COST-EFFECTIVENESS ANALYSIS OF ESTABLISHING A COMMUNITY BASED FRIEND CENTER VERSUS IMPLEMENTING A TRAINING COURSE FOR MEN WHO HAVE SEX WITH MEN

Mr. Sittikorn Rongsumlee

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science Program in Health Economics and Health Care Management
Faculty of Economics
Chulalongkorn University
Academic Year 2010
Copyright of Chulalongkorn University

การวิเคราะห์ต้นทุน-ประสิทธิผลของการจัดตั้งศูนย์เพื่อนในชุมชนเทียบกับการจัดหลักสูตรฝึกอบรมสำหรับกลุ่มชายที่มีเพศสัมพันธ์กับชาย

นายสิทธิกร รองสำลี

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
สาขาวิชาเศรษฐศาสตร์สาธารณสุขและการจัดการบริการสุขภาพ
คณะเศรษฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2553

ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

Thesis Title	COST-EFFECTIVENESS ANALYSIS OF ESTABLISHING A COMMUNITY BASED FRIEND CENTER VERSUS IMPLEMENTING A TRAINING COURSE FOR MEN WHO HAVE SEX WITH MEN
By	Mr. Sittikorn Rongsumlee
Field of Study	Health Economics and Health Care Management
Thesis Advisor	Chantal Herberholz, Ph.D.
Thesis Co-advisor	Assistant Professor Sukhontha Kongsin, Ph.D.

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

……..Dean of the Faculty of Economics
(Professor Teerana Bhongmakapat, Ph.D.)

THESIS COMMITTEE

……..Chairman
(Associate Professor Siripen Supakankunti, Ph.D.)

……..…… Thesis Advisor
(Chantal Herberholz, Ph.D.)

……..Thesis Co-advisor
(Assistant Professor Sukhontha Kongsin, Ph.D.)

…….. External Examiner
(Associate Professor Narathip Chutiwongse)

สิทธิกร รองสำลี : การวิเคราะห์ต้นทุน-ประสิทธิผลของการจัดตั้งศูนย์เพื่อนในชุมชนเทียบกับการจัดหลักสูตรฝึกอบรมสำหรับกลุ่มชายที่มีเพศสัมพันธ์กับชาย (COST-EFFECTIVENESS ANALYSIS OF ESTABLISHING A COMMUNITY BASED FRIEND CENTER VERSUS IMPLEMENTING A TRAINING COURSE FOR MEN WHO HAVE SEX WITH MEN) อ.ที่ปรึกษาวิทยานิพนธ์หลัก อ.ดร.ชานทอล เฮอร์เบอร์โฮล, อ.ที่ปรึกษาวิทยานิพนธ์ร่วม: ผศ.ดร.สุดนธา คงศีล, 116 หน้า

การวิจัยนี้มีวัตถุประสงค์เพื่อวิเคราะห์ต้นทุน-ประสิทธิผล ของการจัดตั้งศูนย์เพื่อนในชุมชนเทียบกับการจัดหลักสูตรฝึกอบรมสำหรับกลุ่มชายที่มีเพศสัมพันธ์กับชาย ในปี พ.ศ.2551-2553 โดยวัดประสิทธิผลจากกลุ่มเป้าหมายที่มีความรู้และความตระหนักเพิ่มขึ้นจากการดำเนินการตามมาตราการหลักทั้ง 2 แบบ และมีการวิเคราะห์ต้นทุนส่วนเพิ่มในการวิจัยครั้งนี้

การเก็บข้อมูลใช้แบบบันทึกข้อมูลต้นทุนในแต่ละมาตราการหลัก โดยมีจำนวนกลุ่มตัวอย่างทั้งสิ้น 224 ราย ซึ่งเป็นชายที่มีเพศสัมพันธ์กับชายที่เคยเข้าร่วมโครงการในระหว่างปี พ.ศ.2551-2553 ข้อมูลประสิทธิผลใช้การสัมภาษณ์โดยใช้แบบสอบถาม และวัดประสิทธิผลในหน่วยการเพิ่มขึ้นของจำนวนชายที่มีเพศสัมพันธ์กับชาย ที่มีความรู้และความตระหนักในเรื่องของการป้องกันเอชไอวี/เอดส์

ผลการศึกษา พบว่า ต้นทุนทั้งหมดจากการดำเนินโครงการป้องกันเอดส์ในกลุ่มชายที่มีเพศสัมพันธ์กับชาย โดยการจัดตั้งศูนย์เพื่อนในชุมชนเป็นมาตรการหลัก งบประมาณรอบที่ 1 รวมเป็นเงินทั้งสิ้น 2,678 บาทต่อเดือน คิดเป็นต้นทุนต่อการเพิ่มความรู้ในการป้องกันเอดส์ 1 ราย เป็นเงิน 72 บาทต่อเดือน คิดเป็นต้นทุนต่อการเพิ่มความตระหนักในการป้องกันเอดส์ 1 ราย เป็นเงิน 47 บาท งบประมาณรอบที่ 2 รวมเป็นเงินทั้งสิ้น 5,343 บาทต่อเดือน คิดเป็นต้นทุนต่อการเพิ่มความรู้ในการป้องกันเอดส์ 1 ราย เป็นเงิน 144 บาท/เดือน คิดเป็นต้นทุนต่อการเพิ่มความตระหนักในการป้องกันเอดส์ 1 ราย เป็นเงิน 83 บาท/เดือน

ต้นทุนทั้งหมดจากการดำเนินโครงการป้องกันเอดส์ในกลุ่มชายที่มีเพศสัมพันธ์กับชาย โดยใช้การจัดหลักสูตรฝึกอบรมเป็นมาตรการหลัก งบประมาณรอบที่ 1 รวมเป็นเงินทั้งสิ้น 2,546 บาทต่อเดือน คิดเป็นต้นทุนต่อการเพิ่มความรู้ในการป้องกันเอดส์ 1 ราย เป็นเงิน 318 บาท/เดือน คิดเป็นต้นทุนต่อการเพิ่มความตระหนักในการป้องกันเอดส์ 1 ราย เป็นเงิน 82 บาท/เดือน งบประมาณรอบที่ 2 รวมเป็นเงินทั้งสิ้น 5,377 บาทต่อเดือน คิดเป็นต้นทุนต่อการเพิ่มความรู้ในการป้องกันเอดส์ 1 ราย เป็นเงิน 316 บาท และ คิดเป็นต้นทุนต่อการเพิ่มความตระหนักในการป้องกันเอดส์ 1 ราย เป็นเงิน 158 บาท

การศึกษานี้สรุปได้ว่า การดำเนินโครงการป้องกันเอดส์ในกลุ่มชายที่มีเพศสัมพันธ์กับชาย โดยใช้การจัดตั้งศูนย์เพื่อนในชุมชนเป็นมาตรการหลักคุ้มค่ากว่า การจัดหลักสูตรฝึกอบรม ดังนั้น ในโครงการป้องกันเอดส์ในกลุ่มชายที่มีเพศสัมพันธ์กับชาย ควรใช้การจัดตั้งศูนย์เพื่อนในชุมชนมาเป็นมาตรการหลัก ผลการศึกษานี้สามารถนำไปใช้เพื่อวางแผนการจัดสรรงบประมาณ และควบคุมการใช้ทรัพยากร งบประมาณ และกลยุทธ์ในการจัดการป้องกันเอชไอวี

สาขาวิชา เศรษฐศาสตร์สาธารณสุขและการจัดการบริการสุขภาพ ลายมือชื่อนิสิต.....

ปีการศึกษา 2553 ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก.....

ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์ร่วม.....

##5385736029 : MAJOR HEALTH ECONOMICS AND HEALTH CARE MANAGEMENT
KEYWORDS : COST-EFFECTIVENESS / ESTABLISHING A COMMUNITY BASED FRIEND CENTER / IMPLEMENTING A TRAINING COURSE / MEN WHO HAVE SEX WITH MEN SITTIKORN RONGSUMLEE: COST-EFFECTIVENESS ANALYSIS OF ESTABLISHING A COMMUNITY BASED FRIEND CENTER VERSUS IMPLEMENTING A TRAINING COURSE FOR MEN WHO HAVE SEX WITH MEN. THESIS ADVISOR: CHANTAL HERBERHOLZ, Ph.D., CO-ADVISOR: ASST. PROF. SUKHONTHA KONGSIN, Ph.D., 116 pp.

This cross-sectional study was aimed to analyze the cost – effectiveness of the two HIV prevention interventions, P1: establishing a community based friend center versus P2: implementing a training course for men who have sex with men (MSM) in Ubonratchathani province. And incremental cost-effectiveness was also conducted.

Data were collected by using costing data recording forms in perspective view of each intervention. The samples were 224 MSM who involved in interventions during 2008-2010. The interview were conducted by using questionnaires in order to collect effectiveness data in terms of increasing number of MSM with knowledge on HIV/AIDS and attitudes.

It was found that the total cost of P1 in the first round was 2,678 Bht/mth. The cost-effectiveness ratio of increasing 1 MSM with knowledge was 72 Bht/mth and the cost-effectiveness ratio of increasing 1 MSM with attitudes was 47 Bht/mth. In the second round, the total cost was 5,343 Bht/mth. The cost-effectiveness ratio of increasing 1 MSM with knowledge was 144 Bht/mth, the cost-effectiveness ratio of increasing 1 MSM with attitudes was 83 Bht/mth.

The total cost of P2 in the first round was 2,546 Bht/mth. The cost-effectiveness ratio of increasing 1 MSM with knowledge was 318 Bht/mth and the cost-effectiveness ratio of increasing 1 MSM with attitudes was 82 Bht/mth. In the second round, the total cost was 5,377 Bht/mth. The cost-effectiveness ratio of increasing 1 MSM with knowledge was 316 Bht/mth and the cost-effectiveness ratio of increasing 1 MSM with attitudes was 158 Bht/mth.

The study results, suggest that establishing a community based friend center is more cost-effective than implementing a training course. Therefore, the HIV prevention program for MSM should focus on establishing a community based friend center more than implementing a training course. The result of this study also provides useful information as a basis for budget allocation, evaluate of resources utilization and HIV prevention management.

Field of Study Health Economics and Health Care Management

Academic Year 2010

Student's Signature……...

Advisor's Signature……...……

Co-advisor's Signature ……...

