate of studies concerning social insurance services in Samutprakarn (no provider network) by Tangcharoensathien et al. (1993) and Kamolrattanakul et al. (1993).

3.6 Substudy 2; the knowledge and attitude of the MEDSEC facility's managers

The objective of this substudy was to identify from the provider perspective how the MEDSEC network was set up and how it has grown over time, and the payment system to MEDSEC providers.

3.6.1 Sample group and sampling technique
Quota technique was applied to propose 9 facility managers to be interviewed. As the MEDSEC network has been classified to be 4 subnetworks, 4 clinics/polyclinics (1 from each subnetwork) and 4 small hospitals (1 from each subnetwork) were selected by multistage cluster random sampling technique. One general hospital was selected by simple random sampling technique to represent general hospitals of the network.

3.6.2 Research design
In this substudy the research design is a cross-sectional descriptive study. In-depth interviews was carried out by a researcher (medical doctor) with the managers of selected providers by using a guideline (Form no.2, annex 1) in March 1995. The collected data were analyzed and discussed according to the tropics in a guideline (annex 2).

3.7 Substudy 3; knowledge, health seeking behaviour, utilization rate, and satisfaction of the insured of MEDSEC network

There are factors influencing the low utilization rate such as limited facilities, 1 main contractor only available for workers to seek care, employer choosing registered hospitals on behalf of the employees, poor understanding of SSO regulations, and low satisfaction with medical care. Therefore it is necessary to examine the knowledge, health seeking behaviour, utilization rate, and satisfaction of the insured for the MEDSEC network. As it is the biggest network, operated in the extended coverage area in Bangkok, and held the positive characteristics of profit incentives; it was worthwhile to study the utilization rate of the insured of MEDSEC network.

<u>3.7.1 Conceptual framework</u>

Factors affecting the health seeking behaviour of the insured can be classified into 3 groups: general characteristics of the insured, knowledge and attitude of the insured about SSA, and other factors (figure 3.2). These factors also affect the satisfaction of the insured namely: accessibility, hospital's first point reception, waiting time, friendliness of staff, doctor-patient interaction, cleanliness, and medical care quality.

The hypotheses of this substudy are that the accessibility of care for the insured of a private network is better than without a network, and the patient's satisfaction with the services of a private network is better than with a public contractor (no network facilities). The main objective of this substudy is to identify the health-seeking behaviour of the insured of the MEDSEC network, the utilization rate (based on data from interviews with workers), the insured's knowledge about social insurance, and the satisfaction of the insured with the MEDSEC network compared with their previous experience with public contractors (no network facilities). The factors which are investigated are factors concerning knowledge/attitude about social insurance, and accessibility of the insured. For the characteristics of MEDSEC providers, they are identified in an other substudy. The utilization rate of the insured is compared with data from MEDSEC/Nopparat network records, and a study of nonnetwork providers in Samutprakarn by Tangcharoensathien et al. (1993).

Figure 3.2 Conceptual framework of consumer substudy


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                        ┌─────────────────────┐
                        │  Factors affecting  │
                        │   health seeking    │
                        │     behaviour       │
                        └─────────────────────┘
```

Characteristics of the insured	Knowledge/attitude of the insured about SSA	Other factors
-Age -Sex -Educational status -Economic status -Marital status -Characteristics of job	-Social security card -Name of main contractor & network facilities -Working hours of the facilities -Preferring to choose main contractor -Diseases covered & uncovered by SSA -Proper person to educate -Benefits covered -Process of services -Reimbursement for emergency and general treatment expenditure	-Knowledge about natural history of disease -Accessibility -Working hour of the insured/day -Period of working/day -Medical service in the firm. -Other culture/social belief -Characteristics of provider

Receive care from MEDSEC		Receive care from others

Satisfied/unsatisfied

-Accessibility
-OPD reception
-waiting time
-Friendliness
-Doctor-patient interaction
-Cleanliness
-Medical care quality

Note: Adapted from Tangcharoensathien et al. (1993).

3.7.2 Sample size, sample group and sampling technique

In the absence of better information, the sample size for this substudy was calculated by using the proportion of insured workers when ill using outpatient services at registered hospitals (from the study in Samutprakarn, Tangcharoensathien et al., 1993) which is a relevant proportion (0.22) because the sample groups of the MEDSEC network and of the study in Samutprakarn share almost the same occupational status. This study is designed to estimate it within $\pm$ 0.05. Applying the formula (adapted from Armitage and Berry, 1987):

$$\text{Sample size} \geq (Z_X + Z_B)^2 \times \frac{P(1-P)}{(tol)^2}$$

When Z_X = Z-score at the sensitivity 95% = 1.96

Z_B = Z-score at the specificity 80% = 1.28

P = Expected proportion from this study = 0.22

tol = Accepted tolerance error in proportion = $\pm$0.05

Therefore   Sample size $\geq (1.96 + 1.28)^2 \times \frac{0.22(1-0.22)}{(0.05)^2}$

$\geq$ 720.6

The number of studied employees needed to be $\geq$721. The number of workers in a company varies from 10 to 3,500 with the peak between 100-450/firm. To avoid selecting too small or too large a company which is not appropriate for comparison, the number of workers in 4 selected companies was proposed to be about 100-450.

To provide the geographical coverage of the sample firms in all areas of Bangkok, companies were classified into 4 groups by using the 4 subnetworks of the MEDSEC network. In each subnetwork group, companies were categorised into 2 groups by reason of having previously selected public or private as a main contractor. A simple random sampling technique was applied to choose 2 subnetwork groups for private group sample representatives and 2 subnetwork groups for public sample representatives. Simple random sampling techniques were applied to choose 1 company which had about 100-450 workers from the 4 subnetwork groups to provide 2 companies in which the insured had experience of choosing private main contractors and 2 companies in which the insured had experience of choosing public main contractors before (figure 3.3). This was for comparison of the result of experience in public/private facilities. All the workers in the selected companies were interviewed using structured questionnaire (form No.3, annex 1).

Figure 3.3 Sample groups and sampling technique in consumer substudy

ALL WORKERS FROM ALL COMPANIES

Companies classified by subnetworks and experience of having selecting private or public main contractors before

Subnetwork 1

Companies having selected **private** main contractors before

Companies having selected **public** main contractors before

Subnetwork 2

Companies having selected **private** main contractors before

Companies having selected **public** main contractors before

Subnetwork 3

Companies having selected **private** main contractors before

Companies having selected **public** main contractors before

Subnetwork 4

Companies having selected **private** main contractors before

Companies having selected **public** main contractors before

Simple random sampling 2 subnetworks for private and 2 subnetworks for public experience groups

Subnetwork

Companies having selected **private** main contractors before

Subnetwork

Companies having selected **private** main contractors before

Subnetwork

Companies having selected **public** main contractors before

Subnetwork

Companies having selected **public** main contractors before

Simple random sampling to select 1 company with 100-450 workers

Simple random sampling to select 1 company with 100-450 workers

Simple random sampling to select 1 company with 100-450 workers

Simple random sampling to select 1 company with 100-450 workers

A company (100-450 workers) having selected **private** main contractors before

A company (100-450 workers) having selected **private** main contractors before

A company (100-450 workers) having selected **public** main contractors before

A company (100-450 workers) having selected **public** main contractors before

For the health seeking behaviour investigation, a period of time was defined to include sickness episodes. A recall period of 1 month for minor acute morbidity and 6 or 12 months for major morbidity which needs admission to hospital were used to identify the sample groups. Although the best period to recall perceived morbidity is 2 weeks (Kroeger, 1983), when incidence rate is considered, a month period should be applied because there is a more accurate number of episodes included (Ross et al, 1984). Nchinda (1977) also supports that there was a considerably higher morbidity rate/week of recall when the period was 4 weeks (5.4%/week) relative to 2 weeks (2.2%/week). Admission to hospital for ≥ 1 night is a clearcut event for the patient to remember even with a long recall period such as 12 months (Cartwright, 1983). Because of the problem of changing main contractors during a 12 months period, workers in the selected firms were interviewed about admission to hospital within 6 months, or 12 months if the firms had selected the MEDSEC network continuously for >1 year.

3.7.3 Research design   In this substudy the research design is a cross-sectional descriptive study.   Interview was carried out by trained interviewers between December 1994 - February 1995.

3.7.4 Development of questionnaire

Two firms which were not selected groups were randomly selected. Eight workers/firm were selected by quota technique. Group discussion was carried out with the selected workers once in each firm to identify proper questions for the structured interview questionnaire of workers and for the structured interview questionnaire of inpatients admitted to MEDSEC network and Nopparat hospital in the substudy of assessing the satisfaction of inpatients of MEDSEC/Nopparat networks. The group discussion was concentrated within the guideline (annex 2) and led by a researcher. A pretest of the questionnaire was carried out with 60 workers of 2 firms, 30 from each firm. Then the structural questionnaire was corrected according to the pretest result.

Collection of data from the employers in the selected firms was also carried out by in-depth interview using guideline (form No.4, annex 1), and from existing records. These data were analyzed to look at:
   - performance of the worker before/after the contract with MEDSEC by looking at the rate of absenteeism of the workers, and the profit of the firm
   - incentive payment from MEDSEC to employers
   - marketing approach of MEDSEC
   - principle of choosing main contractor
   - reason why they chose MEDSEC network
   - employers' perception of services of providers in the network.

3.8 Substudy 4: Evaluation of quality of care

The objective of this substudy is to explore the quality of care of facilities of networks by measuring infrastructure and satisfaction of inpatients between MEDSEC/Nopparat networks, and analysis of outpatient drug prescriptions and inpatient treatment between the insured/noninsured of MEDSEC facilities.

3.8.1 Approaches of quality assessment

Broad indicators to evaluate the potential quality of services of hospitals are quality of administration and management, patient care, buildings and equipment, essential drugs (Thompson and Edwards, 1991), prescriptions (Hogerzeil et al, 1993), and inpatient care (Phijaisanit et al., 1985).

Donabedian (1980) defined the balance of health benefits and harms as the essential core of the definition of quality. Donabedian (1988a) stated that the purpose of assessment was to pass judgment on the quality of health care itself; regardless of whether the service was rendered by practitioners or institutions, implemented by patients or used by the community. There are 3 approaches to assess quality:
- **Structure** refers to
    - material resources: facilities, equipment, drugs, and money
    - human resources: the number and qualifications of personnel
    - organizational structure: medical staff organization, methods of peer review, and methods of reimbursement.
- **Process** includes
    - the patient's activities in seeking care and carrying it out
    - the practitioner's activities in making a diagnosis and recommendation or implementing treatment such as drug prescription, medical records
- **Outcome** refers to
    - an improvement of patient's knowledge and beneficial changes in behaviour
    - the degree of patient's satisfaction with care
    - other changes which contribute to the patient's current and future health (Donabedian, 1988b).

In the assessment of quality of care, it is vital to specify criteria, norms, and standards which tune the relevant attributes of structure, process, and outcome (Donabedian, 1981). There are 2 main types of criteria: implicit and explicit (Donabedian, 1988a), and some intermediate forms between these 2 main criteria.

In the implicit criteria, an expert uses an unspoken rule when he decides to give information about a case and is asked to use confidential knowledge and experience to judge the value of the process of service or of its outcome (Donabedian, 1988a). The important advantage of implicit criteria is the adaptability to a particular case if the reviewer is qualified and accomplished in the task (Donabedian, 1988a). However, it is remarkably expensive and rather ambiguous because there is a lack of accurate guidelines for quantification and limited knowledge on the part of the reviewer.

In the explicit criteria, rules are defined in great detail usually by a panel of experts. There is little room for judgment by the reviewer. The major advantages are that the method is standardized and easy to use. The disadvantages are that it is expensive and difficult to develop criteria, it may not be relevant to the situations of practice, it may not be flexible to the different characteristics of particular cases, and it may not appropriately represent what is more or less effective in improving health.

The difficulty has been controlled by designing the criteria which apply. The criteria are usually used only to classify cases into those which are likely to be well managed and those which are not. Then the cases are reviewed by using the implicit criteria (Donabedian, 1988a). There are 2 basic defects in criteria design: deficient adaptability to the certain characteristics of each case and deficient notice regarding the relative importance of criteria items influencing the outcomes of services. Donabedian (1988a) recommended that the first defect can be corrected by using an improved form of criteria maps and the second by initiating a set of weights based on the contribution of specified progression in the criteria maps to the outcome of service.

In this substudy, especially in analysis of inpatient care, the explicit criteria is applied. Rules and definitions were clarified by panels of medical experts.

To measure the functions of the health care system, each distinguished health problem needs to be traced in relation to another (Kessner et al., 1973). The tracer method is developed to measure both process and outcome of health care. Donabedian (1988b) recommended that the sampling technique should be either simple or stratified random sampling because cases are classified by diseases/conditions. In the "tracer method", patients may be first classified by subdivisions of the area of health service in general (Kessner et al., 1973). Then ≥ 1 purposively selected categories of patients, identified by diagnosis or otherwise, can be assumed to characterise clinical achievement of the service for the group. However

the tracers are selected and combined corresponding to the criteria. There are 6 criteria for selecting appropriate tracers:

- A tracer should have a definite functional impact
- A tracer should be relatively well defined and easy to diagnose
- Prevalence rates should be high enough to permit the collection of adequate data from the limited population sample
- The national history of the condition should vary with utilization and effectiveness of medical care
- The techniques of medical management of the condition should be well defined for ≥ 1 of the following processes: prevention, diagnosis, treatment, or rehabilitation
- The effects of the nonmedical component on the tracer should be understood (Kessner et al., 1973).

Another approach to sampling is to begin with cases suffering from adverse outcomes and study the process of treatment that has influenced it. If the outcome is uncommon and destructive every case might be reviewed (Donabedian, 1988b). There is some evidence that, under particular conditions, this method will distinguish a very high proportion of critical deficiencies in the process of care, but not of deficiencies that are less critical (Mushlin and Appel, 1980).

In this substudy, the tracer method was applied to analyze outpatient drug prescriptions and inpatient medical records.

In this substudy, selecting 3 approaches (structure, process, and outcome of services) to assess the quality of care of networks is reasonable since good structural characteristics increase the probability of good process of care, and good process of care increases the possibility of providing specified changes in the health and well-being of a particular person and population (Donabedian, 1988a, 1988b). Although the structural characteristics are rather blunt instruments in quality appraisal, the assessment of this part is necessary. This is because good structural characteristics yield good kinds of care (Donabedian, 1988b).

In process quality assessment, reports exist from many countries mentioning problems of drug prescription problems: polyphamacy; multiple prescriptions; fixed combination drugs; and too frequent use of antibiotics, vitamins and injections. Many studies agree that there is commonly inappropriate use of drugs to treat specific problems such as use of tetracyclines for children, chloramphenicol for minor infection, dypyrone as an analgesic, antidiarrhoeal antibiotics for diarrhoea where ORS will do (Ross-Degnan et al, 1992). In Thailand where capitation payment is applied in social insurance, the most serious disadvantage is the risk of poor-quality service rendered by some providers due to

undertreatment, overusing unreasonable drugs. Therefore analyzing prescriptions is essential to measure the quality of care.

Donabedian (1988b) stated that all the success in quality assessment depends on available, suitable, and accurate information. The major source of information regarding the process of care and current outcome is the medical record. But it is usually incomplete, especially missing vital parts of technical care and interpersonal process. Moreover, other essential information such as diagnostic tests, clinical observation, and clinical assessment is unfortunately inaccurate. However in the MEDSEC network, the insured outpatient prescriptions and inpatient medical records were crucially requested to be completed when they were sent to MEDSEC office to obtain reimbursement of the medical fee. For the noninsured, since the payment of the noninsured was FFS basis, the outpatient prescriptions and inpatient medical records of the noninsured tended to be completed because the calculation for the patient fee needed a complete medical record. Therefore it is worthwhile to analyze the outpatient prescription and inpatient medical records of the insured/noninsured of MEDSEC network.

In outcome quality assessment, there are patient characteristics convincingly related to patient satisfaction (Health Services Research Group, 1992). Satisfied patients are likely to carry on with their doctor, keep appointments, follow with treatment, refer other patients to their doctor and receive treatment. This satisfied behaviour of patients should improve the medical treatment outcome if the health care provided is of high technical quality. The validity of patients' judgments about interpersonal variables and issues of accessibility and availability tend to be accepted.

Furthermore, consumer ratings of interpersonal aspects of care seem to be reliable and valid (Health Services Research Group, 1992). These ratings seem reasonably correlated with those of the technical quality (Hulks et al., 1970). The doctor's interpersonal practice when providing simple medical treatment such as upper respiratory infection(URI) may affect a patient's assessment of technical aspects of service. Therefore, in the outcome assessment, the degree of patient's satisfaction with care is an appropriate measure. This is because the patient's satisfaction would affect the medical treatment outcome. It may be judged to be 1 of the desired outcomes of care (Donabedian, 1988b) because other outcomes are difficult to measure or develop some time after treatment.

The process of patients in seeking care is a possible measure in the process assessment. It is worthwhile because the continuity or increase

in the proportion of the insured seeking care from the registered facility is an indicator to assess the quality of care.

In this substudy the selected aspects of quality assessment are:
- Structure of MEDSEC/Nopparat networks which involves material resources, human resources, and organizational structure
- Outcome which is the degree of inpatients' satisfaction with care of MEDSEC/Nopparat networks.
- Process includes outpatient drug prescription and inpatient treatment between the insured/noninsured

3.8.2 Analysis of infrastructure of MEDSEC and Nopparat networks

The objective of this substudy is to evaluate the quality of care of MEDSEC/Nopparat networks by analysis of infrastructure compared between MEDSEC/Nopparat networks. The hypothesis of this substudy is that the infrastructure of a private network is better than of a publicly-organized network.

- Distribution of facilities Address of all facilities (124) of MEDSEC network were identified and mapped. Coverage of workers by district of Bangkok, facility, and subnetwork was carried out to identify the work-load and accessibility.

- Sample group, sample size, and sampling technique Sample groups of the MEDSEC network were classified to be 5 groups: 4 subnetworks of the MEDSEC network and 1 general hospital group. Because the total number of facilities of MEDSEC network is 124 and of Nopparat network is 50, the ratio of sample size of MEDSEC:Nopparat network should be about 2:1. Because of difficulty in access to all the facilities' managers, a quota technique (about 50% of facilities) was applied. The sample size of MEDSEC facilities was taken as 61. Thus the sample size of Nopparat network was 31. Simple random sampling technique was applied to choose 15 facilities from each subnetwork, and 1 general hospital from the general hospital group. For the Nopparat network, 30 facilities were also selected by using simple random technique. The Nopparat hospital which is the only 1 general hospital of the network also was purposively selected.

- Research design In this substudy the research design is a cross-sectional descriptive study. A postal questionnaire was sent to selected facilities of the MEDSEC network by the director of the MEDSEC office, and to selected facilities of Nopparat network by the director of Nopparat hospital during January-March 1995. Attached to each postal questionnaire there was a letter requesting the facility managers to answer the questionnaire faithfully because it would be used for monitoring the

structure of a particular facility every 6 months. This affected the validity of the data from the answered questionnaire. Therefore by this means the postal questionnaire was appropriate for the data collection.

- indicators and questionnaire development Adapting from the questionnaire for evaluating contracting out hospitals of South Africa by Broomberg, J. (1994), the draft questionnaire was structured. The indicators in the questionnaire can be grouped into 6 sections: general administration, outpatient service, laboratory and X-ray, pharmacy, operating and delivery room, and inpatient ward.

The draft questionnaire was sent to 4 clinics, 2 small hospitals, and 1 general hospital of the MEDSEC network which were not those sampled for pretesting. The finalized questionnaire (from No.5, annex 1) was corrected and used.

3.8.3 Measuring the satisfaction of inpatients of MEDSEC/Nopparat networks

The objective of this substudy was to evaluate the quality of care of networks by measuring the satisfaction of inpatients in MEDSEC/Nopparat hospitals. The hypothesis of this substudy is that the insured of a private network are more satisfied with inpatient treatment than the insured of a publicly-organized network.

- Research design In this substudy the research design is a cross-sectional descriptive study. Inpatients were interviewed by trained nurses (one from each hospital) using a structured questionnaire (form No.6, annex 1) during January-February 1995. The interview should be carried out on the last day of an admission. This is because patients are likely to be willing to express their opinions if they are about to be discharged. However, the most effective means of satisfactory assessment is by postal questionnaire. This is because in the interview by structured questionnaire, patients are likely to be unwilling to express their opinions. But the reason for the use of a structured interview was because the response rate to mail questionnaires in Thailand is very low (<30%).

- Sample group, sampling technique, and sample size This substudy was to compare inpatient satisfaction between MEDSEC/Nopparat networks. Four selected hospitals mentioned in section 3.3.1 and Parkket hospital (selected from the general hospital group of MEDSEC network by simple random sampling technique) were sample groups for the MEDSEC network. For Nopparat network, there is only 1 hospital of >50 beds, Nopparat hospital. Therefore the selected hospital as a sample group was Nopparat hospital.

There was not enough information about insured inpatients under the SSA to estimate the proportion of satisfaction. So the sample size for this substudy was decided to be 300 for MEDSEC and 150 for Nopparat networks. Data from MEDSEC office shows that, in 1994, there were about 30 workers/month admitted to hospital. From this figure and the total sample size (300), the sample size for each individual MEDSEC hospital was classified as: 65 for each of the 4 small selected hospitals, and 40 for Parkket hospital. From MEDSEC data (1994), it is shown that the ratio of secondary:tertiary care was 10:1. In this substudy the ratio of sample size of secondary:tertiary care of MEDSEC hospital was set up to be 7:1 to provide the number of sample size of a hospital to be >30 to ensure comparison between hospitals.

However from the data collection, there were 271 and 128 cases collected from MEDSEC and Nopparat respectively. According to the sample size calculations outlined below, the number obtained in this substudy has 75% power to detect a difference of 12.5%.

$$\text{Sample size } n1 \geq \frac{f(a,b)^2 \ [P_1(1-P_1) + r \ P_2(1-P_2)]}{(d)^2}$$

Where:

$$f(a,b)^2 = [I^{-1}(a/2) + I^{-1}(b)]^2$$

I = inverse cumulative normal distribution function

P_1 = expected satisfactory proportion in MEDSEC network

P_2 = expected satisfactory proportion in Nopparat network

n1 = sample size for MEDSEC network

n2 = sample size for Nopparat network

r = ratio of number of sample of MEDSEC relative to Nopparat networks

   = n1/n2

d = Accepted tolerance error in proportion = $P_1 - P_2$

Pilot studies have shown P_1 is approximately equal to 0.8. A difference of 0.125, is acceptably important to detect. The ratio of sample size of MEDSEC relative to Nopparat networks was proposed to be 2 due to the total number of the insured of MEDSEC in Bangkok in 1995 being 185,445 and in Nopparat 80,000.

Choose   a = 0.05

          b = 0.2 (80% power)

Then $n_1 = \dfrac{7.83 \ [(0.8 \times 0.2) + (2 \times 0.675 \times 0.325)]}{(0.125)^2}$ = 300

          n_2 = 300/2 = 150

From the data collection, 271 and 128 samples were collected from MEDSEC and Nopparat networks respectively. This provides 75% power to detect a difference of 12.5%.

- Indicators and questionnaire development

McIver (1992) stated that identification of indicators and questions was very important when interviewing for inpatient satisfaction. He also suggested that pretesting of the questionnaire and selecting the appropriate questions is essential. However he recommended classification of the important satisfaction indicators into 5 groups:
-admission activities
-treatment and care
-information and communication activities
-ward environment and facility
-discharge and outcome activities.

After selecting the indicators suggested by McIver (1992), a structured questionnaire was constructed. The questionnaire was pretested with 14 inpatients in a hospital which was not a sample hospital. Then the questionnaire was corrected especially the section of admission group indicators. This is because, in Thailand the GPs and referral system is not the same as in the UK. Finally the indicators were identified (annex 2).

3.8.4 Analysis of outpatient drug prescriptions of the insured/noninsured of MEDSEC hospitals

The objective of this substudy is to evaluate the quality of care of MEDSEC facilities by analysis of outpatient drug prescriptions between the insured/noninsured of MEDSEC facilities. The hypothesis of this substudy is that the insured of a private network have received less effective drug treatment than the noninsured in outpatient service. This is because the payment for the insured is by capitation. In this payment system, there are questions of poor quality of care. Facilities may tend to use fewer diagnostic tests and fewer drugs in order to increase their expected profit.

- Indicators and method   The essential selected drug-use indicators and recommended methods for data collection have been described by Hogerzeil et al. (1993). Such indicators recommended by WHO (1993) are: prescribing indicators, patient care indicators, and health facilities indicators (Hogerzeil et al., 1993). In this substudy, the indicators used are only prescribing indicators because there are no patient care indicators recorded. Some patient care indicators (% of drugs adequately labelled and

patients' knowledge of correct dosage) are studied in the measurement of infrastructure of MEDSEC/Nopparat networks. For the health facility indicators, all study hospitals have a copy of the essential drug lists and key drugs available. Therefore the general indicators in this substudy are average number of drugs/encounter, percentage of drugs prescribed by generic name, percentage of encounters with an antibiotic prescribed, percentage of encounters with an injection prescribed, percentage of drugs prescribed from Thailand Essential Drug List, and average charge/encounter. It is suggested that the higher proportion of generic names and essential drugs prescribed in a prescription the better the quality of care is, but the higher proportion containing >1 antibiotic or an injection the lower quality of care is (Thompson and Edwards 1991, Hogerzeil et al. 1993).

From the 6 criteria for selecting tracers mentioned before, 4 tracers: URI, arthritis, urinary tract disease (UTD), and Hypertension (HPT) were chosen for exploring in more detail in the prescribing analysis. Indicators to measure the quality of care in the tracers are the general indicators that have been mentioned before and amount of each item of drugs prescribed. The detail of treatment of the patients in this study was also compared to the standard treatments adopted from the Food and Drug Administration (FDA) of Thailand which are the gold standard to treat 10 diseases (annex 2), and to the treatment in general medical text books. Detail of reasons to choose 4 tracers are:

> **-URI** It is the most common disease that affects workload, consumes a lot of resources, and is easy to diagnose because of its definite signs/symptoms. There is a gold standard treatment developed by FDA of Thailand.
>
> **-Arthritis** It is a chronic and high cost disease and consumes a lot of resources. The prevalence is high enough to permit the collection of adequate data. There is a gold standard treatment developed by FDA of Thailand.
>
> **-UTD** It is a high cost disease, consumes a lot of resources, and is easy to diagnose because of its definite signs/symptoms. The prevalence is high enough to permit the collection of adequate data. The treatment is well defined in general text books.
>
> **-HPT** It is a high cost disease which affects the financial system. The prevalence is high enough to permit the collection of adequate data. There is a gold standard treatment developed by FDA of Thailand.

- Research design In this substudy the research design is a cross-sectional descriptive study. Prescriptions were collected by trained nurses (one from each hospital) by using a prescribing analysis form (form No.7, annex 1) during January-June 1994.

- Sample group, sampling technique, and sample size

Four selected hospitals mentioned in section 3.3.1 constituted the sample groups in this substudy. An equal number of prescriptions of outpatients both insured and noninsured, were collected from each hospital. This was to compare whether the insured of the MEDSEC network received a less effective drug treatment than the noninsured in the outpatient service.

A random or stratified sample of 20 facilities was recommended, with 30 randomly selected general outpatient encounters/facility (Hogerzeil et al.1993). Previous studies have indicated that this sample size results in a 95% CI of $\pm 7.5\%$. Hogerzeil et al. (1993) argued that since prescription patterns tend to be more uniform within than between health facilities, it is more cost-effective to increase the number of facilities than the number of prescriptions/facility. However, in cases when it is important to describe or compare drug use by individual facilities or prescriber, ≥ 100 prescriptions/health facility or prescriber should be reviewed (Hogerzeil et al.1993). This sample will usually give a 95% CI of $\pm 10\%$. In this substudy the quota technique is applied for the sample size (1,000 for the insured and 1,000 for the non insured). About 250 prescriptions of the insured and 250 of the noninsured from each selected hospital (4 hospitals) were collected during January-June 1994 by using simple random technique. The reason for collecting prescriptions for 6 months was because if it is >6 months, the number of samples in each month might be <30 which is too small for some statistical comparison; and due to the low response of collecting data from private facilities, 6 months is the maximum period accepted by managers of facilities for cooperation in collecting prescriptions. All the 2,000 prescriptions were analyzed according to the general indicators, and casemix of the sample groups; and then prescriptions of the 4 selected tracers were analyzed according to the general indicators, and amount of each item of drugs prescribed.

3.8.5 Analysis of inpatient medical records of the insured/noninsured of MEDSEC hospitals

The objective of this substudy was to analyze the process aspect of quality of medical care of inpatients from medical records of MEDSEC hospitals and to investigate outcome aspects of medical treatment of a disease by postal questionnaire, comparing the insured and noninsured of the MEDSEC network. The hypothesis of this substudy was that the insured of a private network have received less effective treatment than the noninsured in the inpatient service. This is because payment for the insured is by capitation and for the noninsured on a FFS basis. And in FFS, inpatients possibly receive a higher quality of care than in the capitation method because of acceptable attractive premises, no excess referrals, no under investigation, high

courtesy and prompt service, and well organized and equipped surgeries; while in the capitation method, there are questions concerning poor quality of inpatient care probably due to short LOS, too few diagnostic tests and overused deputising services.

- Research design   In this substudy the research design was a cross-sectional descriptive study.   Inpatient medical records were collected by trained nurses (1 from each hospital) during August-October 1994.

- Sample group, tracer selection, and sample size   Four selected hospitals mentioned in section 3.3.1 were the sample groups in this substudy. From a study of Kamolrattanakul, P, et al (1993) it was found that diarrhoea was the most common disease (27.4%) of the social security inpatients.   The second most common disease (16.5%) was acute appendicitis; in this substudy the sample group shared almost the same characteristics as in that study. Thus diarrhoea and acute appendicitis were selected to be tracers in this substudy.   From the 6 criteria for selecting tracers mentioned before, the reason for choosing these tracers were:

> (1) Diarrhoea   affects the service and financial system since it is the most common disease.   It is very easy to diagnose due to having very definite signs/symptoms.   There is a clearcut definition of this disease defined by WHO which has a standard international treatment.   The outcome of treatment is easy to measure.   If any result is discovered, it can be adopted internationally
>
> (2) Acute appendicitis affects the financial management of medical care since it is the second most common disease in this group and it is a surgical condition which has a high cost.   Generally, under the capitation payment basis of social insurance in Thailand, there is no quality and cost control of this disease, therefore it affects both the quality of service and the financial system.   It is easy to diagnose because it has definite signs/symptoms.   There is a well-defined and standard treatment.   If there is any instrument (such as check list or questionnaire) or means for evaluating this disease discovered, it would be applicable internationally.

From the study of Kamolrattanakul, et al (1993), the proportion of insured patients having diarrhoea is 0.27.   To include >200 cases of diarrhoea which is enough for statistical comparison, the sample sizes of the inpatients included in this substudy should be about 800.

Data from MEDSEC office have shown that, in 1993, there were about 70, 60, 50, and 20 workers/month admitted to Rama-Suksawat, Ram-Intra, Wicharn-Yut, and Wipawadi-Rangsit hospitals respectively.   From these admission figures and the total sample size (800), the sample sizes for individual hospitals

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were calculated to be: 280 for Rama-Suksawat, 240 for Ram-Intra, 200 for Wicharn-Yut, and 80 for Wipawadi-Rangsit hospitals.

<u>- Indicator and questionnaire development</u> There are 2 stages of data collection: general and tracer data collection. For general data collection, every inpatient medical record of selected hospitals was collected by trained nurses to classify casemix and price charged. The inpatient casemix classification of MOPH of Thailand adapted from ICD10 which was appropriate to this substudy was used because it is practical, not too detailed, and applicable to a small sample size. For the tracer data collection, data from every medical record of diarrhoea and acute appendicitis patient were identified and analyzed by using an inpatient medical record evaluation form (form No.8, annex 1).

In diarrhoeal patients, indicators adapted from physical examination and the treatment form for diarrhoea of the Communicable Disease Control Department of Thailand were used. The main indicators for diarrhoea are history of patient, physical examination criteria, laboratory tests, diagnosis, treatments, and result of treatment (annex 2). After analyzing by using the indicators, a classification of effectiveness of drug use indicator was identified by 7 medical specialists in the diarrhoeal disease treatment section of Bumrajnaradun communicable control hospital to be high, moderate, low, and non effective for treatment of diarrhoea. This classification, a rating scale of effectiveness of drugs, was carried out twice. The first round was carried out individually and the second round was carried out by discussing the mode of the rating scale and then a consensus was made to achieve the final scale of effectiveness of drugs used. Then this rating scale form was applied to analyze the effectiveness of drugs used in all the diarrhoeal inpatient medical records. Applying the cost of drugs used in 1 small hospital (Ram-Inthra) to other 3 hospitals, an average total drug cost of diarrhoeal inpatients was calculated by non, low, moderate, and high effectiveness drugs used. The total cost of low, moderate, and high effective of drugs used, which were defined to be effective to treat these patients was also calculated. And then the **proportion of cost-effective** of drugs used was calculated by the following formula:

Proportion of cost-effective drugs = $\dfrac{\text{Total cost of effective drugs used}}{\text{Total cost of all drugs used}}$

When -Total cost of effective drugs used = total cost of low, moderate, and high effective drugs used for diarrhoea

-Total cost of all drugs used = total cost of all drugs used for diarrhoea

In acute appendicitis patients, general indicators for evaluating this disease were adapted from Rains et. al (1977). They were age, sex, nausea, vomiting, diarrhoea, abdominal pain, temperature, abdominal palpitation, rectal examination, complete blood count, urine analysis, duration between admission and operation, complete nurse notes, anaesthetic notes, surgical notes, pathological section examination, and LOS. After analyzing the patient records using general indicators, these indicators were classified by 7 general surgeons of Nonthaburi regional hospital of the MOPH using a 5 points rating scale from less to more important for the quality of treatment of acute appendicitis. This classification was carried out twice. The first round was made by the doctors individually. The second round was carried out by group discussion with all doctors of the results of the first round in order to achieve the final consensus scale. Then this rating scale form was applied to analyze all acute appendicitis inpatient treatments. To complete the evaluation of treatment of acute appendicitis, evaluating outcome of treatment is essential. It was carried out by mailing a postal questionnaire to every acute appendicitis inpatient. The indicators used in the questionnaire were age; sex; duration between discharge from hospital and healthy recovery; duration between discharge from hospital and return to work; perception of quality of care; and complications: fever, micturition, wound infection, cough with sputum, anorexia, vomiting, abdominal pain, mucous bloody diarrhoea or dysentery, and hiccough. The completed questionnaires were analyzed to compare the quality of care and outcome of treatment between the insured and noninsured of the hospitals.

3.9 Data processing and data analysis

Qualitative data were transformed into well organized sets of notes. The data were ordered and compressed with regard to the objectives and aims. Coding, usually in short rememberable labels, was closely carried out to follow the topics in the guide or the checklist manual. Text from the organized sets of notes was analyzed. Data text which had belonged to the same issue was listed to be together. Summarizing data was executed by various forms: matrices, diagrams, flow charts, tables, and narrative text (Varkevisser et al., 1991). Findings from the summarized data were verified to detect associations between variables. Quantitative data was entered and analyzed by using programmes such as EPI-INFO, SPSSPC+.

3.10 Summary

MEDSEC is selected as a tracer network and Nopparat is selected as a comparative network. In the evaluation of outpatient and inpatient treatment, the noninsured in the same selected private network facility were compared with the insured because of the difference of their payment

method. According to the conceptual framework, this study looked at the networks from consumer, provider, and purchaser perspectives. And to meet the objectives of this study, 4 substudies were carried out.

In the first substudy, the operating system, financial management, and charge rate for medical care of MEDSEC; and the utilization rate of MEDSEC/Nopparat networks were examined. Interviewing MEDSEC staff and collection of secondary data was made concerning how the MEDSEC network was set up and how it has grown over time, the payment system to providers, and the charge rate of MEDSEC. For the utilization rate examination, data were collected from both MEDSEC and Nopparat records.

For the second substudy, knowledge and attitude of the facility's managers concerning how the MEDSEC network was set up and how it has grown over time, and the payment system to providers of MEDSEC were examined. Nine managers (4 of clinics, 4 of small hospitals, and 1 of a general hospital) were interviewed in-depth by a medical doctor.

In the third substudy, health seeking behaviour, utilization rate (based on interviews with workers), knowledge, and satisfaction of the insured of MEDSEC with the services of MEDSEC facilities were examined. A structured questionnaire was used to interview 750 workers of 4 firms by trained interviewers.

For the last substudy, evaluation of quality of care was carried out in 4 aspects: analysis of infrastructure, assessing the satisfaction of inpatients, analysis of outpatient drug prescriptions, and analysis of inpatient treatment. In the analysis of infrastructure, postal questionnaires were randomly sent to 61 MEDSEC and 31 Nopparat facilities. For the assessment of the satisfaction of inpatients, a structured questionnaire was used to interview 271 inpatients of 4 MEDSEC hospitals, and 128 of Nopparat hospital by trained nurses. In the analysis of outpatient drug prescriptions, 1,000 prescriptions of the insured and 1,000 of the noninsured were collected from 4 MEDSEC hospitals by trained nurses. For the analysis of inpatient treatment, 800 medical records were collected from 4 MEDSEC hospitals by trained nurses. In the analysis of outpatient and inpatient treatment, tracer methods were applied to yield better results.

Chapter 4
Operating and payment system in MEDSEC
and Utilization rate of MEDSEC and Nopparat networks

To study how to organize the provision of care under the SSA, it is essential to examine the payment system of the MEDSEC network. Payment mechanisms probably influence the utilization rate of the insured. This chapter describes the payment systems in the MEDSEC network and the utilization rate of MEDSEC/Nopparat networks in 3 main sections. The first section describes the operating system and payment mechanisms of MEDSEC including the referral system, marketing and relationships within the network, the charge rate, proportion of payment and bonus, and the effect of payment mechanisms on behaviour of facilities. The second and last sections present the background of Nopparat network and the utilization rates of MEDSEC/Nopparat networks.

4.1 Operating and payment system in MEDSEC

MEDSEC has been operating since 1992. It was initiated by the manager of the Pattaya Memorial Hospital in 1991. It is a for-profit network owned by a private company and not quoted on the stock-exchange. The network received seed money for the first capital cost from Pattaya Memorial Hospital which was to be repaid over a period of 1 year. Regarding the classification of subnetworks of MEDSEC mentioned in chapter 3, most of the RIG providers were located in the north and east of Bangkok. For RSG, EBG, CBG they were located in the west and the south, the east, and central areas respectively. Figure 4.1 shows the organization and referral system of MEDSEC. All the financial management was rendered by the MEDSEC office which had 10 full-time staff, controlled by the Executive Committee composed of 8 persons, 2 from each subnetwork. It is likely that MEDSEC bears no risk (money in equals money out). The profit has been shared by subnetworks and within subnetworks. About 3% of all facilities in MEDSEC quitted the network because they were penalised for over charging.

Every OP prescriptions and IP medical records are sent to MEDSEC office through subnetworks offices. Subnetwork offices manage quality assurance by review the prescriptions and medical records. However, the quality assurance is not impressively carried out due to no incentive for this activities.

Figure 4.1 The organization and referral system
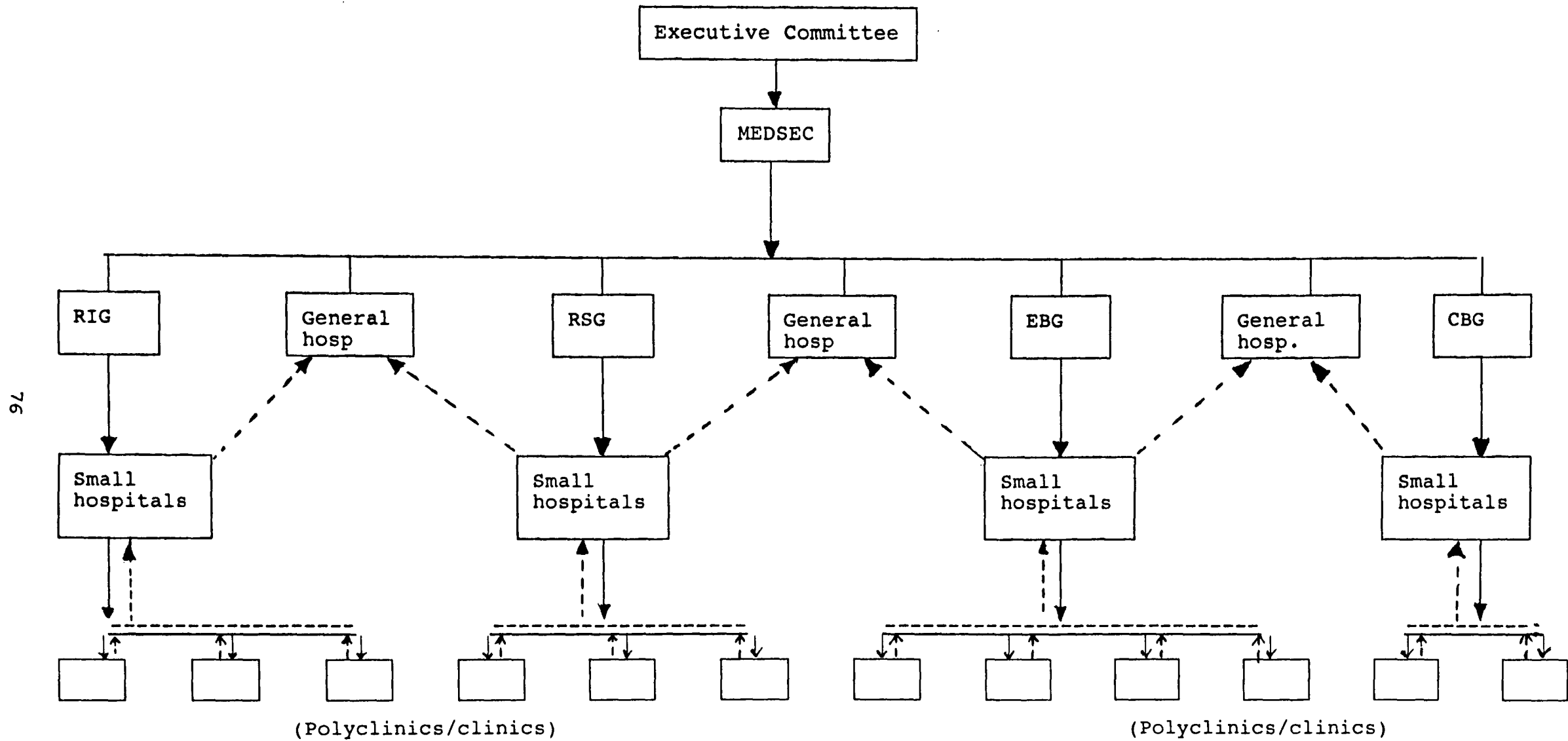
NOTE: Organizational management _____   Referral system ----------------

There is a difference in the number of clinics/polyclinics and small hospitals between the subnetworks. The distance between facilities was ≥ 3 kilometres. According to the director of MEDSEC, this rule was to protect the implicit and explicit profit gain of each facility. Every facility has to deposit 50,000 Baht to MEDSEC to guarantee the provision of care. Providers will be fined by forfeiting the guarantee deposit if they refuse to provide care.

