# ANALYSIS ON INTERVENTIONS TO TYPE2 DIABETES MELLITUS COVERED BY UNIVERSAL HEALTH COVERAGE SCHEME IN THAILAND

**TAKUMA KATO**

**A THEMATIC PAPER SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH (PUBLIC HEALTH)**
**FACULTY OF GRADUATE STUDIES**
**MAHIDOL UNIVERSITY**
**2014**

Thematic Paper
entitled

# ANALYSIS ON INTERVENTIONS TO TYPE2 DIABETES MELLITUS COVERED BY UNIVERSAL HEALTH COVERAGE SCHEME IN THAILAND

Takuma Kato
.....
Mr. Takuma Kato,
Candidate

S. Kong
.....
Asst. Prof. Sukhontha Kongsin,
Ph.D.
Major advisor

Sukhun Jiamton
.....
Asst. Prof. Sukhun Jiamton,
Ph.D.
Co-advisor

B. Mahai
.....
Prof. Banchong Mahaisavariaya,
M.D., Dip. Thai Board of Orthopedics
Dean
Faculty of Graduate Studies
Mahidol University

O. Pacheun
.....
Assoc. Prof. Oranut Pacheun,
Dr.P.H.
Program Director
Master of Public Health
Faculty of Public Health
Mahidol University

Thematic Paper
entitled

# ANALYSIS ON INTERVENTIONS TO TYPE2 DIABETES MELLITUS COVERED BY UNIVERSAL HEALTH COVERAGE SCHEME IN THAILAND

was submitted to the Faculty of Public Health, Mahidol University
for the degree of Master of Public Health
on
March 17 ,2014

Takuma Kato
.....
Mr. Takuma Kato,
Candidate

Panrasri Khonputsa
.....
Ms. Panrasri Khonputsa,
Ph.D.
Chair

S. Kong
.....
Asst. Prof. Sukhontha Kongsin,
Ph.D.
Member

Sukhun Jia
.....
Asst. Prof. Sukhun Jiamton,
Ph.D.
Member

B. Mahai
.....
Prof. Banchong Mahaisavariaya,
M.D., Dip. Thai Board of Orthopedics
Dean
Faculty of Graduate Studies
Mahidol University

.....
Assoc. Prof. Phitaya Charupoonphol,
M.D., Dip. Thai Board of Epidemiology
Dean
Faculty of Public Health
Mahidol University

# ACKNOWLEDGEMENTS

I would like to thank Research Centre for Health Economics and Evaluation for providing the scholarship funding to conduct this study.

I would like to express my special thank to my paper advisor, Asst. Prof. Sukhontha Kongsin for her excellent guidance, kindness, open feedbacks, encouragement and handling me very practically during the study and I appreciate it.

I highly appreciate my co-advisor, Asst. Prof. Dr. Sukhun Jiamton for his valuable advices and great support in analysis of research, presentation style and finely tuning each small detail in my paper. I have learned volumes of skills that will be great help for my further carrier too. I am also grateful to Mr. Sittikorn Rongsumlee, for big help he handed during data collection.

My study and this thematic paper would not have been brought to completion without the strong and generous support of many people and organizations in Bangkok, Thailand. I wish to extend my appreciation and acknowledgement to people who support me during this course.

With all my gratitude and my love, my heartfelt thanks to all lectures and staffs of Faculty of Public Health and my friends in MPH program for their friendship and support during my studying in Thailand. I learned a lot from them too.

Last but not least, I also would like to express my thanks to my family, without their support and assistance I would have never reached this position.

Finally, I really appreciate all interviewees who allocated their valuable time for discussing and sharing with me useful information and knowledge to this study.

Takuma Kato

ANALYSIS ON INTERVENTIONS TO TYPE2 DIABETES MELLITUS COVERED BY UNIVERSAL HEALTH COVERAGE SCHEME IN THAILAND

TAKUMA KATO 5637161 PHMP/M

M.P.H.

THEMATIC PAPER ADVISORY COMMITTEE: Asst. Prof. SUKONTHA KONGSIN, PhD. (LONDON), Asst. Prof. SUKHUM JIAMTON, MD, PhD. (LONDON)

ABSTRACT

The main disease burden in the world has been shifting from infectious diseases to Non Communicable Diseases (NCDs) gradually. Type 2 Diabetes Mellitus is one of the most significant diseases since it is not curable and leads to many complications. In Thailand, Universal Coverage Scheme (UCS) has launched in 2001. Some individual interventions were excluded at the beginning. Later, several interventions were entitled into UCS newly. The criteria to select interventions under UCS seemed not to be clear until present. In this research, the review of criteria and evaluation was conducted to propose suitable framework for selection.

As for the reviewing to criteria, key informant interview and document review were conducted. For analysis on equity, the data extraction was conducted collecting data including general information, indicators of equity and service utilization, from each level of health facility through the existing projects.

The suggested criteria of selection to interventions were actually considered at the selection of renal replacement therapy. However, the review was required since there were big gap between the expectation at that time and the reality and the data was updated. Regarding the evaluation, out of 1202 respondents, median age was 56 years (IQR 52,62) and 58.8% of them are female. Multivariate logistic regression shows that Age [Coefficient (95%CI) 0.03(0.01-0.05), $p = 0.02$], Education level [Coefficient (95%CI) 1.01(0.88-1.14), $p < 0.01$], Foot care [Coefficient (95%CI) -1.56(-1.98-(1.14)), $p < 0.01$], Routine Kidney Check up [Coefficient (95%CI) 1.27(0.90-1.63), $p < 0.01$], Dialysis [Coefficient (95%CI) 1.53(0.24-2.81), $p = 0.02$] have significant association with horizontal equity. Sustainability was immeasurable properly at the present. Additionally, the efficiency should be included instead according to literature review.

In conclusion, suggested framework for selection of interventions is feasible and should be conducted routinely by the government in the case of changes of economics and politics for better assessment using data in time series.

KEY WORDS: TYPE 2 DIABETES MELLITUS / EQUITY / UNIVERSAL HEALTH COVERAGE

70 pages

# CONTENTS

# CONTENTS (cont.)

# LIST OF TABLES

# LIST OF FIGURE

# LIST OF ABBREVIATIONS

| | |
|---|---|
| CEA | Cost effective analysis |
| CSMBS | Civil Servant Medical Benefit Scheme |
| CUP | Contracting unit for primary care |
| CUS | Contracting unit for secondary care |
| CUT | Contracting unit for tertiary care |
| DALYs | Disability-adjust life years |
| DM | Diabetes mellitus |
| DRG | Diagnosis Related Group |
| HSRI | Health System Research Institute |
| IMS-CEA | Intervention mixed strain cost effective analysis |
| MOPH | Ministry of Public Health |
| NCD | Non-communicable Disease |
| NHSO | National Health Security Office |
| NSO | National Statistics Office |
| PD/HD | Peritoneal dialysis and hemodialysis |
| SSS | Social Security Scheme |
| T2DM | Type 2 Diabetes Mellitus |
| WHO | World Health Organization |

# CHAPTER I
# INTRODUCTION

## 1.1 Justification and rationale

More than 30 years have passed since the Alma Ata declaration, which has announced ”Health for All” at the first time. Afterward, the Millennium Development Goals (MDGs) have been developed to combat and control communicable diseases, such as HIV and Tuberculosis (TB), improve maternal health and reduce Infant Mortality Rate (IMR). Many countries are still facing many challenges on MDGs in the world, but other countries have almost approached some goals of MDGs. Now, in 2013, World Health Organization (WHO) was considering next goal and measurements toward the change of disease structure and double burden of communicable diseases and Non-Communicable Diseases (NCDs) as agenda of POST 2015(1). According to WHO report, the number of death by non-communicable disease has reached 36 million deaths globally in 2008(2). It is projected that total deaths due to NCDs increases by 17% over the coming 10 years(3). As one of the agenda of POST MDGs, WHO set 25% reduction by 2025 as the goal for NCDs(4, 5).

Of 4 main NCDs (Hypertension, Diabetes Mellitus, Chronic Respiratory Diseases, Cancer), Diabetes Mellitus (DM) is one of the key diseases to reduce burdens of NCDs in the world. People suffered from DM are at risk of developing many kinds of disability and life-threatening health issues. Consistent high blood glucose could cause severe complications affecting the heart and vascular, nerves, kidneys and eys. They are also at increased risk of suffering from infectious diseases, which people without DM usually have no risk to. In many highly developed countries, DM is a leading cause of cardiovascular disease (CVD), blindness, and kidney failure. Type 2 Diabetes Mellitus (T2DM) has a strong dependence to their lifestyle compared with other DM. As the prevalence of type 2 DM increases in low and middle-income countries in accompany with economic growth, the impact of these costly complications is huge. Maintaining the levels of blood glucose, blood pressure and

cholesterol close to standards could delay or prevent the complications related to T2DM. People with T2DM need regular monitoring for complications (6).