ACKNOWLEDGEMENTS

The success of this thesis can be attributed to the extensive support and assistance from my major advisor, Lecturer Dr. Chantal Herberholz and my co-advisor, Assistant Professor Dr. Sukhontha Kongsin. I deeply thank them for their invaluable advice, guidance, supervision and encouragement made throughout this study.

My special thanks and appreciation are also extending to my thesis committee, Associate Professor Siripen Supakankunti, Associate Professor Narathip Chutiwongse, whose valuable comments and suggestion have greatly improved the exposition.

I would also express my appreciation to Assistant Professor Dr. Sukhum Jiamton, for his really fulfilling guidance and comments.

I am thankful to Research Centre for Health Economics and Evaluation (ReCHEE) and Health Economics Academy for Research and Training Foundation (HEART) for providing work station and the scholarship funding for my study at Faculty of Economics, Chulalongkorn University and I am also grateful to the beloved colleagues from ReCHEE who contributed their time and kindness help me for doing my thesis.

I am also thankful to all project staff at The Local Area Development Support Project (LDP), Services for the Health in Asian and African Regions (SHARE) Thailand, Rainbow Sky Association of Thailand (RSAT), Provincial Health Office in Ubonratchathani province and MSM who participated in this study.

I would like to especially thank Mr. Arthit Limpaisarn and Dr. Kyaw Min Soe for their useful suggestion in writing and reviewing English grammar of this thesis

I also would like to thank my classmates in M.Sc. Health Economics, Chalalongkorn University, 2010 for giving suggestions for my study, my friends especially Kookkai who helps me in analyzing data, Eak and Pam who give moral support and encouragement.

Finally, I would like to put my heartfelt and unfathomable gratitude to my Mom who always supports me in every aspect with love and my family for their supports.

Contents

Page

Abstract (Thai)…….…….. iv
Abstract (English)……..……..……. v
Acknowledgements……..…….. vi
Contents……..……..……..…..... vii
List of Tables……..….x
List of Figures……..……..…xii
List of Abbreviations……..……..…xiii

CHAPTER I INTRODUCTION 1
1.1 Problems and its Significance 1
1.1.1 HIV in General 2
1.1.2 HIV/AIDS epidemic and burden of disease 2
1.1.3 HIV Prevention in Thailand 6
1.1.4 HIV Prevention intervention for MSM in Thailand 7
1.2 Research Questions 8
1.2.1 Primary Research Question 8
1.2.2 Secondary Research Questions 8
1.3 Research Objectives 8
1.3.1 General objective 8
1.3.2 Specific objectives 8
1.4 Hypothesis 9
1.5 Scope of the study 9

Page

CHAPTER II LITERATURE REVIEW 10

2.1 Cost, Cost-Effectiveness Analysis and Incremental Cost-Effectiveness Analysis Theory 10

2.2 Risk factor of HIV in MSM 12

2.3 Effectiveness of HIV intervention for MSM 13

2.4 Cost Analysis of HIV prevention intervention of MSM 14

CHAPTER III RESEARCH METHODOLOGY 16

3.1 Conceptual Framework 16

3.2 Study Design 19

3.3 Study site 19

3.4 Research methodology 21

3.4.1 Population and Sample 21

3.4.2 Data collection 23

3.4.3 Tools 27

3.4.4 Methods of data collection 29

3.5 Data analysis 29

3.5.1 Calculation for Capital costs 31

3.5.2 Calculation for Recurrent costs 34

3.5.3 Cost-Effectiveness Analysis 47

3.6 Ethical consideration 47

CHAPTER IV RESULTS AND DISCUSSIONS 49

4.1 Characteristics of MSM in the study 49

4.2 Knowledge result 52

Page

4.3 Attitudes result 54

4.4 Project cost data 55

4.4.1 Capital Cost 56

4.4.2 Recurrent Cost 57

4.5 The Cost-effectiveness analysis of establishing a community based friend center versus implementing a training course 59

4.6 Incremental cost-effectiveness analysis of establishing a community based friend center versus implementing a training course 61

CHAPTER V CONCLUSIONS AND RECOMMENDATIONS 63

5.1 Conclusions 63

5.2 Policy implication 64

5.3 Limitation of the study 65

5.4 Possible Extensions 65

REFERENCES 66

APPENDICES 69

Appendix A: Background information 70

Appendix B: Check List for Determining Costs 77

Appendix C: Questionnaire for MSM interview 81

Appendix D: Capital costs for establishing a community based friend center and implementing a training course 85

Appendix E: Recurrent costs for doing community based friend center and implementing a training course 91

Appendix F: Certificate of Approval 102

BIOGRAPHY 103

LIST OF TABLES

Page

Table 1 : Major diseases attributable to disability-adjusted life years (DALYs) of Thai People by sex, 2004 3

Table 2 : Total AIDS expenditure by functions, 2008-09, current year price 5

Table 3 Types of health economic evaluation 11

Table 4 : Difference of site of HIV prevention intervention project 20

Table 5: Total cost of establishing a community based friend center and implementing a training course for men who have sex with men 30

Table 6 : Total Personnel Costs for doing a community based friend center 35

Table 7 : Total Personnel Costs for doing an implementing a training course 36

Table 8 : Calculation for Total Material costs for doing a community based friend center 37

Table 9 : Calculation for Total Material costs for doing an implementing a training course 38

Table 10 : Calculation for Total Telephone costs for doing a community based friend center 39

Table 11 : Calculation for Total Telephone costs for doing an implementing a training course 39

Table 12 : Calculation for Total Utilities costs for doing a community based friend center 40

Table 13 : Calculation for Total Utilities costs for doing an implementing a training course 40

Table 14 : Characteristics of MSM who are participated in project 1 (establishing a community based friend center) 1st round and 2nd round 50

Table 15 : Characteristics of MSM who are participated in project 2 (implementing a training course) 1st round and 2nd round 51

Page

Table 16 : Knowledge assessment of establishing a community based friend center 53

Table 17 : Knowledge assessment of implementing a training course..... 53

Table 18 : Attitudes assessment of establishing a community based friend center..... 54

Table 19 : Attitudes assessment of implementing a training course..... 55

Table 20 : Total Capital Cost..... 56

Table 21 : Total Recurrent Cost..... 58

Table 22: Cost-effectiveness of establishing a community based friend center versus implementing a training course..... 59

Table 23 : Incremental cost-effectiveness analysis of establishing a community based friend center versus implementing a training course 62

LIST OF FIGURES

Page

Figure 1 : HIV Prevalence among MSM in Selected Asian cities, 2006-2008 4

Figure 2 : Cost-effectiveness analysis of establishing a community based friend center versus implementing a training course for men who have sex with men 17

Figure 3 : Incremental cost-effectiveness analysis of intervention by combined establishing a community based friend center (Project 1) first and second round and implementing a training course (Project 2) first and second round 18

LIST OF ABBREVIATIONS

Abbreviation of Symbol	**Term**
AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral therapy
CDC	Center for Disease Control and Prevention
CEA	Cost Effectiveness Analysis
DALYs	Disability Adjusted Life Years
HIV	Human Immunodeficiency Virus
HSRI	Health Systems Research Institute
ICEA	Incremental Cost Effectiveness Analysis
IDU	Injection Drug Users
MARP	Most-at-risk Populations
MSM	Men Who Have Sex with Men
OPV	Orphans and Vulnerable Children
PLWA	People Living With HIV/AIDS
ReCHEE	Research Centre for Health Economics and Evaluation
STI	Sexually Transmitted Infection
UNAIDS	United Nations Program on HIV/AIDS
UNDP	United Nations Development Program
UNGASS	United Nations General Assembly Special Session
USAIDS	United States Agency for International Development
WHO	World Health Organization

CHAPTER I

INTRODUCTION

1.1 Problems and its Significance

The United Nations Program on HIV/AIDS (UNAIDS) and World Health Organization (WHO) (2009) reported that HIV/AIDS has become a major public health problem affecting the quality of life of people living with HIV/AIDS in geography way, politics, social, culture and economy. It is estimated that about 33.5 million of people were living with HIV/AIDS in the year 2008. (The United Nations Program on HIV/AIDS (UNAIDS) and World Health Organization (WHO), 2009) In Thailand, HIV/AIDS stands for the first leading causes of DALYs (Disability Adjusted Life Years) for males, and the second for females according to the data from the Ministry of Health Thailand. (Ministry of Public Health, 2005-2007) The high prevalence of HIV has been reported among Men Who Have Sex with Men (MSM) [1] through many studies Thailand. Studies conducted by United Nations Development Programme (UNDP) and United States Agency for International Development (USAID) (2009) showed that there was significant HIV incidence among 18-22 year-old MSM with continued high rates of infection over time. (UNDP and USAID, 2009)

Health Systems Research Institute (HSRI) was funding to support the operation of two projects working on HIV/AIDS among MSM. The core indicator was that 80 percent of MSM who enrolled in the project had knowledge and attitudes about HIV prevention to prevent new infections. The main intervention of one of the projects was establishing a community based friend center; and the other project was implementing a training course.

More resources are needed to combat the epidemic of HIV in MSM nowadays and it is important to address appropriate intervention programs to prevent the spread of the disease among MSM. The researcher is interested in performing a comparative study

---

1 The term men who have sex with men (MSM) is used in CDC surveillance systems. It indicates the behaviors that transmit HIV infection, rather than how individuals self-identify in terms of their sexuality. (CDC, 2010)

of establishing a community based friend center versus implementing a training course for men who have sex with men, to find out which intervention method would be effective for HIV prevention.

1.1.1 HIV in General

In 1981, the Acquired Immunodeficiency Syndrome (AIDS) was first clinically identified and described in patients with symptoms of severe immunosuppression in the United States. Immune abnormalities were the main characteristics of the syndrome which caused the destruction of CD4 T lymphocytes due to infection. There was no accurate definition for the new syndrome and the causative agent was also unknown. Then the U.S. Center for Disease Control and Prevention (CDC) suggested that a combination of opportunistic infections and immunosuppression were indicative of "Acquired Immunodeficiency Syndrome" (AIDS) Human Immunodeficiency Virus or HIV can be transmitted in many ways such as sexual contact with an infected person, sharing needles and/or syringes with someone who was infected, or, less commonly, through transfusions of infected blood, HIV-infected women to her new born baby during delivery or through breast-feeding after birth. (CDC National Prevention information network, 1999). In Thailand, data from Suk, K. (2005) he concluded that the first cases of AIDS patient was diagnosed at Ramathibodi Hospital in 1984 (Suk, K., 2005) After that the transmission increased rapidly and became one of the leading causes of death among the population between age 20-44.

