

ความยากจนที่เกี่ยวข้องกับค่าใช้จ่ายด้านสุขภาพและการเข้าถึงบริการสุขภาพใน 4 ภาคของประเทศไทยก่อนและหลังการมีหลักประกันสุขภาพถ้วนหน้า



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ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

IMPOVERISHMENT ASSOCIATED WITH OUT-OF-POCKET HEALTH CARE  
SPENDING AND ACCESS TO HEALTH CARE IN THAILAND'S 4 REGIONS PRE  
AND POST UNIVERSAL COVERAGE IMPLEMENTATION



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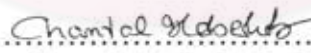
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ประเทศไทยมีหลักประกันสุขภาพถ้วนหน้าโดยวัตถุประสงค์เพื่อรับรองการเข้าถึงบริการสุขภาพของประชาชนและเพื่อลดภาระค่าใช้จ่ายด้านสุขภาพ การศึกษานี้มีวัตถุประสงค์เพื่อวิเคราะห์การเปลี่ยนแปลงหลังการมีหลักประกันสุขภาพถ้วนหน้าในด้านความยากจนที่เกี่ยวข้องกับค่าใช้จ่ายด้านสุขภาพและการเข้าถึงบริการสุขภาพในแต่ละภาคของประเทศไทย

การศึกษานี้ใช้ข้อมูลจากการสำรวจสถานะทางเศรษฐกิจและสังคมครัวเรือนปี 2544, 2549 และ 2552 และการสำรวจอนามัยและสวัสดิการในปี 2544 และ 2552 วัดความยากจนจากค่าใช้จ่ายด้านสุขภาพ โดยการคำนวณจำนวนคนยากจน และช่องว่างความยากจน ใช้การวิเคราะห์การถดถอยโลจิสติกเพื่อหาปัจจัยของความยากจนที่เกิดจากค่าใช้จ่ายด้านสุขภาพ และปัจจัยในการใช้บริการสุขภาพ

ผลการวิเคราะห์ชี้ให้เห็นว่าหลังการมีหลักประกันสุขภาพถ้วนหน้า ความยากจนที่เกิดจากค่าใช้จ่ายด้านสุขภาพลดลงเรื่อยๆ นอกจากนั้น การใช้บริการสุขภาพยามเจ็บป่วยของผู้มีประกันสุขภาพเพิ่มขึ้นด้วย อย่างไรก็ตาม ภาคเหนือและภาคอีสานยังคงได้รับผลกระทบจากความยากจนจากค่าใช้จ่ายด้านสุขภาพมากกว่าภาคกลาง และได้ แสดงให้เห็นว่า หลักประกันสุขภาพถ้วนหน้ายังคงมีข้อจำกัดอยู่ ส่วนปัจจัยโดยรวมที่มีผลต่อความยากจนจากค่าใช้จ่ายสุขภาพเหมือนกันในทุกภาค คือ ขนาดครอบครัว จำนวนสมาชิกที่เป็นคนแก่ และเด็ก อายุหัวหน้าครอบครัว เศรษฐฐานะของครัวเรือน ค่าใช้จ่ายด้านสุขภาพ และการมีประกันสุขภาพ ในส่วนของปัจจัยการให้บริการสุขภาพจะเพิ่มขึ้นในคนที่อายุเพิ่มขึ้น ขนาดครอบครัว และคนที่มิประกันสุขภาพโดยเฉพาะอย่างยิ่งผู้ที่ได้รับจากสวัสดิการข้าราชการ หรือรัฐวิสาหกิจ การให้บริการสุขภาพจะลดลงในผู้ที่แต่งงานแล้ว การศึกษาที่เพิ่มขึ้น และผู้ประกอบการเกษตร

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KEYWORDS : IMPOVERISHMENT / HEALTH CARE SPENDING / ACCESS TO  
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THANAPORN BUSSABAWALAI: IMPOVERISHMENT  
ASSOCIATED WITH OUT-OF-POCKET HEALTH CARE SPENDING  
AND ACCESS TO HEALTH CARE IN THAILAND'S 4 REGIONS  
PRE AND POST UNIVERSAL COVERAGE IMPLEMENTATION.  
ADVISOR: Lecturer Chantal Herberholz, Ph.D., CO-ADVISOR:  
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Thailand introduced universal coverage (UC) aiming to ensure people accessing to health services and to reduce their burden of health care cost. This study aimed to analyze the change after implementation of universal coverage scheme in terms of poverty impact from health care payments and access to health care in Thailand's 4 regions.

The study used data from Socio-Economic Surveys (SES) in year 2001, 2006 and 2009, and Health and Welfare Surveys (HWS) in year 2001 and 2009. This study measured impoverishment from health care payments by calculating poverty headcounts and poverty gap. Logistic regression models were used to find determinants of poverty due to health care payments and health care utilization.

The results indicate that after UC implementation, poverty impact due to health care payments declined gradually over time; in addition, health care utilization of insured people when they were ill increased as well. However, North and Northeast obviously still had greater poverty impact from health care more than Central and South. This can partly indicate that UC still had limitations. Household size, number of elderly, number of children, age of the head, living standards, medical expenses, and health insurance correlated with poverty due to health care payments similarly in every region. For determinants of health care utilization, the likelihood of health service use increased in individuals increasing in age, family size, and covered by health insurance especially Civil Servants Medical Benefits Scheme (CSMBS). Individuals who married, higher education and working in agricultural industry were less likely to use health service.

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## LIST OF ABBREVIATIONS

CSMBS	Civil Servants Medical Benefits Scheme
$G_{pre}$	Pre poverty gap
$G_{post}$	Post poverty gap
$H_{pre}$	Pre poverty headcounts
$H_{post}$	Post poverty headcounts
HWS	Health and Welfare Survey
MoPH	Ministry of Public Health
MSWP	Medical Service Welfare for the People
NHSO	National Health Security Office
$NG_{pre}$	Pre payment normalized gap
$NG_{post}$	Post payment normalized gap
NSO	National Statistical Office
OOP	Out-of-pocket
Pre-UC	Pre Universal Coverage
Post-UC	Post Universal Coverage
SES	Socio-Economic Survey
SSS	Social Security Scheme
UC	Universal Coverage
VAVP	Motor Vehicle Accident Victims Protection
VHIP	Voluntary Health Insurance with Government Subsidies Project
WBI	World Bank Institute

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# CHAPTER I

## INTRODUCTION

### **1.1 Problems and significance**

Out-of-pocket (OOP) health care spending has long been important and concerned issue in many countries because costly and unexpected payments for health care with no adequate health insurance coverage can lead individuals or households to poverty. Another considerable problem in health care system is access to health services. Many people especially the poor still encounter with this problem because of financial barrier and again without insurance, even though health service is the fundamental rights that all people are supposed to receive. Therefore, universal coverage (UC) becomes a challenging policy for government and health policy makers to improve access to health care and protect people from poverty caused by health care payments.

Thailand introduced universal coverage reforms in 2001 aiming to ensure equal access to quality health care for all, and to protect them from catastrophic situation caused by health expenses exceeding their financial capacity (National Health Security Office [NHSO], 2011: online). It is known as the 30 baht scheme, which people covered by this have to pay 30 baht for treatment. This scheme allows them to utilize services in their health district, either health centers or district hospitals, and can be referred for specialist treatment at provincial or regional hospitals if necessary (Phusit Prakongsai, Supon Limwattananon, and Viroj Tangcharoensathien, 2009). Although the government has been changed, this project is continually preceded. Besides, the government later abolished the 30 baht co-payment and made it free.

People covered by this scheme receive various benefit package including ambulatory care, hospitalization, disease prevention, health promotion and even high-cost medical services such as artificial organs, surgical operation, radiotherapy or chemotherapy, etc. Prescription drugs under national essential drug list are also free of charge (Phusit Prakongsai et al., 2009).

The UC scheme affects many people in the whole country; patients, health care providers, and the government. Therefore, it is necessary to evaluate outcomes after implementing this scheme whether it is successful or not, what the problems are, and how the problems can be solved. However, this study focuses solely on the consequences of UC on households.

Many studies assessed the effect of UC policy on households in many viewpoints such as financial risk protection, health care finance, benefit incidence, health care utilization or household saving; nevertheless, most of those studies

concentrate on the whole country's outcomes (Phusit Prakongsai et al., 2009; Supon Limwattananon, Viroj Tangcharoensathien, and Phusit Prakongsai, 2005). Therefore, this study aims to focus on the outcomes after implementing UC comparing among 4 regions in Thailand (Central, North, Northeast, and South). The outcomes in each region are likely to be different due to the fact that there are many variations among regions such as income per capita, consumption, lifestyle, education, health care services and sanitation, geography, ethnic group, etc.

According to those variations across regions, this study therefore intends to search the outcomes associated with UC policy in each region. Thus, the study will provide another viewpoint and some useful information in terms of poverty impact from health care OOP payments and determinants affecting on that poverty in each region; in addition, it will also show the access to health care and its associated factors before and after UC policy implementation. So, this can partially indicate whether UC policy successes or not, and it may be a guideline for policy makers to improve or solve the problems directly to the point.

## **1.2 Research Questions**

1. Have impoverishment caused by health care out-of-pocket payment and the determinants thereof in Thailand's 4 regions changed after UC implementation?
2. Have the factors associated with health care utilization in Thailand's 4 regions changed after implementation of UC?

## **1.3 Objectives**

### General objective:

To analyze impoverishment from health care out-of-pocket payment and access to health care in 4 regions (Central, North, Northeast, South) in Thailand before and after implementing universal coverage scheme

### Specific objectives:

1. To measure poverty headcounts due to health care out-of-pocket payment in 4 regions in Thailand before and after implementing universal coverage scheme
2. To measure poverty gaps due to health care out-of-pocket payment in 4 regions in Thailand before and after implementing universal coverage scheme
3. To assess factors associated with impoverishment caused by health care out-of-pocket payment in 4 regions in Thailand before and after implementing universal coverage scheme
4. To assess factors associated with health care utilization in 4 regions in Thailand before and after implementing universal coverage scheme

#### **1.4 Scope of the study**

The scope of this study is to provide the measures for impoverishment from health care out-of-pocket payment; poverty headcounts and poverty gaps, in 4 regions in Thailand consisting of Central, North, Northeast, and South in year 2001, 2006, and 2009, and also determinants; socio-economic factors, demographic factors and type of health care use, affecting on that poverty. In addition, this study aims to show the access to health care and its associated factors; predisposing, enabling, and need factors, in year 2001 and 2009.

#### **1.5 Possible benefits**

1. This study will indicate and evaluate updated outcomes of UC policy whether it is successful or not regarding to poverty from OOP health care payment and healthcare utilization in each region, which may conduce to improvement of the policy.
2. This study will provide the factors associated with household poverty caused by health care payments and healthcare utilization so that it can be useful in order to guide policy makers to plan further in terms of universal coverage policy directly to the point in each region.

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## CHAPTER II

### BACKGROUND

This chapter will show some useful information about Thailand's profile related to this study. It is divided into two parts which are: variation in many aspects across 4 regions in Thailand, and health insurance in Thailand both in Pre and Post UC implementation.

#### **2.1 Variations across Thailand's regions**

Thailand, similar to other developing countries, has continued facing the problems of disparity across regions. For example, poverty and economic disparity is one thing that obviously seen in Thailand. Average monthly income and expenditure both per household and per capita are different across regions. Bangkok and vicinity have the highest monthly income and expenditure compared with others, but on the other hand Northeast has the lowest. Central and South regions have roughly similar figures, but higher than North and Northeast (National Statistical Office [NSO], 2008).

According to the data from Office of National Economic and Social Development Board in 2008, it was reported that poverty in Thailand decreased gradually after economic crisis. Poverty headcounts decreased from 20.98% in 2000 to 8.48% in 2007, which was approximately 5.4 million people still being poor. However, when considering distribution of the poor in 2007, there were 2.8 million poor people in Northeast; 52.2% of the poor in the whole country. This was followed by North which had 1.5 million poor people; 28% of the poor in the whole country. Moreover, 88% of the poor lived in rural area and most of them worked in agricultural industry.

Besides, unequal health resources allocation such as health manpower, health facilities, and technology also indicates the regional difference. These disparities are one of the most important factors resulting in different health outcomes. For example, The Thailand Health Profile Report 2005-2007 revealed that the ratio of population to doctor (population per doctor ratio) for the Northeast has steadily declined, but still higher than those in other regions; the North, South and Central having a comparable ratio during 1998-2005. Similar to the ratio of population to other health personnel; dentist, pharmacist, and nurse, Northeast has declined, but higher than other regions. For distribution of health facilities, trends in population to hospital bed ratio between 1998 and 2005 period fell slightly in the Northeast (with more beds), while those for

other regions including Bangkok seemed to be stable or rising slightly. In addition, the Northeast had the highest bed occupancy rate, reflecting a higher burden of the hospitals in that region, compared with other regions. An analysis of bed distribution by province revealed that most provinces in the Northeast had a higher population/bed ratio; compared with that in other provinces in other regions the distribution of beds was similar to that for healthcare providers. Another important problem is inequality in high-technology medical devices, especially CT scanner, MRI, ESWL and mammography, considered based on the device to population ratios (number of devices per 1 million populations). For Bangkok, the ratios are highest. Using the discrepancy index, the Bangkok/Northeast discrepancy declining from 12-fold in 1994 to 7.2-fold in 1999 and rose to 9.3-fold in 2006 for CT-scanners. The declining of that discrepancy rate may cause from decreasing in imported medical equipment values due to economic crisis. Therefore, after the economic crisis was over, the import values were increased resulting in increasing of inequalities in medical device diffusion.