In Thailand, NCDs were projected to account for 71% of total death with cardiovascular diseases representing 21%, cancer 12% and diabetes 6% in 2010. However, the rank of DM in DALYs of Thailand is the second. The undiagnosed people with DM are still around 50%. Besides, the prevalence is expected to increase in several decades. There is another burden in terms of medical expenditure that can reach $ 3 billion per year based on expenditure so far. The government has already launched the strategic plan "Healthy way of Thailand" targeting to modify people's consumption behavior(7). However, there are many challenges: screening of complications, identification of factors related to poor outcome, policy to specify clear target for monitoring and improvement of data availability(8). It is expected that those systematic approach would be attained when people can access to health facilities abundant using health insurance in Thailand.

As another POST-2015 agenda, which targets to sustainable developments, the inequity has been focused(9), and universal coverage (UC) has been emphasized on to reduce it. UC has three kinds of advantages in financial aspects: reducing the out of pocket spending, prepayment and risk pooling(10). It can lead the fairer, more efficient health financing that pools risk and shares healthcare costs equitably across the population. Therefore, it can be one of then most important methods to achieve "Health for All". Moreover, it functions to improve the economics to prevent catastrophic financial situation due to health care in poor people. Even in low-income countries where national budget for health issue is relatively small, some of them have introduced universal coverage (UC) in their own system. Recently, in this context, Thailand has been focused on as one of the most successful middle-income countries to introduce UC.

Thailand has done many achievements in economic and social aspects, although some of countries in Indochina have suffered from militarism and holocaust since the World War Ⅱ. The economy in Thailand has grown rapidly especially since 1961 based the first 5 year National Economic and Social Development Plan (1961-1966). Main industries have changed from agricultural sector to manufacture for three decades, the economic status. On the other hand, the Gini coefficient of income

distribution has swelled from 0.41 in 1961 to 0.54 in 1992(11). As the health protection scheme in Thailand, Civil Servant Medical Benefit Scheme (CSMBS) and Social Security Scheme (SSS) were established in 1960s. CSMBS was managed for central government employee and small public employee and it covered 7 percent of the population. SSS functioned toward private employees equivalent to 15 per cent of the population. Subsequently those two schemes just covered small proportion of people, low-income scheme has launched in 1975. However, it has not covered all people in Thailand. The constitution in 1977 has declared that health should be considered as a prerogative of people and equal access to healthcare services should be promised. This concept originally leads to the idea of universal health coverage in Thailand(12). Not only in financial measurement, but also investment of health facilities has been done from the beginning of the first five-year plan. The government set the goal as "*One hospital for every district and one health center for every sub-district*" to improve the accessibility to healthcare services. The ideal accessibility was considered that people could access to the facilities in 1-hour walk. Until 2008, the government has arranged 891 hospitals, which enfold more than 90 percent of the districts, and 9,758 health centers, which extend over every sub-district(11).

In 2002, Thailand has launched universal coverage policy. Although many reformists tried several times to introduce this, until this achievement, they finally attained the launch due to civil society mobilization, political commitment and economic growth, which has come after the completion of economic crisis of 1996-1997. Thailand government has established the National Health Security Office (NHSO), the organization that has the responsibility for managing the UCS to manage the clinical and financial data. Every year, NHSO has to negotiate the capitation rate compared with other insurances(13).

During one decade after the launch of UC, many successful achievement and effect has already been reported. According to those reports, many users showed their high satisfaction. However, it has also indicated some challenges such as decentralization and affordability.(13) The UC comprises several systems such as revenue, service delivery and out-of pockets. In those, to focus on the equity and affordability, the Benefit Package (BP) and comprehensive packages should be focused. Benefit package, which is called as Essential health package (EHP) in

Thailand, can enhance the equity of people covered by UC(14). However, additional deliberate efforts to improve accessibility to EHP are also necessary to attain more equity. Transportation and waiting time to get services should be of components of items to assess the equity. It was actually reported that the patients diagnosed may not be able to even access to required health care services because of the transportation and the capacity of health facilities in their rural areas(15). However, no report has showed how the selection of interventions in BP and EHP affect those equity and affordability.

The individual interventions that should be covered by UC are controversial. According to WHO reports, dialysis and transplants for the patients of diabetes mellitus are considered as secondary health services although those were tertiary services previously(6). Those changes would be crucial for the affordability and the recruitment of health personnel needed to provide health services. If the facilities that can provide individual interventions are not accessible, more patients was expected to deteriorate their diseases and visit close facilities with acute events or untreatable complications(16). Then, those patients with a last stage of diseases needs expensive interventions such as coronary bypass surgery, renal transplantation, anti-cancer therapy. If public subsidy covers all of those interventions with well-trained staffs, significant budget was expected to be needed(17). Hence, the choices of services covered by UC is crucial to meet the objective of UC, however, the system to select those seems not to be established well.

## 1.2 Research questions

1. Are selected interventions to diabetes mellitus covered by UCS are appropriate in Thailand?

2. How should the government judge which intervention to Type 2 DM should be covered by UCS?



## 1.3 Research objectives

1. To review interventions to diabetes mellitus covered by UCS in

Thailand through documents reviews, key informant interview and data analysis.

2. To find suitable model to judge interventions to Type 2 Diabetes Mellitus covered by UC

## 1.4 Study framework

In this study, the review of the interventions covered by UHC was conducted based on the below possible model of framework for criteria and evaluation.

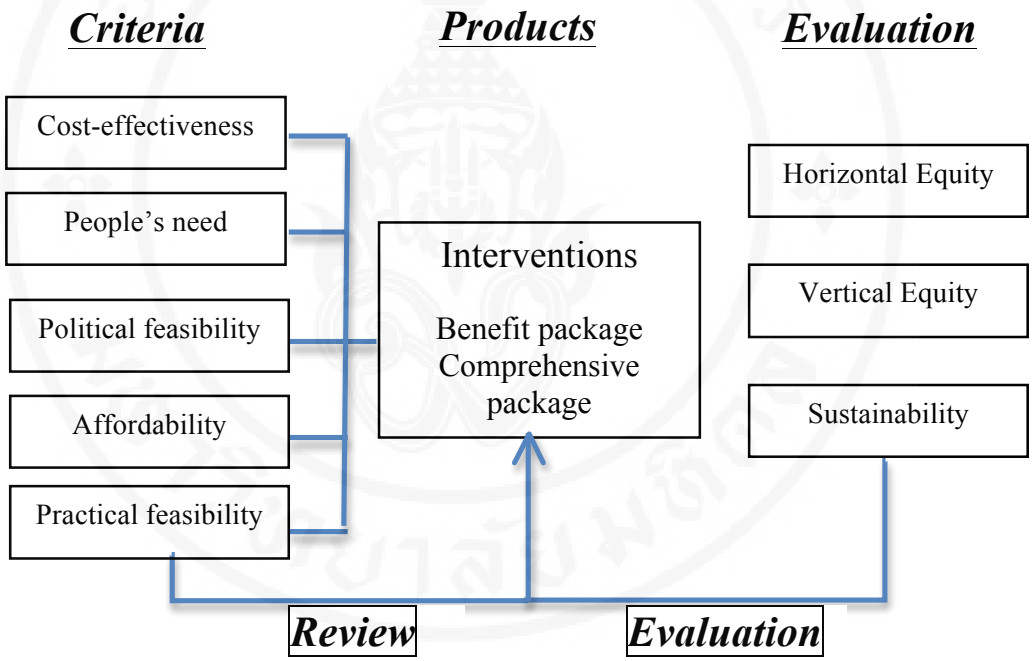


**Figure 1.1** Study framework

## 1.5 Operational definition

*Cost-effectiveness* refers to an economic assessment in which the expenses and consequences of alternate healthcare services are expressed cost per unit of health outcome.

*People's need* refers to the number of people who need the services and DALYs.

*Political feasibility* refers to political acceptance in terms of constitution, policy and the power of determiner.

*Affordability* refers to the ability to hold or provide budget to conduct the services in provider level and national level.

*Interventions* are defined as services provided with people. In principle, the benefit package stands for population wide approach to people who are not suffered from the specific disease or undiagnosed. The comprehensive one often stands for individual therapy to patients.

*Practical feasibility* refers to the ability to supply the services in terms of the capacity such as human resource and equipment.

*Horizontal equity* is defined in three different ways:

Equal access to healthcare for equal need.

Equal use of healthcare for equal need.

Equal heath care expenditure for equal need.

*Vertical equity* is defined as doing with treating people differently when the level of need among them differs- i.e. trying to make small the gap between the rich and the poor through preferential treatment.

*Sustainability* is defined as the ability to continue to provide the services in terms of finance and human resource.

# CHAPTER II
# LITERATURE REVIEW

## 2.1 Universal coverage policy in Thailand

### 2.1.1 History and financing

Universal health coverage was been launched " to equally accredit all Thai people to qualified healthcare according to their needs, regardless of their socioeconomic stature". To achieve the successful goals, the financing system is one of the most important parts in the system. Generally, UC can be designed in different forms due to the economic and political situation in the world.

Thai government has chosen the general tax as the main source of financing although there are a number of variations in terms of prepayment system. They also practice the co-payment system of THB 30 per visit. This co-payment system could reduce the out-of-pocket payment relatively. At the launch of UC, they introduced the capitation payment since this system was functioned in SSS to provide adequate health care services to users. The capitation by the government equals to the UC budget. It is calculated based on the capitation rate and the total number of people covered by UC. The capitation rate was reflected by evidence concerning utilization, unit cost and annual fiscal capacities(18).