1.1.2 HIV/AIDS epidemic and burden of disease

UNAIDS, WHO (2009) reported that HIV/AIDS continues to be a major public health problem and one of the most important health priorities worldwide. The number of people living with HIV/AIDS (PLHA) reached a number of 33.4 million in 2008 and this number was 20% higher than the number in 2000. Moreover, the prevalence was about 3 times higher than that of 1990. (UNAIDS, WHO, 2009)

Bureau of Epidemiology (2011) reported that Thailand is one of the countries in the world suffering for the rapidly increasing in generalized epidemic of HIV/AIDS. The

cumulative number of HIV infected patients accounted for 372,874 cases and HIV related death was 98,153 cases from 1984 to March 31, 2011 (Bureau of Epidemiology, 2011)

Report from Ministry of Public Health (2007) concluded that Disability Adjusted Life Years (DALYs) was used to measure the health status of Thai people and HIV/AIDS was found to be the first leading causes of DALYs in males and the second leading causes in female which is shown in Table 1. (Ministry of Public Health, 2005-2007)

Table 1 : Major diseases attributable to disability-adjusted life years (DALYs) of Thai People by sex, 2004

No.	Male			Female		
	Disease	**DALYs**	**Percent**	**Disease**	**DALYs**	**Percent**
1	**HIV/AIDS**	**645,426**	**12.1**	Cerebrovascular disease	307,131	7.9
2	Road traffic injuries	600,004	11.3	**HIV/AIDS**	**290,711**	**7.5**
3	Alcohol abuse	329,068	6.2	Diabetes	267,549	6.9
4	Cerebrovascular disease	305,105	5.7	Depression	191,490	4.9
5	Liver Cancer	294,868	5.5	Liver Cancer	140,480	3.6
6	Ischemic heart disease	178,011	3.3	Road traffic injuries	135,832	3.5
7	Chronic obstructive pulmonary disease	175,549	3.3	Ischemic heart disease	117,790	3.0
8	Diabetes	168,702	3.2	Knee osteoarthritis	117,042	3.0
9	Depression	136,895	2.6	Chronic obstructive pulmonary disease	112,663	2.9
10	Cirrhosis	133,046	2.5	Cataract	110,572	2.8

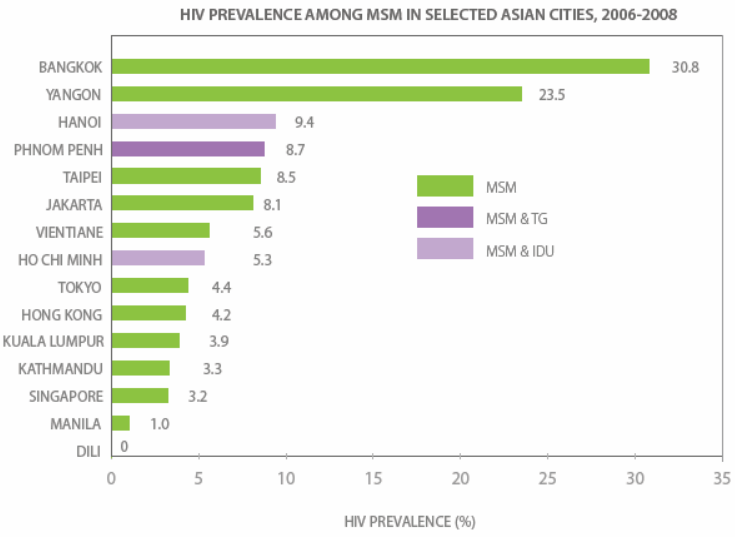
Source: Working Group on Burden of Disease and Risk Factors, Thailand International Health Policy Program, 2006

Study of Baral, S. et al. (2009) reported that men who have sex with men (MSM) in Asia and the Pacific were facing a serious and rapidly growing HIV epidemic. MSM were 19 times more likely to be infected with HIV than the general population in Asia. (Baral, S. et al., 2007)

Griensven, V. et al. (2009) reported that the high HIV prevalence among MSM has been reported throughout multiple recent studies in the region: 8.7% in Cambodia, 7.8% in Vietnam, 5.6% in Lao PDR, and 30.8% in Thailand shown in figure 1. (Griensven, V. et al., 2009)

A cohort study by UNDP and USAIDS in Bangkok showed a significant incidence of HIV infection among 18-22 year old. MSM was also high rates of infection over the time so prevention intervention among MSM was needed urgently.

Figure 1 : HIV Prevalence among MSM in Selected Asian cities, 2006-2008



Source: UNDP and USAID, 2009

Even though the epidemic of HIV had been recognized as a global crisis, the resource located for the control of the epidemic was still severely limited. And the expenditure for the prevention of HIV/AIDS was insufficient. Compare to the expenditure on overall HIV prevention, the expenditure used for prevention among MSM group was very low in Asia Pacific region. And the data showed that the cost used for the prevention programs for MSM was less than 4% of total expenditure for HIV prevention programs. (UNDP and USAID, 2009)

The spread of HIV infection had been rapidly increasing in the recent years, however, there was still shortage of budget to with the control issue in Thailand. Table 2

shows that Thailand was focusing on the budget in the treatment rather than prevention.

Health resources were needed for MSM prevention in Thailand. The scarcity of resources demonstrated that it was important to identify the HIV prevention intervention option to optimize the efficiency of resource used and the budget allocation. Hence, cost-effectiveness analysis would help to facilitate in decision making process by measuring the effectiveness of the available HIV prevention intervention for MSM. This study is expected to assess value for money or cost effectiveness of the National AIDS program for the MSM prevention intervention.

Table 2 : Total AIDS expenditure by functions, 2008-09, current year price

	2008		**2009**	
	Thai Baht, million	**Percent**	**Thai Baht, million**	**Percent**
1. Prevention	**1,500**	**21.7%**	**987**	**13.7%**
2. Care and Treatment	**4,560**	**65.8%**	**5,483**	**76.1%**
3. Orphans and Vulnerable Children (OVC)	50	0.7%	52	0.7%
4. Program Management Administration Strengthening	397	5.7%	250	3.5%
5. Incentive Human Resources	44	0.6%	208	2.9%
6. Social protection and social services excluding Orphans and vulnerable Children	219	3.2%	171	2.4%
7. Enabling Environment and community Development	2	0.0%	8	0.1%
8. Research excluding operational research	156	2.3%	49	0.7%
Total	6,928	100.0%	7,208	100.0%

Source: IHPP, Review of Policies and Plans on HIV/AIDS Report, 2010

1.1.3 HIV Prevention in Thailand

USAIDS reported that Thailand's initial response to the epidemic was weak. However, since the National AIDS Control Program was moved from the Ministry of Public Health to the Office of the Prime Minister in 1991, the country's HIV/AIDS prevention efforts had been recognized as one of the world's most successful. The Ninth National Economic and Social Development Plan (2002–2006) emphasized the adoption of a human-centered approach to bring about reform through the public health system, especially the health care system. The policy on AIDS had worked toward educating the citizens on HIV/AIDS and preventive measures; developing a system of medical, public health, social, and consultation services to improve the quality of life of people living with HIV/AIDS (PLWHA); developing medical biotechnology, medicine, and AIDS vaccination research; and working with all parties involved, such as the government and private sector, to prevent and alleviate the HIV/AIDS situation. Thailand's HIV/AIDS activities included conducting a public education campaign targeting the general public and most-at-risk populations (MARPs), improving treatment guideline for sexually transmitted infection (STI), and discouraging people from visiting sex workers, promoting condom use, and requiring sex workers to receive monthly STI tests and carry records of the test results.

In 2004, Thailand received a third-round grant from the Global Fund to Fight AIDS, Tuberculosis and Malaria to prevent HIV/AIDS among IDUs and increase care and support for them. Objectives of the grant were to train peer leaders within IDU communities; create harm-reduction centers; educate health care providers, police, prison staff, and policymakers; and provide peer-based outreach, education, counseling, referral services, and HIV testing support. The U.S. Government provided one-third of the Global Fund's contributions.

Since the change of government in 2006, Thailand had reinvigorated HIV/AIDS prevention and control efforts. In 2007, the authority adopted a three-year strategic plan that focuses on scaling up HIV prevention efforts, particularly for people most likely to be exposed to HIV and for difficult-to-reach populations. Early in 2007, the government

announced that it was compulsory licensing patents on drugs to treat HIV. Thus, the government continued to strive for achieving universal access to treatment. In the end of 2006, 88 percent of HIV-infected people were receiving ART according to UNAIDS. (USAIDS, 2008)

1.1.4 HIV Prevention intervention for MSM in Thailand

The current National Integration Strategic Plan for HIV/AIDS Prevention and Alleviation was articulated at the local level in some areas where the challenges were high, e.g. the 4th HIV/AIDS prevention and alleviation in Bangkok Metropolitan (2007-2011), intervention on AIDS in MSM in Chonburi Thailand set up the interventions to reduce new HIV infections in MSM groups and the network of sexual diversity in 2007-2008, and facilitate the Universal Access Plan on HIV/AIDS Prevention and Alleviation Implementation (2007-2011). The program was mainly supported by international organizations. This support focused on the network of sexual diversity to help establishing peer educators and drop-in centers. As for the government sector, there was a development of services that were client-friendly, and also created links to the network's system and services. The initiation of joint work between the network and the Bureau of Epidemiology first began for a survey on HIV prevalence in MSM. (National AIDS Prevention and alleviation Committee, 2007)

Prevention of HIV transmission was recommended by WHO that included the priority health sector interventions in concentrated epidemic for MARP included condom promotion, peer-mediated information, education, distribution of prevention commodities, linkage/referral to prevention and care and treatment sites friendly. In Thailand, there was innovation intervention for MSM that was increasing knowledge which was establishing a community based friend center and implementing a training course (The detail of both projects were show in Appendix A) However, in the present time, there was no report comparing the cost-effectiveness of each intervention.

1.2 Research Questions

1.2.1 Primary Research Question

What was the cost-effectiveness of (i) establishing a community based friend center versus (ii) implementing a training course for MSM to optimize resources use in Ubonratchathani province?

1.2.2 Secondary Research Questions

1. What were the total costs and unit cost of establishing a community based friend center versus implementing a training course for MSM in Ubonratchathani province?

2. What were the outcomes in terms of increasing number of MSM with knowledge on HIV/AIDS and attitudes of establishing a community based friend center versus implementing a training course for MSM in Ubonratchathani province?

