EFFECT OF SOCIAL HEALTH INSURANCE ON QUALITY OF CARE: A CASE STUDY OF MAHOSOTH HOSPITAL IN VIENTIANE, LAO PDR
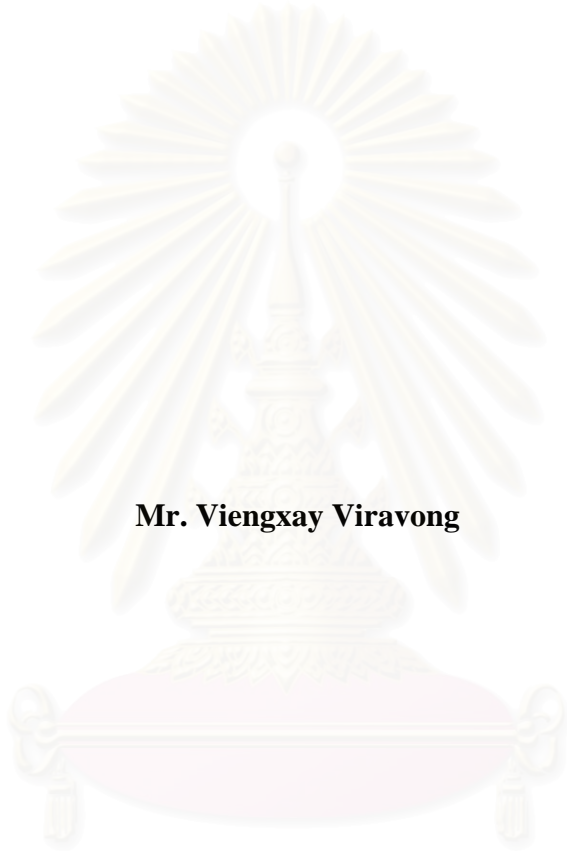
Mr. Viengxay Viravong

ผลกระทบของระบบประกันสังคมต่อคุณภาพการรักษาพยาบาล

กรณีศึกษา โรงพยาบาลมโหสถ นครหลวงเวียงจันทน์

ประเทศสาธารณรัฐประชาธิปไตยประชาชนลาว

นาย เวียงชัย วีระวงษ์

Thesis title   : EFFECT OF SOCIAL HEALTH INSURANCE ON

QUALITY OF CARE: A CASE STUDY OF MAHOSOTH

HOSPITAL IN VIENTIANE, LAO PDR

By   : Viengxay Viravong

Program   : Health Economics

Thesis Advisor   : Associate Professor Siripen Supakankunti, Ph. D.

Thesis Co-Advisor   : Associate Professor Kamthorn Pruksananonda, M.D.

Accepted by the Faculty of Economics, Chulalongkorn University in Partial Fulfillment of the Requirements for Master of Science Degree in Health Economics

……………………………………….Dean of the Faculty of Economics

(Associate Professor Sothitorn Mallikamas, Ph. D.)

Thesis Committee

……………………………………………Chairman

(Assistant Professor Chanetwallop N. Khumthong)

………………………………………Thesis Advisor

(Associate Professor Siripen Supakankunti, Ph. D.)

………………………………………Thesis Co-Advisor

(Associate Professor Kamthorn Pruksananonda, M.D.)

………………………………………..Thesis Member

(Worawet Suwanrada, Ph. D.)

เวียงชัย วีระวงษ์ : ผลกระทบของระบบประกันสังคมต่อคุณภาพการรักษาพยาบาล กรณีศึกษา โรงพยาบาลมโหสถ นครหลวงเวียงจันทน์ ประเทศสาธารณรัฐประชาธิปไตยประชาชนลาว. (EFFECT OF SOCIAL HEALTH INSURANCE ON QUALITY OF CARE: A CASE STUDY OF MAHOSOTH HOSPITAL IN VIENTIANE, LAO PDR) อ. ที่ปรึกษา: รศ. ดร. ศิริเพ็ญ ศุภกาญจนกันติ, อ.ที่ปรึกษาร่วม: รศ.นพ. กำธร พฤกษานานนท์, 107 หน้า. ISBN: 974-53-2291-1

การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาปัจจัยที่ส่งผลกระทบต่อคุณภาพการรักษาและเพื่อเปรียบเทียบคุณภาพการรักษาผู้ป่วย ที่มีประกันสุขภาพและผู้ป่วยที่ไม่มีประกันสุขภาพภายใต้ระบบประกันสุขภาพ ณ โรงพยาบาลมโหสถ นครหลวงเวียงจันทน์ ประเทศสาธารณรัฐประชาธิปไตยประชาชนลาว

ในการศึกษานี้ได้ทำการประเมินกระบวนการรักษาด้วยการวิเคราะห์ประวัติการรักษาทางการแพทย์โดยศึกษากระบวน การและผลการรักษาโดยวิเคราะห์จากใบสั่งยาที่ออกโดยแพทย์เป็นเครื่องชี้วัดคุณภาพการรักษาสำหรับผู้ป่วยนอกส่วนในกรณีผู้ป่วย ในได้ใช้กระบวนการรักษาทางการแพทย์ และระยะเวลาที่ผู้ป่วยอยู่ในโรงพยาบาลเป็นเครื่อง ชี้วัดคุณภาพการรักษา นอกจากนี้ ยังทำการสัมภาษณ์ความพึงพอใจของผู้ป่วยในการประเมินผลการรักษาด้วย

เมื่อศึกษาค่าที่วัดระดับการที่แพทย์ปฏิบัติตามกระบวนการมาตรฐานในการรักษาเป็นอัตราร้อยละ (the percen-tage of conformed standard procedure: PCSP) สำหรับผู้ป่วยใน พบว่ามีความแตกต่างอย่างมีนัยสำคัญระหว่างผู้ป่วย ที่มีประกันสุขภาพ และผู้ป่วยที่ไม่มีประกันสุขภาพโดยได้ค่า x^2=16.46ค่าเฉลี่ยของ PCSP ของผู้ป่วยที่มีประกัน สุขภาพเท่ากับ 75.821 ซึ่งสูงกว่า ค่าของผู้ป่วยที่ไม่มีประกันซึ่งเท่ากับ 69.179 สำหรับจำนวนวันนอนเฉลี่ย (LOS) ของผู้ป่วยที่มีประกันสุขภาพ เท่ากับ 8.02 วัน ซึ่งสั้นกว่าค่าของผู้ป่วยที่ไม่มีประกันสุขภาพที่เท่ากับ 9.94 วัน โดยมีค่า t = 28.88 และยังพบว่ารายได้ของผู้ป่วย การมีประกันสุขภาพค่ารักษาพยาบาลระดับ PCSP และค่าที่วัดร้อยละของระดับการปฏิบัติ ตามการใช้ยามาตรฐาน (the percentage of conforming standard drug: PCSD) มีความสัมพันธ์ในทางตรงข้ามกับ LOS ยิ่งเมื่อระดับการปฏิบัติตามมาตรฐานการรักษา เพิ่มสูงขึ้นค่าLOSยิ่งสั้นลง การศึกษายังพบว่า การมีหรือไม่มีประกันสุขภาพมีความสัมพันธ์กับความพึงพอใจต่อการรับบริการ โดยมีค่า x^2 = 30.37

สำหรับผู้ป่วยนอกนั้นในตัวอย่างพบว่าจำนวนผู้ป่วยที่มีประกันสุขภาพมีจำนวนมากกว่าผู้ป่วย ที่ไม่มีประกันสุขภาพและ มีความพึงพอใจมากกว่าโดยมีค่า x^2=59.60 ผลการศึกษาแสดงให้เห็นว่าการมีประกันสุขภาพและเพศของผู้ป่วยมีความสัมพันธ์ใน ทางบวกอย่างมีนัยสำคัญต่อความพึงพอใจที่ได้รับ โดยผู้มีประกันสุขภาพจะมีความพอใจมากกว่าผู้ไม่มีประกันสุขภาพสิ่งหนึ่งที่ ผู้ป่วยไม่พอใจคือการต้องรอนานเพื่อจะพบแพทย์ วิธีการชำระเงินค่ารักษาก็เป็นสิ่งหนึ่งที่ส่งผล ต่อความพึงพอใจของผู้ป่วยใน เรื่องของระดับ PCSP ผู้ป่วยที่มีประกันสุขภาพได้รับกระบวนการรักษาที่เหมาะสมตามแนว ทางการรักษามาตรฐาน มากกว่า ผู้ป่วยที่ไม่ประกันสุขภาพ โดยมีค่า t = -56.22 เช่นเดียวกับกรณีผู้ป่วยในระดับ PCSD ในระดับที่ดีที่สุดจะมีค่าสูงที่สุด ในกรณีการรักษาผู้ป่วยที่มีประกันสุขภาพ นั่นหมายความว่าการมีประกันสุขภาพมีผลต่อคุณภาพการรักษาของแพทย์โดยค่าเฉลี่ย ของ PCSDสำหรับผู้ป่วยที่มีประกันสุขภาพเท่ากับ84.434สูงกว่าค่าของผู้ป่วยที่ไม่มี ประกันสุขภาพซึ่งเท่ากับ 81.337

การศึกษาครั้งนี้ได้ให้ข้อมูลเกี่ยวกับคุณภาพการรักษาภายใต้ระบบประกันสุขภาพ จากมุมมองของผู้เชี่ยวชาญ คุณภาพ การรักษาผู้ป่วยที่มีประกันสุขภาพและผู้ป่วยที่ไม่มีประกันสุขภาพมีความแตกต่างอย่างมีนัยสำคัญทั้งในกรณีผู้ป่วยใน และ ผู้ป่วยนอก ด้วยเหตุนี้การรักษาในโรงพยาบาลต้องได้รับการปรับปรุงให้เป็นไปตามแนวทางการรักษา มาตรฐานแห่งชาติ เพื่อนำไปสู่คุณภาพการรักษาที่ดีขึ้น.

สาขาวิชา เศรษฐศาสตร์สาธารณสุข	ลายมือชื่อนิสิต..
ปีการศึกษา 2547	ลายมือชื่ออาจารย์ที่ปรึกษา...
	ลายมือชื่ออาจารย์ที่ปรึกษาร่วม...

This study aims to examine factors affecting quality of care, and to compare the quality of care between insured and uninsured patient under the social security health insurance organization at Mahosoth hospital in Vientiane Capital City of Lao PDR.

The process of care was assessed by analyzing the medical prescription records at the inpatient care and outpatient care department of the hospital. The quality of care was assessed by the process and outcome approaches. Considering about quality of outpatient care, the prescription records in practicing of doctors were used. At the inpatient care, the medical procedures and length of stay were used as indicators for assessing the quality of care and interviewed patient satisfaction was used to evaluate the outcome of care provided by the hospital at both inpatient care department and outpatient care department.

In term of percentage of conformed standard procedure (PCSP) for inpatient, there were statistically significant with showing the correlation between level of PCSP and insurance status with $\chi^2 =$ 16.46; mean of PCSP of insured patients was higher than that of uninsured with 75.821 and 69.179, respectively. The length of stay (LOS) of the insured was shorter than the uninsured with t = 28.88; mean of LOS of insured patient was less than that of uninsured with 8.02 and 9.94, respectively. Besides the income of patient, insurance enrollment, cost of treatment, PCSP and percentage of conforming standard drug (PCSD) were negative related to LOS. The higher level of compliance to the standard treatment was correlated with the shorter LOS. The study also found that there were correlation between satisfaction and insurance status with $\chi^2 =$ 30.37. The result from model showed that on average the LOS for patients who got malaria disease were 6.420 days and pneumonia disease were 5.816 days with very statistic significance. With income of patient, insurance enrollment, cost of treatment, PCSP and PCSD were negative related with LOS.

For outpatient care, the number of the insured was greater than the uninsured. The insured were more satisfied than uninsured patient with $\chi^2 =$ 59.60. The results showed that, insurance enrollment and gender were statistically significant and positively related to the satisfaction. The insured patient was more satisfied higher than that uninsured patient. Waiting time for consultation from doctors was one factor that patients were complaining about satisfaction. The payment method for the care was also affecting the satisfactory of the patients. In term of the level of PCSP of outpatient, the insured patients received proper procedures following the standard treatment guidelines higher than the uninsured with t = -56.22. Similarly, the score of PCSD at excellence level was highest percentage for the insured; mean of PCSD of insured was higher than that of uninsured with 84.434 and 81.337, respectively. It means that the insurance status has influence on the quality of care provided from the doctors.

This research provides information about quality of care under the health insurance scheme from different perspectives, the quality of care was statistically significant different between the insured and uninsured patients at both department, from the professional perspective. Therefore, the quality of care of services in hospital must be improved by following the national standard treatment guideline, because the higher level of compliance to the standard treatment, the better the quality of care.

Field of study…Health Economic	Student's signature……….…………………...
Academic year…2004	Advisor's signature………….………………..
	Co-advisor's signature……………….……….

ACKNOWLEDGEMENTS

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATION

ARI	Acute respiratory infection
IPD	Inpatient care Department
LOS	Length of stay
MHC	Maternal and child health
MHO	Ministry of Health
MoLSW	Ministry of Labour and Social Welfare
$NASD_i$	Number of actual standard drugs prescribed in medical record of inpatient
$NASD_o$	Number of actual standard drugs prescribed in medical record of outpatient
NASP	Number of actual standard procedures in medical record
NTSP	Number of total standard procedures in the national treatment guideline
OPD	Outpatient care Department
$PCSD_i$	Percentage of conforming standard drug of inpatient
$PCSD_o$	Percentage of conforming standard drug of outpatient
PCSP	Percentage of conforming standard procedure
SSO	Social security organization
UNDP	United Nation Development Programme
WHO	World Health Organisation

CHAPTER I

INTRODUCTION

1.1 Socio-economic situation of Lao PDR

Lao PDR is a land-lock country in the Southeast Asian, with an area of 236,800 square kilometers. It shares common boundary with China to the north, with Thailand to the west (with the Mekong River serving often as the demarcation lion), with Myanmar to the northwest, with Vietnam to the east separated by the Annam Cordillera (Saiphouluang) mountain ranges and with Cambodia to the south. Forests and rivers, which are major sources of national revenues, cover about half of the country's land area. The country is divided into 17 provinces and one special zone (see Map of Lao PDR).

The climate is determined by the monsoons mainly. The rainy season is from around May to October, with average rainfall about 1780 mm, and a dry cool season prevails from about November to February. The remainder of the year is hot and humid.

The population is estimated about 5.8 million in 2004 (Committee for Planning and Cooperation, 2003). The economy of the country remains small and unexpanded, with GDP estimated at US$ 384. The main industry is agriculture and forestry, which accounts for about 60% of GDP. Rice is the major agricultural product, and the production has been increased both by cultivation of farming land, especially of irrigated land, and by improvement of productivity. Export earnings depend upon two staple commodities, i.e. electricity and timber, providing about 70% of revenue. The country also has unexploited natural resources such as metals and jewels.

1.2 Background Of Health insurance in Lao PDR

Social security health insurance was introduced in Lao PDR, in 1989. This scheme was cover difference population segment. There was no separation of funds to allow for clear commitment regarding an allocation for health care.

The reform in the social security system took the deficiencies problem in account. The social security organization (SSO) started collecting contribution in June 2001. The main organizations involved in the preparation were the Ministry of Health (MoH) and Ministry of Labour and Social Welfare (MoLSW). The first mainly providers assistance were ILO, the United Nation Development programme (UNDP), the Belgian Technical Cooperation (BTC) and WHO.

Social Security Organization (SSO) was established in 2001 beginning with registration and collection of contributions of large enterprises in Vientiane Capital City that have 100 or more employees and extended to cover enterprises with 10 or more employees in the beginning of 2002. And now there were more than 107 enterprises and 18,348 insured persons registered and paying contributions with SSO (annual report 2001-2002, SSO).

Figure. 1 The map of Lao PDR

1.3 Health situation in Lao PDR

1.3.1 Health status

The overall status of health in Lao PDR is low. The average life expectancy at birth in the year 2000 was 59 years, 61 for female and 57 for male. Infant, under-5 and maternal mortality rate were high (Table 2.1). However it has been decreased compare to period during 1990s. The maternal mortality rate per 100 000 live births decreased from 750 in 1992 to 530 in the year 2000; the infant mortality decreased from 118 in 1985 to 82 per 1000 live births in 2000; and the under-5 mortality rate also decreased (Table 2.2).

An annual Population growth rate in 2000 was 2.65% according to the Lao Reproductive Health Survey Report 2000 (UNDP and Committee for Planning and Cooperation, 2003). The majority of population about 77% is living in rural areas where subsistence agriculture is prevalence. The National Reproductive Health Survey 2000 data indicated that 52% of population had access to safe drinking water, in rural 38% and urban 76 %. In urban area twice as many compared to rural area. Access to adequate sanitation was still insufficient, as only 38% of all households had latrines. This indicates a lack of awareness of the importance of hygiene and limited knowledge about the use of latrines especially in the rural areas.

Table 1. Core Demographic and Health of Lao PDR

Population	Total	5,525,000 (2003)	Life Expectancy at birth (years)	Both	59
	0-14 yrs	43.59% (2001)		Male	57
	65+yrs	3.5% (2001)		Female	61
Crude birth rate (per 1000 population)		34.0	Total fertility rate		4.9
Crude death rate (per 1000 population)		6.3	% of population served with sate water	Total	52.0
				Urban	75.5
Infant mortality rate (per 1000 live births)		82.2		Rural	37.6
			% of population with adequate sanitation facilities	Total	37.3
Maternal mortality rate (per 100,000 live births)		530.0		Urban	67.1
				Rural	19.0

Source: Committee for Planning and Cooperation, 2003, WHO Regional Office for the Western Pacific, 2004

Table 1.1 Change in Demographic and Health Indicators

Year	Total Population (millions)	Annual Population Growth Rate (%)	Life Expectancy (years)			Infant Mortality Rate (per 1,000 live births)	Under-5 Mortality Rate (per 1,000 live births)	Maternal Mortality Rate (per 100,000 live births)	Source
			Overall	Male	Female				
1985	3.585	2.9				118	139		State Satistical Centre and UNFPA: *Population of Lao PDR.* 1992.
1992	4.5	2.8 (1992-2000)	50.3			98	145	750	UNDP,1995, op. cit.
1993	4.6	2.8 (1993-2000)	51.3	49.8	52.8	96	141	650	UNDP: *HDR.* 1996.
			49			125	182	656	NSC: *LSIS.*
1994	4.7	3.1 (1994-2000)	51.7	50.3	53.3	93	134	650	UNDP: *HDR.* 1997.
1995	4.9	2.8 (1995-2015)	51	50	52	104			NSC: *Results from the Population Census 1995.* 1997.
1996	5.0	2.5 (1985-1995)	52.2	50.8	53.8	102	128		UNDP: *HDR.* 1998.
1999	5.2	2.2 (1975-1999)	53.1	51.9	54.4	93	111		UNDP, 2001, op. cit.
2000	5.2	2.65	59	57	61	82.2	106.9	530	SPC and NSC, 2001, Lao Reproductive Health Survey 2000.