The provinces that are the centers of the region and the provinces in the central region have a high utilization rate, while most provinces in the Northeast have a lower utilization rate than other provinces. An analysis of the relationship between service utilization and the population/doctor ratios and between inpatient service utilization and the population/bed ratios reveals that the provinces with a lot of health resources (low population/doctor and population/bed ratios) will have higher utilization rates, confirming the influence of health resources on the chances of people's service utilization (Ministry of Public Health [MoPH], 2007).

Another main determinant associated with poverty due to OOP health spending and health care utilization is health insurance coverage. Different in health insurance can also result in different health outcomes. Number of people covered by each type of health insurance are various across regions (Table 2.1). Percentage of people with no insurance is lowest in Northeast, North, South, and Central which is 0.76%, 1.98%, 2.37, and 3.28% respectively. The reason why those people still did not have health insurance, even though there was universal coverage, is those people were stateless, non Thai resident, lack of official evidence, or those with uncertain habitat (National Economic and Social Development Board [NESDB], 2011: online). Northeast has the highest number of population covered with UC scheme; whereas, Central region has the highest number of population covered with Social security (SSS) and Civil servant medical benefits scheme (CSMBS).



Table 2.1 Number of population by type of health insurance and region: 2009

Type of health insurance	Region			
	Central	North	Northeast	South
<b>Total</b>	<b>15,838,216</b>	<b>12,119,426</b>	<b>22,738,919</b>	<b>9,231,076</b>
No health insurance	519,196	239,795	172,246	218,803
Have health insurance	15,319,020	11,879,631	22,566,673	9,012,273
-Universal coverage (UC)	10,462,077	9,888,568	19,576,235	7,555,705
-Social security (SSS)	3,610,011	997,865	1,166,008	773,787
-Civil servant medical benefits (CSMBS)	1,205,785	981,167	1,813,988	685,774
-Private health insurance	721,519	349,366	363,627	264,707
-Health insurance covered by Employer	113,477	26,868	1,660	9,749
-Others	87,404	61,116	142,122	69,634

Source: Health and Welfare Survey (HWS) 2009

## 2.2 Health insurance in Thailand

Before transition to universal coverage, Thailand also had many health insurances introduced to cover people in each group. So, this study will divide Thailand's health insurance into two parts; Pre-universal coverage implementation, and Post-universal coverage implementation.

### 2.2.1 Pre-universal coverage implementation

Access to effective and standard health care irrespective of socio-economics is the fundamental right for people in country. In accordance with that notion, government has long made an effort to achieve that by introducing many health programs and policy covering people in every group. Before the major health security system reform in 2001, health insurance schemes can be classified into six schemes as follows (MoPH, 2007):

### 1) Medical Service Welfare for the People (MSWP) Project

The scheme's objective was to provide medical services to the poor and underprivileged. Initially, in 1975 the project covered only poor people, but later was extended to cover the elderly, children under 12 years of age, the disabled, war veterans, religious leaders, and community leaders as well as village health volunteers including their families. This project covered 30% of the population in 2001. The benefits of the project included outpatient and inpatient medical care except for certain services. In the beginning, the cardholders could obtain services only at MoPH health facilities with health centers serving as the front-line providers. In 1997, the eligible person can receive health services directly at the hospital with health centers as its network members. This model was later adopted as the universal healthcare scheme.

However, the problems of the project were the lack of coverage and accuracy in card issuance for the poor. An evaluation indicated that a lot of poor people did not receive the healthcare cards while a rather large number of card-receivers were not really poor (MoPH, 2007; Viroj NaRanong and Anchana NaRanong, 2006).

### 2) Voluntary Health Insurance with Government Subsidies Project (VHIP)

The MoPH implemented this project (commonly known as voluntary health card project) between 1983 and 2001 in two major phases. In the first ten years, the project was conducted as community funds aimed at increasing access to essential primary health services by setting low-priced health cards including maternal and child health cards, family medical care cards, and individual medical care cards. During the second half of the scheme, an improvement in the scheme operations was undertaken to become a full-scale voluntary health insurance scheme beginning in 1994. Under the new scheme, the national and provincial health insurance funds were established with the government subsidizing health-card price. The scheme was popular among the people and expanded widely particularly in rural areas. In 2001, the scheme coverage was 23.4% of Thai population. The benefits of the scheme were not quite different from those for the MSWP scheme.

However, the problem of this scheme was a lack of good risk distribution as it was a voluntary insurance scheme and only one premium rate, resulting in a larger-than-normal proportion of cardholders with health risks and a low rate of cost recovery, particularly in the provinces with low coverage rates in relation to the population (MoPH, 2007).

### 3) Civil Servants Medical Benefits Scheme (CSMBS)

The government and state enterprises have had a medical service welfare system for civil servants and state enterprise employees as well as their spouses, children and parents since 1978. The scheme covered approximately 8.5% of Thai population in 2001. The benefits under this scheme are better than those under other schemes in that the eligible person can seek medical treatment at any state-run health facilities and, in case of emergency, at a private hospital (with a limitation on reimbursement) for civil

servants. But for state enterprise employees, mostly they are free to choose any hospital as they wish; and their benefits are not much different from other schemes. However, there may be fewer exceptions; for example, they are eligible to the treatment for chronic kidney failure and organ transplantation. Under this scheme, fee-for-services payments are made to the hospital.

The major problem of this scheme is the rapid increase in the medical expenditure resulting from the fee-for-services payment mechanism (MoPH, 2007; Viroj Tangcharoensathien, 1997).

#### 4) Public Sector Compulsory Health Insurance Scheme

In the private employment sector, there are two funds: (1) Workmen's Compensation Fund covering work-related illnesses or injuries of employees with premiums paid only by employers and (2) Social Security Fund (SSF) covering employees' illnesses, disabilities, deaths, and retirements, with premiums jointly paid in equal proportion by the employees, employers, and the government. The SSF's aim is to provide security for employees when they get sick based on the principles of risk sharing. In 2001, the SSF covered 7.6% of Thai population.

This scheme is managed by the Social Security Office of the Ministry of Labor through the Social Security Commission. The benefits under this scheme are similar to those under other schemes provided by the government for outpatient/inpatient, maternity, and dental services. The eligible person may choose to register at any public or private hospital under the scheme and may change the hospital registered once a year (MoPH, 2007).

#### 5) Motor Vehicle Accident Victims Protection (VAVP) Act

Health insurance for injuries from traffic accidents is compulsory insurance required of all owners of motor vehicles and motorcycles registered to pay insurance premiums. The scheme aims to protect persons injured from road traffic accidents and provide them with suitable medical services and also provide compensation for cases with disabilities or deaths. Its major problem is the duplication of eligibility with other health insurance schemes; and it has complex steps and regulations for reimbursements, resulting in a transfer of payments to other insurance funds or state hospitals (MoPH, 2007).

#### 6) Private Voluntary Health Insurance

In Thailand most private health insurance plans are an integral part of life insurance or accident group insurance. The purpose of private health insurance is to cover the risk of medical care payment that may occur in the future. The premiums are usually dependent on the risk level of the individual or group of individuals. In 2001, only 1.2% of Thai populations were reported to have private health insurance. The benefits of private health insurance mostly cover inpatient medical expenses, which are

generally higher than outpatient medical expenses, with a cap on protection coverage while income-loss compensation is also paid during illness (MoPH, 2007).

In conclusion, there are six major health security schemes in Thailand; Medical Service Welfare Project (MSWP), Voluntary Health Insurance Project (VHIP), Civil Servants Medical Benefits Scheme (CSMBS), Public Sector Compulsory Health Insurance, Motor Vehicle Accident Victims Protection (VAVP), Private Health Insurance, prior to UC policy implementation. Nevertheless, some of those still have the problems as stated above; therefore, UC policy was introduced in 2001.

### 2.2.2 Post-universal coverage implementation

It was the big change in Thai Health system after the government introduced UC policy in 2001, commonly known as 30-baht health care. Its objective is to ensure that people in the country will have access to health care as fundamental right. MSWP and VHIP were abolished and replaced by UC policy, but others remain the same. Therefore, after implementation of UC policy, there are five health security schemes in Thailand; Universal Coverage (UC), Civil Servants Medical Benefits Scheme (CSMBS), Social Security Scheme (SSS), Motor Vehicle Accident Victims Protection (VAVP), and Private Health Insurance.

The coverage of health insurance has risen to 92.5% of the Thai population after UC covering the entire country in 2002, including 74.2% under the universal health care scheme, 6.6% under the civil servants medical benefits scheme, and 11.5% under the social security scheme, while the rest are under small systems such as politicians and Thais residing in other countries. Approximately 4.6 million people or 7.5% of entire population are not registered in any health insurance scheme (MoPH, 2007).

Universal coverage was introduced in Thailand in 2001, but the scheme covered all districts of Bangkok and the entire country in April 2002. It has covered 45.40 million people with a budget from taxpayers' money of 55,000 million baht each year (2002). Initially, the budgetary management was undertaken by the MoPH allocating the budget for all provinces, but it transmitted management role to the National Health Security Office (NHSO) established in 2003. For policy administration, the decentralization of management authority to provincial administration is used, under the responsibility of the area fund management committee (MoPH, 2007). The policy aims to reduce national health expenditure and household expenditure by the establishment of a collective tax-based financing system and paying providers according to the number of registered population under the scheme. In addition, households pay only a nominal contribution of 30 baht per visit to a medical service (Viroj Tangcharoensathien and Pongpisut Jongudomsuk, 2004); however, the government abolished the 30 baht co-payment and made the UC scheme free.

Primary health care unit is the first service unit serving as the main service contractor prior to referring eligible persons to provincial or regional hospitals if necessary. The scheme also provides the choice for registered person either public or private sector (Phusit Prakongsai et al., 2009). The benefit package covered

comprehensive program both curative benefits and prevention benefits. Curative benefits include general examination, curative, rehabilitative services, high-cost medical services including artificial organs and prostheses, and care for accident and emergency illnesses with ability to go for medical care at any health facility (participating in the scheme) located nearest. As for prevention benefits, the scheme covered annual physical examination, immunization, family planning, antiretroviral drug for pregnancy women and dental preventive services (NHSO, 2011: online).

Table 2.2 Characteristics of health insurance schemes in Thailand: 2007

Characteristics	UCS	CSMBS	SSS	Private health insurance
1. Scheme nature	Social welfare	Fringe benefit	Compulsory contribution	Voluntary
2. Target group	Every Thai citizen not covered under the CSMBS and the SSS	Government employees, pensioners, and their dependants (spouse, parents, and children)	Private and temporary public employees	Individual and private firms
3. Financing				
—Source of funds	General tax revenue	General tax revenue	Tripartite 1.5% of payroll each, up to payroll of B 15,000 (reduced to 1% since 1999)	Out of pocket or employers
—Payment mechanism	Mainly capitation	Fee for service	Mainly capitation	Fee for service
—Copayment	None, unless using the nonemergency service from nonregistered facilities	Yes, at some inpatient care and at private hospitals	Maternity and emergency services if beyond budget ceiling	Depends on policy
4. Benefit package				
—Ambulatory services	Mainly public with some private	Mainly public	Public and private	Public and private
—Inpatient services	Mainly public with some private	Public and private (emergency only)	Public and private	Public and private
—Choice of provider	Limited and must register with first-line provider in vicinity of residence or workplace	Almost unlimited and can go to any public facility	Moderate limitation, registration required with first-line providers, but with more choices.	High with free choice
—Conditions included	Comprehensive package	Comprehensive package	Comprehensive package with nonwork related illnesses	Depends on policy
—Conditions excluded	15 conditions	No	15 conditions	Depends on policy
—Maternity benefit	Yes	Yes	Yes	Depends on policy
—Annual physical check up	Yes	Yes	No	Depends on policy
—Prevention and health promotion	Yes	Yes	Yes	Usually not
—Population coverage	74.6%	8.01%	12.9%	2.16%
—Expense per capita, 2007 baht	1,899	5,000	1,900	n.a.

Source: The World Bank (2008)

## CHAPTER III

### LITERATURE REVIEW

#### 3.1 Impoverishment from health care payments

##### 3.1.1 Poverty headcounts and poverty gap from health care payments

Poverty is “pronounced deprivation in well-being.” The conventional view links well-being primarily to command over commodities, so the poor are those who do not have enough income or consumption to put them above some adequate minimum threshold. This approach sees poverty largely in monetary terms, and is the starting point for most analyses of poverty. Another approach indicates that poverty may also be tied to a specific type of consumption; thus someone might be house poor or food poor or health poor. These dimensions of poverty can often be measured directly, for instance by measuring malnutrition or literacy. However, the broadest approach to well-being (and poverty) focuses on the “capability” of the individual to function in society (Sen, 1987). The poor lack key capabilities, and may have inadequate income or education, or be in poor health, or feel powerless, or lack political freedoms. Viewed in this way, poverty is a multi-dimensional phenomenon. So, for instance, while higher average incomes will certainly help reduce poverty, these may need to be accompanied by measures to empower the poor, or insure them against risks, or to address specific weaknesses such as inadequate availability of schools or a corrupt health service (World Bank Institute [WBI], 2005).