The co-payment of THB 30 for every visit was stopped in 2006. The evaluation indicated that the stop of the co-payment system did not have any effect on the utility at all. Then it has been reintroduced until 2008.

The number of people covered by insurance has increased from 2005 until 2011(95.1% to 98.0%). According to the report, the utilization of people covered by universal coverage has not changed in outpatients and inpatients(13)

### 2.1.2 Health care service delivery in benefit package

The Universal Coverage Scheme can be used by public and private health care facilities, although the registration is needed only for private health facilities through the submission of required application forms and investigation according to standard of the UCS (18).

Thai health system was divided into 3 level cares as other countries: primary, secondary and tertiary care. Primary care has been labeled as receptionists to provide care for UCS beneficiaries. Primary care should provide people in their cover areas with constant and widespread care. Based on the services provided, health facilities under the UCS can be categorized into the below three units.

*Primary care*: Contracting units for primary care (CUPs) are charge in primary care. These CUPs are primary health facilities providing healthcare services including preventive, curative and rehabilitative ones such as ambulatory care, home based care, and community care. Each CUP has its own covering area and people.

*Secondary care*: Contracting units for secondary care (CUSs) are charge in secondary care. The CUSs provide secondary care, basically inpatient services. They are facilities covering from primary care to pre-tertiary care.

*Tertiary care*: Contracting units for tertiary care (CUTs) are charge in tertiary care. The CUTs offer high-cost care and concentrated care with high machineries. They can be regional hospitals, university hospitals, or specialized health institutes.

In theory, UCS beneficiaries are free to choose their primary providers in the area they registered. However, since there is very restricted number of primary care providers in countryside areas, beneficiaries are assigned mainly to primary health facilities in public near their communities.

## 2.2 Non-Communicable Disease and aging



The report of global burden of diseases in 1990 and 2010 ensured the change of diseases distribution all over the world. The actions for communicable diseases has been making progress, and more non-communicable diseases burdens have been getting more proportion to the total even in low-income countries except

sub-Sahara Africa. Most of low-income and lower middle income countries has strategic plans, policies and strategies, yet they have not implemented those. In contrast, Thailand has its own policies based on WHO recommendation, and then it has been implemented relatively mainly to the rapid aging. Aging has grown exponentially recently and the fertility rate is much lower than 2.03 in Thailand. United nations have the prospect that elderlies was expected to increase almost in this hundred year (19). The median age in 2013 was 36.9, but it was expected to become 51.1(19). Life expectancy at birth would be 74.3 in 2015, but it also grows until 80.5 in 2050, and 86.4 in 2100.

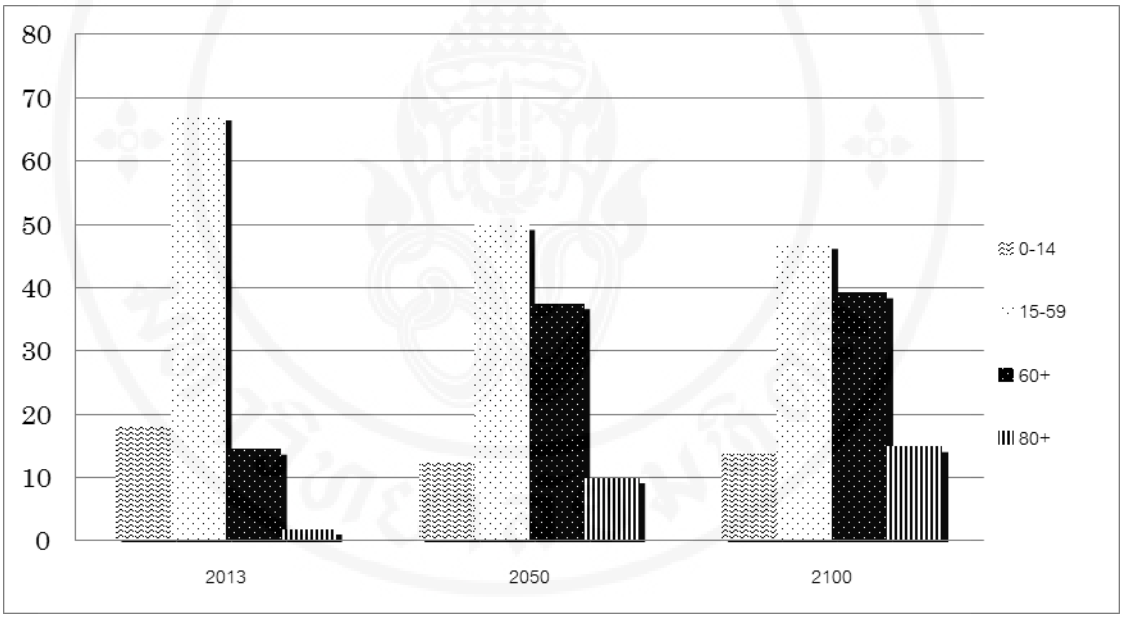


**Figure 2.1** Percentage distribution of the population in selected age groups

Thailand has already has higher distribution of life lost by Non-Communicable Diseases. (Bangkok: 55%, Regional Average 36%) Then, the proportion of risk factors such as smoking (Male 45%, Female 3%) and obesity (Male 4.9%, Female 11.8%) are also higher than regional average.



## 2.3 Interventions to NCDs and criteria of its selection

To reduce the burden of NCDs in low- and middle-income countries is one of the main agenda in global health. Some packages have been developed to tackle on this agenda in the world. "BEST BUYS" are minimum package recommended by World Health Organization (WHO) at global level. BEST BUYS comprises several interventions which have better cost effectiveness rate(20). To minimize the burden of NCDs, population-wide approaches and individual interventions are both required(21). As example, Multinational Monitoring of Trends and Determinants of Cardiovascular Disease (MONICA) project arranged by WHO revealed that the integrated approach could dramatically reduce the incidence rates and mortality rate(22). In UK, the mortality of coronary heart disease has dramatically decreased from 1981 to 2000. 58% of this decrease has attributed to population-wide approach, in contrast, 42% of this decline has be done due to individual intervention(23) .

However, each country applied that information into their own situations using some criteria. In terms of affordability, compared with population-wide approach, high-risk approach, namely, individual interventions cost more. The expenditure on those interventions is supposed to rise gradually if the horizontal equity are attained and more and more people get access to those healthcare services in low- and middle-income countries(24).

Moreover, the interventions are complex and act interdependently and independently both(25). Hence, the evaluation of each intervention has several challenges. Multiple evaluations including process measures are required(26).

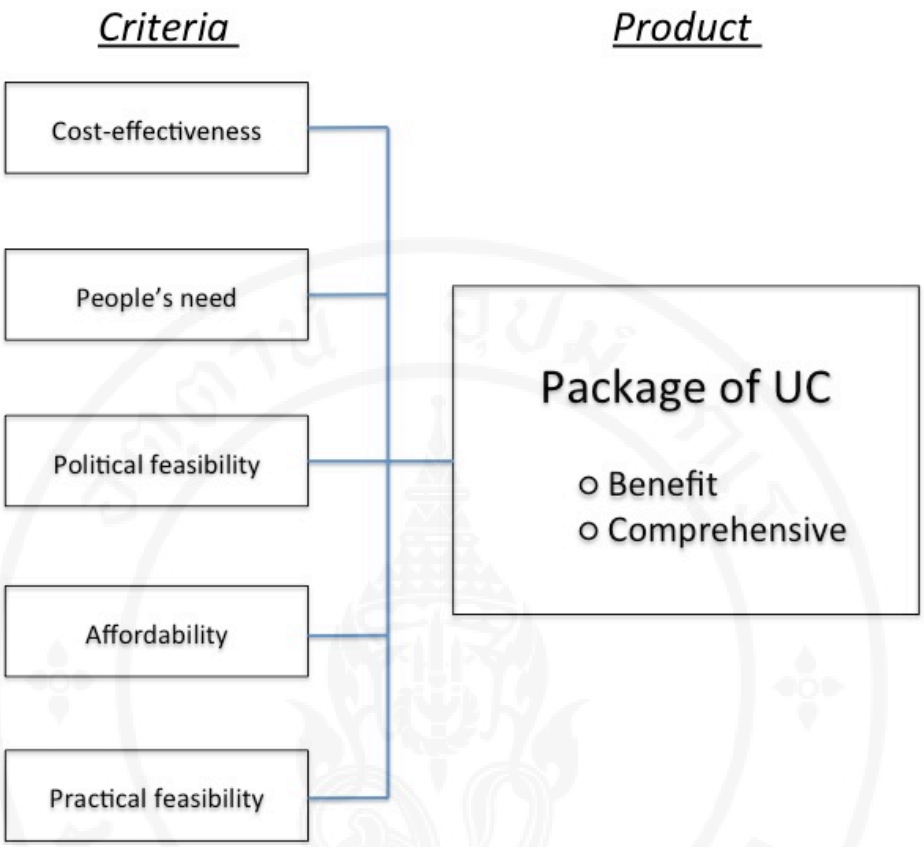


**Figure 2.2** Association between selected package and suggested criteria(14)

## 2.4 Type 2 Diabetes Mellitus

Diabetes Mellitus (DM) is one of metabolic diseases in which people has high blood sugar by the reasons that the pancreas does not produce enough insulin, or that cells in their body do not react to the insulin.(27) Type 2 of DM (T2DM) is the most major type of diabetes and categorized by insulin resistance, which may be united with comparatively reduced insulin secretion.(27) It usually occurs in adults, but has been seen in children recently. Many people with T2DM remain unaware of their diseases long time because their symptoms take years to develop or be recognizable, during the window period the body has been broken by the overload glucose in the blood. They often got the diagnosis of T2DM only when their complications have already emerged.(28)