Table 1.2 Health Indicators in Southeast Asian Countries

Year	Annual Population Growth Rate (%) 1999-2015	Population Density (per km²) 1999	Life Expectancy (years) 1995-2000	Infant Mortality Rate (per 1,000 live births) 1999	Under-5 Mortality Rate (per 1,000 live births) 1999	Maternal Mortality Rate (per 100,000 live births) 1980-1999
Lao PDR	2.2	22	52.5	93	111	650
Cambodia	2.3	71	56.5	86	122	470
Myanmar	1.0	70	55.8	79	112	230
Indonesia	1.1	110	65.1	38	52	450
Vietnam	1.3	232	67.2	31	40	160
Philippines	1.6	247	68.6	31	42	170
Thailand	1.0	121	69.6	26	30	44
Malaysia	1.5	66	71.9	8	9	39
Brunei	1.6	50	75.5	8	9	0
Singapore	1.2	3900	77.1	4	4	6
Japan	0.0	336	80.5	4	4	8

Source: UNDP: *Human Development Report HDR.* Oxford University Press, Oxford, 2001.

Compared to other ASEAN countries, people in Lao are the least healthy. Lao PDR had the lowest population density at 22 persons per km^2, while Singapore has the highest at 3,900 persons per km^2 in 1999 (Table 2.3). However, the population growth rate in Lao PDR were the next highest after that in Cambodia. They have the shortest life expectancy at birth, highest mortality rate. In the region women are suffering the most from pregnancy-related illnesses with the highest maternal mortality rate.

1.3.2 Health problems

The major diseases causing morbidity and mortality as detected by the health information system from provincial hospitals in 2000 are listed below (Table 2.4). The major causes of mortality and morbidity are communicable diseases; notably malaria, acute respiratory infections (ARI), and diarrhoeal diseases. Physical weakness and decreases in normal biological resistance due to inadequate nutrition, lack of clean water, poor sanitation and limited access to health care are affecting the incidence, severity, and outcome of these diseases.

Table 1.3 Leading Causes of Morbidity and Mortality, 2000

Morbidity (Rate per 100,000 population)		Mortality (Rate per 100,000 population)	
Malaria	4083.17	Malaria	40.09
Pneumonia	728.44	Pneumonia	3.34
Gastritis	689.63	Diarrhoea	1.36
Influenza	522.78	Heart failure	1.36
Diarrhoea	496.49	Injury	1.32

Source: WHO Regional Office for the Western Pacific, 2004

Malaria is regarded the major cause of health problem with 70% of the population considered to be at risk, however only 19.3% of the population were using the treated mosquito-net before the survey in 2000. Malaria controls programmes have made an impact and the death rate for malaria, based on data from hospitals, is reported to have improvement over the 1992-2002 period from 8.61 incidence per 1000 population in 1992 to 3.87 in 2002.

ARI and diarrhoeal disease are the main child illnesses. Conventional programmes for ARI and diarrhoea, namely, ARI/CDD (control of diarrhoeal diseases) have been focused on improvement of case management through drug package including antibiotics for ARI

and ORS for diarrhoeal diseases. The limited accessibility to healthcare facilities (district or provincial level) due to the distance, poor transportation system in the rural areas, and high medical costs of treatment is considered the major issue on reduction of ARI and diarrhoea. Additionally, inadequate water supply and sanitation, under-nutrition, poor hygiene practices, crowded households and exposure to smoke, are affecting high morbidity of children. Therefore, improvement of the living conditions in remote areas of the country has been suggested as a strategy for the prevention of the diseases.

Recent survey has shown a high prevalence of food-borne intestinal parasites and soil-transmitted nematodes (Yong et al 2003). The overall prevalence of intestinal parasite infections was 62% nationwide among school-age children. The link between those prevalence and socioeconomic factors such as agricultural practices, sanitary conditions and environmental contamination by human excreta has been illustrated. On the other hand, dietary habits are linked with the distribution of food-borne intestinal parasites. Majority of people eat raw fish and many use animal and/or human faeces as a fertilizer.

1.3.3 Health insurance in Lao PDR

In Lao PDR, three main health insurance systems are operating; namely health insurance under the social security system for civil servants, private health insurance scheme for workers in private enterprises where providers are paid either by fee for services or by capitation, and community-based voluntary health insurance for self-employed and community members implemented in three districts as pilot plans under the Ministry of Health and WHO programme.

Since 1994 the social security system for public sector under the decree 178/PM is covering the civil servants including soldiers and policemen; while the decree 207/PM was issued in December 1999 to cover the workers in formal sector including the state owner enterprises. Both systems are compulsory, providing range of comprehensive protection against risk contingencies; health care, sickness, maternity, death, employment injury, invalidity, old-age pension and survivors pension. The sources of funds are contribution by

employers and employees, and the government is bearing warranty to ensure stability and liquidity of funds.

At the time being, the social security department within Ministry of Labor and Social Welfare governs the public scheme, while Ministry of Finance is custodian of funds. The private scheme is managed by the social security organization as autonomous body under supervision of Board directors. The next phase of development of social security has two main objectives; that is the consolidation and expansion of the private sector scheme to smaller employers and the provinces, and the implementation of reformed public sector scheme. By the year 2013, the two social security schemes are scheduled to be merged in the same institution, having two separated financial accounts. This is concerned to reduce administrative cost.

Since the social security system for public officers covers broad range of insurance and its payment is reimbursement to the individuals, that is no health insurance organization involvement, thus this research mainly focuses on the private health insurance scheme.

1.4 Rationale

Improvement of health and quality of life is the overall goal of the national policy in many countries. To achieve this goal, quality of health services provided to population is one of the key factors. Quality of care is now critical issue for providers, funding agency, and consumers. The health providers are more interested in getting more information about their performance. The funding agency and patients increasingly care about the quality of healthcare available. Therefore, the assessment of quality of care is vital for the health system. The focus on improvement of the quality, which was originally developed in the industry sector, is pervasive in all sectors of the economy. In addition, quality of care is one of important determinants of the health service utilization. If the health services received from provider are satisfactory the utilization of health services will be increased. Generally, patient satisfaction results from quality of care, to some extent. In other words, the poor quality of care creates dissatisfaction of the patients at the health services leading to the low service utilization.

The problem of poor quality of care is a major concern for health system in Lao PDR. Quality improvement of medical care is one of priorities in health Master plan of Ministry of Health for 2002-2005 and 2005-2010 in Lao PDR (MOH, 2002). The shortage of financial resources in health budget, hospitals have been deteriorating, health equipment is becoming obsolete, and drug supply is insufficient. According to the survey on health providers in all provinces conducted by MOH 2000, the majority of providers cited low salaries, inadequate equipment and insufficient drugs and medical supplies as problems affecting the quality of health care services.

Hospital services in Lao PDR are important parts of the health care system, constituting the single largest part of health care expenditure. One estimate is that about 35% of the total health budget is spent on the public hospitals. The main network for curative services remains the public health care system. It consists of 3 central teaching hospitals, 5 regional hospital including one teaching hospital, 13 provincial hospitals, 125 district hospitals, and about 705 functional health centers. The government budget accounts for only 17-25% of the central hospital recurrent expenditure, 25-52% at regional/provincial hospitals, and 32-85% at district hospitals. The remainder is from patient fees and capitation fees from social insurance (MOH and WHO, 2003). Budget constraints increasingly determine the provision of health care services in the country. Analysis of quality of care can demonstrate how to maximize the healthcare benefits attainable within a specific budget. Despite this promise, analysis of quality of care has been criticized for setting health care priorities in a way that violates people's values.

As a solution to the budget constrains, increase of social health insurance coverage is emphasized in the national health policy in Lao PDR. Public insurance programmes have been have expanded in response to low utilization of health facilities and growing number of uninsured persons. Policymakers and the general public have questioned the impact of development on healthcare access and quality. The question is why some people are eligible for free or heavily subsidized insurance taking advantage of such programs. There is also concern about how low-income people, especially minority, children or those with special health care needs, fare under the managed care. However, there is little research on managed care's impact on these populations, and none that attempts to isolate the effects of

the different features of managed care delivery systems. There has been few work on health finnancing system which ensure access and quality of care for people.

In Lao PDR, the implementation of the social health insurance scheme for private workers is based on real situation and readiness of each individual hospital. The central and teaching hospitals in Vientiane Capital City are only hospitals carrying out the scheme at the period of this survey, 2004. Mahosoth hospital is the first hospital to serve the health insurance scheme since 2001, and provision of health care services in this hospital has not been separated between insured and non-insured patients. Since the beginning of the scheme, this health facility has not yet been assessed its financing scheme implementation, as well as its users satisfaction on the services.

1.5 Research questions

(1) Is there any difference between quality of care for patients with health insurance and patients without health insurance?

(2) If the difference exists, what are factors associated with that difference?

1.5.1 Objectives of the study

1.5.1.1 General objective

The overall objective is to analyze the factors affecting the quality of care at Mahosoth Hospital.

1.5.1.2 The specific objectives of the study

(1) To analyze quality of care between insured and non-insured patients.

(2) To compare factors affecting the quality of care of insured and non-insured patients.

1.6   The scope of the study

This research based on the case study of the Mahosoth Hospital. The data were collected within the year 2005 and related to six types of diseases, i.e. pneumonia, malaria, diarrhea and parasitosis for inpatient; gastric disturbance and having blood test of malaria for outpatients. These diseases are major causes of mobility and mortality in Lao PDR.

Indicators for assessing the quality of care in terms of process and outcomes were selected. This study was carried out with the hypothesis that the insured patients received better quality of care than the uninsured patients.

CHAPTER II

LITERATURE REVIEW

2.1 Health insurance

2.1.1 Principles and practice

Health insurance is a arrangement with a third party in which prospective consumers of health care make payment to them regular amount of money, so that in the event of illness some or all of the costs for care incurred to the service provider will be covered. Since major illness is irregular and unpredictable for individuals, health insurance was developed in many countries in the world. For the individuals the serious illness is the large risk of extra expenses and also probable losses of assets. Health insurance, in other word, is a measure for protection against the unexpected costs for health care incurred to the members of the insurance system. Thus, health insurance is a very secure way to keep access to healthcare, and also to increase affordability to the services especially for the low-income households. (Phua, 1994).

There are two major aspects on the effects of health insurance: financing services with raising funds for health care, and securing the service provision. In many countries, health insurance systems have been established appropriately with a role to mobilize funds from private sector for health services. The introduction of health insurance contributes to improve the quality of care by providing more motivation and resources to the health providers (Abel-Smith, 1992). In terms of securing the services, there are two methods, direct and indirect, in providing health care under insurance schemes. In the direct method, the health insurance organization establishes its own healthcare facilities. In the indirect method, medical care is purchased from existing public and private health providers by the health insurance agency.

Inefficiency is a main problem of health insurance scheme. The third-party payment system can bring about moral hazard and asymmetric information. As a result of that, two negative characteristics affecting the health sector can be observed, cost escalation and inequity of insurance services. Since the expenses are covered by health insurance agency under the system, both health providers and patients are less concerned about the cost and amount of health services utilized. As a consequence, excessive prescribed drugs and unnecessary treatment are given, and patients visit hospitals frequently. Moreover, doctors have direct influence on consumption in the healthcare market, since consumers do not have sufficient knowledge. Besides the increase in cost, some other issues can be emerged; emphasis on curative medicine, tendency toward an excessive use of technology, and the exclusion of the high-risk group (WHO, 1987). Equity in health insurance systems is another problem. There is inequity that it benefits a minority but imposes a cost on the rest of society by absorbing scarce resources in the health sector (Phua, 1993). In system with a low insurance coverage, there were differential levels of utilization of services due to moral hazard of the insured patients and probably limited access for the uninsured (Kutzin and Barnum, 1992).

2.1.2 Health insurance in Lao PDR

The health insurance is relatively new to the Lao PDR. It can be categorized into three main types; community-based health insurance, private health insurance scheme, and public social security system covering the government officers (MOH and JICA 2002).

In many villages community-based health insurance has been operating for some years. The village funds for staring or expanding home business are used to cover major health expenses. As a government initiative to improve health services, community-based health insurance scheme was implemented at first in three districts, Sethathirath, Luangprabang and Champasack, with assistance from WHO since 1997. It is supposed to cover the workers of informal private sector and their families, and cover only a pre-defined set of hospitals and health centers. The pilot operations proved successful, and the MOH set up a community-based health insurance division in the Department of Planning and Finance to coordinate this initiative.

The private insurance company, a subsidiary from *Assurances Générales du France,* was firstly allowed to operate in 1990. The social security system for employees in private sector was established under the Labour Act of 1994 and social security decree 207/PM, which covers the workers of formal private enterprises, issued in 1999. The health insurance system is currently operated only in Vientiane Capital City, where three main hospitals, Mahosoth, Mittaphab and Sethathirath, are under contract with the social health insurance organisation. The system is capitation basis and limited to a defined set of services. The users do not have to pay for the care received under this prepayment insurance scheme. However, the workers of formal private sector covered by this scheme are still very small percentage because the majority of the country population is farmer.

The public social security system for the government officers was stared under decree 178/PM managed by the Ministry of Labour and Social Welfare (MLSW). The social benefits provided by the scheme comprise retirement pensions, survivors benefits, employment injury and sickness benefits, maternity benefits and so on. The medical expenses of the government staff and their families are covered through reimbursement system. Contribution deducted from staff salaries (6%) has been insufficient for annual outlays and government's treasury contributes as an additional source. The procedures of claim and rate of reimbursement has been not satisfactory for the government officers. One of major issues on this system is distribution of responsibility between the MLSW, Ministry of Finance and provincial Finance Departments.

(1) Compulsory Health insurance (CHI):

The social security scheme for the private enterprise staff was initiated in June 2001 after signing of contract between the Mohosoth hospital and the Social Security Organisation in May 2001, in accordance to the Prime Minister's degree No 207/PM of December 1999 (MLSW, 2002). Prior to the implementation of the scheme, the hospital and the social security organisation had organized a meeting with the concerned health officers to discuss the Prime Minister's degree, regulations, and agreement of social security. Based on the agreement, the scheme is of capitation type that covers only the insured person and his/her child or children of under 6 years old using the services at the contracted hospital with an annual coverage amounting to 85,000 Kip/capita. In January

2002 the regulation has changed to annual premium of 100,000 Kip/capita. However, the survey revealed the amount of the premium was high compared with the salary, resulting in low coverage of the health insurance system. On earlier of May 2004 the new regulation was issued to reduce the annual coverage to 60,000 kip/capita for the insured person (employee) and his/her immediate family members (wife/husband and child or children of under 6 years old). After operation with the new regulation, the number of the insured employees is getting increased. Benefits subjected to the hospital are mostly utilized for purchasing medicines and medical supplied and equipment 60%, 5% for administrative cost, reserve for unexpected cost 5%, 20% for incentive, 5% for welfare funds, and 5% for miscellaneous (Mahosoth hospital).

(2) Voluntary Health insurance (VHI)

The first pilot of the voluntary health insurance programme was initiated in 2001, particularly in Vientiane Capital City. The target population of the VHI programmme is the self-employed and the informal enterprise workers in Vientiane who are not included in the scope of the CHI. In this system, the individuals sign contract with the Social Security Organisation and pay the premium by themselves. The community-based insurance system mentioned above is another form of the VHI scheme.

2.1.3 Payment methods of health insurance

Payment methods under the health insurance scheme are affecting the orientation of health services, the location of healthcare facilities, the level of technology used, quality and quantity of care provided, the allocation of resources and the cost of health care (Phua, 1993). There are different mechanisms of payment under health insurance scheme. In general, it can be illustrated as a triangular structure of the provider (healthcare facility), the consumer (insured person), and the purchaser (health insurance agency). A hospital normally wants to cover its operation costs as well as to make surplus; an insured wants to receive better quality care at low cost; a health insurance agency wants to make more profits by expanding their business through contractual payment directly with the health providers.

Under the current health insurance schemes, mainly three payment methods are common; payment by fee-for-service, capitation, and diagnosis. Every payment method has its

advantage and disadvantage. It is not easy to choose an appropriate method of payment for health insurance system. Each country has to consider experiences and lessons from others as well as from their own health system in order to adopt the most suitable one.

The payment by fee-for-service has advantages, for doctors it is flexible to raise income through providing further treatment to the patients, for patients it is more free to chose higher quality and more satisfactory health services (Abel Smith, 1992). The difficulty of cost control and excessive services such as unnecessary surgery, extra prescribed drugs, overuse of advanced technologies are main argument on the fee-for service payment.

The cost containment can be obtained with either the capitation method or payment based on diagnosis. Capitation is a method of payment according to the number of patients without regard to the units of service provided. Cost can be predicted and controlled under this payment method. Simple and easy administration for insurance agency, and continuous care and relatively free choice of doctors for patients are other advantages. The major question on this system is inadequate services due to overuse of deputizing services and less diagnostic examinations.

Payment by diagnosis is based on the category of the diseases and regardless of the type and quantity of medical services provided to the patients. This payment method has been developed in the United States, with advantages of minimized cost, shorter length of stay, and less expensive practices as substitution. This diagnosis system, however, may not be appropriate for many developing countries due to its complicated administrative procedures (Siriwanarangsun, 1996).

Under health insurance system in Lao PDR, hospitals get payment based on a mixed payment system. Capitation and fee-for-service combined payment for outpatient care; fee-for-service and flat payment per bed per day for inpatient care. It is a complicated payment system but the payment is based on real expenditure of health care services, and actually there is no ceiling for both inpatients and outpatients.

2.2 Healthcare services

2.2.1 Healthcare system

The Lao health sector consists of (1) four administrative levels of public facilities, (2) a growing number of local, private providers, and (3) programs and interventions supported by international donors and NGOs (MOH and JICA, 2002).

There are four types of public health services according to the administrative levels in the country; central, province, district and village levels. Central hospitals are located in Vientiane Capital city, and provincial hospitals are located at each province. Most of districts have a district hospital implemented at district level since 1992, and many local health posts are operating in rural areas. However, the services are limited and adequately used in rural areas due to lack of equipment and supplies and low accessibility.

Table 2.1 Health Facilities at Each Level

Level	No. of hospitals		Service Population	Definition
Central Hospital	3 Hospitals		The whole population	Tertiary curative care and teaching. The third level hospital in the referral system. Mahosoth Hospital (454 beds) Mittaphab Hospital (150 beds) Sethathirath Hospital*1 (163 beds)
Regional Hospital	5 Hospitals	18 Hospitals (Ave. 108 beds)	Population 670,000-125,000	The second level hospital in the referral system. It has responsibility for providing health care for the entire population in the region
Provincial Hospital	13 Hospitals		Population 70,000 – 700,000 5 – 12 districts	Providing consultation, treatment, health promotion, preventive health service etc. and maintaining technical standards determined by MOH second level in the referral system
District Hospital	142 Hospitals (Ave. 18 beds)		Population 10,000 – 100,000	The first level of the referral system and a local training site for health care and primary health care activities in the district
Health Centre	565 Health Centres (Ave. 3 beds)			Primary health care services including prevention, health promotion, diagnosis and treatment of basic diseases

Private providers comprise private pharmacies, private clinics and informal traditional practitioners. Private pharmacies, over 1,700 private pharmacies registered in

1994 and an increasing unknown number of unregistered ones, are selling mainly imported drugs in the market and distributing 80% of the drugs consumed in the country. Private clinics are small and usually operated by physicians or nurses who also hold a public job, mostly concentrated in Vientiane. Traditional practitioners, including herbalists such as monks and village healers and non-herbalists like akin and shamans, are common and widely operating due to remoteness and ethnic diversity.