One objective that may be set for a health care system is that spending on health care should not push households into poverty, or further into it if they are already there. Measures of the ‘poverty impact’ can be defined by comparing the mean levels of poverty before and after health care spending (Wagstaff and Doorslaer, 2003). To define poverty impact, the two key variables underlying the approach are: the health care payment variable whose poverty impact one wishes to assess; and a variable capturing the living standards of the household that incurs the payment (O’Donnell et al., 2008).

There are a number of aggregate measures of poverty that can be computed. By far the most widely-used measure is the *headcount index*, which simply measures the proportion of the population that is counted as poor. However, the measure also has some weaknesses. The headcount index does not take the intensity of poverty into account; moreover, it does not indicate how poor the poor are, and hence does not change if people below the poverty line become poorer. A moderately popular measure of poverty is the *poverty gap index*, which adds up the extent to which individuals on average fall below the poverty line, and expresses it as a percentage of the poverty line (WBI, 2005).

Doorslaer et al. (2006) indicated that out-of-pocket health payments exacerbate poverty. Failure to recognize variation in out-of-pocket health payments could also result in misinterpretation of trends in poverty over time or of differences between countries. The study measured poverty by calculating the number of individuals with less than the internationally accepted threshold of absolute poverty (US\$1 per head per day) after making health payments; poverty headcounts, and also calculated the amount by which household resources fell short of the poverty line to assess poverty gap in the study of the effect of payments for health care on poverty estimates in 11 countries in Asia. The results showed that an additional 2.7% of the population under study (78 million people) ended up with less than \$1 per day after they had paid for health care.

To determine the outcomes of UC policy affecting to individuals or households in Thailand, poverty impact is one of the measurements that many studies generally use. Previous study (Supon Limwattananon et al., 2005) assessed the impact of universal coverage in Thailand using impoverishment as a result of OOP health care payments. The research found that change in poverty headcounts after OOP expenditure is accounted for dropped from 2.1 percentage points during the pre-UC period in 2000 to 0.8 to 0.5 percentage points during the post-UC periods in 2002-2004. Moreover, the post-OOP poverty gap which was normalized to the proportion of poverty lines for the impoverished households reduced slightly from 0.7 percentage points in 2000 to 0.4 and 0.2 percentage points after the UC implementation. Those results were consistent with another study (Tewarit Somkotra and Lagrada, 2008) stated that poverty headcount and poverty gap declined from the Pre-UC (2000) to Post-UC (2002, 2004) period. In addition, they also found that those poverty decreased gradually in each region whether urban or rural area; particularly observed in the North and Northeast regions. This study will also focus on this issue, but in later year; 2006 and 2009, including determinants of that poverty.

### 3.1.2 Determinants of poverty from health care payments

Poverty headcounts and poverty gap are just the tools measuring the poverty; however, those do not concern about the causes of poverty. It is essential for policy makers to find out its causes so that they can set a policy properly.

Among the key causes, or at least correlates, of poverty are regional level characteristics, community level characteristics, and household and individual characteristics. At regional level, factors associated with poverty include vulnerability to flooding or typhoons, remoteness, quality of governance, property rights and their enforcement. As for community level characteristics, these include the availability of infrastructure (roads, water, and electricity) and services (health, education), proximity to markets, and social relationships. Determinants of poverty regarding household and individual characteristics can be considered in three aspects; demographic, economic, and social. Demographic characteristics generally include indicators of household size

and structure, dependency ratio, gender of head. Economic characteristics include employment status, hours worked, property owned. Aside from those demographic and economic indicators, social characteristics are measures of health, education and shelter (WBI, 2005).

Regression analysis is commonly undertaken to identify the contributions of different variables to poverty. There are two main types of analysis. First approach is attempts to explain the level of expenditure (or income) per capita– the dependent variable – as a function of a variety of variables (the “independent” or “explanatory” variables). Another approach is attempts to explain whether a household is poor or not, using a logit or probit regression. In this case the independent variables are as in previous approach, but the dependent variable is binary, usually taking on a value of 1 if the family is poor and zero otherwise. Although this second approach is sensitive to error because some of the information is lost, it is likely to be useful when designing targeted intervention (WBI, 2005). Therefore, this study will use the second approach because this study targets to determine factors and solve problems associated with poor households after health care payment.

Geda et al. (2005) examine probable determinants of poverty status in Kenya, employing both binomial and polychotomous logit models. The study shows that poverty status is strongly associated with the level of education, household size and engagement in agricultural activity, both in rural and urban areas. Another study about determinants of household poverty in Ukraine during transition using two comparable surveys from 1996 and 2004 using probit model showed that poverty in both periods follows some of the determinants commonly identified in the literature, including greater poverty among households with children and with less education (Brück et al., 2007)

In Thailand, socioeconomic and demographic characteristics of the poor are also studied. International labor organization (2000) presented the distribution of the poor by some salient characteristics consisting of family headed by agriculturists (farmers), living in villages, heads of households aged 50-59 and 60 and over, and no formal education or only elementary education. Moreover, the household size is an important variable that has an impact on poverty as well. Since the larger households are likely to have larger number of children of different ages, it seems that children in Thailand are suffering from a greater degree of poverty than adults, but the incidence of poverty then increases sharply among the elderly who are 70 years or more (The National Statistical Office, 1999).

For the determinants of impoverishment due to health care payment, Spandonaro and Doglia (2006) identified determinants for impoverishment using



logistic model stated that it seems to be highly associated with income; in addition, an elderly person drastically increases the probability of poverty. Similarly, factors increased OOP studied in Kenya are income, patients aged more than 65 years, and visiting private facilities (Xu et al., 2005). Another study in China showed that household per capita expenditure, household chronic disease proportion, and education level of household head are significant determinants of impoverishment after reimbursement is concerned, in the study of the influence of rural health security schemes on health utilization and household impoverishment (Shi et al., 2010).

In regard to factors associated with poverty due to health care payments and UC policy in Thailand, Phusit Prakongsai, Viroj Tangcharoensathien, and Supon Limwattananon (2006) indicated that households having OOP payments for in-patient services or utilizing health services at private hospitals were most likely to face impoverishment and also catastrophic health expenditure. An analysis of health care use at private hospital reveals the relative increase in household impoverishment around 99-100% after health care payments regardless of type of health services. However, other socio-economic or demographic factors were not included in the study. Those results were similar to another study (Tewarit Somkotra and Lagrada, 2009) which assessed about financial risk of health care payments focused on catastrophic health care spending in Thailand. They also indicated that the households who remain at risk of catastrophe after UC implementation are better-off households because of their preference for using private facilities and households having a member who experienced hospitalization. Others with increased likelihood of incurring catastrophic health expenditures are households with a greater proportion of elderly members and those having a member with a chronic illness or disability.

Another related study regarding financial risk of health care payments in Thailand, Supon Limwattananon et al. (2005) found that the likelihood of catastrophic incidence increased with size of the households, living in rural areas, and increasing in the household living standards in terms of total consumption expenditures. The catastrophic incidence was less likely to occur in the households with increasing number of beneficiaries of SSS and CSMBS, and with increasing household members who were non-elderly adults and children, and in the households whose the heads had secondary and higher education. Differences in the likelihood of catastrophic incidence across the regional locations of households were not statistically significant.

However, apart from UC policy, there are many other poverty reduction policies launched by government during this past decade affecting household poverty as well. The government has provided comprehensive assistance for all people at the grassroots level inclusively. The assistance is meant to support people in expense reduction, income generation and opportunity provision (Monthip Sriratanatabucanon, Slides). For

example, community and village fund is the fund given to people in the community aiming for providing opportunity and social welfare. The government offered them one million for each village, and allowed them manage and control by themselves. Moreover, the government introduced the scheme regarding to debt management for agriculturalists through Bank for Agriculture and Agricultural Co-operative (BAAC) targeting to solve their debt problem and poverty so that they can have their savings for further invest. People bank scheme is also one of the urgent policies implemented for the poor accessing to source of investment funds with low interest. Another well-known policy is One Tambun One Product (OTOP). Its objectives are adding value to local products, and people in the community can produce good-quality products using local material and knowledge (Thailand development research institute [TDRI], 2011: online). Besides, many other policies aiming to reduce poverty were introduced such as social pension for elderly, social assistance for AIDs or disabled person, free school lunch or supplementary food, government scholarships, government loan for education, etc. All of those policies are also the factors associated with poverty alleviation besides UC policy; nevertheless, percentage of the poor accessed to UC policy is the most among other poverty program as showed in table 3.1 (Monthip Sriratanatabucanon, Slides).



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Table 3.1 Access by the poor to various poverty programs in 2002 (% of respective groups)

Poverty Programs	Poor	Vulnerable	Non-poor, Non- Vulnerable	Total
Universal Health Care	85.4	86.0	67.1	69.7
Social Insurance	0.5	0.8	9.3	8.1
Old Age Assistance	0.5	0.7	0.4	0.4
Debt Moratorium	2.4	2.4	1.9	2.0
Farmers Assistance Fund	0.9	0.9	0.5	0.6
School Lunch Program	11.1	12.4	6.8	7.5
Education Scholarship	0.3	0.2	0.2	0.2
Education Loans	0.9	1.1	0.6	0.6
People Bank	0.1	0.0	0.2	0.2
Village Revolving Fund	7.0	8.4	7.6	7.6

Source: Monthip Sriratanatabucanon

Note: The Vulnerable Group is defined as individuals whose household incomes were below 1.2 times of the poverty lines.

In conclusion, most studies in Thailand assessed poverty impact associated with OOP health care spending before and after UC implementation for the whole country except Tewart Somkotra and Lagrada (2008) assessing it for each region. However, that study did not provide the factors associated with that poverty in each region. Besides, other previous studies which identified the factors related with financial risk of health care payments focused only on catastrophic health care spending (Supon Limwattananon et al., 2005; Tewart Somkotra and Lagrada, 2009). So, this study will both measure the poverty impact from OOP health care spending; using poverty headcounts and poverty gap, and also identify factors; socio-economic and demographic, associated with that poverty in each region before and after UC implementation.

### 3.2 Access to health care

Equity in access to medical care is another important issue that not only policy makers but also citizen have long been concerned. Therefore, many health policies including UC policy aim to improve that, and it is also necessary to evaluate whether those policies are able to improve it or not.

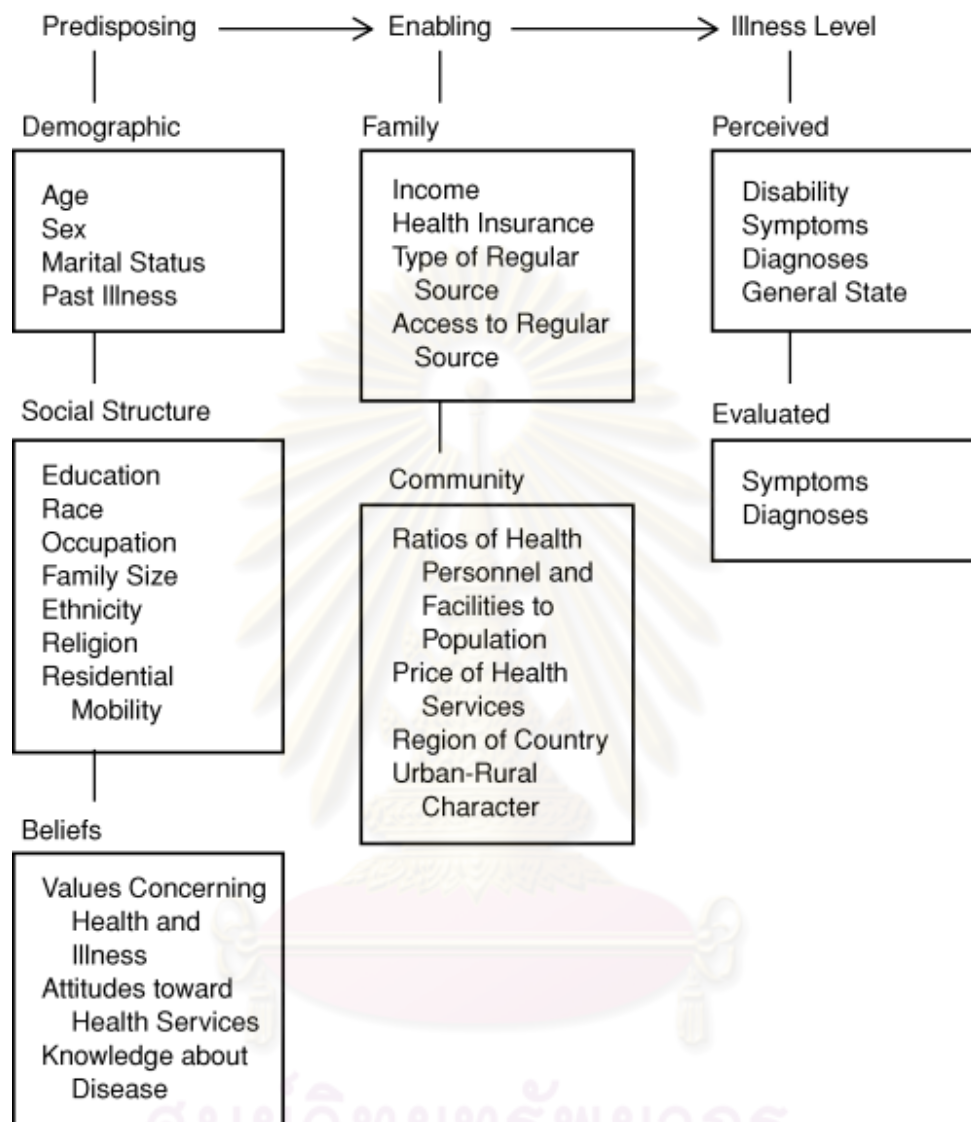
Access has been taken as synonymous with the availability of financial and health system resources in an area (Aday and Andersen, 1974). Another study suggested that access also means services are available whenever and wherever the patient needs them (Freeborn and Greenlick, 1973). However, for utilization of health services, Andersen suggested the model explaining utilization by propensity to use (as showed in figure 3.1) and characterized utilization in terms of type (refers to the kind of service received and who provided it), site (place where the care was received), purpose (such as preventive or illness-related), and the time interval involved (enters or revisits in a given time interval).