4.1.1 Referral system

Each subnetwork has ≥ 1 small hospitals (30-50 beds) to act as a centre for financial management, referral system management, marketing, etc. Since small hospitals provide outpatient services similar to clinics/polyclinics, they will be considered as providing primary as well as secondary care. Under each subnetwork there are ≥ 2 clinics/polyclinics providing primary care.

For outpatient care, patients were allowed to seek care from any providers in the network except general hospitals. For secondary and tertiary care, patients were referred from lower to higher level care within the subnetwork ie. from clinic/polyclinic to small hospital and then to any general/specialist hospital (figure 4.1).

Geographically, the consumers have unequal choice in services from different numbers of facilities in the subnetworks. At the primary care level, there was, in theory, considerable consumer choice in the network. But because of the problems of traffic in Bangkok and the distance between clinics/polyclinics (≥ 3 kilometres), consumer choice was limited in practice. For secondary care, patient choices were limited by the referral system. However if the patients is willing to receive second level care from any provider, they can request to be referred to their favourite hospitals in the network. For tertiary care, generally patients were referred to a general hospital which was near to the subnetwork and charged the lower price.

4.1.2 Payment system in MEDSEC

The capitation payment is paid monthly from SSO to MEDSEC through the main contractors. There are 2 payment bases in MEDSEC network: FFS and capitation. FFS payment is applied to providers during the year. By the end of the year, capitation payment is applied to the subcontractor by considering the number of outpatient visits. If any subnetwork provides the highest number of outpatient visits for the workers of a firm, it will be considered as a fund holder of the quota of the capitation payment of that firm. Inpatient care takes first call on the fund. There is a

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guideline for rates which is both disease and procedure oriented for inpatient FFS charge applying to small hospitals and general hospitals but not to specialized hospitals. The rate was originally based on MOPH price list plus 15%. This rate has increased twice in 1994-1995, each time by 10%. It is paid by type of surgical case and LOS for medical patient. For OP, there is a suggestion guideline for maximum charge/visit such as 170 Baht/visit (1992) which is generally less than that of the noninsured patients. A monthly report of the fees and detail of services is sent from every provider to MEDSEC. By the 15th of the following month, the fee is paid according to the monthly report for OP care to every subnetwork and then paid to polyclinics/clinics in each subnetwork subsequently. The fee for inpatients is also paid to small hospitals through the subnetwork and paid directly to general hospitals. The fee is paid with a certain limit rate which is considered by the executive committee of MEDSEC. The rest of the fee is put in an account and paid later if there are enough funds at the end of the year.

Figure 4.2 shows details of financial management. The SSO will prospectively pay 700 baht/person to MEDSEC through the main contractors. The total budget is allocated for administration (12.5%), and medical care fee and bonus to the providers (87.5%). In the network, there are 2 main groups: EG and GBG, with Pattaya Memorial hospital and the MEDSEC office as the administrative centres for EG and GBG respectively. The administrative budget is earmarked for the MEDSEC office (5%) and Pattaya Memorial hospital (1%), for subnetwork administration (4%), and risk fund (2.5%). However this risk fund is now absorbed by MEDSEC office administration. The bonus is kept by the MEDSEC office during the year.

For example, assume there are 100 workers in a company (figure 4.2). The total fee claimed is 3,000, 2,500, 200, 300 and 30,000 Baht for RIG, RSG, EBG, CBG and supracontractor respectively. This amount would usually be paid to subnetworks and supracontractors monthly. The mean fee/visit of the facility with the highest number of visits is taken as the standard. At the end of the year, the amount of money in excess of the mean fee paid to subnetworks which charged more than the mean fee should be returned to the fund-holder subnetwork. Subnetworks which charged less than the mean fee will receive compensation from the fund holder subnetwork to bring the payment up to the mean fee. In figure 4.2, RIG provided the highest number of visits. So the mean fee is 150 Baht/visit. So the total profit is 61,250 - 30,000 - 4,050 - 1,500 - 300 - 150 = 25,250 Baht. This profit paid as a bonus to RIG, the fund holder subnetwork. In summary, the total amount paid to RIG, RSG, EBG, CBG and supracontractors is 4,050 (+ 25,250), 1500, 300, 150 and 30,000 Baht respectively. In cases of insufficient budget, every subnetwork has to return their money to produce the same average fee/visit until the account for this particular company is

balanced. The specialized and general hospitals always get paid, so the subcontractors bear the risk. From the director of MEDSEC's viewpoint, this rule encourages subcontractors to save their expected profit by controlling the charge rate of facilities in their subnetworks. For general and specialized hospitals, there was a little price control run by nurses in the medical audit section of the MEDSEC office, using inpatient guideline charge rates which are very flexible. From the viewpoint of managers of small hospitals and clinics, this payment mechanism might create unfair resource allocation to smaller facilities in the network and cause major obstacles in case of deficit in the budget for reimbursement and bonus in the network. This deficit is expected and planned to be absorbed by the risk fund. Unfortunately the risk fund has been absorbed by the administration. The probable reason why general hospitals are able to take first slice of the profit is because the MEDSEC director is the main share-holder of 2 main contractors in MEDSEC network. This influenced the MEDSEC director to maintain his financial profit in his main contractors by protecting the first chance of profit in general hospitals in the network.

According to the agreement, the facilities have to submit bills to MEDSEC by the 25th of the following month. Practically, some facilities only sent these in after 2 months. This causes delay of payment because allocation of quota of workers for bonus calculation is firstly made monthly and then yearly. If any bill is not presented or clearly agreed then all the payments should be suspended.

There are mechanisms to cope with unexpectedly high reimbursement. Firstly the bills are audited by MEDSEC IP auditing personnel. If any bill charges the standard rate, it will be paid. The standard rate is the average charge for both simple and complicated cases. If any bill charges a higher rate than standard rate, the auditing personnel cut this to the standard rate. If the facilities are not satisfied with any payment, they can appeal to the medical committee and then to the executive committee. The decision of the executive committee is the final conclusion. The medical committee is composed of 4 doctors, 1 from each subnetwork. This process also applies to any bill that has no standard charge rate.

There are 2 systems to pay providers in subnetworks by the subnetwork office, the capitation applied at the end of the year as from MEDSEC office and standard fee payment (about 150 Baht/outpatient visit). For the capitation the facility takes the risk. For standard fee payment, the subnetwork takes the risk. There is a special agreement of standard fee between the subnetwork and facilities to pay the agreed providers both for inpatient and outpatient care. The majority of facilities are paid by the capitation method except some facilities in EBG which are paid a standard

fee. This is because EBG had experiences a very high profit gained from the bonus in the first year of joining the MEDSEC network. However, the MEDSEC office tried to convince subnetworks to pay facilities by the capitation method as from MEDSEC to promote the bonus system.

Figure 4.2   Financial management of MEDSEC

```
+-------------------------------+
|             SSO               |
+-------------------------------+
                |
+-------------------------------+
|      700 Baht/insured         |
+-------------------------------+
                |
+-------------------------------+
|     Main contractors          |
+-------------------------------+
                |                      +--------------------------------+
                |                      | -7.5% for admin(5% for         |
+----------------------+             | general admin, 2.5% for        |
|       MEDSEC         |-------------| risk fund)                     |
+----------------------+             +--------------------------------+
                |                      | -4% for subnetwork admin       |
+----------------------+             +--------------------------------+
| 87.5% for provider   |             | -1% for Pattaya Memorial       |
| reimbursement monthly|             | Hospital admin                 |
| & yearly bonus       |             +--------------------------------+
+----------------------+
```
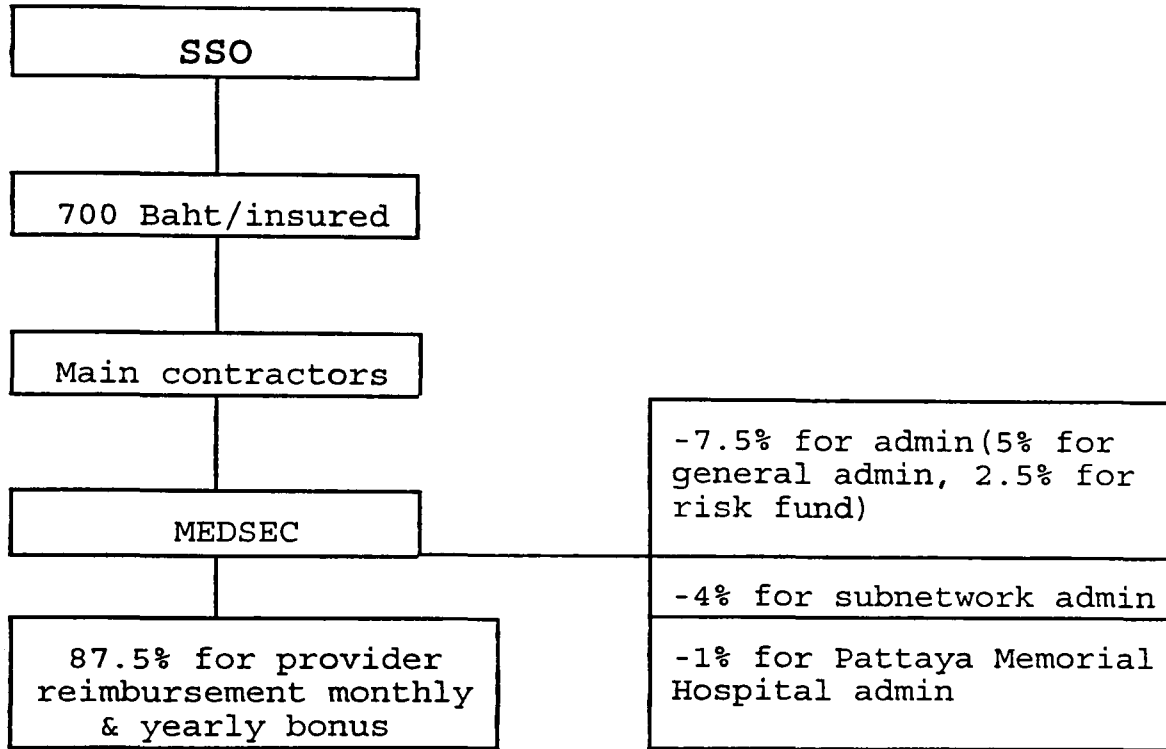
Example, there are 100 workers in a company.
So total budget is = 100 x 612.50 = 61,250 Baht.

	RIG	RSG	EBG	CBG	Supracontractor &inpatient fee
No.Visit	20	10	2	1	-
Mean/visit[1]	150	250	100	300	-
Subtotal	3,000	2,500	200	300	30,000
To RIG	-	100x10	-	150x1	-
From RIG	-	-	50x2	-	-
Total[2]	4,050	1,500	300	150	30,000

Note: 1. Mean/visit is a mean fee charged for outpatient, calculated yearly.
        2. Total for RIG=3,000+1,000+150-100=4050
                     RSG=2,500-1,000=1500
                     EBG=200+100=300
                     CBG=300-150=150

4.1.3 Marketing and relationships within the network From interview of the managers of facilities, since 1992 more providers and workers are involved. This is because its marketing skills and management services are working well, many subscribers have been choosing the network, its payment system with bonus is attractive, facilities serve medical care with reasonable prices and facilities have room to assist more patients, especially inpatients. From interview of MEDSEC staff, the marketing and propaganda activities of MEDSEC are:

- frequently sending information documents to introduce MEDSEC/network facilities' activities to managers of firms selecting MEDSEC
- sending marketing personnel to see the managers and workers in the firms to inform them and answer expected questions regarding service problems
- assigning responsible areas for subnetworks to contact the managers and workers
- assigning all facilities to public relations with SSO clients, using billboards and posters provided by MEDSEC, and by encouraging good doctor/nurse-patient relationships
- affixing billboards and posters in target areas where there are many workers and firms
- setting up mobile medical teams to serve workers in the firms
- sending a doctor to provide care in some firms having ≥ 100 workers for 2 hours/week.

Apart from the marketing and propaganda activities of the MEDSEC office, all facilities are assigned to contact firms and workers near to their setting. The marketing activities of facilities are: sending vouchers and documents about: facilities' venue and services available, process of services under SSA, how to select MEDSEC network, and fundamental problems and answers regarding services; frequent contact with company managers and workers to solve problems by telephone and direct contact; and sending facility's marketing personnel to contact the personnel managers of firms and workers to do public relation work.

For the recruitment of providers, the subnetworks are assigned to search for new providers. The criteria to recruit providers are that new providers should be suitably located (close to firms, 3 kilometres away from the existing providers); and should meet the minimum infrastructure standards (staff, equipment, and premises). The providers may be rejected from MEDSEC if there are many complaints from workers.

There are some social activities within MEDSEC providers: social parties, group picnics, social dinners, and group investments in other interesting business. In the future, other activities are expected to be: a newsletter, journal, and occasional publications.

4.1.4 Charge rate of MEDSEC network

The purpose of this section is to examine the charge rate in order to further explore the effect of payment mechanisms in the MEDSEC network.

The average charge/visit of outpatients of all facilities decreased every year from 172.33 Baht/visit (1992) to 171.43 (1993) and 157.07 (1994) (table 4.1). For inpatients of small hospitals, the charge rate increased from 79.97 (1992) to 126.11 (1993) and decreased to 80.05 Baht/worker/year (1994). The average charge/day for inpatients of small hospitals increased from 410.98 (1992) to 627.39 (1993) and decreased to 458.20 Baht/day (1994). Comparing charge rates between subnetworks, in general, the charge rate of inpatients (/visit) and outpatient (/worker, /day) of Bangbon was highest in 1992 -1993 (table 3A.1-3A.2, annex 3). The high charge and utilization rates (presented later) affected the bonus of the Bangbon subnetwork to be a minus one (data from MEDSEC office). According to the director of MEDSEC, this caused Bangbon subnetwork to withdraw from the MEDSEC network in 1994.

For general hospitals, the OP charge rate increased from 185.60 (1993) to 262.49 Baht/visit/year (1994) which was higher than that of small hospitals in 1992-1994. The average charge/day of general hospitals was 766.15 Baht/day in 1994 which was higher than those of the small hospitals in 1992-1994 (table 4.1, 4.2). It is likely that the charge rates of small hospitals in 1994 were lower than 1992-1993. This is because the data available in 1994 was only for January-August and Siam general hospital joined the network. These affected the utilization rate (presented later) of the insured in terms of total LOS and total number of visit, which then affected the charge rates.

Table 4.1 Total charge, charge rate, and average charge of outpatients of all facilities and inpatients of MEDSEC small hospitals, 1992-1994

Years	Outpatients of all facilities		Inpatients of small hospital	
	Total charged (Baht)	Average charge /visit	Charge rate /worker/year	Average charge /day
1992	15,043,814	172.33	79.97	410.98
1993	31,291,839	171.43	126.11	627.39
1994*	18,170,830	157.07	80.05	458.20

Note: * = January-August 1994

Table 4.2 Total charge, charge rate, and average charge/day of MEDSEC general hospitals, 1993-1994

	1993	1994*
- No of the insured	110,581	138,742
- No of patients	19,511	24,347
- Charge in a year(Baht)	20,523,488	24,278,859
- Charge rate(/worker/year)	185.60	262.49
- Average charge/day(Baht)	not available	766.15

Note: * January-August 1994

4.1.5 Proportion of payments to facilities and bonus

The proportion of the payment budget going to general hospitals increased from 30.30% (1993) to 42.86% (1994); while the share of payment to clinics/small hospitals for OP cases, to small hospitals for IP cases, and for bonuses decreased. Moreover the bonus which has been claimed by MEDSEC to be an encouraging component to promote quality and efficiency of the network critically decreased from 1,970,360 Baht (1993) to 3,167 (1994) (table 4.3).

Table 4.3 Budget for medical fee payment to clinics, small and general hospitals; and bonus; 1993-1994

	1993		1994	
	Total	%	Total	%
-Number of the insured	110,581	-	138,742	-
-Total budget(87.5%)	67,730,863	100.00	84,979,475	100.00
-Payment for OP of clinics & small hospitals	13,945,176	20.59	12,216,360	14.38
-Payment for IP of clinics & small hospitals	31,291,839	46.20	36,341,660	42.76
-Payment to general hospitals	20,523,488	30.30	36,418,289	42.86
-Remaining for bonus	1,970,360	2.91	3,167	0.00

The balance of income and expenditure regarding the insured was a surplus during 1992-1993. In 1994, the utilization rate (presented later) of the insured strikingly increased and all the facilities especially the general hospitals tried to charge higher IP fees (where the standard fee did not apply). Moreover the standard IP fee was increasing 10% every year while the capitation rate was still 700 Baht. Hence the expected bonus for 1994 was possibly a very low surplus. From the half year evaluation of the bonus, the RIG subnetwork which is situated near to a general hospital, Siam hospital, was minus. Hence the balance of income and expenditure of facilities was likely to be minus in some subnetworks.

4.1.6 Effect of payment mechanisms on behaviour of facilities

The charge rate (/worker/year) and the proportion of budget (%) paid to general hospitals (by FFS) increased while the proportion paid to other facilities (by capitation) decreased. Moreover, the charge rate/visit of outpatients of clinics and small hospitals decreased during 1992-1994. It is likely that the effect of the payment system in the MEDSEC network by capitation with an incentive bonus influenced the subcontractors to save their expected profit by controlling the charge rate of small hospitals and clinics in their subnetworks, while for general hospitals (by FFS) they could not. Since the general hospitals were always paid, it probably created unfair resource allocation to facilities and induced major problems in deficits in the budget for reimbursement and bonus. This is the danger of the payment system where the primary and secondary facilities bore all the risk. If the facilities or subnetworks face a high loss like Bangbon subnetwork, they might withdraw from the network.

The payment system of MEDSEC also affects the referral behaviour of facilities. The MEDSEC IP standard fees are not able to cover all diseases/conditions. However, prices charged for the insured in case of no standard fee can be estimated from the price list for general patients of that particular hospital. According to the interview with managers of facilities, the price charges for diseases which were not priced in the standard fee affect the referral behaviour of facilities, as suggested by the behaviour of small hospitals or clinics which tend to refer patients to a general hospital with a cheaper general price list.

The interview with managers of facilities also shows that the stage of patients when they were referred from clinics was usually not serious because patients seeking care from clinics are not seriously sick. If they are critically ill they will seek care from hospitals. From the view of the manager of a general hospital, the stage of MEDSEC patients when they were referred was usually very serious, because small hospitals try to keep their patients to save their fund-holding group bonus.

4.2 Background of Nopparat network

Nopparat network is the biggest publicly-organized network in terms of the number of the insured. The main contractor of this network is Nopparat hospital. In 1991, 50,829 workers selected Nopparat hospital. The number of the insured decreased to 36,974 (January 1993). Since there was only 1 facility for the insured to seek care and Nopparat hospital has no outpatient service after working hours, this caused the problem of lower accessibility for the insured to seek care. Then an investigation to establish a network, to respond to the competition with other main

contractors especially with the private networks, was rendered in February 1993 by examining the number of the insured and firms that selected Nopparat hospital. It was found that 330 firms in 25 districts in the east of Bangkok chose Nopparat hospital. Out of these 25 districts, 7 districts had >10 firms/district. These 7 districts were chosen as target areas to establish a network for Nopparat hospital. All private and public facilities were mapped to select some appropriate facilities for the network. A meeting with selected facilities to encourage them to join the network was held. Then a publicly-organized network, Nopparat network, was founded and has run since June 1993. At the time of establishment, it was composed of 38 facilities. By 1995 the number of facilities has increased to 50. As regards the number of the insured, coverage increased from 39,148 (1993) to 66,015 (1994) and 80,000 (1995).

Nopparat network is managed and controlled by a committee composed of Nopparat hospital officers. There is a commitment between facilities and Nopparat hospital regarding payment system, referral system, and health care provision process. Payment to facilities is FFS with a maximum limit such as 170 Baht/visit of outpatients and 600 Baht/day of inpatients.

In the referral system, clinics, polyclinics, health centres, and small hospitals have to refer patients to Nopparat hospital. The secondary and tertiary care is almost always provided by Nopparat hospital. The relationship between facilities is very limited, being only to provide care and payment activities. However, there was 1 meeting between facilities/year. Two providers quitted the network because of too few workers near 1 provider, and 1 facility was closed. There were also 2 clinics withdrawn from the network due to their low quality of care.

As Nopparat is a public hospital, there are a lot of restrictive regulations regarding subcontracting with private providers. Exceptionally, the MOPH has been allowed to launch this publicly-organized network. However, there are some restrictions of budget regulations. The bureaucratic regulation in the payment process has caused delay of payment and difficulty in management, such as delay of payment to private ambulances for referring patients to Nopparat hospital which was not mentioned in the agreement. This delay in payment decreases the motivation of the private ambulance to refer patients which influences the satisfaction of the insured and creates the misunderstanding of the facilities with the network. Moreover there is difficulty concerning publicity and recruitment of the insured. As Nopparat hospital is a public health care provider, having publicity or marketing/propaganda activities to recruit more insured is prohibited. This causes a lower ability to recruit more insured than the private network which has less prohibition regarding publicity.

4.3 Utilization rate of MEDSEC and Nopparat networks

The hypothesis for this section is that the accessibility of seeking care of the insured of a private network is better than without a network and than a publicly-organized network. For the situation without a network, data were from a study of the insured in Samutprakarn by Tangcharoensathien et al. (1993). The purpose of this section is to examine the utilization rate of MEDSEC/Nopparat networks.

In the Samutprakarn study, the sample group were from firms selecting 5 main contractors, 1 public and 4 private main contractors with no provider network, while in this study they were from firms choosing 3 private main contractors of the MEDSEC network. In Samutprakarn, firms were usually close to their main contractors but for MEDSEC, firm were distributed in all areas of Bangkok.

4.3.1 Utilization rate of insured outpatients of MEDSEC/Nopparat networks

The utilization rates of MEDSEC/Nopparat networks were increasing every year during 1992-1994. In the same year, that of MEDSEC was slightly higher than that of Nopparat network (Table 4.4). Comparing the rates with the Samutprakarn study (Tangcharoensathien et al, 1993), the utilization rate of MEDSEC/Nopparat in 1992-1994 were higher than that of Samutprakarn in 1992 (0.63/worker/year).

Table 4.4 Utilization rate/worker/year of OP of MEDSEC/Nopparat networks, 1992-1994

Years	Nopparat	MEDSEC
1992	No network	1.24
1993	1.22	1.65
1994	1.66	1.69*

Note: * = January-June 1994

4.3.2 Utilization rate of insured inpatients of MEDSEC small hospitals

Unfortunately data for the utilization rates of insured inpatients of the Nopparat network were not available due to poor records of insured inpatients in the Nopparat network. Therefore in this substudy, only the utilization rates of insured inpatient of MEDSEC network are presented. The utilization rates of insured inpatients of MEDSEC small hospitals were 2.36, 4.40, and 3.22 visit/100 persons/year in 1992, 1993, and 1994 respectively (table 4.5). The average LOS in MEDSEC small hospitals increased every year from 0.19 (1992) to 0.20 (1993) and 0.23 day/person/year (1994). The IP utilization rate (%)/year, charge rate/worker/year increased in 1993, and then decreased in 1994. This is

because in 1994, data were complete only between January-August, and from data of MEDSEC network in 1992-1993, the insured received care from the registered facilities during the first half of the year less than in the second half. Moreover, in 1994, the Siam general hospital, well-known by the public for good quality of care, joined the network. For general cases, special cases such as complicated cases and surgical cases, or serious cases which have a high price, the insured tend to seek care or request to be referred to Siam hospital. This caused the utilization rate, average charge/worker/year, and average charge/day of inpatients of small hospitals in 1994 to be lower than before. The evidence of increasing utilization rate in general hospitals, almost all in Siam hospital, is presented in the next section.

Comparing utilization rates between subnetworks of MEDSEC, the utilization rate of inpatients and outpatients of Bangbon was the highest in 1992-1993 (table 3A.3-3A.4, annex 3). The highest utilization rates affected the bonus of the Bangbon subnetwork to be minus as mentioned before.

Table 4.5 Utilization rate (/100 worker/year) and average LOS (day/worker/year) of MEDSEC small hospitals, 1992-1994.

	Utilization	LOS
1992	2.36	0.19
1993	4.40	0.20
1994*	3.22	0.23

Note: * = January-August 1994

4.3.3 Utilization rate of the insured of MEDSEC general hospitals

The utilization rate of insured inpatients of MEDSEC general hospitals increased from 1.12 (1993) to 1.56 admission/100 persons/year (1994). The average LOS of workers in MEDSEC general hospitals was 0.25 day/person/year in 1994. It was higher than that of the small hospitals which was 0.23 day/person/year in 1994 (table 4.5, 4.6). The increase in utilization rates of general hospitals and their higher LOS than small hospitals affected the increase in the proportion of the budget for medical care to be allocated to general hospitals as mentioned before.

Table 4.6 Utilization rate/100 person/year and LOS (day/person/year) of inpatient of MEDSEC general hospitals, 1993; and January-August 1994

Number/rate	1993	1994
- Utilization rate	1.12	1.56
- Total admission days	not available	23,123
- LOS	not available	0.25

4.4 Summary

MEDSEC was operated by the MEDSEC office controlled by the Executive Committee. It was likely that MEDSEC bears no risk. The profit or risk was shared by subnetworks and within subnetworks. Outpatients were treated by any providers except general hospitals. For secondary and tertiary care, patients were referred from lower level care to higher level care. A lot of marketing and propaganda activities were performed by MEDSEC and subnetwork offices to recruit and maintain their insured. There were some social activities within MEDSEC providers to maintain their relationships. There were 2 payment bases in MEDSEC: capitation with incentive bonus applied to primary and secondary level care facilities and FFS to tertiary care hospitals.

The average charge/visit of outpatients of MEDSEC decreased every year. For inpatients of small hospitals, charge rates, and average charge/day increased in 1993 and decreased in 1994. Comparing subnetworks of MEDSEC, the charge rates of Bangbon were the highest. For general hospitals, the charge rate increased in 1994, and the charge rate and the charge/day were higher than those of small hospitals in the same year.

In 1994, the proportion of the medical care budget paid to general hospitals was highest compared to other provider groups. Compared to 1993, the proportion of payment to general hospital increased while the share to other facilities and for bonus decreased. The bonus, which is an important component in the MEDSEC network, decreased critically from 1.97 million Baht (1993) to 3,167 Baht (1994).

According to the view of managers of general hospitals, the stage of patients referred from clinics was not serious, but from small hospitals was very serious because small hospitals tended to keep their patients to save their bonus. Price charges of general hospitals which were not priced according to the standard fee influences small hospitals or clinics to refer patients to a cheaper general hospital. There was a danger in the MEDSEC payment system where the first and second level facilities bore all the risk. If they face high loss from high utilization or charge rate like Bangbon subnetwork, they will probably withdraw from the network.

The Nopparat network was managed and controlled by a committee composed of Nopparat hospital officers. Payment was by FFS method with a maximum limit. For the referral system, all facilities had to refer patients to Nopparat hospital. The secondary and tertiary care was almost all provided by Nopparat hospital. The relationship between facilities was very limited. As Nopparat is a public hospital, there were a lot of restrictive

regulations regarding subcontracting with private providers, payment method, publicity and recruitment of the insured.

In 1994, the OP utilization rate of the insured of the MEDSEC network was 1.69 /worker/year and IP admission rate was 4.78 (3.22+1.56) /100 workers/year.

The OP utilization rates of MEDSEC/Nopparat networks increased while the OP average charge/visit of MEDSEC was decreasing every year during 1992-1994. The OP utilization rate of MEDSEC was higher than that of Nopparat network (a publicly-organized network). The OP utilization rates of MEDSEC/Nopparat networks were higher than that of the main contractors in Samutprakarn (without network). Since the data of IP utilization rate and LOS of Nopparat facilities was not available, this substudy presents only those of MEDSEC network. The IP utilization rate of small hospitals increased in 1993, and then decreased in 1994. The average LOS in MEDSEC small hospitals increased every year from 1992-1994. For general hospitals, the IP utilization rate increased from 1993-1994. The average LOS of general hospitals were higher than those of small hospitals in the same year. The increase in IP utilization rates of general hospitals and their higher LOS increased the proportion of budget for medical care allocated to general hospitals. Comparing OP and IP utilization rates between subnetworks of MEDSEC, those of Bangbon were the highest in 1992-1993. This caused the bonus of the Bangbon subnetwork to be minus, resulting in the Bangbon subnetwork withdrawing from the network.

Chapter 5
Knowledge, health seeking behaviour, utilization rate, and satisfaction with MEDSEC facilities

In this substudy, 1,044 workers from 4 firms - Sahafarm, Yatming, Almond, and Eden, and 4 managers of the firms - were interviewed during December 1994 - February 1995. The results are presented in 5 sections: knowledge of the insured, health-seeking behaviour and utilization rate, satisfaction of the insured, factors affecting utilization rate, and employer knowledge and attitude. The sex ratio of male:female of the samples is 1:4. Other characteristics of the insured in this study are presented in tables 4A.1-4A.10 (annex 4).

5.1 Knowledge of the insured

It was found that 33.4 % of the insured gave incorrect answers for the name of their main contractors, or did not know; 33.9 % answered the question on the working hours of facilities incorrectly; 54.7% answered question on the list of diseases which were not covered by the scheme incorrectly (≥ 4 out of 15); 12.5 % did not know that they have to present the Social Security card when they receive care; 70.7 % didn't know which facilities they can receive free care at in case of an emergency; 22.2% answered incorrectly about the expenditure for emergency care which can be reimbursed from SSO; 75.6% did not know about categories of benefits covered by SSA in 1995 (table 4A.11); and 93.9% of the insured (973 workers) would like to choose their main contractors.

5.2 Health seeking behaviour and utilization rate

During 1 month, 265, 83, 65, and 20 workers were perceived to be sick for 1, 2, 3, and 4 episodes respectively. From these, the OP illness rate/year can be calculated as the following:

$$\text{OP illness rate/year} = \frac{\text{total number of episode in a year}}{\text{total number of population}}$$

$$= \frac{[265+(83 \times 2)+(65 \times 3)+(20 \times 4)] \times 12}{1036}$$

$$= 8.18 \text{ episodes/person/year}$$

The most common place for the insured to seek OP care is at working place clinics run by their firms (41.1%), followed by MEDSEC facilities (26.3%), other private clinics (16.8%), self prescription (13.1%), and other hospitals (2.7%). At working place clinics of some firms (>100 workers), MEDSEC sends medical doctors to treat the sick insured for 2 hours/week.

From the proportion of OP seeking care from MEDSEC (0.263), and OP illness rate (8.17), the OP utilization rate of MEDSEC can be calculated as the following:

MEDSEC OP utilization rate/year = illness rate x proportion of using MEDSEC
$$= 8.17 \times 0.263$$
$$= 2.15 \text{ visit/person/year.}$$

The most common reason for those insured with MEDSEC to seek care from other places is dissatisfaction with MEDSEC services (46.9%), followed by difficulty of access (25.5%), emergency sickness (13.8%), and other (13.8%) (table 4A.12, annex 4).

During 1 year, 127, 34, 8, 5, 4, and 1 workers were seriously ill (need admission) for 1, 2, 3, 4, 5, and 6 episodes respectively. The IP illness rate can be calculated as the following:

IP illness rate/year = $\dfrac{\text{total number of illness(admitted) in a year}}{\text{total number of population}}$

$$= \frac{127+(34 \times 2)+(8 \times 3)+(5 \times 4)+(4 \times 5)+(1 \times 6)}{1036}$$

$$= 0.256 \text{ times/person/year}$$

During 1 year, 930 persons (89.7%) were not seriously ill (did not need admission to MEDSEC hospitals); 65 (6.3%), 29 (2.8%), 6 (0.6%), 4 (0.4%), and 2 (0.2%) persons admitted to MEDSEC facilities for 1, 2, 3, 4, and 5 times respectively. The admission rate can be calculated as the following:

MEDSEC admission rate/year = $\dfrac{\text{total number of admissions in a year}}{\text{total number of population}}$

$$= \frac{65+(29 \times 2)+(6 \times 3)+(4 \times 4)+(2 \times 5)}{1036}$$

$$= 0.161 \text{ times /person/year}$$

From the data of total number of illness (admitted), and the total number of admission to MEDSEC facilities in 1 year mentioned before, the proportion of the insured admitted to MEDSEC hospitals can be calculated as the following:

Proportion (%) of the insured admitted to MEDSEC facilities

$$= \frac{\text{total number of admission to MEDSEC hospitals} \times 100}{\text{total number of illness(admitted)}}$$

$$= \frac{65+(29 \times 2)+(6 \times 3)+(4 \times 4)+(2 \times 5)}{127+(34 \times 2)+(8 \times 3)+(5 \times 4)+(4 \times 5)+(1 \times 6)} \times 100$$

$$= 63\%$$

Since the traffic in Bangkok is heavy, patients tend to seek care from facilities near to their homes or work places. To examine the places where the insured get sick and start seeking care is essential. The most common place where the insured got sick was at the work place (58.3%), and insured started seeking care most commonly from the work place (50.7%, table 5.1). When the proportion of the insured becoming sick in work place was compared with the proportion seeking care from the work place, the proportion was higher for those becoming sick. But if the proportion of the insured got sick and started seeking care from home were compared, the proportion is higher for when they started seeking care (table 5.1). It is therefore likely that the insured went back home then sought for medical care.

Table 5.1 Place where the insured become sick and start seeking care

Place	When sick(%) (N=708)	Start seeking care(%) (N=708)
- Home	40.1	44.8
- Work place	58.3	50.7
- Other	1.6	4.5
Total	100.0	100.0

5.3 Satisfaction of the insured

Regarding the satisfaction of the insured with services, majority of the insured were satisfied with all aspects (except with cleanliness) at the "fairly satisfied" level. The highest level of satisfaction with cleanliness is "very satisfied" (table 5.2). From table 5.2, changing the 5 to 3 points rating scale by joining "very much" and "very satisfied" to become "satisfied", and compressing "very dissatisfied" and "very much dissatisfied" to become "dissatisfied"; the insured were more satisfied than dissatisfied with all aspects with the highest proportion of satisfaction with cleanliness (66.6%, table 4A.13, annex 4).

As regards the satisfaction with MEDSEC services compared with experience of public facilities, the majority of the insured who were satisfied with MEDSEC was the same as with public facilities for all variables (table 5.3). Changing the 5 point scale to a 3 point one, by joining "much more" and "more satisfied" on MEDSEC to become "satisfied" with MEDSEC, and compressing "much more" and "more satisfied" with public facilities to become "satisfied" with public facilities, the insured were more satisfied with all studied aspects of MEDSEC than those of public facilities with the highest proportion of satisfaction with the waiting time (49.7%, table 4A.14, annex 4).

Table 5.2 Satisfaction of the insured with services of MEDSEC facilities (5 point scale, N=708)

Variable	Very Much Satisfied (%)	Very Satisfied (%)	Fairly Satisfied (%)	Very Dissatisfied (%)	Very Much Dissatisfied (%)
-Accessibility	5.9	28.4	42.1	15.7	7.9
-Waiting time	8.8	31.1	37.8	13.7	8.8
-Perception on medical quality	6.3	32.2	43.3	11.9	6.3
-Reception	7.4	32.6	44.9	0.6	5.5
-Friendliness of personnel	7.1	33.8	41.5	12.5	0.1
-Cleanliness	9.5	51.1	32.1	4.5	2.7

Table 5.3 Satisfaction (%) of the insured with services by experience with MEDSEC and public facilities (5 point scale, N=708)

Variables	Much More satisfied with MEDSEC	More satisfied with MEDSEC	The Same satisfaction	More Satisfied with public	Much More Satisfied with public
-Accessibility	14.9	25.0	32.1	17.2	10.8
-Waiting time	16.6	33.1	31.0	11.2	8.0
-Perception on medical quality	13.7	30.3	33.7	13.9	8.4
-Reception	14.4	32.4	33.5	11.9	7.9
-Friendliness of personnel	14.0	29.7	36.5	14.1	5.7
-Cleanliness	14.7	27.9	40.5	10.2	6.6

5.4 Factors affecting utilization rate

Since there are evidences of very low utilization rate under SSA (Tangcharoensathien et al, 1993), investigation of factors affecting the utilization rate is necessary for drawing the policy recommendations to improve the circumstance. Factors affecting the utilization of the insured can be classified into 4 groups: firms that the insured belong to; socioeconomic factors; knowledge of the insured; and satisfaction with services. Logistic regression was applied to analyze factors affecting OP and IP utilization rate to control for confounding variables. Dependent variables were converted into dichotomous responses of 0 and 1. The general model for fitting is:

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

where Z is the linear equation 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 (Pindyck and Rubinfeld, 1981).

Independent variables to determine the likelihood are listed in table 4A.15, (annex 5). Dummy variables for firms, marital status, and educational status, were created.

The characteristics of study variables by MEDSEC/other, and OP/IP are presented in table 5.4. Generally, means of the variables are similar between all OP/IP patients except for Sahafarm workers of OP which is remarkably lower than those of IP. This mean suggests that 10% of OP and 23% of IP came from Sahafarm. Comparing between OP of MEDSEC/other, means of the variables are similar between MEDSEC/other patients except for Sahafarm workers, married marital status, and knowledge about social security benefit and opening hour of MEDSEC facilities, for which the means of MEDSEC OP are markedly higher than those of the other. Also, the means of MEDSEC OP for Eden workers, manual producer, and knowledge about reimbursement of emergency fee are remarkably lower than those of the other. For IP of MEDSEC/other, the means of MEDSEC/other IP are similar except for Eden workers, primary school graduation, and knowledge about social security benefit, for which the means of MEDSEC IP are strikingly higher than those of the other. Also, the means of MEDSEC IP for Almond and Sahafarm workers are markedly lower than those of the other.

During the initial logistic regression modelling for OP and IP; single and other marital status variables, and higher educational status were included

in the models, but none gave significant results. There was a statistically significant correlations between single and married marital status (R coefficient = 0.8999). So, at the final stage, these 2 variables were dropped out for OP and IP models. For OP models, since there were statistically significant correlations between all satisfactory variables (R coefficient ≥ 0.96), and the variable for cleanliness satisfaction gave a higher significant than the others for OP models, at the final stage, all satisfactory variables except cleanliness were dropped out from OP models. However, in the OP model, 3 models for 3 episodes of illness were tested, the second and third episodes models were not statistically significant. Therefore only the first episode model is presented.