A large number of vertical programmes funded and often managed by international agencies and NGOs, having a particular focus such as Malaria, PHC, Tuberculosis control and HIV/AIDS etc. Many of these projects often bypass the MOH management and make it quite difficult to integrate among their efforts.

The diversity of health services leads to a complicated financial arrangement in the health sector. Coordination and integration of these providers are in progress, but still at the initial stages.

2.2.2 Healthcare financing

Financial patterns in the healthcare system can be characterized by sources and allocation of funds. Original sources of funds in the health sector are government through tax revenues, households through direct payments to providers, and international donors. About 55% of the total expenditure is covered by householders' out-of-pocket payments, government expenditure accounts for the smallest part while the foreign aid constitutes the second main source of the health sector (Figure 2.1).

Figure 2 Composition of Health Expenditure in Lao PDR
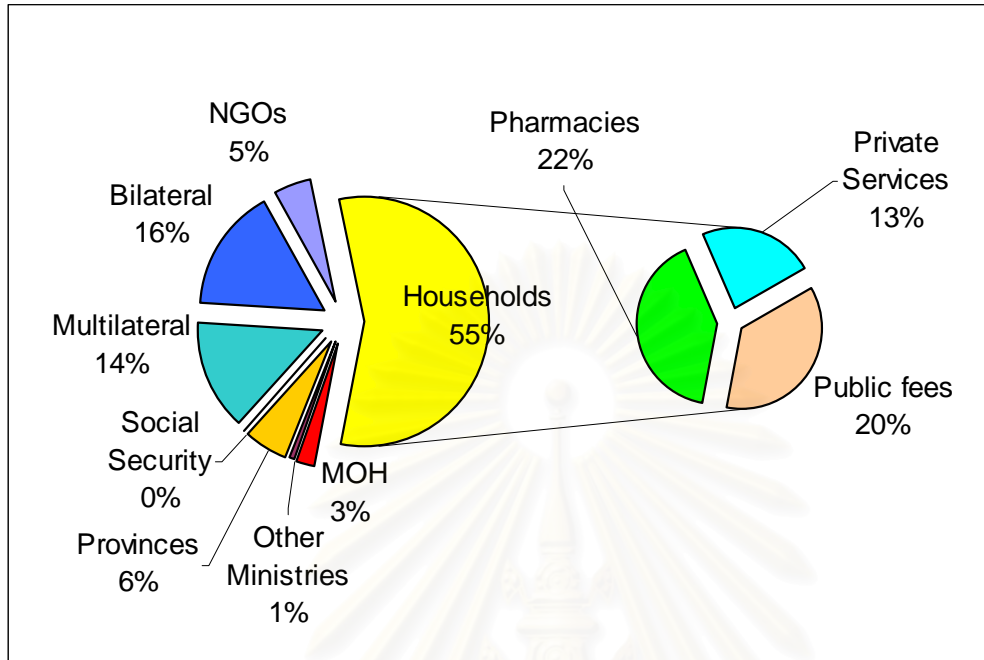
Source: MOH-JICA: *Lao Health Master Planning Study2002*

In terms of the resource allocation, capital expenditure mostly construction accounts for 30-40% of governmental health expenditure: personnel (29%) and treated (26%) are in most of the rest. In addition, almost half of expenditure at the central level goes to the central referral hospitals. In private expenditure, about 2/3 of household spending on health goes to private services and pharmacies, and 1/3 to public health system. The usage of international funds normally falls into four categories: medical equipment and pharmaceuticals, construction and vehicles, technical assistance, and study fellowships and tours.

2.3 National health policy

Several health policy documents contain various targets for health development in Lao PDR (WHO 2004). The *"Health Strategy to the Year 2020"* sets the general goal of health development to the year 2020 as: "To free the healthcare services in Lao PDR from the state of underdevelopment and to ensure full healthcare service coverage, justice and equity in order to increase the quality of life of all Lao ethnic groups". Four main concepts and six health policies have been developed as follows.

Four basic concepts are:

1. Full coverage and equity of healthcare services;
2. Development of early integrated healthcare services;
3. Demand-based healthcare services;
4. Self-reliant health services.

Six development policies are:

1. Strengthening the ability of health care providers;
2. Improving community-based health promotion and disease prevention;
3. Improving and expanding hospitals at all levels and in remote areas;
4. Promoting and strengthening the use of traditional medicine with the integration of modern and traditional care;
5. Promoting operational health research; and
6. Ensuring effective health administration and management, self-sufficient financial systems, and establishing health insurance fund.

The *"Lao Health Master Planning Study"* was conducted by the MOH and Japan International Cooperation Agency (JICA) in 2001-2002, identifying the seven precedent programmes to be implemented first and 31 "very high priority" programmes in the health sector. Under the study, the following overall strategies were worked out as initial step for the long-term goals:

1. Promoting sector-wide coordination at national, provincial and district levels;
2. Reforming the financial system and strengthening the financial management capacity of MOH, provincial health offices, and district health offices;
3. Improving quality of health worker training, and allocating well-trained workers in districts health offices;

4. Building the system and capacity of health management in a decentralized context;

5. Promoting efficient and effective infectious disease control;

6. Implementing the PHC approach to strengthen district health systems;

7. Operating central and provincial hospitals efficiently and

8. Increasing the availability and affordability of essential drugs and promoting rational drug use.

The study emphasized the necessity for sector-wide coordination; however, it has not yet been completely harmonized with the earlier "*Health Strategy to the Year 2020*". The health chapter in "*The National Poverty Eradication Programme (NPEP)*" is a third major policy document in the health sector. The NPEP is focused on poverty reduction especially in the 72 poor and 47 poorest districts. The health priorities in the NPEP are listed below:

1. Information, education and communication as in integrated part of health services;

2. Expansion of the service network for the health promotion of the people in rural areas including improved health care financing and management;

3. Improving and upgrading the capacity of health workers from village to postgraduate level with an emphasis on ethnic minority health workers, an appropriate gender balance, and incentives for retaining health workers where there are shortages;

4. Maternal and child health (MCH) promotion in rural areas;

5. Immunization;

6. Water supply and environmental health;

7. Communicable disease control;

8. Control of sexually transmitted infections, including HIV/AIDS;

9. Village drug revolving fund development;

10. Food and drug safety; and

11. Promotion of traditional medicine integrated with modern medical treatment;

12. Strengthened sustainability including financing, management, quality assurance and legal framework.

Improved coordination and integration are required for setting the clear strategies with these documents. The health sector is extremely donor and project driven which are

multiple competing and overlapping demands from donors. The MOH has strongly required the development of more integrated approaches, particularly to MCH and immunization services, the development of more decentralized methods of delivering services, and also the development of a unified and simplified health information system.

2.4 Quality of care

The low utilization of health facilities is a major concern in Lao PDR. The utilization of health services is strongly associated with the quality of care. The change in the quality of care can reflect, to some extent, utilization of health services.

2.4.1 Definitions

Before assessing quality of care, it needs to be defined. There are a number of definitions or sets of parameters for quality in the health sector. Definitions by the several authors are as follows:

Quality of care is a balance of benefits minus risks and costs (Donabedian,1988). Quality of care is the capacity of the elements of care to achieve legitimate medical and non-medical goals (Steffen, 1988). The goals are depending on the different perspectives such as government, health insurance companies, hospital administrators, patients and their families or health care providers. In general, these goals are classified into medical and non-medical goals, involving technical aspects and interpersonal aspects respectively. Quality of care is the degree to which health services are consistent with current professional knowledge and increasing the likelihood of desired outcomes for individuals (Friedman, 1995).

Quality of care is care or service that meets specified requirements, and given current knowledge and resources, fulfill expectations for maximizing benefits and minimizing risks to the health of patients (Racoveanu and Johansen, 1995). In summary, quality of care can be defined as to be the level of health service, which are conforming to the current knowledge, meeting expectations and requirements, and improving the health and well-being of patients.

Health care of good quality is also identified. Donabedian (1988) judged the health care to be good quality, if care was conformed to the practice that could have been expected to achieve the best results.

Quality of care should:

1. Produce optimal improvement in the patient's health;
2. Emphasize the promotion of health and the prevention of diseases;
3. Be provided in a timely manner;
4. Seek to achieve the patient's informed cooperation and participation in the care process and decisions concerning it;
5. Be based on accepted principles of medical science;
6. Be provided with sensitivity and concern for the patient's welfare;
7. Make efficiently documented to allow continuity of care and peer evaluation.

These elements can be used to identify care of high quality (Steffen, 1988). According to Racoveanu and Johansen (1995), health care of good quality is characterized by:

1. A high degree of professional excellence;
2. Efficiency in the use of resources;
3. Minimal risk to the patients;
4. Satisfaction of patients;
5. A favorable impact on health.

The component of good quality of health care is a basis on which to develop indicators in assessment of quality of care.

2.4.2 Assessment of quality of care

A structure-process-outcome framework has been applied for assessing the quality of care (Donabedian, 1988). In this traditional framework, "structure" concerns the resource allocation aspects in the health services including the attributes of physical infrastructure (such as facilities, equipment, and money), of human resources (such as number and qualification of staff), and of institutional structure (such as organization, peer

review methods, and methods of reimbursement). "Process" refers to the actual procedures carried out in providing and receiving healthcare. It contains the practitioner's activities in making a diagnosis, consulting or implementing treatment and the patient's activities in seeking care and carrying it out. "Outcomes" are the end result of care, including the improvements in the knowledge of patient and changes in behavior, the level of patient's satisfaction, and other changes in current and future health of patient.

In this research, the quality of care is assessed by process and outcome approaches. Since this research is based on the case study in one hospital, the structure attribute can be neglected.

Specifying criteria and standards representing the characteristics of each framework is essential in assessment of quality of care. There are two main approaches to specify criteria; implicit and explicit (ibid.). In the implicit approach, unstated criteria that can be suggested by expert practitioners based on personal knowledge and experience to judge the attributes. It has high adaptability to a particular case, but it is very expensive and relatively imprecise because of lack of accurate guidelines for quantification. In the explicit approach, clear criteria for each category are specified in advance before the assessment of individual cases. It is easy to use and standardized, but it is also costly and difficult to develop criteria, and inflexible to the different characteristics.

Tracer method is developed to measure both process and outcome of health care. According to Donabedian (1988) the sampling technique should be either simple or stratified random sampling as patients are categorized by condition or disease. Patients are firstly classified by subdivision of the health care services (e.g. inpatient department, outpatient department etc.), and then characterized with clinical achievement according to the selected categories of patients (identified by diagnosis or otherwise). Corresponding to the following criteria, the diseases should be selected as tracer:

1. A tracer should have a definite functional impact;
2. A tracer should be relatively well defined and easy to diagnose;
3. Prevalence rates should be high enough for collection of adequate data from limited population sample;
4. The natural history of the condition should vary with utilization and effectiveness of medical care;

5. The medical management techniques should be well defined for more than one of the following processes: prevention, diagnosis, treatment, or rehabilitation;

6. The effects of the non-medical component on the tracer should be understood.

In this study, the tracer method was applied to assess the outpatient and inpatient medical record and drug prescription for selected diseases.

2.5 Quality of care under the health insurance scheme

In the context of health economics, three issues; equity, efficiency and cost-effectiveness should be considered when assessing the health financial system (Phua, 1990). Quality of care, including both of process and outcome aspects, is also indispensable for health financing scheme. The process of health services is highly dependent upon the resources allocated, and the outcomes of health status are considered as the final output resulting from inputs of health resources and health care. Quality has been a topic of attention in the health care field. In the meanwhile, health insurance has been playing a vital role in the health delivery system in many countries. The payment mechanisms under health insurance systems have been analyzed by several researchers.

Studies related to quality of care under health insurance systems were reviewed. When the health insurance schemes in Thailand were analyzed by Supachutikul (1995), quality of care was also assessed. It was commented that few studies were carried out on quality of services across various financing structure while the equity, efficiency, and quality of care are the ultimate goals for every country. Bennette (1994) analysed consumer knowledge and perceptions of hospitals among formal sector workers in Bangkok using in-depth-interview method. It was found that nearly 50% of respondents had been very dissatisfied with the services provided at hospital, at least one time. In another research, the drug prescription compared between the Social Security patients and other patients were investigated (Siriwanarangson, 1995). Some diseases had been selected to investigate the difference in prescribing patterns for ambulatory patients in a private social security network. The payment mechanism to the network was capitation from the Social Security office, and it was found that the item per prescription of the Social Security patient was not lower. The conclusion is drawn that payment mechanism affects the change in physician

practices, which tends to reduce the extra costs from unnecessary treatment and leading to improvement of services.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Research design

3.1.1 Study design

This study looks at the quality of care from the perspectives of consumer, provider, and purchaser. With the assessment of the process aspect, the quality of care is seen from the provider perspective. The satisfaction of patients with health care services provided reflects the quality perceived by the patients. The purchaser, health insurance agency, at the same time pays attention to quality as well as the cost of health care services received by the insured patients.

Both insured patients and non-insured patients mentioned in this study receive health services from the same hospital. The difference here is the method of payment. For non-insured patients, they have to pay themselves directly to the hospital, whereas, the medical costs of insured patients are paid by the health insurance agency to the hospital.

The quality of care received by insured and non-insured are assessed and compared with each other. In this study, the process and outcome approaches will be used to assess the quality of care. The insured patients and non-insured patients received the care at the same hospital so quality of care in terms of structural attributes such as facilities, quality and quantity of staff etc. can be considered the same for the two groups of patients. The quality of care will examined for both outpatient (OP) care and inpatient (IP) care. In fact, the payment method uses by the health insurance agency applied to OP care and IP care are not the same. For OP care and IP care the costs of health care claims from the hospital for insured patients are reimburses on real expenditure without any ceiling. It is paid on a fee-for-service principle for drugs, blood, transfusions, laboratory tests, X-rays, operations etc., and expenditure on consumable materials are paid for as a flat payment for bed per day. As mentioned how health services are delivered, so that if the payment to providers is by fee-for-service the service maybe better than in a capitation or pre-prepaid system. Therefore,

the comparison of quality of care between insured and non-insured patients may reveal different results for OP care and IP care.

The tracer method is applied to assess the process of care, including analyzing medical records for IP care and analyzing drug prescriptions for OP care, as well as the outcome aspect of quality of care regarding patient satisfaction. The patients are first classified by the area of health system into inpatient department (IPD) and outpatient department (OPD), and then categories of patient are identified by diagnosis. According to the criteria of selecting tracers mentioned in the previous chapter, two diseases, gastric disturbance and having blood test for malaria were chosen to analyze drug prescriptions at OPD; four diseases, pneumonia, malaria, diarrhea and parasitosis were selected to analyze medical records at IPD. These diseases are the most common diseases listed in the 10 leading causes of morbidity in Vientiane Capital city. At the same time, their treatment is available in the national treatment guidelines approved by the MOH.

For IP care, process of care is examined in terms of medical procedures and length of stay (LOS). Medical procedures refer to the diagnosis and treatment which patients received from the health provider, which are available in medical records. They include the examination, laboratory tests, X-rays, prescribed drugs. The explicit criteria are based on the Standard Treatment Guidelines (STG). The performed examination, laboratory tests, prescribed drugs is compared with what is required in the national treatment guidelines for each disease. The higher the level of compliance with the guidelines the better the treatment and care performed will consider to be.

For OP care, analyzing prescriptions is essential as a measure of the quality of care (Siriwanarangsun, 1996). The indicators used here were prescribing indicators recommended by WHO (1993) including: average number of drug/encounter, percentage of encounters with an antibiotic prescribed, percentage of drugs prescribed from the Lao PDR National essential drug list, and average charge/encounter. It is suggested that the higher the proportion of generic names and essential drugs prescribed in a prescription the better the quality of care is, but the higher the proportion containing more that 1 antibiotic or an injection the lower quality of care is (Thompson and Edwards, 1991; Hogerzeil et al, 1993, quoted by Siriwanarangsun, 1996).

The degree of patient's satisfaction was used to measure the outcome of care. A survey was planned to get this response from patients who had received services from hospital at both OPD and IPD.

3.1.2 Conceptual framework

The conceptual framework of this study is illustrated as shown below (figure 4.1). For measuring process and outcomes, Medical procedures such as prescribed drugs, diagnosis and length of stay (LOS), and patient satisfaction are determined and analyzed between the insured and the non-insured.
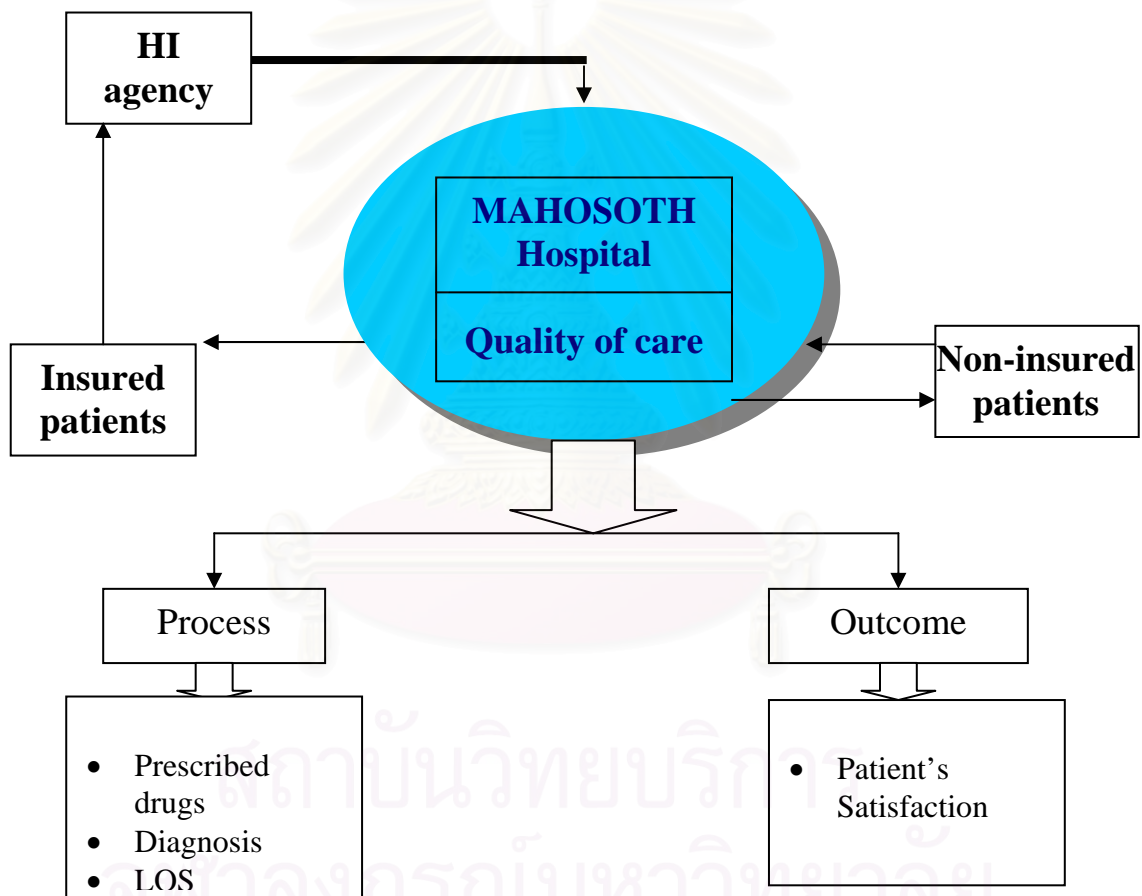
Figure 3 Conceptual framework

3.2 Data Collection

3.2.1 Data source

The information collected from patients are general information (age, gender, education, income, etc.) and level of satisfaction with healthcare received. Medical records such as drug prescription and diagnosis are obtained from the Mahosoth hospital. The secondary data such as statistics of health status, health insurance information are collected from MOH, National statistics in Lao PDR and Social security health insurance agency. Methods of data collection are: questionnaires (for general information), Interviews (for the level of patients satisfaction), and document survey (for drug prescription, diagnosis and laboratory tests).