Regarding a framework for the study of access to medical care, Aday and Andersen (1974) provided definitions and aspects of the concept of access to medical care that views health policy as designed to affect characteristics of the health care delivery system and of the population at risk in order to bring about changes in the utilization of health care services and in the satisfaction of consumers with those services. In addition, indicators are suggested for the measurement of the various relevant aspects of access, with the system and population descriptors seen as process indicators and utilization and satisfaction as outcome indicators in a theoretical model of the access concept.

The characteristics of populations at risk describing as the individual determinants of health service utilization are the predisposing, enabling, and need component (Andersen and Newman, 1973). The predisposing component includes variables that describe the "propensity" of individuals to use services. These properties exist prior to the onset of illness episodes. They include such as age, sex, race, religion, and values concerning health and illness.

The enabling component describes the "means" individuals have available to them for the use of services. Both resources specific to the individual and his family (e.g., income, insurance coverage) and attributes of the community in which the individual lives (e.g., rural-urban character, region) are included here. The need component refers to illness level, which is the most immediate cause of health service use. The need for care may be either that perceived by the individual or that evaluated by the delivery system.

Figure 3.1 Individual determinants of health service utilization



Source: Andersen and Newman (1973)

Arcury et al. (2005) determines the importance of geography and spatial behavior as predisposing and enabling factors in rural health care utilization in 12 rural Appalachian North Carolina counties. Multivariable logistic models identified independent correlates of health services utilization. The study showed that, in the multivariate model, having a driver's license and distance for regular care are significant, as did several predisposing (age, gender, ethnicity), enabling (household income), and need (physical and mental health measures, number of conditions). Geographic measures, as predisposing and enabling factors, were related to regular check-up and chronic care, but not to acute care visits.

There are many other studies assessing about determinants of health care utilization. The study explored determinants of general practitioner (GP) visits and referrals (outpatient and hospitalization) in Northern Norway performed with regression models (Fylkesnes, 1993). Its result showed that among the various health status dimensions included, self-rated health was found to be the most important determinant, regardless of type of service. Factors, other than health status aspects affecting GP visits, were preoccupation with health and help seeking attitude. However, volume of resources (GP per population), socio-demographic characteristics and social networks did not appear as important. For referrals, higher rate of referral of patients with higher educational achievement indicates a bias towards higher social status groups. In addition, high GP/population ratio and residence in municipalities with referral care facilities were both found to be associated with higher probability of referral.

Another study is about socio-economic and location determinants of accessibility and utilization of primary health-care in Northamptonshire, UK (Field and Briggs, 2001). Factors which affect access and utilization in asthmatics and diabetics were identified relating to age, gender, social class, employment, ethnicity and proximity to the GP surgery. The young, elderly and females report higher rates of utilization, as do nonmanual workers and those who are unemployed. However, accessibility and utilization vary greatly in response to mobility and location characteristics. In Kenya, using logit regression, key determinants of access to health care are determined as income and education, but health insurance is not statistically significant (Xu et al., 2005).

The study assessing the impact of socio-economic factors on maternal health care utilization in Turkey uses logistical regression techniques to estimate models of the prenatal care use and birth delivery assistance (Celik and Hotchkiss, 2000). Separate models are also estimated for urban and rural women. The results indicate that educational attainment, parity level, health insurance coverage, ethnicity, household wealth and geographic region are statistically significant factors that affect the use of health care services.

In Thailand, Bhumisuk Khananurak (2010) assessed the impact of demographic, socioeconomic and geographic characteristics of health utilization of out-patients at primary, secondary and tertiary level among Thai elderly using logistic regression. The study indicated that age, elderly living alone, education, occupation, living area, wealth index, and health insurance are associated with health utilization.

Many methods are used to assess the impact of health insurance implemented on access to health care. For example, concentration index of health services use; especially outpatient and inpatient service, at various level of health care are measured whether it is pro-poor or not comparing before and after UC implementation (Prakongsai et al., 2009; Limwattananon et al., 2005). Another method using to analyze health services use is logistic regression model in order to assess the impact of health insurance coverage and other socioeconomic factors on probability of using health services.

Kaewkwan Tangtipongkul (2010) studied on the impact of UC and other socioeconomic factors on the likelihood of receiving clinical breast examinations, mammograms, and cervical screening tests by using a logistic regression. It was found that among low income women with the UC significantly increased the probability of utilizing cervical screening tests. While among women in the high monthly household income group having the Civil Servant Medical Benefit Scheme and private health insurance increased the propensity to get clinical breast examinations and cervical screening tests. The private health insurance is the only health insurance that has significant and positive probability of having mammograms among women from high monthly household income group.

In other countries, impact of health insurance schemes on access to health care was analyzed by using logistic regression as well. For example, the study in Rwanda (Priyanka et al., 2010) used logistic regression model with a binary utilization variable as the dependent variable. Utilization included outpatient and inpatient services. The covariates considered included age, sex, whether the household head had completed primary education, household size, household expenditure quintile, region, household insurance status and the interaction of household insurance status with expenditure quintile. Similarly, the study in South Africa (Lamiraud, Booysen, and Scheil-Adlung, 2005) demonstrated the role of social health protection in access to care and poverty reduction. Modeling framework was adopted; utilization model, catastrophic payments, and impoverishment, including impacts of other determinants apart from membership in a social health protection scheme such as age, education, total expenditure of the household and health status are studied.

Another related study, Shi et al. (2010) studied about the influence of the rural health security schemes on health utilization and household impoverishment in rural China. Logistic regression was applied to identify the determinants of unmet need for hospitalization. In reference to the analysis of that, the dependent variable was the individuals' unmet admission and the independent variables included household per capita expenditure, household chronic disease proportion, insurance status, and demographic characteristics of the individual (age, gender, ethnicity, level of education, occupation). They found that the most common reasons for not seeking in-patient services were: economic barriers (80.2%), condition judged not serious (4.5%), and poor service quality or ineffective treatment (3.7%). The proportion of responders who had their need for in-patient admission unmet was inversely related to level of education and increasing household expenditure, and directly associated with proportion of persons in household with chronic illness. With decreasing household income, the unmet need for in-patient care steadily increased from 25.5% in the highest quintile to 54.8% in the lowest quintile.

To my knowledge, there is no research in Thailand studied about the change of probability of access to health care and its associated factors before and after UC implementation. Therefore, this study will use logistic regression model to find the change of those probability and factors; the predisposing, enabling, and need factors.

## CHAPTER IV

### RESEARCH METHODS

This study will assess about poverty associated with out-of-pocket (OOP) health care payments and factors affecting on it in 4 regions in Thailand; Central, North, Northeast, and South, before and after implementation of UC policy. In addition, this study will also show the access to health care and its associated factors. Therefore, this chapter is divided into three parts; measuring poverty due to health care payments, determinants of poverty due to health care payments, and access to health care.

#### **4.1 Conceptual framework**

After UC policy was implemented, and covered the entire country in 2002, people and health system were affected in many ways. This study will focus solely on 2 aspects which are poverty impact and access to health care considering health care utilization as showed in figure 4.1.

In first part, two keys variables are used; total consumption expenditure and OOP health care payments. After deducting health care spending from consumption expenditure (as proxy of living standards), poverty impact from health care; the poverty headcount and poverty gap, are measured by comparing those results with regional poverty line. Factors associated with that poverty are then assessed by using logistic regression. Factors include demographic and socio-economic which are: household size, number of elderly, number of children, age of household head, sex of the head, education of the head, area, consumption expenditure, tenure, outpatient service expenses, inpatient service expenses, medicine and supplies, receiving government welfare, and health insurance. Health insurances considered in this study are Medical Service Welfare for the People (MSWP) and Voluntary Health Insurance Project (VHIP) in Pre-UC (2001), but Social Security Scheme (SSS), Civil Servants Medical Benefits Scheme (CSMBS), and Universal Coverage (UC) are included for Post-UC (2009). Although Social Security Scheme (SSS) and Civil Servants Medical Benefits Scheme (CSMBS) were introduced before UC period, there was no data about these schemes in Socio-Economic Survey in Pre-UC (2001).So, CSMBS and SSS are excluded from the model in Pre-UC.

That poverty impact from health care payments may affect on individuals' access to health care. This study analyzes access to health care considering health care

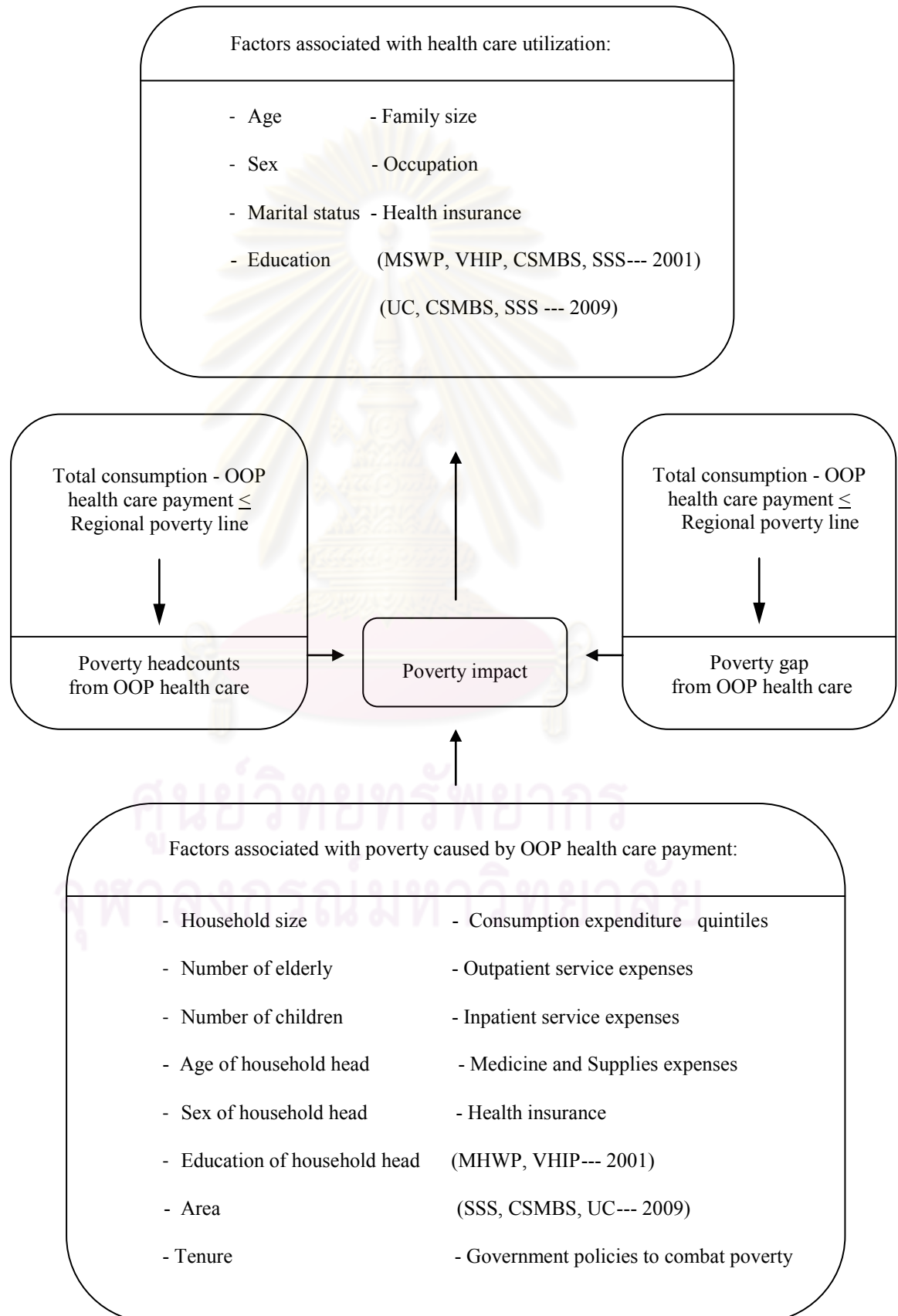


utilization of people who reported ill during 2 weeks and 1 month before interview in year 2001 and 2009 respectively (the interval is not the same because of a bit difference in survey's questions each year). Many indicators are suggested for measuring various aspects of access to health care such as characteristics of health care system, utilization, or satisfaction as stated in chapter III (Aday and Andersen, 1974). However, this study uses health care utilization as an indicator for access to health care. Factors associated with health care utilization include predisposing and enabling factors (Andersen and Newman, 1973). Predisposing factors are age, sex, marital status, education, family size, and occupation; while, enabling factor is health insurance consisting of Medical Service Welfare for the People (MSWP), Voluntary Health Insurance Project (VHIP), Civil Servants Medical Benefits Scheme (CSMBS), Social Security Scheme (SSS) in Pre-UC, and Universal Coverage (UC), Civil Servants Medical Benefits Scheme (CSMBS), Social Security Scheme (SSS) in Post-UC.