The total number of patient with T2DM is increasing speedily in the world, mainly in low-income and middle-income countries. This escalation is also allied with

economic growth, ageing population, urbanization, and change of lifestyle. Western pacific and Asian regions are the highest prevalence area in the world due to such lifestyle change. And Thailand has the same risk that may possibly grow up the prevalence of DM.(6)

Toward this rapidly increasing burden of T2DM, WHO launched some recommendations of interventions. The cost-effective choice of interventions based on systematic review is selected and published as BEST BUY as above(20). Moreover, the article including the data of efficiency of intervention to T2DM was published as following (See Table 2.1).

The indicators are required to assess the above interventions introduced. The controllability of FBG and HbA1c is one of most reliable indicator to assess the intervention to diabetes. In Thailand, one study, which conducted to 1,795 subjects, shows that 40.8% of patients with T2DM were able to control their levels of Fasting Blood Glucose (FBG) and 22.7% of patients could control their HbA1c levels.(29) This result means that the present interventions did not work so well comparatively at that time and how difficult it is to reduce the burden of T2DM.

**Table 2.1** Individual interventions in Type 2 DM with evidence of efficacy(30)

| **Interventions** | **Benefit** |
|---|---|
| Interventions of lifestyle for preventing T2DM in people at high risk | Reduction of 35–58% in incidence |
| Metformin for people at high risk of T2DM | Reduction of 25–31% in incidence |
| Glycaemic control in patients with HbA1c greater than 9% | Reduction of 30% in microvascular disease per 1 percent decrease in HbA1c |
| Blood pressure control in people whose pressure is greater than 130/80mmHg | Reduction of 35% in macrovascular and microvascular disease per 10 mmHg drop in blood pressure |

**Table 2.1** Individual interventions in Type 2 DM with evidence of efficacy(30) (cont.)

| **Interventions** | **Benefit** |
|---|---|
| Annual eye examinations | Reduction of 60-70% in serious vision loss |
| Foot care in patients with high risk of ulcers | Reduction of 50-60% in serious foot disease |
| Angiotensin converting enzyme inhibitor use in all people with T2DM | Reduction of 42% in nephropathy; 22% decrease in cardiovascular disease |

# CHAPTER III
# MATERIALS AND METHODS

## 3.1 Development of methodology

To review the services to T2DM covered by UC from several aspects, several viewpoints were picked up as the possible criteria. Those were from one of the recommendations by WHO and equity was added to that. The key informant interviews, facility survey and documents reviews were conducted to assess the interventions from each perspective. Each method employed in the study relating to the objectives and the results chapters are summarized in Table 3.1.

**Table 3.1** Research method employed in this research

| Criteria | Document Review | Key Informant Interview | Extracted Data |
|---|---|---|---|
| Cost effectiveness | ● | ● | |
| People's need | ● | ● | |
| Political feasibility | ● | ● | |
| Affordability | ● | ● | |
| Practical feasibility | ● | | |
| Horizontal equity | ● | | ● |
| Vertical equity | ● | | ● |
| Sustainability | ● | ● | |

In this research, interventions to diabetes mellitus covered by UCS were assessed in terms of the following criteria. Indicator, information needed and methods were shown in the following chart.

**Table 3.2** Indicators and information needed to assess services

| Criteria | Indicators and information needed |
|---|---|
| Cost effectiveness | Incremental cost-effectiveness ratio of representative intervention to diabetes mellitus in study setting |
| People's need | 1. The number of people who need the interventions to control their diabetes mellitus<br>2. DALYs |
| Political feasibility | 1. Integrity with other insurance services.<br>2. Verify the cutting off point for service coverage based on Thailand constitution and political conflict |
| Affordability | 1. The affordability to provide DM services covered by UCS in each health facility<br>2. Projection of affordability when people suffering from diabetes could access to services |
| Practical feasibility | Whether adequate equipment and health personnel of health facilities to provide DM services |

**Table 3.3** Indicators for assessment of horizontal equity

| Item | Indicator |
|---|---|
| Horizontal Equity | Travel distance to each health facility<br>Transport and communication services<br>Waiting times<br>Patients equally get information about the effectiveness and availability of treatment<br>Charges and ability to pay are same |

Prioritization decision

The prioritization score can be calculated by the following formula (31).



*Formula 1.*

***PRSa = α [Equity] + (1-α) [Efficiency]***

The efficiency can be measured in terms of its cost-effectiveness, and the equity is outlined as the below.

*Formula 2.*

***Equity = β [severe health conditions] + (1-β) [poverty reduction]***

The implications of different weighting of efficiency and equity can be compared.

Some interventions that are newly introduced and have controversial points are selected and assessed using the formula.

## 3.2 Document review

A document review of peer-reviewed and grey literature including policy documents and annual reports of the MOPH and government statistics was undertaken. The following key words were used on the 2nd of January 2014 PubMed ((diabetes[Title]) AND Thailand[Title/Abstract]) OR (("Diabetes Mellitus"[Mesh] OR "Type 2 Diabetes Mellitus"[Mesh]) AND "Thailand"[Mesh]). Studies presenting data on feasibility, affordability, equity, cost-effectiveness, and sustainability were included. The data of combination with other NCDs were excluded. The systematic literature review was complemented by other sources obtained through publications in Ministry of Public Health (MOPH) of Thailand.

## 3.3 Key informant interview

### 3.3.1 Subjects of interview

The chart shows the category and number of subjects of questionnaire.

| Category | No. of participants |
|---|---|
| **Key informant interviews** | |
| 1. Health personnel in Bangkok Metropolitan Administration Hospital | 1 |
| 2. National Health Security office (Nonthaburi) | 1 |
| 3. National Health Security office (Bangkok) | 1 |
| **Total** | 3 |

**3.3.2 Contents of interview**

Key informant interviews gathered all available data to conduct the analysis and prepare a report on:

- Policy and strategy
- Achievement of targets
- Affordability
- Cost-effective analysis
- Political feasibility
- Cost related to diabetes
- Health personnel providing services to patients with diabetes

**3.3.3 Inclusion criteria**

Health personnel in health facility>

- Health personnel aged over 18 with both sex
- Health personnel who can speak and read English
- Health personnel working in health facility more than 1 year
- Health personnel who provided DM services in daily work

Decision maker of services covered by UCS

- Person who aged over 18 with both sex
- Person who can speak and read English
- Person who has ever decided intervention covered by UCS
- Person working in MOPH or National Health Security Office (NHSO)

### 3.3.4 Exclusion criteria

- Cannot communicate well
- Persons who are not interested and refused to participate in the survey

### 3.3.5 Discontinuation criteria

The subject who feels uncomfortable and refuse to continue answering the question by interviewers can withdraw and are discontinued interviewing.

### 3.3.6 Duration of data collection

The data was collected for approximate one month.

This study was conducted in January and February in 2014 after receiving the ethical approval from Ethics Committee for Human Research, Faculty of Public Health, Mahidol University.

## 3.4 Data collection as secondary data

This study used extracted data from the existing previous projects that were conducted among T2DM patients from every level of facility in Thailand. Those research projects were started in 2009 and ended in 2011.

This study extracted about 300 records from each level of facility (all together about 1,200 records)

- Primary care unit - 300 records,
- Community hospitals - 300 records,
- Provincial Hospital –300 records and
- Bangkok Metropolitan Administration Hospital –302 records

## 3.5 Equity analysis



Horizontal equity analysis using logistic regression based on the scoring method as Table 3.4 was carried out in SPSS 18.0. The scoring of horizontal equity

was conducted based on the below scoring method. Waiting time and Travel distance were assigned into 2 categories. 30km was used since about 5% of subjects commute to health facility in the distance of more than 30km. 20minutes for waiting time was applied from Thai Standard (32). In this scoring method, 0 means no factor for horizontal inequity and 4 stands for the maximum of horizontal inequity.

**Table 3.4** Scoring method of horizontal inequity

| **Items** | **0** | **1** |
|---|---|---|
| Travel Distance (KM) | D<30 | D=>30 |
| Waiting Time (Minutes) | T<20 | T=>20 |
| Equally informed | Yes | No |
| Ability to pay | Yes | No |

## 3.6 Ethical Consideration

Before asking any questions, the respondents gave an information sheet to read and any clarification was provided by researcher and an interviewer. The information sheet was read to those respondents who cannot read. The respondents are adequately informed about this study including objectives, methods, anticipated benefits and potential hazards. The participation of respondents was completely voluntary and they were allowed not to participate or even drop out during the survey. No incentives were provided to the respondents in cash. The name of subject was omitted and only the identification number is used. But address was obtained for checking if any correction was required. Due to the privacy of respondents, all answers given by them were kept strictly confidential. The respondents were showed respect and thank for their contribution to this study.