A stratified random sampling technique is used to collect the primary data (Figure 3.1).
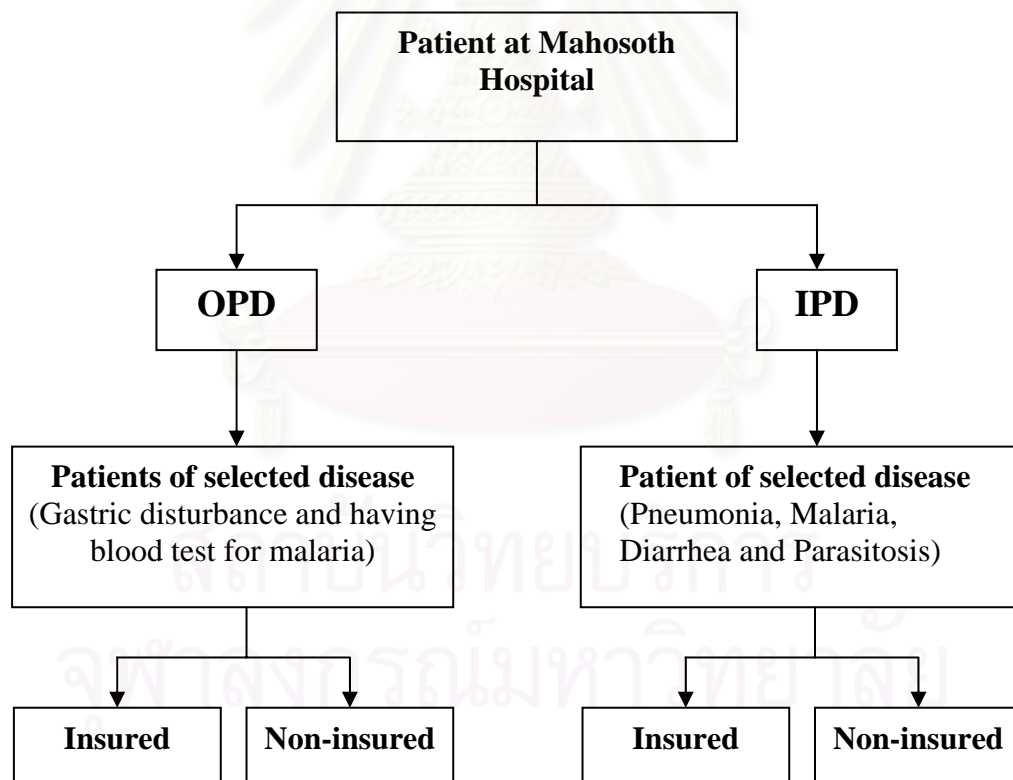
Figure 3.1 Stratified sampling technique

The data are collected within year 2004. The units of sample are encounter (for OPD), medical record (for IPD) and patient (for survey). In order to eliminate the confounding variables, some exclusion criteria should be mentioned here:

- The cases with complications

- Patients with age of under 15

- Pneumonia caused by virus or other factors.

3.2.2 Sample size

1. Calculation of sample size for OPD

Calculation of sample size is required for medical records prescriptions at OPD and this calculation can be applied for survey on patient's satisfaction at OPD. According to the objectives of this study, in each tracer there are 2 groups of patients, insured and non-insured, which are independent to each other. The quota technique is used here since there is not any available information related to the means or the proportions of variables of interest.

* Sample design:

$$N = \frac{Z^2_{1-\alpha/2} \, P*(1-P)}{d^2}$$

Of which:

N : is the estimate sample size

$Z_{1-\alpha/2}$: is the standard normal deviation set at 1.96 corresponding 95% confidence interval (α equal to 0.05).

P : is proportion of patients who satisfy with the service of the hospital, which is estimated equal to 0.80.

d : is degree of accuracy set at 5%

$$N = \frac{(1.96)^2 * 0.80 * 0.20}{(0.05)^2} = 245 \text{(patient)}$$

Therefore, sample size for outpatient is 245 patients.

2. Calculation of sample size for IPD

Calculation of sample size is required for medical records prescriptions at IPD and this calculation can be applied for interview of patient's satisfaction at IPD. Patients are to be interviewed by trained interviewers. For IPD the interview are carried out at the time of the patients stay in the Mahosoth hospital. According to the objectives of this study, in each tracer there are 2 groups of patients, insured and non-insured, which are independent to each other.

The equation for calculation of sample size for IPD is identical to the equation for OPD. Therefore the sample size for inpatient is also 245 patients.

3. Sampling procedures for Inpatient

In the beginning, we randomly choose four types of selection diseases: pneumonia, malaria, diarrhea and parasitosis. When in the real practicing within 1 month for collecting data we selected all patients to get enough sample size. Therefore the interviewed patients include all insured and uninsured patients who admitted in hospital from March to April 2005.

4. Sampling procedures for outpatient

For outpatient, we randomly collected data, after every 2 days we choose all patients visited at the hospital to access the needed include insured and uninsured patients until getting enough sample size.

3.2.3 Questionnaire development

In this study, the questionnaire is carried out as pre-test to examine the quality of care by using 30 sampling. The study test survey should have at least 25 respondents answering the questions. The questionnaire in this research comprised of 3 parts, which are general information on consumer behavior, then the perception toward the quality of care of Health insurance patients and non- insurance patients, and personal data or demographic profile.

The questionnaire is to be used for interview the group of respondents for the purpose of detecting problems in the questionnaire instruction or design. In a pretest the study will look for evidence of ambiguous questions and respondent misunderstanding, where the questions mean the same thing to all respondent, the point at which respondent fatigue sets in, places in the questionnaire where a respondent is likely to terminates, and other considerations. If the reliability value is at least 0.6 it is considered to be reliable. To do this pre-test is using the Reliability Analysis – Scale (Cronbach's Alpha) methodology.

3.3 Outcome measurement

3.3.1 Quality of care at IPD

(1) Medical procedures

With reference to the diagnosis and treatment which patients received from health care provider, explicit measurement is applied. The performed examination, laboratory tests, prescribed drugs are compared with those listed in the national treatment guidelines for each disease. The outcomes are measured by the degree of conformity, which will be determined as follows.

Analysis the physical examination, the diagnosis reported in medical records to compare with standard guideline in order to identify the percentage of conforming standard procedures as below:

$$PCSP = \frac{NASP}{NTSP} \times 100\%$$

Where:

PCSP = the percentage of conforming standard procedures

NASP = Number of actual standard procedures in medical record

NTSP = Number of total standard procedures in the national treatment guidelines

Analysis drugs prescribed in medical records and comparing with standard guidelines in order to identify the percentage of conforming drug prescription for IP patients as follow:

$$PCSD_I = \frac{NASD_I}{NTSD_I} \times 100\%$$

Where:

$PCSD_I$ = the percentage of conforming drug prescription for inpatients

$NASD_I$ = Number of actual standard drugs prescribed in medical record

$NTSD_I$ = Number of total standard drugs in the national treatment guidelines

Table 3 Description indicators of prescription of inpatient

	Measurement Level	Description	Source of data
PCSP	Ordinal	The percentage of conforming standard procedures	Medical record
NASP	Ordinal	Number of actual standard procedures in medical record	Medical record
NTSP	Ordinal	Number of total standard procedures in the national treatment guidelines	Medical record
$PCSD_I$	Ordinal	The percentage of conforming drug prescription for inpatients	Medical record
$NASD_I$	Ordinal	Number of actual standard drugs prescribed in medical record	Medical record
$NTSD_I$	Ordinal	Number of total standard drugs in the national treatment guidelines	Medical record

Taking into account the fact that one drug may be prescribed under different name, all drug maybe prescribed under different names, all drugs will considered by their generic names.

According to PCSP and PCSD$_I$, the degree of conformity to the standard guidelines will be classified in to some levels: excellent, good, medium, and bad for each group of patients corresponding to the following range: 90% and above; 70%-89%; 40%-69%; less than 40%, respectively. The unit of measurement is percentage of medical records in each group of patients conforming to the national treatment guidelines to a certain degree. It is considered that the higher level of conformity with the national treatment guidelines associates with the better quality of care.

To investigate the percentages of PCSP and PCSD is need to compare with the standard treatment guideline.

After doctor checked-up each patient we collected prescriptions and noted in to the table to estimate the total of score. We used the formula above to get the real score of PCSP.

We have difference guideline for examine PCSD by using teen indicators. There are at following:

1. Number of drug;
2. Essential drug;
3. International name of drug;
4. Drug in the store;
5. Clear hand writing;
6. Traditional medicine;
7. Antibiotic drug;
8. Correct antibiotic drug;
9. Injection;
10. Injection needed.

The table of those indicators for PCSP and PCSD attach at the appendix C and D.

(2) Length of stay

This refers to the days counted from the day of admission to the day of discharge. It is available in medical records. Unit of measurement is 1 day.

The length of stay in IP care has been considered as a quality control and evaluation index of care. There are several factors having an impact on LOS. The age of the patient, the severity of disease at the time of admission, the type of disease, the payment method, and of course the performance of care provided. To some extent, this reflects quality of health delivery: holding others factors constant, the better care may reduce LOS. On the other hand, LOS is also an important indicator that reflects the incurred medical costs. A shorter LOS leads to lower medical costs and vice versa. Short LOS may be a good sign reflecting good quality of care but may also reflect early discharge in order to avoid high costs, for example in the capitation system. In contrast, a long LOS may reflect bad quality of care and may be the result of unnecessary hospitalization in order to obtain high profit for the hospital in a fee-for service payment system. Therefore, LOS will include in analyzing medical records.

(3) Inpatient satisfaction

In health care patient satisfaction is liked to predetermined attitudes toward the medical care system as well as expectations and perceptions regarding the quantity and quality of care received (Rossiter et al, 1989). The interview can provide the responses about overall satisfaction with health care received, and then the degree of inpatient satisfaction is classified into 2 levels: satisfaction and dissatisfaction. The unit of measurement is the percentage of inpatient satisfied with the health care received.

3.3.2 Quality of care at OPD

(1) Prescribing pattern

This refers to the use of drugs by physician. Again, explicit measurement is applied. Each prescription for an outpatient will be analyzed based on the indicators of drug prescribing recommended by WHO (1993) including:

- Average number of drugs prescribed per encounter
- Percentage of drugs prescribed by generic name

- Percentage of encounters with an antibiotic
- Percentage of encounters with an injection prescribed
- Percentage of drugs prescribed from essential drug list
- Average charge per encounter

Unit of measurements are the number of drugs, the percentage prescribed by generic name, the percentage of prescriptions with an antibiotic, the percentage of prescriptions with an injection prescribed, the percentage prescribed from essential drug list, and Kip corresponding to each indicator.

After analysing the general prescribing pattern, then each prescription will compare with the standard guidelines for each kind of disease. The measurement will be based on the degree of conformity through determining the percentage of conforming standard drug prescription for OP patients as follow:

$$PCSD_O = \frac{NASD_O}{NTSD_O} \times 100\%$$

Where:

$PCSD_O$ = The percentage of conforming standard drug prescription for outpatients

$NASD_O$ = Number of actual standard drugs prescribed in the prescription

$NTSD_O$ = Number of total standard drugs in the national treatment guidelines

Taking into account the fact that one drug may be prescribed under different name, all drug maybe prescribed under different names, all drugs will considered by their generic names.

According to $PCSD_O$, the degree of conformity to the standard guidelines will be classified in to some levels: excellent, good, medium, and bad for each group of patient corresponding to the following range: 90% and above; 70%-89%; 40%-69%; less than 40%, respectively. The unit of measurement is percentage of prescriptions in each group of patients conforming to the national treatment guidelines to a certain degree.

(2) Outpatient satisfaction:

The interview is conducted to investigate the outpatient satisfaction about the health services provided. The degree of overall outpatient satisfaction is classified into 2 levels: satisfaction and dissatisfaction. The unit of measurement is the percentage of OP satisfied with the health care provided.

3.3.3 Medical cost

It was noted that medical costs in years of life saved by a preventive measure should only be included when the issue is the measure's potential effect on total medical expenditures, not when the point of the analysis is to determine whether it is a good investment. Nonetheless, the current interest in the narrower issue-and especially in whether prevention can cut medical expenditures-makes it worth analysing.

An analysis can also extend beyond these comparisons to include the evaluation of alternative policies for persuading people to exercise. Persuasion can take the form of promotional activities such as advertising better or more convenient exercise facilities, subsidies for the cost of facilities, time off from work to exercise but at additional cost. The analysis will require information about how many additional people and what additional cost in order to produce cost-effectiveness ratios that will show which methods work best. This is the cost from the hospital perspective, calculated by hospital charge for both patients. It includes: bed-day charges, lab tests, X-rays, blood, drugs, surgical, examination fee and etc. It is measured in money terms. The unit of measurement is Kip.

3.4 Data analysis

3.4.1 Analysis of inpatient care

(1) Medical procedures

The general characteristics of patients are described such as sex, age insurance enrollment for each selected disease. The objective is to compare the medical procedures

received by insured and non-insured patients. The medical procedures will be examined by two proxy indicators: PCSP and $PCSD_I$. These indicators will compare between insured and non-insured patients by classification info four levels: excellent, good, medium, and bad. The un-paired Student's test will use to test the significant difference of PCSP and $PCSD_I$ between two groups of patients. The significance level is 0.05.

In fact, for inpatient care, both insured and non-insured patients pay the hospital based on fee-for-service principles. The difference is that the non-insured patient pays directly to the hospital while the insured patient's expenses are paid by the health insurance agency. The effect of third party payment may work here. The doctor is likely to prescribe more drugs, to request more laboratory tests etc. for insured patients. However, the national treatment guidelines indicate necessary physical examination, laboratory test, and drugs to cure the disease, which should constrain doctors to some extent. Therefore, it is possible that there is no difference between two groups of patients in terms of the conformity to the national treatment guidelines.

For PCSP and $PCSD_I$, the hypothesis is that there is no difference between the insured and non-insured patients.

(2) Length of stay

As mentioned earlier, LOS reflects the effect of payment method on quality of care as well as the medical cost occurred. From the point of view of the health insurance agency, this indicator is very important when examining the performance of the health provider. The objective is to compare LOS between the insured and non-insured patients for each selected disease. In addition, the association of the affecting factors on LOS is studied.

Firstly, un-paired Student's test will use to test for any significant difference of LOS between two groups of patients for each selected disease. From the literature review, it is said that third party payment effect, LOS tends to be longer for the insured patient.

- The hypothesis proposed is that LOS for the insured patients is shorter than LOS

for the uninsured patients.

Secondly, the multiple regression is use to study the effect of different factors on LOS. From literature review, it is said that LOS can be affected by the age of patient, the severity of disease, the type of disease, the payment method, and of course the performance of payment method, and of course the performance of care provided. Using model 1 can identify the association of these factors on LOS:

Model 1:

$$LOS = \beta_0 + \beta_1 INE_i + \beta_2 Log(INP)_{Ii} + \beta_3 AGE_i + \beta_4 EDU_i + \beta_5 SEX_i + \beta_6 Log(COSTi)$$

$$+ \beta_7 PNEU_i + \beta_8 MALA_i + \beta_9 DIAR_i + \beta_{10} PCSP_i + \beta_{11} PCSD_{Ii} + \beta_{12} RES_i + u_i$$

The payment method based on fee-for-service the health insurance agency applies to IP care may create the incentive for the doctor to increase LOS of insured patient in order to get more benefits. Therefore, the insurance enrollment may positively associate with LOS. The patients who admit the hospital with severe status of disease tend to have longer LOS. Holding the other factors constant, the older patient is likely recovered later than the younger one. The patient with high income can afford high medical cost, thus the income may positively associate with LOS. Meanwhile, the better the conformity to the national treatment guidelines the sooner the good result come. Accordingly, PCSP and $PCSD_I$ are expected to be negatively associated with LOS. The description of variables in model 1 and their expected association on LOS are presented in table 3.1.

Table 3.1 Description of the variables in multiple regressions for LOS

Variables	Description of variables	Expected sign
LOS	Length of stay	
INE	Insurance enrollment; Dummy variable	-
	INE=1: having health insurance	
	INE=0: not having health insurance	
INP	Income of patient	- / +
AGE	Age of patient	+
EDU	Educational of patient	-

SEX	Sex of patient; dummy variable	+
	SEX=1: male	
	SEX=0: female	
PNEU	Pneumonia disease is selected disease:	+
	dummy variable	
	$PNEU_1 = 1$: having pneumonia	
	$PNEU_2 = 0$: otherwise	
MALA	Malaria disease is selected disease: dummy	+
	variable	
	$MALA_1 = 1$: having malaria	
DIAR	$MALA_2 = 0$: otherwise	+
	Diarrhea disease is selected disease: dummy	
	variable	
	$DIAR_1 = 1$:having diarrhea	
PCSP	$DIAR_2 = 0$: otherwise	-
	The percentage of conforming standard	
$PCSD_I$	procedures	-
COST	The percentage of conforming standard drug	-
RES	prescription for IP patient	-
	Medical cost	
	Residence area; Dummy variable	
	RES=1: urban	
	RES=0: otherwise	

3.4.2 Analysis of outpatient care

(1) General analysis of prescription

Student's test will use to test the significant difference of these indicators between the insured and non-insured patient groups. Significance level is 0.05. For outpatient care, there is a ceiling in payment for insured patients. Accordingly, the doctor has to keep in their mind the limitation when they prescribe for insured patients.

(2) Prescription analysis of two selected diseases

The percentage of conforming standard drug prescription for OP patient ($PCSD_O$) is determined for each encounter. Then this indicator will be compare between insured and non-insured patients by classification into four levels: excellent, good, medium, and bad. The Student's-test will be use to test for significant difference of $PCSD_O$ between two groups of patients.

- The hypothesis is that $PCSD_O$ of insured patients is higher than uninsured patients.

3.4.3 Satisfaction of patients

(1) Satisfaction of inpatient

The analysis will be base on questionnaires collected from inpatients. The questionnaires collected will be analyzed in terms of: general characteristics, the percentage of overall satisfied responses, and the percentage of satisfied responses to specific dimension. These characters will be comparing between insured and non-insured patients. Chi-square will be used to test for significant difference of overall satisfaction between the two groups of patients. The payment method applied for inpatient is fee-for-service without any ceiling; the third party payment can make the insured patient more satisfy when receiving more drugs, more laboratory tests, more care and attention etc.