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Figure4.1 Conceptual framework showing measures of poverty, factors associated with poverty from OOP health care payment and health care utilization



## 4.2 Method of analysis

### 4.2.1 Measuring poverty due to health care payments

This study will measure impoverishment by calculating poverty headcounts and poverty gap caused by health care out-of-pocket payment in 4 regions in Thailand in Pre-UC (2001) and Post-UC (2006, and 2009).

- **Poverty headcount** denotes the proportion of individuals whose resources (in this study resources are total consumption) fall below the poverty line.
- **Poverty gap** is the average amount by which resources fall short of the poverty line as a percentage of that line.
- **Poverty impact** is measured by comparing estimates of the poverty headcount and poverty gap before and after OOP for health care payments deducted from household resources.

(Doorslaer et al., 2006)

Poverty line is determined by using Thailand's official poverty lines (which specific to each region) from National Economic and Social Development Board. Consumer Price Index (CPI) is used to adjust for inflation to convert poverty line for another year. Total household consumption (as proxy of living standards or resources) and OOP health care payments are collected from Socio-Economic Survey in year 2001, 2006, and 2009.

The measures of impoverishment; poverty headcounts and poverty gap, are calculated. First, the key variables consisting of poverty line and total consumption per capita are used in order to define poverty headcounts ( $H_{pre}$ ) and poverty gap ( $G_{pre}$ ) before taking health care payments into account, and this again after having deducted any health care payments from consumption expenditure, resulting in poverty headcounts ( $H_{post}$ ) and poverty gap ( $G_{post}$ ) due to health care payment (O'Donnell et al., 2008).

Differences in pre and post payment headcounts and gaps can then be computed.

$$\text{Poverty impact} = H_{post} - H_{pre}$$

$$\text{Poverty impact} = G_{post} - G_{pre}$$

### 4.2.2 Determinants of poverty due to health care payments

Socio-Economic Survey in Pre-UC (2001) and Post-UC (2009) are used to find the change of factors associated with households that being impoverished from health care spending before and after UC implementation. Logistic regression model is used and run separately in each region and year 2001 and 2009 to find those determinants in each region. Explanatory variables include socio-economic factors, demographic

factors, health insurance coverage and type of health care use. The model for each region is showed as following:

The logit model of poverty due to health care payments and determinants in Pre-UC

$$\ln \left( \frac{P_i}{1-P_i} \right) = \beta_0 + \beta_1 \text{SIZE} + \beta_2 \text{EDL} + \beta_3 \text{CHD} + \beta_4 \text{SEX} + \beta_5 \text{AGE} + \beta_6 \text{EDU} + \beta_7 \text{AREA} \\ + \beta_8 \text{EXP2} + \beta_9 \text{EXP3} + \beta_{10} \text{EXP4} + \beta_{11} \text{EXP5} + \beta_{12} \text{TEN} + \beta_{13} \text{OP} + \beta_{14} \text{IP} \\ + \beta_{15} \text{MS} + \beta_{16} \text{MSWP} + \beta_{17} \text{VHIP} + \beta_{18} \text{ANTIPOV} + \varepsilon$$

The logit model of poverty due to health care payments and determinants in Post-UC

$$\ln \left( \frac{P_i}{1-P_i} \right) = \beta_0 + \beta_1 \text{SIZE} + \beta_2 \text{EDL} + \beta_3 \text{CHD} + \beta_4 \text{SEX} + \beta_5 \text{AGE} + \beta_6 \text{EDU} + \beta_7 \text{AREA} \\ + \beta_8 \text{EXP2} + \beta_9 \text{EXP3} + \beta_{10} \text{EXP4} + \beta_{11} \text{EXP5} + \beta_{12} \text{TEN} + \beta_{13} \text{OP} + \beta_{14} \text{IP} \\ + \beta_{15} \text{MS} + \beta_{16} \text{SSS} + \beta_{17} \text{CSMBS} + \beta_{18} \text{UC} + \beta_{19} \text{ANTIPOV} + \varepsilon$$

, where  $\beta_0$  = constant

$\varepsilon$  = error

$P_i$  is probability of households being impoverished from health care payment.

Dependent variable is households being impoverished from health care payment.

1= households being impoverished from health care payment

0= households not being impoverished from health care payment

Table 4.1 Explanatory variables in poverty associated with health care payment model

Variables	Description	Unit of measurement	Expected sign
SIZE	Household size	Number of people in household	+
EDL	Elderly ( $\geq 60$ yrs.)	Number of elderly in household	+
CHD	Children (<15 yrs.)	Number of children in household	+
SEX	Sex of household head	1= male 0= female	-
AGE	Age of household head	Years	+

Table 4.1 (continued)

Variables	Description	Unit of measurement	Expected sign
EDU	Education of household head	1= secondary and higher level 0= below primary and primary level	-
AREA	Area	1= municipal area 0= non-municipal area	-
EXP2*	Consumption expenditure per household	1= expenditure quintiles 2 0=otherwise	+
EXP3*	Consumption expenditure per household	1= expenditure quintiles 3 0=otherwise	+
EXP4*	Consumption expenditure per household	1= expenditure quintiles 4 0=otherwise	+
EXP5*	Consumption expenditure per household	1= expenditure quintiles 5 0=otherwise	+
TEN	Tenure	1= owns dwelling and land 0= rent dwelling or land	-
OP	Outpatient Services	Baht	+
IP	Inpatient Services	Baht	+
MS	Medicine and Supplies	Baht	+
MSWP**	Medical Service Welfare for the People Project	1= Yes 0= No	-
VHIP**	Voluntary Health Insurance Project	1= Yes 0= No	-
SSS**	Social Security Scheme	Number of household members who are beneficiaries of SSS	-
CSMBS**	Civil Servant Medical Benefit Scheme	Number of household members who are beneficiaries of CSMBS	-

Table 4.1 (continued)

Variables	Description	Unit of measurement	Expected sign
UC**	Universal Coverage Scheme	Number of household members who are beneficiaries of UC	-
ANTIPOV***	Government policies to combat poverty	1= receiving the scheme 0= not receiving	-

\* Compared against expenditure quintiles1 as the reference category

\*\* Others; private health insurance, welfare by employer, no health insurance, was omitted.

\*\*\* Government policies include social pension for elderly, social assistance for disabled person, free school lunch or supplementary food, government scholarships, fund for farmer, government loan for education, people bank, village and other fund scheme.

Using the data from Socio-Economic Survey (SES) in Pre-UC (2001) and Post-UC (2009)

#### Variables and explanation

Dependent variable:

- Households being impoverished from health care payment

Binary variable of households classified as poor due to health care payments is used as dependent variables. Those households are classified by using the result of poverty headcounts from 4.2.1.

Explanatory variables:

- Household size and structure

This includes household size, number of elderly and number of children in household. Household size and structure are important in that they show a possible correlation between the level of poverty and household composition. Household composition, in terms of the size of the household and characteristics of its members (such as age), is often quite different for poor and non-poor households (WBI, 2005).

- Characteristics of household head

Age, sex, and education of household head are also an important variables associated with poverty. Head of household with increasing in age tends to be poor

because of decreasing in ability to work and earn money as stated in study (International labor organization, 2000) that households' head aged 50-59 and 60 and over is related with poor family. Besides, households headed by women are likely to be poorer than those headed by men because of facing discrimination problem. Those women also encounter other problems such as low levels of literacy, receiving lower wages, and less access to land or equal employment (WBI, 2005). Apart from age and sex, education level of household head is significant determinants of impoverishment due to health care payment as well (Shi et al., 2010). This may result from those with higher education are likely to have higher living standard, and they also can use their knowledge to deal with their situations when facing with health problems or financial risk due to health care payment.

- Area

Area especially in rural or non-municipal area usually lacks of health facilities and health manpower. In addition, people there generally work as agriculturist and earn little income. When they face with health problems, they have to spend more, besides medical bills, not only travelling cost but also opportunity cost. As a result, people living that area are likely to suffer from financial risk due to health care spending.

- Household consumption expenditure

In developing countries like Thailand, formal employment is less common, many households have multiple and continually changing sources of income, and home production is more widespread. Moreover, consumption will be more directly related to current living standards than will current income (O'Donnell et al., 2008). Therefore, this study uses household consumption expenditure to reflect living standard instead of income. Households with lower living standard are likely to be impoverished from health care spending more than those with higher.

- Tenure

In this case, tenure includes dwelling and land ownership. Renting or owning house and land is one of the indicators correlated with poverty and household living standards (WBI, 2005). Households having their own house and land are likely to be poor less than those who renting.

- Medical and health care payments

Out-of-pocket health care payments are classified into three parts; medical and supplies, medical services (outpatients), and medical services (inpatients), with a recall

period of one month. Medical and supplies include the payment for modern medicine, traditional/herbal medicine, contraceptives and condom, vitamins, and first-aid kits/medical equipments. Outpatient's medical services include public health centre/public hospital, private clinic/ hospital, traditional healer, private dental clinic, optometry services & equipment, and other health services. Inpatient's medical services include public health centre/public hospital, private clinic/ hospital, and other expense. Other expenses such as travelling cost, accommodation, and opportunity cost were excluded because of data unavailability. The more households paying for that health care, the more they tend to become poor.

- Health insurance

It is commonly known that appropriate health insurance can protect households or individuals from financial risk caused from health care payments. Therefore, health insurance is directly correlated with household impoverishment from health care. This was proved by many studies. For example, Supon Limwattananon et al. (2005) showed that the catastrophic incidence was less likely to occur in the households with increasing number of member beneficiaries of SSS and CSMBS.

- Government policies to combat poverty

Apart from UC policy which aims to reduce poverty due to health care spending, there are many other policies launched by government for alleviating poverty in other fields such as social pension for elderly, social assistance for disabled person, free school lunch or supplementary food, fund for farmer, etc. Many policies were found affecting on the poor; however, most of the poor still had problem of access to those schemes such as village fund, people bank, or education loans, etc. (NESDB, 2008).

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#### 4.2.3 Access to health care

Health and Welfare Surveys (HWS) in Pre-UC (2001) and Post-UC (2009) are used in order to determine the change of health care utilization, and also its associated factors; the predisposing, enabling, and need factors, in each region in Thailand. Logistic regression model is used with a binary utilization variable as the dependent variable and run separately in each region to find the utilization in each region in year 2001 and 2009. The study assesses only in subpopulation who reported ill during 2 weeks and 1 month before interview in year 2001 and 2009 respectively to define as need for health services. The model takes the form:

##### The logit model of health care utilization and determinants in Pre-UC

$$\ln \left( \frac{P_i}{1-P_i} \right) = \beta_0 + \beta_1 \text{AGE} + \beta_2 \text{SEX} + \beta_3 \text{MAR} + \beta_4 \text{EDU} + \beta_5 \text{SIZE} + \beta_6 \text{OCC} + \beta_7 \text{MSWP} \\ + \beta_8 \text{VHIP} + \beta_9 \text{SSS} + \beta_{10} \text{CSMBS} + \varepsilon$$

##### The logit model of health care utilization and determinants in Post-UC

$$\ln \left( \frac{P_i}{1-P_i} \right) = \beta_0 + \beta_1 \text{AGE} + \beta_2 \text{SEX} + \beta_3 \text{MAR} + \beta_4 \text{EDU} + \beta_5 \text{SIZE} + \beta_6 \text{OCC} + \beta_7 \text{SSS} \\ + \beta_8 \text{CSMBS} + \beta_9 \text{UC} + \varepsilon$$

, where  $\beta_0$  = constant

$\varepsilon$  = error

$P_i$  is probability of individual using health care service

Dependent variable is health care utilization

1= individual using health care service

0= individual not using health care service

Table 4.2 Explanatory variables in health care utilization model

Variables	Description	Unit of measurement	Expected sign
AGE	Age	Years	+
SEX	Sex	1= male 0= female	+
MAR	Marital status	1=married 0=never married	+
EDU	Education	1=secondary and higher level 0= below primary and primary level	+
SIZE	Family size	Number of people in family	-
OCC	Occupation	1= agricultural industry 0= non- agricultural industry	-
MSWP*	Medical Service Welfare for the People Project	1= yes 0= otherwise	+
VHIP*	Voluntary Health Insurance Project	1= yes 0= otherwise	+
SSS*	Social Security Scheme	1= yes 0= otherwise	+
CSMBS*	Civil Servant Medical Benefit Scheme	1= yes 0= otherwise	+
UC*	Universal Coverage Scheme	1= yes 0= otherwise	+

\* Compared against no health insurance as the reference category

Others; private health insurance, welfare by employer, was omitted.