3. Which HIV prevention interventions project for MSM in Ubonratchathani province was the most cost-effectiveness?

4. What was the incremental cost-effectiveness of establishing a community based friend center versus implementing a training course for MSM in Ubonratchathani province in the first and second round?

1.3 Research Objectives

1.3.1 General objective

To assess value for money or cost effectiveness of a community based friend center versus implementing a training course for MSM in Ubonratchathani province.

1.3.2 Specific objectives

1.To analyze the total cost and unit cost of establishing a community based friend center versus implementing a training course for MSM in Ubonratchathani province.

2.To analyze the outcomes in terms of increasing number of MSM with knowledge on HIV/AIDS and attitudes of establishing a community based friend center versus implementing a training course for MSM in Ubonratchathani province.

3.To compare cost-effectiveness of two HIV prevention interventions project for MSM in Ubonratchathani province.

4.To analyze the incremental cost-effectiveness of establishing a community based friend center versus implementing a training course for MSM in Ubonratchathani province in the first and second round.

1.4 Hypothesis

The cost-effectiveness of establishing a community based friend center for MSM is greater than the cost-effectiveness of implementing a training course for MSM in Ubonratchathani province.

1.5 Scope of the study

This study analyzed the HIV prevention intervention project for MSM, namely (i) Prevention of AIDS in men who have sex with men along the border and (ii) AIDS prevention to reduce the new infections and promote the living with the infected among groups of men who have sex with men in Ubonratchathani province. Mueang district had more population, density of population, average income per capita, number of hospitals, number of primary care unit, number of AIDS patients than in Det-Udom district. There were more area, number of sub-districts, number of health center and villages in Det-Udom district than in Mueang district. These were implemented the first round from 2008 to 2009 and the second round from 2009 to 2010. The study was focused on cost-effectiveness analysis of HIV prevention intervention project for MSM.

CHAPTER II
LITERATURE REVIEW

This chapter reviews the prior works and literature on cost, cost-effectiveness analysis and incremental cost-effectiveness analysis theory, risk factor of HIV in MSM, effectiveness of HIV intervention for MSM and cost analysis of HIV prevention intervention of MSM.

2.1 Cost, Cost-Effectiveness Analysis and Incremental Cost-Effectiveness Analysis Theory

Kaewsonthi, S., Kamolrattanakul, P. (1991) stated that cost was specific of explicit cost and could see only for the accounting purposes. For the economist, cost means resources used both of explicit cost and implicit cost including negative consequence that is not expense and cannot see but it will specify the value of evaluating and also add up to be cost that means opportunity cost. (Kaewsonthi, S., Kamolrattanakul, P., 1991)

Drummond, M.F. et al. (1997) proposed distinguishing characteristics of health care evaluation by considering whether both cost (input) and consequences (output) of the alternatives are studied, and whether comparison of alternatives are perform. (Table 3) By scheme, it is possible to classify the health economic evaluation into several categories. The cells 1 and 3 contain evaluation situations in which only costs or output are evaluated, these are considered to be “partial evaluation”. The cell 2 represents the evaluation situation that both costs and output are studied, but no comparison between alternatives. This is also considered to be “partial evaluation”. The cell 4 contains the comparison between alternatives is analyzed. This is considered to be full economic evaluation. (Drummond, M.F. et al., 1997)

The cost-effectiveness analysis (CEA) is one form of full economic evaluation where both the costs and output of health program or treatment are examined. The output or effectiveness is measured in health outcome (not in monetary term).

Table 3 Types of health economic evaluation

		(Is studied) Specific Study in cost and output?		
		No		Yes
		Study in output only	Study in cost only	
Comparing with more than 2 alternatives?	No	**1A** Outcome description	**1B** Cost description	**2** Cost-outcome description
	Yes	**3A** Effectiveness evaluation	**3B** Cost analysis	**4** 1.Cost-minimization analysis 2.Cost-effectiveness analysis 3.Cost-benefit analysis 4.Cost-utility analysis

Silvia, M. and Thomas, D. (2002) defined meaning of economic evaluation that "Economic evaluation is the comparative analysis of alternative lines of action that includes the effects as well as the costs of those actions such as the identification, valuation, and measurement and then comparison of costs (input) and consequences (outcome) of two or more alternatives treatment or activities". The outcomes are then expressed in terms of days of disability avoided, year of life gained, medical complications avoided and the outcome can be translated into monetary units. (Silvia, M. and Thomas, D., 2002)

Creese, A. and Parker, D. (1994) stated that the main type of cost-classification can be separate into 2 items i.e. capital items (more than a year) and recurrent items (those that are used up in the course of a year and are usually purchased frequently). The cost category must be related to the particular situation, cover all possibilities and must not have common characteristics. The alternative with the lowest cost per unit of effectiveness is the most cost-effective. There are five steps that are required for every cost-effectiveness analysis: 1) Defining the program's objective; 2) Identifying the

possible ways of achieving those objectives; 3) Identifying and measuring the costs of each option; 4) Identifying and measuring the effectiveness of each option; 5) Calculating the cost-effectiveness of each option and interpreting the results. (Creese, A. and Parker, D., 1994)

Fisher, A., and Foreit, J. (2002) gave definition that Incremental Cost-Effectiveness Analysis (ICEA) was the type of analysis, in HIV operations research project they were concerned with whether the additional costs of a new activity were justified by the number of additional outcomes resulting from the activity. The incremental cost effectiveness ratio is calculated as the difference in the cost of two treatments or alternatives divided by the difference in outcome of the two treatments. (Fisher, A., and Foreit, J., 2002)

2.2 Risk factor of HIV in MSM

CDC National Prevention information network (2010) found that education, income, alcohol and illicit drug, low awareness of HIV status, use of drugs during sex, stigma and homophobia, racism, poverty, and lack of access to health care and complacency about HIV are the factors increasing risk of getting HIV infection and other STDs among MSM in U.S. (CDC National Prevention information network, 2010)

The Foundation for AIDS Research called “amfAR” (2006) studied risk behaviors of MSM in 24 countries of Asia. They concluded that low condom use was the risk factor of infection HIV among MSM in Asia because of lack of knowledge, lack of availability, or failure to translate knowledge and availability into action. Moreover, incorrect beliefs (believe they are not at risk of becoming HIV positive, believe someone who looks healthy cannot still transmit HIV, believe HIV/AIDS and STIs can be avoided by withdrawing before ejaculation and believe unprotected anal sex does not present a risk for HIV infection) was the one risk factor that affected to infection HIV among MSM because they were misinformation persists due to a shortage of explicit. (amfAR foundation for AIDS Research, 2006)

Griensven, V. et al. (2005) studied 121 Thai men who were 18 years or older, were residents of Bangkok and reported anal or oral sex with a man during the past 6 months. It was found that lower education, recruitment from a park, self-identification as homosexual, receptive and insertive anal intercourse, more years since first anal intercourse, and more male sex partners were significantly and independently associated with HIV prevalence.(Griensven, V. et al., 2005). These findings were supported by Koblin, B.A. et al. (2006) who studied the risk factor for HIV infection among men who have sex with men in the USA. They concluded that there was increasing of HIV infection because of more male sex partners, unprotected receptive and insertive anal intercourse. (Koblin, B.A. et al., 2006) In another study, Sovannara, K. and Ward, C. (2004) studied risk factors of men who have sex with men in Cambodia. They found that anal sex with multiple partners, and infection with other STIs and syphilis were risk factors for HIV infection. (Sovannara, K. and Ward, C., 2004)

2.3 Effectiveness of HIV intervention for MSM

Herbst, J. et al. (2005) reviewed published and unpublished reports of HIV prevention interventions that focused on MSM to study the effectiveness of HIV intervention for MSM in 2005. They explained that interventions (including small group or community-level outreach or peer education, individual and group consulting, skill training, and motivational campaigns to maintain behavior change) showed a significant decrease in unprotected and anal sex and number of sexual partners and with a significant increase in condom use during anal intercourse. (Herbst, J. et al., 2005) These finding were supported by Kelly, J. et al. (1989) who reviewed the published and unpublished reports from 1988 through December 2007 from 46 articles in Sweden for studied the effectiveness of behavioral intervention to reduce AIDS risk activities of MSM. They concluded that providing AIDS risk education, cognitive-behavioral self-management training, sexual assertion training, and attention to the development of steady and self-affirming social supports can decrease unprotected and increase behavioral skills of refusing sexual coercions because HIV prevention interventions can protect MSM to

misunderstand information about HIV and other STIs. (Kelly, J. et al., 1989) In the similar study, Kelly, J. et al. (1999) conducted experimental analysis of HIV risk behavior reduction following intervention with key opinion leaders of population in late 1989, in Biloxi, Hattiesburg, Mississippi, Monroe and Louisiana, USA. They concluded that peer norms could reduce the proportion of men with more than one sexual partner and unprotected anal intercourse. Moreover, they could increase in condom use during anal intercourse among men who have sex with men. (Kelly, J. et al., 1999)

2.4 Cost Analysis of HIV prevention intervention of MSM

Study from Sangrujee, N., Alkenbrack, S., and Martin, G. (2005) found that unit cost of comprehensive package of service for MSM in Asia by outreach package (including training outreach worker) was less than unit cost mass media package (including workshop, mass media campaign, behavior change communication campaign and materials: CD and brochure). (Sangrujee, N., Alkenbrack, S., and Martin, G., 2005)

Comparison of Cost-Effectiveness of HIV prevention interventions was carried out by Cohen, D.A., Wu, S.Y., and Farley, T.A. (2004) They did a comparison of the cost-effectiveness for 26 HIV prevention interventions including biomedical interventions, structural interventions, and interventions designed to change risk behaviors of individual. They concluded that the intervention that most cost-effectiveness in men who have sex with men was individually focused interventions to change risk behavior. (Cohen, D.A., Wu, S.Y., and Farley, T.A., 2004)

Pinkerton, S.D. et.al (2004) studied cost-effectiveness of a community level HIV prevention intervention using peer leaders to promote risk reduction among MSM in Mississippi. The study found that the intervention cost $17,150, or approximately $65,000 per infection averted.(Pinkerton S.D. et al., 2004). Similar Kahn, K. et al. (2001) conducted the study on young MSM implemented for eight months in a midsized city (Eugene, OR) with a second midsized community (Santa Barbara, CA) as a control. The project took a community-level prevention approach to alter norms and attitudes

regarding HIV and sexual behavior, and found that the cost per HIV infection averted totaled between $14,600 and $18,300 across 5 years. (Kahn, K. et al., 2001)