**Individual Consent**

Before starting all interviews, participants were provided the information orally about the purpose and nature of the study. An information sheet has also been handed over to them when they agree to participate in the study. A informed consent was be required for all participants to be in this study. The participant was informed

that all information collected was held in strict confidence. The respondent was be free to terminate the interview at any point, and to skip any questions that she/he does not wish to respond to.

**Confidentiality**

The id and addresses of the respondents were appeared in any form in the interview schedule. Faculty of Public Health, Mahidol University, that makes the rules about how study is done and the student researcher along with his preceptor and co-preceptor, have the right to look at records from this research subjects. If an outside review occurs, the records were privately kept to the extent allowed by the guidelines of ethics committee. Finally, after this research, all the material recorded was be erased and no one can use the data recorded.

# CHAPTER V
# DISCUSSION

## 5.1 Interpretation of the analysis

Analyses at certain level of facilities have shown the some factors affected the horizontal equity. At the level of PCU and Community Hospital, the service of foot care has the significance as the service affected to horizontal equity. However, the interpretation of this result includes two possible ideas logically due to the cross sectional study. Those two are that the service produces or reduce horizontal equity among the subjects and the subjects who have horizontal equity tend to get that service. In this setting, the latter option is more plausible. Then, at the level of provincial hospital, the result presents that age affected the horizontal equity. In this setting, it is possible to interpret that more aged people who have inequity could not reach the health facility. This is the big limitation of cross-sectional study and the analysis of data from health facilities. However, every analysis has 560.2-1368.9 at Chi-square of deviance. It can be interpreted that more variable should be included into analysis and affects the horizontal equity.

As one interpretation of this analysis, it can be suggested that the social determinants affecting horizontal equity should be paid attention when health providers give services related to the disease. Moreover, if some services affect the horizontal inequity strongly, it should be reconsidered about the appropriateness as the services under UCS. Moreover, the health personnel should be noticed which interventions are prone not to be provided to people who has horizontal inequity.

The defining of the parameter to vertical equity of each intervention is quite difficult, although some researchers suggested several indicators to measure it based on deprivation indices (41). Especially, poverty reduction is one of the components of vertical equity, but still it has not been outlined well until now. Moreover, the judgment of trade-off between equity and efficiency is also indefinable. This trade-off should be considered in the setting cover more services not only the

services to T2DM. The formula was taken on in some institution(42). However such a formula should be adjusted into each own country situation carefully. This is another issue left for the policy maker.

## 5.2 The criteria of selection of interventions covered by UCS

The above 5 criteria were considered at some extent, when they have decided to include renal replacement therapy. Of those 5 criteria, it was inferred that they have put emphasis on CEA. Then, in fact, they have calculated CEA expected in Thai situation using general result of CEA in the world. However, the used cost was expected cost by policy maker, and actually the present cost, especially of PD/HD solution is still more expensive than one expected at that time. Therefore, the reviewing of those criteria is required. It was supposed that the practical feasibility has not been considered adequately. Although the judgment of that is difficult before the launch of that service for sure, the expectation of service delivery based on required number of qualified staff may be required to reduce the gap of quality among facilities.

## 5.3 The importance of review for criteria

As the review in this paper has shown the change of practical feasibility and DALYs and the prevalence are updated, the needs of people, the affordability of the government, and practical feasibility are changeable. Hence, the interventions covered by UCS should be reconsidered. The choices are parts of complex adaptive system.

## 5.4 The difficulty of CEA in the certain situation



Before the coverage of UCS to renal replacement therapy, the health facilities have been providing those services to people who use other health insurance schemes, such as SSS and CSMBS there. Hence, the launch of new coverage of renal

replacement therapy under UCS did not mean the introduction of new technology in the facilities. The initial cost, which is generally cost when new technology is introduced, are not spent at that time.

## 5.5 Consideration for sustainability

In this study, the sustainability was the most difficult component in this framework. Some researches and some institutions suggested several criteria to judge the sustainability of health system and this research followed some indicators which seem to be applicable to this study (43). Nevertheless, every suggested indicator were specific to health situation and diseases at some extent, hence they were not applicable to any other situation. Therefore it is still not clear how can sustainability be measured.

International institutions should conduct study this point on sustainability. As a result, the sustainability might not be able to be included into this study framework as indicator of evaluation at the present although it should be included ideally.

## 5.6 Appropriateness of study framework

In conclusion, it was supposed that this study indicated the practical feasibility to utilize this framework at some extent. However, the evaluation of sustainability was not suitable to enter into this study framework since the indicator is not consent in the world yet. Moreover, the efficiency based on the impact of the selected intervention should be comprised with other services. The impact should be considered not as DALYs but also with social impacts such as reducing the workload of caregivers.

Regarding other parts, if the government decides to collect data to evaluate and review interventions, it is adequately possible to conduct the evaluation and review this framework. According to the interview, they have never evaluated the newly introduced intervention until now. It may be because that Thai economics has been growing up steadily and the cabinet is continuing to put emphasis on health and to allocate some budget into NCDs separately. However, if the situation changes, the

policy maker might have to consider which intervention should be declined from coverage of UCS. At that time, this study framework would be more useful for them.

## 5.7 Strength, weakness and limitation of this study

This study has some strength and weakness. In comparison with other theoretical method, the direct interview to people who actually have selected the interventions covered by UCS, were conducted in this study. Hence, the result can be more realistic and applicable to the real selection.

There was the disparity of the focused interventions between in the review and in the evaluation as one of weakness on this study. Especially, the evaluation of renal replacement therapy was lack since the data regarding to that intervention could not be collected. Besides, the indicators for evaluation, especially vertical equity, were not the general standards.

One of limitation on this study was recall bias. This research asked some old judgment and thought. It caused recall bias somehow. Ideally, the process should be monitored on time. Moreover, the data was extracted from the hospitals located surrounding Bangkok although some researchers indicated the gap of equity between urban area and rural areas(44).

# CHAPTER VI
# CONCLUSION AND RECOMMENDATION

## 6.1 Conclusion

It was revealed that upon the selection of interventions covered by UCS, policy makers have given thought to each element of study framework according to key informant interview. However, some of elements were still vague to judge and especially CEA were put emphasis on compared with other elements. Furthermore, if one newly interventions are launched, policy maker can review those elements using the real data related to that intervention. Regarding renal replacement therapy, they have conduced CEA and grasped the prevalence and DALYs of T2DM, however, the real cost of PD/HD solution is different from their expected cost and the practical feasibility of kidney transplants due to less kidney donors is still low. Thus, the review of criteria is required to assess correctly after that service has launched.

This below model, in which some components of criteria and evaluation was changed based on the assessment of feasibility to conduct, is feasible to evaluate the interventions covered by UCS. Evaluation for the newly introduced interventions should be conducted based on equity and efficiency. In the future, the sustainability should be included after adequate research for indicators to assess it. However, indicators to measure both equities might need to be discussed and be improved for better evaluation. Afterwards, the government can set more appropriate indicator and make system to collect those data in cooperated with other countries.

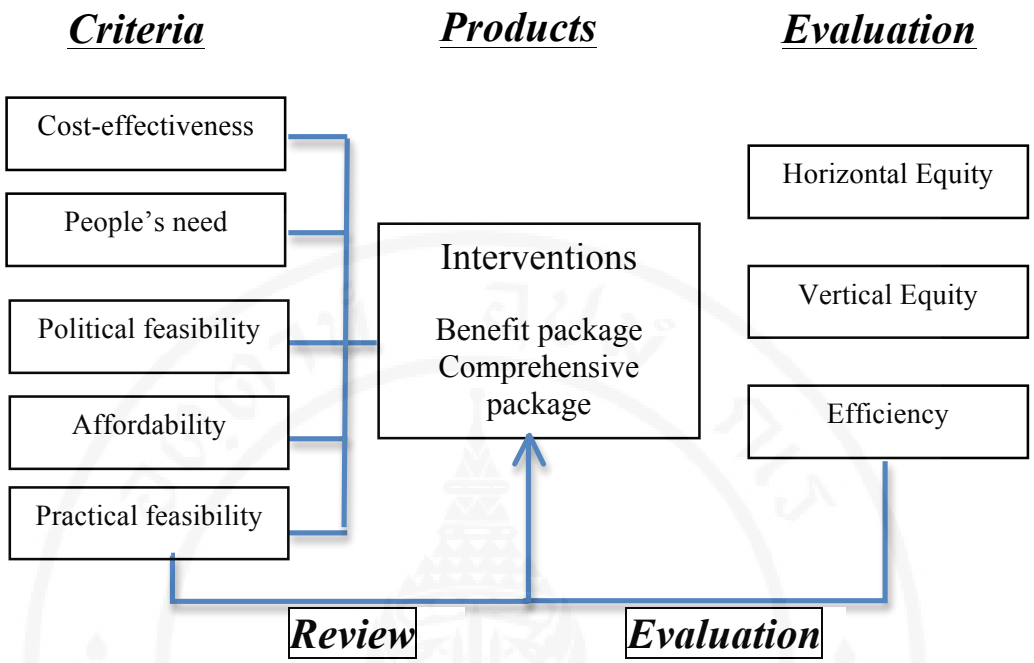


**Figure 6.1** Suggested framework

## 6.2 Recommendation

***Evaluate routinely to keep equity and efficiency***

The necessity of review and evaluation are required routinely although they are not common at present, according to some interviews to key persons. That may be because the cabinet has allocated special budget into NCDs and economic growth in Thailand is stable. However, aging is going to proceed without a doubt and economic depression might come in near future. At that time, the necessity must be elevated and the routine evaluation until that time must be quite helpful to judge properly.