Using the data from Health and Welfare Surveys (HWS) in Pre-UC (2001) and Post-UC (2009)

## Variables and explanation

Dependent variable:

### - Health care utilization

This study focuses only in population who reported ill during 2 weeks and 1 month before interview in year 2001 and 2009 respectively to define as need for health care. Health care utilization includes hospital, clinic, or health center service use, but excluded herb medicine use, traditional healer, and buy own medicine.

Explanatory variables:

### - Demographic

Demographic factors such as age, gender, and marital status suggesting the likelihood that people will need health services (Andersen and Newman, 1973; Hulka and Wheat, 1985). For example, individuals increasing in age are likely to use health services more than those who are younger because they have higher risk to face with health problems.

### - Education

Education is also included in predisposing factors associated with health care use. Education can determine the status of a person in the community, his or her ability to cope with problems and commanding resources to deal with the problems (Andersen, 1995). There are two aspects considering about education and health services use. First, person with higher education may use health services more than person with lower education because they tend to concern more about their health. However, those with higher education may use health services less because they know how to protect themselves or deal with health problems.

### - Family size

Household size may affect individual's health care utilization. Individual living in bigger family is likely to be hard to access health care. Household size is often correlated with poverty, so they have to be busy with their work and insufficient both money and time.

#### - Occupation

Social structure such as occupation is one of the predisposing factors in health care use. People working in different industry tend to have different health utilization behavior. Individuals who workings as agriculturalist are likely to have low living standard, and have no time and no money to use health care.

#### - Health insurance

Health insurance is directly related with access to health services. Health insurance and its benefits are very important and supposed to be concerned because those can represent personal enabling resources to use health care (Mechanic, 1979). Study in Thailand (Kaewkwan Tangtipongkul, 2010) has also showed that poor people with health insurance significantly increased the probability of utilizing some health services.

### **4.3 Data and analysis**

This study is a descriptive study, collecting secondary data from two nationally representative household surveys, Socio-Economic Surveys (SES) in year 2001, 2006 and 2009, and Health and Welfare Surveys (HWS) in year 2001 and 2009. Data characteristics of those two surveys are presented in table 4.3. Socio-Economic Surveys (SES) was recorded for each household. Two main data from this study; OOP payments for health care and households' living standards, is used to find poverty impact from health care. OOP health payments consists of medical and supplies, medical services (outpatients), medical services (inpatients). Total household consumption expenditure is used to reflect living standards. Those data is reported in terms of monthly expenses. Health and Welfare Surveys (HWS) were recorded for each household member consisting of individual characteristics and data related to health. The study uses those characteristics and their health care utilization in 2 weeks and 1 month prior the interview in 2001 and 2009 respectively; to find factors associated with health care use. Those two surveys were conducted by The National Statistical Office (NSO) and use a multi-stage, random sampling technique to represent households in Thailand. The study weighs all data by using weight values provided directly by NSO to make the results be national representative.

Table 4.3 Data characteristics in surveys

Survey	Sample size	Living standards	OOP health payments	Health care use
Socio-Economic Survey 2001	12266 households	monthly consumption expenditures	medical and supplies, outpatient services, inpatient services	-
Socio-Economic Survey 2006	44918 households	monthly consumption expenditures	medical and supplies, outpatient services, inpatient services	-
Socio-Economic Survey 2009	43844 households	monthly consumption expenditures	medical and supplies, outpatient services, inpatient services	-
Health and Welfare Survey 2001	222470 individuals	-	-	recall period : prior 2 weeks
Health and Welfare Survey 2009	146174 individuals	-	-	recall period : prior 1 month

Note: Data characteristics of living standards and OOP health payments in HWS and health care use in SES are not presented because some data are not available and not used in the study.

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## CHAPTER V

### RESULTS AND DISCUSSION

In previous chapter, research methodology is already stated, so this chapter will show the results of this study and again the results are divided into three parts which are: poverty due to health care payment, determinants of poverty due to health care payments, and access to health care.

#### **5.1 Poverty due to health care payments**

Table 5.1 presents the measures of impoverishment; poverty headcounts and poverty gap, in Thailand's 4 regions in Pre-UC (2001) and Post-UC (2006, 2009). Pre-payment headcount and post-payment headcount reflect individuals who fall below poverty line before deducting health payment from total consumption expenditure and after deducting it respectively. Similarly, pre-payment gap and post-payment gap are amount by which resources fall short of the poverty line before and after deducting health payment, but it is most meaningful when using normalized poverty gap (poverty gaps are divided through by the poverty line) to compare the gaps across years (Wagstaff and Doorslaer, 2003). Poverty impact is differences in pre and post payment headcounts and gaps.

Poverty headcounts and poverty gap in every region decreased over time in both pre and post health care payment as showed in table 5.1. In addition, overall poverty impact due to health care payment both headcounts and gap continuously declined as well.

Considering poverty headcounts, pre-payment headcounts were highest in Northeast (32.74%), followed by North (19.49%), South (14.75%), and lowest in Central (8.40%) in 2001. The pre-payment headcounts percentage decreased over time to year 2009, and the rank was still the same. After subtracting OOP health care payment from consumption expenditure resulting in post-payment headcounts and the difference between those pre and post is poverty impact which was mostly highest in North and Northeast. Compared with those two regions, Poverty impact from health payments in Central and South was lower; only 0.19% and 0.10% in 2009.

Table5.1 Poverty headcounts and poverty gaps associated with health care payment in each region in 2001, 2006, and 2009

	2001	2006	2009
<b>Central region:</b>			
<b>Poverty headcounts</b>			
Pre-payment headcount (Hpre)	8.40%	4.14%	3.13%
Post-payment headcount (Hpost)	9.71%	4.43%	3.32%
Poverty impact (Hpost - Hpre)	1.31%	0.29%	0.19%
<b>Poverty gaps</b>			
Pre-payment gap (G pre)	20.87	11.77	8.40
Post-payment gap (G post)	23.53	12.56	8.93
Poverty impact (G post - G pre)	2.66	0.79	0.53
<b>Normalized poverty gaps</b>			
Pre-payment normalized gap (NG pre)	1.64%	0.80%	0.51%
Post-payment normalized gap (NG post)	1.85%	0.85%	0.54%
Normalized poverty impact (NG post - NG pre)	0.21%	0.05%	0.03%
<b>North region:</b>			
<b>Poverty headcounts</b>			
Pre-payment headcount (Hpre)	19.49%	10.85%	9.67%
Post-payment headcount (Hpost)	21.02%	11.59%	10.41%
Poverty impact (Hpost - Hpre)	1.53%	0.74%	0.74%
<b>Poverty gaps</b>			
Pre-payment gap (G pre)	45.48	30.48	27.83
Post-payment gap (G post)	50.67	32.32	29.59
Poverty impact (G post - G pre)	5.19	1.84	1.76
<b>Normalized poverty gaps</b>			
Pre-payment normalized gap (NG pre)	4.25%	2.41%	1.87%
Post-payment normalized gap (NG post)	4.73%	2.55%	1.99%
Normalized poverty impact (NG post - NG pre)	0.48%	0.14%	0.12%
<b>Northeast region:</b>			
<b>Poverty headcounts</b>			
Pre-payment headcount (Hpre)	32.74%	15.68%	12.37%
Post-payment headcount (Hpost)	35.50%	16.76%	13.01%
Poverty impact (Hpost - Hpre)	2.76%	1.08%	0.64%
<b>Poverty gaps</b>			
Pre-payment gap (G pre)	76.29	37.80	33.04
Post-payment gap (G post)	84.04	40.03	34.73
Poverty impact (G post - G pre)	7.75	2.23	1.69
<b>Normalized poverty gaps</b>			
Pre-payment normalized gap (NG pre)	7.38%	3.05%	2.24%
Post-payment normalized gap (NG post)	8.13%	3.23%	2.36%
Normalized poverty impact (NG post - NG pre)	0.75%	0.18%	0.12%

Table 5.1 (continued)

	2001	2006	2009
<b>South region:</b>			
<b>Poverty headcounts</b>			
Pre-payment headcount (Hpre)	14.75%	6.02%	4.41%
Post-payment headcount (Hpost)	16.83%	6.32%	4.51%
Poverty impact (Hpost - Hpre)	2.08%	0.30%	0.10%
<b>Poverty gaps</b>			
Pre-payment gap (G pre)	40.33	15.57	12.22
Post-payment gap (G post)	44.07	16.71	12.81
Poverty impact (G post - G pre)	3.74	1.14	0.59
<b>Normalized poverty gaps</b>			
Pre-payment normalized gap (NG pre)	3.70%	1.16%	0.79%
Post-payment normalized gap (NG post)	4.05%	1.25%	0.83%
Normalized poverty impact (NG post - NG pre)	0.35%	0.09%	0.04%

Source: Socio-Economic Survey (SES) in 2001, 2006 and 2009

Poverty gap before deducting health care payment from household resources, like poverty headcounts, were generally highest in Northeast and North. After deducting that payment, in 2009, the gap raised very a little. The percentage point changes in North and Northeast were similar (0.12%) and higher than Central and South which was 0.03% and 0.04% respectively.

## 5.2 Data description

This part shows data description of population in SES 2001 and 2009. Table 5.2 shows socio-economic and demographic characteristics of the sample. Family size was not much different across regions. Number of elderly in household increased a little in North and Northeast from 2001 to 2009; while, number of child decreased in every regions but higher in Northeast and South compared with Central and North. Percentage of male was higher than female. Means of household head's age were higher from 2001 to 2009, and North and Northeast were higher than the rest. Percentage of sample that household head completed secondary and higher level of education was less than those who had primary or below primary level. Sample population lived in municipal area less than non-municipal area. Consumption expenditure per household per month represented living standards was highest in Central, followed by South, Northeast and North. Percentage of sample that owning dwelling and land was higher than those who renting.



Table 5.2 Socio-economic and demographic characteristics of sample by regions and years

Variables	Central		North		Northeast		South	
	2001	2009	2001	2009	2001	2009	2001	2009
Family size* (person)	3.45	3.17	3.32	3.07	3.9	3.53	3.78	3.4
Elderly* (person)	0.43	0.43	0.48	0.54	0.47	0.55	0.47	0.48
Child* (person)	0.79	0.65	0.77	0.64	1.14	0.89	1.08	0.85
Sex								
-Male	68.80%	61.30%	70.90%	67.60%	76.70%	70.40%	77.80%	69.00%
-Female	31.20%	38.70%	29.10%	32.40%	23.30%	29.60%	22.20%	31.00%
Age*(years)	48.08	49.47	51.34	53.64	50.25	53.58	49.06	50.88
Education								
-Secondary and higher	28.00%	40.10%	14.30%	33.30%	13.00%	24.90%	24.40%	40.90%
-Below primary and primary	72.00%	59.90%	85.70%	66.70%	87.00%	75.10%	75.60%	59.10%
Area								
-Municipal	33.90%	36.40%	20.60%	23.20%	16.70%	17.40%	22.80%	28.50%
-Non-municipal	66.10%	63.60%	79.40%	76.80%	83.30%	82.60%	77.20%	71.50%
Expenditure per household per month*(baht)	10402.3	15893.8	6408.42	10496.3	6082.68	10833.3	8407.83	15039.9
Tenure								
-Owns dwelling and land	77.80%	76.10%	95.00%	93.10%	96.70%	96.40%	88.20%	86.90%
-Rent dwelling and land	22.20%	23.90%	5.00%	6.90%	3.30%	3.60%	11.80%	13.10%

\* Variables showing in terms of mean

Table 5.3 shows descriptive data of each type of medical expenses. The data shows that outpatient services' expenses decreased in every region from 2001 to 2009 except in North. Inpatient services' expenses also decreased except in Central and South. On the other hand, medical and supplies' expenses increased in every region except in Northeast.

Table 5.3 Means of medical expenses by regions and years

Type of medical expenses	Central		North		Northeast		South	
	2001	2009	2001	2009	2001	2009	2001	2009
Outpatient services (baht)	170.78 (210.21)	135.65	98.62 (121.39)	137.15	113.72 (139.97)	90.15	151.2 (186.11)	185.9
Inpatient services (baht)	56.21 (69.19)	107.6	91.13 (112.17)	73.91	48.89 (60.18)	59.73	43.42 (53.44)	79.26
Medical and supplies (baht)	59.05 (72.68)	89.78	34.33 (42.25)	61.24	33.75 (41.54)	34.39	40.85 (50.28)	66.15

Note: Number in parenthesis is adjusting values using Consumer Price Index.