In another study, Pinkerton, S.D. et al. (1997) compared the two HIV prevention interventions for MSM, a safer sex lecture and the same lecture plus a 1.5-hour skills training session, was compared to see the effectiveness and found that skills training significantly increased condom use 12 months post-intervention. The intervention also proved cost saving. For a program cost of approximately $13,000, the intervention averted more than $170,000 in medical costs and saving more than 21 QALYs. (Pinkerton, S.D. et al., 1997)

A study for effectiveness and cost-effectiveness of HIV of Pattanaphesaj, J., and Teerawattananon, Y. (2010) showed that condom use was proven to be the only effective and cost-effective intervention for men who have sex with men in Thailand. Voluntary HIV counseling and testing showed effectiveness, however, community-based education was clinically effective but cost-ineffective. Peer education and STI control were shown to be ineffective among this population. (Pattanaphesaj, J., and Teerawattananon, Y., 2010)

By reviewing the previous studies, there were many studies that focused on the general population and merely on MSM. And there were no study of the cost effectiveness of HIV interventions among high risk groups especially MSM in Thailand. So, I would like to study cost-effectiveness analysis of comparison HIV prevention interventions for MSM by establishing a community based friend center versus implementing a training course for men who have sex with men in Ubonratchathani province. The intervention should be assessed, so as to identify which intervention has the highest effectiveness in term of increasing number of MSM with knowledge on HIV/AIDS and attitudes when compared with cost incurred.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Conceptual Framework

This study was conducted to calculate the cost and cost-effectiveness of two HIV prevention interventions for the men who have sex with men in Thailand, by identifying the most effectiveness prevention intervention project.

The cost-effectiveness ratio calculated by dividing the total costs for each intervention by increasing number of MSM with knowledge on HIV/AIDS and attitudes.

Incremental cost effectiveness analysis (ICEA) is used to analyze the cost data of establishing a community based friend center implementing a training course in the first round and the second round. This is because both of them are difficult to differentiate between the outcome of first round and second round.

By ICEA in this study we can determine which intervention (establishing a community based friend center versus implementing a training course) has more operative efficiency for increasing number of MSM with knowledge on HIV/AIDS and attitudes.

The diagram for conceptual framework of this study is shown in Figures 2 and 3

Figure 2 : Cost-effectiveness analysis of establishing a community based friend center versus implementing a training course for men who have sex with men

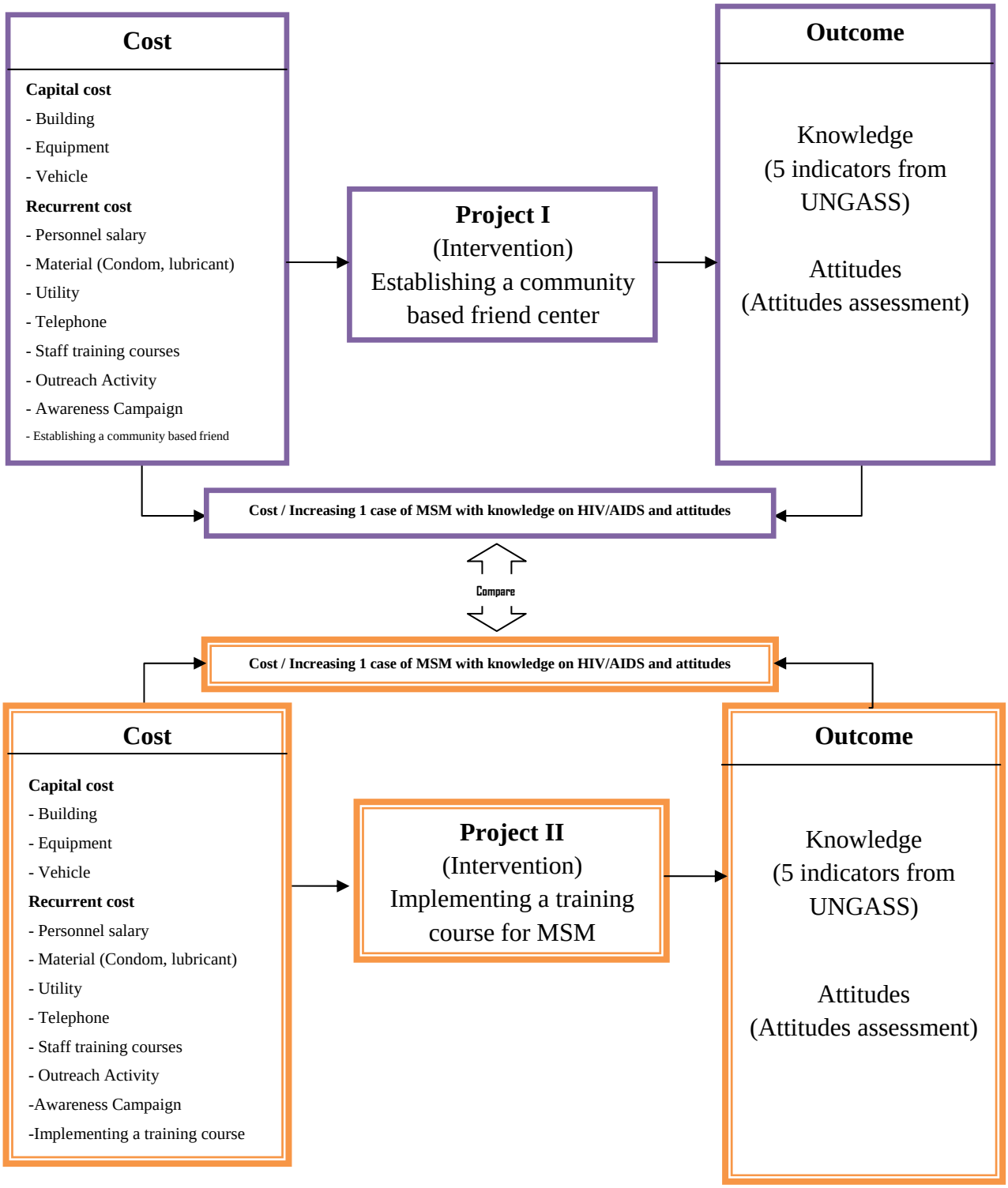
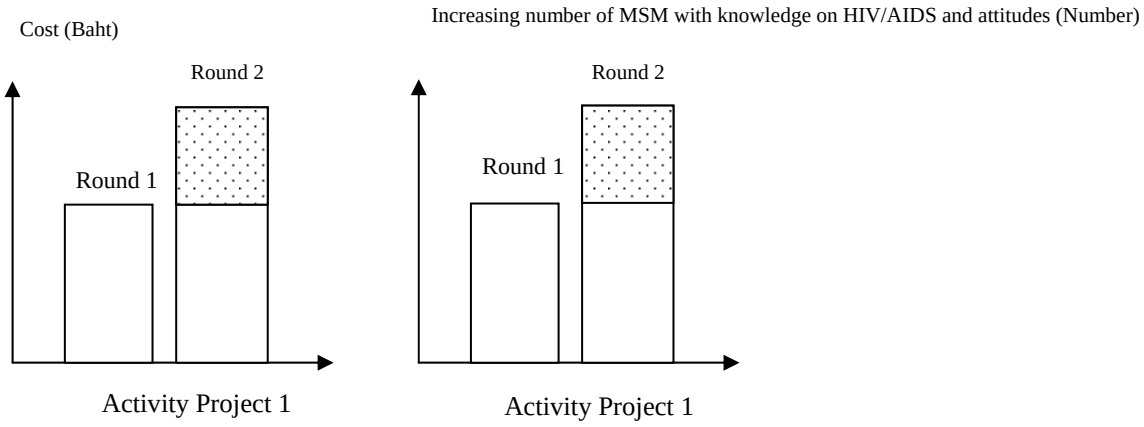
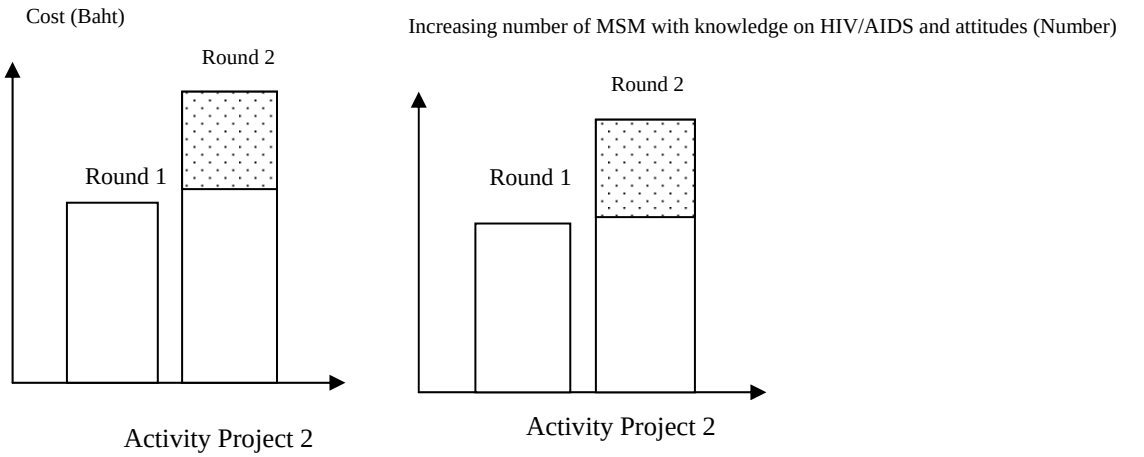


Figure 3 : Incremental cost-effectiveness analysis of intervention by combined establishing a community based friend center (Project 1) first and second round and implementing a training course (Project 2) first and second round



$$ICEA_{P.1} = \frac{\text{Cost of P.1 in round 2 - Cost of P.1 in round 1}}{\text{Increasing number of MSM with knowledge on HIV/AIDS and attitudes of P.1 round 2 - Increasing number of MSM with knowledge on HIV/AIDS and attitudes of P.1 round 1}}$$



$$ICEA_{P.2} = \frac{\text{Cost of P.2 in round 2 - Cost of P.2 in round 1}}{\text{Increasing number of MSM with knowledge on HIV/AIDS and attitudes of P.2 round 2 - Increasing number of MSM with knowledge on HIV/AIDS and attitudes of P.2 round 1}}$$

Figure 3 shows the comparison of costs between two rounds which is combined intervention by establishing a community based friend center first round and second round and intervention by implementing a training course first round and second round. The effectiveness was expressed as increasing number of MSM with knowledge on HIV/AIDS and attitudes.