***Set better indicator to conduct better review and evaluation***

The indicator to measure equity should be discussed adequately. The indicator this study used is still controversial in the world. And some international institutions are trying to set some common indicator, which can be utilized among

countries introducing UCS. To share the knowledge and experiences, the global standard on equity should be included to assess it in Thailand(45).

***Make Thai own evidence and share the experience***

The selection of intervention should get more logical using more suitable evidence. As the IHPP and MOPH has already referred, they should take in the real CEA using the present data after the launch of that services to get more appropriate evidence for the better judgment. In collaborated with supporters such as DFID and JICA, they might make Thai own evidence in Thai setting to judge whether those interventions should be continued or not, especially in case of economic crisis.

## 6.3 Further study

Take each certain number of subjects who have been ever diagnosed at once regardless their routine visits to health facilities to assess the equity more properly

# REFERENCES


1. UNSG names high-level panel to develop post MDG agenda 2012 [cited 2013 28th / Nov]. Available from: http://www.who.int/workforcealliance/media/news/2012/highlevelmdg/en/
2. Cause-specific mortality, 2008: WHO region by country. Geneva: World Health Organization, 2011.
3. Mendis S. WHO study on Prevention of REcurrences of Myocardial Infarction and StrokE (WHO-PREMISE). Bulletin of the World Health Organization. 2005.
4. 65th World Health Assembly closes with new global health measures. Geneva: World Health Association 2012. May 26:[Available from: ttp://http://www.who.int/mediacentre/news/ releases/2012/wha65_closes_20120526/ en/index.html.
5. United Nations General Assembly. Political declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases September 16, 2011. Available from: http: //http://www.un.org/ga/search/view_doc .asp?symbol=A/66/L.1.
6. IDF DIABETES ATLAS. International Diabetes Federation, 2013.
7. Ministry of Public Health of Thailand's Strategic Health Plan at the 64th World Health Assembly in Geneva Bangkok: Ministory of Public Health, Thailand; 2013. Available from: http://www.thaigov.go.th/en/news-room/item/61182-ministry-of-public-health-of-thailand%E2%80%99s-strategic-health-plan-at-the-64th-world-health-assembly-in-geneva.html.
8. Deerochanawong C. Diabetes management in Thailand: a literature review of the burden, costs, and outcomes.
9. AGENDA USTTOTP-UD. Addressing inequalities: The heart of the post-2015 agenda and the future we want for all. Geneva: ECE, ESCAP, UNDESA, UNICEF, UNRISD, UN Women, 2012.

10. The world health report: health systems financing: the path to universal coverage. Geneva 27, Switzerland: World Health Organization, 2010.
11. Thai health profile. Ministry of Public Health, 2010.
12. The 2011 Health and Welfare Survey Bangkok, Thailand: National Statistical Office, Ministry of Information and Communication Technology; 2011 [cited 2013]. Available from: http://web.nso.go.th/en/survey/data_survey/HWS_2011_eng.pdf.
13. Office HISR. Thailand's Univesal Coverage Scheme: Acheivements and Challenges. 1 ed2012.
14. Essential health package: What are they for? What do they change? World Health Organization, 2008.
15. Prevention of recurrent heat attacks and strokes in low and middle income populations: evidence-based recommendations for policy-makers and health professionals. Geneva: World Health Organization, 2007.
16. Prevention of cardiovascular disease: guidelines for assessment and management of total cardiovascular risk. Geneve: World Health Organization, 2007.
17. Frenk J Gm-DsO, Knaul FM. The democratization of health in Mexico: financial innovations for universal coverage. Bulletin of the World Health Organization,. 2009. Epub 548.
18. Office HISR. Thailand's Universal Health Coverage Scheme: Achievements and Challenges. 2012 May.
19. Department of Economic and Social Affairs PD. World Population Prospects New York: United Nation, 2013.
20. Forum WHOWE. From Burden to “Best Buys”: Reducing the Economic Impact of Non-Communicable Disease in Low- and Middle-Income Countries. Geneva: 2011.
21. Global strategy for the prevention and control of noncommunicable diseases. : World Health Organization, 2000.
22. MONICA monograph and multimedia sourcebook. Geneve: World Health Organization, 2003.

23. Unal B, Critchley JA, Capewell S. Explaining the decline in coronary heart disease mortality in England and Wales between 1981 and 2000. Circulation. 2004 Mar 9;109(9):1101-7. PubMed PMID: 14993137.
24. Organization WH. Global status report on noncommunicable disease 2010. Geneve: World Health Organization, 2011.
25. Michelle Campbell RF, Andrew Haines. Framework for design and evaluation of complex interventions to improve health. British Medical Journal. 2000;321:694–6.
26. Barasa E. Viewpoint: Economic evaluation of package of care interventions employing clinical guidelines. Tropical medicine & international health : TM & IH. 2011 Jan;16(1):97-104. PubMed PMID: 21371210. Pubmed Central PMCID: PMC3276840. Epub 2011/03/05. eng.
27. McGraw-Hill. Greenspan's basic & clinical endocrinology. 9, editor. New York2011.
28. McGraw-Hill. Harrison's Principles of Internal Medicine. 19, editor2011.
29. Sathira-Angkura T, Kongsin S, Intaraprasong B, Pattaraarchachai J, Jiamton S. Factors associated with the effectiveness of diabetes care at primary care settings. Journal of the Medical Association of Thailand = Chotmaihet thangphaet. 2011 Dec;94(12):1513-20. PubMed PMID: 22295741.
30. Jamison DT et al e. Disease control priorities in developing countries. New York,: Oxford University Press., 2006.
31. Lorna Guinness VW. Introduction to Health Economics. 2nd, editor. London: Open University Press; 2011.
32. Teerawattananon Y, Mugford M, Tangcharoensathien V. Economic evaluation of palliative management versus peritoneal dialysis and hemodialysis for end-stage renal disease: evidence for coverage decisions in Thailand. Value in health : the journal of the International Society for Pharmacoeconomics and Outcomes Research. 2007 Jan-Feb;10(1):61-72. PubMed PMID: 17261117. Epub 2007/01/31. eng.
33. Organization WH. Package of essential noncommunicable (PEN) disease interventions for primary health care in low-resource settings. 2010.

34. de Wit GA, Ramsteijn PG, de Charro FT. Economic evaluation of end stage renal disease treatment. Health policy. 1998 Jun;44(3):215-32. PubMed PMID: 10182294. Epub 1998/05/07. eng.
35. Chi-yuan Hsu EV, Feng Lin, Michael G. Shlipak. The Incidence of End-Stage Renal Disease Is Increasing Faster than the Prevalence of Chronic Renal Insufficiency. Annals of Internal Medicine. 2004 (141(2)):95-101.
36. Praditpornsilpa K, Lekhyananda S, Premasathian N, Kingwatanakul P, Lumpaopong A, Gojaseni P, et al. Prevalence trend of renal replacement therapy in Thailand: impact of health economics policy. Journal of the Medical Association of Thailand = Chotmaihet thangphaet. 2011 Sep;94 Suppl 4:S1-6. PubMed PMID: 22043559.
37. Tantivess S, Werayingyong P, Chuengsaman P, Teerawattananon Y. Universal coverage of renal dialysis in Thailand: promise, progress, and prospects. Bmj. 2013;346:f462. PubMed PMID: 23369775. Epub 2013/02/02. eng.
38. Sustainable Health Systems Visions, Strategies, Critical Uncertainties and Scenarios. Cologny/Geneva Switzerland: World Economic Forum, 2013.
39. Carrera C, Azrack A, Begkoyian G, Pfaffmann J, Ribaira E, O'Connell T, et al. The comparative cost-effectiveness of an equity-focused approach to child survival, health, and nutrition: a modelling approach. Lancet. 2012 Oct 13;380(9850):1341-51. PubMed PMID: 22999434. Epub 2012/09/25. eng.
40. Lorenc T, Petticrew M, Welch V, Tugwell P. What types of interventions generate inequalities? Evidence from systematic reviews. Journal of epidemiology and community health. 2013 Feb;67(2):190-3. PubMed PMID: 22875078.
41. McIntyre D, Muirhead D, Gilson L. Geographic patterns of deprivation in South Africa: informing health equity analyses and public resource allocation strategies. Health policy and planning. 2002 Dec;17 Suppl:30-9. PubMed PMID: 12477739. Epub 2002/12/13. eng.
42. MILANOVIC B. Conflict between Horizontal equity and maximum poverty reduction, How Best to allocate Funds to Regions. Asia and Pacific Forum on Poverty. 2001:1-25.
43. Blanchet K, Girois S. Selection of sustainability indicators for health services in challenging environments: balancing scientific approach with political

engagement. Evaluation and program planning. 2013 Jun;38:28-32. PubMed PMID: 23266399.