- The hypothesis for testing the significant difference of satisfaction between insured and uninsured inpatients is that, the insured patient is more satisfied with health care provided than uninsured patient.

The level of patient satisfaction depends not only on insurance enrollment but also on many factors such as: age, education level, income, medical care and treatment etc. To study the association of those factors with the patient satisfaction at OPD, logistic regression will be used in this study.

Model 2:

$$P_{1i} = \frac{1}{1 + e^{-Z_1}}$$

Where

P_1 = Probability of IP satisfaction

$$Z_{1i} = \ln \left(\frac{P_{1i}}{1 - P_{1i}}\right) = \alpha_0 + \alpha_1 INE_i + \alpha_2 Ln(INP_i) + \alpha_3 AGE_i + \alpha_4 SEX_i + \alpha_5 Log(COST_i) + \alpha_6 EDU_i + \alpha_7 LOS_i + \alpha_8 RES_i$$

The expected associations of these variables with inpatient satisfaction in model 2 are assumed basing on the result of previous studies on inpatient satisfaction (see Table 3.2).

Table 3.2 Description of the variables in logistic regression for inpatient satisfaction

Variables	Description of variables	Expected sign
P_1	Probability of Inpatient satisfaction	
Z_1	Linear predictor	
INE	Insurance enrollment; dummy variable	+
	INE=1: having health insurance	
	INE=0: not having health insurance	
INP	Income of patient	- / +
AGE	Age of patient	+
SEX	Sex of patient; dummy variable	+
	SEX=1: male	
	SEX=0: female	
EDU	Educational of patient	+

COST	Medical cost	-
LOS	Estimated Length of stay of patient	-
RES	Residence area; Dummy variable RES=1: urban RES=0: otherwise	-

(2) Satisfaction of outpatients

The similar analysis will be based on questionnaires collected from outpatients. Because of limitation in payment at the outpatient care area, the insured patients may be less satisfied than non-insured patients when they receive less and cheaper drugs, less attention of doctor and nurse etc.

The hypothesis is that the insured patients are less satisfied with health care provided than non-insured patients.

The logistic regression will be applied again to study the association of affecting factors on the patient satisfaction at OPD with model 3.

Model 3:

$$P_{2i} = \frac{1}{1 + e^{-Z_2}}$$

Where:

P_2: Probability of Outpatient satisfaction

$$Z_{2i} = \ln\left(\frac{P_{2i}}{1 - P_{2i}}\right) = \gamma_0 + \gamma_1 INE_i + \gamma_2 Log(INP_i) + \gamma_3 AGE_i + \gamma_4 SEX_i + \gamma_5 Log(COSTi) + \gamma_6 EDU_i + \gamma_7 TIME_i + \gamma_8 RES_i$$

The expected associations of these variables with outpatient satisfaction in model 3 are estimated based on the results of previous studies on outpatient satisfaction (see Table 3.3).

Table 3.3 Description of the variables in logistic regression for outpatient satisfaction

Variables	Description of variables	Expected sign
P_2	Probability of Outpatient satisfaction	
Z_2	Linear predictor	
INE	Insurance enrollment; dummy variable	-
	INE = 1: having health insurance	
	INE = 0: not having health insurance	
	Income of patient	
	Age of patient	
INP	Sex of patient; dummy variable	- / +
AGE	SEX=1: male	+
SEX	SEX=0: female	+
	Educational level of patient	
	Medical cost	
EDU	Waiting time for consultation	+
COST	Residence area	
TIME	RES=1: urban,	-
RES	RES=0: otherwise	-
		-

3.4.4 Hypothesis testing

(1) Test for significance of each Variable

The logistic model analysis we can test the hypothesis that a coefficient is different from zero by using Wald test and p value to assess the significance of each coefficient, with:

$H_0 : \alpha_i = 0$ $i = 1, 2, ...5$

$H_1 : \alpha_i \neq 0$ $i = 1, 2, ...5$

The meaning of this test is if the null hypothesis H_0 is true, the corresponding independent variable is not related to regression Z, and its value is useless; in the opposite case when alternative H_1 is true, we can conclude that there is a relationship between that variable and regression Z.

To determine significantly, following process was used: Conduct a test with confident significant 95% and calculate the Wald test.

$$Z = \frac{\alpha_i}{se\ \alpha_i}$$ SE is standard error

Reject H_0 if the computed z value is less than critical z value or p <0.05

Accept H_0 if otherwise

Predict a change of probability of independent variable when dependent variable is change

Suppose, a logit regression is

$$Ln \frac{p}{1-p} = \alpha_0 + \alpha_1 X$$

When X increases to $X+a$, that means X change is ΔX a change of right equation is :

$$\Delta Ln \frac{p}{1-p} = \alpha_1 \Delta X$$

To simplify, we utilize the fact that for any continuous variable X, $\Delta \log X \approx \Delta X/X$, and the fact that $\log (x/y) = \log x - \log y$. Then

$$\Delta Ln \frac{p}{1-p} \approx \left(\frac{1}{p} + \frac{1}{1-p}\right) \Delta p = \frac{1}{p(1-p)} \Delta p$$

So we get

$$\frac{1}{p(1-p)} \Delta p = \alpha_1 \Delta X \text{ and}$$

$$\Delta p \approx \alpha_1 [p(1-p)] \Delta X$$

When X changes, we will calculate a change of p and predict the probability of independent variable.

Applying this theory to this research, for example, we predict the probability of patient using Commune Health Center when income increases. We get a formula

$$\Delta p \approx \alpha_1 [p(1-p)] \Delta INCOME$$

When INCOME increases 100,000 Kips, a change of probability is

$$\Delta p \approx \alpha_1 [p(1-p)] *100$$

(2) Test for significance of each factor

For model analysis, the hypothesis that a coefficient was different from zero by using t-test and F-test. The hypothesis was:

$H_0 : \gamma_i = 0$ $i = 1, 2, \ldots 5$

$H_1 : \gamma_i \neq 0$ $i = 1, 2, \ldots 5$

If the value of F-test is less than critical value or p value greater than 0.05 that means we have to accept null-hypothesis or in other word all coefficients are equal to zero simultaneously. It means that the corresponding independent variable is not related with dependent variable.

If the value of F-test is greater than critical value or p value less than 0.05 that means we reject null-hypothesis and accept alternative hypothesis, in this case all coefficients are not equal to zero simultaneously, then t-test and p value to check the significance of each coefficient. If coefficients are significant that meant that independent variables can affect dependent.

$$F = \frac{ESS/(k\text{-}1)}{RSS/(n\text{-}k)}$$

In which : ESS: Error sum of square

RSS: Residual sum of square

K: number of variable

N: number of observation

If $F > F\alpha(k\text{-}1)$, reject H_0,

Otherwise, do not reject it.

(3) The χ^2 –test for independence

The expected and observed frequencies f_e and f_o are used to compute a sample statistic for testing the hypothesis that the row and column categories are independent. The underlying idea is that the observed frequencies should be close to the frequencies that woul be expected if the categories are independence. Large differences will lead us to reject the hypothesis of independence. The statistic that is used for the test is called the sample χ^2. It is computed from the formula

$$\text{Sample } \chi^2 = \sum \frac{(f_o - f_e)^2}{f_e}$$

The formula shows that larger the squared differences are relative to their respective expected frequencies, the larger will be the value of the sample χ^2. Therefore, large value of the sample χ^2 lead to rejecting the independent hypothesis.

The distribution of the sample χ^2 computed from a contingency table is approximated

by a chi-square distribution with ν degrees of freedom, where

ν = (r – 1) (c – 1)

The chi-square approximation is satisfactory if the expected cell frequencies are not too small. To be specific, we shall follow the rule that each f_e value must be at least 5. If an f_e value is less than 5, we shall combine adjacent row (or columns) in the contingency table to get f_e value of at least 5 before computing the sample χ^2; also ν will be computed after combining rows or columns.

The steps followed in testing a contingency table for independence at significance level α parallel those we have followed in earlier test; however, the hypotheses are stated in terms of independence. The hypotheses are

Ho: the row and column categories are independent

H₁: the row and column categories are not independent

Significantly large values of the sample χ^2 statistic lead to the rejection of *Ho*;

Reject Ho if sample $\chi^2 > \chi^2_{\alpha,\upsilon}$

where α = significance level of the test

To carry out the test, we compute the expected frequencies by the cell-count rule for independence

$$f_e = \frac{(\text{row total}) \times (\text{column total})}{\text{grand total}}$$

Then we compute

$$\text{Sample } \chi^2 = \sum \frac{(f_e - f_e)^2}{f_e}$$

Finally, we

Accept or reject *Ho*, based on the decision rule and sample χ^2.

3.5 Mahosoth hospital

Mahosoth hospital is a central and teaching hospital located in Vientiane Capital city, and the largest hospital with 454 beds a total of 607 staff (MOH and WHO, 2003). It provides tertiary care following the principle of referral system in the country. However, patients can self-refer and Mahosoth provides large amounts of primary care. It is comprised of multiple buildings, usually one per service, with a large surface area (20,670 m^2). The oldest buildings were constructed in 1920's and many buildings are not maintained properly. Under the "*Health Strategy to the Year 2020*" Mahosoth hospital was planned to renovate to ensure its role as a teaching hospital and tertiary level referral hospital over the hole country; the remodeling programme is being completed recently.

According to the survey conducted by the MOH and WHO (2003), number of outpatient visits to outpatient department (OPD) including visits to Emergency room between the year 2001 to 2002 was 143,435, and inpatient department (IPD) admissions spending at least one night in the hospital were 19,777. The average of length of stay (LOS) per inpatient was 3.73 days, and IPD days, which is calculated the IPD admissions multiplied by the average LOS, was 73,855. Bed occupancy was 45% during the survey period.

The service of Mahosoth hospital is higher compared to other hospitals in the country, however national average is generally low. Total staff number per each bed was 1.34 while the unit service (either one outpatient visit or one hospital day of inpatient) per total staff was 358. The number of laboratory analysis per unit service in Mahosoth was 1.08, the highest among the central hospitals. The hospital is well facilitated with imaging examination equipment such as X-rays, ultrasounds and CT scans.

Financing in Mahosoth hospital was analyzed by MOH and WHO (2003). About 90% of total recurrent expenditure was covered by Lao sources, 10% by donor contribution. Among the national sources, government budget was 21%, patient sources were 75%, and 4% from the source of capitation payments. The percentage of government contribution was the second lowest among the 16 surveyed hospitals in the country. The patient sources of revenue are from several sources including revolving drug funds, laboratory, radiology, and room charges etc. The capitation payments are form the health insurance system operated by the Social Security Organization for the workers of formal

private sector. The costs per unit of service for outpatient and inpatient in Mahosoth were compared and there were no significant difference; 51,837 Kip per one OP visit and 59,952 Kip per one IP day respectively. The cost per one unit service 54,596 Kip was relatively high compared with other hospitals, which doesn't indicate quality of care but effectiveness of service.

The production of healthcare requires a complex combination of physical infrastructure, equipment, human resources, and financial resources. To improve quality of health care, capital investment on healthcare assets and human resources, and increased recurrent expenditure are crucial. The governmental budget on health has limit and almost fixed, and percentage of patient payments is high, giving heavy burden especially to the poor households; therefore the source form improved insurance system is most promising source of health service.

CHAPTER IV

RESULTS

Information on the total of 490 patients (245 inpatients and 245 outpatients) of selected diseases were complied and investigated as per the methods described in the previous chapter. A research team including 7 health workers in the Ministry of health and the National institute of public health were assigned to collect data. The data collection was carried out from February 17 to March 15, 2005 at Mahosoth hospital in Vientiane, Lao PDR. This chapter provides the results achieved regarding the quality of care of insured and uninsured patients by analyzing of patient care, the prescribing pattern, length of stay and patient satisfaction.

4.1 Analysis of inpatient care

4.1.1 General status of inpatients

According to the methodology outlined in the previous chapter, 245 medical records of inpatients were collected.

From the table 4, 4.1, 4.2 and 4.3, the percentage of the uninsured patients was a little higher than percentage of the insured patients (52.2% and 47.8%). The percentage of uninsured patient in age group 15-49 years old was higher than that of the insured, similarly to the age group 50-60 years old, the percentage of the uninsured was also higher than insured, but the percentage of insured patient in age group over 60 years old was higher than that of uninsured patients (69.2% and 30.8%). In other word, the insured elderly were more than uninsured elderly in this research. The number of patients between the male and the female were almost the same, however, the percentage of the uninsured female was a little higher than the insured male (52.0% and 43.3%). Considered about patient in urban and rural areas, percentage of insured patient who stayed in rural area was higher than that of the uninsured patient (53.1% and 46.9%), but in the urban area the percentage of uninsured patient was higher than that of insured patient (41.9% and 58.1%).

Table 4 Age group of patient and insurance status of inpatient

Age group of patient	Insurance status		Total
	Uninsured	Insured	
15-49 yrs	104	94	198
% within age group of patient	52.5%	47.5%	100.0%
50-60 yrs	20	14	34
% within age group of patient	58.8%	41.2%	100.0%
>60 yrs	4	9	13
% within age group of patient	30.8%	69.2%	100.0%
Total	128	117	245
% of Total	52.2%	47.8%	100.0%

Table 4.1 Mean of age and insurance status of inpatient

Insurance status	Mean	N	Std. Deviation	Minimum	Maximum
Uninsured	37.27	128	12.144	17.00	76.00
Insured	39.08	117	12.990	16.00	75.00
Total	38.13	245	12.562	16.00	76.00

t =47.01, p = 0.000, df = 244

Table 4.2 Gender of patient and insurance status of inpatient

Gender	Insurance status		Total
	Uninsured	Insured	
Female	68	52	120
% within Gender	56.7%	43.3%	100.0%
Male	60	65	125
% within Gender	48.0%	52.0%	100.0%
Total	128	117	245
% of Total	52.2%	47.8%	100.0%

Table 4.3 Resident and insurance status of inpatient

| Area of resident | Insurance status | | Total |
	Uninsured	Insured	
Rural	60	68	128
% within area	46.9%	53.1%	100.0%
Urban	68	49	117
% within area	58.1%	41.9%	100.0%
Total	128	117	245
% of Total	52.2%	47.8%	100.0%

Table 4.4 shows that at primary school and secondary school level, the percentages of insured patients were higher than that of uninsured patients with 64% with 36 %, and 55% with 45% respectively. On the other hand, at high school and higher education level, the numbers of insured patients were less than that of the uninsured with the percentage 49% with 51%, and 30% with 70% respectively. There were correlation between insurance status and group of education of insured and uninsured patient with $\chi^2 = 16.817$, p = 0.001, df = 3.

As show in table 4.5, there was much different about insurance status among different group of income levels. Monthly income was classified into five quintiles; the group 1 was patients with the lowest income per capita, then the higher and the highest was group 5. In group 1 and group 2, the insured patients were higher than the uninsured, with 53% for group 1 and 58% for group 2. But for the group 3, 4 and 5, the percentage of the insured patients, 44%, 46%, and 37% respectively, were smaller than that of the uninsured. There were no correlation between group of income level and insurance status with $\chi^2 = 6.100$, p = 0.192, df = 4.

Results from the table 4.5.1 showed the mean of income of both group of patient, there was significant deference between insured and uninsured with t = -16.912, p = 0.000, df = 244. It means that the uninsured patients pay higher from their own pocket, but this does not imply that the quality of care is better.

For table 4.6, among four selected diseases for analysis of inpatient care, the percentages of the insured patients suffered from diarrhea and parasitosis diseases were higher than the uninsured with 53% and 48% respectively. However, the percentages of the insured patients of pneumonia and malaria diseases were smaller than that of the uninsured that is 40%, 49% and 60%, 51% respectively. There were correlation between insurance status and group of diseases with $\chi^2 = 2.880$, p = 0.410, df = 3.

Table 4.4 Education level and insurance status of inpatient

Education level	Insurance status		Total
	Uninsured	Insured	
Primary school	19	34	53
% within group of education	35.8%	64.2%	100.0%
Secondary school	24	29	53
% within group of education	45.3%	54.7%	100.0%
High school	33	32	65
% within group of education	50.8%	49.2%	100.0%
Higher	52	22	74
% within group of education	70.3%	29.7%	100.0%
Total	128	117	245
% of Total	52.2%	47.8%	100.0%

$\chi^2 = 16.817$, p = 0.001, df = 3

Table 4.4.1 Classify group of income by five quintile

Group of income	Mean	N	Std. Deviation	Minimum	Maximum
1	177.11	45	51.19	100.00	250.00
2	335.85	53	39.73	300.00	400.00
3	530.63	48	54.16	450.00	600.00

4	774.07	54	80.53	650.00	900.00
5	1433.33	45	611.63	1000.00	3000.00
Total	643.02	245	502.24	100.00	3000.00

Table 4.5 Income level and insurance status of inpatient

Income level	Insurance status		Total
	Uninsured	Insured	
Group 1	21	24	45
% within group	46.7%	53.3%	100.0%
Group 2	22	31	53
% within group	41.5%	58.5%	100.0%
Group 3	27	21	48
% within group	56.3%	43.8%	100.0%
Group 4	29	25	54
% within group	53.7%	46.3%	100.0%
Group 5	29	16	45
% within group	64.4%	35.6%	100.0%
Total	128	117	245
% of Total	52.2%	47.8%	100.0%

$\chi^2 = 6.100$, p = 0.192, df = 4

Table 4.5.1 Mean of income and insurance status of inpatient

Insurance status	Mean	N	Std. Deviation	Minimum	Maximum
Uninsured	3.18	128	1.394	1	5
Insured	2.81	117	1.351	1	5

Total	3.00	245	1.383	1	5

t = -16.912, p = 0.000, df = 244

Table 4.6 Diseases of patient and insurance status of inpatient

Diseases	Insurance status		Total
	Uninsured	Insured	
Pneumonia	44	29	73
% within disease	60.3%	39.7%	100.0%
Malaria	37	36	73
% within disease	50.7%	49.3%	100.0%
Diarrhea	35	39	74
% within disease	47.3%	52.7%	100.0%
Parasitosis	12	13	25
% within disease	48.0%	52.0%	100.0%
Total	128	117	245
% of Total	52.2%	47.8%	100.0%

χ^2 = 2.880, p = 0.410, df = 3

4.1.2 Medical procedures

Comparing each medical record with the standard treatment guidelines in terms of physical examination, diagnosis, and prescribed drugs, the explicit method was used. PCSP and PCSD were calculated for each case reflecting the level of conformity to the standard guidelines to indicate the quality of health services provided to the patients. Then scores of

PCSP and PCSD were compared between insured and uninsured groups for each selected disease.

Results of PCSP for inpatients in the table 4.7 and 4.8 showed that the confirming procedures treatment of doctor compared to the national standard treatment guideline, the level of PCSP score, at the moderate level the insured were less than the uninsured (27% and 40%); and at the good level, the percentage of the insured and uninsured were equal with 45%. However, at the excellence level, the percentage of insured patients was much higher than that of uninsured patient (28% and 15% respectively). Considered about the mean of PCSP score of doctors in practice of treatment, it was 75.8205 for the insured patients and 69.1797 for the uninsured, it was significant different with t = -72.206, p = 0.000 and df = 244. It means that medical procedures of doctors were better for the insured patients in terms of compliance with the standard guidelines.