Table 5.4 Mean of variables used in logistic regression models by OP for first episode and IP & by using MEDSEC and other facilities

Variables	OP			IP		
	MEDSEC	OTHER	Total	MEDSEC	OTHER	Total
Firms						
ALM	0.15(0.4)	0.23(0.4)	0.21(0.4)	0.07(0.3)	0.33(0.5)	0.17(0.4)
EDEN	0.38(0.5)	0.48(0.5)	0.46(0.5)	0.64(0.5)	0.19(0.4)	0.48(0.5)
SAH	0.23(0.4)	0.06(0.2)	0.10(0.3)	0.12(0.3)	0.42(0.5)	0.23(0.4)
Yatming*	0.24(0.4)	0.23(0.4)	0.23(0.4)	0.10(0.3)	0.17(0.4)	0.13(0.3)
Socioeconomic						
AGE	30.20	30.05	30.09	33.62	29.22	32.00
	(8.8)	(13.3)	(12.3)	(17.1)	(9.2)	(14.8)
MSTATM	0.59(0.5)	0.46(0.5)	0.50(0.5)	0.51(0.5)	0.53(0.5)	0.52(0.5)
MSTATS*	0.33(0.5)	0.46(0.5)	0.43(0.5)	0.42(0.5)	0.43(0.5)	0.42(0.5)
NJOB	0.66(0.5)	0.76(0.4)	0.74(0.4)	0.68(0.5)	0.74(0.4)	0.70(0.5)
PEDUCAT	0.44(0.5)	0.42(0.5)	0.42(0.5)	0.48(0.5)	0.29(0.5)	0.41(0.5)
SEDUCAT	0.39(0.5)	0.44(0.5)	0.43(0.5)	0.36(0.5)	0.43(0.5)	0.38(0.5)
SEX	0.20(0.4)	0.18(0.4)	0.18(0.4)	0.25(0.5)	0.33(0.5)	0.28(0.5)
TINCOME	5103.47	4985.95	5014.72	5258.24	5277.43	5265.26
	(2519.4)	(3077.1)	(2948.0)	(2383.9)	(2175.3)	(2305.6)
WHOUR	61.17	61.98	61.78	62.60	56.38	60.32
	(16.2)	(15.2)	(15.4)	(16.8)	(12.7)	(15.7)
Knowledge						
KCARD	0.96(0.2)	0.91(0.3)	0.92(0.3)	0.92(0.3)	0.94(0.3)	0.92(0.3)
KCOVER	0.37(0.5)	0.16(0.4)	0.21(0.4)	0.22(0.4)	0.12(0.3)	0.18(0.4)
KDIS	0.47(0.5)	0.44(0.5)	0.45(0.5)	0.41(0.5)	0.38(0.5)	0.40(0.5)
KEMERG	0.33(0.5)	0.32(0.5)	0.32(0.5)	0.35(0.5)	0.37(0.5)	0.36(0.5)
KHOUR	0.72(0.5)	0.63(0.5)	0.65(0.5)	0.67(0.5)	0.60(0.5)	0.64(0.5)
KMAIN	0.64(0.5)	0.60(0.5)	0.61(0.5)	0.61(0.5)	0.62(0.5)	0.61(0.5)
KPAY	0.72(0.5)	0.81(0.4)	0.79(0.4)	0.73(0.4)	0.69(0.5)	0.72(0.5)
Satisfaction						
CLEAN	0.96(0.2)	0.93(0.3)	0.94(0.3)	0.89(0.3)	0.91(0.3)	0.90(0.3)
FRIEND	0.85(0.4)	0.83(0.4)	0.84(0.4)	0.86(0.4)	0.92(0.3)	0.88(0.3)
NEAR	0.85(0.4)	0.81(0.4)	0.82(0.4)	0.83(0.4)	0.89(0.3)	0.85(0.4)
QUAL	0.85(0.4)	0.84(0.4)	0.84(0.4)	0.82(0.4)	0.89(0.3)	0.84(0.4)
RECEPT	0.88(0.3)	0.86(0.4)	0.87(0.3)	0.87(0.3)	0.94(0.2)	0.89(0.3)
WAIT	0.85(0.4)	0.82(0.4)	0.83(0.4)	0.78(0.4)	0.84(0.4)	0.80(0.4)
Sample size	105	324	429	168	97	265

Note: ----(-----) = mean(SD)
        - Key concerning variable names and value labels is in table 4A.15, annex 5
        * Variables excluded from models

Table 5.5 shows coefficients for logistic regression models explaining OP and IP utilization. Significant variables (P-value<0.05) that reduced the probabilities of receiving OP care are being an Eden worker relative to Almond, Sahafarm and Yatming workers; being a manual producer; and knowledge about reimbursement of fee for emergency care. Significant variables (P-value<0.05) that increased the probabilities of receiving OP care are being Sahafarm workers relative to Almond, Eden and Yatming workers; higher total income; higher number of working hour/day; and knowledge about social security cards, social security benefit, and opening hours of MEDSEC facilities (table 5.4-5.5). The most important factors influencing the OP probabilities of receiving care are knowledge variables followed by firm variables. For socioeconomic variables, the most influential variable to the model is being a manual producer which associates with the income and working hour/day of the workers.

For IP model, significant variables (P-value<0.05) that reduced the probabilities of receiving IP care are being Almond and Sahafarm workers relative to Eden and Yatming workers, and being a manual producer. Significant variables (P-value<0.05) that increased the probabilities of receiving IP care are being an Eden worker relative to Almond, Sahafarm and Yatming workers; graduation from primary school, knowledge about emergency services, and satisfaction with cleanliness (table 5.4-5.5). The most important factors influencing the IP probabilities of receiving care are being a worker in firms, followed by nature of the job and educational status of the workers. There is only 1 variable of the knowledge and satisfaction variables influencing the models. The power of OP models is 83.68%, and IP is 81.89%.

Table 5.5 Regression coefficients and P-values for OP (first episode) and IP logistic regression models

Variables	OP		IP	
	Coeff.	P-value	Coeff.	P-value
Firms				
ALM	-0.04	0.93	-2.82	0.00*
EDEN	-1.16	0.01*	1.53	0.04*
SAH	1.85	0.00*	-2.77	0.00*
Socioeconomic				
AGE	0.02	0.26	0.01	0.62
MSTATM	0.46	0.09	0.63	0.14
NJOB	-0.66	0.04*	-1.75	0.00*
PEDUCAT	-0.30	0.50	1.28	0.02*
SEDUCAT	0.02	0.97	0.72	0.21
SEX	0.54	0.14	0.80	0.08
TINCOME	0.01	0.03*	-0.01	0.07
WHOUR	0.03	0.01*	-0.01	0.44
Knowledge				
KCARD	1.39	0.04*	0.64	0.47
KCOVER	2.35	0.00*	0.12	0.84
KDIS	-0.35	0.26	-0.34	0.45
KEMERG	-0.02	0.94	0.91	0.04*
KHOUR	0.64	0.04*	-0.33	0.50
KMAIN	0.28	0.33	0.20	0.61
KPAY	-0.84	0.02*	-0.01	0.99
Satisfaction				
CLEAN	0.73	0.24	2.53	0.00*
FRIEND	-	-	-0.80	0.35
NEAR	-	-	0.13	0.85
QUAL	-	-	-1.05	0.22
RECEPT	-	-	-0.60	0.58
WAIT	-	-	-0.30	0.63
-2 Log likelihood	95.75	<0.05*	125.11	<0.05*
df	19		24	
power of model	83.68%		81.89%	

Note: * = Statistically significant, P-value<0.005

5.5 Employer knowledge and attitude

The interviews with managers of 4 firms, the reasons that many clients select MEDSEC are because its marketing skills are working well, there are a lot of providers in the network, and facilities serve satisfactory medical care to workers. The managers know of MEDSEC through various means: introduction by the director of a small hospital and by a personnel manager of one firm, from a letter and mail voucher sent by the manager of MEDSEC office, from a doctor of one clinic, from a facsimile sent by MEDSEC office, and from marketing personnel of MEDSEC. Moreover during a year, employers are frequently approached by MEDSEC in various ways: frequently receiving a document introducing MEDSEC/network about the objective of MEDSEC, names and venue of facilities, operating activities, outcome of

services, and problems and interventions to solve problems; receiving instruction and explanation of problems, constraints, and questions regarding services through direct contact with marketing personnel of MEDSEC and directors of MEDSEC facilities; being contacted by telephone with MEDSEC nurse and doctor in case of emergency treatment for the worker; 1 annual meeting with the personal manager of firms outside Bangkok which include some sightseeing; 2 meetings in Bangkok to understand the process of service and to discuss problems in September (before selecting main contractor) and February each year; being sent a doctor to treat workers in the work place, 2 hours a week. This saves the expense of the firm for hiring doctors for this inevitable activity; occasionally being serviced by a mobile medical team to serve workers in the firm; and being sent vouchers, billboards, and posters related to social security activities for further updating information of workers. This marketing approach of MEDSEC has created a warm relationship between the employers and the network.

Managers tend to select a main contractor that has a network, has more facilities in the network, has more specialized hospitals in the network, has facilities near to the firm and workers' home, and has service after working hours of the workers. Half of the managers (2 persons) have considered the workers' satisfaction by giving a questionnaire to their workers before choosing the main contractor. Moreover, the employers preferred the main contractors that can help their company to increase working hours of the worker by reducing absenteeism from sickness and time consumed to seek care and decrease company health care expenditure by reducing the reimbursement of private clinic fees of workers (some companies have had this health benefit since before the SSA was enacted). However, from the viewpoint of the manager of Eden firm, the absenteeism rate of the worker in the company has decreased by about 31.3% after choosing MEDSEC. This is because the workers can receive care from facilities during after working hours.

All employers denied that there is a direct incentive payment to employers if they select MEDSEC. There are some meetings for personal managers of firms outside Bangkok plus some sightseeing, and some small gifts to employers during new year celebrations.

The categories of satisfaction of the employers with MEDSEC facilities were: prompt treatment for emergency care, less waiting time, availability of service after working hours to save worker working hours, cleanliness of premises of MEDSEC network, easy access to facilities both from home and work place, availability of ambulance service, good referral system to higher care hospitals, and less refusal to provide care (less discrimination) compared to past experience with public main contractors. The categories of dissatisfaction of the employers with MEDSEC facilities

were: small setting of hospitals and clinics, less medical equipment in a particular setting, different drugs used between the insured/noninsured, and changing of general practitioners for a worker over time lead to less patient-doctor relationship. Managers commented that public contractors provide care mainly during working hours of the workers. This is not convenient for either the insured and or the firms. Moreover the insured complained that they were not satisfied with the services of public contractors.

5.6 Summary

More than 50% the workers did not know about uncovered diseases and conditions, free of charge emergency care, and benefits under SSA; 22-50% of the workers did not know about their main contractor's name, the working hours of MEDSEC facilities, or about reimbursement fees for emergency care; 12.5% of the workers did not know that they have to present Social Security card when they receive care; and 93.9% would like to choose their main contractors.

The OP illness rate of the insured of MEDSEC network is 8.18 episodes/person/year. The IP illness rate is 0.256 times/person/year. The admission rate to MEDSEC hospitals is 0.161 times/person/year. IP utilization proportion to MEDSEC hospitals is 63%. The proportion OP seeking care from MEDSEC facilities is 26.3%. The OP utilization rate was 2.15 visit/person/year, during November 1994-January 1995. When the insured became sick and started seeking care, it is likely that the sick insured went back home then sought care.

Comparing 6 'satisfaction variables', the insured were more satisfied than dissatisfied with MEDSEC in all variables, with the highest proportion of satisfaction with the cleanliness. The insured were more satisfied with MEDSEC care than with experiences with public facilities for all the 6 variables, with the highest proportion of satisfaction with the waiting time.

Logistic regression was used to analyze factors affecting OP and IP utilization rate. Two models, OP first episode and IP models, were presented. Variables affecting the probability of receiving OP care were: being a worker in Eden and Sahafarm firms; being a manual producer; total income/month; working hours/day; and knowledge about social security cards, social security benefit, opening hours of MEDSEC facilities, and reimbursement of fees for emergency care. For the IP model, variables explaining the probability of seeking IP care were: being a worker in Almond, Eden and Sahafarm firms; being a manual producer; graduation from

primary school; knowledge about emergency services; and satisfaction with cleanliness. The power of OP models is 83.68% and IP is 81.89%.

Results from in-depth interviews with 4 employers shows that the main contractor to be chosen should be a network having more facilities and more specialized hospitals, having facilities near to the firm and worker's home, and having services after working hours of workers. All employers said that there is no direct incentive payment to employers but only some meetings outside Bangkok plus sightseeing, and some gifts to employers on some occasions. An employer mentioned that after choosing MEDSEC, the absenteeism of workers dropped about 30% because of the availability of MEDSEC services during after working hours.

Chapter 6
Evaluation of quality of care

This chapter presents the results from evaluating 4 aspects of quality of care of the MEDSEC/Nopparat networks. It begins with the evaluation of structural aspects, followed by satisfaction of MEDSEC inpatients and prescribing practises at MEDSEC facilities. The final section presents the evaluation of inpatient treatment at MEDSEC hospitals.

6.1 Structure of MEDSEC and Nopparat networks

The objective of this section is to assess the quality of care of MEDSEC/Nopparat networks by analyzing the infrastructure of each of the networks. The hypothesis of this section is that the infrastructure of a private network is better than that of a publicly-organized network.

6.1.1 Distribution and coverage of MEDSEC and Nopparat facilities

- MEDSEC facilities

In order to review the organization of a provider network under the SSA and because the MEDSEC network is the largest network and has expanded over time, it is helpful to study the distribution of its facilities and their coverage to demonstrate the features of the network.

In 1995, the insured of MEDSEC were 280,000; 230,000 lived in greater Bangkok and 185,445 lived in 35 districts of Bangkok. The mean of number of workers covered was 5,298.4/district and of firms selecting MEDSEC network was 48.5/district (table 6.1.1). There were 124 facilities in the MEDSEC network, 77 were in Bangkok. The mean of number of facilities/district in Bangkok was 2.8. Nine districts had no facility, 2 districts had $\geq 3,000$ workers but had no facility, 3 districts had $\geq 5,000$ workers/facility. The mean of average workers/facility/district was $2,533.8 \pm 2,609.7$.

MEDSEC facilities were concentrated in the centre and along the main roads of Bangkok (figure 6.1). The distribution of facilities can be described as in 4 areas: north and northeast of Bangkok for RIG, west and southwest for RSG, southeast for EBG, and central for CBG (Figure 6.1). From the policy of MEDSEC executive committee, the indicator used to increase the number of facilities/district was the number of additional insured over the previous year. One additional facility was provided in any district that had 5,000 additional insured people compared to the previous year.

Table 6.1.1   Number of firms, workers, facilities, and worker/facilities by district of Bangkok

Districts No.	Number of firms	Number of workers	facility	Mean(worker) /facility
1	10	274	1	274.0
2	8	757	0	*
3	165	12694	1	12694.0
4	20	1007	2	503.5
5	104	13319	2	6659.5
6	17	608	0	*
7	19	814	1	814.0
8	14	926	2	463.0
9	6	93	0	8
10	79	15336	5	3067.2
11	22	2095	4	523.8
12	37	6286	6	1047.7
13	23	1020	0	*
14	51	2783	1	2783.0
15	37	2604	2	1302.0
16	76	7281	3	2427.0
17	29	6006	0	*
18	44	3434	3	1144.7
19	93	6331	1	6331.0
20	22	3449	0	*
21	81	5733	2	2866.5
22	216	25884	12	2157.0
23	15	1990	0	*
24	65	6931	3	2310.3
25	49	10574	4	2643.5
26	40	6385	4	1596.3
27	67	13030	3	4343.3
28	26	3429	1	3429.0
29	27	5897	4	1474.3
30	14	488	1	488.0
31	11	925	0	*
32	15	688	0	*
33	16	1269	1	1269.0
34	8	1841	3	613.7
35	170	13264	5	2652.8
total	1696	185445	77	-
mean	48.5	5298.4	2.8	2533.8**
SD	49.3	5639.9	2.4	2609.7**
Minimum	6.0	93.0	0.0	-
Maximum	216.0	25884.0	12.0	-

Note: * = no facility in the district
       ** = exclude 9 (no facility) districts

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Legend:

1 = RAMA SUKSAWAT GR.
2 = RAM INTHRA GR.
3 = EASTERN BANGKOK GR.
4 = CENTRAL BANGKOK GR.

MAP OF BANGKOK

≈ CHOAPRAYA RIVER
— MAIN ROAD
▬ BOUNDARY OF BANGKOK
● MEDSEC FACILITTY
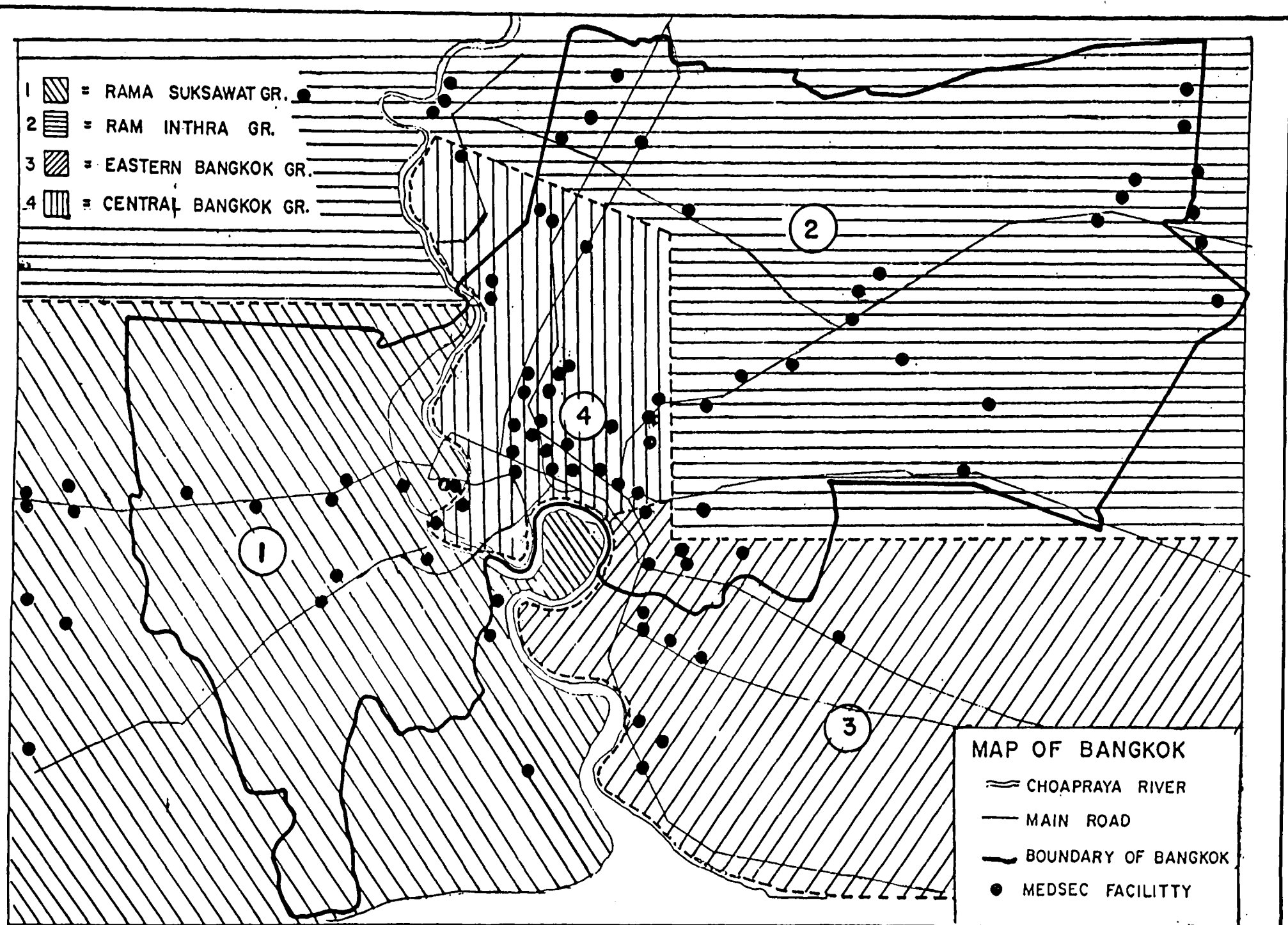
Figure 6.1 Mapping of MEDSEC facilities and subnetworks in Bangkok and metropolitan

- Nopparat facilities

Figure 6.2 shows the coverage area of the Nopparat network. At the time of its establishment, June 1993, it was composed of 36 facilities: 28 private clinics/polyclinics, 7 Bangkok Metropolitan health centres, and Nopparat hospital. There were ≥ 2 facilities in a particular target district. The number of facilities increased to 50 in 1995: 1 general hospital, 2 public community hospitals, 7 Bangkok Metropolitan health centres, 1 private small hospital, and 39 private clinics/polyclinics. However the coverage area was still 7 districts. From the interview with the Nopparat hospital director, the indicator used to increase the number of facilities/district was the number of additional firms selecting Nopparat network in comparison to the previous year.

6.1.2 Infrastructure of the MEDSEC and Nopparat networks

Quota technique was used to select 50% of facilities, 61 from the MEDSEC and 31 from the Nopparat network. Simple random sampling techniques were applied to choose facilities. A postal questionnaire, with a letter from the director of the particular network asking the facility managers to answer the questionnaire faithfully, were sent to the selected facilities. The response rate was 100%.

This section presents the comparison between 6 clusters of structural aspects of the networks. The proportion of MEDSEC clinics in the sample is less than for the Nopparat network. The number of MEDSEC hospitals was higher than in the Nopparat network but Nopparat had 1 large hospital (Table 6.1.2). The dominant service for the clinics is outpatient primary care; for hospitals with 10-51 beds is outpatient and nonspecialized inpatient care; for hospitals with 100-300 beds is general practitioner and general specialized (medicine, surgery, obstetrics, and paediatrics) outpatient and inpatient care; and for hospitals with ≥ 400 beds is general practitioner, general specialized, and subspecialized outpatient and inpatient care. In the MEDSEC network, 10-30% of patients were insured, and in Nopparat 5-20%.

- General administration cluster

Characteristics for this cluster were similar for both networks except for the proportion having emergency electricity sources and autoclave services which were more common in facilities of the MEDSEC network (P-value<0.05, table 5A.1.1-5A.1.2, annex 5). For IP information, although there was no statistical significant difference, Nopparat had generally better IP information than the MEDSEC network.

MAP OF BANGKOK

CHOAPRAYA RIVER
MAIN ROAD
BOUNDARY OF BANGKOK

Coverage area of
Nopparat network
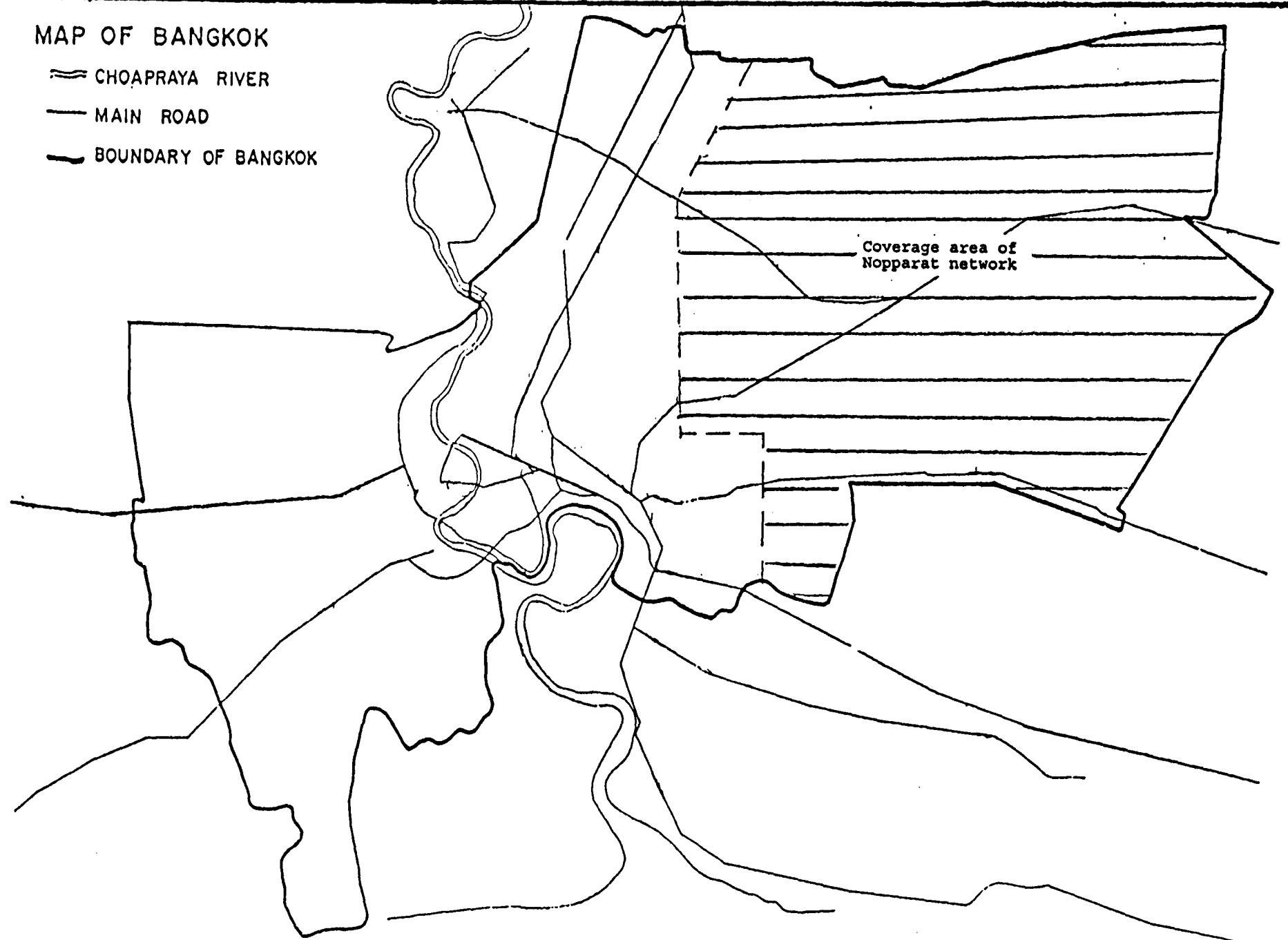
Figure 6.2 Coverage area of Nopparat network in Bangkok

Table 6.1.2   Characteristics of facilities for MEDSEC(N=61) and Nopparat(N=31) facilities in the sample by **number of beds registered or operated**

No of bed	Registered		Operated	
	MEDSEC	Nopparat	MEDSEC	Nopparat
0	47(77.0)	25(80.6)	47(77.0)	25(80.6)
10-51	11(18.0)	5(16.1)	10(16.4)	5(16.1)
100	2(3.3)	0(0.0)	4(6.6)	0(0.0)
300	1(1.6)	0(0.0)	-	-
420	-	-	0(0.0)	1(3.2)
650	0(0.0)	1(3.2)	-	-

Note: ----(----) = Number(%)

- Outpatient service cluster

For OP personnel, the main personnel groups studied were medical doctors, registered nurses and technical nurses. In clinics, mean numbers of personnel working in MEDSEC facilities were higher than for the Nopparat network during 16.30-21.30 and 21.30-6.00 hours except for registered nurses. During the shift 8-16.30 hours, mean numbers of personnel were similar for the 2 networks. For medical specialist, mean numbers of specialist doctors were similar except for OB-GYN doctors with MEDSEC having higher number than Nopparat network (P-value<0.05, table 6.1.3).

For facilities with 10-30 beds, table 6.1.4 demonstrates that staffing levels of personnel were similar except for general surgeons, plastic surgeons, and orthopaedic doctors where MEDSEC had higher level than Nopparat (P-value<0.05).

For facilities with $\geq$100 beds, mean numbers of personnel and specialist doctors of MEDSEC networks were lower than Nopparat hospital except of personnel on duty during 16.30-21.30 hours where the MEDSEC numbers were higher than the Nopparat network. The mean number of personnel at Nopparat hospital during 16.30-21.30 hour was lower than during 21.30-6.00 hour. This is likely because during 16.30-21.30 hours the doctors and nurses of Nopparat hospital tend to work in their own private clinics which were mostly open during 16.30-21.30 hour and there were choices of Nopparat network facilities available during that period to serve the insured (table 5A.1.3, annex 5).

Table 6.1.3 Personnel working in the OP service, for clinics of the networks

| Variable | Mean(SD) | | P-value* |
	MEDSEC(N=47)	Nopparat(N=25)	
1.Personnel(No), 8-16.30 hour.			
- Medical Dr.	1.0(0.5)	0.8(0.9)	0.09
- Register Nurse	0.5(0.7)	1.3(2.7)	0.05
- Technical Nurse	0.5(0.7)	0.3(0.7)	0.25
2.Personnel(No), 16.30-21.30 hour.			
- Medical Dr.	1.3(0.5)	1.0(0.6)	0.01
- Register Nurse	0.5(0.5)	0.4(0.5)	0.41
- Technical Nurse	0.4(0.5)	0.2(0.4)	0.03
3.Personnel(No), 21.30-6.00 hour.			
- Medical Dr.	0.4(0.5)	0.1(0.2)	0.00
- Register Nurse	0.1(0.4)	0.0(0.0)	**
- Technical Nurse	0.1(0.4)	0.0(0.0)	**
4.Medical specialist			
- Medicine	0.8(2.1)	0.2(0.4)	0.14
- General Surgery	0.4(0.7)	0.1(0.3)	0.10
- Plastic Surgery	0.1(0.4)	0.1(0.3)	0.41
- Orthopaedics	0.2(0.4)	0.1(0.3)	0.35
- Paediatrics	0.3(0.5)	0.2(0.4)	0.29
- OB-GYN	0.7(0.8)	0.2(0.4)	0.00

Note: * T-test pooled variance estimated (2 tail),
      ** No variance for comparison

Table 6.1.4 Personnel working in the OP service, for facilities with 10-30 beds of the 2 networks

| Variable | Mean(SD) | | P-value* |
	MEDSEC(N=47)	Nopparat(N=25)	
1.Personnel(No), 8-16.30 hour.			
- Medical Dr.	2.3(0.9)	3.0(2.0)	0.37
- Register Nurse	2.8(1.3)	3.0(3.7)	0.88
- Technical Nurse	1.0(1.2)	0.8(0.4)	0.72
2.Personnel(No), 16.30-21.30 hour.			
- Medical Dr.	2.0(1.3)	1.8(0.8)	0.77
- Register Nurse	2.5(1.6)	1.6(1.5)	0.31
- Technical Nurse	0.7(0.5)	1.2(0.8)	0.16
3.Personnel(No), 21.30-6.00 hour.			
- Medical Dr.	1.2(0.6)	0.6(0.5)	0.10
- Register Nurse	1.8(1.0)	1.6(1.5)	0.77
- Technical Nurse	0.7(0.8)	0.8(1.1)	0.85
4.Medical specialist			
- Medicine	1.5(0.9)	0.8(0.4)	0.11
- General Surgery	2.1(1.1)	0.6(0.5)	0.01
- Plastic Surgery	1.1(0.3)	0.6(0.5)	0.04
- Orthopaedics	2.1(1.1)	0.8(0.5)	0.03
- Paediatrics	0.9(0.3)	1.0(0.0)	**
- OB-GYN	1.2(0.4)	0.8(0.4)	0.11

Note: * T-test pooled variance estimated (2 tail)
      ** No variance for comparison

The proportions for specialty clinics in facilities of outpatient cluster were similar for the 2 networks (P-value>0.05, table 5A.1.4-5A.1.6, annex 5). Most mean numbers of other variables were similar except of OP room and physical examination beds for MEDSEC clinics which were higher than

those for the Nopparat network. Also OP visits to MEDSEC small hospitals were lower than those for the Nopparat network (P-value<0.05, table 5A.1.7-5A.1.8, annex 5). For hospitals with $\geq$100 bedded, mean numbers of other variables of Nopparat hospital were better than those for the MEDSEC network except toilets (table 5A.1.9, annex 5). For other variables of the outpatient cluster, most were similar between the networks except the proportion of patients receiving care after working hours (17-22 hour) at clinics which was higher in the MEDSEC than the Nopparat network (P-value<0.05, table 5A.1.10-5A.1.12, annex 5).

- Laboratory and X-ray service cluster

For the laboratory service, levels of provision for most of the variables were similar except the proportion of determining urine analysis, urea and electrolyte test, and malaria slide examination which were higher at MEDSEC clinics than in the Nopparat network; and the proportion of facilities reporting simple test results within an hour which was lower at MEDSEC clinics than those of Nopparat (P-value<0.05, table 6.1.5-6.1.7, 5A.1.13 in annex 5). For hospitals, most services listed in table 6.1.5 were available and showed no difference between the 2 networks. In table 6.1.6, the majority of MEDSEC/Nopparat clinics had no laboratory service section and specimens were sent to be tested at outside laboratory facilities. This demonstrates that clinics tended to invest less capital in laboratory services but most could provide necessary tests listed in table 6.1.5. However because there was no laboratory on site, most could not provide emergency laboratory services. Table 6.1.7 shows that 20% of MEDSEC small hospitals had no laboratory service section in facilities while those of Nopparat had. This suggests that the MEDSEC hospitals tended to invest less capital cost in laboratory service but most facilities of both networks could provide necessary tests listed in table 6.1.5. However because of the effect of no on site laboratory service section, MEDSEC small hospitals had less emergency laboratory services than those of the Nopparat network. One of the reasons that the MEDSEC network was able to service more tests than the Nopparat network was because the majority of tests in MEDSEC were carried out by other private laboratories outside the facilities, while in the Nopparat network these were done at the facility itself. So they are able to have a wider range of tests serviced than in the Nopparat facilities. However this affects the period of time to report the simple tests which were longer in MEDSEC than in the Nopparat network.

For the X-ray service, most of the structures were similar except the proportion having emergency X-ray services at clinics where for MEDSEC it was higher than in the Nopparat network (P-value<0.05, table 6.1.8, 5A.1.14-5A.1.15 in annex 5). However (table 5A.1.15, annex 5) 25% of large MEDSEC hospitals had no emergency X-ray service while Nopparat hospital

had. Items for X-ray services at MEDSEC clinics and age of X-ray machines at small MEDSEC hospitals were better than those of Nopparat networks (table 6.1.9-6.1.10); and items of variables at the largest hospitals of Nopparat were better than in the MEDSEC network except for the age of X-ray machines of MEDSEC which were better than in the Nopparat network (table 6.1.11).

Table 6.1.5 Laboratory services for clinics of MEDSEC (N=47) and Nopparat (N=25) networks

	Proportion(%)		
Service available	MEDSEC	Nopparat	P-value*
-Urine analysis	89.4	60.0	0.01
-Urea and electrolyte	74.5	32.0	0.00
-Serum glucose	83.0	68.0	0.25
-CBC	87.2	68.0	0.10
-Pregnancy test	97.9	84.0	0.09
-Malaria slide	83.0	56.0	0.03
-VDRL	83.0	68.0	0.25
-Cerebo-spinal fluid microscope	29.8	8.0	0.07
-Widal test	76.6	52.0	0.07
-Platelet count	78.7	64.0	0.29
-Stool microscope	83.0	60.0	0.06
-Liver function test	78.7	68.0	0.47
-CSF chemistry	17.0	12.0	0.83
-Stool culture/sensitivity	27.7	24.0	0.96

Note: * Chi-square test with Yate's correction (2 tail).
      - done by facility itself or sending specimens outside

Table 6.1.6 Characteristics of laboratory section for clinics of MEDSEC (N=47) and Nopparat (N=25) networks

	Proportion(%)		
Variable	MEDSEC	Nopparat	P-value*
- Laboratory section owned,			
By facility itself	23.4	16.0	0.70
By other institute	2.1	4.0	
No laboratory service section**	74.5	80.0	
- Time consumed to report simple test			
Within hour	12.8	16.0	0.00
Same day	23.4	16.0	
By 2 days	59.6	32.0	
By 3 days	2.1	0.0	
By more than 4 days	0.0	16.0	
No laboratory service	2.1	20.0	
- Technical laboratory quality inspecting			
No laboratory in facility	27.7	52.0	0.22
Done by facility itself	25.5	20.0	
Done by external group	29.8	20.0	
Done by itself and external group	17.0	8.0	
- Emergency service			
No emergency service	85.1	92.0	0.32
Done by facility itself 24 hour	6.4	8.0	
On call come by 1 hour	8.5	0.0	

Note: * Chi-square test with Yate's correction (2 tail).
      ** Sending to other laboratory outside facility

Table 6.1.7 Characteristics of laboratory section for hospitals with 10-30 beds by network

Variable	Proportion(%)		
	MEDSEC (N=10)	Nopparat (N=5)	P-value*
- Laboratory section owned,			
By facility itself	70.0	80.0	0.52
By other institute	10.0	20.0	
No laboratory service section**	20.0	0.0	
- Time consumed to report simple test			
Within hour	60.0	80.0	0.24
Same day	20.0	0.0	
By 2 days	20.0	0.0	
By more than 3 days	0.0	20.0	
- Technical laboratory quality inspecting			
No laboratory in facility	20.0	0.0	0.31
Done by facility itself	20.0	60.0	
Done by external group	10.0	20.0	
Done by itself and external group	50.0	20.0	
- Emergency service			
No emergency service	50.0	20.0	0.47
Done by facility itself 24 hour	30.0	60.0	
On call come by 1 hour	20.0	20.0	

Note: * Chi-square test with Yate's correction (2 tail).
  ** Service by sending to other laboratory outside facility

Table 6.1.8 Characteristics of structure of x-ray cluster for clinics by network

Variable		Proportion(%)		
		MEDSEC	Nopparat	P-value
- Have ultrasound(N1=47,N2=25)	Yes	12.8	0.0	0.09**
- Emergency x-ray	No emergency service	63.8	96.0	0.01*
service	Result by 2 hour	25.5	4.0	
(N1=47,N2=25)	other	10.6	0.0	
- X-ray room	standard qualified	90.3	71.4	0.22**
(N1=31, N2=7)	Not standard	9.7	28.6	

Note: * Chi-square test with Yate's correction (2 tail).
  N1, N2 = Total number of MEDSEC, and Nopparat facilities.
  ** Fisher exact test (2 tail)

Table 6.1.9 Characteristics of structure of facilities of the X-ray service cluster for clinics of MEDSEC (N=47) and Nopparat (N=25) networks.

Variable	Mean(SD)		
	MEDSEC	Nopparat	P-value*
1.X-ray service/year(No.)	306.2(340.1)	108.3(300.6)	0.03
2.X-ray personnel(No.)	0.9(0.8)	0.3(0.7)	0.00
3.X-ray personnel trained/year (day)	1.1(2.8)	0.0(0.0)	**
4.X-ray machine(No.)	0.7(0.5)	0.3(0.4)	0.00
5.Age of X-ray machine set(year)	6.0(2.6)	7.7(2.9)	0.02

Note: * T-test pooled variance estimated (2 tail)
  ** No variance for comparison

Table 6.1.10   Characteristics of structure of facilities of the X-ray service cluster for **hospitals with 10-30 beds of** MEDSEC (N=10) and Nopparat (N=5) networks.

Variable	Mean(SD)		
	MEDSEC	Nopparat	
1.X-ray service/year(No.)	1950.0(1790.5)	408.0(682.9)	0.14
2.X-ray personnel(No.)	1.5(0.5)	1.0(0.0)	**
3.X-ray personnel trained/year (day)	0.9(1.3)	0.2(0.5)	0.28
4.X-ray machine(No.)	1.0(0.0)	1.2(0.4)	**
5.Age of X-ray machine set(year)	4.9(1.6)	8.6(0.9)	0.00

Note: *   T-test pooled variance estimated (2 tail)
        ** No variance for comparison

Table 6.1.11   Characteristics of structure of facilities of the X-ray service cluster for **hospitals with ≥100 beds of** MEDSEC (N=4) and Nopparat (N=1) networks.

Variable	Mean(SD)	
	MEDSEC	Nopparat
1.X-ray service/year(No.)	404.8(290.8)	25000.0
2.X-ray personnel(No.)	1.3(0.5)	2.0
3.X-ray personnel trained/year (day)	0.0(0.0)	5.0
4.X-ray machine(No.)	1.8(1.5)	3.0
5.Age of first X-ray machine set(year)	5.3(5.2)	11.0
6.Age of second X-ray machine set (year)	4.0(0.0)	8.0
7.Age of third X-ray machine set (year)	3.0(0.0)	5.0

Note: -No variance for significant test,

- Pharmacy cluster

Table 6.1.12-6.1.14 indicate that most variables in the pharmacy cluster were similar except the proportion having a pharmacist and a drug stock system which were higher at Nopparat clinics than those of the MEDSEC network (P-value<0.05). Although there was no statistical difference, 75% of large hospitals of MEDSEC had no pharmacist, and 50% of these hospitals had no expiry date labelled on drug packages while Nopparat hospital had (table 6.1.14).

- Operation and labour room cluster

Most characteristics of structures for this cluster were similar between the networks except for the proportion having complete emergency sets in the OR which was higher in MEDSEC than in the Nopparat networks (P-value<0.05, table 5A.1.16-5A.1.17, annex 5).

Table 6.1.12 Characteristics of structure of pharmacy cluster for clinics by network

Variable		Proportion(%)		P-value
		MEDSEC (N=47)	Nopparat (N=25)	
- Having pharmacist,	Yes	2.1	24.0	0.00**
- Patient's name on package	Yes	95.7	96.0	1.00**
- Dosage used on package	Yes	95.7	100.0	0.54**
- Expired date on package	Yes	14.9	16.0	0.90*
- Recheck before delivery	No	6.4	16.0	0.42*
	Yes, every time	53.2	48.0	
	Yes, sometime	40.4	36.0	
- Drug stock system	Yes	12.8	60.0	0.00*
- Air condition at drug stock,	No	14.9	24.0	0.62*
	Yes, some room	53.2	40.0	
	Yes, almost every room	10.6	8.0	
	Yes, every room	21.3	28.0	

Note: * Chi-square test with Yate's correction (2 tail)
** Fisher exact test (2 tail)

Table 6.1.13 Characteristics of structure of pharmacy cluster for hospitals with 10-30 beds by network

Variable		Proportion(%)		P-value
		MEDSEC (N=10)	Nopparat (N=5)	
- Having pharmacist,	Yes	50.0	80.0	0.58*
- Patient's name on package	Yes	100.0	100.0	***
- Dosage used on package	Yes	100.0	100.0	***
- Expired date on package	Yes	30.0	20.0	1.00**
- Recheck before delivery,	Every time	70.0	100.0	0.51**
	Sometime	30.0	0.0	
- Drug stock system	Yes	100.0	100.0	***
- Air condition at drug stock,	Some room	30.0	0.0	0.38*
	Almost every room	10.0	20.0	
	Every room	60.0	80.0	

Note: * Chi-square test with Yate's correction (2 tail)
** Fisher exact test (2 tail), *** Cannot compute

Table 6.1.14 Characteristics of structure of pharmacy cluster for hospitals with ≥100 beds by network

Variable		Proportion(%)		P-value
		MEDSEC (N=4)	Nopparat (N=1)	
- Having pharmacist,	Yes	25.0	100.0	0.40**
- Patient's name on package	Yes	100.0	100.0	***
- Dosage used on package	Yes	100.0	100.0	***
- Expired date on package	Yes	50.0	100.0	1.00**
- Recheck before delivery	Yes	100.0	100.0	***
- Drug stock system	Yes	100.0	100.0	***
- Air condition at drug stock,	No	25.0	0.0	0.66*
	Yes, almost every room	25.0	0.0	
	Yes, every room	50.0	100.0	

Note: * Chi-square test with Yate's correction (2 tail)
** Fisher exact test (2 tail), *** Cannot compute

- Inpatient service cluster

Most characteristics of structural aspects for this cluster were similar between the networks except for the mean of % of beds with sphygmomanometer (BP) where the % for MEDSEC second ward was higher than for the Nopparat network (P-value<0.05, table 5A.1.18, annex 5).

6.1.3 Summary

The MEDSEC network has a wide coverage of facilities in districts of Bangkok with only 9 districts not being covered. There were 2 districts which had $\geq 3,000$ workers but had no facility and 3 districts had $\geq 5,000$ workers/facility. For the Nopparat network, facilities were restricted to 7 districts in the east of Bangkok and which provided coverage for the insured of ≥ 10 firms/district choosing Nopparat network. The indicator used increase facilities/district for MEDSEC was 5,000 additional insured over the previous year for 1 additional facility. For Nopparat network, it was the number of additional firms selecting Nopparat network from the previous year.