ICEA calculation of project 1 is the total cost of project 1 in the second round minus the total cost of project 1 in the first round divided by increasing number of MSM with knowledge on HIV/AIDS and attitudes of project 1 in the second round minus increasing number of MSM with knowledge on HIV/AIDS and attitudes of project 1 in the first round.

ICEA calculation of project 2 is the total cost of project 2 in the second round minus total the cost of project 2 in the first round divided by increasing number of MSM with knowledge on HIV/AIDS and attitudes of project 2 in the second round minus increasing number of MSM with knowledge on HIV/AIDS and attitudes of project 2 in the first round.

3.2 Study Design

The HIV-prevention intervention project was a cross-sectional descriptive study using economic evaluation. In this study, cost-effectiveness analysis was performed to compare between two selected HIV-prevention intervention projects among MSM in Ubonratchathani province. The cost data were retrospectively collected from secondary data of two HIV prevention interventions for MSM. The effectiveness part was performed using instrument developed from indicators mentioned in the two projects (5 indicators from UNGASS and attitudes assessment). Baseline data were collected in 2009 and data from the same group were collected again in March – May 2011.

3.3 Study site

The study sites were in Det-Udom district (Project 1) and Mueang district (Project 2) in Ubonratchathani province, Thailand. The reason for selecting

Ubonratchathani province (2 sites) because the project 1 had only in Ubonratchathani province and other 7 provinces (Bangkok, Chonburi, Rachaburi, Chaing Mai, Phuket, Khon Kaen and Udonthanee) had only one project (project 2). The study desires to compare MSM in the similar population but difference in context (rural and urban).

There were more population, density of population, average income per capita, number of hospitals, number of primary care unit, number of AIDS patients in Mueang district than in Det-Udom district. In contrary, there were more area, number of sub-districts, number of health center and villages in Det-Udom district than in Mueang district. The difference of site of HIV prevention intervention project shown in Table 4

Risk factors in Mueang district was more male sex partners and low condom use and risk factors in Det-Udom district was anal sex with multiple partners and low education.

Table 4 : Difference of site of HIV prevention intervention project

Characteristics	Det-Udom district	Mueang district
Population	171,450	216,683
Male	85,708	109,765
Female	84,981	113,871
Area	1,158,375 sq.km.	655.582 sq.km.
Density of population	148 persons/sq.km.	556 persons/sq.km.
No. of sub-district	16	12
No. of Village	237	155
Average income per capita	10,826 Baht/year	25,928 Baht/year
No. of Hospital	1	4
No. of Health Center	25	18
No. of Primary Care Unit	3	5
No. of AIDS patients	436	1,190

Source: 1. Ministry of Interior, 2009

2. Report on Health Resources, Ubonratchathani Health Office.

3.4 Research methodology

3.4.1 Population and Sample

3.4.1.1 Study population

There were two groups of population in this study; the first group participated with project 1 that had intervention prevention by establishing community based friend center for MSM in Det-Udom district, Ubonratchatani province and the second group participated with project 2 that had intervention prevention by implementing a training course for MSM in Mueang Ubonratchatani district.

3.4.1.2 Inclusion and Exclusion criteria

- **Inclusion criteria on the HIV prevention project were:**

1. The projects/programs had been implemented in MSM population.
2. Written informed consent from responsible person of preventive project such as manager was required to participate in this study.

- **Exclusion Criteria on the HIV prevention project was:**

1. The project manager would like to withdraw from the study.

- **Inclusion criteria on the MSM were:**

1. MSM who were 15 years old and above (up until interview date)
2. MSM who were able to communicate with researcher.

- **Exclusion Criteria on the MSM were:**

1. The participants would like to withdraw from the study.

3.4.1.3 Sampling Technique

The MSM sample groups were MSM who involved in project during 2008-2010. Briefly, MSM was selected by the project manager from those who lived nearby site of the study, was available and willing to join the project. They had been interviewed in order to collect effectiveness data (in terms of increasing number of MSM with

knowledge on HIV/AIDS and attitudes) of HIV prevention. The formula for calculated sample size of MSM group in this study come from Karnjanawasri, S. (2008) as follows:

$$n = \frac{NZ^2\sigma^2}{NE^2 + Z^2\sigma^2}$$

Where:

n = Number of sample size

N = Population that both projects recruit into the study in projects during 2008-2010 (Project 1 = 225 cases Project 2 = 100 cases).

Z = Reliability 95%, Z = 1.96 or approximately 2

E = Error of Measurement; Not exceed 10% of the standard deviation.

σ^2 = Variance (This study did not know the value of variance and assume that $\sigma=1$) (Karnjanawasri, S., 2008)

$$\text{Sample size}_{\text{project1}} = \frac{225\,(2)^2\,\sigma^2}{225\,(0.10)^2 + (2)^2\,\sigma^2}$$

$$\text{Sample size}_{\text{project2}} = \frac{100\,(2)^2\,\sigma^2}{100\,(0.10)^2 + (2)^2\,\sigma^2}$$

From calculating, the sample of this study were project 1 = 144 cases (first round = 72 cases and second round = 72 cases) and project 2 = 80 cases (first round = 40 cases and second round = 40 cases).

The research population for this study was targeted MSM-clients as planned to cover under the two projects indicated in proposals of (i) prevention of AIDS in men who have sex with men along the border project and (ii) project on AIDS prevention to reduce

the new infections and promote the living with the infected among groups of men who have sex with men. For inferential purpose of the study, a number of MSM samples were selected. To be eligible as a study sample, one has to meet inclusion criteria as:

- being a enrolled client at the targeted MSM under the two projects

- being recorded as an active clients in the ReCHEE's database within the last round 2008-2009, confirmed by the corresponding project managers at which he is registered and was interviewed at the last round.

A sample was excluded if a client:

- was recorded as a referred client from other provinces

- had severe medical condition that does not allow him/her to be interviewed and self-administering the client questionnaire

- was in withdrawal condition (about 5%)

3.4.2 Data collection

Primary data

The effectiveness was collected as a cross-sectional descriptive study in year 2011 by using data of those target population (MSM) from indicators mentioned in the Monitoring and Evaluation Research on Model Development and Redefine Mechanisms for AIDS Prevention and Alleviation in Youth and other Most at Risk Population Project by ReCHEE, Faculty of Public Health, Mahidol University.

Secondary data

The cost data were retrospectively collected from secondary data of two HIV prevention interventions for MSM. The projects (HIV prevention intervention) had been supported or allocated funds from Health Systems Research Institute (HSRI) in 2008 - 2010 (The first round from 2008-2009 and the second round from 2009-2010) and the effectiveness data that using for baseline data also collected from secondary data at the end of the first round.

3.4.2.1 Operational Definition

According to the conceptual framework of the study, operational definitions of term listed in the framework are explained below.

- Economic cost: Cost in this study are divided into 2 main groups as follows:
    - Capital costs: It is defined as costs spending to implement and operate a prevention project. Sometimes it is called as occupancy costs. Normally, the capital cost has its useful lifetime more than one year. It is composed of building cost, equipment cost and vehicle cost.
    - Recurrent Costs: It is composed of 2 main costs: labor cost and non-labor cost. For the labor cost, it is defined as the payment for salaries or wage of the staff including all fringe benefits. For the non-labor recurrent cost, it is defined as the cost spent for materials, utility, administrative, and maintenance cost of all equipment and machines.
- Effectiveness: Increasing number of MSM with knowledge on HIV/AIDS and attitudes by each intervention of HIV preventive project.
- Cost-Effectiveness Analysis (CEA): CEA is a comparison of the cost of different intervention to achieve an outcome (effectiveness) which is the cost of each intervention divided by its effectiveness. Therefore, the result that we obtained is the cost per unit of outcome.
- Men who have sex with men (MSM): male who had sexual behaviors of having sex with other males, regardless of gender identity, motivation for engaging in sex
- Establishing a community based friend center: It is defined as one part of the HIV prevention intervention of the HIV prevention project for MSM in Thailand. The main activities of the establishing a community based friend center are composed of:

- Setting up the peer group in the communities to be used as the source of knowledge and, training and counseling center. It was a center providing the public health services to the communities. It did not specifically focus on only the homosexual males but it was an activity serving a particular group i.e. teenager women elderly. Location of centre took place in the beauty salon in community.
- Training by giving general knowledge.
- Educating about AIDS (communication skill) and concepts on developing the human potential.
- Training on how to be speaker about AIDS.
- Training on the developing in the management, knowledge and skill of working as a team. Providing the arena for the leaders to share the experience starting from their own peer group on one to one basis and among friends at drop-in centers and meeting points of people in the communities.
- Approaching the leaders of men who having sex with men in the communities.

- Implementing a training course: It is defined as one part of the HIV prevention intervention of the HIV prevention project for MSM in Thailand. The main activities of the implementing a training course are composed of:
    - Approaching the key people by searching among men who have sex with men to be trained as the leader in the area.
    - Selecting the people who were volunteers to lead the education system to be trained as the key people to work in the field. The training topics included HIV, STI, skill in working in the communities which stressed on passing on the knowledge in the communities, and refusing skill. This curriculum was called Life Skill Defeating AIDS Camp.

- Implementing based on working as a team. A team comprises of a project head and a field staff working in the responsible area and within a certain specified activities. The team leader was a mentor advising the team in counseling, suggesting and training.
- Organizing activities periodically by cooperating with the local organization, communities and other involved people.
- Developing the service system together with staffs in the brothels and providing the special clinic volunteers to provide the consultation, satisfactory services and friendship to the target groups.
- Developing the supporting system and giving out condoms by setting up the condom funded by collaborating with other organizations to back up condom and provide for the reimbursement of the necessary areas.

- Outreach Activity: It is a strategy for providing health-related services by delivering the services to individuals in their own community, where they live or spend time ("reaching out" to the population"). Outreach activities had been performed similar in both projects include:
    - Education, giving information about HIV/AIDS.
    - Providing materials for health promotion.
    - Reinforcing positive behavior change.
    - Identifying service needs and providing referrals.
    - Recruitment for research or service projects.
- Awareness Campaign: awareness campaign action had been performed similar in both projects include the following:
    - Running a broad public education campaign about prevention of AIDS, non-discrimination and care for people living with AIDS, that aims to reach as many people as possible.