Table 4.7 Level of PCSP score and insurance status of inpatient

Level of PCSP	Insurance status		Total
	Uninsured	Insured	
Moderate	52	31	83
% within insurance status	40.6%	26.5%	33.9%
Good	57	53	110
% within insurance status	44.5%	45.3%	44.9%
Excellence	19	33	52
% within insurance status	14.8%	28.2%	21.2%
Total	128	117	245
% within insurance status	100.0%	100.0%	100.0%

χ^2 = 16.46, p = 0.000, df = 2

Table 4.8 Mean of PCSP score and insurance status of inpatient

Insurance status	Mean	N	Std. Deviation	Minimum	Maximum
Uninsured	69.1797	128	14.81882	30.00	100.00
Insured	75.8205	117	15.91931	30.00	100.00
Total	72.3510	245	15.67887	30.00	100.00

t = -72.206, p = 0.000 and df = 244

Table 4.9 and 4.10 describe the level of PCSD score for inpatients, and table 4.11 shows the mean cost of drugs prescribed for each inpatient. There was no correlation between insured patient and uninsured patient of PCSD score for the insured and that for uninsured patients with χ^2 = 2.75, p = 0.252, df = 2. But in term of the compliance with standard guidelines in general (which mean of insured 78.1624 and uninsured 74.3750) with t = -79.73, p = 0.000 and df = 244; doctor concerns much for the insured patient than that uninsured patient. In specific level, at moderate level was 20% for the insured and 31% for the uninsured, but at good level and excellence levels, the insured received higher scores (46% and 34%) while the uninsured got lower scores (42% and 27%).

As shows in the table 4.11, the average cost of prescribed drugs for the insured patient was about 1.5 times higher than that of the uninsured. This is significant different with   t = 16.18, p = 0.000, df = 244. It means that the health insurance agency had to pay more for health care costs for the insured patients or it could be implied that insurance is very important financial source for health care.

Table 4.9 Level of PCSD score and insurance status of inpatient

Level of PCSD	Insurance status		Total
	Uninsured	Insured	
Moderate	40	23	63
% within insurance status	31.2%	19.7%	25.7%
Good	54	54	108
% within insurance status	42.2%	46.2%	44.1%
Excellence	34	40	74
% within insurance status	26.6%	34.2%	30.2%
Total	128	117	245
% within insurance status	100.0%	100.0%	100.0%

$\chi^2 = 2.75$, p = 0.252, df = 2

Table 4.10 Mean of PCSD score and insurance status of inpatient

Insurance status	Mean	N	Std. Deviation	Minimum	Maximum
Uninsured	74.3750	128	15.57304	40.00	100.00
Insured	78.1624	117	13.96730	50.00	100.00
Total	76.1837	245	14.91873	40.00	100.00

t = -79.73, p = 0.000 and df = 244

Table 4.11 Mean of Cost of Drugs and Insurance status of inpatient

Insurance status	Mean of Cost	N	Std. Deviation	Minimum	Maximum
Uninsured	205.23	128	233.264	60	1500
Insured	334.60	117	267.498	100	1500
Total	267.01	245	257.937	60	1500

t = 16.18, p = 0.000, df = 244

4.1.3 Length of stay

As the results shown in table 4.12, the patients with insurance had shorter length of stay than patients without insurance. Mean of length of stay for the insured was significant smaller than that for the uninsured with 8.02 and 9.94 (t = 28.88, p = 0.000, df = 244). It means that the insured patients were treated shorter than uninsured patients.

Table 4.12 Mean of Length of Stay and Insurance status of inpatient

Insurance status	Mean of LOS	N	Std. Deviation	Minimum	Maximum
Uninsured	9.94	128	4.547	3	27
Insured	8.02	117	4.239	2	22
Total	9.02	245	4.497	2	27

t = 28.88, p = 0.000, df = 244

There were difference factors affected to length of stay, such as income, PCSP and PCSD of patients. Using the Model 1 as explained in the previous chapter, the linear regression was run for selected factors. From the result in table 4.13, there were many

insignificant independent factors in the regression such as Age, Gender, Education, Area of Resident and Diarrhea diseases with p values greater than 0.05, so these insignificant variables need to be excluded for the regression.

Table 4.14 illustrates the result of new regression after excluding insignificant variables, and it obtained that all independent variables, including malaria, pneumonia income, insurance status, Cost of treatment, PCSP and PCSD, were significant with p value less than 0.05. In other words, these factors are affecting the length of stay of inpatients. Insurance status had negative effect to the length of stay with coefficient = -1.47, p = 0.005, it means that in general the insured patients had 1.47 day shorter length of stay in hospital or they were treated shorter than uninsured patients. Regarding income status, the higher income group had the shorter LOS (coefficient equaled –1.515 for log of income).

Among selected disease, malaria and pneumonia were positive related with coefficient 6.420, p = 0.000 and 5.816, p = 0.000, it means that on average the LOS for patients who got malaria disease were 6.420 days and pneumonia disease were 5.816 days with very statistic significance.
The coefficients of PCSP and PCSD were negative with –0.243, p = 0.020 and –0.344, p = 0.023; it means that the higher level of compliance to the national treatment guidelines the shorter LOS.

Also it can be said that Pneumonia and malaria were two diseases contributing LOS longer compared with other selected diseases.

The coefficient of cost was with –0.852, p = 0.009 and it means that cost of treatment is higher the LOS will be shorter. Also, the coefficient of income was with –1.881, p = 000 and it means that patient with has high income their LOS will be shorter than who has low income.

Table 4.13 Result of regression of Los for inpatient

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	25.358	3.218		7.881***	0.000
AGE	0.025	0.019	0.069	1.281	0.201
SEX	0.025	0.449	0.003	0.056	0.956
EDU	-.016	0.074	-0.014	-0.214	0.830
AORES	-0.155	0.481	-0.017	-0.322	0.747
LNCOST	-1.026	0.363	-0.193	-2.828**	0.005
LOGINC	-1.766	0.359	-0.284	-4.925***	0.000
PNEU	6.393	0.845	0.651	7.566***	0.000
MALARIA	7.095	0.794	0.723	8.940***	0.000
DIARRHEA	0.838	0.797	0.086	1.052	0.294
PCSP	-0.247	0.105	-0.118	-2.350*	0.020
PCSDI	-0.339	0.156	-0.106	-2.171*	0.031
Insurance status	-1.428	0.536	-0.159	-2.662**	0.008

a Dependent Variable: LOS

$R^2 = 0.488$, Adjusted $R^2 = 0.462$

F = 16.48 p = 0.000

Note: (*p<0.05; **p<0.01; ***p<0.001)

Table 4.14 Result of Regression of Length of stay after rerun again

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	26.545	2.978		8.914***	0.000
MALARIA	6.420	0.541	0.654	11.876***	0.000
PNEU	5.816	0.569	0.593	10.223***	0.000
LOGINC	-1.881	0.310	-0.302	-6.064***	0.000
Insurance status	-1.470	0.515	-0.164	-2.851**	0.005
LNCOST	-.852	0.321	-0.160	-2.650**	0.009
PCSP	-0.243	0.104	-0.116	-2.339*	0.020
PCSDI	-0.344	0.151	-0.108	-2.282*	0.023

a Dependent Variable: LOS

R^2=0.482 , Adjusted R^2 =0.466

F = 33.24, p = 0.000

Note: (*p<0.05; **p<0.01; ***p<0.001)

4.1.4 Satisfaction of inpatients

According to the result in table 4.15, the percentage of satisfaction of insured patients was more than uninsured patients, 54% insured and 20%. This means that the insured patients were more satisfied with the health care provided from the hospital than that the patients without insurance. There were correlation between insurance status and satisfaction of healthcare service in the hospital with χ^2 = 30.37, p = 0.000, df = 1.

Table 4.15 Satisfaction and insurance status of inpatient

Satisfaction	Insurance status		Total
	Uninsured	Insured	
Not satisfied	102	54	156
% within group	79.7%	46.2%	63.7%
Satisfied	26	63	89
% within group	20.3%	53.8%	36.3%
Total	128	117	245
% of Total	100.0%	100.0%	100.0%

$\chi^2 = 30.37$, p = 0.000, df = 1

The logistic regression for inpatient satisfaction was run for each case of the selected and by using the stepwise method in table 4.16. It illustrates that there were two significant independent variables insurance status and education level with p-value<0.05. Other variables such as age, gender, residential area, cost, LOS and income were not statistically significant to the probability satisfaction of each patient. Coefficient of independent variable Insurance was 1.393 with p=0.00, it means that $\ln(P_i/(1-P_i))$, linear predictor Z_i, of insured patient is 1.393 higher than that of uninsured patient. In other word, probability of satisfaction of insured patient is higher than that of uninsured patient.

Substitute mean of education equals 10.2 (schooling years), linear predictor for insured patient will be;

$$Ln(p_i/(1-p_i)) = -0.466 + 1.393*INSURANCE_i – 0.084*EDU_i$$

$Ln(p_i/(1-p_i)) = -0.466+1.393*1–0.084*10.2 = 0.0702$

$\therefore P_i/(1-P_i) = e^{0.0702} = 2.71^{0.0702} = 1.073$

Therefore, $P_i = 0.518$

And for uninsured patient,

$Ln(p_i/(1-p_i)) = -0.466+1.393*0–0.084*10.2 = -1.323$

∴ Pi/(1-Pi) = $e^{-1.323}$ = $2.71^{-1.323}$ = 0.266

Therefore, Pi = 0.210

Therefore, in general, insured patients are more satisfied than uninsured patients. In this equation the result also shows that the coefficient of independent variable education is 0.084 with $p < 0.05$. It means that for the patient with higher education, Ln (pi/(1-pi)) was less or for patient with higher education the probability of satisfaction was less.

Table 4.16 Regression for Satisfaction of inpatient

Method = Forward Stepwise (Likelihood Ratio)

	B	S.E.	Wald	df	Sig.	Exp(B)
Insurance status***	1.393	0.294	22.486	1	0.000	4.027
Education*	-0.084	0.039	4.552	1	0.033	0.920
Constant	-0.466	0.464	1.010	1	0.315	0.627

a Variable(s) entered on step 1: Insurance status
b Variable(s) entered on step 2: Education.
Note: (*p<0.05; **p<0.01; ***p<0.001)

Ln(pi/(1-pi)) = -0.466 + 1.393*INSURANCEi – 0.084*EDUi

Table 4.17 Insignificant variables for the Regression for satisfaction

Variables	Score	df	Sig.*
Age	2.159	1	0.142
Gender	3.572	1	0.059
Area of residence	1.536	1	0.215
Cost	0.362	1	0.547
LOS	1.002	1	0.317
Log(Income)	0.306	1	0.580
Overall Statistics	7.917	6	0.244

Note: (*) significance level corresponds to F-test, as (p <0.05) for respective variables.

From tables 4.17.1, 4.17.2, 4.17.3, 1.17.4, 4.17.5 and 4.17.6 illustrated that the relationship between satisfactions of patient for health care provided of the hospital. Concerning to the doctors and nurses practice: doctor's performance, nurse's performance, courtesy of doctor, courtesy of nurse, idea about LOS and costs of treatment for the inpatient care in the hospital, in general, insured patients were more satisfied than that of uninsured patients. From the results we can concluded that, insured patients received better service than that for uninsured patients. However, the result from table 4.17.2 (a) there was no correlation between satisfied and dissatisfied of insured patients and level of satisfied from the nurse's performance with $\chi^2 = 1.166$, p = 0.558, df = 1.

Table 4.17.1 The patient satisfied doctor's performance of IPD

(a) **Insured patient**

Insured patient	Level of satisfaction from doctor's performance		Total
	4 Good	5 Very good	
Dissatisfied	54	-	54
% within group	100%		100.0%
Satisfied	56	7	63
% within group	88.9%	11.1%	100.0%
Total	106	11	117
% within group	89.7%	9.4%	100.0%

(b) **Uninsured patient**

Uninsured patient	Level of satisfaction from doctor's performance		Total
	4 Good	5 Very good	
Dissatisfied	97	5	102
% within group	95.1%	4.9%	100.0%
Satisfied	26	-	26
% within group	100.0%	-	100.0%
Total	120	8	128
% within group	93.8%	6.3%	100.0%

Table 4.17.2 The patient satisfied nurse's performance of IPD

(a) **Insured patient**

Insured patient	Level of satisfaction from nurse's performance		Total
	3 Fair	4 Good	
	5	49	
% within group	9.3%	90.7%	100.0%
Satisfied	10	53	63
% within group	15.9%	84.1%	100.0%
Total	15	102	117
% within group	12.8%	87.2%	100.0%

$\chi^2 = 1.166$, p = 0.558, df = 1

(b) **Uninsured patient**

Uninsured patient	Level of satisfaction from nurse's performance		Total
	3 Fair	4 Good	
Dissatisfied	2	102	102
% within group	2.0%	98.0%	100.0%
Satisfied	5	21	26
% within group	19.2%	80.8%	100.0%
Total	7	121	128
% within group	5.5%	94.5%	100.0%

$\chi^2 = 16.320$, p = 0.000, df = 1

Table 4.17.3 The patient satisfied doctor's courtesy of IPD

(a) **Insured patient**

Insured patient	Level of satisfaction from doctor's courtesy	Total
	4 Good	
Dissatisfied	54	54
% within group	100.0%	100.0%
Satisfied	63	63
% within group	100.0%	100.0%
Total	117	117
% within group	100.0%	100.0%

(b) **Uninsured patient**

Uninsured patient	Level of satisfaction from doctor's courtesy			Total
	3 Fair	4 Good	5 Very good	
Dissatisfied	1	99	2	102
% within group	1.0%	97.1%	2.0%	100.0%
Satisfied	3	22	1	26
% within group	11.5%	84.6%	3.8%	100.0%
Total	4	121	3	128
% within group	3.1%	94.5%	2.3%	100.0%

Table 4.17.4 Patient satisfied nurse's courtesy and insurance status of inpatient

(a) **Insured patient**

Insured patient	Level of satisfaction from nurse's courtesy			Total
	3 Fair	4 Good	5 Very good	
Dissatisfied	0	53	1	54
% within group	0.0%	98.1%	1.9%	100.0%
Satisfied	2	59	2	63
% within group	3.2%	93.7%	3.2%	100.0%
Total	2	112	3	117
% within group	1.7%	95.7%	2.6%	100.0%

(b) **Uninsured patient**

Uninsured patient	Level of satisfaction from nurse's courtesy		Total
	3 Fair	4 Good	
Dissatisfied	17	85	102
% within group	16.7%	83.3%	100.0%
Satisfied	10	16	26
% within group	38.5%	61.5%	100.0%
Total	27	101	128
% within group	21.1%	78.9%	100.0%

$\chi^2 = 5.329$, p = 0.021, df = 1

Table 4.17.5 Assessment satisfaction for length of stay of patient and insurance status of inpatient

(a) **Insured patient**

Insured patient	Assessment satisfaction of LOS		Total
	3 Moderate	4 Long	
Dissatisfied	38	16	54
% within group	60.3%	29.7%	100.0%
Satisfied	44	19	63
% within group	69.8%	30.2%	100.0%
Total	82	35	117
% within group	70.0%	30.0%	100.0%

$\chi^2 = 2.126$, p = 0.547, df = 1

(b) **Uninsured patient**

Uninsured patient	Assessment satisfaction of LOS		Total
	3 Moderate	4 Long	
Dissatisfied	79	23	102
% within group	77.4%	22.6%	100.0%
Satisfied	19	7	26
% within group	63.1%	26.9%	100.0%
Total	98	30	128
% within group	76.6%	23.4%	100.0%

$\chi^2 = 9.602$, p = 0.022, df = 1

Table 4.17.6 Assessment Cost of treatment for satisfaction and insurance status of inpatient

(a) **Insured patient**

Insured patient	Level inpatient satisfaction for cost of treatment		Total
	2 Low	3 Fair	
Dissatisfied	45	9	54
% within group	83.3%	16.7%	100.0%
Satisfied	55	8	63
% within group	87.3%	12.7%	100.0%
Total	100	17	117
% within group	85.5%	14.5%	100.0%

$\chi^2 = 1.737$, p = 0.629, df = 1

(b) **Uninsured patient**

Uninsured patient	Level inpatient satisfaction for cost of treatment			Total
	2 Low	3 Fair	4 high	
Dissatisfied	34	5	63	102
% within group	33.4%	4.9%	61.7%	100.0%
Satisfied	18	8	-	26
% within group	69.2%	30.8%	-	100.0%
Total	52	13	63	128
% within group	40.6%	10.2%	49.2%	100.0%

4.2 Analysis of outpatient care

4.2.1 General status of outpatients

245 prescriptions of two selected diseases selected from OPD Department were interviewed. As table 4.18 illustrates that within 139 gastric disturbance patients, 61% were insured and 39% uninsured; within 106 outpatients having blood test for malaria, 70% were insured and 30% uninsured.

Table 4.18 Diseases of patient and insurance status of outpatient

Diseases	Insurance status		Total
	Uninsured	Insured	
Gastric disturbance	54	85	139
% within gastric disturbance	38.8%	61.2%	100.0%
Having blood test	32	74	106
% within Having blood test	30.2%	69.8%	100.0%
Total	86	159	245
% of Total	35.1%	64.9%	100.0%

$\chi^2 = 1.994$, p = 0.178, df = 1

Tables 4.19, 4.20 and 4.21 show general information of outpatients. In all age groups of outpatient, the percentages of the insured patients were higher than the uninsured: within the age group of 15-49 years old, the insured patients were 53%; the age group of 50-60 years old 87%; and the age group over of 60 years old 78%. The insurance status was correlated with age group with $\chi^2 = 28.882$, p = 0.000, df = 2.

The percentage of the female patients with insurance was higher than that of the patients without insurance (72% and 28%), but for male patients, the percentages of the insured and uninsured were both 50%. There were correlated between group of gender for insured and uninsured patient with $\chi^2 = 10.928$, p = 0.001, df = 1

Regarding residential area of outpatients, insured patients in both urban and rural residents were highly than uninsured patient (64% for the urban residents and 80% of rural residents were insured). However, the result from the table found that there were in statistically significance between insurance status and area of resident.