The infrastructure was compared by 6 clusters: general administration, outpatient service, laboratory and X-ray service, pharmacy, operation and labour room, and inpatient service. Variables for which MEDSEC had a better infrastructure than Nopparat network or vice versa are shown in table 5A.1.19. In clinics, MEDSEC had better structural variables in several clusters than the Nopparat network but in large hospitals, Nopparat had better structure than those of the MEDSEC network. For small hospitals, both networks were similar for structural quality.

For the outpatient cluster, the mean numbers of personnel at clinics during 16.30-6.00 hours (after working hours), and the mean numbers of outpatient rooms and examination beds in MEDSEC were higher than in the Nopparat network. In small hospitals, MEDSEC had more specialist doctors than Nopparat network because, according to MEDSEC policy, small hospitals in the network need to have specialist doctors to attract the insured to select the MEDSEC network. For large hospitals, the Nopparat network generally had better indicators of structure than the MEDSEC network because the Nopparat sample hospital was Nopparat hospital which has 420 beds while the sample hospitals of MEDSEC were all 100 bedded hospitals. Usually the bigger the size of hospital the better structure is. However, since the MEDSEC network tended to provide more services than the Nopparat networks after working hours, the personnel during 16.30-21.00 hours at the larger hospitals of MEDSEC were more than in the Nopparat network.

6.2 Satisfaction of inpatients admitted to MEDSEC and Nopparat hospitals

This section presents the results from evaluating satisfaction of inpatient of MEDSEC/Nopparat hospitals. It concentrates mainly on 4 aspects of services provided: medical treatment and care; information and communication; ward environment and facilities; and discharge and outcome.

All the inpatients, 399 workers (57, 69, 56, 61, 28, and 128 from Rama-Suksawat, Ram-Intra, Wicharn-Yut, Wipawadi-Rangsit, Parkket, and Nopparat hospitals respectively) were interviewed just before being discharged. during January-February 1995. The ratio of Male:female of all samples is 4:6. However there was no significant difference by gender or MEDSEC hospitals in the 4 aspects (table 5A.2.1-5A.2.12, annex 5), therefore the data were pooled. The majority of the workers were married and had graduated from primary school. There was no significant difference concerning age, marital status, and educational status of the insured between MEDSEC/Nopparat networks (table 5A.2.13-5A.2.15, annex 5).

Table 6.2.1 shows that a greater proportion of patients were satisfied with outpatients/inpatients general care at MEDSEC than those using the Nopparat network (P-value<0.05).

Table 6.2.1 Proportion (%) of patients satisfied with general care by network

Level of satisfaction		MEDSEC (N=271)	Nopparat (N2=128)	P-value*
1. Outpatient				
	Good	98.5	82.0	0.00
	Fair	1.1	17.2	
	Bad	0.4	0.8	
2. Inpatient				
	Good	97.8	78.9	0.00
	Fair	1.1	19.5	
	Bad	1.1	1.6	

Note * Chi-square test with Yate's correction (2 tail)

6.2.1 Medical treatment and care

Table 6.2.2 demonstrates that patients using MEDSEC were significantly more satisfied with medical treatment aspects than those using the Nopparat network (P-value<0.05) except for feelings of embarrassment.

For 5 levels of satisfaction concerning different groups of personnel, the proportion of the insured rating their satisfaction either as 'excellent' or 'very good' regarding all groups of personnel, was higher for MEDSEC than for the Nopparat network (table 6.2.3). If the 5 level rating scale was changed to a 3 level scale by combining excellent and very good, and

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fair and bad together, the insured were still more highly satisfied at the level of excellent and very good in the MEDSEC rather than the Nopparat network for all 5 groups (P-value<0.05).

6.2.2 Information and communication

The proportion of patients satisfied for all variables concerning perception about communication in medical care provided was higher for MEDSEC than the Nopparat network (P-value<0.05, table 6.2.4).

6.2.3 Ward environment and facility

Levels of satisfaction for all variables concerning perception of the inpatient environment and facilities were higher for MEDSEC than the Nopparat network (P-value<0.05) except regarding keeping personal belonging (table 6.2.5).

<u>Table 6.2.2</u> Patients' perception about medical care by network

Variable		Proportion(%)		P-value*
		MEDSEC	Nopparat	
1.Explain regulation and available facilities (N1=271,N2=128)	Yes	70.5	46.1	0.00
2.Explain before providing treatment, (N1=271,N2=128)	Yes	80.8	57.0	0.00
3.Patient need, considered (N1=271,N2=128)	Yes	83.4	63.3	0.00
4.Made embarrassed (N1=271,N2=128)	Yes	6.6	11.7	0.13
5.Respect patient privacy, (N1=271,N2=128)	Yes	78.6	64.1	0.00
6.Respond for assistance** (N1=182,N2=84), Immediate,<10 Min		84.1	53.6	0.00
Quick,10-15 Min		14.8	25.0	
Slow,>15 Min		1.1	21.4	
7.Satisfy to pain released** (N1=226,N2=111)	Yes	96.5	69.4	0.00
8.General satisfaction with treatment, (N1=271,N2=128)	Yes	94.8	82.0	0.00

<u>Note</u> * Chi-square test with Yate's correction (2 tail)
N1, N2 = Total number of MEDSEC, Nopparat patients
** Applied only with relevant inpatients

Table 6.2.3 Inpatients' satisfaction with personnel between MEDSEC (N=271) and Nopparat (N=128) networks

Personnel group		Proportion(%)					P-value*
		Excel-lent	Very good	Good	Fair	Bad	
Medical doctor	MEDSEC	19.9	35.1	33.6	9.2	2.2	0.00
	Nopparat	14.1	19.5	49.2	13.3	3.9	
Nurse	MEDSEC	16.6	35.8	32.5	14.8	0.4	0.00
	Nopparat	5.5	10.9	46.1	32.0	5.5	
X-ray & laboratory	MEDSEC	25.1	11.8	59.4	3.3	0.4	0.00
	Nopparat	13.3	8.6	52.3	19.5	6.3	
Cleaner	MEDSEC	6.6	15.5	47.6	28.8	1.5	0.00
	Nopparat	3.1	12.5	42.2	30.5	11.7	
Other group	MEDSEC	9.2	15.9	45.0	29.5	0.4	0.00
	Nopparat	1.6	3.9	57.8	28.9	7.8	

Note * Chi-square test with Yate's correction (2 tail)

Table 6.2.4 Inpatients' perception about communication in medical care provided by network

Variable		Proportion(%)		P-value*
		MEDSEC (N=271)	Nopparat (N=128)	
-Doctor & nurse explain before providing treatment	Satisfied	89.3	69.5	0.00
	Unsatisfied	10.7	30.5	
-Doctor's time to explain patient's question	Satisfied	89.3	71.1	0.00
	Unsatisfied	10.7	28.9	
-Nurse's time to explain patient's question,	Satisfied	95.6	75.8	0.00
	Unsatisfied	4.4	24.2	
-Interaction with X-ray & laboratory staff	Satisfied	91.1	67.2	0.00
	Unsatisfied	8.9	32.8	
-Relative informed adequately	Satisfied	87.8	64.8	0.00
	Unsatisfied	12.2	35.2	
-Personnel's time to explain relative's question	Satisfied	80.8	61.7	0.00
	Unsatisfied	19.2	38.3	

Note * Chi-square test with Yate's correction (2 tail)

Table 6.2.5 Inpatients' perception about the hospital environment and facilities by network

Variable			MEDSEC (N=271)	Nopparat (N=128)	P-value*
			Proportion(%)		
-Room temperature		Good	87.5	62.5	0.00
		Fair	12.5	36.7	
		Bad	0.0	0.8	
-Patient bed		Good	90.8	74.2	0.00
		Fair	9.2	25.	
		Bad	0.0	0.8	
-Cleanliness		Clean enough	70.1	46.9	0.00
		Something not clean	29.9	53.1	
-Food		Good	87.1	67.2	0.00
		Not good	12.9	32.8	
-Disturbance while sleeping/resting		Yes	12.9	27.3	0.00
		No,fine	87.1	72.7	
-Bothering of ward rule		No,fine	93.0	80.5	0.00
		Yes,some bothered	7.0	19.5	
-Place to keep valuable personal belonging		Yes	38.0	39.8	0.81
		No	62.0	60.2	

Note: * Chi-square test with Yate's correction (2 tail)

6.2.4 Discharge and outcome

A significantly higher proportion of patients were satisfied for all variables related to inpatient's perceptions about discharge and outcome in the MEDSEC than the Nopparat network (P-value<0.05) except concerning written notice given for follow up appointments (table 6.2.6).

Table 6.2.6 Inpatients' perception about discharge and outcome by network

Variable		MEDSEC (N=271)	Nopparat (N=128)	P-value*
		Proportion(%)		
1. Right time to discharge	Yes	96.7	82.0	0.00
2. Explanation about taking drug at home	Adequate	97.0	88.3	0.00
	Not adequate	3.0	11.7	
3. Explanation to help patient getting better at home	Yes	91.9	75.0	0.00
4. Given written notice for follow up	Yes	80.8	80.5	0.48
	No notice	11.1	14.1	
	No FU appointment	8.1	5.5	
5. Perception of health at discharge	Better	91.9	76.6	0.00
	Not sure	8.1	19.5	
	Worse	0.0	3.9	

Note * Chi-square test with Yate's correction (2 tail)

6.2.5 Summary

In this substudy, 399 insured inpatients (271 from MEDSEC and 128 from Nopparat networks) were interviewed to compare levels of satisfaction between the networks. Higher proportions of inpatients were satisfied with 33 variables (91.7%) of the 4 aspects of inpatient services in MEDSEC in comparison to those using the Nopparat network, except for 3 variables (8.3%): patient feelings of embarrassment, service for looking after personal belongings, and written notice given for follow up appointments.

6.3 Prescribing analysis for MEDSEC facilities

The objective of this section is to assess outpatient care at MEDSEC facilities by analyzing drug prescriptions between those for the insured and noninsured. The hypothesis is that the insured of a private network have received less effective drug treatment than the noninsured. The result is presented in 2 parts: general analysis of prescriptions and prescription analysis for 4 tracers.

6.3.1 General analysis of prescriptions

Outpatient prescriptions, 1,845 cases from 4 small hospitals (1 from each sub-network), are analyzed. The ratio between male:female patients was 1:1.5. The insured numbered 1,017, noninsured 828. The duration of study was 6 months, January-June 1994. Mean of samples of the insured/noninsured at each hospital/month was 38.3 ± 53, maximum 45, minimum 30.

URI was the most common disease among the insured (Table 6.3.1), with the highest proportion at 28.7%, followed by gastro-intestinal (GI) tract infection (15.1%), surgery and trauma (14.0%) and arthritis (9.3%). For the noninsured, surgery and trauma was the most common (21%).

The mean number of items of drugs/prescription for the insured was higher than for the noninsured but the price/prescription for the insured was lower than that for the noninsured (P-value<0.05) (Table 6.3.2). Proportion of items of generic names and essential drugs shared in a prescription for the insured were higher than for the noninsured (P-value<0.05, Table 6.3.3). Table 6.3.4 demonstrates that the proportion of patients prescribed with ≥ 1 antibiotic drug and ≥ 1 drug injection prescribed for the insured was lower than for the noninsured (P-value<0.05).

In general, drug use for all diseases/conditions for the insured was more rational than for the noninsured by looking at the mean of the proportion of items of generic names and essential drugs, and the proportion of ≥ 1 antibiotic and injection prescribed.

Table 6.3.1 Proportion(%) of patients by diseases/conditions & insurance status

Disease /Conditions	Insured (N = 1,017)	Noninsured (N = 828)	Total (N =1,845)
URI	28.7	11.6	21.0
GI DISEASE	15.1	12.7	14.0
SURGERY & TRAUMA	14.0	21.0	17.1
ARTHRITIS	9.3	3.3	6.6
NERO-PSYCHIC DISEASE	8.7	4.8	6.9
SKIN DISEASE	6.1	2.6	4.5
LRI	5.6	6.0	5.8
EYE, NOSE, EAR, TOOTH	3.9	3.7	3.8
HPT	2.2	0.7	1.5
OB-GYN DISEASE	1.8	17.9	9.0
ENDOCRINE DISEASE	1.4	1.7	1.5
NO DIAGNOSIS	1.4	1.3	5.8
OTHER MEDICAL CONDITION	1.0	0.7	0.9
UTD	0.8	2.2	1.4

Note LRI=Lower Respiratory Tract Infection

Table 6.3.2 Mean total number of items of drugs and price by insurance status

	Insured	Noninsured	P-value*
1.Total items	2.8(1.3)	2.6(1.6)	0.00
2.Price,Baht	172.8(70.2)	280.0(232.2)	0.00

Note: * = T-Test (Pool Variance Estimated), (---) = (SD)

Table 6.3.3 Mean proportion (%) of items of generic name and essential drugs prescribed in a prescription, by insurance status

	Insured	Noninsured	P-value**
-Generic name	38.0*(24.6)	25.2(32.3)	0.000
-Essential	68.2(32.7)	63.3(28.3)	0.000

Note: * = Number of items of generic name prescribed in a prescription x 100
                    Total items of drugs prescribed in a prescription

     ** = T-Test(Pool Variance Estimated), ----(---) = %(SD)

Table 6.3.4 Proportion (%) of patients prescribed >1 antibiotic drug and injection by the insured (N=1017)/noninsured (N=828)

	Insured	Noninsured	P-value*
Antibiotic drug	40.5	47.6	0.00
Injected medicine	7.0	25.0	0.00

Note * = Chi Square Test with Yates Correction (2 tail)

6.3.2 Prescription analysis of 4 tracers

- General prescription analysis URI, arthritis, UTD, and HPT were chosen as tracers according to the reasons described in chapter 3. The mean of number of items of drugs/encounter for the insured with URI and HPT was lower than the noninsured; and mean price charged for the URI, arthritis, and HPT patients for the insured was lower than the noninsured (P-value<0.05) (table 6.3.5). The proportion of items of generic name or essential drugs prescribed in a prescription for the insured was higher than for the noninsured with URI (P-value<0.05, table 6.3.6). However the proportion of items of generic names or essential drugs prescribed in a prescription for the insured was higher than the noninsured with arthritis, UTD, and HPT although there were no significant statistical differences.

For antibiotics used in the 4 tracers, the proportion of patients who were prescribed ≥1 antibiotic was lower for the insured than the noninsured only in URI patients (P-value<0.05) (table 6.3.7). Since there is no indication to prescribe antibiotics for arthritis and HPT patients yet antibiotics were prescribed for both groups with these diseases, this indicates that the antibiotics were used irrationally. For medicines given by injection, the proportion of ≥1 drug being given parenterally was lower in the insured than in the noninsured with URI, arthritis, and HPT (P-value<0.05, table 6.3.8). There was no reason for injectable medicines to be used routinely in the 4 diseases: table 6.3.8 indicates that there was irrational drugs injection for both groups. However the proportion of patients prescribed ≥1 antibiotic or an injection for the insured was lower than the noninsured in all tracers although there was no significant statistical difference.

In general, the result from 4 tracers shows the same pattern as that for all cases except the mean number of items of drugs used (of the tracers, the insured received less than the noninsured). It is likely that the price/cost of the insured was kept down by limiting number of items of drugs prescribed. As the payment system of MEDSEC was a capitation with an incentive bonus method related to the number of outpatient visits and there was a maximum guideline of OP charge/visit of 170 Baht, in the opinion of MEDSEC staff, these factors influenced the behaviour of health workers to make more patients return to see doctors more frequently so they could split a prescription to be ≥2 prescriptions and then charge the MEDSEC office consequently. The limitation of number of items of drugs prescribed in the "split" prescription might affect the adequacy of treatment of a particular patient.

Table 6.3.5 Mean number of items of drugs/encounter and price for tracer conditions, by insurance status

		URI	Arthritis	UTD	HPT
Total items	Insured	3.4(1.1)	2.8(1.1)	2.8(0.7)	2.3(1.3)
	Noninsured	3.9(1.1)	3.1(1.2)	2.3(1.3)	4.0(1.3)
	P-value*	0.00	0.15	0.35	0.01
Price(Baht)	Insured	173.8(49.1)	205.1(93.8)	263.0(132.3)	178.2(68.6)
	Noninsured	261.5(96.8)	317.3(218.0)	272.1(121.2)	361.7(190.9)
	P-value*	0.00	0.00	0.87	0.00

Note * = T-Test (Pool Variance Estimated), ---(-----) = Number(SD)

Table 6.3.6 Mean proportion (%) of items of generic names and essential drugs prescribed in a prescription for tracer conditions, by insurance status

		URI	Arthritis	UTD	HPT
Generic name	Insured	42.1*(21.8)	22.7(21.3)	25.8(23.1)	35.9(26.5)
	Noninsured	32.0(22.5)	17.7(25.4)	22.2(30.5)	16.9(30.0)
	P-value**	0.00	0.31	0.77	0.15
Essential drug	Insured	76.3(30.2)	39.2(23.8)	59.8(43.9)	65.8(38.6)
	Noninsured	55.7(22.4)	38.1(29.6)	58.9(23.3)	65.0(18.1)
	P-value**	0.00	0.84	0.95	0.96

Note   * = The same as in table 6.3.3
      ** = T-Test(Pool Variance Estimated), ---(-----) = %(SD)

Table 6.3.7 Proportion (%) of patients prescribed ≥1 antibiotic for tracer conditions, by insurance status

Diseases	Insured	Noninsured	P-value
1. URI(290,95)	79.0	93.7	0.002*
2. Arthritis(94,27)	2.1	11.1	0.07**
3. UTD(8,18)	75.0	83.3	0.63**
4. HPT(22,6)	4.5	33.3	1.00**

Note - * = Chi Square Test with Yates Correction (2 tail)
     -** = Fisher Exact Test (2 tail)
     -(----,----) = (Total Number of the insured, noninsured)

Table 6.3.8 Proportion (%) of patients prescribed ≥1 dose of injection of drugs for tracer conditions, by insurance status

Diseases	Insured	Noninsured	P-value
1. URI	10.7	27.4	0.001*
2. Arthritis	1.1	29.6	0.000**
3. UTD	12.5	22.2	1.00**
4. HPT	9.1	16.7	0.000**

Note - * = Chi Square Test with Yates Correction (2 tail)
     -** = Fisher Exact Test (2 tail)

- URI

In the individual analyses of 4 tracers, all drugs were recorded by their generic name, because many different brand names were used in hospitals. The prices of individual drugs could therefore not be compared.

In patients with URI, the proportion with ≥ 1 dose of amoxycillin or lincomycin prescribed (which are specific drugs for the treatment of secondary bacterial infection) of the insured was lower than the noninsured (P-value<0.05, table 6.3.9). Table 6.3.10 shows that the mean number of tablets for the majority of specific treatment drugs prescribed for the insured were lower than for the noninsured (P-value<0.05). These are: amoxycillin, erythromycin, penicillin V; and symptomatic/supportive treatment drugs: paracetamol, antihistamine, cough-suppressor, and lozenge.

From the standard treatment schedules for URI prepared by the Thai FDA (FDA of Thailand, 1988a), the main recommendation is to treat URI by symptomatic/supportive care such as rehydration, rest, antipyretic drug, antiemetic drug, expectorant, anticough drug, lozenge, and antihistamine. Antibiotics are only needed when there is secondary bacterial infection which can be detected by prolonged symptoms.

In this substudy, the proportion of prescription with certain antibiotics such as amoxycillin and lincomycin prescribed to the noninsured was higher than for the insured but the proportion of ≥ 1 dose of symptomatic treatment drugs prescribed to the noninsured/insured was not different. This indicates that the specificity of drug used for URI patient of the insured was better than the noninsured. However when comparisons are made of the dose of a particular medicine, the insured received less doses of a particular drug (including antibiotics) than the noninsured. This confirms that the price/cost of the insured was likely kept down by limitation in the dose of a particular drug prescribed. Unfortunately, no data were available to confirm that the courses of treatment were split between several prescriptions. Some antibiotics prescribed to both the insured or noninsured - cloxacillin, lexinor, doxycycline, lincomycin, and kanamycin - are not appropriate. This indicates the poor quality of care provided to both groups.

Table 6.3.9 Proportion (%) of URI patients prescribed a particular drug by the insured (N=278)/noninsured (N=94).

Drugs	Number		Proportion (%)		P-value
	Insured	Noninsured	Insured	Noninsured	
1.Specific treatment drugs***					
-Amoxycillin(250mg)	145	63	52.2	67.0	0.02*
-Cloxacillin(250mg)	10	7	3.6	7.4	0.21*
-Erythromycin(250mg)	17	8	6.1	8.5	0.57*
-Ampicillin(250mg)	5	2	1.8	2.1	1.00*
-Penicillin(125mg)	38	5	13.7	5.3	0.05*
-Cotriamoxazole	11	0	4.0	0.0	0.07**
-Lexinor(200mg)	2	1	0.8	1.1	1.00**
-Doxycycline(250mg)	0	2	0.0	2.1	0.06**
-Lincomycin	22	18	7.9	19.1	0.00*
-Kanamycin	2	0	0.7	0.0	1.00**
2.Symptomatic/supportive treatment drugs					
-Paracetamol(500mg)	212	77	76.3	81.9	0.32*
-Antihistamine	123	49	44.2	52.1	0.23*
-Cough-suppressor	109	39	39.2	41.5	0.79*
-Expectorant	61	17	21.9	18.1	0.52*
-Lozenge	40	18	14.4	19.1	0.35*

Note: * = Chi Square Test with Yates Correction (2 tail)
     ** = Fisher Exact test (2 tail)
     *** = Used only for secondary bacterial infection

Table 6.3.10 Mean number of tablets/dose for URI patients by insurance status

Drugs	Mean (SD)		P-value
	Insured	Noninsured	*
1.Specific treatment drugs			
-Amoxycillin	11.8(2.5)	14.4(3.8)	0.00
-Cloxacillin	9.6(1.3)	12.0(3.7)	0.07
-Erythromycin	13.1(3.5)	18.5(5.2)	0.01
-Ampicillin	11.6(0.9)	11.0(1.4)	0.51
-Penicillin V	13.4(2.9)	17.4(2.4)	0.01
-Cotriamoxazole	11.9(0.6)	0.0(0.0)	-
-Lexinor	9.0(4.2)	20.0(0.0)	-
-Doxycycline	0.0(0.0)	10.0(0.0)	-
2.Symptomatic/supportive treatment drug			
-Paracetamol	14.2(4.5)	17.0(4.2)	0.00
-Antihistamine	11.5(3.4)	13.4(4.9)	0.00
-Cough-suppressor	11.1(2.0)	12.4(2.3)	0.00
-Expectorant	11.4(2.0)	12.6(3.2)	0.07
-Lozenge	9.6(3.7)	13.7(6.5)	0.00

Note: * = T-test (Pooled Variance Estimate), (---) = (SD)
      - total number by each drug prescribed in table 6.3.9

- Arthritis

Most of the drugs were prescribed similarly to the insured/noninsured except diflunisal. This was prescribed less frequently to the insured than the noninsured (P-value<0.05, table 6.3.11). Considering the doses (table 6.3.12), the average number of tablets for specific drugs were similar when compared between the insured/noninsured except for piroxicam, paracetamol, and calcium where the insured were prescribed less than the noninsured (P-value<0.05).

From standard treatment schedules for arthritis developed by the Thai FDA (FDA of Thailand, 1988b), the main recommendation is to treat arthritis by use of the nonsteriodal anti-inflammatory drugs (NSAIDS), such as ASA, ibuprofen, naproxen, ketoprofen, indomethacin, diclofenac, piroxicam etc.. The potency of any NSAID is dependent on the response to a particular NSAID by an individual patient. Sometimes pain killers such as paracetamol and codeine are needed to relieve symptoms. Physical therapy such as heat treatment, gentle joint exercise and joint rest, are essential to prevent excess joint movement or to decrease excess joint pressure. Antibiotics are only needed in rare cases of secondary bacterial infection. In this substudy, the drugs prescribed to the insured/noninsured were NSAIDS and paracetamol which were the same as recommended in the gold standard. Antibiotics were infrequently prescribed for either the insured or noninsured. Some drugs prescribed to both the insured or noninsured are not indicated: vitamins and diazepam. This indicates the poor quality of aspects of care provided to both groups. However, when comparisons are made of the dose of a particular medicine, the insured received less doses of a particular drug than the noninsured. This shows that the price/cost of the insured was likely to be kept down by limiting the drugs prescribed, and the dose of a particular drug prescribed for both specific and symptomatic/supportive treatment drugs. Nevertheless more expensive (/course) drugs such as diclofenac were more prescribed than equally effective but cheaper NSAIDS. This was significantly more typical among the noninsured (table 6.3.13).

- UTD

All drugs prescribed were similar between the insured/noninsured (P-value<0.05, table 6.3.14), in addition, the doses (table 6.3.15) were also similar between the insured/noninsured (P-value<0.05). Leelarasamee (1994) recommends that to treat UTD, it is important that the correct antibiotic sensitive to the causative agent is prescribed. Some antibiotics prescribed are not appropriate: tetracycline (to the insured) and metronidazole (to the insured/noninsured). This indicates the poor use of antibiotics. In this substudy, the drugs prescribed and the mean dose of

drug prescribed, especially antibiotics for the insured/noninsured, were not different. This indicates that in UTD, there was no difference in treatment between the insured/noninsured. However as the sample size was very small, this result does not exclude real differences.

Table 6.3.11 Proportion (%) of arthritis patients prescribed a particular drug by the insured (N=93)/noninsured (N=26).

Drugs	Number		Proportion(%)		P-value
	Insured	Noninsured	Insured	Noninsured	
1.Specific treatment drugs					
-Diclofenac	43	15	46.2	57.7	0.42*
-Ibuprofen	13	6	14.0	23.1	0.36**
-Indomethacin	10	2	10.8	7.7	1.00**
-Piroxicam	17	4	18.3	15.4	1.00**
-Diflunisal	0	4	0.0	15.4	0.00**
-ASA	13	1	14.0	3.8	0.30**
-Mefenamic acid	6	0	6.5	0.0	0.34**
-Steroid	9	1	9.7	3.8	0.69**
-Antibiotic	2	3	2.2	11.5	0.07**
2.Symptomatic/supportive treatment drugs					
-Polperisone HCl	21	8	22.6	30.8	0.55*
-Paracetamol	55	15	59.1	57.7	1.00*
-Antacid	7	3	7.5	11.5	0.45**
-Serrapeptase	9	1	9.7	3.8	0.69**
-Calcium	8	2	8.6	7.7	1.00**
3.Other					
-Vitamins	9	3	9.7	11.5	0.72**
-Diazepam	13	3	14.0	11.5	1.00**

Note * = Chi Square with Yates Correction (2 tail)
      ** = Fisher Exact test (2 tail)

Table 6.3.12 Mean number of tablets/dose for arthritis patients by insurance status

| Drugs | Mean (SD) | | P-value |
	Insured	Noninsured	*
1.Specific treatment drugs			
-Diclofenac	13.3(3.7)	14.8(2.0)	0.14
-Ibuprofen	11.6(4.3)	14.7(7.8)	0.28
-Indomethacin	12.6(2.5)	12.5(3.5)	0.96
-Piroxicam	9.9(1.4)	12.3(2.6)	0.02
-ASA	14.8(6.1)	20.0(0.0)	-
-Diflunisal	0.0(0.0)	9.8(4.5)	-
-Mefenamic acid	10.0(0.0)	0.0(0.0)	-
-Steroid	9.9(2.3)	15.0(0.0)	-
2.Symptomatic/supportive treatment drugs			
-Polperisone HCl	12.4(3.2)	13.1(5.0)	0.63
-Paracetamol	12.0(3.5)	17.7(7.5)	0.00
-Antacid	14.9(2.7)	21.7(7.6)	0.06
-Serrapeptase	12.1(3.4)	10.0(0.0)	-
-Calcium	14.3(1.2)	22.5(10.6)	0.03
3.Other			
-Vitamins	13.3(3.3)	17.3(4.6)	0.13
-Diazepam	10.8(4.7)	8.7(5.5)	0.51

Note * = T-test (Pooled Variance Estimate), (---) = (SD)
      -   total number by each drug prescribed in table 6.3.11

Table 6.3.13 Mean cost(Baht) of NSAIDS/prescription of arthritis patients by insurance status

| Drugs | Cost/tablet* | Cost/3 days | Mean cost** | |
			Insured	Noninsured
-Diclofenac	0.26	3.12	3.45	3.84
-Ibuprofen	0.26	3.12	3.02	3.81
-Indomethacin	0.19	2.28	2.39	2.38
-Piroxicam	0.22	0.66	2.19	2.70
-ASA	0.10	2.40	1.48	2.00
-Diflunisal	4.50	27.00	0.00	44.10
-Mefenamic acid	0.30	2.70	3.00	0.00

Note: * Cost from Ram-Inthra hospital
       ** Mean cost = cost/tablet x mean dose

Table 6.3.14 Proportion (%) of UTD patients prescribed a particular drug by the insured (N=8)/noninsured (N=17).

Drugs	Number		Proportion(%)		P-value
	Insured	Noninsured	Insured	Noninsured	*
1.Specific treatment drugs					
-Cotriamoxazole	3	10	37.5	58.8	0.41
-Tetracycline(250mg)	0	1	0.0	5.9	1.00
-Kanamycin	1	1	12.5	5.9	1.00
-Lexinor(200mg)	3	3	37.5	17.6	0.34
-Metronidazole	1	2	12.5	11.8	1.00
2.Symptomatic/supportive treatment drugs					
-Antispasmodic	5	8	62.5	47.1	0.67
-Phenazopyridine HCl	4	3	50.0	17.6	0.16
-Paracetamol(500mg)	1	4	12.5	23.5	1.00

Note * = Fisher Exact test (2 tail)

Table 6.3.15 Mean number of tablets/injections per dose for UTD patients by insurance status

Drugs	Mean(SD)		P-value
	Insured	Noninsured	*
1.Specific treatment drugs			
-Cotriamoxazole	14.0(1.7)	18.4(6.5)	0.28
-Tetracycline	0.0(0.0)	10.0(0.0)	-
-Kanamycin	2.0(0.0)	2.0(0.0)	-
-Lexinor	14.7(4.6)	22.7(6.8)	0.17
-Metronidazole	12.0(0.0)	8.0(5.7)	-
2.Symptomatic/supportive treatment drugs			
-Antispasmodic	14.2(5.5)	13.3(3.3)	0.70
-Phenazopyridine HCl	15.0(0.0)	9.3(3.1)	-
-Paracetamol	12.0(0.0)	18.8(2.5)	-

Note * = T-test (Pooled Variance Estimate), (---) = (SD)
      - total number by each drug prescribed in table 6.3.14

- HPT

Most drugs and doses used were similar between the insured/noninsured except that the proportion using diazepam for the insured was lower than the noninsured (P-value<0.05, table 6.3.17). Considering the dose of drugs prescribed (table 6.3.17), most of the doses of drugs used were similar between the insured/noninsured except for paracetamol and diazepam where the insured were less likely to be prescribed than the noninsured (P-value<0.05).

Using the recommendations prepared by the Thai FDA as the "gold standard" for treatment of HPT (FDA of Thailand, 1988c), then treatment can be classified in 4 steps. Patients should be treated in a stepwise fashion. The higher step is needed if the hypertension does not respond to drugs used. The first step is to use only hydochlorothiazide (HCTZ). If a patient has allergic effect with HCTZ, furosemide is an alternative drug.

The second step is to use reserpine, or methyldopa, or a betablocker, or prazosin, or hydralazine. The dose and drug of choice depends on the patient's response to a particular drug. The third step is to use guanethidine, or calcium antagonists, or angiotensin converting enzyme inhibitor, or minoxidil. The fourth step is to be referred and treated by a cardiovascular specialist doctor. In this substudy, drugs used for the insured/noninsured were drugs which were similar to those recommended by FDA except diazepam. Some other drugs prescribed to either the insured or noninsured are not indicated: vitamins and paracetamol. This indicates unnecessary prescribing in both groups. However when the doses of a particular medicine prescribed are compared, the insured received less dose of a particular drug than the noninsured, particularly for symptomatic/supportive treatment drugs. This confirmed again that the price/cost of the insured was likely to be kept down by limiting of the dose of some symptomatic/supportive treatment drugs prescribed. This limitation of drugs prescribed did not affect the cure from disease and is an indication of more rational drug therapy for the insured patients. However the sample size of the noninsured was small and the implications from this result should be carefully considered.

Table 6.3.16 Proportion (%) of HPT patients prescribed a particular drug by the insured (N=23)/noninsured (N=5).

Drugs	Number		Proportion(%)		P-value
	Insured	Noninsured	Insured	Noninsured	*
1.Specific treatment drugs					
-Hydrochlorothiazide	8	4	34.8	80.0	0.13
-Furosemide	1	1	4.3	20.0	0.33
-Isosorbide dinitrate	3	1	13.0	20.0	1.00
-Prazosin	3	1	13.0	20.0	1.00
-Clonidine HCl	3	0	13.0	0.0	1.00
-Clopamide	4	0	17.4	0.0	1.00
-Digoxin	5	0	21.7	0.0	0.55
2.Other					
-Vitamins	1	1	4.3	20.0	0.33
-Paracetamol	6	2	26.4	40.0	0.61
-Diazepam	7	5	30.4	100.0	0.01

Note   * = Fisher Exact test (2 tail)

Table 6.3.17 Mean number of tablets/dose for HPT patients by insurance status

Drugs	Mean(SD)		P-value
	Insured	Noninsured	*
1.Specific treatment drugs			
Hydrochlorothiazide	15.9(11.0)	10.0(4.1)	0.34
Furosemide	12.0(0.0)	6.0(0.0)	-
Isosorbide dinitrate	12.0(6.9)	15.0(0.0)	-
Prazosin	7.0(0.0)	15.0(0.0)	-
Clonidine HCl	10.7(1.2)	0.0(0.0)	-
clopamide	9.0(2.4)	0.0(0.0)	-
Digoxin	15.4(11.5)	0.0(0.0)	-
2.Other			
Vitamins	12.0(0.0)	15.0(0.0)	-
Paracetamol	11.0(1.1)	17.5(3.5)	0.00
Diazepam	8.5(3.5)	15.4(5.3)	0.02

Note * = T-test (Pooled Variance Estimate), (---) = (SD)
   - total number by each drug prescribed in table 6.3.16

6.3.3 Summary

URI was the most common disease among the insured. For all cases, in general, the insured were better treated than the noninsured in terms of the proportion of items of generic name or essential drugs prescribed in a prescription and proportion of prescriptions with ≥ 1 dose of antibiotic and injection. From the price and proportion of patients prescribed ≥ 1 dose of antibiotic and injection, it was likely that the price/cost of the insured was kept down by limiting the use of antibiotics and injections. However too frequent use of antibiotics and injections in a specific disease/condition that is not essential causes problems of irrational drug use. URI, arthritis, UTD, and HPT were chosen for tracer analysis. In general the result from these 4 tracers shows the same pattern as for all cases.

From the dose of drugs prescribed and price charged for URI, arthritis, and HPT, it was confirmed again that the price/cost of the insured was likely to be lower because of limitation of doses of drugs prescribed. As the payment system of MEDSEC was capitation method by considering the highest number of outpatient visits, facilities tended to require more visits by asking the insured patients to see doctors more frequently and then a prescription could be split and charged more than once. This might affect the adequacy of treatment of the patient. Nonetheless some drugs such as diazepam, vitamins, paracetamol, and some antibiotics prescribed to the insured/noninsured in the analysis of tracers are not appropriate. It is likely that poor quality of treatment was provided to some insured/noninsured inpatients.

6.4 Analysis of inpatient treatments of the insured/noninsured of MEDSEC hospitals

The objective is to analyze the process aspect of the quality of inpatient treatment by analyzing medical records at MEDSEC hospitals, and to investigate issues related to outcome of medical treatment for 1 disease by postal questionnaire, with comparison between insured/noninsured of MEDSEC network. The hypothesis of this substudy is that insured inpatients of a private network have received less effective treatment than noninsured inpatients due to the effect of payment method in the comparison groups. The result is presented in 2 parts: general analysis of medical records and analysis of 2 tracers, diarrhoea and appendicitis.

6.4.1 General analysis of medical record

The records of 807 inpatients admitted to 4 selected hospital during July-October 1994 were analyzed: 363 were the insured and 444 were noninsured; 280, 248, 195, and 84 were admitted at Rama-Suksawat, Ram-Inthra, Wipawadi-Rangsit, and Wichan-Yut hospitals respectively.

Using the inpatient casemix classification of the MOPH of Thailand adapted from ICD10, the casemix was classified. The highest proportion of patients admitted was for diarrhoea (17.5%), followed by skin disease (12.4%), other intestinal disease (12.1%), other accident (8.2%), musculo-skeleton disease (7.9%), URI (7.6%) etc. (table 6.4.1). Classifying the casemix by hospitals, the proportions of casemix distribution compared between hospitals was generally similar.

Table 6.4.1 Inpatient admittance by diseases/conditions & insurance status

Diseases /Conditions	Proportion(%)		
	Insured (N=363)	Noninsured (N=444)	Total (N=807)
Appendicitis	5.2	5.2	5.2
Diarrhoea	22.6	13.3	17.5
Other intestinal disease	12.9	11.5	12.1
URI	8.3	7.0	7.6
LRI	1.4	0.7	1.0
Eye, Ear disease	3.0	2.9	3.0
Cardiovascular disease	5.8	3.4	4.5
Skin disease	7.4	16.4	12.4
Musculo-skeleton disease	8.8	7.2	7.9
OB-GYN	5.8	9.0	7.6
Car accident	7.2	4.5	5.7
Other accident	6.1	9.9	8.2
Other disease	5.5	9.0	7.4
Total	45.0	55.0	100.0

The mean IP charges for the insured were lower than for the noninsured both for all cases and by groups of disease/condition (P-value<0.05, table 6.4.2, 6.4.3). The mean charge was similar between 4 hospitals by diseases /conditions both overall and by the insured/noninsured. Since there were no differences in casemix and charge, the samples from 4 hospitals were pooled. The reason why the mean charge for the insured was lower than that for the noninsured is likely to be because a maximum allowable charge by disease/condition is set for the insured.

6.4.2 Analysis of medical records 2 tracers

- Diarrhoea

The records of 126 inpatients with diarrhoea were analyzed; 72 were the insured and 54 were the noninsured; 38, 36, 32, and 20 were from Rama-Suksawat, Ram-Inthra, Wipawadi-Rangsit, and Wichan-Yut hospitals respectively. All cases were treated until recovery. None were referred. Tables 6.4.4-6.4.6 indicate that there was no difference in age, signs/symptoms of diarrhoea, severity, stool feature, and laboratory examination by the insured/noninsured (P-value$\geq$0.05). There was no difference in these variables by hospital both overall and by the insured/noninsured. Stool culture was not done in all cases. This is rational for diarrhoea cases because stool culture is not recommended routinely.

Table 6.4.2 Average charge (Baht) for inpatient by insurance status

	Number	SD	Min.	Max.	Mean	P-value*
Insured	363	4727.9	240.0	33640.0	4058.0	0.00
Noninsured	444	5036.3	2210.0	24600.0	6677.5	
Total	807	5067.6	240.0	33640.0	5499.2	

Note: * = T-test pooled variance estimated

Table 6.4.3 Average price (Baht) for inpatient by disease/condition & insurance status

Diseases/conditions	Insured	Noninsured	P-value*
Appendicitis(N1=19,N2=23)	14105.3(2081.8)	19969.4(1390.8)	0.00
Diarrhoea(N1=82,N2=59)	2218.9(1701.8)	3500.9(1283.1)	0.00
Other intestinal disease(N1=47,N2=51)	3219.7(2729.6)	5021.7(3698.8)	0.01
URI(N1=30,N2=31)	2506.7(1790.9)	4187.3(1653.7)	0.00
LRI(N1=5,N2=3)	4606.0(2787.1)	8833.3(793.9)	0.04
Eye, Ear disease(N1=11,N2=12)	1415.9(1540.5)	2567.6(824.1)	0.03
Cardiovascular disease(N1=21,N2=15)	2828.6(2703.3)	5833.1(2174.7)	0.01
Skin disease(N1=27,N2=73)	2548.8(2923.4)	4395.4(4023.5)	0.03
Musculo-skeleton disease(N1=32,N2=32)	3532.8(2834.1)	6313.7(3096.5)	0.00
OB-GYN(N1=21,N2=40)	6748.7(6469.9)	9681.3(4036.8)	0.03
Car accident(N1=26,N2=20)	6730.4(7202.2)	12924.5(3269.1)	0.00
Other accident(N1=22,N2=44)	6224.1(8044.4)	9158.8(3646.7)	0.04
Other disease(N1=20,N2=40)	3190.0(3007.9)	4907.0(2514.6)	0.02
Total(N1=363,N2=444)	4058.0(4727.9)	6677.5(5036.3)	0.00

Note: * = T-test pooled variance estimated, ----(----) = mean(SD)
       N1, N2 = Number of the insured, and noninsured

Table 6.4.4 Characteristics of inpatients with diarrhoea by insurance status

Variable	Mean(SD)		P-value*
	Insured	Noninsured	
1. History			
-Age(year)(N1=70,N2=54)	29.1(7.8)	28.5(7.6)	0.66
-Duration between diarrhoea and hospitalization(day)(N1=72,N2=54)	1.0(0.4)	0.7(1.5)	0.10
-No of stool in 24 hours(N1=70,N2=54)	5.2(2.9)	5.3(3.8)	0.96
-LOS(Days)(N1=72,N2=54)	2.0(0.7)	2.2(0.9)	0.28
2. Physical Exam			
-Temperature(°C)(N1=72,N2=54)	37.1(0.8)	37.1(0.7)	0.48
-Pulse Rate/Min.(N1=72,N2=54)	83.4(8.4)	85.1(16.5)	0.44
-Respiratory Rate/Min.(N1=72,N2=54)	20.6(1.6)	20.4(1.7)	0.61

Note: * = T-test pooled variance estimated,
       N1, N2 = Number of the insured, and noninsured

Table 6.4.5 Stools feature of diarrhoea patients by insurance status

Feature	Proportion(%)			P-value*
	Insured (N=70)	Noninsured (N=54)	Total (N=124)	
Loose	61.4	50.0	56.5	0.45
Watery	37.1	46.3	41.1	
Loose+Watery	1.4	1.9	1.6	
Mucous	0.0	1.9	0.8	
Total	100.0	100.0	100.0	

Note: * = Chi-square test with Yate Correction (2 tailed)

Table 6.4.6   Items carried out for patients with diarrhoea by insurance status

| Variable | | Proportion(%) | | P-value |
		Insured (N=72)	Noninsured (N=54)	
1. History				
-Temperature	≥38° c	87.5	85.2	0.91*
	<38° c	12.5	14.8	
-Abdominal Pain,	Yes	9.7	3.7	0.34*
-Abdominal Cramp,	Yes	70.8	85.2	0.09*
-Dyspepsia,	Yes	1.4	3.7	0.56**
-Vomiting,	Yes	61.1	59.3	0.98*
2. Physical Examination				
-Blood Pressure,	Shock	4.2	1.9	0.63**
	Normal	95.8	98.1	
3. Laboratory				
-Stool Examination	Done	13.9	5.6	0.22*
-Stool Culture	Done	0.0	0.0	-

Note: * = Chi-square test with Yate Correction (2 tailed)
       ** = Fisher exact test (2 tailed)

There was no difference in drugs used in the treatment for patients with diarrhoea between the 4 hospitals both overall and by the insured/noninsured. The insured received fewer items of drugs including ORS, kaopectin, and tetracycline than the noninsured (table 6.4.7); but the proportion used of the drugs - antispasmodic and lexinor - was higher for the insured than for the noninsured (P-value<0.05). For antibiotic drugs used in inpatients in Thailand, the most effective antibiotic is lexinor (table 5A.4.1, annex 5) and the treatment/course is cheaper than other antibiotics. For antispasmodic drugs, it was used to relieve abdominal pain. So it is likely that the treatments were more effective for the insured than for the noninsured. Since the payment for inpatients in the network are FFS with maximum limitation, while there was no maximum limitation for the noninsured, it was likely that the price/cost of the insured was kept down by limiting the use of ORS, kaopectin, and tetracycline.