44. Haynes R, Gale S. Deprivation and poor health in rural areas: inequalities hidden by averages. Health & place. 2000 Dec;6(4):275-85. PubMed PMID: 11027953. Epub 2000/10/12. eng.

45. Chalkidou K, Marten R, Cutler D, Culyer T, Smith R, Teerawattananon Y, et al. Health technology assessment in universal health coverage. The Lancet. 2013;382(9910):e48-e9.

# APPENDICES

# APPENDIX A
# DATA EXTRACTION FORM

**แบบฟอร์มรวบรวมข้อมูล** (Data extraction form)
**สำหรับการวิเคราะห์รูปแบบการให้บริการผู้ป่วยโรคเบาหวานชนิดที่ 2**
**ภายใต้โครงการหลักประกันสุขภาพแห่งชาติ ในประเทศไทย**

| | | |
|---|---|---|
| รหัส: ☐☐☐ | | ☐ 1. โรงพยาบาลส่งเสริมสุขภาพระดับตำบล ☐ 2. โรงพยาบาลชุมชน ☐ 3. โรงพยาบาลจังหวัด ☐ 4. โรงพยาบาลทั่วไปสังกัดกรุงเทพมหานคร |
| วันคัดลอกข้อมูล | | ___/___/___ (วัน/เดือน/ปี) |
| **คำแนะนำในการตอบแบบสอบถาม** | | |
| **กรุณาใส่เครื่องหมาย (✓ )ลงกล่อง❑ในการตอบคำถาม (เพื่อเลือกคำตอบที่เหมาะสมที่สุด) และเติมคำในช่องว่าง** | | |
| **ส่วนที่ 1: คำถามทั่วไปเกี่ยวกับส่วนสุขภาพ** | | |
| 1 | อายุ | ☐☐ ปี |
| 2 | เพศ | ❑1. ชาย ❑2. หญิง |
| 3 | รายได้ต่อเดือนของครอบครัว | ☐☐☐☐☐ บาท/เดือน |
| 4 | การศึกษา สูงสุด | ❑1. อ่านไม่ออก ❑2. อ่านออก เขียนได้ ❑3. ชั้นประถมศึกษา ❑4. ชั้นมัธยมศึกษาตอนต้น ❑5. ชั้นมัธยมศึกษาตอนปลาย ❑6. วิทยาลัย/มหาวิทยาลัย |
| 5 | ประกันสุขภาพที่ใช้ | ❑ 1. โครงการหลักประกันสุขภาพ<br>❑ 2. สวัสดิการข้ารักษาพยาบาลข้าราชการ และหรือข้าราชการบำนาญ<br>❑ 3. ประกันสังคม<br>❑ 4. ประกันบริษัทเอกชน<br>❑ 5. อื่นๆ |
| 6 | ทำไมถึงเลือกใช้สถานบริการนี้? | ❑1. สถานพยาบาลของรัฐ (ครอบคลุมโดย โครงการหลักประกันสุขภาพ)<br>❑ 2. อยู่ใกล้กับครัวเรือนที่อาศัย ❑☐3. เคยใช้บริการมาก่อน<br>❑4. อื่นๆ ..... |
| 7 | เงินเดือน/รายได้ของคุณเท่าไหร่? | ☐☐☐☐☐ บาท/เดือน |
| 8 | ระยะทางจากบ้านถึงสถานบริการแห่งนี้ใช้เวลาเดินทาง | ☐☐ ชั่วโมง ☐☐ นาที |
| 9 | ค่าใช้จ่ายในการเดินทาง | ☐☐☐☐ บาท |
| 10 | คุณสามารถจ่ายค่าใช้จ่ายในการมารับบริการ ใช่หรือไม่? | ❒ 1.ใช่ ❒ 2. ไม่ใช่ ❒ 3.ไม่ตอบ |

| ส่วนที่ 2: การปฏิบัติ | | |
|---|---|---|
| ข้อ | คำถาม | |
| 1 | คุณทราบว่าเป็นเบาหวานเมื่อไหร่? | ☐☐ ปี ☐☐ เดือน ที่แล้ว |
| 2 | คุณทราบว่าเป็นเบาหวานได้อย่างไร? | .....<br>..... |
| 3 | คุณเคยได้รับกิจกรรมการดูแลรักษาโรคเบาหวานโดยผู้ให้บริการออกไปให้บริการนอกสถานบริการหรือไม่ | ❒ เคย (ตอบคำถามข้อ 4 ต่อ) ❒ไม่เคย (ตอบคำถามข้อ 5 )<br>❒ไม่ทราบ (ตอบคำถามข้อ 5 ) |
| 4 | ความรู้ใดที่คุณได้รับจากกิจกรรมการดูแลรักษาโรคเบาหวาน โดยผู้ให้บริการออกไปให้บริการนอกสถานบริการ | ❒ 1. ส่งเสริมกิจกรรมทางด้านการตรวจร่างกาย<br>❒ 2. สนับสนุนกลวิธีการเดินทางมารับบริการของผู้ป่วย<br>❒ 3. สามารถให้บริการการปรึกษาเกี่ยวกับกิจกรรมการตรวจร่างกายในระดับการให้บริการปฐมภูมิ<br>❒ 4. สามารถแนะนำการทดแทนไขมันอิ่มตัว ด้วยไขมันไม่อิ่มตัว<br>❒ 5. สนับสนุนความตระหนักและใส่ใจเกี่ยวกับอาหาร<br>❒ 6. ให้ความรู้เรื่องโทษของการดื่มสุรา |
| 5 | คุณได้รับการบริการการรักษาโรคเบาหวานชนิดใดเป็นประจำ? | ❒ 1. การตรวจตาประจำปี ❒ 2. การดูแลเท้า<br>❒ 3. การตรวจสภาพการทำงานของไต<br>❒ 4. การปรับปรุงการมารับยาอย่างต่อเนื่องและสม่ำเสมอ<br>❒ 5. การเปลี่ยนวิถีการใช้ชีวิต ❒ 6.การชำระเลือดผ่านเยื่อบุช่องท้อง<br>❒ 7. การฟอกเลือดด้วยเครื่องไตเทียม ❒ 7. การปลูกถ่ายไต<br>❒ อื่นๆ( ) |
| 6 | คุณไปใช้บริการที่ศูนย์สุขภาพบ่อยแค่ไหน | .....<br>..... |
| 7 | คุณใช้เวลาเฉลี่ยประมาณเท่าไหร่ในการรอรับการบริการจากศูนย์สุขภาพโรคเบาหวาน? | (เฉลี่ย) ประมาณ ☐☐ ชั่วโมง ☐☐ นาที |
| 8 | คุณได้รับข้อมูลเกี่ยวกับเบาหวานจาก? | .....<br>..... |

| ส่วนที่ 3. ความคาดหวัง | | |
|---|---|---|
| 1 | หากอาการเบาหวานของคุณเป็นระยะสุดท้ายแล้ว คุณสามารถไปโรงพยาบาลประจำจังหวัดของคุณเองได้อย่างต่อเนื่องและประจำได้หรือไม่? | ❒ 1. ไปได้ ❒ 2. ไปไม่ได้ ❒ 3. ไม่ทราบ<br>เหตุผล.....<br>..... |
| 2 | ใช้เวลาเดินทางเท่าไหร่ ถึงโรงพยาบาลประจำจังหวัดของคุณ? | (เฉลี่ย) ประมาณ ☐☐ ชั่วโมง ☐☐ นาที |
| 3 | ค่าใช้จ่ายในการเดินทางไปยังโรงพยาบาลประจำจังหวัดของคุณ? | ❒❒❒❒❒ บาท<br>โดย ( เดิน, จักรยาน, รถยนต์, รถเมล์, อื่นๆ(.....) ) |
| 4 | โปรดให้คำแนะนำสำหรับการพัฒนาการจัดบริการเกี่ยวกับโรคเบาหวาน? | .....<br>.....<br>.....<br>..... |

# APPENDIX B
# INTERVIEW FORM TO POLICY MAKERS

Date: |__|__| |__|__| |__|__|

Time|__|__| |__|__|

Place of interview……

The purpose of this study is to gather information useful for assessment of services to diabetes. The information we gather will help us learn about services so as to help us understand your needs and further requirement and how your services/programs /interventions may facilitate service delivery. Your honest comments would help us to improve our understanding therefore please be frank about your opinion. We appreciate your helping us today, as well as your important contribution to improvement for services to diabetes.