Table 5.4 Beneficiary from government welfare by regions and years

Government welfare	Central		North		Northeast		South	
	2001	2009	2001	2009	2001	2009	2001	2009
Policies								
- receive	20.90%	47.20%	30.40%	68.40%	41.20%	77.40%	31.10%	54.40%
-not receive	79.10%	52.80%	69.60%	31.60%	58.80%	22.60%	68.90%	45.60%
MSWP								
- receive	13.30%		33.10%		40.30%		22.90%	
- not receive	86.70%		66.90%		59.70%		77.10%	
VHIP								
- receive	24.50%		35.00%		42.00%		27.70%	
-not receive	75.50%		65.00%		58.00%		72.30%	
CSMBS*		0.29		0.33		0.3		0.35
SSS*		0.63		0.17		0.14		0.24
UC*		2.13		2.51		3.06		2.75

\* Variables showing in terms of mean

Note: Health insurance data in 2001 was presented in terms of receiving or not receiving, but health insurance data in 2009 was presented in terms of number of member in household receiving each scheme.

Table 5.4 shows data of sample beneficiaries from government welfare. Most people in North and Northeast in 2009 received government welfare aiming to reduce poverty; excluding UC scheme. People receiving MSWP and VHIP were also concentrated in North and Northeast. Number of member in household covered by UC in every region was higher than other schemes.

### **5.3 Determinants of poverty due to health care payments**

Table 5.5 presents logistic regression results for determinants of poverty due to health care payments in Thailand's 4 regions in Pre-UC (2001) and Post-UC (2009). The results show in terms of Odds Ratio (OR), so it can be easy and more meaningful to interpretation. The independent variables, as stated in chapter III, include household size, number of elderly, number of children, age of household head, sex of the head, education of the head, area, consumption expenditure, tenure, outpatient service expenses, inpatient service expenses, medicine and supplies, receiving government welfare, and health insurance.

The results show that most variables are significant. Family size appeared to be variable that strongly affected on households' poverty especially in Northeast. Households with increasing in size were likely to be poor after health care payments are taking into account in both Pre-UC (2001) and Post-UC (2009). The likelihood of being impoverished due to health care payments also increased with households increasing in number of elderly and child in every region in Post-UC (2009). Households whose head were male tended to be poor in Central and North in Pre-UC (2001), which contrast with Post-UC (2009). On the other hand, households headed by male were likely to be poor in North and Northeast in Post-UC (2009). Overall, increasing in age of households' heads was likely to be poor; in addition, household heads with higher level of education were less likely to be poor.

Living area and living standards of households also related with poverty due to health care payments. In Post-UC (2009), households living in municipal area were less likely to be poor except in Northeast. Households with higher living standards (represented by consumption expenditure) were less likely to be poor in every region in both Pre-UC (2001) and Post-UC (2009). Tenure variable relating to households' poverty varied across regions.

In general, households with increasing in health care payments; outpatient service expenses and inpatient service expenses, were likely to be poor. However, the results of medical and supplies contradicted with expectation. The result in Post-UC (2009) except in Northeast showed that households with increasing in medical and supplies expenses were less likely to be poor. This may caused from that households with better living standards or not poor generally use medical and supplies, and pay for it more than the poor.

For government policies aiming to combat poverty, the results varied across regions. In Central region, year 2001 and 2009, households receiving those policies' welfare were likely to be poor, similar to North in 2009. However, the results were

different in Northeast and South in 2009. It showed that households receiving welfares from government were less likely to be poor in those two regions.

For health insurance, households receiving Medical Service Welfare for the People (MSWP) and Voluntary Health Insurance Project (VHIP) in Central were likely to be poor due to health care payments; whereas, households receiving those schemes in other regions, except Voluntary Health Insurance Project (VHIP) in Northeast, were less likely to be poor. As for health insurance in Post-UC (2009); including Social Security Scheme (SSS), Civil Servants Medical Benefits Scheme (CSMBS), and Universal Coverage (UC), households increasing in number of members covered by any of those schemes were less likely to be poor in every region except households covered with Universal Coverage (UC) in North.



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Table 5.5 Odds Ratios of Logistic regression analysis: determinants of poverty after taking health care payments into account in each region in 2001 and 2009

Variables	Central		North		Northeast		South	
	2001	2009	2001	2009	2001	2009	2001	2009
Family size	19.59*	7.142*	26.771*	13.446*	20.804*	19.284*	6.619*	8.065*
Elderly	0.979*	1.128*	1.734*	1.189*	1.100*	1.140*	0.762*	1.377*
Child	1.191*	1.363*	1.49*	1.575*	0.785*	1.055*	1.355*	1.481*
Sex <sup>1</sup>	1.234*	0.759*	0.813*	1.116*	0.614*	1.092*	1.167*	0.819*
Age	1.035*	1.032*	0.999*	1.007*	1.004*	1.013*	1.056*	1.011*
Education <sup>2</sup>	0.152*	0.931*	0.187*	1.963*	0.242*	0.535*	0.065*	1.431*
Area <sup>3</sup>	0.417*	0.686*	1.025*	0.583*	0.634*	1.054*	1.030*	0.700*
Expenditure quintiles 2 <sup>4</sup>	0.002*	0.013*	0.015*	0.011*	0.018*	0.004*	0.018*	0.011*
Expenditure quintiles 3 <sup>4</sup>	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
Expenditure quintiles 4 <sup>4</sup>	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
Expenditure quintiles 5 <sup>4</sup>	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000	0.000
Tenure <sup>5</sup>	1.25*	0.932*	0.325*	1.058*	0.325*	0.948*	1.588*	1.999
Outpatient services	1.004*	1.000*	1.002*	1.002*	1.002*	1.002*	1.001*	1.001*
Inpatient services	1.001*	1.001*	1.004*	1.002*	1.002*	1.002*	1.002*	0.998*
Medical and supplies	1.000*	0.997*	1.003*	0.999*	1.002*	1.001*	1.002*	0.999*
Policies <sup>6</sup>	1.468*	1.397*	0.804*	1.058*	1.095*	0.618*	1.846*	0.684*
MSWP <sup>6</sup>	1.207*	-	0.774*	-	0.915*	-	0.751*	-
VHIP <sup>6</sup>	1.139*	-	0.536*	-	1.028*	-	0.598*	-
CSMBS	-	0.584*	-	0.767*	-	0.584*	-	0.824*
SSS	-	0.629*	-	0.736*	-	0.706*	-	0.333*
UC	-	0.933*	-	1.120*	-	0.800*	-	0.964*

Source: Socio-Economic Survey (SES) in 2001 and 2009

Note: \* p<0.05

<sup>1</sup> male vs. female (reference category)

<sup>2</sup> secondary and higher level vs. below primary and primary (reference category)

<sup>3</sup> municipal area vs. non-municipal area (reference category)

<sup>4</sup> compared against expenditure quintiles 1 as reference category

<sup>5</sup> owns dwelling and land vs. rents dwelling and land (reference category)

<sup>6</sup> receiving vs. not receiving (reference category)

#### 5.4 Access to health care

Table 5.6 shows data description of self-reported illness and health service utilization in each region in HWS year 2001 and 2009. Percentages of self-reported illness in year 2009 were higher than year 2001 in every region. In Pre-UC (2001), people who reported be ill covered by Civil Servants Medical Benefits Scheme (CSMBS) were more likely to use health service than those with covered by other schemes, followed by those who covered by Medical Service Welfare for the People (MSWP), Voluntary Health Insurance Project (VHIP), and Social Security Scheme (SSS). People with no health insurance were less likely to use health service. People in South covered with health insurance (all those 4 schemes) tended to use health service more than other regions. As for Post-UC (2009), people covered with Civil Servants Medical Benefits Scheme (CSMBS) were still likely to use health service than other schemes, followed by Universal coverage (UC) and Social Security Scheme (SSS). Those who covered by Universal Coverage (UC) in North and Northeast were likely to use health service more than individuals covered by this scheme in Central and South. North region had the lowest percentage of health care utilization for individual with no health insurance in both year 2001 and 2009.

Table 5.6 Self-reported illness and health service use by region in year 2001 and 2009

Region	Year	Self-reported illness	health service use					
			MSWP	VHIP	CSMBS	SSS	UC	no health insurance
Central	2001	1994674 (14.4%)	66.50%	65.90%	70.30%	61.40%	-	56.60%
	2009	3070530 (19.4%)	-	-	73.00%	60.00%	61.00%	39.90%
North	2001	1724207 (17.1%)	65.40%	61.20%	70.80%	58.80%	-	48.80%
	2009	2928674 (24.2%)	-	-	72.40%	63.40%	66.30%	35.50%
Northeast	2001	2966331 (17.4%)	65.90%	63.30%	71.90%	60.30%	-	54.00%
	2009	4592225 (20.2%)	-	-	72.00%	59.10%	66.90%	59.10%
South	2001	1120282 (14.7%)	71.50%	66.20%	73.20%	67.80%	-	56.00%
	2009	1659464 (18.0%)	-	-	72.70%	47.20%	63.50%	56.00%

Source: Health and Welfare Survey (HWS) in 2001 and 2009

Determinants of access to health care considering health care utilization are studied by using logistic regression. The study includes individuals who reported ill during 2 weeks and 1 month before interview in year 2001 and 2009 respectively. The intervals prior to the interview are not the same due to survey's questions in each year are a bit different. Explanatory includes age, sex, marital status, education, family size, occupation, health insurance consisting of Medical Service Welfare for the People (MSWP), Voluntary Health Insurance Project (VHIP), Civil Servants Medical Benefits Scheme (CSMBS), Social Security Scheme (SSS) in Pre-UC, and Universal Coverage (UC), Civil Servants Medical Benefits Scheme (CSMBS), Social Security Scheme (SSS) in Post-UC. The result is shown in table 5.7.

Table 5.7 Odds Ratios of Logistic regression analysis: determinants of health care utilization in Thailand's 4 regions in 2001 and 2009

Variables	Central		North		Northeast		South	
	2001	2009	2001	2009	2001	2009	2001	2009
Age	0.995*	1.008*	0.996*	1.010*	0.995*	1.004*	0.994*	1.003*
Sex <sup>1</sup>	1.109*	1.121*	0.897*	0.856*	0.928*	0.885*	0.927*	1.081*
Marital status <sup>2</sup>	0.823*	0.700*	0.924*	0.746*	0.977*	0.842*	1.05*	0.990
Education <sup>3</sup>	0.653*	0.485*	0.750*	0.685*	0.726*	0.645*	0.711*	0.480*
Family size	1.061*	1.120*	0.963*	1.054*	1.012*	1.021*	0.977*	1.017*
Occupation <sup>4</sup>	0.778*	0.909*	0.666*	0.926*	0.775*	0.854*	0.797*	0.713*
MSWP <sup>5</sup>	1.496*	-	1.896*	-	1.559*	-	1.894*	-
VHIP <sup>5</sup>	1.682*	-	1.793*	-	1.557*	-	1.632*	-
CSMBS <sup>5</sup>	2.284*	4.819*	2.539*	4.969*	2.317*	1.688*	2.286*	2.377*
SSS <sup>5</sup>	1.505*	3.829*	1.495*	4.195*	1.392*	1.156*	1.726*	0.856*
UC <sup>5</sup>	-	2.315*	-	3.492*	-	1.223*	-	1.391*

Source: Health and Welfare Survey (HWS) in 2001 and 2009

Note: \* p<0.05

<sup>1</sup> male vs. female (reference category)

<sup>2</sup> married vs. not married (reference category)

<sup>3</sup> secondary and higher level vs. below primary and primary (reference category)

<sup>4</sup> agricultural industry vs. non-agricultural industry (reference category)

<sup>5</sup> compared against no health insurance as reference category

From table 5.7, the results show that individuals increasing in age were less likely to use health service when they were ill. However, the results changed in Post-UC (2009); the likelihood of health care utilization increased with individuals increasing in age in every region. Sex variable also significantly related with health care use, but it varied across region. Male was likely to use health care more than female in Central and South in 2009. Unlike in North and Northeast, female was more likely to use health service. For marital status, individuals who married were likely to use health service less than those who not married.

In both Pre-UC (2001) and Post-UC (2009), individuals with secondary and higher level of education tended to use health service less than those with below primary and primary level of education in every region. In addition, individuals living in increasing in family size were likely to use health service. Individuals working in agricultural industry were less likely to use health service compared with those working in non-agricultural industry in every region.

For health insurance, individuals covered by health insurance; any health insurance in both Pre-UC and Post-UC including Medical Service Welfare for the People (MSWP), Voluntary Health Insurance Project (VHIP), Civil Servants Medical Benefits Scheme (CSMBS), Social Security Scheme (SSS), and Universal Coverage (UC), were likely to use health service more than individuals with no health insurance in every region except only individuals covered by SSS in South. Therefore, this can partly indicate the success of health insurance in terms of increasing in health care utilization.

## **5.5 Discussion**

This study provides the results of the change happened before and after implementation of UC policy in each region in Thailand. In terms of poverty impact caused by OOP health care payment, the results are consistent with other studies. Supon Limwattananon et al. (2005) and Tewarit Somkotra and Lagrada (2008) indicated that poverty headcount and poverty gap declined from the Pre-UC (2000) to Post-UC (2002, 2004) period and decreased gradually in each region. The data in this study also show that after UC implementation, in the long term, poverty impact; both headcounts and gap, due to health care payments decreased little by little.