Applying the rating scale for effectiveness of drugs prescribed suggested by 7 medical specialists and the cost of drugs used at Ram-Inthra hospital (table 5A.4.1-5A.4.2, annex 5), the total drug cost/day and the drug cost of non, low, moderate, and high effectiveness drugs used/day for patients with diarrhoea were calculated. The mean cost/day of highly effective and ineffective drugs used for the insured was lower than for the noninsured, and the proportion of cost-effective drugs used for the insured was higher than the noninsured (P-value<0.05, table 6.4.8). This indicates that the treatment of the insured was more cost-effective than of the noninsured.

Table 6.4.7 Proportion of patients with diarrhoea by drug prescribed & insurance status

Drugs		Insured (N=72)	Noninsured (N=54)	P-value
-ORS,	Yes	43.1	83.3	0.00*
-IV,	Yes	97.2	100.0	0.51**
-Anti-emetic,	Yes	55.6	44.4	0.29*
-Antispasmodic,	Yes	66.7	31.5	0.00*
-Paracetamol,	Yes	19.4	16.7	0.87*
-Cimetidine,	Yes	6.9	7.4	1.00*
-Kaopectin,	Yes	23.6	51.9	0.00*
-Imodium,	Yes	45.8	48.1	0.93*
-Antiflatulent,	Yes	18.1	16.7	1.00*
-Vitamin,	Yes	1.4	7.4	0.16**
-Lexinor,	Yes	59.7	35.2	0.01*
-Cotrimoxazole	Yes	11.1	13.0	0.97*
-Gentamicin,	Yes	1.4	3.7	0.58**
-Tetracycline,	Yes	1.4	29.6	0.00*
-Metronidazole,	Yes	1.4	3.7	0.80*
-Ampicillin,	Yes	1.4	1.9	1.00**
-Doxycycline	Yes	1.4	0.0	1.00**
-Amoxycillin,	Yes	0.0	1.9	0.43**

Note: * = Chi-square test with Yate Correction (2 tailed)
** = Fisher exact test (2 tailed)

Table 6.4.8 Mean of total cost/day; mean of cost/day of high, moderate, low effective, and ineffective drugs prescribed to patients with diarrhoea by insurance status

	Insured (N=72)	Noninsured (N=54)	P-value *
-Total cost/day	92.3(16.1)	96.1(5.9)	0.10
-Cost/day of high effective drug	82.0(14.4)	87.3(2.8)	0.01
-Cost/day of high & moderate effective drug	89.4(15.5)	91.4(6.1)	0.36
-Cost/day of high, moderate, and low effective drug	90.4(15.7)	92.9(6.0)	0.27
-Cost/day of ineffective drug	1.9(2.7)	3.2(3.1)	0.01
-Proportion of cost-effective drugs used**	98.0(2.7)	96.7(3.1)	0.01

Note: * = T-test pooled variance estimated, ----(----) = mean(SD)
** = $\dfrac{\text{Cost/day of high, moderate, and low effective drug}}{\text{Total cost/day}} \times 100$

- Appendicitis

The records of 41 inpatients with appendicitis were analyzed; 18 were the insured and 23 noninsured; 11, 13, 13, and 4 were from Rama-Suksawat, Ram-Inthra, Wipawadi-Rangsit, and Wichan-Yut hospitals respectively. Tables 6.4.9-6.4.10 indicate that patient's age, temperature, LOS, time between admission and surgery, and sex distribution between the insured/noninsured were similar (P-value$\geq$0.05). There was also no

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difference in these variables by hospital both overall and by the insured/noninsured. Table 6.4.9 illustrates that the appendicitis patients had no complication because the average of LOS of the insured and noninsured was similar and short (4.6 days) and the mean time between admission and surgery was also short (5.7 and 6.8 hour). As mentioned in chapter 3, appendicitis is relatively easy to diagnose because it has definite signs/symptoms and there is a well-defined and standard treatment, therefore the medical condition of the insured/noninsured for this substudy were comparable.

Most of the other characteristics of appendicitis patients were similar except the proportion who had been asked history of diarrhoea, had a pathological examination, and had a record of the surgical operation notes which were higher for the insured than the noninsured (P-value<0.05, Table 6.4.10). All of which indicate a better quality of care with regard to the adequacy of completion of these process indicators.

A rating scale related to the process of care for acute appendicitis mentioned in section 3.8.5. was applied. According to the classification of the 5 points rating scale (0-5 score), less important (0 score) and more important (5 score) process items relevant to the quality of treatment of patients (table 5A.4.3, annex 5), means scores of process activities of appendicitis patients were calculated. The mean score of having diarrhoea history asked, having pathological section examined, and total score of all variables was higher for the insured than for the noninsured (table 6.4.11). An important reason affecting the result is that the medical records of insured inpatients were generally more complete than for the noninsured. This is because facilities have to attach a copy of the complete inpatient record to send to the MEDSEC office to request payment of the fee while for the noninsured they do not have to. This regulation clearly encourages a good quality process of care. It helps ensure that certain variables such as history taking records, physical exam records, laboratory investigated reports, complete nurse note, anaesthetic note, and a note of the surgical operation, are more complete for the insured than the noninsured.

Table 6.4.9 Characteristics of patients with appendicitis by insurance status

| Variable | Mean (SD) | | P-value* |
	Insured (N=18)	Noninsured (N=23)	
-Age (year)	27.2 (7.2)	23.8 (5.1)	0.08
-Temperature (°C)	37.3 (0.5)	37.4 (0.5)	0.50
-LOS (day)	4.6 (1.8)	4.6 (1.8)	0.87
-Time between admission and surgery (hour)	6.8 (5.0)	5.7 (4.2)	0.45

Note: * = T-test pooled variance estimated

Table 6.4.10 Characteristics of patients with appendicitis by insurance status

Variable		Proportion (%)		P-value
		Insured (N=18)	Noninsured (N=23)	
-Sex,	Male	33.3	39.1	0.96*
	Female	66.7	60.9	
-Vomiting,	Ask	55.6	39.1	0.46*
-Diarrhoea,	Ask	33.3	4.3	0.04*
-Abdominal pain,	Ask	100.0	100.0	-
-Temperature,	≥38 °C	27.8	30.4	1.00*
	<38 °C	72.2	69.6	
-Abdomen palp,	Done	100.0	100.0	-
-Rectal Exam,	Done	38.9	21.7	0.39*
-CBC Exam,	Done	100.0	87.0	0.24**
-Urine Analysis,	Done	61.1	82.6	0.24*
-Patho. Exam,	Sent	44.4	4.3	0.01**
-Nurse note,	Complete	55.6	78.3	0.23*
-Anaesthetic note,	Done	100.0	100.0	-
-Surgical note,	Done	100.0	34.8	0.00*

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Note: * = Chi-square test with Yate Correction (2 tailed)
      ** = Fisher exact test (2 tailed)

Table 6.4.11 Mean scores for process activities recorded for inpatients with appendicitis by insurance status

Variable	Insured (N=18)	Noninsured (N=23)	P-value*
-Vomiting	1.3 (1.5)	2.2 (1.3)	0.06
-Diarrhoea	0.9 (1.0)	0.2 (1.6)	0.01
-Abdominal pain	5.0 (0.0)	5.0 (0.0)	-
-Temperature	2.0 (0.0)	2.0 (0.0)	-
-Abdominal palpation	5.0 (0.0)	5.0 (0.0)	-
-Rectal Exam	1.7 (1.5)	0.7 (1.3)	0.24
-CBC Exam	4.0 (0.0)	3.5 (1.4)	-
-Urine Analysis	1.8 (1.5)	2.5 (1.2)	0.13
-Pathological Section	2.2 (2.6)	0.2 (1.0)	0.00
-Nurse Note	1.1 (1.0)	1.6 (0.8)	0.13
-Anaesthetic Note	5.0 (0.0)	5.0 (0.0)	-
-Surgical Note	5.0 (0.0)	1.7 (2.4)	-
-LOS	3.3 (1.0)	3.6 (0.9)	0.43
-Time Between Admission & Surgery	3.9 (1.3)	4.1 (1.1)	0.51
Total Score	41.8 (3.6)	37.2 (4.8)	0.00

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Note: * = T-test pooled variance estimated, ----(----) = mean(SD)

In order to evaluate treatment of appendicitis, an indication of their outcome of treatment was sought by mailing a postal questionnaire to every patient included in the sample several weeks after discharge from hospitals. Twenty eight out of 41 questionnaires were completed and returned; some workers had left their job and some companies had closed. Analysis of these questionnaires indicate that the mean of age, sex, number of days before they felt healthy after discharge, and the number of days before returning to work after discharge of the insured/noninsured were similar (table 6.4.12-6.4.13). Importantly table 6.4.13 also illustrates that the proportion having fever, infected wound, and anorexia/vomiting after discharge was lower for the insured than the noninsured (P-value<0.05).

Giving a score of 1 for each symptom which occurred within 1 month after discharge, the total score of symptoms for both groups was calculated. The mean score of symptoms for the insured was lower than for the noninsured (P-value<0.05, table 6.14). Although symptoms of complications for the insured were less than for the noninsured, interpretation of the result should be very cautious due to the small sample sizes (14 numbers of the insured, 14 noninsured). However the proportion (%) who perceived the quality of medical services was not different by the insured/noninsured (table 6.4.15).

Table 6.4.12 Characteristics of patients with appendicitis by insured (N=14)/noninsured (N=14) (data from mailed questionnaire)

| Variables | Mean(SD) | | |
	Insured	Noninsured	P-value*
-Age (years)	24.8(4.5)	27.0(8.0)	0.38
-Healthy after discharge(day)	55.2(43.7)	56.8(49.3)	0.93
-Back to work after discharge(day)	16.0(5.3)	57.5(74.4)	0.05

Note: * = T-test pooled variance estimated

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Table 6.4.13 Gender and symptoms occurring within 1 month after discharge for patients with appendicitis, from mailed questionnaire, by insurance status

Variables		Proportion (%)		P-value
		Insured (N=14)	Noninsured (N=14)	
-Sex,	Male	35.7	28.6	1.00*
	Female	64.3	71.4	
-Fever,	Yes	0.0	50.0	0.00**
-Micturition,	Yes	18.2	18.2	1.00**
-Infected wound,	Yes	0.0	38.5	0.02**
-Cough(sputum),	Yes	28.6	16.7	0.65**
-Anorexia/vomit,	Yes	0.0	33.3	0.03**
-Abdominal pain,	Yes	23.1	66.7	0.07*
-Diarrhoea/dysentery,	Yes	7.1	8.3	1.00**
-Hiccough,	Yes	7.7	9.1	1.00**

Note: * = Chi-square test with Yate Correction (2 tailed)
** = Fisher exact test (2 tailed)

Table 6.4.14 Mean score of symptoms occurring within 1 month after discharge for patients with appendicitis, from mailed questionnaire, by insurance status

	Number	SD	Min.	Max.	Mean	P-value*
Insured	10	0.6	0.00	2.0	0.8	0.04
Noninsured	11	1.7	0.00	5.0	2.1	
Total	21	1.4	0.00	5.0	1.5	

Note: Given 1 score for 1 symptom occurred

Table 6.4.15 Patients' perceptions of quality of hospital care for appendicitis by insurance status, from mailed questionnaire

Perception	Proportion (%)		P-value*
	Insured (N=14)	Noninsured (N==14)	
-Very good,disease cure	100.0	85.8	0.34
-Not good,not cure	0.0	7.1	
-Don't know	0.0	7.1	

Note: * = Chi-square test with Yate Correction (2 tailed)

6.4.3 Summary

The most common diagnosis for inpatients of the study hospitals, both among the insured and all cases, was diarrhoea. The mean charge for the insured was lower than for the noninsured both for all cases and by separate diseases /conditions. This is likely to be because there was a limitation to the maximum charge by disease/condition only for the insured.

The inpatient records, 126 diarrhoea and 41 appendicitis, for 2 tracers were analyzed. For diarrhoea, facilities tend to use more effective drugs such as lexinor and antispasmodic with the insured more than the noninsured. It was likely that the price/cost of the insured was kept down by limiting use of ORS, kaopectin, and tetracycline. Applying the rating scale of effectiveness of drugs used and the cost of drugs used, the treatment for the insured was more cost-effective than for the noninsured. For appendicitis, the proportion who had been asked history of diarrhoea, had a pathological examination, and had a record of the surgical operation notes were higher for the insured than the noninsured. All of these indicate a better quality of treatment regarding the adequacy of completion of the process indicators. The important reason influencing the result is that the medical records of insured inpatients were generally more complete than for the noninsured due to the request of MEDSEC to attach a completed copy of the records of the insured. This regulation explicitly encourages good quality processes of treatment. The result from the postal questionnaire shows that the mean score of complication symptoms of the insured was lower than the noninsured. This indicates that the inpatient cares for the insured was better than for the noninsured. However interpretation of the result should be cautious since the sample size was small. Nevertheless the proportion (%) of perception of patients with appendicitis regarding quality of medical care was not different by insurance status.

Chapter 7
Discussion and policy recommendation

This chapter is in 3 sections. The first section discusses the methodology. The second section discusses the main findings from chapters 4-6. Moreover, supplementary data to illustrate more the findings are discussed. The last section identifies the policy recommendations for health care provider networks.

7.1 Methodology

7.1.1 Comparison groups

The main aim of this study was to evaluate the MEDSEC network. To accomplish a reliable result, comparison groups were applied for specific substudies. In the evaluation of satisfaction of inpatients, there was only 1 sample hospital for the Nopparat network. Since Nopparat hospital was the only hospital in the network providing secondary/tertiary care, this limited the result from this substudy. Application of the conclusions from this substudy should be cautious.

7.1.2 Administering of postal questionnaire

In structural evaluation, mailed questionnaires were sent to only 50% of the facilities because of budgetary limitations. Since the response rate was usually poor, to maximise returns, a letter from the director of the related network was sent to request facility managers to answer faithfully because the answers would be used for monitoring the structure of that particular facility. If the structural quality of facilities was over estimated, it might cause problems in the next evaluation and then the facility might be withdrawn from the network. Using this technique, 100% of completed questionnaires were returned.

For evaluation of inpatient satisfaction, due to poor response (30%) to postal questionnaires in Thailand, a postal questionnaire was not used although this is the most effective means for satisfaction study, instead, interviews were conducted with the inpatients on the last day of admission. Using interviews, it is likely that the insured tended to answer more positively when they were in the hospital. As this method was used in both networks, the positive effect was influenced across all samples, therefore the comparison in this case is relevant. However, interpretation and application of degree of satisfaction should be carefully made.

In the analysis of inpatient treatment, the outcome of treatment of appendicitis patients was investigated by using postal questionnaires. During data collection, some companies were closed and some patients changed their working place and home. This caused the sample size to be too small (28). Hence the comparison was limited.

7.1.3 Casemix of prescribing and inpatient treatment evaluation

In these 2 substudies the proportions of patients by diseases/conditions were different between the insured/noninsured. This unexpected data skewed the results of comparison. However the tracer analysis method was applied to control this bias. In general, the result from the tracer analysis was sound and useful.

7.1.4 Memory recall and perception of patients' satisfaction

Regarding the assessment of satisfaction of the insured from the interviews according to whether the insured were happier when they were with MEDSEC than they were before (section 5.3), there was a limitation of memory recall and perception of satisfaction of the insured. However in section 6.2, the satisfaction of the inpatients of MEDSEC/Nopparat networks were compared. The interpretation and application of this result provides useful additional information to that from section 5.3.

7.1.5 Tracer analysis

In the analysis of drug prescriptions and inpatient treatment, a tracer analysis was applied. All tracers were selected by using criteria described by Kessner et al. (1973). Unfortunately, the samples of some tracers analyzed (UTI and HPT in drug prescription analysis, and appendicitis in inpatient treatment) were too small for comparison and affected the result.

7.1.6 Validity of secondary data

The secondary data about the MEDSEC network consisted of the financial control reports of the network, which were summarised from monthly payment records to all parties. For Nopparat network, the secondary data were collected from yearly published reports of the network which were accurate and reliable. The validity of these data was credible.

7.2 Main findings

7.2.1 Organization of MEDSEC network

The referral system and administrative organization of the MEDSEC network was divided into 4 subnetworks. This arrangement had advantages since, in Bangkok, the movement of ambulance vehicles to refer patients is restricted by poor traffic. A subnetwork office can be a subcentre for the MEDSEC office to manage quality assurance of facilities. Since the bonus system base was mainly calculated by subnetwork, subnetworks try to be fund holders of firms so they can receive the surplus of bonus at the end of the year. To achieve the surplus of bonus for a firm, subnetworks have to control clinics and small hospitals in the subnetworks to prevent overcharging, overinvestigating, and overtreating of patients by review the prescriptions and medical records in terms of quality of care and charge. The subnetworks tend to reject the charge that there are higher than the maximum OP charge rates and the IP standard charge rates. Further discussion about charge and payment is presented in section 7.2.2. To be a fund holder, subnetworks have to encourage the facilities to provide services with satisfactory care to the insured so as to maintain their clients and consequently to accomplish the highest number of visits. It is likely that the organizational structure encourages facilities to provide care as much as possible. The evidence of competing tendencies to keep down the charge and to satisfy the clients are discussed in section 7.2.4. The audit of prescriptions and IP records, and the evidence of competing tendency to lower the charge of the facilities in the subnetworks probably promote the cost-effectiveness of care. However there might be some disadvantages of this arrangement due to more administrative cost and activities. This might then reduce the budget for service fees which will probably influence the quality of care if there is not an adequate budget to pay for expensive costs.

In MEDSEC, some of the marketing and propaganda activities were proposed to increase the knowledge of the insured. These activities probably were done ineffectively. This is because the insured still lack knowledge. The lack of knowledge will be discussed in section 7.2.3. This shows that the organization and management of MEDSEC network in health education and public relation concerning knowledge and information was inadequately performed, although the propaganda to attract more subscribers was probably performed well. This was supported by the increasing number of insured in the MEDSEC network during the past few years.

Standards for enrolment of qualified main contractors have been set. For provider networks, there was no standard for qualification which would assure quality of care. The provider networks were organized by some main

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contractors and facilities without any regulation to assure the quality of care. This is a danger of the service delivered to the insured. In MEDSEC network, there was only minimum requirement about infrastructure: staff, equipment, and premises to qualify providers. The infrastructure of MEDSEC network will be discussed in section 7.2.4.

In terms of managed care models, MEDSEC office and Nopparat hospital acted as purchaser agencies. The MEDSEC office performed some activities which are similar to those in successful managed care (Enthoven 1988, 1993). Such activities include: proposing the payment system in the network, administering the budget allocated from SSO and paying facilities, standardizing the quality of care between facilities by medical record auditing, and introducing procompetitive actions by payment mechanism through a bonus system. Some of these activities will also be discussed in sections 7.2.2-7.2.4. Some activities have been performed poorly such as surveillance of the performance of facilities, managing quality assurance, initiating and managing the risk fund, and managing subsidies available for emergency or high cost fees. Few infrastructural qualifications were required for facilities to enrol with the network, and there was little auditing of prescribing and inpatient records to control the performance and quality of care in the network. Regarding the risk fund, it was initiated but absorbed by the administrative costs of the MEDSEC office. For emergency and high cost fees, the MEDSEC office faced an irritating process of reimbursement for high cost diseases because the MEDSEC office was not legally recognized by SSO. This results in ineffective performance of this task by the MEDSEC office. In emergency and accident cases, the insured can pay and seek care from other providers which are not their main contractors. The expenses of the first 72 hours of treatment can be reclaimed from the SSO by the patients. If the period of admission exceeds 72 hours and the patient does not inform his main contractor, then he is liable for any costs. If he informs and is refused treatment at his main contractor, then any costs in excess of the original 72 hour treatment have to be paid by his main contractor. Since there are >1 main contractors in MEDSEC network, the MEDSEC office - as a cooperative centre for referral system - possibly responds inadequately to refer inpatients. Hence the patients were then improperly referred back to the network. This affected the loss of the profit of facilities. Some of the other reasons why the important activities for a good purchaser have not been or have been poorly performed are because they were not assigned to be performed by the network office, and there was no financial motivation payment for ensuring good purchaser activities. However, important activities that MEDSEC network didn't perform but which are crucial are: preventing patients from discrimination; and collaboration between the network office, SSO, employer, and the insured to initiate rules of interaction and responsibility between the insured and providers. This

covers how the network facilities should provide care, how the insured receive care, what the role of SSO and employers are in controlling the quality of care of the networks. Since the payment system under SSA is capitation, there is a risk that main contractors tend to discriminate against patients so as to earn more profit from less use of care. Although in the MEDSEC network there are mechanisms to encourage provision of care, the discrimination is likely to occur. Therefore in a provider network, procedures for preventing patient discrimination are still necessary.

7.2.2 Payment system, charge rate, and utilization rate (from secondary data collection)

The MEDSEC payment system to general hospitals is on an FFS basis with a standard rate which is the average charge for both simple and complicated cases. It is very difficult to pay for all patients with and without complication by the same rate. In complicated cases, facilities always apply to be reimbursed more than the standard rate; for easy cases they charge at the standard rate. This causes conflict between MEDSEC IP auditing personnel and facility managers. This FFS payment basis also caused serious problems of delay of monthly payments to facilities, because of time taken to approve the nonstandard inpatient fee bills.

The FFS method is one of the possible factors affecting the charge rate, LOS/admission, and average charge/day of general hospitals making them higher than those of clinics and small hospitals in the MEDSEC network (table 7.1). Hence the proportion of total fee paying to general hospitals was the highest proportion compared to clinics/small hospitals in the network. Moreover the charge rate, LOS/admission, and charge/day of general hospitals and proportion of paying to general hospitals was increased every year, while for clinics and small hospitals it was decreased. This shows that the MEDSEC general hospitals made the most of the profit. If the bonus of the network is negative, the smaller groups will face loss of business while general hospitals do not. General hospitals also have bargaining power from being main contractors, to influence the use of FFS method for general hospitals. This is because if the MEDSEC network does not comply with the request to use this payment system, the general hospitals (main contractors) may not contract with MEDSEC in the next year. This will affect the quota of the insured allocated to MEDSEC in the next year.

The expected bonus from providing services with a low price charged to the MEDSEC office is likely to act as an incentive for subnetworks. According to the director of MEDSEC, the providers under subnetworks, clinics/polyclinics and small hospitals, tended not to overcharge, overinvestigate, or overtreat. Generally, this financial incentive creates

a competitive environment within the network. However, because of the problems of traffic in Bangkok, geographical alignment of the subnetworks, and the distance between clinics/polyclinics (≥ 3 kilometres), the competition is limited. According to the director of MEDSEC, for the general hospital, because payment system is only on FFS basis, there is likely to be overtreatment, overinvestigation, and overcharging. In the MEDSEC network, however, there was a medical record auditing mechanism to control the quality of medical care. So the unreasonable treatments were regulated to a certain degree. Nonetheless small hospitals tended not to refer patients to general hospitals which charge a higher price. This indicates that price competition between general hospitals is promoted.

The utilization rate of the insured of MEDSEC/Nopparat was generally increasing every year (Table 7.1). The utilization rates of the MEDSEC network between 1992-1994 (1.24-1.69 visit/person/year) were lower than that indicated by the utilization survey of the workers of November 1994-January 1995 (2.15 visit/person/year). The possible reason why they are different is because the samples are different (all workers for 1992-1994 and workers from 4 firms for 1994-1995). The utilization rate of the insured of Nopparat was slightly less than MEDSEC networks probably because Nopparat network was established 18 months after the MEDSEC network. If they had been running for the same period of time, the utilization rate may possibly be nearly the same.

Table 7.1 Summary of main findings on utilization rate (from MEDSEC/Nopparat networks secondary data collection), and payment system

Study issue	Method	Main finding
Charge rate	Secondary data collection from MEDSEC	-OP charge/visit of MEDSEC network was decreasing every year -IP charge/worker and /day of small hospitals increased from 1992-1993, and then decreased -IP charge/worker of general hospitals was increasing every year -IP charge/worker and /day of general hospitals were higher than of small hospitals
Charge rate & referred behaviour of facilities	Interview with directors of MEDSEC general hospitals	-stage of referred patients from clinics was not serious, from small hospitals was very serious* -clinics/small hospitals refer patients to a cheaper general price list general hospital*
Proportion of payment to facilities and bonus	Secondary data collection from MEDSEC network	-budget paying to general hospitals shared the highest proportion compared to other groups -proportion of paying to general hospital increased but to clinics/small hospitals decreased -bonus was critically decreased from 1.97 million Baht(1993) to be 3,167 Baht(1994)
Utilization rate	Secondary data collection from MEDSEC & Nopparat network	-OP utilization rates of MEDSEC & Nopparat networks were increasing every year -OP utilization rate of MEDSEC was higher than of Nopparat networks, and of the main contractors in Samutprakarn -IP utilization rate of small hospitals increased from 1992-1993, and then decreased -LOS/admission of small hospitals was increasing every year -IP utilization of general hospitals was increasing every year -LOS/admission of general hospitals was higher than of small hospitals

Note: * The directors of general hospitals viewpoint

7.2.3 Knowledge, health seeking behaviour, utilization rate (data from structured interview with workers), and satisfaction with MEDSEC facilities

The self perceived illness rate was 8.18 episode/person/year (Table 7.2). This was 2.8 times higher than the self perceived illness of the insured in a study by Tangcharoensathien et al. (1993) in Samutprakarn, Thailand, 2.4 times higher than the self perceived illness of 15-39 years old of Cote d'Ivoire in 1985 (3.336/person/year), 1.9 times higher than the self perceived illness of the 15-39 years old of Ghana in 1987-1988 (4.32/person/year), and 1.7 times higher than the self perceived illness of the 15-39 years old of Peru in 1985-1986 (4.68/person/year) (Christopher et al. 1992). A possible reason why self perceived illness of this group is higher than in other studies is because this study was conducted during winter when an outbreaks of common colds were likely in a close factory environment. Table 7.2 demonstrations that the proportion of the insured seeking OP treatment from the MEDSEC facilities (26.3%) was slightly higher than of the study of Tangcharoensathien et al. (1993) which was 22.0%. The

OP utilization rate (2.15 visit/person/year) was 1.7 times that of the OP utilization rate (1.27 visit/person/year) of private main contractors in Samutprakarn in 1992-1993 (Kamolrattanakul, et al., 1993). The likely reason is because in MEDSEC, there were more small facilities to provide care than in Samutprakarn where there was no provider network. Moreover the 2 studies were not in the same areas, over the same period of time, or using the same groups of samples. Higher utilization rates for the MEDSEC than for Samutprakarn groups may also be due to the more recent date of MEDSEC study.

The proportion of admission to MEDSEC hospitals in this study was 63% of all admission, very similar to the 64% shown in 1993 (Tangcharoensathien et al.), although there were fewer MEDSEC main contractors/worker than in the study by Tangcharoensathien et al. (1993) where the main contractor were, in fact, closer to the workers' firms. This is likely to be because MEDSEC has a good referral system. These proportions however, are still very low. This indicates that some insured were not satisfied with both groups and consequently sought care from other facilities. Looking at the IP illness rate of MEDSEC insured (0.256 times/person/year) and the admission rate (MEDSEC hospitals, 0.161 times/person/year), some insured didn't receive inpatient care from MEDSEC. The possible reason is because the MEDSEC network had only 3 general hospitals (main contractors) which were not near the homes or working places of all the insured. The insured may not like the hospitals or feel inconvenienced by receiving care from hospitals that were far from their home or working place. Compared with the Samutprakarn study, the IP admission rate of MEDSEC (0.161 times/person/year) is higher than that of private facilities in Samutprakarn (0.034 times/person/year) (Kamolrattanakul et al., 1993). It is likely that the insured of MEDSEC had higher accessibility than those of Samutprakarn.

Table 7.2 Summary of main findings on knowledge, health seeking behaviour, utilization rate, and satisfaction with MEDSEC facilities

Study issue	Method	Main finding
Knowledge of the insured	Interview with workers	-50⁺% of the workers didn't know about uncovered diseases/conditions, free of charge emergency care, and benefits under SSA -22-50% of the workers didn't know about their main contractor name, working hour of MEDSEC facilities, and reimbursement fee from emergency care -12.5% of the workers didn't know that they have to present Social Security card
Health seeking behaviour & utilization rate	Interview with workers	-OP illness rate=8.18 episodes/person/year. -OP seeking treatment from MEDSEC facilities =26.3% -OP utilization rate(MEDSEC)=2.15 visits/person/year -IP illness rate=0.256 times/person/year. -admission rate to MEDSEC hospitals=0.161 times/person/year -IP seeking treatment from MEDSEC hospitals=63% -likely that the sick insured went back home then sought care
Satisfaction of the insured	Interview with workers	-the insured were more satisfied with MEDSEC than dissatisfied with 6 aspects -the insured were more satisfied with MEDSEC than public facilities for all 6 variables -93.9% would like to choose their main contractor
Factors affecting utilization rate	Interview with workers	-most important factors influencing the OP model is knowledge variables followed by firm variables, and manual producer variable which is associated with the income and working hour/day of the workers -most important factors influencing the IP model is firm variables followed by nature of job and educational status of the workers, knowledge about emergency service, and graduation from primary school -the power of OP models is 83.68%, IP 81.89%.
Employer view on network	In-depth interview with employers	-the main contractor to be chosen should be a network having more facilities and more specialized hospitals, having facilities near to firm and worker's home, and having service after working hour of workers. -an employer mentioned that after choosing MEDSEC, the absenteeism of the worker has dropped about 30% due to availability of MEDSEC services after working hour

Lack of knowledge of the insured about social insurance is one of the causes of low utilization rate (Tangcharoensathien et al., 1993). Table 7.2 presents the factors that influence the utilization rate of the insured. The firm variables influence the probability of seeking care in both IP and OP models, but they affect the IP model more than the OP model. This is possibly because of the inconvenience to inpatients of travelling in Bangkok, and because the distance between the firms and MEDSEC facilities is further than for OP. Since the proportion of the insured lacking knowledge is generally high, it influences the probabilities of seeking care from MEDSEC facilities remarkably in the OP model. The OP

model shows that being manual producer, which is associated with lower income and working hour/day, influences the probability of seeking care. In the IP model, it is confirmed that socioeconomic variables especially the characteristics of job and graduation from primary school, and also satisfaction with cleanliness of MEDSEC affects the model. For knowledge about diseases/conditions uncovered, free of charge emergency care, and reimbursement fee from emergency care, the regulations have been changed every year. Sometimes, they have been changed twice a year. This causes considerable misunderstanding between providers and the insured.

Results of the study by Tangcharoensathien et al. (1993) indicate that the proportion of the insured lacking knowledge about diseases/conditions covered by the scheme was >50%, about free of charge emergency care was >50%, reimbursement fee from emergency care was 87%, benefits under SSA was about 44-62%, and their main contractor name was 11%. Surprisingly the knowledge of the insured in this study was only slightly better than those in the study of Tangcharoensathien et al. (1993), although they have proposed a policy intervention to improve the knowledge of the insured by various means such as educating the insured through labour unions, the employers, the representatives of the employees, and the main contractors. Moreover, though there were a lot of activities regarding health education and public relations that MEDSEC network office and facilities have undertaken to improve the lack of knowledge of the insured, it is still inadequate to tackle the problems. This is possibly because there was no incentive for the network to improve knowledge since the lower the use of the insured, the higher the profit; nor is there incentive for other related parties such as facilities, managers of firms, or employer's unions, to provide sufficient health education to the insured.

For all 6 aspects: accessibility, waiting time, perception on medical quality of care, reception, cleanliness, and friendliness of personnel; although the insured were more satisfied with MEDSEC than dissatisfied and MEDSEC also had the highest number of facilities compared to other network; the insured were still less satisfied with accessibility to services compared to the other aspects. The possible reason was because some districts of Bangkok, especially in the centre, had no MEDSEC network facility and the traffic of Bangkok was very heavy. So the insured in the districts that had no facilities tended to seek care from clinics in their firms which were run by firms themselves. Increase of facilities in all districts that are near to homes of the insured is necessary. Supporting this view is the evidence that the sick insured tended to go back home and then sought care. This indicates that the workers preferred to seek care from facilities near to their homes. It was also confirmed that the employers preferred the network which had facilities near to worker's home/office. For the preference of selection of the main contractor, most

of the insured favoured selection of the main contractor by themselves. Employers favoured the network having both more facilities and more specialists in the hospitals. They preferred facilities that provided services after working hours of the insured. This is because the firms can increase profits by suffering less absenteeism of the insured by ensuring their health or not having to receive care from facilities during working hours.

7.2.4 Quality of care evaluation

Infrastructure of MEDSEC and Nopparat networks

It is important to have facilities in a district to increase the accessibility to medical care for the insured working or living in that particular district. Using the indicator of the number of additional workers to add a facility to a district, as in MEDSEC network, is more effective than using the additional firms as an indicator as in Nopparat network. This is because the number of workers in firms varies a lot, and if the method of selecting the main contractor changes to be by the insured themselves, the number of firms in a district having workers selecting a main contractor will be more dispersed.

For the outpatient cluster, the mean numbers of personnel at clinics during 16.30-6.00 hours (after working hours), and the mean numbers of outpatient rooms and examination beds in MEDSEC were higher than in Nopparat network. This might indicate that MEDSEC network is able to serve the insured during the peak hours and after working hours better than Nopparat network. One reason why the characteristics of structural aspects, such as emergency services, emergency instruments, and personnel related to emergency services of smaller facilities, were generally better at MEDSEC than at Nopparat, is because the opening time/day of MEDSEC facilities was longer than in Nopparat, especially as they open after the working hours of the insured.

In the clinics, structures concerning emergency care and services after working hours (such as having complete simple and emergency services of laboratory and X-ray services available) were important to provide sufficient and necessary care. This is not only because the insured need to receive care at convenient times but also to receive a good quality of care at facilities. From this study, MEDSEC network had better structures concerning services after working hours, and concerning laboratory test and X-ray service while Nopparat network had shorter reporting time of simple laboratory tests (table 7.3). Each network should therefore strengthen its weaker structures.

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For 10-30 bed hospitals, both networks had nearly the same structure. Some variables that showed differences were the specialized doctors, pharmacy and laboratory sections (table 7.3). According to the recommendation of the MOPH, there should be 4 basic specialist doctors in a 30 bed hospital. In this substudy, most of MEDSEC network's small hospitals had 4 basic specialist doctors, plastic surgeon, and orthopaedics doctors. But for Nopparat network the general surgeon, plastic surgeon, and orthopaedics doctors were fewer than MEDSEC network. It is necessary to have an orthopaedics doctor in small hospitals because injury from work of the insured are common and often emergencies. Most of the conditions needing plastic surgeon are not emergencies. Patients who need plastic surgery can be referred to general hospitals. Therefore plastic surgery doctors are not definitely needed in small hospital. For pharmacy and laboratory service sections, it is necessary to have such activities and variables mentioned in the substudy for facilities to render good medical care.

Although in both networks, there were private clinics and small hospitals, the infrastructure of the clinics of MEDSEC were better than in the Nopparat network. For small hospitals, they were similar. This indicates that the MEDSEC network was more careful in selecting clinics to join the network than the Nopparat network was.

In $\geq$100 bed hospitals, number of personnel and services provided during after working hours are crucial. The MEDSEC network had a better structure than the Nopparat network for this. However, the Nopparat hospital had some better structures such as number of personnel (in general), building, and instruments (table 7.3) which were essential for services provided after working hours of the insured and for emergency treatment. For pharmacy and laboratory activity, as $\geq$100 beds hospitals are tertiary care, it is critically required to have a complete range of activities listed in these 2 sections.

Nopparat network is a publicly-organised network and the government pays the salary of pharmacists from a global budget to operate a wide range of pharmacy related tasks such as community drug funds, pharmacy health education, hospital drug stock control, simple drug production (IV fluid, gastrointestinal mixture etc.), IP drug quality control etc.. This enables Nopparat to have more pharmacists than MEDSEC network. It is notable that 75% of the large hospitals of MEDSEC had no pharmacist although it is a legal requirement to have a pharmacist in this size of hospital. One half of the larger MEDSEC hospitals had no system for labelling the expiry date on drugs though it is vitally essential due to FDA regulation. MEDSEC network was found to have fewer drug stocks, because private hospitals tend not to bear the burden from dead stock. They try to purchase drugs from a drug company as they really need them.

Table 7.3 Summary of main findings on evaluation of infrastructure of the networks

Study issue	Method	Main finding
Distribution & coverage of MEDSEC/ Nopparat network facilities	Secondary data collection from MEDSEC & Nopparat networks	-in MEDSEC network, 2 districts of Bangkok having >3,000 workers had no facility, and 3 districts had >5,000 workers/facility -in Nopparat network, facilities were distributed in 7 districts of east Bangkok having the insured from ≥10 firms/district -indicator to increase 1 additional facility/district was 5,000 additional insured for MEDSEC, and some additional firms selecting Nopparat network compared to previous year for Nopparat network
Structure of clinics	Mailed questionnaire	structure that MEDSEC network had better: -mean numbers of personnel during 16.30-21.30 and 21.30-6.00 hour, OB-GYN doctor, OP room and physical examination bed, X-ray personnel, X-ray machine, and age of X-ray machine set -proportion having urine analysis, urea and electrolyte, malaria slide test, and emergency X-ray service structure that Nopparat network had better: -proportion of facility about time consumed to report simple test within hour, having pharmacist, and having drug stock system
Structure of 10-30 beds facilities	Mailed questionnaire	structure that MEDSEC network had better: -mean number of general surgery, plastic surgery, orthopaedics specialist doctors; and age of X-ray machine set structure that Nopparat network had better: -proportion having emergency laboratory services section
Structure of ≥100 beds facilities	Mailed questionnaire	structure that MEDSEC network had better: -mean number of personnel during 16.30-21.30 hour, toilet, and age of X-ray machines structure that Nopparat network had better: -mean numbers of OP rooms, GP and specialist examination rooms, physical examination beds, Dr-patient desks, otolaryngoscope, ophthalmoscope, ambulance, years after redecorate/build of OP, personnel and specialist doctors except the mean number of personnel during 16.30-21.30 hour, X-ray personnel, days of X-ray personnel trained, number of X-ray machine* -proportion having emergency X-ray service, having pharmacist, having expired date labelled on package
Structure of all facilities	Mailed questionnaire	structure that MEDSEC network had better: -proportion having emergency electricity sources, autoclave service in facilities, and complete emergency set in OR -mean of % of beds with BP of the second ward structure that Nopparat network had better: -most of IP information variables

Satisfaction of inpatients of MEDSEC and Nopparat networks

Although Nopparat hospital had a better infrastructure compared to other hospitals, the inpatients were still more satisfied with MEDSEC than Nopparat hospitals (table 7.4). This is likely to be due to over load of

duty and mechanism of payment to personnel of Nopparat hospital which didn't motivate personnel to provide satisfactory medical services to the insured. As the patients have a limited knowledge of technique of medical quality of care, using only assessment of satisfaction cannot conclude the definite difference of quality of care between networks. However the instrument used in this substudy, adapted from McIver (1992) of King Fund Centre, was pretested and adjusted, and then it was administered with very little restriction. This is because it is simple and suitable to both private and public hospitals.

Table 7.4 Summary of main findings on evaluation of satisfaction of inpatients of 2 networks

Study issue	Main finding
-Medical treatment & care	-more satisfied with MEDSEC than Nopparat networks for all variables except feelings of embarrassment.