Table 4.19 Age group of patient and Insurance status of outpatient

Age group	Insurance status		Total
	Uninsured	Insured	
15-49	73	83	156
% within age group	46.8%	53.2%	100.0%
50-60	9	62	71
% within age group	12.7%	87.3%	100.0%
>60	4	14	18
% within age group	22.2%	77.8%	100.0%
Total	86	159	245
% of Total	35.1%	64.9%	100.0%

$\chi^2 = 28.882$, p = 0.000, df = 2

Table 4.20 Gender of patient and insurance status of outpatient

Gender	Insurance		Total
	Uninsured	Insured	
Female	47	120	167
% within gender	28.1%	71.9%	100.0%
Male	39	39	78
% within gender	50.0%	50.0%	100.0%
Total	86	159	245
% of Total	35.1%	64.9%	100.0%

$\chi^2 = 10.928$, p = 0.001, df = 1

Table 4. 21 Resident of patient and insurance status of outpatient

Residence area	Insurance		Total
	Uninsured	Insured	
Rural	4	16	20
% within area	20.0%	80.0%	100.0%
Urban	82	143	225
% within area	36.4%	63.6%	100.0%
Total	86	159	245
% of Total	35.1%	64.9%	100.0%

$\chi^2 = 2.371$, p = 0.220, df = 1

As the result from table 4.22 shows the education levels of outpatients, the higher education level of outpatients was less insured; only 41% of group members were insured, 59% were non-insured. Other education levels were highly insured; 69% of primary school level, 84% of secondary level, and 67% of high school level patients were having insurance. There was correlation between groups of education level and insurance statuswith $\chi^2 = 36.558$, p = 0.000, df = 3.

Table 4.22 Education level and insurance status of outpatient

Education level	Insurance status		Total
	Uninsured	Insured	
Primary school	12	27	39
% within education level of out patient	30.8%	69.2%	100.0%
Secondary school	15	78	93
% within education level of out patient	16.1%	83.9%	100.0%
High school	11	21	32
% within education level of out patient	34.4%	65.6%	100.0%
Higher than high school	48	33	81
% within education level of out patient	59.3%	40.7%	100.0%
Total	86	159	245
% of Total	35.1%	64.9%	100.0%

$\chi^2 = 36.558$, p = 0.000, df = 3

The table 4.23 illustrates the income level of outpatients and insurance status. Monthly income was classified into five quintiles; the group 1 was patient with lowest income per capita, then higher and the highest was group 5. There was remarkable difference between low income and high income groups. Within low-income groups, majority of patients, 81% and 95% of group 1 and 2 respectively were insured. On the other hand, in the higher income groups, the percentages of the insured patients were lower; 48%, 46% and 44% were insured in the group 3, 4 and 5 respectively.

Table 4.22.1 Classify groups of income by five quintile

Group of income	Mean	N	Std. Deviation	Minimum	Maximum
1	189.68	31	60.91	60.00	250.00
2	300.00	73	0.00	300.00	300.00
3	437.60	48	59.51	340.00	500.00
4	718.75	48	88.50	550.00	800.00
5	1136.67	45	340.19	850.00	2000.00
Total	548.71	245	360.93	60.00	2000.00

Table 4.23 Income by quintile groups of patient and insurance status of outpatient

Income group	Insurance status		Total
	Uninsured	Insured	
Group 1	6	25	31
% within group	19.4%	80.6%	100.0%
Group 2	4	69	73
% within group	5.5%	94.5%	100.0%
Group 3	25	23	48
% within group	52.1%	47.9%	100.0%
Group 4	26	22	48
% within group	54.2%	45.8%	100.0%
Group 5	25	20	45
% within group	55.6%	44.4%	100.0%
Total	86	159	245
% of Total	35.1%	64.9%	100.0%

Table 4.24 and 4.25 show that the average of cost of services for the insured was higher while the average waiting time spent by one insured patient was much lower. It means that insured patients were treated faster than the uninsured patients and the care provided for the inpatients were relatively better because the insurance agency could reimburse more for the hospital. This is significant different with $t = 33.66$, $p=0.000$, $df = 244$.

The average waiting time for the insured patient was shorter than the uninsured: around 35 min for the insured and 65 min for the uninsured. This is significant different with $t = 21.68$, $p = 0.000$, $df = 244$. The uninsured patients had to wait for long time to get consultation from doctor, thus they were less satisfied than the insured.

Table 4.24 Means of cost and insurance status of outpatient

Insurance status	Mean of cost	N	Std. Deviation	Minimum	Maximum
Uninsured	111.87	159	62.792	60	300
Insured	193.97	86	67.779	55	430
Total	165.16	245	76.748	55	430

$t = 33.66$, $p = 0.000$, $df = 244$

Table 4.25 Means of waiting time and insurance status of outpatient

Insurance status	Mean of Waiting time	N	Std. Deviation	Minimum	Maximum
Uninsured	64.47	159	36.676	10	120
Insured	35.03	86	35.344	5	120
Total	54.13	245	38.785	5	120

$t = 21.68$, $p = 0.000$, $df = 244$

4.2.2 Medical procedures

The level of PCSP and PCSD were used to evaluate the medical procedures of doctors for outpatients, which can indicate the quality of care. Prescriptions for outpatients

were examined and PCSP and PCSD were determined for each patient in terms of the level of conformity to the standard guidelines. The scores of PCSP and PCSD were compared between insured and uninsured groups.

As table 4.26 illustrates that the PCSP of the insured were only at good and excellent levels (73% and 27%) and that of the uninsured were half good (50%) and half excellent levels (50%); The insurance status were correlated with level of PCSP with $\chi^2 = 11.675$, p = 0.000, df = 1.

Table 4.27 shows, however, the mean of PCSP, it was almost the same but the level of PCSP of the insured patients was a little higher than that of the uninsured; 84.767 and 84.186 respectively. There was significant difference between insured and uninsured in terms of PCSP, with t = -56.22, p=0.000 and df = 244.

Table 4.26 Level of PCSP and insurance status of outpatient

Level of PCSP	Insurance status		Total
	Uninsured	Insured	
Good	43	116	158
% within Insurance status	50%	73.0%	64.9%
Excellence	43	43	86
% within Insurance status	50.0%	27.0%	35.1%
Total	86	159	245
% within Insurance status	100.0%	100.0%	100.0%

$\chi^2 = 11.675$, p = 0.000, df = 1

Table 4.27 Mean of PCSP and Insurance status of out patient

Insurance status	Mean	N	Std. Deviation	Minimum	Maximum
Uninsured	84.186	86	1.09507	60.0	100.0
Insured	84.767	159	0.73564	70.0	100.0
Total	84.563	245	0.87690	60.0	100.0

t = -56.22, p=0.000 and df = 244

Concerning the compliance with standard drug prescription for outpatients, the level of PCSD was compared between the insured and uninsured patients. Table 4.28 and 4.29 show the level and the mean of PCSD of outpatient. At excellence level the insured was higher than the uninsured (54% and 26%) but at the good level, the percentage of the insured was much lower (46% and 74%); with χ^2 = 18.48, p = 0.000, df = 1, there were correlated between group of insured and uninsured patient in term of PCSP level.

Table 4.29 illustrates that mean of PCSD of the insured were higher than that of the uninsured (84.434 and 81.337 respectively) with significant t =-145.67, p=0.000 and df= 244. It means that the insured had better opportunity to receive proper drug prescription or in other word they may get higher quality than uninsured patient.

Table 4.28 Level of PCSD and insurance status of outpatient

Level of PCSD	Insurance status		Total
	Uninsured	Insured	
Good	64	74	137
% within Insurance status	74.4%	46.5%	55.9%
Excellence	22	85	107
% within Insurance status	25.6%	53.5%	43.7%
Total	86	159	245
% within Insurance status	100.0%	100.0%	100.0%

χ^2 = 18.48, p = 0.000, df = 1

Table 4.29 Mean of PCSD and Insurance status of out patient

Insurance status	Mean	N	Std. Deviation	Minimum	Maximum
Uninsured	81.337	86	.81322	70.0	100.0
Insured	84.434	159	.92089	60.0	100.0
Total	83.347	245	.89524	60.0	100.0

t=-145.67, p=0.000 and df= 244

4.2.3 Satisfaction of outpatients

As the results from table 5.30 illustrated the percentage of satisfaction of outpatients about the services of hospital, in general the level of satisfaction of the insured was fair with 49 % on the other hand; the uninsured was less satisfied with the services only 5% satisfied and 95% unsatisfied. It means that among out patient, the insured were more satisfied than the uninsured. There was correlated between group of insured and uninsured patient and the satisfaction of healthcare service at the hospital with $\chi^2 = 59.60$, p = 0.000, df = 1.

Table 4.30 Satisfaction of outpatient and insurance status of outpatient

	Insurance status		Total
	Uninsured	Insured	
Not satisfied	82	81	163
% within Insurance status	95.3%	50.9%	66.5%
Satisfied	4	78	82
% within Insurance status	4.7%	49.1%	33.5%
Total	86	159	245
%	100.0%	100.0%	100.0%

$\chi^2 = 59.60$, p = 0.000, df = 1

Logistic regression to study the association of different factors on patient satisfaction by stepwise method was used. From results in the table 4.31, coefficient of independent variable Insurance is 3.201 with p=0.00 it means that Ln(Pi/(1-Pi)), linear predictor Zi, of insured patient is 3.201 higher than that of uninsured patient, in other word, probability of satisfaction of insured patient is higher than that of uninsured patient. Therefore, in general, insured patients are more satisfied than uninsured patients.

In this equation the result showed that the coefficient of independent variable of gender is 0.741 with p= 0.038. It means that Ln (Pi/(1-Pi)) of male is 0.741 higher than female, and in other word, probability of satisfaction of male patient is higher than that of female patient.

Suppose for male insured patient, linear predictor will be;

$$\text{Ln (Pi/(1-Pi))} = -3.418 + 3.201\ \text{INSURANCEi} + 0.741\ \text{GENDERi}$$

Ln (Pi/(1-Pi)) = −3.418+3.201*1+0.74*1=0.523

∴ Pi/(1-Pi) = $e^{0.523}$=$2.71^{0.523}$= 1.687

Therefore, Pi = 0.628

And for male uninsured patient;

$$\text{Ln (Pi/(1-Pi))} = -3.418 + 3.201\ \text{INSURANCEi} + 0.741\ \text{GENDERi}$$

Ln (Pi/(1-Pi)) = −3.418+3.201*0+0.74*1=-2.678

∴ Pi/(1-Pi) = $e^{-2.678}$=$2.71^{-2.678}$= 0.0687

Therefore, Pi = 0.064

We can see that the probability of satisfaction of insured patient was much higher than uninsured patient.

Table 4.31 Regression for Satisfaction of outpatient

Block 1: Method = Forward Stepwise (Likelihood Ratio)

	B	S.E.	Wald	df	Sig.	Exp(B)
Gender **	0.741	0.357	4.316	1	0.038	2.098
Insurance status ***	3.201	0.555	33.232	1	0.000	24.556
Constant ***	-3.418	0.559	37.388	1	0.000	0.033

a Variable(s) entered on step 1: Insurance status.

b Variable(s) entered on step 2: Gender
Note: (*p<0.05; **p<0.01; ***p<0.001)

$$Ln(pi/(1-pi))= -3.418+3.201 \text{ INSURANCE} + 0.741 \text{ GENDER}$$

Table 4.31.1 Classification Table

Observed			Predicted		
			Satisfaction		Percentage Correct
			Yes	No	
Step 1	Satisfaction	Yes	163	0	100.0
		No	82	0	0.0
	Overall Percentage				66.5
Step 2	Satisfaction	Yes	149	14	91.4
		No	57	25	30.5
	Overall Percentage				71.0

a The cut value is .500

As the results from the tables 4.32, 4.32.1, 4.32.2, 4.32.3, 4.32.4, 4.32.5 and 4.32.6 show the relationship of the insured and the uninsured with satisfaction about doctor's performance, nurse's performance, attitude of doctors and nurses, consultation, time waiting for consultation and cost of treatment for outpatients of the hospital; there were similar situation insured and uninsured patient.

Table 4.32 Patient satisfied doctor's performance and insurance status of outpatient

(a) **Uninsured patient**

Uninsured patient	Level satisfaction from doctor's performance				Total
	2 Poor	3 Fair	4 Good	5 Very good	
Satisfied	1	5	73	3	82
% within group	1.2%	6.1%	89.0%	3.7%	100.0%
Dissatisfied	0	1	3	0	4
% within group	0.0%	25.0%	75.0%	0.0%	100.0%
Total	1	6	76	3	86
% within group	1.2%	7.0%	88.4%	3.5%	100.0%

(b) **Insured patient**

Insured patient	Level satisfaction from doctor's performance				Total
	2 Poor	3 Fair	4 Good	5 Very good	
Satisfied	0	5	76	0	81
% within group	0.0%	6.2%	93.8%	0.0%	100.0%
Dissatisfied	1	4	72	1	78
% within group	1.3%	5.1%	92.3%	1.3%	100.0%
Total	1	9	148	1	159
% within group	0.6%	5.7%	93.1%	0.6%	100.0%

Table 4.32.1 Patient satisfied nurse's performance and insurance status of outpatient

(a) **Uninsured patient**

Uninsured patient	Level of satisfaction from nurse's performance		Total
	3 Fair	4 Good	
Satisfied	6	76	82
% within group	7.3%	92.7%	100.0%
Dissatisfied	3	1	4
% within group	75.0%	25.0%	100.0%
Total	9	77	86
% within group	10.5%	89.5%	100.0%

$\chi^2 = 12.123$, p = 0.000, df = 1

(b) **Insured patient**

Insured patient	Level of satisfaction from nurse's performance				Total
	2 Poor	3 Fair	4 Good	5 Very good	
Satisfied	0	6	75	0	81
% within group	0.0%	7.4%	92.6%	0.0%	100.0%
Dissatisfied	1	3	73	1	78
% within group	1.3%	3.8%	93.6%	1.3%	100.0%
Total	1	9	148	1	159
% within group	0.6%	5.7%	93.1%	0.6%	100.0%

Table 4.32.2 Patient satisfaction from doctor's courtesy and insurance status of outpatient

(a) **Uninsured patient**

Uninsured patient	Level of satisfied doctor's courtesy		Total
	3 Fair	4 Good	
Satisfied	4	78	82
% within group	4.9%	95.1%	100.0%
Dissatisfied	1	3	4
% within group	25.0%	75.0%	100.0%
Total	5	81	86
% within group	5.8%	94.2%	100.0%

(b) **Insured patient**

Insured patient	Level of satisfied doctor's courtesy		Total
	3 Fair	4 Good	
Satisfied	13	68	81
% within group	15.6%	84.0%	100.0%
Dissatisfied	8	70	78
% within group	10.3%	89.7%	100.0%
Total	21	137	159
% within group	13.2%	86.8%	100.0%

Table 4.32.3 Patient satisfaction from nurse's courtesy and insurance status of outpatient

(a) **Uninsured patient**

Uninsured patient	Level of satisfied nurse's courtesy		Total
	3 Fair	4 Good	
Satisfied	12	74	82
% within group	14.0%	86.0%	100.0%
Total	12	74	86
% within group	14.0%	86.0%	100.0%

(b) **Insured patient**

Insured patient	Level of satisfied nurse's courtesy		Total
	3 Fair	4 Good	
Satisfied	18	63	81
% within group	22.2%	77.8%	100.0%
Dissatisfied	17	61	78
% within group	21.8%	78.2%	100.0%
Total	34	123	159
% within group	22.5%	77.5%	100.0%

$\chi^2 = 2.898$, p = 0.368, df = 1

Table 4.32.4 Patient satisfaction from consultation time and insurance status of outpatient
(a) **Uninsured patient**

Uninsured patient	Level of satisfied Consultation time		Total
	3 Moderate	4 Much	
Satisfied	79	4	83
% within group	95.1%	4.9%	100.0%
Total	79	4	86
% within group	95.1%	4.9%	100.0%

(b) **Insured patient**

Insured patient	Level of satisfied Consultation time			Total
	2 Little	3 Moderate	4 Much	
Satisfied	10	39	32	81
% within group	12.3%	48.1%	39.5%	100.0%
Dissatisfied	7	45	26	78
% within group	9.0%	57.7%	33.3%	100.0%
Total	17	84	58	159
% within group	10.7%	52.8%	36.5%	100.0%

$\chi^2 = 1.513$, p = 0.487, df = 1

Table 4.32.5 Patient satisfaction from waiting time and insurance status of outpatient
 (a) **Uninsured patient**

Uninsured patient	Waiting time of outpatient				Total
	2 Short	3 Moderate	4 Long	5 Too long	
Satisfied	1	66	11	4	82
% within group	1.2%	80.5%	13.4%	4.9%	100.0%
Dissatisfied	1	2	1	0	4
% within group	25.0%	50.0%	25.0%	0.0%	100.0%
Total	2	68	12	4	86
% within group	2.3%	79.1%	14.0%	4.7%	100.0%

(b) **Insured patient**

Insured patient	Level of satisfied Waiting time		Total
	3 Moderate	4 Long	
Satisfied	62	19	81
% within group	71.5%	28.5%	100.0%
Dissatisfied	55	23	78
% within group	70.5%	29.5%	100.0%
Total	117	42	159
% within group	72.3%	23.9%	100.0%

Table 4.32.6 Patient satisfaction from Cost of treatment and insurance status of outpatient

(a) **Uninsured patient**

Uninsured patient	Level of satisfied Cost of treatment		Total
	3 Fair	4 High	
Satisfied	64	22	86
% within group	74.5%	25.5%	100.0%
Total	64	22	86
% within group	74.5%	25.5%	100.0%

(b) **Insured patient**

Insured patient	Level of satisfied Cost of treatment		Total
	2 Low	3 Fair	
Satisfied	39	42	81
% within group	48.1%	51.8%	100.0%
Dissatisfied	41	37	78
% within group	52.6%	47.4%	100.0%
Total	80	79	159
% within group	52.2%	47.8%	100.0%

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The quality of care is the most important for improving quality of life of population in Lao PDR. Health care problem is a main issue in the policy of government to reduce the mortality rate and morbidity rate, especially in the regions where these rates are high. In terms of health expenditures, the country depends upon the source of households who pay large amount from their own pocket, while monthly earnings of households are low. The health insurance is an important part for health expenditure, and it can reduce the burden of the individuals who earn low income. However, the health insurance system is still new in Lao PDR, only few percentage of health expenditure is covered by the insurance.

5.1.1 The quality of care

The quality of care for the insured and uninsured patients at Mahosoth hospital was compared on basis of process and outcome approaches. The tracer method was applied in this study to analyze the quality of care. For IPD, pneumonia, malaria, diarrhea and parasitosis were chosen; for OPD, gastric disturbance and having blood test for malaria were selected. The explicit method was applied in evaluating the process of care; the national standard treatment guidelines were used as criteria. The level of compliance to the standard treatment guidelines was compared between the insured patients and uninsured patients. The patient satisfaction was considered as an important aspect of outcome assessment of health care. An interview on patient satisfaction was designed to compare the level of satisfaction between the insured and the uninsured.

5.1.2 General information of patients

Data including medical records and questionnaires on 245 patients in IPD department suffering from four diseases and 245 patients in OPD department were collected, according to the methodology outlined in this research. Within 245 inpatients, there were 73 pneumonia with 40% insured and 60% uninsured, 73 malaria with 49% insured and 51% uninsured, 74 diarrhea with 53% insured and 47% uninsured, and 25 parasitosis with 52% insured and 48% uninsured. Within 245 outpatients, 139 gastric disturbance patients with 61% insured and 39% uninsured; 106 having blood test for malaria patients with 70% insured and 30% uninsured were surveyed.