North and Northeast obviously have greater poverty impact caused by health care payments more than Central and South; whereas, the average number of members in household covered by Universal Coverage (UC) was highest in Northeast seeing from SES data descriptive in table 5.4. This can possibly indicate that although UC policy could alleviate poverty impact of OOP payment for health care, there are still some limitations of the policy which cannot perfectly protect people from financial risk due to health care payments compared with other insurance. However, the higher poverty impact of North and Northeast may link with their poverty before health care payments are taking into account. People with higher living standard in other regions may better cope with financial problems due to healthcare and not fall below the poverty line.



For determinants of poverty after taking health care payment into account, most variables in the model were significant. Household size and structure significantly correlate with that poverty as expected in every region in Post-UC. Household size with higher number of members is likely to be poor more than small household size. Similarly, elderly and children who have low potential to work and earn their living can cause high burden to the family, so household with increasing in number of elderly and children tends to be poor as well. Household head's characteristics consisting of age, sex, and education also associate with poverty. In Central and South (Post-UC), households whose head was male were less likely to be poor. However, female-headed households were less likely to be poor in North and Northeast. The results were quite contradicted with expected, but there is study (TDRI, 2011: online) indicated that female-headed households were less likely to be poor with the reason that they can migrate and enter in jobs relating with services easier than male. Moreover, it can roughly be seen that increasing age of household head relates with poverty in almost every region too. This is caused from the potential of household head earning their income decreases when they are older. In total, higher education of household head was less likely to be poor in every region except in North and South (Post-UC). Although policy maker cannot directly solve the problems associated with those demographic characteristics, it would be advantages to know and indicate the characteristics of the poor that need help.

Area is another factor that has an effect on poverty due to health care payments in every region in both years. In 2009, households living in municipal area were likely to be poor less than those living in non-municipal area except in Northeast. The possible explanation is that area especially in rural or non-municipal area usually lacks of infrastructure, health facilities, and it is difficult to access public goods or services including health care services. When they are ill, they have to spend lots of travelling cost and also opportunity cost, or buying medicine by themselves instead of going to the hospital even though they covered by UC. So, they are more likely to be poor due to health care use. Another important factor, total consumption expenditure quintiles which is a proxy of living standards related with poverty as well. Households with higher living standard are naturally likely to fall below the poverty line less than households with lower living standard.

Households with increasing in health care expenses including outpatient service expenses and inpatient service expenses were likely to be poor. This indicated that health care expenses related with poverty due to health care payments and it was still the problem of households. However, the results of medical and supplies were different and contradicted with expectation. Households with increasing in medical and supplies expenses were less likely to be poor in Post-UC except in Northeast. This may caused from that households with better living standards or not poor generally use medical and supplies, and pay for it more than the poor. In addition, Northeast was the only one region that having the problem from this kind of expenses.

Government policies introduced to combat poverty and promote people welfare were quite successful in Northeast and South in 2009 because the results show that households receiving that welfare were less likely to be poor. This was different from

Central and North, so it would be good if government can promote and improve those welfares especially in these two regions. Similar to health insurance for the poor; Medical Service Welfare for the People (MSWP) and Voluntary Health Insurance Project (VHIP), in Central, households receiving each of that health insurance tended to be poor. However, households receiving those schemes were less likely to be poor in other regions. This can indicate part of the success of the schemes in those regions. For Post-UC (2009), increasing in number of members in household covered with any kind of health insurance; Civil Servants Medical Benefits Scheme (CSMBS), Social Security Scheme (SSS), and Universal Coverage (UC), was less likely to be poor due to health care payments except only households covered by UC in North. Therefore, the reason for that problem in North should be further studied to find the solution and improve it in the future.

Considering access to health care, the study shows that individuals covered by Civil Servants Medical Benefits Scheme (CSMBS) were likely to use health care service more than other schemes when they were ill. The results are the same in every region in both 2 years. These causes from benefit packages of this scheme are better than others. Besides, there is some difference between health services uses of individuals covered with Social Security Scheme (SSS) and individuals covered with health insurance for the poor; Welfare for the People (MSWP) and Voluntary Health Insurance Project (VHIP) in 2001, and Universal Coverage (UC) in 2009. Social Security Scheme (SSS) is supposed to be used more than those schemes because individuals covered by SSS have to make contribution to the fund and the benefit coverage is suppose to be more as well, but the results reversed. This may cause from unequal benefit package of those schemes such as benefit of Social Security Scheme (SSS) and Universal Coverage (UC) which are now disputed, or individuals covered by SSS are in working age so they are less likely to use health service.

Health insurances for the poor; Welfare for the People (MSWP) and Voluntary Health Insurance Project (VHIP) in 2001, and Universal Coverage (UC) in 2009, were quite successful because population more than half used health care services when they feel ill and the percentage of utilization is high next on down from Civil Servants Medical Benefits Scheme (CSMBS). Percentage of health care utilization of individuals covered by Universal Coverage scheme (UC) in North and Northeast were higher than Central and South. In addition, North and Northeast had the highest percentage of people covered by UC, so it shows that individuals in North and Northeast rely on this scheme a lot. Therefore, this scheme should be concerned more especially in these 2 regions in terms of benefit package of the scheme or supported health facilities.

In Central region, percentage of people covered by UC was lowest and people with no insurance was highest compared with other regions as stated in chapter II and the results present that people with no insurance there were less likely to use health services. People with no health insurance may be stateless, non Thai resident, lack of official evidence, those with uncertain habitat (NESDB, 2011: online), or better off households with not register in any health insurance including UC. Nevertheless, certain reason and solution should be further study to increase utilization and number of people covered with health insurance in this region.

It is quite surprising for Southern that people there covered with any kind of health insurances seemed to use health services more than other regions in Pre-UC (2001), but health services utilization decreased especially Social Security Scheme (SSS). This can also see from the logistic regression result that individuals covered by Social Security Scheme (SSS) tended to seek for health care less than individuals with no health insurance. This may cause from unequal benefit package the schemes such as benefit of Social Security Scheme (SSS) and Universal Coverage (UC), or individuals covered by SSS are in working age so they are less likely to use health service.

From logistic regression result, individuals covered with health insurance tended to use health services when they are ill more than individuals with no health insurance except individuals covered by SSS in South. Apart from those health insurance variables which are found strongly affect on health care use in both Pre-UC and Post-UC, there are other determinants of health care utilization. Individuals increasing in age tend to use health service more than younger as expected in every region in Post-UC. These may cause from individuals with increasing in age were more risk to face health problems and more concerned about their health. Sex variable was significant, but varied across region. Individuals who married tended to use health services less than single. Education was also significant. Individuals with higher level of education were less likely to use health service, quite contradicted with expected. However, the result may cause from that those with higher level of education have better knowledge and can deal with their health problems without health service use better than individuals with lower level of education. Moreover, agriculturalist should be supported more to use health services because the regression results show that they were less likely to use health services compared with individuals working in non-agricultural industry.

However, this health care utilization study had limitation that the model uses subpopulation that reported ill, but not control in terms of severity of illness because of limited data. Therefore, some of them may not use health care services because of non-severity illness.

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## CHAPTER VI

### CONCLUSIONS AND RECOMMENDATIONS

#### 6.1 Conclusions

There was a big change in Thai health systems after government introduced universal coverage reforms in 2001. The scheme aims to ensure people accessing to standard and effective health services regardless of their socio-economics, and to protect households from financial risk and poverty because of health care cost. It is originally known as the 30 baht scheme, which people covered by this have to pay a small charge (30 baht) for treatment. However, the government abolished the 30 baht co-payment and made the UC scheme free. The UC scheme affects many people in the whole country; patients, health care providers, and the government. Therefore, it is necessary to evaluate outcomes after implementing this scheme whether it is successful or not.

Many studies assessed the effect of UC policy on households in many viewpoints; nevertheless, most of those studies concentrate on the whole country's outcomes. Therefore, this study aims to focus on the outcomes after implementing UC comparing among 4 regions in Thailand (Central, North, Northeast, and South). This study focuses only the outcomes in terms of poverty impact from health care OOP payments and determinants affecting on that poverty in each region; in addition, it also shows the access to health care and its associated factors; predisposing, enabling, and need factors, before and after UC policy implementation.

The study is a descriptive study, collecting secondary data from two nationally representative household surveys, Socio-Economic Surveys (SES) in year 2001, 2006 and 2009, and Health and Welfare Surveys (HWS) in year 2001 and 2009. This study will measure impoverishment by calculating poverty headcounts and poverty gap. Logistic regression model is used to find determinants of poverty due to OOP health care payments and health care utilization in each region in Pre-UC (2001) and Post-UC (2009).

The results of measuring poverty due to health care payments indicate that after UC implementation, poverty impact both headcounts and gap declined gradually over the time. The results are consistent with previous studies. The study shows that UC policy is successful in terms of both reducing poverty including increasing health service utilization in every region. However, North and Northeast obviously have greater poverty impact after taking health care payments into account more than Central and South, while the average of members covered by UC in households were highest in Northeast. Therefore, this can partly indicate that UC still has some limitations that cannot absolutely protect them from poverty due to health care payments.

For determinants of poverty due to health care payments, most variables were significant, and most of them similarly affected on poverty in each region; only some variables varied across regions such as sex, education, area, etc. The variables which affected on each region in the same way such as family size, number of elderly, number of children in household, age of household's head, living standards, health care expenses, and health insurance in 2009. However, North was the only one region that households increasing in number of members covered by UC were likely to be poor.

Considering access to health care, individuals covered with health insurance tended to use health services when they are ill more than individuals with no health insurance except individuals covered by SSS in South. Individuals covered by Civil Servants Medical Benefits Scheme (CSMBS) were likely to use health care service more than other schemes, followed by health insurance for the poor (Welfare for the People (MSWP) and Voluntary Health Insurance Project (VHIP) in 2001, and Universal Coverage (UC) in 2009), and Social Security Scheme (SSS). Percentage of health care utilization of individuals covered by Universal Coverage scheme (UC) in North and Northeast were higher than Central and South. In addition, North and Northeast had the highest percentage of people covered by UC, so it shows that individuals in North and Northeast rely on this scheme a lot. The percentage of individuals with no health insurance was highest in Central and percentage of health care utilization of those with no health insurance also low. Therefore, certain reason and solution should be further study to increase utilization and number of people covered with health insurance in this region.

Other factors increasing in health care utilization; apart from health insurance, were increasing in age and family size. On the other hand, individuals who were married, having secondary and higher level of education, and working in agricultural industry were less likely to use health service when they were ill.

## **6.2 Policy recommendations**

Although UC policy implementation is successful seeing from gradually decreasing of poverty due to health care payments and increasing in access to health care, there are some points that still needed to be solved. First point to concern is poverty impact due to health care payments in every region especially in North and Northeast. According to the results that important factors such as family size, number of elderly, number of children, age of household's head, living standards, health care payments, or health insurance associated with that poverty impact. Therefore, policy makers may launch some schemes relating with those variables. For example, Thailand's population is ageing rapidly, so health centers should give priority to prevention programs for elderly and children who normally taking high risk to face with health problems and can cause financial risk to households. Some treatment excluding from benefit package in UC scheme should be free or reduced in price such as medicine excluding from the national essential drug list; especially medicine treating for disease normally occurred in elderly or children. In addition, government should improve policies alleviating people poverty by increasing access to the schemes or launching

policies which truly satisfy the needs in each region to improve people living standards. Government should support more to make health insurance cover all people in Thailand. To finance the policies, general tax-finance is the main resource, and government then allocates their spending budget to district and subsequently pass budget to sector in sub-district such as health center so that it can be easily accessed by targeted people. Besides, budget should be provided more to the areas that actually suffer the problems. Therefore, it is also challenging for government to find the way to increase their revenue such as putting more people on the tax roll (The Nation, 2011: online) in order to provide more welfare or programs.

According to the result that individuals receiving health insurance were likely to use health services, health insurance should be promoted to cover all people especially in Central which had the highest percentage of people with no health insurance. Moreover, individuals covered by SSS in South were less likely to use health services. Therefore, it should be studied more about the problems in those two regions and plan policies further. Individuals with higher education were less likely to use health services because they have better knowledge to cope with their health problems. Therefore, it may be good for providing more education to reducing the problem of high demand in UC scheme. Besides, policy maker should be concern and support more about increasing access to health care in individuals working in agricultural industry.

### **6.3 Limitations of the study**

The limitation is the study assessing the change of the outcomes; impoverishment and access to health care, in only two years (2001 and 2009). Therefore, the results can not indicate that the change is absolutely caused from UC implementation because many other health or anti-poverty policies have also been launched during that time. Moreover, this study used cross-sectional data in only those two years, so it cannot be seen the change of the results year by year. Another limitation is some important factors are not included in the study such as traveling cost or traveling time, attitudes towards health services, values concerning health and illness, ratio of health personnel and facilities to population, etc. due to lack of survey data. There was also no data to indicate the severity of illness in the access to health care model, so this study cannot define truly need for health care. Lastly, Socio-Economic Surveys (SES) and Health and Welfare Surveys (HWS) in year 2001 and 2009 were separately conducted and the population in those two surveys was different. Therefore, this study cannot analyze the results linking between poverty impact from health care and health care utilization.

Further research should therefore isolate the effect of UC policy on those outcomes from other health or anti-poverty policies and also use longitudinal data to clearly see the trend of outcomes. In addition, it is suggested that the factors stated above should also take into account.

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**APPENDIX**

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