-Information & communication	-more satisfied with MEDSEC than Nopparat networks for all variables
-Ward environment & facility	-more satisfied with MEDSEC than Nopparat networks for all variables except service about keeping personal belonging
-Discharge & outcome	-more satisfied with MEDSEC than Nopparat networks for all variables except about written notice given for follow up appointment

Prescribing analysis of facilities of MEDSEC

The analysis used methodology and instruments adapted from WHO (1993) which is an effective evaluation method for quality assessment of one aspects of the processes of medical services. Table 7.5 shows the summary of the main findings of this substudy. URI was the most common disease among the insured or noninsured which was the same as the study of the insured by Kamolrattanakul et al. (1993). The average number of drugs prescribed/encounter of the insured/noninsured were less than those recorded in Indonesia (Mean=3.3) and Nigeria (Mean=3.8) by Hogerzeil et al. (1993).

The insured were prescribed a higher proportion of generic names and essential drugs than the noninsured. This indicated that the insured had been more cost-effectively treated.

The average number of drugs prescribed to the insured in URI, which does not require drug treatment, was higher than of the noninsured (table 7.5). In the arthritis and UTD which are diseases that need medicine for proper treatment, there was no difference of the average number of drugs

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prescribed between the insured/noninsured. This suggests that there was no limitation to the number of drugs prescribed for the insured patient if it was necessary.

The injection of medicine and antibiotics prescribed are indicators used to measure whether there is any unnecessarily expensive treatment. This is because in developing countries, medicine is often overused with injections and antibiotic drugs prescribed for diseases that do not absolutely need them. It affects not only the health of the people but also the cost of services. Comparing the proportion of injections prescribed to the insured (7.0%) with the study of Hogerzeil et al. (1993), the proportion of ≥ 1 dose of injection prescribed in 10 out of 11 countries was higher than in this study. The proportion of ≥ 1 dose of injection of the insured (7%) was about 3 times lower than of the noninsured (25%). For antibiotics used, the proportion of ≥ 1 dose of antibiotics drugs prescribed of the insured was lower than the noninsured. However in a particular tracer analysis, there were evidences of irrational prescription of antibiotics (in URI, UTD), injections (all tracers), vitamins (arthritis, HPT), diazepam (arthritis, HPT), and paracetamol (HPT) for both groups. The use of injections in all tracers is not necessary. It is potentially dangerous to give medicine parenterally and more expensive than appropriate oral medication. These indicate that there was poor outpatient care for some patients in both groups.

In URI patients, indicated antibiotics were prescribed more specifically for the insured than the noninsured. For the insured, there was a guideline of maximum outpatient charge rates of about 170 Baht/visit. The mean charge of the insured was 172.8±70.2 Baht/visit which was lower than of the noninsured. It is likely that because of the effect of the payment mechanism for the insured by capitation base with guidelines and bonus incentives system of the network, the charged rate of the insured was possibly kept down by limiting injection and antibiotic use which resulted in more rational and cost-effective treatment.

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Table 7.5 Summary of main findings on prescribing analysis of facilities of MEDSEC

Study issue	Main finding
-General analysis	-URI was the most common disease -treatment for the insured was more rational than the noninsured in terms of the higher proportion of generic name and essential drugs prescribed, and lower proportion of ≥ 1 dose of antibiotic and injection prescribed -irrational prescription of antibiotics and injection to both groups -price/cost of the insured was likely to be kept down (lower than the noninsured) by limiting drugs used
-URI patient	-specificity of drug used for URI patient of the insured was better than the noninsured by looking at antibiotic and symptomatic treatment drugs prescribed -the insured received lower dose of a particular drug than the noninsured -irrational prescription of cloxacillin, lexinor, doxycycline, lincomycin, and kanamycin to both groups
-Arthritis patient	-items of necessary drugs prescribed to the insured/noninsured were similar -proportion of ≥ 1 dose and the dose of a particular essential drugs prescribed for the insured were less than the noninsured -irrational prescription of vitamins & diazepam to both groups -more expensive/course NSAIDS (diclofenac) prescribed to both groups
-UTD patient*	-proportion of ≥ 1 dose of drugs used and mean of dose of drugs used were similar between both groups -irrational prescription of tetracycline & metronidazole to both groups
-HPT patient*	-drugs prescribed for both groups generally the same as recommended in the gold standard -the insured received fewer items and doses of symptomatic/supportive drugs than the noninsured -irrational prescription of vitamins & paracetamol to both groups

Note: * small sample sizes

In arthritis patients, more expensive NSAIDS were a more likely to be prescribed than equally effective but cheaper drugs. This was remarkably more common among the noninsured. This indicates that the patients were unlikely to be treated cost-effectively.

From the items and dose of drug prescribed and price charged for URI, arthritis, and HPT, it was confirmed that the price/cost of the insured was likely to be kept down by limiting items and doses of drugs prescribed for the insured more than for the noninsured. It is unclear about the causal factors affecting this limitation of drugs used. However, it is likely to be due to either underdosing or multiple visits and splitting a prescription to be >1 prescription. This is the danger of the payment

mechanism of MEDSEC which has to be modified for better efficiency of treatment since it might affect the adequacy of treatment in some cases.

Inpatient treatment of the insured/noninsured of MEDSEC hospitals

This substudy used explicit criteria adapted from general text books and agreed by a panel of medical experts during the process of data collection, which was easy to administer and might be helpful for measuring the quality of care for inpatients in other settings. Table 7.6 shows the summary of the main findings of this substudy. Diarrhoea was the most common disease among the insured which was the same as in the study of the insured by Kamolrattanakul et al. (1993). The mean charge of the insured was lower than the noninsured. It is likely that the charged rate of the insured was possibly kept down because of the effect of the capitation based payment mechanism for the insured with a standard mean charge by diseases/conditions for small hospitals and bonus incentive system of the network.

In the analysis of diarrhoea, facilities tended to use more effective and short acting drugs with the insured than with the noninsured. The facilities didn't only want to satisfy the insured to select the network in the next year but also wanted to be a fund holder. This is because if the insured are satisfied with facilities, they will receive care from that facility more than others. Then that facility will have highest number of outpatient visits and will be considered as a fund holder for that particular firm and will then gain profit from the surplus bonus. From explicit criteria of treatment of diarrhoea, treatment of the insured was more cost-effective than the noninsured. This is probably because private facilities run as private companies and have a profit-motive to run the business: the budget to pay for the insured is limited due to the capitation payment basis, so they have to operate more cost-effectively to maintain their profit. However as the payment system is capitation with bonus incentive system, it was likely that price/cost of the insured was kept down by limiting some drugs used such as ORS, kaopectin, and tetracycline. This might be a danger because the insured patients may possibly receive inadequate treatment. For appendicitis patients, it indicates that treatment of the insured was better than of the noninsured, by looking at the proportion of patients having complicating symptoms. However, because of too small a sample size in the evaluation of outcome of appendicitis treatment, conclusions cannot be confidently drawn from this substudy.

Table 7.6 Summary of main findings on analysis of inpatient treatment of MEDSEC hospitals

Analysis of	Main finding
-Overall treatment	-diarrhoea was the most common disease among the insured and all cases -mean charge of the insured was lower than the noninsured both for all cases and by diseases/conditions
-Diarrhoea	-facilities tend to use more effective and short acting drugs with the insured than the noninsured to satisfy the insured -price/cost of the insured was kept down by limiting drugs prescribed -treatment for the insured was more cost-effective than the noninsured
-Appendicitis	-treatment of the insured was more effective than the noninsured -from evaluating outcome of appendicitis treatment*, mean score of complication symptoms of the insured was lower than the noninsured** -patients' perception of quality of medical treatment of the insured & noninsured (%) was not different**

Note: *   Data from postal questionnaire
      ** small sample size (28)

7.3 Policy recommendations

The ultimate aim of this study is to identify health policy recommendations regarding health care provider networks which would improve the physical accessibility of the insured, patient's satisfaction, quality of care, and the payment mechanism within a network. This section presents policy recommendation aspects regarding provider networks that are drawn from the main findings.

7.3.1 Functions of network office

To introduce a better purchaser in the provider network, all activities concerning successful managed care models, whether performed by MEDSEC or not, should be proposed to be performed by the network office. The provider network should undertake both administrative and quality of care activities. Administrative activities consist of: network collaboration with the SSO, the employer, and the insured to initiate rules of interaction and responsibility between the insured and providers; proposal of the payment system in the network; administration of the budget allocated from the SSO and paying facilities; managing subsidies available for emergency or high cost fees to the insured or facilities; initiating and managing the risk fund; and introducing procompetitive actions by payment mechanism. Quality of care activities that should be done by the

network office are: managing quality assurance; surveillance of the performance of facilities; standardizing the quality of care between facilities by analyzing drug prescription or medical record auditing; and preventing patient discrimination. However some of these activities were not attractive without financial motivation and assignment. Therefore, some interventions that should be proposed are assigning these tasks under legal agreement to provider networks, and giving additional credit to a good performing network. This additional credit will then be added to other credit of good performing of quality of care. The network with the higher credit from being a good network, either in terms of good performance of the network office or facilities, should be paid more than the others.

7.3.2 Structure of the network

Since there was no standard setting of structure and function of facilities in the network or network office, the quality of services rendered by facilities in provider networks cannot be monitored and promoted. To have an effective provider network, standard structure of facilities and network office should be introduced. In the initial regulation for coverage, it should be necessary to have a facility in a district serving a minimum number of the insured. It is valuable to use this indicator to add a facility as in MEDSEC network. As MEDSEC network had operated for the insured for ≥ 3 years and the insured were more satisfied than dissatisfied with the network, it is worthwhile to start using the indicator to add a facility as in MEDSEC (1 facility/district to serve primary care for 5,000 workers).

The network should meet standard requirements of structural variables of 6 clusters as mentioned in section 6.1.3. This standard should be set by SSO policy makers by using the central distribution and other statistical figures presented in section 6.1. However some crucial variables that should be proposed are the opening period of the facilities after working hours of the insured, emergency services, pharmacy section activities, and laboratory and X-ray services. Some specific structural findings that are significantly needed should be classified by number of beds of facilities. For no bed facilities, it is necessary to serve the insured after working hours, have simple laboratory test available, and have emergency X-ray services available. In 10-30 bed hospitals, there should be 4 basic specialists and orthopaedics doctors, emergency laboratory tests and X-ray services, and a pharmacist and important pharmacy section services. For ≥ 100 bed hospitals, basic structures to be proposed are: having standard number of personnel, premises, and instruments that were essential for services after working hours of the insured and for emergency treatment;

and having a complete range of activities listed in pharmacy and laboratory sections.

7.3.3 Monitoring system

In the substudy of infrastructure, a postal questionnaire was administered together with a letter from the director of the related network to both public/private facilities. The response to questions was extraordinarily well completed (100% replied). So adaption of this instrument and method either to be used as monitoring by the network or for a survey of SSO, might be of value. This study presents the central distribution of continuous data, proportion of discrete data, and other essential statistics of 6 clusters of structure of facilities which might be needed for policy makers to use for setting up the initial standard for good structure of a provider network. However the minimum standard set of data for monitoring infrastructure of facility should consist of: opening period of the facilities after working hours of the insured, emergency services, pharmacy section activities, and laboratory and X-ray services. This minimum standard setting should be classified by the categories of clinics, and 10-30 and ≥ 100 bed facilities.

In the quality control, self monitoring by the network office is more effective than external quality assessment by SSO in terms of cost, appropriateness, and reliability of the result. The network office can closely monitor the facilities in the network because it has authority to control facilities. The monitoring system performed by the network office would be cheaper than by SSO because it is simple and easy to be administered in a close and smaller system. This decentralized quality monitoring system by network offices is also appropriate because the network offices know the quality of care of a particular facility to some extent. They can simply detect the unrepresentative data or skewed data of quality of care of a facility. Actions to control quality can be achieved through payment systems. As facilities in the network are paid by the network office, if the facilities do not provide good quality of care, they would not be well paid. However if the monitoring is conducted by SSO, the network office might try to hide their defects.

Satisfaction with services of the insured should be investigated by applying the instrument used in section 6.2 adapted from McIver (1992) of King Fund Centre, which was pretested and adjusted, used with a very little constraint, and proved simple and suitable to both private/public hospitals. Investigation should be conducted by the network office and then the results should be reported to SSO. In medical quality monitoring, information about overtreatment or undertreatment in relation to outcome of treatment should also be monitored. Outpatient prescribing analysis of

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some relevant tracers should be done by the network office and then reported to SSO. Some essential variables such as total items, dose, generic name, essential drugs list, antibiotics, and injections should be applied in the prescribing analysis process. For inpatient medical record analysis, the explicit criteria adapted from analyzing diarrhoea and appendicitis inpatient treatments, should be applied to monitor the quality of care of the insured of the network by the network office and then reported to SSO. Results of the quality assurance sent to SSO might be used to pay additional budget for a good network which provides service as a minimum requirement of quality of care to the insured.

7.3.4 Government facility role

In this study, the insured of MEDSEC network were more satisfied with private than public networks, although the infrastructure of Nopparat, a public hospital, was better than MEDSEC hospitals. To compete with a private network, the public sector should be autonomous from inefficient bureaucratic regulation and constraints by being given 'self-governing' authority (Punnarunothai, 1993). Self-governing hospitals are supposed to work with more flexible decisions and be more responsive to patient needs. A self-governing public hospital is able to respond to problems quickly. Moreover it is able to manage financial constraints more easily. Therefore self-governing hospitals should be encouraged for public hospitals that are suitable to be purchasers in social insurance. However, in general public hospitals, there is poor quality of care due to lack of profit incentives to ensure quality of care. Standardizing quality of care of general public hospitals is necessary. To ensure good management and effective quality of care for all patients, there should be some criteria that the public general hospitals should meet.

7.3.5 Referral system

Since in a provider network, the level of care of facilities vary from no bed facilities to specialist hospitals, a systematic referral system is needed to provide the best care with lowest cost. To initiate a perfect subcontract network in urban areas, both direct and indirect, there should be 3 levels of facilities: primary (clinics/polyclinics), secondary (small hospitals), and tertiary (general/specialized hospitals) care. Smaller facilities consume less budget in terms of either capital or running costs than bigger facilities. However in urban areas, it is very difficult to classify the function of small hospitals from a general hospital and function of general hospitals from a specialized hospital. In Bangkok where the existing public hospitals are mainly general or specialized hospitals, they are able to provide either secondary or tertiary care. The cost-effectiveness of having new small hospitals to provide facilities at

3 levels of care is doubtful. Therefore it is not necessary to initiate any new small hospitals to make up 3 levels care. In Bangkok where movement of patient ambulance vehicles for referring patients is limited by heavy traffic, a geographical subnetwork for referral systems is required. Grouping of primary, secondary, and tertiary care facilities in the near-by area is appropriate and useful in this situation.

7.3.6 Payment system of network

Payment system is one of the forceful factors that encourages efficiency and controls cost. In any particular payment system, there are advantages and disadvantages. Apart from quality assurance which is expected to be powerful in providing good quality of care, an appropriate payment system of networks should be also proposed to control quality of care. Initial approval of payment system is essential. Networks should propose their payment system to SSO before being admitted as provider networks. SSO should consider which payment in the network is able to encourage adequate treatment to the insured in terms of both quantity and quality of care. The payment system should promote competition. To achieve a perfect provider network, the payment system should encourage efficiency, quality, and contain cost. However, patients may not understand the implications of services: they may perceive their availability as evidence of excellent products (Hilsenrath, 1991). Some evidence of excellent products perceived by the patients are: more convenient location of providers, short waiting time, cleanliness of premise, friendliness of personnel, and good reception. In capitation, facilities compete for patients on aspects that patients can recognize. The other aspects of quality of care such as medical treatments might be neglected. Nonetheless it is not so harmful to encourage facilities to compete on the nonprice competition characteristics as long as total cost is contained and technical quality is adequately maintained.

Since the illness and the medical cost are uncertain, within a provider network where the capitation method is applied as in MEDSEC network, the budgets for paying for high cost patients are more worried. This is because facilities which are fund holders of a small group of the insured might face higher risk of loss than others if there is burden of high cost diseases paid. However to solve the uncertain risk of burden from huge medical fees, and to assure the insured adequate and prompt treatment, risk funds should be initiated and organised to be one of the important part of the payment mechanism. Network offices should submit details of their risk fund payment system to SSO to be approved before being admitted as a provider network. Monitoring and presenting of these funds by regular reporting from network office to SSO, is crucially needed.

Since fixed capitation (700 Baht/worker/year) was applied in 1991, the OP utilization rate has increased from about 1 visit/person/year in 1991 to about 2 in 1994. The general inflation rate of Thailand is about 5% every year (Bank of Thailand, 1994), and the private market price is increasing every year. An annually increased capitation payment should therefore be proposed and applied to main contractors both with or without network. However if it is to be proposed, it needs to have encouraging characteristics to increase quality and quantity of medical care such as by using the utilization rate and admission rate, having facilities available near to the insured home, and having standard for the necessary structure of facilities. Nevertheless, since 1995, 2 additional payments have been in place to promote higher quantity of care. This additional payment is applied to all main contractors either having or not having a provider network. There should be some additional payment mechanism to promote quality of care by using data such as structure of the network mentioned in section 7.3.2, and data from monitoring system mentioned in section 7.3.3, to pay for the good network.

Competition is meant to reduce excess cost. Competition between providers of health care could be a useful mechanism to improve effectiveness of care and lower cost. Contracting clinics or small hospitals with reasonable financial incentives and suitable monitoring systems as in MEDSEC network showed good outcome in terms of satisfaction of the insured. However there was some danger from this payment system because small hospitals tended to keep some patients to save their expected bonus. Hence the level of sickness of some patients referred from small hospitals to general hospitals was very serious. Prevention of this serious disadvantage such as by a medical record audit method with financial penalties or incentives should be ensured by the network office.

Since MEDSEC general and specialized hospitals were paid by the FFS method, they consumed the highest proportion of the budget. This was a serious burden to the network. Special payment schedules for these hospitals such as DRGs (Dowling 1979) should be introduced. For networks in general, there should be a cost effective schedule of payment to general or specialized hospitals.

Allocating quotas of the insured to a main contractor (50,000 workers/100 beds) is one of the constraints limiting the development of the provider network. In the provider network where there were many facilities to provide care, although a lot of facilities had <100 beds, the allocated quota of the insured to the network was still strictly regulated to 50,000/100 beds for each qualified main contractor. This allocation criteria should be changed to consider the characteristics of each level of facilities: the number of primary care facilities, a good referral

system to higher care facilities, and the quality of care of all level of facilities in the network.

7.3.7 Knowledge and attitude of the insured

It is important to reduce the lack of knowledge of the insured because it influences their health seeking behaviour. One intervention to achieve this problems is health education which should be accomplished by many means such as:

- -by provider facilities and provider network office
- -through related parties: labour union, the employers, and the representative of the employees
- -by mobile SSO counselling team
- -through public media such as radio, television, newspaper, and special SSO newspaper and printed matter.

SSO should spend more of its budget on health education and public relations to encourage a better understanding among the insured about social insurance. SSO might not have enough personnel to undertake educational media, therefore, contracting with private specialist companies would be the appropriate and effective action.

Problems associated with the knowledge of the insured about their main contractor's name and about preference of selecting a main contractor, would be diminished if the insured are allowed to select main contractor by themselves. However, the insured should be educated on how to select their best main contractor. Therefore SSO should educate how to choose the best main contractor and introduce a system of selection of main contractor by the insured in all provinces. This will also increase the satisfaction of accessibility to care because the insured tend to choose their main contractor and receive care from facilities that are close to their homes or offices.

Regulations about diseases/conditions uncovered, free of charge emergency care, and reimbursement of fees for emergency care, have been changed every year, therefore, a master plan to control this change over time is needed. SSO should have a master medium term (5 years) plan for the regulation of these 3 issues proposed by year and try not to change this plan during the proposed period.

Chapter 8
Conclusion and future research needs

8.1 Conclusion

The primary concern of this study was to evaluate the MEDSEC network. The results show the relevance of the evaluation and accomplish the objectives of examining the organization, payment system, utilization, and factors affecting utilization by those insured of MEDSEC; and assessing the quality of care of MEDSEC compared with the publicly-organized, Nopparat network.

There are advantages to the payment system of MEDSEC, which is FFS under capitation basis with bonus profit system. The insured were more satisfied with the MEDSEC network than with the other. The evaluation of infrastructure substudy provides useful information for setting the standard structure of the network and for monitoring the structural quality of facilities. The quality of care provided for the insured was generally better than for the noninsured of MEDSEC facilities. Evidence of better quality was shown in the analysis of prescriptions, both overall and specifically for particular diagnoses/conditions, and in the tracer analysis both regarding process indicators (ie. items noted in the inpatient records) for different groups of patients and outcome indicators (ie. complications - symptoms/signs) of appendicitis patient. However, there were some disadvantages for the insured in the MEDSEC network concerning fewer items and doses of drugs used/encounter, which might cause inadequacy in treatment.

The workers have difficulty perceiving relevant information to understand the regulations and process of providing care, and this leads to lower utilization of care. An effective provider network and effective health education should be introduced to combat this.

In this study most of the substudies are useful and can be used to develop policy recommendations, with the exception of the evaluation of inpatient satisfaction. Health policy recommendations regarding health care provider networks are identified concerning the functions of a good provider network office, the monitoring of a network's quality of care, the payment system of networks, and actions to improve the knowledge of the insured concerning the regulations on access to care. To promote a good provider network, harmonious patterns of provider network functions and collaboration between parties (network office, facilities, consumers, and SSO) should be encouraged, which include: the functions of a network office adapted from the successful managed care models, cost-effective third party payment and

administrative system, primary health care and good referral system, and the principle of using local existing facilities in a competitive environment.

8.2 Generalization of the result

Since the MEDSEC/Nopparat networks were situated in Bangkok, the characteristics of the insured and facilities involved were urban dominated. Thus, to generalize and apply the policy implication on provider networks to the whole kingdom requires caution. This is because in other provinces, the selected main contractor is usually situated near to either the living or working places of workers. If the main contractor is not close to the firm or the worker's home, or the firm is situated in remote area, an extended outpatient service and relevant referral system should possibly be proposed to substitute for the full range of the provider network. This might be more cost-effective than to have the complete provider network system.

Zschock (1982) suggested that to increase efficiency in the provision of care, primary care emphasis should be proposed in social insurance. In provinces of Thailand, there are many private clinics providing primary care, especially after-work hours of the insured, and the main contractors - mostly public general hospitals - are in urban settings and generally provide primary care only during the insured's working hours. To maximize the benefits to the insured in urban areas, private clinics should be included in the provider network. Nevertheless, in some 12 regional, major provinces, where the urban community dominates, perhaps the proposed regulation of the full range of the provider network can be applied.

In developing countries, there are problems of low coverage, medical care provision to include access to the private sector, equity in access to services, and cost control. This study shows the possibility of organizing a private provider network to increase the accessibility of the insured to medical care, especially to private providers. Moreover, as the payment system is by capitation method, the increase in cost is controlled. This experience of the private provider network, which is similar to HMOs, shows the strengths which might be applied to other developing countries. However, to generalize this result and implications, countries need to consider important characteristics of their own health care delivery systems, especially whether facilities are dominated by either private or public ownership, or by either general practitioner or specialized facilities. This is because the private sector operates more flexibly, with business profit consciousness, while the public sector has greater restrictions with less profit awareness. For the dominance of facilities in terms of levels of care, countries should consider having primary care

for a first contact, and having a good referral system to refer patients needing higher care. Moreover, characteristics of the insured in terms of socioeconomic status are also important in deciding how the provider network should operate. This is because low educational status of the insured causes problems of misunderstanding of service processes and benefits given, which decreases the insured's utilization of care.

8.3 Future research needs

From this study, aspects arising that are unclear and need further research are: the model of quality of care assurance rendered by a network office, causal factors affecting the number of items/doses of drugs prescribed - whether underdosing or multiple visits, suitable provider network for nonurban provinces of Thailand, and the range of care to be provided by primary care facilities. Studies needed for policy recommendations are: the suitable number of insured and/or other groups covered by a primary care provider, the gold standard for infrastructure of facility and provider networks, an appropriate model of self-governing hospitals, DRG schedule and computer module for the DRG method.

The state of the art concerning quality of care assurance of general providers in Thailand is limited especially for the provider network facilities. As mentioned in section 7.3.3, it is important to have self monitoring of the quality of care provided by facilities in the network; the method and minimum set of activities for monitoring quality assurance within the network by the network office need to be studied.

In prescribing, the price/cost of the insured was likely to be kept down by prescribing fewer items/doses of drugs for the insured than for the noninsured. This is likely to occur either by underdosing or by multiple visits. For multiple visits, it possibly arises through primary facilities wanting to split a prescription, and then charging MEDSEC office more than once. However, from this study, it is still not clear what are the causal factors affecting the limitation of items/doses of drugs prescribed to the insured. Research into the causal factors affecting the number of items/doses of drugs prescribed, whether by underdosing or multiple visits, is needed.

As mentioned in section 8.2, in nonurban provinces, an appropriate provider network model is needed to promote cost-effectiveness of medical care. Research concerning a suitable provider network for such provinces should be undertaken and proposals put to SSO.

In the referral system, clinics have been proposed as a primary facility in the health delivery system network to tackle the poor accessibility of the insured. In the primary care facility, it serves not only the insured but also the general population. There are no studies about the highest number of clients to be taken care of by clinics with the highest quality of care. Studies about the number of the insured and/or the other groups covered by a primary care provider should be undertaken. However, the range of care to be provided should also be studied. This is because in Thailand, there is no standard list of care that ensures clinics are able to provide acceptable quality. In some developed countries, they have primary care teams to provide a wider range of primary care. In the UK, for example, the primary care team includes medical doctors, practice nurses, psychiatric nurses, social workers, health visitors, home nurses, dieticians etc.. The services are offered for general medical diseases/conditions, minor surgery, vaccination, blood sampling, eye syringing, family planning, cervical smear and other routine screening tests, antenatal clinics, baby clinics, diabetic clinics, psychiatric treatment, counselling for personal problems, home visits, home nursing care etc..

In this study, opting out of self-governing hospitals has been proposed to create competition with the private network. Since the state of the art about self-governing hospitals in Thailand is very limited, a study to describe an appropriate model of self-governing hospitals for Thailand is worthwhile.

In the payment system of MEDSEC network, general and specialized hospitals were paid by FFS method, and they spent the highest proportion of the budget. Special payment schedules - eg. DRGs - should be studied to reduce these problems. As the IP records and data at MEDSEC office for general/specialized hospitals of MEDSEC network are quite complete, a study of DRG schedules and computer modules for the DRG payment should be promptly undertaken. The resulting schedule and model should be able to be generalized to all networks.

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Instruments for the study

Form No.1

Ministry of Public Health

Samsan Road, Bangkok 10200   Telephone 2821886

THE RESPONSE OF THE PRIVATE SECTOR TO COMPETITIVE CONTRACTING:A CASE STUDY OF A PRIVATE HEALTH PROVIDER NETWORK IN THAILAND

<u>PURCHASER VIEWPOINT</u>

IN-DEPTH INTERVIEW GUIDELINE

with the manager of MEDSEC and staff

Introduction to the manager of the MEDSEC and staff

This study is to evaluate a private health provider network, MEDSEC network.   The aim of this study is to identify health policy recommendations about health care provider networks in social insurance in Thailand which would improve the accessibility to care of the insured, their satisfaction, quality of care, and payment system within a private network.   The main, general objective of this study is to evaluate MEDSEC network in terms of organization, payment system, quality of care, and behaviour and utilization rate of the. insured.   The study is contained in four substudies:

-operating system, financial management, and charge rate for medical care of MEDSEC; and the utilization rate of MEDSEC and Nopparat networks

-knowledge and attitude of the facility's managers about MEDSEC

-health seeking behaviour, utilization rate, knowledge, and satisfaction of the insured with the services of MEDSEC facilities.

-evaluation of quality of care

This in-depth interview with you and your staff, and secondary data collection from your office is part of this study.   The specific objectives of this study are to identify how MEDSEC network was set up and how it has grown over time, the payment system to providers of MEDSEC; and to examine the utilization rate of MEDSEC and Nopparat networks.

Form No.1

Questions

1.Historical development of MEDSEC
    1.1 How was MEDSEC set up?
    1.2 Who are the initiators?
    1.3 Who are the planners?
    1.4 Who paid for the first capitation budget?
    1.5 How has it grown?
2.What is the marketing and propaganda system to employers?
3.What is the marketing and propaganda system to providers?
4.Is the amount of capitation payment(700 Baht) adequate?
5.Is there any incentive payment system to employers and doctors? If yes, how does it work?
6.What are the current contractual relationships within the network? (ASPECTS OF INTEREST: VIEW ON SATISFACTION OF MEMBERS IN THE EXECUTIVE COMMITTEE, HOW MANY PROVIDERS WITHDREW FROM THE NETWORK LAST YEAR, VIEW ON THE FUTURE TREND OF MEMBERSHIP WITHIN MEDSEC, WHAT ARE THE SOCIAL ACTIVITIES BETWEEN PROVIDERS)
5.What are the recent details of the payment system between MEDSEC and sub-networks, between sub-network and providers in the sub-network, between MEDSEC and general hospitals? Is there any limitation of fee-for-service payment to general hospital, to sub-network? Can MEDSEC pay providers at the agreed time?
6.Do you check providers before they are allowed to join network?
7.Is there any criteria on the minimum buildings, equipment, standards, available staff to recruit providers?
8.What is the quality control mechanism of the service with general hospitals, small hospitals, clinics/polyclinics?
9.What are the mechanisms to cope with unexpectedly high reimbursement for some diseases?
10.How do first and second level providers decide where to refer patients?
11.Does price charged by general hospitals affect the decision of small hospitals to refer patients? If yes, what is the evidence(SUCH AS DECREASED NUMBER OF INPATIENTS PER MONTH OF THE HOSPITAL WITH HIGHER PRICES CHARGED)?
12.How do patients decide which provider to go to?
13.What aspect of services do patients value?
14.Is there any effect of non-price competition such as good reception, cleanliness, convenience, friendly personnel between providers in the same level of care? If yes, what is the evidence (SUCH AS DECREASED NUMBER OF OUT-PATIENTS VISITS PER MONTH OF THE PROVIDERS WITH COMPLAINTS OF POOR SERVICE FROM THE INSURED)?

Form No.1

Secondary data collection
from the MEDSEC office checklist

Sources of information

    1.monthly report of MEDSEC office to the executive committee of MEDSEC

    2.monthly report of payment to providers

    3.yearly report of balance of payment and income

    4.all the minutes of meeting in the MEDSEC Office and of the executive committee.

1.How effective is the marketing and propaganda system?

2.Is there any incentive payment system to the employers and doctors? If yes, how is it organized?

3.What is the recent detail of the payment system?

4.Did any sub-network return any money to balance the account of any firm last year(in case the balance of capitation of that firm is negative)?   How many of them?   How much was the amount in Baht?

5.Is there any financial risk to MEDSEC?

6.What is the utilization rate and charge rate of the insured within the various providers in the network?

7.What are the quality control procedures of services?

Form No. 2

<table>
<tr><td colspan="2">Ministry of Public Health</td></tr>
<tr><td>Samsan Road, Bangkok 10200</td><td>Telephone 2821886</td></tr>
<tr><td colspan="2">THE RESPONSE OF THE PRIVATE SECTOR TO COMPETITIVE CONTRACTING:A CASE STUDY OF A PRIVATE HEALTH PROVIDER NETWORK IN THAILAND</td></tr>
<tr><td colspan="2"><div align="center"><u>PROVIDER VIEWPOINT</u>
IN-DEPTH INTERVIEW GUIDELINE WITH
The manager of providers</div></td></tr>
</table>

Selection of providers

1.Four clinics/polyclinics(one from each sub-network).

2.Four small hospitals(one from each sub-network).

3.One general hospital(by simple random sampling technique)

Introduction to the manager of the providers

This study is to evaluate a private health provider network, MEDSEC network. The aim of this study is to identify health policy recommendations about health care provider networks in social insurance in Thailand which would improve the accessibility to care of the insured, their satisfaction, quality of care, and payment system within a private network. The main, general objective of this study is to evaluate MEDSEC network in terms of organization, payment system, quality of care, and behaviour and utilization rate of the insured. The study is contained in four substudies:

    -operating system, financial management, and charge rate for medical care of MEDSEC; and the utilization rate of MEDSEC and Nopparat networks

    -knowledge and attitude of the facility's managers about MEDSEC

    -health seeking behaviour, utilization rate, knowledge, and satisfaction of the insured with the services of MEDSEC facilities.

    -evaluation of quality of care

This in-depth interview with you is a part of this study. And the specific objective of this study is to identify the provider perspective of how MEDSEC network was set up and how it has grown over time, and the payment system to MEDSEC providers.

Form No. 2

Questions

1.How does the network encourage employers to register with it?

2.Why did you decide to be involved with MEDSEC?

3.Could you explain the terms of the contract in the agreement between MEDSEC and you? (ASPECTS OF INTEREST: DETAIL OF PAYMENT AGREEMENT; QUALIFICATION OF PROVIDERS IN EVERY LEVEL; REGULATION IN THE CONTRACT BETWEEN SUB-NETWORK AND PROVIDERS IN THE SUB-NETWORK; PENALTIES IN A PARTICULAR SITUATION SUCH AS REFUSING TO TREAT WORKERS, NOT TO PAY PROVIDERS IN THE SUB-NETWORK; HOW MUCH OF THE INSTALMENT)

4.What would you like to change in the agreement? How is it to be changed?

5.Could you explain the payment system of MEDSEC?

6.What are the advantages and disadvantages of the payment system to you?

7.How do you charge for the insured? Is it higher, lower or the same price as other patients?

8.Do you know whether the income and expenditure regarding the insured is balanced or not? How much is the difference?

9.How is the stage of sickness at which the patients is referred decided? What is the reason for referral?

10.Is there any difference in price charged between higher care hospitals?

11.Does the price of higher level care hospital affect your decision to refer a patient?

12.Is there any effect of non-price competition such as good reception, cleanliness, convenience, friendly personnel between providers in the same level care as your facilities?

13.How is the accessibility for the insured to receive care?

Form No. 3

Ministry of Public Health

Samsan Road, Bangkok 10200	Telephone 2821886

THE RESPONSE OF THE PRIVATE SECTOR TO COMPETITIVE CONTRACTING:A CASE
STUDY OF A PRIVATE HEALTH PROVIDER   NETWORK IN THAILAND

EMPLOYEES VIEWPOINT

INTERVIEW QUESTIONNAIRE

IDENTIFICATION OF STUDY FIRMS

Applying a multi-stage sampling technique, four firms (one firm from each subnetwork) will be selected. Two firms must in the past have had a public provider as a main contractor. The selected firms should have about 100-450 workers in a particular firm.

Introduction guide

The aim of this study is to identify health policy recommendations about health care provider networks in social insurance in Thailand which would improve the accessibility to care of the insured, their satisfaction, quality of care, and payment system within a private network.   The main, general objective of this study is to evaluate MEDSEC network in terms of organization, payment system, quality of care, and behaviour and utilization rate of the insured. The study is contained in four substudies:

-operating system, financial management, and charge rate for medical care of MEDSEC; and the utilization rate of MEDSEC and Nopparat networks
-knowledge and attitude of the facility's managers about MEDSEC
-health seeking behaviour, utilization rate, knowledge, and satisfaction of the insured with the services of MEDSEC facilities.
-evaluation of quality of care

This structured interview with you and other employees is part of this study. The specific objectives of this study is to examine the health seeking behaviour, utilization rate, knowledge, and satisfaction of the insured of MEDSEC network.

(1-4)   (5-6)

Identification Code   [___ ___ ___]   Month...... 1994   [___ ___]
of the firm and worker

Name of the firm and address . . . .
. . . .
Worker's name ....
Interviewer's Name ....

Form No. 3

		Col./ Code	skip to
1.	Age in years	(7-8) ___ ___	
2.	Sex Male Female	(9) 1 2	
3.	Marital status Single Married Divorced Widow Separated	(10) 1 2 3 4 5	
4.	Educational status Primary school Secondary school Vocational education Certificated education Bachelor degree Master or doctorate degree	(11) 1 2 3 4 5 6	
5.	Where are you staying (Home)? 5.1 Subdistrict .... 5.2 District .... 5.3 Province	(12-14) _____ _____ _____	
6.	Income per month from this firm (BAHT/MONTH) (INCLUDE ALL ALLOWANCE)	(15-19) _____	
7.	Other income from other sources (not from the firm) /month (BAHT/MONTH)	(20-24) _____	
8.	What is your duty in this firm Administrator or manager Secretary Product producer by using machine Product producer by manual labour Other	(25) 1 2 3 4 5	

Form No. 3

		Col./ Code	skip to
9.	Balance of your income and expenditure	(26)	
	Enough with saving	1	
	Enough but no saving	2	
	Not enough but no debt	3	
	Not enough with debt	4	
10.	How many hours do you work in a week (IN HOURS)	(27-28) ___	
11.	Normally, when do you work?	(29)	
	Day time	1	
	Night time	2	
	Day and night time alternatively	3	
12.	Is there any medical service on the work site for the workers when you are sick in the firm? Yes	(30) A	
	No	0	Q14
	I don't know	5	
13.	Who provides the medical services in the firm?	(30)	
	Nurse	1	
	Medical doctor	2	
	Nurse and/or medical doctor	3	
	Other	4	
14.	Do you know about the Social Security Act? Yes	(31) 1	
	No	0	
15.	Do you know your registered providers Yes	(32) A	
	No	0	Q17
16.	What is the name of your registered main contractor?	(32)	
	Correct name of main contractor	1	
	Incorrect name of main contractor	0	

Form No. 3

		Col./Code	skip to
17.	What are the facilities you know of that you are entitled to go to free of charge?(LIST THE NAMES)		
18.	Who informs you about the registered providers?		

19.	As the main contractor was selected by the employer, would you prefer to select the main contractor by yourself?
	
	            Yes
	            No
		(33)
		
		1
		0	

20.	What are the working hours of your registered providers under the Social Security Act when you can obtain services?
	 . . . . (NUMBER IN HOURS)
	Correct answer(24 HOUR/DAY, EVERY PROVIDER)
	        Not correct answer
	         I don't know
		(34)
		1
		2
		0	

21.	Are there any disease or conditions that are not covered by social insurance?
	            Yes
	            No
		(35)
		A
		0
			
			Q23

Form No. 3

		Col./ Code	skip to
22.	What are these diseases and conditions(LIST AT LEAST 4 DISEASES AND/OR CONDITIONS)?	(35)	
	Correct, at least 4 diseases/conditions	4	
	Correct, 3 diseases/conditions	3	
	Correct, 2 diseases/conditions	2	
	Correct, 1 disease /condition	1	
23.	Do you have a social security card?	(36)	
	Yes	1	
	No	0	Q25
24.	Do you have to use it when you need to receive care from your registered provider?	(37)	
	Yes	1	
	No	0	
25.	In case of emergency or accident, where can you receive care free of charge?	(38)	
	From registered providers only	0	
	Any providers	1	
	I don't know	2	
	No free of charge providers	3	
26.	In case of emergency or accident, if you have paid the treatment fee, can you have it reimbursed?	(39)	
	Yes	1	
	No	2	
	I don't know	0	

Form No. 3

		Col./ Code	skip to
27.	Do you know how many benefits are covered under the Social Security Act? What are they? (4 BENEFITS=UNRELATED TO WORK ILLNESS CARE, MATERNITY, DEATH BENEFIT, AND DISABILITY BENEFIT) . . . . Yes(CORRECT ANSWER) No(INCORRECT ANSWER)	(40) 1 0	
28.	Between 1 Nov. 1993 to 31 October 1994, were you admitted to a hospital? Yes, ...times No Ist time seek care from .... IInd time seek care from................. IIIrd time seek care from................. IVth time seek care from................. Vth time seek care from................. VIth time seek care from................	(41) _____ 0	
29.	During 1 to 31 October 1994, were you ill(not needed admission to a hospital)? Yes, one episode[1] Yes, two episodes Yes, three episodes Yes, four episodes Yes, disabled No, good health	(42) 1 2 3 4 5 0	Q51 Q51 Q51

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[1] Episode= illness(condition or disease) occurred, not consider how many times patient visit to facilities.

Form No. 3

		Col./ Code	skip to
30.	QUESTION REGARDING THE FIRST EPISODE At the first episode, last month, -What was the symptom? . . . . -What was the cause of the symptom?		