- Organizing local awareness raising events and campaigns to change sexual behavior and attitudes to people with AIDS.
- Creating openness about the disease by speaking about it, publicly supporting people who are open and encouraging voluntary testing.
- Organizing support for people with AIDS by mobilizing volunteers into community care.
- Organizing community support and care for AIDS orphans.

3.4.3 Tools

Questionnaires and costing record forms had been used in this study: There were 2 forms as follows:

Form 1 Cost record form

Form 2 Questionnaires for MSM (In Appendix C)

- Part I Personal data: The personal data questionnaire was developed for collecting subject general information including age, education and occupational.
- Part II 5 indicators from United Nations General Assembly Special session (UNGASS) (Knowledge Assessment)[2]

The knowledge about HIV/AIDS Prevention that was focused on the basic concept on HIV/AIDS transmission. Module contained 5 questions, which were closed-ended type's answers of two possible of choices and assigned to have only one of correct answer for each question. For each of correct answers, a score of 1 point was given and 0 point was given for incorrect answer. Score must be 5 points (100%) indicated that MSM with knowledge.

- Part 3 Attitudes Assessment

---

2 Guidelines on construction of core indicators report, 2010

The total score of 6 points was categorized into two levels of attitudes of HIV/AIDS prevention (Core indicators were set up from the project: "Monitoring and Evaluation Research on Model Development and Redefine Mechanisms for AIDS Prevention and Alleviation in Youth and others Most at Risk Population", and that were approved by M&E Steering Committee[3], February 2010) as follows:

Scores between 5-6 points indicated better attitudes. (Referred MSM with positive attitudes toward HIV/AIDS prevention)

Scores between 3-4 points indicated moderate attitudes. (Referred MSM with negative attitudes toward HIV/AIDS prevention)

Scores between 0-2 points indicated worse attitudes. (Referred MSM with negative attitudes toward HIV/AIDS prevention)

There were 6 positive questions (items 1, 2, 3, 4, 5 and 6). Scoring criteria for positive question are:

Yes	=	1 point
No	=	0 point
Not Sure	=	0 point

Therefore, from the knowledge and attitudes raw score the respondents would be divided into two groups: one group with 1 point (those who had better knowledge or better attitudes) and another group had 0 point (those who had less knowledge or less attitudes).

---

3 The committee is responsible to (i) development the models and mechanisms to prevent HIV/AIDS by using knowledge management mechanism based on the participation of various related parties based on strategic framework for integrated prevention and solution of the national HIV/AIDS. (ii) support capacity building and put up participation and ownership of the party alliance government and civil societies, including academic sectors as well as the provinces and local government. (iii) develop policy recommendation. Source: (The final report of monitoring and Evaluation Research on Model Development and Redefine Mechanisms for AIDS Prevention and Alleviation in Youth and other Most at Risk Population Project, 2010)

3.4.4 Methods of data collection

1. Collected cost of two HIV prevention intervention from responsible of preventive project managers, These are composed of:

   Capital cost

   - Building, space: Health service office
   - Other equipment with a cost (price) of 5000 Baht or more
   - Vehicle

   Recurrent cost

   - Personnel salary
   - Telephone
   - Utility
   - Material (Office supplies, Condom and lubricant and media)
   - Staff training
   - Outreach Activity
   - Awareness Campaign
   - Community based friend center activity
   - Training courses for MSM

2. Collected effectiveness data interview by following the 5 indicators from UNGASS, questionnaire for Attitudes Assessment. MSM who are enrolled in preventive projects to find the effectiveness of the prevention intervention.
3. Perform the cost-effectiveness analysis across different HIV prevention interventions project for MSM.

3.5 Data analysis

- Effectiveness data using computer program (statistical package)
- Calculation of costs

All the cost items are shown in Table 5 Total cost items for establishing a community based friend center are the same as those costs implementing a training course.

Table 5: Total cost of establishing a community based friend center and implementing a training course for men who have sex with men

Cost items	Unit of measurement	Source of Data
Capital cost:		
-Building	Baht/year	Secondary data* (Part 1A)
-Equipment	Baht/year	Secondary data* (Part 1B)
-Vehicle	Baht/year	Secondary data* (Part 1C)
Recurrent:		
-Personnel	Baht/year	Secondary data* (Part 2)
-Material(Condom, lubricants)	Baht/year	Secondary data* (Part 3)
-Telephone	Baht/year	Secondary data* (Part 4)
-Utilities	Baht/year	Secondary data* (Part 5)
Staff Training program		Secondary data * (Part 6)
-Material	Baht/year	
-Per Diem	Baht/year	
-Traveling allowance of participant	Baht/year	
Outreach Activity		Secondary data * (Part 7)
-Material	Baht/year	
-Per Diem	Baht/year	
-Traveling allowance of participant	Baht/year	
Awareness Campaign		Secondary data * (Part 8)
-Material	Baht/year	
-Per Diem	Baht/year	
-Traveling allowance of participant	Baht/year	

Cost items	Unit of measurement	Source of Data
Establishing community based friend center (Only project 1)		Secondary data * (Part 9)
-Material	Baht/year	
-Per Diem	Baht/year	
-Traveling allowance of participant	Baht/year	
Implementing a training course (Only project 2)		Secondary data * (Part 10)
-Material	Baht/year	
-Per Diem	Baht/year	
-Traveling allowance of participant	Baht/year	

*From check list in Appendix B

3.5.1 Calculation for Capital costs

For the capital cost calculation[4], a special procedure (Annuallization or depreciation) is required to estimate the annual costs. The general steps are described as follows (Drummond et al., 2005):

- Estimate the current value of the capital item, i.e. the amount to be paid to purchase a similar item at the present time (i.e. the replacement value rather than original price).

[4] Drummond et al. (2005): provides the definition of capital costs as follows: 1) land does not depreciate at all, equipment depreciate, material and supplier 'depreciate' or are used up instantaneously and so are cost fully in the year of used, and equipment depreciate more slowly and may be handled in a variety of way. 2) Capital equipment costs have 3 components:- depreciate cost, opportunity cost, and actual operating costs.

- Estimate the expected years of useful life of the capital item, after purchase, expert judgment or opinion has to be taken from interviews with staff who use if necessary.
- Derive the annuallization factor by consulting the annuallization table to calculate the correct factor or by using the annuallization formula.

Annuallization formula: $a(r, n) = [r (1+r)^{n}] / [(1+r)^{n} - 1]$

Where: a = annuallization factor
r = discount rate
n = useful life or life time of asset for depreciation

- Calculate annual cost by dividing the current value of the item by the annuallization formula calculation

Total Building costs for Project office Project 1 (Establishing a community based friend center) ($TC_{B.CBF}$)

For establishing a community based friend center = $\sum^{n}_{i=1} [B_{ia}]$

Where: B = Annual costs of building
i = Number of building; i=1….. , n
a = Proportion of space used for establishing a community based friend center

The calculation is the same in first round and the second round.

Total Building costs for Project office Project 2 (Implementing a training course) ($TC_{B.ITC}$)

For implementing a training course = $\sum^{n}_{i=1} [B_{ib}]$

Where: B = Annual costs of building
i = Number of building; i=1….. , n
b = Proportion of space used for implementing training course

The calculation is the same in first round and the second round.

Total Equipment costs for Project office Project 1 (Establishing a community based friend center) ($TC_{E.CBF}$)

For establishing a community based friend center = $\sum^{n}_{i=1} [B_{ie}]$

Where: B = Annual costs of equipment

i = Number of equipment; i=1….., n

e = Proportion time of used for establishing a community based friend center

The calculation is the same in first round and the second round..

Total Equipment costs for Project office Project 2 (Implementing a training course) ($TC_{E.ITC}$)

For implementing a training course = $\sum^{n}_{i=1} [B_{if}]$

Where: B = Annual costs of equipment

i = Number of equipment; i=1….., n

f = Proportion time of used for implementing training course

The calculation is the same in first round and the second round..

Total Vehicle costs for Project office Project 1 (Establishing a community based friend center) ($TC_{V.CBF}$)

For establishing a community based friend center = $\sum^{n}_{i=1} [B_{im}]$

Where: B = Annual costs of vehicle

i = Number of vehicle; i=1….., n

m = Proportion time of used for establishing a community based friend center

The calculation is the same in first round and the second round..

Total Vehicle costs for Project office Project 2 (Implementing a training course) ($TC_{V.ITC}$)

For implementing a training course = $\sum^{n}_{i=1} [B_{ip}]$

Where:	B	=	Annual costs of vehicle
	i	=	Number of vehicle; i=1….., n
	p	=	Proportion time of used for implementing training course

The calculation is the same in first round and the second round..

3.5.2 Calculation for Recurrent costs

- The cost for **staff training program** can be calculated by summation of following items:
  - Annual costs for materials
  - Annual costs for traveling allowance
  - Annual costs for per diem (person x day)
- The cost for **outreach activity** can be calculated by summation of following items:
  - Annual costs for materials
  - Annual costs for traveling allowance
  - Annual costs for per diem (person x day)
- The cost for **awareness campaign activity** can be calculated by summation of following items:
  - Annual costs for materials
  - Annual costs for traveling allowance
  - Annual costs for per diem (person x day)
- The cost for **community based friend center** can be calculated by summation of following items:
  - Annual costs for materials
  - Annual costs for traveling allowance
  - Annual costs for per diem (person x day)
- The cost for **implementing a training course** can be calculated by summation of following items:

- Annual costs for materials
- Annual costs for traveling allowance
- Annual costs for per diem (person x day)

3.5.2.1 Calculation for Personnel costs (TC_P)

Tables 6 and 7 show the total annual income of each project personnel. The data can be obtained from time spent for intervention. So, the total annual personnel cost for each intervention for prevent HIV/AIDS for MSM can be calculated.

Table 6 : Total Personnel Costs for doing a community based friend center

(1) Name of the person	(2) Annual salary		(3) Other fringe benefits		(4) Total annual income		(5) Proportion of time spent for doing a community based friend center (Project 1)		(6) Total personnel cost for doing a community based friend center (Project 1)	
	1st round	2nd round	1st round	2nd round	1st round	2nd round	1st round	2nd round	1st round	2nd round
Total										

Table 7 : Total Personnel Costs for doing an implementing a training course

(1) Name of the person	(2) Annual salary		(3) Other fringe benefits		(4) Total annual income		(5) Proportion of time spent for doing an implementing training course (Project 2)		(6) Total personnel cost for doing an Implementing training course (Project 2)	
	1st round	2nd round	1st round	2nd round	1st round	2nd round	1st round	2nd round	1st round	2nd round
Total										

From the above calculations, the following equations can be obtained.