5.1.3 Results of the analysis

As the results of analysis of inpatient care, there was statistically significant difference between the insured and uninsured patients; in terms of medical procedures of doctors treatment with $t = -72.206$, $p = 0.000$ and $df = 244$, the excellence level of the percentage of conformed standard procedure of doctors treatment (PCSP) of the insured patients was higher than uninsured. On other hand, length of stay (LOS) of the insured was shorter than that of the uninsured. The result of the multiple regression of LOS confirmed the effect of insurance enrollment on shorter LOS. Besides the malaria and pneumonia were positive related with LOS and statistically significant with income of patient, insurance enrollment, cost of treatment, PCSP and PCSD were negative related with LOS. The higher level of compliance to the standard treatment was correlated with the shorter LOS, and this relationship was negative statistically significant.

The analysis on the satisfaction of inpatient was carried out to evaluate outcomes of care. The number of the insured patients satisfied was more than that of the uninsured. From the result of regression, insurance enrollment and education were statistically significant to the probability of satisfaction. The insured patients were likely to be satisfied while the higher education were unlikely to be content with the service provided.

The difference in satisfaction between two insurance statuses is caused by payment method. The insured patients were not necessary to pay for the treatment when they are visiting or admitted to the hospital. On the other hand, the uninsured had to spend all the expenses at each time, thus they concerned the price of services. The doctors' procedures

were also influence by the insurance status, because they don't worry about the expenses on their patients with insurance, and can provide proper treatment following the national standard treatment guideline.

According to the analysis of outpatient care, the number of the insured was greater than the uninsured. Similarly to the inpatient analysis, the insured were more satisfied than that uninsured patient. From the result of regression, insurance enrollment and gender were statistically significant, and positively related to the satisfaction. Waiting time for consultation from doctors was one factor that all patients were complaining about, but it was not statistically significant. The payment method for the care was also affecting the satisfactory of the patients. Regarding the PCSP and PCSD for outpatient, they are also indicators to assess the quality of care in terms of medical procedures. From the results of level of PCSP of outpatient, the insured patients received higher attention of the doctors than the uninsured, with proper procedures following the standard treatment guidelines. Similarly to the score of PCSD, the excellence level was highest percentage for the insured. It means that the insurance status has influence on the quality of care provided from the doctors. In conclusion based on the results, there was not strongly but slightly difference in the quality of care between the insured and uninsured patients.

The process and outcome assessment revealed that the insured patients were provided better services than the uninsured in Mahosoth hospital. Additionally, payment methods for the medical fees were affecting the patients satisfactory. The health insurance is the important financial sources for the health care expenditure; however, the proportion of this source is still small. The increase in the coverage of health insurance is the immediate concerns in Lao health sector.

5.2 Recommendations

Following recommendation is being suggested based on this research on the effects of health insurance on the quality of care. The assessment of quality of healthcare under health insurance is very important, not only for the health insurance agency and the health insured patient but also for the health policymakers.

Currently, quality of care issues do not receive much attention in Lao PDR The standards of quality of care to be followed by the health service providers must be facilitated in order to assess the quality of care in healthcare service. In practice, indicator of quality of care, i.e. national standard treatment guideline and national standard drug prescription, is not utilized or not concerned by both health providers and policymakers. Therefore, the practitioners should conform to these two guidelines and government must monitor their compliance with the guidelines. It is recommended to learn from experiences of the neighboring countries such as Vietnam, Thailand and China.

1. In this research it was found that the patient who has insurance receive better healthcare and many insured patients are likely satisfied with the services of the hospital. Health insurance helps patient to reduce their burden of payment when they get ill seriously and especially for who has low income. The government or concerned should extent the health insurance for all population in the whole country. Encouragement of the people with sufficient information to enroll the health insurance is also important.

2. The waiting time of outpatient is another factor affecting satisfaction to the healthcare services at the hospital. From the interview with the patients about waiting time, it was found that there were many requests to reduce time for waiting and patients were comparing with other hospitals in terms of waiting time rather than quality of care. Because patients have to wait so long time for get consultation from doctor. The policy maker should improve the waiting time to be shorter.

3. From the research on performance of medical procedures in the hospital, the level of conformity to national standard treatment guideline and standard drug prescription was not adequate enough. Thus, in order to improve the medical procedures nationwide, motivation and incentive should be provided to the practitioners. In other words, technical support and training to the health workers is essential to retain better quality of care at all the level of health services.

4. Healthcare expenditure is a major issue on the national economics. Health insurance is one of main financial resources of health care, however, only 4% of total budget in Mahosoth Hospital are covered by the source of health insurance. Since health insurance has a role to mobilize funds from private sector for health services, it is necessary to establish appropriate health insurance systems. Besides, the increase in enrollment of health insurance provides more motivation and resources to the health providers, which leads to improve the quality of care.

5. Securing healthcare for all the people is crucial to achieve the overall goal of Lao heath policy: to improve the needed of health and quality of life of population. Low utilization of health care facilities due to lack of funds and poor access especially in rural areas is one of main issues in health sector. Health insurance plays a role of providing funds to households in the events of illness and securing the access to the health services. However, the concept of insurance is still new for the people in Laos, and they are not used to pre-pay for goods or services. Thus, the government, health providers, and health insurance agency are required to motivate the people with adequate communication. Furthermore, enrollment of current health insurance system is mainly formal private sector employees, but majority of population is either public officers or informal/self-employed workers. Therefore government is required to arrange the structure and regulations for more efficient system to mobilize the resource from the public.

5.3 Limitation of the study

This study cannot avoid from certain limitation due to several reasons.

First, time for data collection was too short compared to the amount of date required. Therefore some information was not sufficient to develop further discussion about quality of care and health insurance enrollment.

In addition, because of limited time and budget for this research, only explicit method was applied for measurement process of care. The standard guidelines are convenient but it is not versatile to some extent. The implicit method using the expert perspectives could be used for more accurate investigation.

Finally, there was limitation of interview place with patients in the hospital: we had to carry out the interviews near the doctors or nurses. This maybe resulted in some biased answers in favor of the hospital, and the level of satisfaction was rather high.

Impact; there are varied of indicators assessment quality of care for health service. In each country had own set of indicator. In this study used only three indicators that were LOS, conformed of doctor treatment (PCSP, PCSD) and satisfaction to illustrate quality of care at Mahosoth hospital in Lao PDR. With these three indicators, it may not adequately measure the quality of care in Lao PDR.

5.4 Suggestion for the further study

For the further study, the methodology also could be implemented to analyze the quality of care at the other hospitals, where in some locations there are similar problems. To assessment quality of health care between patient with health insurance and patient without health insurance using the indicators such as length of say, medical procedures of doctor and patient satisfaction at the hospital.

However, to assess the quality of care is not only to use the explicit method, but there are some methodologies to measurement it as well such as qualitative and implicit method; the management of the hospital: feasibility, acceptability, appropriateness and technical process: reliability and validity.

The research methodology of this study also serves as an introduction to policy makers to design extent of the compulsory health insurance scheme in order to operating health insurance scheme more efficiently.

REFERENCES

Abel-Smith Bian, Aviva Ron, and Giovanni Tamburi (1990). Health insurance in developing countries: The social security approach. International Labour Office, Geneva

Abel-Smith, B. (1992). "Health Insurance in developing countries: Lesson from experience".Health Policy and Planing 7 (3): 215-236

Baker, R. and Fraser, C. (1995). "Development of review criteria: linking guidelines and assessment of quality". British Medical Journal 311: 370-373

Brook, R. H. (1989). "Practice guidelines and practicing medicine: Are they compatible". Journal of American Medical Association 262 (21):3027-3030

Brook, R. H. (1996). " Quality of Health Care". The new England Journal of Medicine 335 (13): 966-969

Committee for Planning and Cooperation (2003). Report of the Lao Reproductive Health Survey 2000, National Statistical Center, Vientiane.

Daniel, W. W. (1995). Biostatistics: a foundation for analysis in the health sciences. The Wiley and Sons.

Delbanco, T. L. (1996). "Quality of care through the patient's eyes". British Medical Journal313: 832-833

Donabedian, A. (1988). " The quality of care: How can it be assessed". Journal of American Medical Association 260 (12): 1743-1748

Indaratna, K. (1996). "Satisfying consumer choice: A quality issue in health sector". Southeast Asian Journal of Tropical Medicine in Public Health 27(3):415-417

JAMA, selected questions and answers: Selected from 1966 issued of the Journal of the American Medical Association. Chicago 1967, 262(1): 57-63

Jencks, S. F. (1995). "Measuring quality of care under Medicare and Medicaid". Health Care Financing Review 16(4): 39-54

Kelsey, w. Douglas Thompson, Jennifer L. and Alfreds. Evans. (1986). Methods in observational epidemiology. Oxford University Press, New York.

Kutzin, J. and Barnum, H. (1992). How health insurance affects the delivery of health care in developing countries. Policy research working papers, population and Human resources World Bank.

Ministry of Health and Japan International Cooperation Agency (JICA) (2002). "Lao Health Master Planning Study", Ministry of Health, Lao PDR

Ministry of Labour and Social Welfare (MLSW) (2002) Annual Report in 2001-2002, Lao PDR.

Phua Kai Hong (1993). Financing Health Care. National University of Singapore.

Racoveanu, N. T. and Johansen K. S. (1995). "Technology for the continuous improment of the quality of health care". World Health Forum, 16

Rosner, Bernard A, (1995). -4th ed. Fundamentals of Biostatistics.

Rossiter, L. F., et al., (1989). "Patient satisfaction among elderly enrollees and disenrollees in Medicare Health Maintenance Organizations: Results from the National

Siriwanarangsun, P. (1996). The response of the private sector to competitive contracting: A case study of a private health provider network in Thailand. Ph.D thesis, LondonSchool of Hygiene and Tropical Medicine.

Steffen, G. E. (1988). "Quality medical care: A definition". Journal of American Medical Association 260(1): 56-61

Supachutikul, Anuwat. (1996). Situation analysis on Health Insurance and future development. Health System Research Institute. Chulalongkorn University, Bangkok

WHO (1993) Drug utilization studies: Method and uses. Geneva

WHO (1993) Evaluation in recent changes in the financing of health system. Geneva

WHO (1987) Health care-Who pay. Geneva

World Bank (1996). World Development Report 1996: From plan to market.

     Oxford University Press.

Yong, Tai-Soon, Deodato, G. and Phommasack, B. et al (2003) "Prevalence of intestinal parasite infections on a national scale among primary schoolchildren in Laos". Parasitology Research
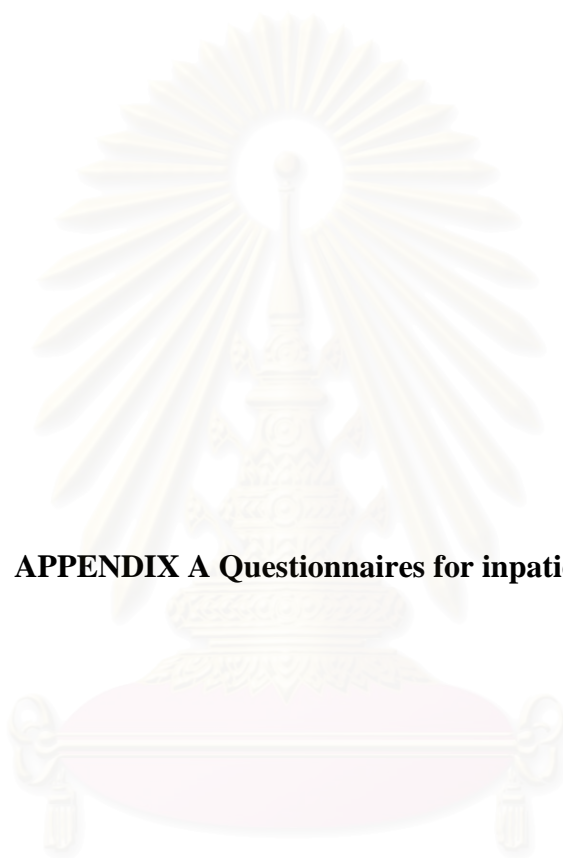
APPENDIX A Questionnaires for inpatient

Questionnaires

(Used for In-patient)

Patient's ID: ……………………

1. Age (years): ……………….

2. Sex:
   1. Male ☐   2. Female ☐

3. Educational status:
   1. Primary school and lower ☐   2. Secondary school ☐
   3. Vocational school ☐   4. Graduate ☐
   5. Post-graduate ☐

4. Area of residence:
   1. Rural ☐   2. Urban ☐

5. Monthly income (Kip):…………………….

6. Insurance enrollment:
   1. Insured ☐   2. Non-insured ☐

7. What are kind of your illnesses?

………………………………………………………………………………………………

8. How much does you pay by yourself (Kip)? …………………………

9. Length of stays (days): ┌──────────────────────┐
                           └──────────────────────┘

10. Do you think that the nurses and doctors have given you enough information about your treatment?
    1. Yes ☐   ---
    2. No ☐   ---

11. Were the nurses or doctors willing to answer your questions?
    1. Yes ☐   ---
    2. No ☐   ---

	Very poor (1)	Poor (2)	Fair (3)	Good (4)	Very good (5)
12.What do you think about the doctor's performance?					
13.What do you think about the nurse's performance?					
14.What do you think about the courtesy of doctor?					
15.What do you think about the courtesy of nurse?					
	Too short (1)	Short (2)	Moderate (3)	Long (4)	Too long (5)
16.What do you think about LOS?					
	Too Low (1)	Low (2)	Fair (3)	High (4)	Very high (5)
17.What do you think about hospital charge?					

18.Are the admission activities simple and favorable to you?

      1. Yes ☐ ---

      2. No ☐ ---

19.Were you comfortable at ward?

      1. Yes ☐ ---

      2. No ☐ ---

20.What do you think about the cleanness of hospital?

      1.Good ☐ --

      2. No Good ☐ --

21.If you were given medicine to take home, do you know what it is for and how you should take it?

       1. Yes ☐ ---

       2. No ☐ --

22.Has someone explained to you how you can help yourself to get better when you are at home?

       1. Yes ☐ ---

       2. No ☐ ---

23.Do you think that the treatment you received in hospital has improved your condition?

       1. Yes ☐ ---2.

       No ☐ ---

24.Do you satisfy with services provided by hospital?

       1. Yes ☐ ---

       2. No ☐ ---

APPENDIX B Questionnaires for outpatient

Questionnaires

(Used for Out-patient)

Patient's ID: ……………………

1.Age (years):………………….

2.Sex:

  2. Male ☐   2. Female ☐

3.Educational status:

      1. Primary school and lower ☐   2. Secondary school ☐

      3. Vocational school ☐   4. Graduate ☐

      5. Post-graduate ☐

4.Area of residence:

      1. Rural ☐   2. Urban ☐

5.Monthly income (Kip): …………………….

6.Insurance enrollment:

      1. Insured ☐   2. Non-insured ☐

7.What is kind of your illness?

      1. Gastric disturbance syndrome ☐   2. Patients having blood test ☐

8.How much do you pay by yourself (Kip)? ☐

9.How long did you wait for consultation? …………….(minute)

10.How long did the doctor spend time for your consultation? ……………..(minute)

11.Do you think that the nurses and doctors have given you enough information about your treatment?

      1. Yes ☐ ---

      2. No ☐ ---

12.Were the nurses or doctors willing to answer your questions?

      1. Yes ☐ ---

      2. No ☐ ---

	Very poor (1)	Poor (2)	Fair (3)	Good (4)	Very good (5)
13.What do you think about the doctor's performance?					
14.What do you think about the nurse's performance?					
15.What do you think about the courtesy of doctor?					
16.What do you think about the courtesy of nurse?					
	Too little (1)	Little (2)	Moderate (3)	Much (4)	Too much (5)
17.What do you think about consultation time?					
	Too short (1)	Short (2)	Moderate (3)	Long (4)	Too long (5)
18.What do you think about waiting time?					
	Too Low (1)	Low (2)	Fair (3)	High (4)	Very high (5)
19.What do you think about hospital charge?					

20.Are the admission activities simple and favorable to you?

    1. Yes ☐   ---

    2. No ☐   ---

21.What do you think about the cleanness of hospital?

       1. Good   [   ] --

       2. Not good. [   ] --

22.If you were given medicine to take home, do you know what it is for and how you should take it?

       1. Yes [   ] ---

       2. No [   ] --

23. What do you think about the facilities of hospital?

       1. Yes [   ] ---

       2. No [   ] ---

24.Do you satisfy with services provided by hospital?

       1. Yes [   ] ---

       2. No [   ] --

APPENDIX C Table of indicator for malaria disease (PCSP)

The sample of table for Malaria indicator of inpatient care (PCSP)

ªö¸§š¸ñ© ²½¨¾©Ä¢É´¾ì¾Àìñ¨ ¦¿ìñ®£öÀ¥ñ®ºÂ»¤Ïð

				Bacground	Diagnose			Treatment					Diagnose	
No.	Age	Weight	About treated before	Symptom 3	Symptom 2	Check-- up	No check up	Drug follow the guideline	Number of drug	Duration	Other drug follow the guideline	Getting better	Day's 3	Day's discharge
1	55	0.5	0.5	2		1	-1	1	1	1		1	1	1
2	37	0.5	0	2		1		1	0	1	-2	1	1	
3	20	0.5	0.5	2		1		0	1	1	-2	1	1	
4	40	0.5	0	2		1		1	1	1		1	1	1
5	30	0.5	0.5	2		1	-1	1	1	1		1	1	
6	37	0.5	0.5	2		1		0	1	1		1	1	1
7	28	0.5	0.5	2		1		1	1	1	-2	1	1	
8	31	0.5	0.5	2		1		1	1	1		1	1	
9	26	0.5	0.5	2				1	1	1		1	1	
10	38	0.5	0.5	2		1		0	1	1		1	1	
11	24	0.5	0	2		1		1	1	1	-2	1	1	
12	33	0.5	0.5	2		1		1	1	1		1	1	
13	21	0.5	0.5	2		1	-1	1	1	1		1	1	
14	29	0.5	0.5	2		1		1	0	1		1	1	
15	22	0.5	0	2		1	-1	1	1	1	-2	1	1	1
Total														
Multiply coefficient		0.5	0.5	2	1	1	-1	1	1	1	-2	1	1	1
Score														
%														

APPENDIX D Table of indicator for drug used (PCSD)

LAO RUD

INDICATORS

Indicator1: Number of drug	Indicator2: Essential drug	Indicator3: International name of drug	Indicator4: Drug in the store	Indicator5: Clear hand writing	Indicator6: Traditional medicine	Indicator7: Antibiotic drug	Indicator8: correct antibiotic	Indicator9: Injection	Indicator10: Injection needed

10
9
8
7
6
5
4
3
2
1
0
Score:

Total score:　　　Average score:

Date:………M:………Year:…　　Name of hospital:……………………..……

CURRICULUM VITAE

1. Name	Viengxay VIRAVONG
2. Sex	Male
3. Date of Birth	February 02, 1970
4. Marriage Status	Single
5. Nationality	Lao
6. Educational Qualification	Polytechnic Institute of Engineering of Soviet Union, Tashkent
	1993
	Bachelor Degree of Civil Engineer
7. Designation	Technician staff of health care planning, Department of Planning and Budgeting, Ministry of Health
8. Address	Ministry of Health, Department of Planning and Budgeting, Planning Division, Simouang Rd. Vientiane Lao PDR.
	Tele: +856 21 222630
	Email: vviengxay@hotmail.co
	xayviravong@yahoo.com