31.	At the first episode, last month, where were you when you first felt sick? At home At the working place Other......................... (WHERE)	(43) 1 2 3	
32.	At the first episode, last month, where did you go to seek care? From home From work place From other............. (NAME)	(44) 1 2 3	
33.	At the first episode, last month, what did you do when you were sick? (ANSWER CAN BE MORE THAN ONE CHOICE, NUMBER THE ORDER OF CARE SEEKING BEHAVIOUR) self prescribed drug workplace clinic other private clinics other hospitals MEDSEC network providers (NAMES).........................	(45) 1 2 3 4 5	 Q37
34.	Why did you not seek services from the registered facilities? Emergency sickness Not satisfied with services rendered Difficulty in access due to traffic problem Other.......................... (REASON)	(46) 1 2 3 4	

Form No. 3

		Col./ Code	skip to
35.	If you did not get services from MEDSEC network, did you pay?, how much did you pay? Yes, ...Baht No	(47-50) _____ 0	Q37
36.	If you have paid according to Q35, were you reimbursed from the Social Security Fund? Yes,........BAHT No	(51-54) _____ 0	
37.	**QUESTION REGARDING THE SECOND EPISODE** Were you sick for 2 times last month **No** **If yes,** What is the symptom of second episode? . . . . -What is the cause of the symptom?	A	Q51
38.	At the second episode, last month, where were you when you first felt sick? At home At the working place Other........................ (WHERE)	(55) 1 2 3	
39.	At the second episode, last month, where did you go to seek care? From home From work place From other.............(NAME)	(56) 1 2 3	
40.	At the second episode, what did you do when you were sick?(ANSWER CAN BE >1 CHOICE, NUMBER THE ORDER OF CARE SEEKING BEHAVIOUR) self prescribed drug workplace clinic other private clinics other hospitals MEDSEC network providers(NAMES)...........	(57) 1 2 3 4 5	Q44

Form No. 3

		Col./ Code	skip to
41.	Why did you not seek services from the registered facilities? Emergency sickness Not satisfied with services rendered Difficulty in access due to traffic problem Other.........................(REASON)	(58) 1 2 3 4	
42.	If you did not get services from MEDSEC network, did you pay?, how much did you pay? Yes, ...baht No	(59-62) _____ 0	Q44
43.	If you have paid according to Q42, were you reimbursed from the Social Security Fund? Yes,..........BAHT No	(63-66) _____ 0	
44.	QUESTION REGARDING THE THIRD EPISODE Were you sick for 3 times last month No If yes, what is the symptom of third episode? . . . . -What is the cause of the symptom?	A	Q51
45.	At the third episode, last month, where were you when you first felt sick? At home At the working place Other.......................... (WHERE)	(67) 1 2 3	
46.	At the third episode, last month, where did you go to seek care? From home From work place From other.............. (NAME)	(68) 1 2 3	

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Form No. 3

		Col./ Code	skip to
47.	<u>At the third episode, last month,</u> what did you do when you were sick?(ANSWER CAN BE MORE THAN ONE CHOICE, NUMBER THE ORDER OF CARE SEEKING BEHAVIOUR) self prescribed drug workplace clinic other private clinics other hospitals MEDSEC network providers(NAMES)	(69) 1 2 3 4 5	Q51
48.	Why did you not seek services from the registered facilities? Emergency sickness Not satisfied with services rendered Difficulty in access due to traffic problem Other........................(REASON)	(70) 1 2 3 4	
49.	If you did not get services from MEDSEC network, did you pay?, how much did you pay? Yes, ... BAHT No	(71-74) _____ 0	Q51
50.	If you have paid according to Q49, were you reimbursed from the Social Security Fund? Yes,........ BAHT No	(75-78) _____ 0	

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Form No. 3

		Col./ Code	skip to
	QUESTION REGARDING SATISFACTION		
51.	Have you ever received health service from MEDSEC network?	(79)	
	Yes	A	
	No	0	LAST
52.	How satisfied are you with the facilities in MEDSEC network from which you usually receive care in terms of <u>waiting time</u>?	(79)	
	Very much satisfied	1	
	Very satisfied	2	
	Fairly satisfied	3	
	dissatisfied	4	
	Very dissatisfied	5	
53.	How satisfied are you with health care provided by MEDSEC network in terms of <u>quality of curative care?</u>	(80)	
	Very much satisfied	1	
	Very satisfied	2	
	Fairly satisfied	3	
	dissatisfied	4	
	Very dissatisfied	5	
54.	How satisfied are you with health care provided by MEDSEC network in terms of <u>good reception?</u>	(81)	
	Very much satisfied	1	
	Very satisfied	2	
	Fairly satisfied	3	
	dissatisfied	4	
	Very dissatisfied	5	

Form No. 3

		Col./ Code	skip to
55.	How satisfied are you with health care provided by MEDSEC network in terms of <u>friendly personnel?</u> Very much satisfied Very satisfied Fairly satisfied dissatisfied Very dissatisfied	(82) 1 2 3 4 5	
56.	How satisfied are you with health care provided by MEDSEC network in terms of <u>cleanliness?</u> Very much satisfied Very satisfied Fairly satisfied dissatisfied Very dissatisfied	(83) 1 2 3 4 5	
57.	How satisfied are you with <u>the physical accessibility to the out patient care facilities in MEDSEC network?</u> Very much satisfied Very satisfied Fairly satisfied dissatisfied Very dissatisfied	(84) 1 2 3 4 5	
58.	The last time you received service from the network, did you know from MEDSEC personnel what disease you had? (MEASURE INTERPERSONAL ASPECT OF CARE) Yes, (WHAT DISEASE) .... No Never received service from network	(85) 1 0 2	

Form No. 3

		Col./ Code	skip to
59.	How satisfied are you with the facilities in MEDSEC network in terms of <u>waiting time</u> compared to public facilities from which you usually receive care? much more satisfied more satisfied the same less satisfied much less satisfied	(86) 1 2 3 4 5	
60.	How satisfied are you with the health care provided by MEDSEC network in terms of <u>quality of curative care</u> compared to public provision? much more satisfied more satisfied the same less satisfied much less satisfied	(87) 1 2 3 4 5	
61.	How satisfied are you with the health care provided by MEDSEC network in terms of <u>good reception</u> compared to public facilities from which you usually receive care? much more satisfied more satisfied the same less satisfied much less satisfied	(88) 1 2 3 4 5	
62.	How satisfied are you with the health care provided by MEDSEC network in terms of <u>friendly personnel</u> compared to public facilities from which you usually receive care? much more satisfied more satisfied the same less satisfied much less satisfied	(89) 1 2 3 4 5	

Form No. 3

		Col./ Code	skip to
63.	How satisfied are you with the health care provided by MEDSEC network in terms of <u>cleanliness</u> compared to public facilities from which you usually receive care?	(90)	
	much more satisfied	1	
	more satisfied	2	
	the same	3	
	less satisfied	4	
	much less satisfied	5	
64.	How satisfied are you with <u>the accessibility to the out patient care facilities in MEDSEC network</u> compared to public provision?	(91)	
	much more satisfied	1	
	more satisfied	2	
	the same	3	
	less satisfied	4	
	much less satisfied	5	

Form No.4

Ministry of Public Health

Samsan Road, Bangkok 10200   Telephone 2821886

THE RESPONSE OF THE PRIVATE SECTOR TO COMPETITIVE CONTRACTING:A CASE
STUDY OF A PRIVATE HEALTH PROVIDER NETWORK IN THAILAND

<u>EMPLOYERS VIEWPOINT</u>

IN-DEPTH INTERVIEW GUIDELINE
With Employers

Selection of the firms

Applying a multi-stage sampling technique, four firms(one firm from
each sub-network) will be selected. Two firms must in the past have
had a public provider as a main contractor. The selected firms
should have about 100-450 workers in a particular firm.

Introduction to the employer

The aim of this study is to identify health policy recommendations
about health care provider networks in social insurance in Thailand
which would improve the accessibility to care of the insured, their
satisfaction, quality of care, and payment system within a private
network. The main, general objective of this study is to evaluate
MEDSEC network in terms of organization, payment system, quality of
care, and behaviour and utilization rate of the insured. The study
is contained in four substudies:

-operating system, financial management, and charge rate for
medical care of MEDSEC; and the utilization rate of MEDSEC and
Nopparat networks
-knowledge and attitude of the facility's managers about
MEDSEC
-health seeking behaviour, utilization rate, knowledge, and
satisfaction of the insured with the services of MEDSEC
facilities.
-evaluation of quality of care

This in-depth interview with you and other three employers is part
of this study. The specific objective of this study is to examine
the knowledge and attitude of the manager of firms with MEDSEC, and
satisfaction of the insured of MEDSEC network.

Form No.4

Questions
1.How did you come to know about MEDSEC?
2.How does MEDSEC perform the marketing approach to you?
3.Why did you choose MEDSEC as a main contractor?
4.Did you consider other main contractors before choosing MEDSEC?
5.Is there any incentive payment from MEDSEC after you chose MEDSEC as a main contractor?
6.What is your perception about services of providers in the network?
7.What is the performance of the worker before/after the contract with MEDSEC(by looking at the rate of absenteeism of the workers)?
8.Are the employees satisfied with the services provided by MEDSEC providers?
9.Is there any medical service in your company for workers?
If yes, for what period of time are services provided?

Ministry of Public Health
Muang District, Nonthaburi 11100   Telephone 5918611
THE RESPONSE OF THE PRIVATE SECTOR TO COMPETITIVE CONTRACTING:A CASE STUDY OF A PRIVATE HEALTH PROVIDER NETWORK IN THAILAND

INFRASTRUCTURE SURVEY

Introduction guide

This study is to evaluate a private health provider network, MEDSEC network.   The aim of this study is to identify health policy recommendations about health care provider networks in social insurance in Thailand which would improve the accessibility to care of the insured, their satisfaction, quality of care, and payment system within a private network.   The main, general objective of this study is to evaluate MEDSEC network in terms of organization, payment system, quality of care, and behaviour and utilization rate of the insured.   The study is contained in four substudies:

-operating system, financial management, and charge rate for medical care of MEDSEC; and the utilization rate of MEDSEC and Nopparat networks

-knowledge and attitude of the facility's managers about MEDSEC

-health seeking behaviour, utilization rate, knowledge, and satisfaction of the insured with the services of MEDSEC facilities.

-evaluation of quality of care

This postal questionnaire is part of this study.   The specific objective of this study is to evaluate the quality of care of MEDSEC and Nopparat networks by analysis and comparison of infrastructure of MEDSEC and Nopparat networks.

Form No. 5

Identification Code [___ ___ ___]   Month......... 1994

Name of facility...

If it is hospital, registered as............beds

Operated...........beds

Venue...

....

Tel:............................Fax..................................

Service time..

Name of the owner...

		Code
	Administrative section	
1.	The director of facility has completed formal courses at postgraduate level.	
	Yes, name of courses.....................	1
	No	0
2.	The first deputy director of facility has completed formal courses at postgraduate level.	
	Yes, name of courses	1
	No	2
	No first deputy	3
3.	The second deputy director of facility has completed formal courses at postgraduate level.	
	Yes, name of courses	1
	No	2
	No second deputy	3
4.	Frequency of management team meetings in a year ....times	
5.	Is there any training plan or programme for senior management staff.	
	No	0
	Yes, list 3 example programmes	1
	1	
	2	
	3	

		Code
6.	Proportion of non-clinical staff receiving in-service training during the past twelve months.	
	No training	1
	Yes, trained.................% of total staff	2
7.	Is there any microcomputer?	
	Yes, ...sets operated	1
	No computer	2
8.	Is there any data collection in MIS? Yes No Don't know - Diagnosis data [ ] [ ] [ ] - Mortality [ ] [ ] [ ] - Complication [ ] [ ] [ ] - Financial information [ ] [ ] [ ] - Personal information [ ] [ ] [ ]	
9.	Are there any patient details on data covered or summarised in file? Yes No 1. Age, Sex [ ] [ ] 2. Admission diagnosis [ ] [ ] 3. Discharge diagnosis [ ] [ ] 4. Admission date [ ] [ ] 5. Discharge date [ ] [ ]	
10.	Frequency of report compiled from data bank report to anyone concerned.	
	weekly	1
	every two weeks	2
	Monthly	3
	every 3 months	4
	every 6 months	5
	yearly	6
	Irregular	7
	No report	8

		Code
11.	Is there any water supply?	
	Yes, no water shortages	1
	Yes, but shortage everyday for............minute	2
	Yes, but shortage sometimes	3
12.	Is there any backup electricity?	
	Yes, using gasoline generator	1
	Yes, using battery	2
	Yes, using other source................	3
	No backup electricity................	4
13.	Waste disposal system.	
	Mix all waste in a bag	1
	Separated in correct colour bags	2
	Handled by professional waste disposal company	3
	Other (detail)............................	4
	Out-patient section	
1.	Number of staff between 8.00-16.30 O'clock. Doctor...............................persons Register Nurse.......................persons Technical Nurse......................persons Nurse-Aid...........................persons Other(details)......................persons	
2.	Number of staff between 16.30-21.30 o'clock. Doctor...............................persons Register Nurse.......................persons Technical Nurse......................persons Nurse-Aid...........................persons Other(details)......................persons	
3.	Number of staff between 21.30-6.00 o'clock. Doctor...............................persons Register Nurse.......................persons Technical Nurse......................persons Nurse-Aid...........................persons Other(details)......................persons	

		Code

4.	Number of specialist doctors both part time and full-time.
	
	    1. Medicine...........................persons
	    2. Surgery.............................persons
	    3. Plastic Surgery....................persons
	    4. Orthopaedic........................persons
	    5. Paediatric.........................persons
	    6. OB-GYN.............................persons	

5.	List special clinics.
	
	    1..
	    2..
	    3..
	    4..
	    5..
	    6..
	    7..
	    8..
	    9..
	    10..	

6.	Number of OPD case /day ....persons
	        Peak hour,...........................o'clock
	    Number of OPD case at peak hour, ...persons	

7.	Number of OPD examination rooms, ...rooms Number of OPD (GP) examination rooms,.........rooms	

8.	How many OPD(GP) examination rooms have these items of equipment.
	
	    1. Examination bed,........................rooms
	    2. Examination couch and chairs,..........rooms
	    3. Functioning otolaryngoscope, ...rooms
	    4. Functioning ophthalmoscope, ...rooms	

9.	Check equipment criteria in the emergency trolley(list in a paper attached). Complete set	1
	Not complete set	2

		Code
10.	Is there any ambulance?	
	Yes,.............................cars	1
	No	2
11.	Status of rooms and floor, whether redecorated or not	
	Yes when,.....................months/years ago	____
	Never redecorated	0
12.	Is there any refrigerator for drinking water service to patients and staff?	
	Yes	1
	No	2
13.	Number of toilets, ...toilets	

<div align="center">Laboratory and X-ray Section</div>

1.	Check list of these tests.	
	Yes No	
	1.1 Urine microscopy [ ] [ ]	
	1.2 Urea and Electrolyte analysis [ ] [ ]	
	1.3 Serum glucose [ ] [ ]	
	1.4 Pregnancy test [ ] [ ]	
	1.5 CBC [ ] [ ]	
	1.6 Malaria slide [ ] [ ]	
	1.7 VDRL(WR or RPR) [ ] [ ]	
	1.8 Cerebro-spinal fluid microscopy [ ] [ ]	
	1.9 Widal serology [ ] [ ]	
	1.10 Platelet count [ ] [ ]	
	1.11 Stool microscopy [ ] [ ]	
	1.12 Liver function test [ ] [ ]	
	1.13 Cerebro-spinal fluid Chemistry [ ] [ ]	
	1.14 Bacterial culture and sensitivity [ ] [ ]	
2.	Is there any laboratory section?	
	Yes, owned by the owner of facility	1
	Yes, owned by other group	2
	No, send specimen to other laboratory	3
	other (mention)...............	4

Form No. 5

		Code
3.	In case of no laboratory in facility, how long the result will be reported. There is a lab. in facility Reported by the same day Reported by the next day Reported by 2 days Reported by 3 days Reported by 4 days Reported by > 4 days	 1 2 3 4 5 6 7
4.	How is the laboratory quality controlled? No, laboratory By people in the same facility By outside people By outside and inside facility people	 0 1 2 3
5.	Is there any emergency laboratory service? No Yes, 24 hours service Yes, on call and available within 1 hour Yes, on call and available within 2 hours Yes, on call and available after 2 hours	 0 1 2 3 4
6.	Laboratory response to urgent request No, urgent service Result response within 2 hours Result response within 3 hours Result response after 3 hours Other (mention)....................	 0 1 2 3 4
7.	Frequency of X-ray services by year, ...requests.	
8.	Number of X-ray staff during day time,......persons.	
9.	In-service training of X-ray staff No Yes,.................days/year	 0 ____
10.	Number of X-ray machines, ...sets	

207

		Code
11.	Is there any Fluoroscopic Screening Machine? Yes No	1 2
12.	Is there any Ultrasound? Yes No	1 2
13.	Is there any urgent X-ray services? No Yes, result response within 2 hours Yes, result response after 2 hours Other (mention)...............................	0 1 2 3
14.	Age of X-ray machine. First Set, ...years.........months old Second Set, ...years.........months old Third Set, ...years.........months old Fourth Set, ...years.........months old	
15.	The standard of X-ray room Yes, standard No, not standard	1 2
Pharmacy Section		
1.	At least 1 pharmacist working at day time Yes No, using other staff (mention)	1 2
2.	How long have staff in this section trained by year? ....days.	
3.	Item included on OPD medicine package labels? Yes No 1. Name [ ] [ ] 2. Dosage and other instructions [ ] [ ] 3. Expire date [ ] [ ]	

Form No. 5

		Code
4.	All prescriptions are routinely checked by pharmacy trained staff for accuracy, drug interactions etc. Yes, every-time Yes, sometime No	 1 2 3
5.	Stock control system ? Yes, formalised stock control system exists No	 1 2
6.	Air conditioned storage of all drug stocks ? No Yes, some stocks Yes, almost every stock Yes, every stock	 0 1 2 3

<div align="center">Operating and delivery room</div>

1.	Number of operating rooms...............theatres.	
2.	Complete set of surgery equipment for all surgeries. Yes Not complete,in some operation doctor carries his own equipment Other(mention),..	 1 2 3
3.	Number of delivery theatres,..................rooms.	
4.	Complete set of delivery equipment for all surgeries. Yes Not complete,in some operation doctors carry his own equipment Other(mention),...............................	 1 2 3
5.	Complete set of equipment in emergency trolley. (list in the paper attached) Yes, complete Incomplete Other (mention), ...	 1 2 3

Form No. 5

		Code
6.	Is there any DC defibrillator in the surgery theatre? Yes	1
	No	2
7.	Autoclave service in facility No, using from other facility	1
	Yes, no testing	2
	Yes, weekly testing	3
	Yes, testing every 2 weeks	4
	Yes, testing every 3 weeks	5
	Yes, tasting every month	6
8.	Is there recovery room? Yes	1
	No	2
9.	In the recovery room, is there any equipment? Yes No 1. One oxygen and suction outlet per bed [ ] [ ] 2. ECG Monitor [ ] [ ] 3. One baumanometer per bed [ ] [ ] 4. Emergency trolley(complete set) [ ] [ ] 5. Boyles Machine [ ] [ ]	

In-patient ward

1.	Space between beds ....cm.	
2.	Supplies and equipment in wards	

	Total No of beds (bed)	Bed in common room (bed)	Bed-screen in common room (screen)	Nurse Station (station)
Ward1	....	....	....
Ward2	....	....	....
Ward3	....	....	....
Ward4	....	....	....
Ward5	....	....	....
Ward6	....	....	....

Form No. 5

		Code

3.	Equipment in ward
	
	          Baumanometer Emergency trolley ECG monitor DC defibrillator
	            (Set) (Set) (Set) (Set)
	
	Ward1 ....
	Ward2 ....
	Ward3 ....
	Ward4 ....
	Ward5 ....
	Ward6	

4.	Number of toilets and hand washing point in wards Hand washing point Toilet Ward 1 .... Ward 2 .... Ward 3 .... Ward 4 .... Ward 5 .... Ward 6	

Emergency trolley set list

1. Equipment
    - Functioning Laryngoscope
    - Endotracheal tubes(one set of all sizes 6-10mm)
    - Oral airways(1x No.2, No.3, No.4)
    - Ambubag and connector
    - Face masks(one set of all sizes)
2. Drugs
    - Adrenalin
    - Atropine
    - Calcium chloride/gluconate
    - Dextrose 50%
    - Dobutamine/Dopamine/Isoprenaline
    - Furosemide
    - Hydrocortisone/Dexamethasone
    - Lignocaine
    - Mannitol
    - Naloxone
    - Sodium Bicarbonate
3. IV fluids and other
    - Dextrose water 5%
    - Normal Saline
    - Ringers Lactate
      (at least 2x1000 ml bags of any one of above solutions)
    - Jelco and butterfly cannulas:
      (3 of at least two sizes (14g,16g,18g,20g)
    - Giving sets:
      (at least 1x60 and 15 dpm infusion sets)

Ministry of Public Health
Muang District, Nonthaburi 11100,   Telephone 5918611
THE RESPONSE OF THE PRIVATE SECTOR TO COMPETITIVE CONTRACTING:A CASE STUDY OF A PRIVATE HEALTH PROVIDER NETWORK IN THAILAND

IN-PATIENT SATISFACTION QUESTIONNAIRE

STUDY HOSPITAL SELECTION

Four small hospitals, one from each sub-network of MEDSEC were selected. They are Ram-Intra, Rama-Suksawat, Wicharn-Yut, and Wipawadi-Rangsit hospitals. One general hospital of MEDSEC, Parkkret hospital; and one general hospital of Nopparat network, Nopparat hospital are selected by simple random sampling technique.

IDENTIFICATION OF PATIENTS

Study period starts 1 Jan 1995. All insured inpatients admitted to 6 hospitals will be interviewed by a nurse before discharge, to complete the number required of each hospital as follows:

-Parkkret	40 cases
-Rama-Suksawat	65 cases
-Ram-Intra	65 cases
-Wicharn-Yut	65 cases
-Wipawadi-Rangsit	65 cases
-Nopparat	150 cases

Form No. 6

Introduction guide

This study is to evaluate a private health provider network, MEDSEC network. The aim of this study is to identify health policy recommendations about health care provider networks in social insurance in Thailand which would improve the accessibility to care of the insured, their satisfaction, quality of care, and payment system within a private network. The main, general objective of this study is to evaluate MEDSEC network in terms of organization, payment system, quality of care, and behaviour and utilization rate of the insured. The study is contained in four substudies:

-operating system, financial management, and charge rate for medical care of MEDSEC; and the utilization rate of MEDSEC and Nopparat networks

-knowledge and attitude of the facility's managers about MEDSEC

-health-seeking behaviour, utilization rate, knowledge, and satisfaction of the insured with the services of MEDSEC facilities.

-evaluation of quality of care

This interview using a structured questionnaire is part of this study. The specific objective of this study is to evaluate the quality of care of networks by measuring the satisfaction of inpatients with MEDSEC and Nopparat hospitals.

Form No. 6

			Code
1.	Age in years		— —
2.	Sex	Male	1
		Female	2
3.	Marital status	Single	1
		Married	2
		Divorced	3
		Widow	4
		Separated	5
4.	Educational status	Primary school	1
		Secondary school	2
		Vocational education	3
		Certificated education	4
		Bachelor degree	5
		Master or doctorate degree	6
5.	Where are you staying (Home)?		
	5.1 Subdistrict		_____
	5.2 District		_____
	5.3 Province		_____
6.	When you arrived at the hospital, were you made to feel welcome?	Yes	1
		No	2
7.	When you first arrived at the ward, did anyone greet you?	Yes	1
		No	2

Identification Code [___ ___ ___]   Month...... 1994
of the firm and worker
Name of the firm and address . . . .
. . . .
Worker's name ....
Interviewer's Name ....

Form No. 6

		Code
	Question about treatment and care	
8.	Before coming to this hospital, have you been treated by any provider? If yes, please give detail	
9.	Treatment given are(drug, surgery, nursing care etc) 1 .... 2 .... 3 .... 4 .... 5	
10.	Did anyone tell you about ward rules and regulations and where to find things like the toilets and bathroom? Yes 1 No 2	
11.	Did anyone make sure that you knew what was going to happen to you? Yes 1 No 2	
12.	Was there consideration for your individual needs? Yes 1 No 2	
13.	Were you ever made to feel embarrassed? Yes 1 No 2	
14.	Did the doctors and nurses always respect your need for privacy? Yes 1 No 2	

		Code
15.	How long did it usually take staff to respond to your calls for assistance?(bell, voice, etc)?	
	Very promptly(within few minutes)	1
	Quite fast(10-15 minutes)	2
	Slow(15 minutes or more)	3
	Don't' know	4
16.	If you suffered pain, were you given something for it within what you consider to be a reasonable time?	
	Yes	1
	No	2
	No pain	3
17.	Are you happy about the treatment you have received?	
	Yes	1
	No	2
18.	Do you think that all the staff who helped in your treatment and care were good at their job?	

	Excellent	Very good	Good	Fair	Poor	Don't Know
Doctors	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Nurses	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Paramedics (X-ray,etc)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Administra -tion	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Porters	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cleaners	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

	Questions about information and communication	
19.	Do you feel that the nurses and doctors have told you enough about your treatment?	
	Yes	1
	No	2

Form No. 6

		Code
20.	Did the nurses or doctors usually seem too busy to answer your questions? Yes, too busy No, OK. Doctors [ ] [ ] Nurses [ ] [ ]	
21.	If you saw other staff(for example, physio-therapists,x-ray staff,etc) did they explain what was going to happen to you? Yes, everyone No, some did not Not applicable	 1 2 3
22.	Do you feel that your relatives were kept well informed about your condition? Yes No	 1 2
23.	Were there times when your relative had questions but didn't know who to turn for answers? Yes No	 1 2
	Questions about ward environment and facilities	
24.	How was the ward temperature? Good Not good	 1 2
25.	Was the bed comfortable? Yes No	 1 2
26.	Cleanliness of ward(Bath room, floor, desk, chair, bed etc. Good Not good	 1 2

Form No. 6

		Code
27.	What were the meals like? Were they big/small enough, hot enough, tasty enough? Yes, they were fine No, they were poor because(please describe) No, meal provided	 1 2 3
28.	Were you often disturbed while sleeping or resting? Yes No	 1 2
29.	Did any of the ward rules bother you, for example,waking time, lights out, visiting time? Yes, some of the rules bothered me, particularly .... No, the rules were fine	 1 2
30.	Did you have a place where you could keep you personal belongings safe? Yes No	 1 2
31.	Do you feel it was the right decision to discharge you on the day it occurred? Yes No	 1 2
32.	If you were given medicine to take home are you clear about what it is for and when you must take it? Yes No Not applicable	 1 2 3
33.	Has someone explained to you how you can help yourself to get better now you are at home? Yes No	 1 2

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Form No. 6

		Code
34.	Have you been given written notice of the date,time and place of any follow up appointment?	
	Yes	1
	No	2
	Not applicable	3
35.	Do you feel that the treatment you received in hospital has improved your condition?	
	Yes,I feel much better	1
	I'm not sure yet	2
	No, I feel worse	3

Ministry of Public Health
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THE RESPONSE OF THE PRIVATE SECTOR TO COMPETITIVE CONTRACTING:A CASE STUDY OF A PRIVATE HEALTH PROVIDER   NETWORK IN THAILAND

PRESCRIPTION ANALYSIS

Selection of providers and prescription

1. Providers selected are 4 small hospitals(1 from each subnetwork).
2. Prescription selection

    -250 prescriptions of the insured & 250 prescriptions of the noninsured from each selected provider will be analyzed.

    -the insured group are the OPs who are covered by social insurance between Jan. 1994-Jul 1994 selected by using multi-stage cluster random sampling technique.

    -the noninsured group are OPs who are not covered by social insurance between Jan 1994-Jul 1994 selected by using multi-stage cluster random sampling technique.

    -selected conditions/diseases have been chose by using tracer method and standard treatment carried out by the office of FDA of Thailand.

    -details of prescription analysis are made using selected tracers.

Introduction to the manager of the providers

This study is to evaluate a private health provider network, MEDSEC network. The aim of this study is to identify health policy recommendations about health care provider networks in social insurance in Thailand which would improve the accessibility to care of the insured, their satisfaction, quality of care, and payment system within a private network. The main, general objective of this study is to evaluate MEDSEC network in terms of organization, payment system, quality of care, and behaviour and utilization rate of the insured. The study is contained in 4 substudies:

    -operating system, financial management, and charge rate for medical care of MEDSEC; and the utilization rate of MEDSEC and Nopparat networks

    -knowledge and attitude of the facility's managers about MEDSEC

    -health seeking behaviour, utilization rate, knowledge, and satisfaction of the insured with the services of MEDSEC facilities.

    -evaluation of quality of care

This prescribing analysis is part of this study. The specific objective of this study is to evaluate the quality of care of MEDSEC facilities by analysis of outpatient drug prescriptions of the insured and noninsured in MEDSEC facilities.

Form No.7

PRESCRIBING ANALYSIS FORM

Name of facility.......................................

Investigator:...................... Date...............

Type of patient   [ ] insured   [ ] non-insure

Seq #	Date ofrx	Sex M/F	# Drug	#Gen-erics	Antib 0/1*	Injec 0/1	#Ess Drug	Diag-nosis
Total								

Note: * No=0, Yes=1

Ministry of Public Health
Muang District, Nonthaburi 11100,   Telephone 5918611
THE RESPONSE OF THE PRIVATE SECTOR TO COMPETITIVE CONTRACTING: A CASE STUDY OF A PRIVATE HEALTH PROVIDER NETWORK IN THAILAND
Evaluation of in-patient medical record

Selection of providers and patient

1.Selection of providers: 4 small hospitals(1 from each sub-network)

2.Selection of patient records:

> 2.1 All the in-patient records, insured and noninsured, between July-October 1995 will be analyzed to identify the case mix by hospital, and charge by hospital and by disease/condition.

> 2.2 Two disease/conditions which are appropriate tracers, appendicitis and diarrhoea, are identified.

3.Analysis of patient record of two tracers: analysis of all patient records of two tracers between July-October 1995 will be carried out by using criteria of good practise for these two tracers which are adapted from

> 3.1 Bailey&Love's short practice of surgery(1977) for appendicitis

> 3.2 Diarrhoeal survey form of Communicable Disease Control Department of Thailand(1994) for diarrhoea

Form No.8

Introduction guide

This study is to evaluate a private health provider network, MEDSEC network. The aim of this study is to identify health policy recommendations about health care provider networks in social insurance in Thailand which would improve the accessibility to care of the insured, their satisfaction, quality of care, and payment system within a private network. The main, general objective of this study is to evaluate MEDSEC network in terms of organization, payment system, quality of care, and behaviour and utilization rate of the insured. The study is contained in four substudies:

- operating system, financial management, and charge rate for medical care of MEDSEC; and the utilization rate of MEDSEC and Nopparat networks
- knowledge and attitude of the facility's managers about MEDSEC
- health seeking behaviour, utilization rate, knowledge, and satisfaction of the insured with the services of MEDSEC facilities.
- evaluation of quality of care

This substudy concerning evaluation of inpatient medical records is part of this study. The specific objective of this study is to analyze the process aspect of quality of medical care of inpatients from medical records of MEDSEC hospitals and to investigate outcome aspects of medical treatment of a disease by postal questionnaire between the insured and noninsured of MEDSEC network.

Form No.8

<div align="center">

Evaluation form for Diarrhoeal Patient

</div>

Name of Hospital [1] Rama-Suksawat   [2] Ram-Intra

[3] Wicharn-Yut   [4] Wipawadi-Rangsit

1) <u>General information</u>

-Age...........Year

-Length of stay ....Day

2) <u>History</u>

-Onset.......Time.....O'clock

-Date of hospitalization...... Time.....O'clock

-Number of stools in last 24 hour...........

-Stool feature

[ ] Loose   [ ] Watery   [ ] Loose and watery

[ ] Mucous   [ ] Bloody   [ ] Mucous and bloody

-Number of urination in last 24 hour.........

-Last urinated......hour before hospitalization

-Sign and symptom

[ ] Fever   [ ] Abdominal pain

[ ] Abdominal cramp   [ ] Dyspepsia

[ ] Vomiting   [ ] Others....................

-Treatment before hospitalization

[ ] To clinic   [ ] Self prescribed

[ ] To other hospital

[ ] Other...............

3) <u>Physical examination</u>

-Weight...........Kg,

-Temp.......... to ....

-BP...............mm Hg.

-PR............... /Min

-RR................ /Min

-Bowel sound ....

-Dehydration.............

Form No.8

Evaluation form for Diarrhoeal Patient(continue)

4) <u>Laboratory</u>

Laboratory	NO	Yes	Result	
			-Ve	+Ve(name)
-Stool exam				
-Stool C/S				

5) <u>Diagnosis</u>

    [ ] Acute Diarrhoea   [ ] Dysentery

    [ ] Other................

6) <u>Treatment</u>

    [ ] ORS   [ ] IV Fluid

    [ ] Antibiotic

        1....................

        2....................

        3....................

        4....................

    [ ] Other Drug

        1....................

        2....................

        3....................

        4....................

7) <u>Result of treatment</u>

    [ ] Better/discharge   [ ] Worse/refer

    [ ] Other...................

Note: Adapted from diarrhoeal survey form of Communicable Disease Control Department, Ministry of Public Health, Thailand, 1994

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Form of rating scale for estimating effectiveness of drugs used in acute diarrhoea				
Drug	High Effective	Moderate Effective	Low Effective	Not Effective
-ORS -5% D/S 1000 cc. -Anti-emetic -Antispasmodic -Paracetamol -Cimetidine(200 Mg) -Kaopectin(Syr.) -Imodium -Antiflatulent -Vitamin -Lexinor(200 Mg.) -Cotrimoxazole -Gentamicin(Inj.) -Tetracycline(250 Mg) -Metronidazole -Ampicillin(250 Mg) -Doxycycline -Amoxycillin(250 Mg)				

Form No.8

Evaluation form for acute appendicitis patient

Name of Hospital

[1]Rama-suksawat   [2]Ram-Intra   [3]Wicharn-Yut   [4]Wipawadi-Rangsit

Seq #	Vom- ting	Dia- rrh.	Abdo. Pain	Temp °C	Abdo. Palp	Rect. Exam	CBC	U/A WBC	Patho. Sect.	Nurse Note	Anes. Note	Surg. Note	Time A-Sx	LOS

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Rating form for assessing quality care
for appendicitis patients

This form is for discussion with five surgeons to identify the importance rating of various factors. The result of this discussion will be used for assessing the quality of care of appendicitis patient.

Please choose the best answers by marking X in the column chose

	less important			more important	
	1	2	3	4	5
1. History taking					
1.1 Vomiting					
1.2 Diarrhoea					
1.3 Abdominal pain					
2 Physical Exam					
2.1 Temperature					
2.2 Abdominal palpation					
2.3 Rectal Examine					
3 Laboratory investigation					
3.1 CBC Examine					
3.2 Urine analysis					
3.3 Pathological section					
4 Medical record					
4.1 Complete nurse note					
4.2 Anaesthetic note					
4.3 Surgical note					
5 Out-come variable					
5.1 Time between admission & surgery					
5.2 Length of stay					
6 Other variables (please note)					
6.1					
6.2					
6.3					
6.4					
6.5					
6.6					

Form No.8

<div align="center">

Questionnaire to evaluate outcome
of medical care of appendicitis patient

</div>

This is a questionnaire to ask appendicitis patients who were admitted in _____ hospital between July-October 1995.

Name of patient_____

Age _____ years,   Sex   [ ] Male   [ ] Female

Home address_____

_____

_____ Tel No._____

1.How long was it before you felt healthy after discharge from that hospital?   _____ days

2.How long was it before you went back to work after discharge from that hospital?   _____ days

3.What do you think about the medical care of the hospital in this matter?

       3.1 Very good, the illness is cured.

       3.2 Not good, the illness is not cured. I had to seek care from other hospital/clinic.

       3.3 I don't know.

       3.4 Other(details)_____

4.Did you still have any of the following symptoms one month after discharge? (choose the appropriate answers by marking X in [ ])

	YES	NO	CAN'T REMEMBER
4.1 Fever	[ ]	[ ]	[ ]
4.2 Frequency of micturition	[ ]	[ ]	[ ]
4.3 Wound infection:pain,redness, swelling,discharge,abscess	[ ]	[ ]	[ ]
4.4 Cough with sputum	[ ]	[ ]	[ ]
4.5 Anorexia and/or vomiting	[ ]	[ ]	[ ]
4.6 Abdominal pain	[ ]	[ ]	[ ]
4.7 Mucous bloody diarrhoea/dysentery	[ ]	[ ]	[ ]
4.8 Hiccough	[ ]	[ ]	[ ]

Note: adapted from Scott, Peter R.(1977), An Aid to Clinical Surgery, Churchill Livingstone, Medical Division of Longman Group Limited, Hong Kong, 1977.

Annex 2
Additional text referred in chapter 3

- Guideline for substudy 2: the knowledge and attitude of the MEDSEC facility's managers

The collected data, from form no.2 in annex 1, were analyzed and discussed in terms of

-the advantages and disadvantages of the payment system for the providers

-price charged, and whether a lower price is charged to social insurance beneficiaries than other consumers

-the extent of risk bearing of providers by comparing profit and loss between providers within the network; this would indicate whether the payment system of the network was fair to providers

-the referral system in terms of number of patients referred/month, and the stage of sickness at which the patients are referred.

- Group discussion guideline:

i. What did you usually do when you were sick?

ii. What is your rationale for choose of facility for medical care?

iii. If you are going to receive care from hospitals or clinics:

- what would you expect them to provide you in terms of medical and non-medical care?
- what would you expect provided at the reception point?
- what would you expect nurses to give you?
- what would you expect doctors to give you?
- what would you expect other staff to give you?

iv. What do you understand by quality of care? List examples of indicators to measure quality of care.

v. What do you understand by satisfaction? List example of indicators for measuring patient satisfaction with health services.

vi. What do you understand by interpersonal aspects of health care? List example of them.

- Indicators in questionnaire for measuring inpatient satisfaction of MEDSEC and Nopparat network

- General characteristic of patient: age, sex, educational status, marital status, address, perception of hospital reception at outpatient and inpatient section.

- Treatment and care: treatment received before, hospital regulation, well informed before receiving care, consideration of patient need, feeling of embarrassment, privacy, response to call

for assistant, treatment response to pain suffering, and level of satisfaction with some personnel groups (doctor, nurse, X-ray and laboratory technician, cleaner, and others).

- <u>Information and communication</u>: doctor, nurse, and other staff (for example: physio-therapists,x-ray staff) proper answers to patient and relative questions; patient's relative adequately informed.

- <u>Ward environment and facility</u>: ward temperature, patient bed, cleanliness, patient food, disturbed while sleeping, inconvenience with hospital regulation (time to wake up, time to turn on the light, time to visit), service for keeping personal belongings.

- <u>Discharge and outcome</u>: proper time for discharge, explanation of how to help yourself to get better at home, clear explanation about medicine to take home, written notice given for follow-up appointment, perception of better health at discharge time.

<u>- Gold standard treatment of diseases by Food and Drug Administration (FDA) of Thailand (In Thai)</u>

In 1991, the Food and Drug Administration (FDA) of Thailand with the support of World Health Organization organized 10 specialist committees for setting up gold standard treatment (for Thailand) of 10 diseases: tuberculosis, HPT, sexual transmitted disease, arthritis, intestinal disease, viral hepatitis, URI, parasitic and protozoa disease, UTD, and infectious and noninfectious diarrhoea. Finally 9 gold standard treatments of 9 diseases except UTD have been completed. Any particular gold standard treatment is usually classified into sections: introduction, incidence and definition, sign/symptom and diagnosis, and treatment.