| Category | Question | Answer |
|---|---|---|
| Selection | Have you ever committed to procedure to select the services covered by UCS? | |
| | If yes, what was your position at that time? | |
| | What part did you decide services to diabetes? | |
| | What is the process to decide services? | |
| | Who consist of members to decide the services? | |

| Category | Question | Answer |
|---|---|---|
| | How many times do they consider the selected interventions covered by UCS per year? | |
| | What is the material (criteria) to decide selected services to diabetes covered by UCS? | |
| Affordability | How do you judge the affordability of one newly entitled intervention at National level? | |
| Cost-effectiveness | Have you ever considered cost-effectiveness of selected interventions? | |
| Political Feasibility | How do you treat with integrity with other insurance services | |
| | Have you ever felt the political difficulty to decide those interventions? | |
| | Do you think whether the policy and power to restrict the services or to cover inappropriate intervention exist or not ? | |
| Practical feasibility | Did you consider the practical availability of selected interventions? If yes, how? | |
| | Please teach the system to collect organ donors in Thailand | |
| | Does the number of organ donor adequate for the need of end-stage of diabetes? | |

| Category | Question | Answer |
|---|---|---|
| | How many patients can get kidney transplant per year? | |
| Cost | How much is the cost of machine for dialysis to introduce to health facility newly? | |
| | How many staffs are working for dialysis services and how many patients receive the service per day? | |
| | How many times do patients come to receive the dialysis services per week? | |
| | How much are the salaries of those staffs? | |
| Overview | Suggest for improving the interventions to DM patients | |

# APPENDIX C
# INFORMATION SHEET

**Information Sheet** **EC-3 Form**

**1.Title of project:**

Analysis on interventions to Type 2 Diabetes Mellitus covered by Universal Coverage Scheme in Thailand

**2.Study site:**

Bangkok and surrounding provinces, Thailand

**3.This project is conducted byTakuma Katounder supervision of preceptor and co-preceptors as follows:**

Preceptor : Asst. Prof. Dr. Sukhontha Kongsin

Co-Preceptor : Asst. Prof. Dr. Sukhum Jiamton,

**4.Brief Background, Rationale:**

According to the report of Global disease burden 2010, the main disease burden in the world has been shifting from infectious disease to Non-Communicable Diseases gradually. In Thai as well, NCDs dominates more than 50% of DALYs at present. Of those NCDs, Type 2 Diabetes Millets is one of the most significant diseases since it is not curable, costs more than others and led many complications such as stroke and ischemic heart disease. To reduce this burden, population wide approach and individual intervention are both needed.

In Thai, Universal Coverage Scheme has launched in 2001.Based on this launch, the coverage of health insurance in Thai has been improved and has reached 98%. Moreover, the covered services by UCS are increasing. In 2007, the dialysis and transplantation has been entitled into covered services. Those services have cost-

effectiveness according to the evidence published in the world. However, the assessment for interventions covered by UCS needs several perspectives such as affordability, equity and sustainability to attain the goals. In this research, the researchers would try to find one suitable model to judge the intervention through the reviewing of interventions to Type 2 Diabetes Mellitus.

**5.Objectives:**

1. To review interventions to diabetes mellitus covered by UCS in Thailand through documents reviews, key informant interview and facility survey.

2. To find suitable model to judge interventions to Type 2DM covered by UC

**6.You are invited to be a volunteer/subject to participate in the project:**

You fulfill the criteria. The aim of this study is to analyze interventions to Type 2 Diabetes Mellitus covered by Universal Coverage Scheme in Thailand. As the results of the study can be issued for health care policy maker, theycan use more criteria to judge the interventions covered by UCS.You are sincerely invited to participate for the interview.

**7. Research activities which involving you when you volunteer to participate in this research project will be as following:**

During the interview, the respondents can ask the interviewers if they are unclear of the questions and then the interviewers will explain back to them until they understand. Questions will be on services to diabetes. Respondent's answers will be confidential. The time taken for each interview will not be more than 60 minutes. If the respondents feel uncomfortable or inconvenience to answer some of the questions, they can skip or withdraw anytime from participation.

**8.Period of time that you will be involved in this research activities:**

60 minutes



**9.Expected benefits of the project to you and to others:**

The results also assist the government to improve the method to choose the services covered by Universal Coverage Scheme.

**10.Risks or any undesirable that may occur to you caused by this research and measure or prevention and risk reclusion method which will be provided during participation in the project.**

There is no physical and mental risk or undesirable consequences that may happen to respondents during conducting the project. However, the researcher and his team would be concerned about the emotion of the participants. In case of any inconvenient during the interview, the respondent can skip the questions or withdraw anytime from participation or can stop from interview.The participation of respondents is completely voluntary and they are allowed not to participate or even drop out during the survey if they feel uncomfortable to answer any question. Their profile will be kept strictly confidential

**11.How can you securely store the data and keep them confidential?**

All the data will be accessible by the researcher only. They will be strictly kept in a safe place and the answers of all respondents will be kept confidential. Afterthis research, all the material recorded will be erased and no one can use the data recorded.

**12.The right of the subject (he/she) to withdraw from the project.**

All participants have the right to refuse or skip the questions if they feel uncomfortable to answer and withdraw at any time since it is voluntary to decide to participate in the research.

**13.Contact address of authorized persons in case of emergency.**

**Takuma Kato (S**tudent ID: 5637161PHMP/M)
Master of Public Health(M.P.H) International Program 2013-2014
Faculty of Public Health, Mahidol University
Address: 18/229 Rajaprarop Road, Rajthevi,
Bangkok 10400 Thailand.

# APPENDIX D
# INFORMED CONSENT FORM

**Informed Consent Form**

Project Title:
Analysis on interventions to Type 2 Diabetes Mellitus covered by Universal Coverage Scheme in Thailand
Responsible person(s) and institute:
Takuma Kato
Student ID: 5637161 PHMP/M
MPH International Program
Faculty of Public Health, Mahidol University
Bangkok 10400, THAILAND

Date ……...……
(day/month/year)

I
(Mr./Mrs./Ms.)…….……..……...……
Home address…….…… Street…….…… Village number……..……
Sub district……. District…...…….. Province……..…….. Postal code…..……..

I have read and understood all statements in the **information sheet**. I have also been explained the objectives and methods of the study, as well as possible risks and benefits that may happen to myself upon the participation in the study. I understand that the information will be kept confidential and my name will not be declared in any case. I shall be given a copy of the signed **informed consent form**.

I have the right to withdraw from the project at any time without any adverse effects upon myself.

Signature…..…….… (Respondent/informant)

(…….……..)

Signature…… (Researcher)

(Takuma Kato)

Signature…….……...… (Witness)

(…….……..)

I cannot read but before having finger print on this **informed consent form**, the investigator/interviewer has read and explained to me in detail about the study, the information sheet and the **informed consent form** until I completely understood.

Signature…….… (Respondent/informant)

(…….)

Signature…….… (Researcher)

(Takuma Kato)

Signature…….…… (Witness)

(……..……..)

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

# APPENDIX E
# PROOF OF ETHICAL CLEARANCE

## Certificate of Approval
## Ethical Review Committee for Human Research
## Faculty of Public Health, Mahidol University

COA. No. MUPH 2014-042

| | |
|---|---|
| Protocol Title : | ANALYSIS ON INTERVENTIONS TO TYPE 2 DIABETES MELLITUS COVERED BY UNIVERSAL COVERAGE SCHEME IN THAILAND |
| Protocol No. : | 209/2556 |
| Principal Investigator : | Dr. Takuma Kato |
| Affiliation : | Master of Public Health (International Program)<br>Faculty of Public Health, Mahidol University |
| Approval Includes : | 1. Project proposal<br>2. Information sheet<br>3. Informed consent form<br>4. Data collection form/Program or Activity plan |
| Date of Approval : | 20 January 2014 |
| Date of Expiration : | 19 January 2015 |

The aforementioned project have been reviewed and approved according to the Declaration of Helsinki by Ethical Review Committee for Human Research, Faculty of Public Health, Mahidol University.

S. Nanthamongkolchai

(Assoc. Prof. Dr. Sutham Nanthamongkolchai)
Chairman of Ethical Review Committee for Human Research

(Assoc. Prof. Dr. Phitaya Charupoonphol)
Dean of Faculty of Public Health

420/1 Rajvithi Road, Bangkok, Thailand 10400
Tel. (662) 3548543-9 ext. 1127, 7404 Fax. (662) 6409854

# BIOGRAPHY

| | |
|---|---|
| **NAME** | Takuma Kato |
| **DATE OF BIRTH** | November 29, 1981 |
| **PLACE OF BIRTH** | Aichi, Japan |
| **INSTITUTIONS ATTENDED** | Keio University, 2001-2007<br>Doctor of Medicine (M.D.)<br>Mahidol University, 2013-2014<br>Master of Public Health |
| **RESEARCH GRANTS** | Research Centre for Health Economics and Evaluation (ReCHEE) |
| **HOME ADDRESS** | 18/229 The Rajaprarop Complete Rajaprarop Road, Phayathai Sub-District, Rajatavee District, Bangkok 10400<br>Tel. +66-917168790<br>E-mail: katotakuma@gmail.com |