<u>- General indicators for diarrhoea tracer analysis</u>

- <u>History of patient</u>: patient's age; onset and admission time; number of diarrhoea; fever; abdominal pain; abdominal cramp; nausea;vomiting, stool feature: watery, mucus, bloody; range of stay in the hospital
- <u>Physical examination</u>: temperature, blood pressure, heart rate, respiratory rate
- <u>Laboratory testing</u>: stool examination, stool culture
- <u>Diagnosis</u> Definite diagnosis of diarrhoeal disease
- <u>Treatment</u>: Oral Rehydrated Sugar (ORS), intra-venous fluid (IV), antibiotic, Other drugs
- <u>Result of treatment</u>: better, discharge; worst, refer; other

Annex 3

Additional tables referred in chapter 4

Table 3A.1   Average charge (Baht/visit) of outpatients of MEDSEC by subnetworks in 1992-1994

Sub-network	1992	1993	1994
RIG	132.87	163.14	178.52
EBG	211.69	194.84	136.95
RSG	159.58	163.43	141.97
Bangbon*	231.82	180.84	-
CBG**	157.00	175.82	140.70
Total	172.33	171.43	157.07

Note: * withdrew from MEDSEC in 1994
      ** fewer providers in subnetwork in 1992

Table 3A.2   Charge rate (Baht/worker) and average charge/day (Baht) of inpatients of MEDSEC by subnetwork in 1992-1994

Sub-network	Charge rate (Baht/worker)			Average charge/day (Baht)		
	1992	1993	1994*	1992	1993	1994*
RIG	52.00	68.61	52.99	247.61	381.21	360.57
EBG	28.19	100.89	135.41	156.58	504.39	461.28
RSG	113.49	172.03	148.13	515.84	716.82	658.40
Bangbon**	258.15	185.33	-	1122.71	712.93	-
CBG***	0.00	187.35	58.95	0.00	1248.98	357.20
Total	79.97	126.11	88.05	410.98	627.40	458.20

Note: * Data from January-August 1994
       ** withdrew from MEDSEC in 1994
      *** fewer providers in subnetwork in 1992

Table 3A.3 Utilization rate/worker/year of outpatients of MEDSEC network by subnetwork, 1992-1994

Sub-network	1992	1993	1994
RIG	1.24	1.78	2.15
EBG	1.25	1.88	2.08
RSG	1.29	1.44	1.63
Bangbon*	1.92	1.99	-
CBG**	0.002	1.40	0.94
Total	1.24	1.65	1.69

Note: * withdrew from MEDSEC in 1994
       ** fewer providers in subnetwork in 1992

Table 3A.4 Utilization rate (/100 workers) and average LOS (day)/worker of inpatient of MEDSEC small hospitals by subnetwork, 1992-1994

Sub-network	Utilization rate(%)/year			Average length of stay(day)/worker		
	1992	1993	1994*	1992	1993	1994*
RIG	1.39	2.72	2.80	0.21	0.18	0.22
EBG	0.60	3.68	3.77	0.18	0.20	0.29
RSG	1.95	4.97	4.07	0.22	0.24	0.15
Bangbon**	13.92	7.40	-	0.23	0.26	-
CBG***	0.00	7.57	2.79	0.00	0.15	0.25
Total	2.36	4.40	3.22	0.19	0.20	0.23

Note: * Data from January-August 1994
      ** withdrew from MEDSEC in 1994
     *** fewer providers in subnetwork in 1992

Annex 4

Additional tables referred in chapter 5

Table 4A.1 Distribution of sample by company

Company	Number	%
1. Sahafarm	102	9.8
2. Yat-Ming	213	20.4
3. Almond	294	28.2
4. Eden	435	41.7
Total	1,044	100.0

Table 4A.2 Characteristics of the insured

Characteristic	Number	Mean	S.D	Maximum	Minimum
Age (Year)	1,014	28.1	5.3	58	16
Income/month (Bath)	1,018	5,041.4	2,473.1	42,000	2,300
Work Hour/day (hour)	986	59.2	13.8	94	20

Table 4A.3 Marital Status

Marital status	Number	%
Single	496	47.5
Married	493	47.2
Separated	27	2.6
Widow	15	1.4
Divorced	13	1.2
Total	1,044	100.0

Table 4A.4 Educational Status

Status	Number	%
- Primary School	395	37.9
- Secondary school	490	47.0
- Vocational Education	79	7.6
- Certification Education	41	3.9
- Bachelor degree and higher	38	3.6
Total	1,043	100.0

Table 4A.5 Working periods in a day

Period	Number	%
-Day time	725	69.5
-Night time	5	0.5
-Alternative day and night	313	30.0
Total	1,043	100.0

Table 4A.6 Characteristics of responsible jobs

Characteristic	Number	%
Administration	8	0.8
Secretary	3	0.3
Producer by machine	186	17.8
Producer by manual	752	72.0
Other	95	9.1
Total	1,044	100.0

Table 4A.7 Balance of income

Balance	Number	%
- Enough with saving	78	7.5
- Enough but no saving	519	49.9
- Not enough but no debt	261	25.1
- Not enough with debt	182	17.5
Total	1,040	100.0

Table 4A.8 Receipt of Social Security card

Receive	Number	%
- Yes	1,031	99.2
- No	8	0.8
Total	1,039	100.0

Table 4A.9 Professions who provide care in the company

Profession	Number	%
- Nurse	593	56.9
- Medical doctor	6	0.6
- Nurse and /or doctor	430	41.3
- Other	10	1.0
- Do not Know	3	0.3
Total	1,042	100.0

Table 4A.10 Mean of payment (Baht) for sickness and reimbursement of the insured during last month

Episode	Pay (S.D)	Reimburse* (S.D)	Total pay** (S.D)
- First episode (N=483)	111.0 (494.1)	12.5 (98.2)	98.0 (486.5)
- Second episode (N=243)	48.7 (126.1)	4.8 (28.4)	43.8 (120.3)
- Third episode (N=159)	37.5 (121.5)	4.6 (41.7)	32.9 (114.5)

Note: * reimbursement by themselves from SSO in case of emergency
         if they did not seek care from their main contractor
      ** total pay = pay - reimbursement (every episode)

Table 4A.11 knowledge of the insured concerning social insurance (N=1,036)

knowledge about	Know(%)	Don't know(%)
Name of main contractor	64.6	33.4
Working hour of MEDSEC facilities	66.1	33.9
Uncovered diseases and conditions	45.3	54.7
Presenting SS card when receive care	87.5	12.5
Free of charge emergency care	29.3	70.7
Reimbursement fee from emergency care	77.8	22.2
Benefits under Social Security Act	24.4	75.6

Table 4A.12 The reasons why the insured don't seek care from MEDSEC

Reason	First episode(%) (N=328)	Second episode(%) (N=129)	Third episode(%) (N=64)	Total (%) (N=521)
- Emergency sickness	11.6	14.7	23.4	13.8
- Don't satisfy with MEDSEC facilities	49.4	44.2	39.1	46.9
- Difficulty to access	24.1	28.7	26.6	25.5
- Other	14.9	12.4	10.9	13.8
Total	100.0	100.0	100.0	100.0

Table 4A.13 Satisfaction (%) of the insured of MEDSEC with variables (3 point scale, N=708)

Variable	Satisfied (%)	Fairly Satisfied(%)	Dissatisfied (%)
-Accessibility	34.3	42.1	23.6
-Waiting time	39.9	37.8	22.5
-Perception on medical quality	38.5	43.3	18.2
-Reception	40.0	44.9	15.1
-Friendliness of personnel	40.9	41.5	17.6
-Cleanliness	60.6	32.1	7.2

Table 4A.14 Satisfaction (%) of the insured with services by experience with MEDSEC and public facilities (3 point scale, N=708)

Variables	Satisfied on MEDSEC	The Same	Satisfied on Public
-Accessibility	**39.9**	32.1	28.0
-Waiting time	**49.7**	31.0	19.2
-Perception on medical quality	**44.0**	33.7	22.3
-Reception	**46.8**	33.5	19.8
-Friendliness of personnel	**43.7**	36.5	19.8
-Cleanliness	**42.6**	40.5	16.8

Table 4A.15 Description of variables used in logistic regression models

Variables	Description	Value
Firms		
ALM	Almond firm	0 = no, 1 = yes
EDEN	Eden firm	0 = no, 1 = yes
SAH	Sahafarm firm	0 = no, 1 = yes
Yatming*	Yat-Ming firm	0 = no, 1 = yes
Socioeconomic		
AGE	Age	Actual value in years
MSTATM	Marital status, married	0 = others, 1 = married
MSTATS*	Marital status, single	0 = others, 1 = single
NJOB	Responsible job	0 = others, 1 = manual producer
PEDUCAT	Primary education	0 = others, 1 = primary education
SEDUCAT	Secondary education	0 = others, 1 = secondary education
SEX	Sex	0 = female, 1 = male
TINCOME	Income/month	Actual number in Baht
WHOUR	Working hour/day	Actual number in hour
Knowledge		
KCARD	Knowledge about social security card	0 = don't know, 1 = know
KCOVER	Knowledge about social security benefit	0 = don't know, 1 = know
KDIS	Knowledge about diseases uncovered	0 = don't know, 1 = know
KEMERG	Knowledge about emergency service	0 = don't know, 1 = know
KHOUR	Knowledge about opening hour of MEDSEC facilities	0 = don't know, 1 = know
KMAIN	Knowledge about name of their main contractor	0 = don't know, 1 = know
KPAY	Knowledge about reimbursement of medical fee for emergency care	0 = don't know, 1 = know
Satisfaction		
CLEAN	Satisfied with cleanliness	0 = don't satisfied, 1 = satisfied
FRIEND	Satisfied with friendliness	0 = don't satisfied, 1 = satisfied
NEAR	Satisfied with accessibility	0 = don't satisfied, 1 = satisfied
QUAL	Satisfied with medical treatment	0 = don't satisfied, 1 = satisfied
RECEPT	Satisfied with general reception	0 = don't satisfied, 1 = satisfied
WAIT	Satisfied with waiting time	0 = don't satisfied, 1 = satisfied

Note: * Variables excluded from models

Additional tables referred in chapter 6

Table 5A.1.1   Structural items included in the general administration cluster by the network (%).

Variable		MEDSEC	Nopparat	P-value
- Post graduate study(N1=61,N2=31)				
-Director	Yes	65.6	80.0	0.24*
-Deputy Director 1	Yes	70.0	87.5	0.58**
-Deputy Director 2	Yes	100.0	50.0	0.43**
- Facility operational plan (N1=61,N2=31)	Yes	21.3	19.4	1.00*
- OP data collection(N1=61,N2=31)				
-Patient diagnosis	Yes	41.0	48.4	0.65*
-Patient mortality	Yes	19.7	19.4	1.00*
-Patient complication	Yes	29.5	19.4	0.43*
-Financial data	Yes	75.4	61.3	0.24*
-Personnel data	Yes	63.9	48.4	0.23*
- IP data collection(N1=14,N2=6)				
-In-patient age	Yes	42.6	64.5	0.08*
-Admitted diagnosis	Yes	45.9	67.7	0.08*
-Discharge diagnosis	Yes	31.1	32.3	1.00*
-Admitted date	Yes	45.9	67.7	0.08*
-Discharge date	Yes	31.1	29.0	1.00*
- Piped-water supply(N1=61,N2=31				
Never shortage		90.2	90.3	1.00*
Shortage sometime		9.8	10.7	
- Emergency electricity sources(N1=61,N2=31)				
Generator		6.6	9.7	0.01*
Battery		54.1	19.4	
Other		6.6	6.5	
No emergency system		32.8	64.5	
- Garbage collecting system(N1=61,N2=31)				
In 1 bag		34.4	32.3	0.22*
In separate bag		59.0	51.6	
In 1 container		0.0	6.5	
Other method		6.6	9.7	
- Autoclave service in facility(N1=61,N2=31)				
No, autoclave		24.6	58.1	0.01*
Yes, working, never tested		19.7	16.1	
Yes, working, tested weekly		23.0	16.1	
Yes,working,tested every 2-3 weeks		1.6	3.2	
Yes, test monthly		31.1	6.5	
- Frequency of reporting system(N1=61,N2=31)				
Weekly		3.3	16.1	0.14*
Monthly		36.1	25.8	
By 3 months		1.6	0.0	
Yearly		1.6	3.2	
Sometimes		18.0	6.5	
Never reported		39.3	48.4	

Note: * Chi-square test with Yate's correction (2 tail).
     ** Fisher exact test (2 tail).
     N1, N2 =Total No of MEDSEC, Nopparat facilities.

Table 5A.1.2   Mean of structural items included in the general administration cluster by network

Variable	MEDSEC (N=61)	Nopparat (N=31)	P-value*
-No of administrative meeting/year	6.1(9.1)	4.8(9.6)	0.54
-Personnel trained/year(%)	7.9(17.8)	6.0(13.8)	0.61
-No of computer(Set)	0.9(1.9)	1.5(6.4)	0.52

Note: * T-test pooled variance estimated (2 tail), (---) = (SD.)

Table 5A.1.3 Mean number of personnel working in the OP service, between facilities with ≥100 beds of the 2 networks

Variable	MEDSEC(N=4)	Nopparat(N=1)
1.Personnel(No), 8-16.30 hour.		
- Medical Dr.	4.5(3.3)	26.0
- Register Nurse	2.3(2.2)	7.0
- Technical Nurse	2.0(1.2)	6.0
2.Personnel(No), 16.30-21.30 hour.		
- Medical Dr.	4.8(3.0)	1.0
- Register Nurse	3.0(2.0)	1.0
- Technical Nurse	2.0(1.2)	1.0
3.Personnel(No), 21.30-6.00 hour.		
- Medical Dr.	1.3(1.0)	5.0
- Register Nurse	0.8(0.5)	15.0
- Technical Nurse	0.8(0.5)	2.0
4.Medical specialist		
- Medicine	7.5(4.9)	10.0
- General Surgery	4.0(3.5)	11.0
- Plastic Surgery	1.3(1.0)	2.0
- Orthopaedics	2.3(1.3)	5.0
- Paediatrics	4.3(2.9)	6.0
- OB-GYN	5.0(2.8)	10.0

Note: -No variance of Nopparat network for significant test

Table 5A.1.4 Proportion (%) of specialty clinics in clinics between MEDSEC (N=47) and Nopparat (N=25) networks

Clinics	MEDSEC	Nopparat	P-value
1. General medicine	42.6	32.0	0.53*
2. Cardio-vascular	6.4	4.0	1.00**
3. General surgery	14.9	12.0	1.00**
4. Plastic surgery	12.8	4.0	0.41**
5. Eye	10.6	4.0	0.66**
6. ENT	12.8	0.0	0.09**
7. Dental clinic	0.0	4.0	0.35**
8. Skin	25.5	12.0	0.30*
9. Paediatrics	27.7	12.0	0.22*
10.Orthopaedics	8.5	12.0	0.69**
11.OB-GYN	40.4	12.0	0.03*
12.Haematology	0.0	4.0	0.35**
13.Psychiatry	10.6	0.0	0.16**

Note: * Chi-square test with Yate's correction (2 tail).
      ** Fisher exact test (2 tail)

Table 5A.1.5 Proportion (%) of specialty clinics in facilities with 10-30 beds between MEDSEC (N=10) and Nopparat (N=5) networks

Clinics	MEDSEC	Nopparat	P-value*
1. General medicine	60.0	100.0	0.23
2. Cardio-vascular	0.0	40.0	0.10
3. General surgery	30.0	0.0	0.51
4. Plastic surgery	50.0	0.0	0.10
5. Eye	10.0	0.0	1.00
6. Skin	20.0	40.0	0.56
7. Paediatrics	40.0	80.0	0.28
8. Orthopaedics	60.0	60.0	1.00
9. OB-GYN	60.0	80.0	0.60

Note: * Fisher exact test (2 tail)

Table 5A.1.6 Proportion (%) of specialty clinics in facilities with ≥ 100 beds between MEDSEC (N=4) and Nopparat (N=1) networks

Clinics	MEDSEC	Nopparat	P-value*
1. General medicine	25.0	100.0	0.40
2. Cardio-vascular	75.0	0.0	0.40
3. Neuro-medicine	25.0	0.0	1.00
4. Endocrine	25.0	0.0	1.00
5. General surgery	75.0	100.0	1.00
7. Eye	25.0	100.0	0.40
8. ENT	75.0	100.0	1.00
9. Skin	75.0	0.0	0.40
10. Paediatrics	0.0	100.0	0.20
11. Orthopaedics	50.0	100.0	1.00
12. OB-GYN	25.0	100.0	0.40
13. Haematology	25.0	0.0	1.00

Note: * Fisher exact test (2 tail)

Table 5A.1.7 Mean of characteristics of OP structure for clinics between MEDSEC (N=47) and Nopparat (N=25) networks.

Variable	MEDSEC	Nopparat	P-value*
1. OP visit/day(No)	76.4(45.8)	54.8(36.2)	0.05
2. OP visit at peak hour/day(No)	43.4(40.1)	35.7(19.5)	0.44
3. OP room(No)	2.3(0.7)	1.7(0.8)	0.01
4. GP.examination room(No)	1.6(0.6)	1.2(1.0)	0.07
5. Specialist examination room(No)	0.7(0.8)	0.5(0.8)	0.36
6. Physical examination bed(No)	2.2(0.8)	1.7(0.7)	0.01
7. DR-patient Desk(No)	2.1(1.4)	1.6(1.0)	0.12
8. Otolaryngoscope(No)	1.1(0.7)	1.0(0.5)	0.26
9. Ophthalmoscope(No)	1.1(0.7)	1.0(0.5)	0.51
10. Ambulance(No)	0.9(0.3)	0.1(0.2)	0.48
11. Years after redecorate/build	2.2(1.6)	2.2(1.6)	0.98
12. Toilet(No)	1.9(1.4)	1.6(1.0)	0.47

Note: * T-test pooled variance estimated (2 tail)

Table 5A.1.8 Mean of characteristics of OP structure for **hospitals with 10-30 beds** between MEDSEC (N=10) and Nopparat (N=5) networks (%).

Variable	MEDSEC	Nopparat	P-value*
1.OP visit/day(No)	114.0(39.8)	152.0(100.3)	0.30
2.OP visit at peak hour/day(No)	40.0(15.8)	133.3(61.1)	0.00
3.OP room(No)	3.9(1.0)	4.0(1.4)	0.88
4.GP.examination room(No)	2.5(0.5)	2.4(0.5)	0.74
5.Specialist examination room(No)	1.4(1.0)	1.6(0.9)	0.71
6.Physical examination bed(No)	3.5(1.1)	3.0(0.0)	**
7.DR-patient Desk(No)	3.5(1.1)	3.6(1.3)	0.88
8.Otolaryngoscope(No)	1.9(1.2)	1.6(0.9)	0.63
9.Ophthalmoscope(No)	1.9(1.2)	1.8(0.8)	0.87
10.Ambulance(No)	1.2(0.6)	0.8(0.8)	0.32
11.Years after redecorate/build	1.8(1.1)	1.0(0.0)	**
12.Toilet(No)	2.6(1.4)	2.3(0.5)	0.63

Note: * T-test pooled variance estimated (2 tail)
      ** No variance for comparison

Table 5A.1.9 Mean of characteristics of OP structure for **hospitals with ≥100 beds** between MEDSEC (N=4) and Nopparat (N=1) networks.

Variable	MEDSEC	Nopparat
1.OP visit/day(No)	290.0(147.4)	900.0
2.OP room(No)	6.0(5.4)	26.0
3.GP.examination room(No)	1.8(1.0)	3.0
4.Specialist examination room(No)	4.3(4.7)	23.0
5.Physical examination bed(No)	5.3(3.9)	8.0
6.DR-patient Desk(No)	6.0(5.4)	8.0
7.Otolaryngoscope(No)	1.0(0.0)	2.0
8.Ophthalmoscope(No)	1.5(1.0)	2.0
9.Ambulance(No)	1.3(1.3)	3.0
10.Years after redecorate/build	1.3(0.5)	1.0
11.Toilet(No)	4.5(4.4)	2.0

Note: -No variance of Nopparat network for significant test

Table 5A.1.10 Characteristics of OP structure for **clinics** between MEDSEC (N=47) and Nopparat (N=25) networks (%).

Variable		MEDSEC	Nopparat	P-value
-Period of higher OP visit,	7-17 hour	21.3	52.0	0.02*
	17-22 hour	78.7	48.0	
-Refrigerator	Yes	100.0	96.0	0.35**
-Complete emergency set	Yes	10.6	4.0	0.66**

Note: * Chi-square test with Yate's correction (2 tail).
      ** Fisher exact test (2 tail)

Table 5A.1.11 Characteristics of OP structure for **hospitals with 10-30 beds** between MEDSEC (N=10) and Nopparat (N=5) networks (%).

Variable		MEDSEC	Nopparat	P-value*
-Period of higher OP visit,	7-17 hour	60.0	100.0	0.23
	17-22 hour	40.0	0.0	
-Refrigerator	Yes	100.0	80.0	0.33
-Complete emergency set	Yes	20.0	40.0	0.56

Note: * Fisher exact test (2 tail)

Table 5A.1.12 Characteristics of OP structure for hospitals with ≥100 beds between MEDSEC (N=4) and Nopparat (N=1) networks (%).

Variable		MEDSEC	Nopparat	P-value*
-Period of higher OP visit,	7-17 hour	25.0	100.0	0.40
	17-22 hour	75.0	0.0	
-Refrigerator	Yes	100.0	100.0	**
-Complete emergency set	Yes	50.0	100.0	1.00

Note: * Fisher exact test (2 tail)   ** Cannot compute

Table 5A.1.13 Characteristics of laboratory section for hospitals with ≥100 beds by network (%)

Variable	MEDSEC (N=4)	Nopparat (N=1)	P-value*
- Laboratory section owned,			
By facility itself	75.0	100.0	1.00
By other institute	25.0	0.0	
- Time consumed to report simple test			
Within hour	50.0	100.0	1.00
Same day	50.0	0.0	
- Technical laboratory quality inspecting			
Done by facility itself	50.0	0.0	1.00
Done by external group	50.0	100.0	
- Emergency service			
No emergency service	25.0	0.0	1.00
Done by facility itself 24 hour	75.0	100.0	

Note: * Fisher exact test (2 tail)

Table 5A.1.14 Characteristics of structure of x-ray cluster for hospitals with 10-30 beds of MEDSEC (N=10) and Nopparat (N=5) networks (%)

Variable		MEDSEC	Nopparat	P-value*
- Have fluoroscope	Yes	20.0	20.0	1.00
- Have ultrasound	Yes	20.0	40.0	0.56
- Emergency x-ray	No emergency service	20.0	40.0	0.36
service	Result by 2 hour	50.0	60.0	
	other	30.0	0.0	
- X-ray room	standard qualified	100.0	100.0	**

Note: * Fisher exact test (2 tail),   ** Cannot compute

Table 5A.1.15 Characteristics of structure of x-ray cluster for hospitals with ≥100 beds by network (%)

Variable		MEDSEC (N=4)	Nopparat (N=1)	P-value
- Have fluoroscope	Yes	25.0	100.0	0.40**
- Have ultrasound	Yes	75.0	100.0	1.00**
- Emergency x-ray	No emergency service	25.0	0.0	0.08*
service	Result by 2 hour	0.0	100.0	
	other	75.0	0.0	
- X-ray room	standard qualified	100.0	100.0	***

Note: * Chi-square test with Yate's correction (2 tail).
      ** Fisher exact test (2 tail),   *** Cannot compute

Table 5A.1.16   Mean of characteristics of structure of facilities of
operating and labour service cluster between MEDSEC (N=14) and Nopparat
(N=6) networks.

Variable	MEDSEC	Nopparat	P-value*
-Operating room(No)	1.4(0.6)	1.7(2.7)	0.69
-Labour room(No)	0.9(0.5)	2.0(3.5)	0.26

Note: * T-test pooled variance estimated (2 tail)

Table 5A.1.17 Characteristics of structure of operating and labour service
cluster between MEDSEC (N=14) and Nopparat (N=6) networks (%)

Variable		MEDSEC	Nopparat	P-value
- Complete set of OR instrument	Complete	61.4	50.0	0.61*
- Complete set of LR instrument	Complete	78.6	66.6	0.61*
- Complete set of OR emergency set	Complete	78.6	16.7	0.02**
- Having post OR	Yes	57.1	16.7	0.16**
- Having oxygen and suction in post OR	Yes	71.4	66.7	1.00**
- Having EKG monitor in post OR	Yes	42.9	0.0	0.11**
- Having sphygmomanometer 1 set/bed in post OR	Yes	42.9	33.3	1.00**
- Having complete emergency set in post OR	Yes	50.0	33.3	0.64**
- Having boyles machine in post OR	Yes	14.3	16.7	1.00**

Note: * Chi-square test with Yate's correction (2 tail)
      ** Fisher exact test (2 tail)

Table 5A.1.18 Mean of characteristics of structure of facilities of inpatient service cluster between networks.

Variable	MEDSEC (N=14)	Nopparat (N=6)	P-value*
1.Space between bed (cm)	100.0(4.4)	93.0(2.1)	0.74
2.In first ward			
- Bed (No.)	14.9(13.2)	16.7(15.6)	0.79
- Non-single bed room(bed)	9.0(10.3)	7.3(9.6)	0.74
- Single bed room (No.)	5.9(10.4)	9.3(13.1)	0.53
- Screen (No.)	6.4(10.6)	9.3(11.8)	0.58
- Nurse station (No.)	1.0(0.7)	0.8(0.8)	0.63
- Single bed room/bed(%)	43.7(44.9)	45.0(44.3)	0.96
- Screen/bed (%)	38.8(48.1)	65.0(44.3)	0.35
- B.P./bed (%)	19.8(15.2)	18.8(8.3)	0.90
- Emergency set/bed (%)	11.1(9.4)	5.6(4.6)	0.29
- EKG/bed (%)	4.3(8.9)	4.0(5.9)	0.95
- DC Defibrillator/bed(%)	1.7(5.4)	4.0(5.9)	0.47
- Hand washing station/bed(%)	36.0(31.1)	30.1(12.9)	0.72
- Toilet/bed (%)	38.6(30.2)	26.1(12.4)	0.44
3.In second ward			
- Bed (No.)	12.1(15.2)	10.2(17.1)	0.80
- Non-single bed room(bed)	7.5(10.5)	1.3(2.8)	0.18
- Single bed room (No.)	4.6(10.7)	8.8(17.6)	0.52
- Screen (No.)	5.9(10.8)	1.2(2.9)	0.31
- Nurse station (No.)	0.4(0.5)	0.5(0.5)	0.57
- Single bed room/bed(%)	42.8(43.8)	63.3(55.1)	0.50
- Screen/bed (%)	35.0(42.4)	33.3(57.7)	0.96
- B.P./bed (%)	19.8(12.2)	3.0(5.2)	0.04
- Emergency set/bed (%)	15.0(12.6)	8.9(6.1)	0.44
- EKG/bed (%)	1.1(2.5)	0.0(0.0)	**
- DC Defibrillator/bed(%)	1.1(2.5)	0.0(0.0)	**
- Hand washing station/bed(%)	27.6(25.2)	12.3(11.5)	0.34
- Toilet/bed (%)	40.3(34.1)	14.1(14.3)	0.23

Note: * T-test pooled variance estimated (2 tail)
      ** No variance for comparison

Table 5A.1.19 Summary of structural evaluation between MEDSEC and Nopparat networks by type of facilities.

Facility	MEDSEC had better structure	Nopparat had better structure
Clinics	-more mean numbers of personnel during 16.30-21.30 and 21.30-6.00 hour, and of OB-GYN doctor -higher mean numbers of OP room and physical examination bed -more frequent number having urine analysis, urea and electrolyte, and malaria slide test -higher proportion of having emergency X-ray service -higher mean number of X-ray personnel, X-ray machine, and age of X-ray machine set	-higher proportion of facilities reporting simple tests within hour -higher proportion having pharmacist and drug stock system
Hospitals with 10-30 beds	-higher mean number of general surgery, plastic surgery, orthopaedics specialist doctors -lower age of X-ray machines	-higher proportion having emergency laboratory service section
Hospitals with ≥100 beds*	-greater mean number of personnel during 16.30-21.30 hour and toilets -lower age of X-ray machines	-all higher mean numbers of personnel and specialist doctors except personnel during 16.30-21.30 hour -higher mean numbers of OP rooms, GP and specialist examination rooms, physical examination beds, Dr-patient desks, otolaryngoscope, ophthalmoscope, ambulance, and years after redecorate/build of OP -higher proportion having emergency X-ray service -higher mean numbers of X-ray personnel, day of X-ray personnel trained, and X-ray machine set -higher proportion having pharmacist and having expired date labelled on package
all facilities	-higher proportion having emergency electricity sources and autoclave service in facilities -higher proportion having complete emergency set in OR -higher mean of percentage of beds with BP of the second ward	-scored better for IP information variables**

Note: * Cannot compute statistical difference since only 1 hospital in Nopparat network
** Generally higher although no statistically significant difference

Table 5A.2.1 Proportion (%) of patients satisfied with general care by MEDSEC facility

Level of satisfaction	Parkket N=28	Rama-Suksawat N=57	Wicharn-Yut N=56	Ram-Intra N=69	Wipawadi-Rangsit N=61	P-value *
1. Outpatient						
Good	96.4	100.0	98.2	100.0	96.7	0.10
Fair	0.0	0.0	1.8	0.0	3.3	
Bad	3.6	0.0	0.0	0.0	0.0	
2. Inpatient						
Good	96.4	98.2	96.4	98.6	98.4	0.43
Fair	3.6	1.8	0.0	0.0	1.6	
Bad	0.0	0.0	3.6	1.4	0.0	

Note * Chi-square test with Yate's correction (2 tail)

Table 5A.2.2 Inpatients' perception about medical care by MEDSEC hospital (%)

Variables		Parkket N=28	Rama-Suksawat N=57	Wicharn-Yut N=56	Ram-Intra N=69	Wipawadi-Rangsit N=61	P-value *
-Explain regulation/ available facilities	Yes	57.1	80.7	66.1	69.6	72.1	0.21
-Explain before providing treatment	Yes	64.3	80.7	83.9	82.6	83.6	0.22
-Considering patient need	Yes	82.1	84.2	87.5	81.2	82.0	0.90
-Made embarrassed	Yes	10.7	12.3	1.8	7.2	3.3	0.14
-Respect patient privacy	Yes	57.1	82.5	80.4	81.2	80.3	0.07
-Respond for assistance							
Immediate,<10 Min		95.5	85.0	79.5	86.4	78.4	0.68
Quick,10-15 Min		4.5	15.0	17.9	13.6	18.9	
Slow,>15 Min		0.0	0.0	2.6	0.0	2.7	
-Satisfy to pain released	Yes	95.5	98.0	100.0	94.5	94.2	0.48
-General satisfy with treatment	Yes	89.3	91.2	96.4	97.1	96.7	0.32

Note * Chi-square test with Yate's correction (2 tail)

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Table 5A.2.3 Inpatients' satisfaction with personnel by MEDSEC hospital (%)

Personnel group	Level of satisfaction	Parkket N=28	Rama-Suksawat N=57	Wicharn-Yut N=56	Ram-Intra N=69	Wipawadi Rangsit N=61	P-value *
-Medical doctor	High	57.1	57.9	50.0	50.7	60.7	0.97
	Moderate	32.1	31.6	35.7	37.7	29.5	
	Low	10.7	10.5	14.3	11.6	9.8	
-Nurse	High	53.6	57.9	55.4	52.2	44.3	0.83
	Moderate	35.7	24.6	30.4	34.8	37.7	
	Low	10.7	17.5	14.3	13.0	18.0	
-X-ray and laboratory	High	53.6	45.6	37.5	24.6	34.4	0.18
	Moderate	46.4	52.6	58.9	69.6	60.7	
	Low	0.0	1.8	3.6	5.8	4.9	
-Cleaner	High	28.6	15.8	32.1	17.4	21.3	0.08
	Moderate	63.3	52.6	37.5	46.5	45.9	
	Low	7.1	31.6	30.4	36.2	32.8	
-Other group	High	35.7	21.1	32.1	20.3	23.0	0.35
	Moderate	53.6	45.6	37.5	44.9	47.5	
	Low	10.7	33.3	30.4	34.8	29.5	

Note * Chi-square test with Yate's correction (2 tail)
High = excellent and very good satisfaction
Moderate = good satisfaction
Low = fair and bad satisfaction

Table 5A.2.4 Inpatients' perception about communication in medical care provided by MEDSEC hospital (%)

Variables		Parkket N=28	Rama-Suksawat N=57	Wicharn-Yut N=56	Ram-Intra N=69	Wipawadi-Rangsit N=61	P-value *
-Doctor and nurse explain before providing treatment,	Satisfactory	92.9	89.5	87.5	92.8	85.2	0.65
	Unsatisfactory	7.1	10.5	12.5	7.2	14.8	
-Doctor's time to explain patient's question	Satisfactory	89.3	96.5	89.3	88.4	83.6	0.27
	Unsatisfactory	10.7	3.5	10.7	11.6	16.4	
-Nurse's time to explain patient's question,	Satisfactory	96.4	93.0	96.4	94.2	98.4	0.65
	Unsatisfactory	3.6	7.0	3.6	5.8	1.6	
-Interaction with X-ray and laboratory staff	Satisfactory	85.7	93.0	92.9	88.4	93.4	0.64
	Unsatisfactory	14.3	7.0	7.1	11.6	6.6	
-Relative informed adequately,	Satisfactory	100.0	93.0	80.4	85.5	86.9	0.07
	Unsatisfactory	0.0	7.0	19.6	14.5	13.1	
-Personnel's time to explain relative's question,	Satisfactory	78.6	75.4	78.6	78.3	91.8	0.17
	Unsatisfactory	21.4	24.6	21.4	21.7	8.2	

Note * Chi-square test with Yate's correction (2 tail)

Table 5A.2.5 Inpatients' perception about environment and facilities by MEDSEC hospital (%)

Variables		Parkket N=28	Rama-Suksawat N=57	Wicharn-Yut N=56	Ram-Intra N=69	Wipawadi-Rangsit N=61	P-value *
-Room temperature	Good	89.3	98.2	85.7	85.5	80.3	0.06
	Fair	10.7	1.8	14.3	14.5	19.7	
-Patient bed	Good	96.4	96.5	92.9	89.9	82.0	0.06
	Fair	3.6	3.5	7.1	10.1	18.0	
-Cleanliness							
	Clean enough	89.3	73.7	62.5	69.6	65.6	0.12
	Something not clean	10.7	26.3	37.5	30.4	34.4	
-Food	Good	96.4	80.7	87.5	84.1	91.8	0.20
	Not good	3.6	19.3	12.5	15.9	8.2	
-Disturbance while							
sleeping/resting,	Yes	7.1	14.0	12.5	14.5	13.1	0.90
	No,fine	92.9	86.0	87.5	85.5	86.9	
-Bothering of ward							
rule,	No,fine	96.4	89.5	89.3	95.7	95.1	0.42
	Yes,some bothered	3.6	10.5	10.7	4.3	4.9	
-Place to keep valuable							
personal belonging,	Yes	75.0	50.9	55.4	71.0	62.3	0.08
	No	25.0	49.1	44.6	29.0	37.7	

Note: * Chi-square test with Yate's correction (2 tail)

Table 5A.2.6 Inpatients' perception about discharge and outcome by MEDSEC hospital (%)

Variables		Parkket N=28	Rama-Suksawat N=57	Wicharn-Yut N=56	Ram-Intra N=69	Wipawadi-Rangsit N=61	P-value *
-Right time to discharge							
	Yes	92.9	96.5	100.0	95.7	98.4	0.36
-Explanation about taking							
drug at home							
	Adequate	92.9	100.0	100.0	94.2	96.6	0.13
	Not adequate	7.1	0.0	0.0	5.8	3.4	
-Explanation to help patient							
getting better at home							
	Yes	85.7	94.7	96.4	92.8	96.9	0.22
-Given written notice for							
follow up,	Yes	75.0	82.5	78.6	81.2	83.6	0.76
	No notice	21.4	8.8	10.7	11.6	8.2	
	No FU appointment	3.6	8.8	10.7	7.2	8.2	
-Perception of health at							
discharge,	Better	89.3	91.2	91.1	91.3	95.1	0.88
	Not sure	10.7	8.8	8.9	8.7	4.9	

Note * Chi-square test with Yate's correction (2 tail)

Table 5A.2.7 Inpatients' satisfaction with general cares by sex of the insured of MEDSEC and Nopparat networks (%)

Level of satisfaction		Male (N=171)	Female (N=228)	P-value*
1. Outpatient	Good	92.4	93.9	0.26
	Fair	6.4	6.1	
	Bad	1.2	0.0	
2. Inpatient	Good	90.1	93.0	0.22
	Fair	7.6	6.6	
	Bad	2.3	0.4	

Note * Chi-square test with Yate's correction (2 tail)

Table 5A.2.8 Inpatients' perception of medical care by sex of the insured of MEDSEC and Nopparat networks (%)

Variable		Male (N=171)	Female (N=228)	P-value*
1.Explain regulation and available facilities	Yes	57.3	66.7	0.07
2.Explain before providing care	Yes	70.2	75.4	0.29
3.Patient need,considered	Yes	73.7	79.4	0.22
4.Made embarrassed	Yes	9.4	7.5	0.62
5.Respect patient privacy	Yes	70.2	76.8	0.17
6.Respond for assistance				
Immediate,<10 Min		70.0	78.1	0.24
Quick,10-15 Min		20.0	16.4	
Slow,>15 Min		10.0	5.5	
7.Satisfy to pain released	Yes	86.1	88.6	0.60
8.General satisfaction with medical treatment	Yes	88.9	92.1	

Note * Chi-square test with Yate's correction (2 tail)

Table 5A.2.9 Inpatients' satisfaction with personnel by sex of the insured of MEDSEC and Nopparat networks (%)

Personnel group	Level of satisfactory	Male (N=171)	Female (N=228)	P-value *
-Medical doctor	High	43.3	51.8	0.21
	Moderate	43.3	35.1	
	Low	13.5	13.2	
-Nurse	High	36.8	42.5	0.59
	Moderate	48.5	36.8	
	Low	24.6	20.6	
-X-ray and laboratory	High	25.7	36.8	0.06
	Moderate	62.0	53.5	
	Low	12.3	9.6	
-Cleaner	High	21.1	19.3	0.90
	Moderate	45.6	46.1	
	Low	33.3	34.6	
-Other group	High	19.3	18.4	0.32
	Moderate	52.6	46.5	
	Low	28.1	35.1	

Note * Chi-square test with Yate's correction (2 tail)
     High = excellent and very good satisfaction
     Moderate = good satisfaction
     Low = fair and bad satisfaction

Table 5A.2.10 Inpatients' perception about communication in medical care provided by sex of the insured of MEDSEC and Nopparat networks (%)

Variable		Male (N=171)	Female (N=228)	P-value*
-Doctor and nurse explain before providing treatment	Satisfactory	81.9	83.8	0.72
	Unsatisfactory	18.1	16.2	
-Doctor's time to explain patient's question	Satisfactory	87.1	80.7	0.12
	Unsatisfactory	12.9	19.3	
-Nurse's time to explain patient's question,	Satisfactory	90.1	88.6	0.76
	Unsatisfactory	9.9	11.4	
-Interaction with X-ray and laboratory staff	Satisfactory	82.5	84.2	0.74
	Unsatisfactory	17.5	15.8	
-Relative informed adequately	Satisfactory	78.9	81.6	0.60
	Unsatisfactory	21.1	18.4	
-Personnel's time to explain relative's question	Satisfactory	71.3	81.6	0.14
	Unsatisfactory	28.7	22.8	

Note * Chi-square test with Yate's correction (2 tail)

Table 5A.2.11 Inpatients' perception about environment and facilities by sex of the insured of MEDSEC and Nopparat networks (%)

Variable		Male (N=171)	Female (N=228)	P-value*
-Room temperature	Good	74.9	82.9	0.09
	Fair	24.6	17.1	
	Bad	0.6	0.0	
-Patient bed	Good	83.6	86.8	0.38
	Fair	15.8	13.2	
	Bad	0.6	0.0	
-Cleanliness	Clean enough	63.7	61.8	0.78
	Something not clean	36.3	38.2	
-Food	Good	77.8	82.9	0.25
	Not good	22.2	17.1	
-Disturbance while sleeping/resting	Yes	18.7	16.7	0.69
	No,fine	81.3	83.3	
-Bothering of ward rule	No,fine	88.9	89.0	1.00
	Yes,some bothered	11.1	11.0	
-Place to keep valuable personal belongings	Yes	40.9	36.8	0.47
	No	59.1	63.2	

Note: * Chi-square test with Yate's correction (2 tail)

Table 5A.2.12 Inpatients' perception about discharge and outcome by sex of the insured of MEDSEC and Nopparat networks (%)

Variable		Male (N=171)	Female (N=228)	P-value*
1. Right time to discharge	Yes	91.8	92.1	1.00
2. Explanation about taking drug at home	Adequate	94.7	93.9	0.88
	Not adequate	5.3	6.1	
3. Explanation to help patient getting better at home	Yes	86.5	86.4	1.00
4. Given written notice for follow up	Yes	84.2	78.1	0.26
	No notice	10.5	13.2	
	No FU appointment	5.3	8.8	
5. Perception of health at discharge	Better	87.1	86.8	0.57
	Not sure	12.3	11.4	
	Worse	0.6	1.8	

Note * Chi-square test with Yate's correction (2 tail)

Table 5A.2.13 Mean of patient's age between MEDSEC and Nopparat networks

Network	N	S.D.	Mean	Min	Max	P-value*
MEDSEC	266	8.0	28.3	16.0	69.0	0.55
Nopparat	126	7.3	27.8	17.0	56.0	
Total	392	7.8	28.2	16.0	69.0	

Note * T-test with pooled variance estimated

Table 5A.2.14 Marital status of patients by network (%)

Marital status	MEDSEC (N=271)	Nopparat (N=128)	P-value*
Single	35.1	41.4	0.21
Married	60.9	57.8	
Divorced	1.1	0.0	
Widow	1.8	0.0	
Separated	1.1	0.8	

Note * Chi-square test with Yate's correction (2 tailed)

Table 5A.2.15 Educational status of patient between MEDSEC and Nopparat networks (%)

Educational status	MEDSEC (N=271)	Nopparat (N=128)	P-value*
Primary school	50.2	44.5	0.52
Secondary school	32.5	32.8	
Vocational education	7.4	7.0	
Certificated education	5.5	8.6	
Bachelor degree	2.6	4.7	
Master or PhD	0.0	0.8	
Never learn	1.8	1.6	

Note * Chi-square test with Yate's correction (2 tailed)

Table 5A.4.1   Estimate of effectiveness of drug treatments in acute diarrhoea patients

Drug	High Effective	Moderate Effective	Low Effective	Not Effective
-ORS	X			
-5% D/S 1000 cc.	X			
-Anti-emetic			X	
-Antispasmodic		X		
-Paracetamol				X
-Cimetidine(200 Mg)				X
-Kaopectin(Syr.)				X
-Imodium				X
-Antiflatulent				X
-Vitamin				X
-Lexinor(200 Mg)		X		
-Bactrim			X	
-Gentamicin(Inj)				X
-Tetracycline(250 Mg)			X	
-Metronidazole			X	
-Ampicillin(250 Mg)				X
-Doxycycline			X	
-Amoxycillin(250 Mg)				X

Table 5A.4.2   Cost per unit of drugs used in diarrhoeal disease

Drug	Unit	Baht/unit	Baht/day	Baht/course
-ORS	Pack	1.50	7.50	-
-5% D/S 1000 cc.	Pack	27.00	81.00	-
-Anti-emetic	Tab	0.35	1.40	-
-Antispasmodic	Tab	0.58	2.32	-
-Paracetamol	Tab	0.08	0.32	-
-Cimetidine(200 Mg)	Tab	0.50	2.50	-
-Kaopectin(Syr.)	180 cc.	10.44	3.48	-
-Imodium	Cap	0.02	0.08	-
-Antiflatulent	Tab	0.76	3.04	-
-Vitamin	Tab	0.08	0.32	-
-Metronidazole	Tab	0.22	0.88	-
-Lexinor(200 Mg.)	Cap	2.45	9.80	9.80
-Tetracycline(250 Mg)	Cap	0.26	2.08	10.40
-Doxycycline	Cap	1.05	2.10	10.50
-Cotrimoxazole	Tab	0.38	1.52	10.64
-Amoxycillin(250 Mg)	Cap	0.94	3.76	18.80
-Ampicillin(250 Mg)	Cap	0.86	6.88	34.40
-Gentamicin(Inj.)	80 Mg.	3.75	11.25	56.20

Note: Source of drugs price is Ram-Inthra hospital

Table 5A.4.3 Score of variables for assessing quality care of appendicitis patients

	less important 0	1	2	3	more important 4	5
1. History taking						
1.1 Vomiting (asked)				3		
1.2 Diarrhoea (asked)			2			
1.3 Abdominal pain (asked) . .						5
2. Physical Exam						
2.1 Temperature(done).			2			
2.2 Abdominal palpation(done).						5
2.3 Rectal Examine(done) . . .				3		
3. Laboratory investigation						
3.1 CBC Examine(done).					4	
3.2 Urine analysis(done) . . .				3		
3.3 Pathological section(done)				3		
4. Medical record						
4.1 Complete nurse note . . .			2			
4.2 Anaesthetic note(done). .						5
4.3 Surgical note(done). . . .						5
5. Out come variable						
5.1 Time between admission & surgery						
- 1-2 hours						5
- 3-4 hours					4	
- 5-6 hours				3		
- 7-8 hours			2			
- 9-10 hours		1				
- 11-12 hours	0					
5.2 LOS						
- 1-4 days						5
- 5-8 days					4	
- 9-12 days				3		
- 13-16 days			2			
- 17-20 days		1				
- 21-24 days	0					