Total personnel cost for doing a community based friend center

$$TC_{P.project1} = \sum^{n}_{i=1} [\sum^{e}_{p=1} S_{ip}] \quad \text{..... (1)}$$

Where: S = Total annual income of health personnel

i = Project personnel; i=1……., n

p = Proportion of time spent on doing a community based friend center; p=1…, e

The calculation is the same in first round and the second round.

Total personnel cost for doing an implementing a training course

$$TC_{P.project2} = \sum^{n}_{i=1} [\sum^{t}_{u=1} S_{iu}] \quad \text{..... (2)}$$

Where: S = Total annual income of health personnel

i = Project personnel; i=1……., n

p = Proportion of time spent on doing an implementing a training course; u=1…, t

The calculation is the same in first round and the second round.

3.5.2.2 Calculation of Total Material Cost (TC_M)

Material cost can be calculated by multiplying unit costs for each material into number of these material used for each intervention within one year. Calculation for this cost item is shown in Table 8 and Table 9

From this calculation the following equation will be obtained.

$TC_{M.project1} = \sum^{n}_{i=1} [M \times N_{project1}]$…….. (3)

Where: M = Unit cost of material

$N_{project1}$ = Number of material used for doing a community based friend center

i = Item of material; i=1……, n

The calculation is the same in first round and the second round.

$TC_{M.project2} = \sum^{n}_{i=1} [M \times N_{project2}]$…….. (4)

Where: M = Unit cost of material

$N_{project2}$ = Number of material used for an implementing a training course

i = Item of material; i=1……, n

The calculation is the same in first round and the second round.

Table 8 : Calculation for Total Material costs for doing a community based friend center

(1) Item of material	(2) Unit cost	(3) Number of material used for doing a community based friend center	(4) Cost of material used for doing a community based friend center
Total			

Table 9 : Calculation for Total Material costs for doing an implementing a training course

(1) Item of material	(2) Unit cost	(3) Number of material used for doing an implementing a training	(4) Cost of material used for doing an implementing a training
Total			

3.5.2.3 Calculation for Telephone costs (TC_{TE})

Telephone cost can be calculated by summarizing costs for each month from proportion of these telephone used for each intervention within one year. Calculation for this cost item is shown in Table 10 and Table 11.

From this calculation the following equation will be obtained.

Total telephone cost for doing a community based friend center

$TC_{TE.project1} = \sum^{n}_{i=1} [\sum^{e}_{p=1} S_{ip}]$ ..... (5)

Where: S = Total telephone bill of project

i = Monthly; i=1……., 12

p = Proportion of time spent on doing a community based friend center; p=1…, e

The calculation is the same in first round and the second round.

Total telephone cost for doing an implementing a training course

$TC_{TE.project2} = \sum^{n}_{i=1} [\sum^{t}_{u=1} S_{iu}]$ ..... (6)

Where: S = Total telephone bill of project

i = Monthly; i=1……., 12

p = Proportion of time spent on doing an implementing a training course; u=1…, t

The calculation is the same in first round and the second round.

Table 10 : Calculation for Total Telephone costs for doing a community based friend center

(1) Month	(2) Total telephone bill	(3) Proportion of time spent for doing a community based friend center (Project 1)	(4) Total telephone cost for doing a community based friend center (Project 1)
Total			

Table 11 : Calculation for Total Telephone costs for doing an implementing a training course

(1) Month	(2) Total telephone bill	(3) Proportion of time spent for doing an implementing a training course (Project 2)	(4) Total telephone cost for doing an implementing a training course (Project 2)
Total			

3.5.2.4 Calculation for Utilities costs (TC_{UT})

Utilities cost can be calculated by summarizing costs for each month from proportion of these utilities used for each intervention within one year. Calculation for this cost item is shown in Table 12 and Table 13

From this calculation the following equation will be obtained.

Total utilities cost for doing a community based friend center

$$TC_{UT.project1} = \sum_{i=1}^{n} [\sum_{p=1}^{e} S_{ip}] \quad \ldots\ldots (7)$$

Where: S = Total utilities bill of project

i = Monthly; i=1……., 12

p = Proportion of time spent on doing a community based friend center; p=1…, e

The calculation is the same in first round and the second round.

Total telephone cost for doing an implementing a training course

$TC_{UT.project2} = \sum^{n}_{i=1} [\sum^{t}_{u=1} S_{iu}]$ ..... (8)

Where: S = Total utilities bill of project

i = Monthly; i=1……., 12

p = Proportion of time spent on doing an implementing a training course; u=1…, t

The calculation is the same in first round and the second round.

Table 12 : Calculation for Total Utilities costs for doing a community based friend center

(1) Month	(2) Total utilities bill	(3) Proportion of time spent for doing a community based friend center (Project 1)	(4) Total utilities cost for doing a community based friend center (Project 1)
Total			

Table 13 : Calculation for Total Utilities costs for doing an implementing a training course

(1) Month	(2) Total utilities bill	(3) Proportion of time spent for doing an implementing a training course (Project 2)	(4) Total utilities cost for doing an implementing a training course (Project 2)
Total			

3.5.2.5 Calculation of Staff Training Program (TC_{ST})

It is calculated by summation of operation costs for staff training program within one year. In this item, operation costs for staff training program contained cost for material, traveling allowance of participants and per diem. The calculation is the same for doing a community based friend center versus doing an implementing a training course.

The equation of total cost for staff training program is following.

$$TC_{ST.Project1} = \sum_{i=1}^{n} [C_{MA} + C_{TA} + C_{PD}] \quad \text{..... (9)}$$

Where:
- C_{MA} = Costs for materials
- C_{TA} = Costs for traveling allowance
- C_{PD} = Costs for per diem
- i = Number of training program within in year; i=1…, n

The calculation is the same in first round and the second round.

$$TC_{ST.Project2} = \sum_{i=1}^{n} [C_{MA} + C_{TA} + C_{PD}] \quad \text{..... (10)}$$

Where:
- C_{MA} = Costs for materials
- C_{TA} = Costs for traveling allowance
- C_{PD} = Costs for per diem
- i = Number of training program within in year; i=1…, n

The calculation is the same in first round and the second round.

3.5.2.6 Calculation of Outreach Activity (TC_{OA})

The cost of Outreach Activity can be calculated by summation of the following items. The calculation is the same for doing a community based friend center versus doing an implementing a training course.

1. Cost for materials.
2. Traveling allowance of participants.
3. Per diem x No. of day for outreach activity

The equation for calculation of Outreach Activity is as follow:

$TC_{OA.Project1}$ = $\sum^{n}_{i=1} [C_{MA} + C_{TA} + C_{PD}]$…….. (11)

Where: C_{MA} = Costs for materials

C_{TA} = Costs for traveling allowance

C_{PD} = Costs for per diem

i = Number of outreach activity within in year; i=1…, n

The calculation is the same in first round and the second round.

$TC_{OA.Project2}$ = $\sum^{n}_{i=1} [C_{MA} + C_{TA} + C_{PD}]$…….. (12)

Where: C_{MA} = Costs for materials

C_{TA} = Costs for traveling allowance

C_{PD} = Costs for per diem

i = Number of outreach activity within in year; i=1…, n

The calculation is the same in first round and the second round.

3.5.2.7 Calculation of awareness campaign (TC_{AW})

It is calculated by summation of operation costs for awareness campaign within one year. In this item, operation costs for awareness campaign contained cost for material, traveling allowance of participants and per diem. The calculation is the same for doing a community based friend center versus doing an implementing a training course.

The equation of total cost for awareness campaign is following.

$TC_{AW.Project1}$ = $\sum^{n}_{i=1} [C_{MA} + C_{TA} + C_{PD}]$…….. (13)

Where: C_{MA} = Costs for materials

C_{TA} = Costs for traveling allowance

C_{PD} = Costs for per diem

i = Number of awareness campaign within in year; i=1……, n

The calculation is the same in first round and the second round.

$TC_{AW.Project2}$ = $\sum^{n}_{i=1} [C_{MA} + C_{TA} + C_{PD}]$…….. (14)

Where: C_{MA} = Costs for materials

C_{TA} = Costs for traveling allowance

C_{PD} = Costs for per diem

i = Number of awareness campaign within in year; i=1……, n

The calculation is the same in first round and the second round.

3.5.2.8 Calculation of community based friend center activity (TC_{CB})

It is calculated by summation of operation costs for community based friend center activity within one year. In this item, operation costs for community based friend center activity contained cost for material, traveling allowance of participants and per diem.

The equation of total cost for awareness campaign is following.

$$TC_{CB.Project1} = \sum_{i=1}^{n} [C_{MA} + C_{TA} + C_{PD}] \text{…….. (15)}$$

Where: C_{MA} = Costs for materials

C_{TA} = Costs for traveling allowance

C_{PD} = Costs for per diem

i = Number of community based friend center activity within in year; i=1……, n

The calculation is the same in first round and the second round.

3.5.2.9 Calculation of training course for MSM (TC_{TC})

It is calculated by summation of operation costs for training course for MSM within one year. In this item, operation costs for training course for MSM contained cost for material, traveling allowance of participants and per diem.

The equation of total cost for training course for MSM is following.

$$TC_{TC.Project2} = \sum_{i=1}^{n} [C_{MA} + C_{TA} + C_{PD}] \text{…….. (16)}$$

Where: C_{MA} = Costs for materials

C_{TA} = Costs for traveling allowance

C_{PD} = Costs for per diem

i = Number of awareness campaign within in year; i=1……, n

The calculation is the same in first round and the second round.

3.5.2.10 Total Costs for establishing a community based friend center versus implementing a training course for men who have sex with men

Total Costs for each intervention for prevent HIV/AIDS in MSM can be calculated from summation of above equations.

Total Costs for establishing a community based friend center (TC_{CBF}) (These are obtained by summing up equations 1, 3, 5, 7, 9, 11, 13 and 15)

$$TC_{CBF} = TC_{P.project1} + TC_{M.project1} + TC_{TE.project1} + TC_{UT.project1} + TC_{ST.Project1} + TC_{OA.Project1} + TC_{AW.Project1} + TC_{CB.Project1} + TC_{B\cdot CBF} + TC_{E\cdot CBF} + TC_{V\cdot CBF} \quad (17)$$

Where: TC_{CBF} = Total costs for establishing a community based friend center

$TC_{P.project1}$ = Total personnel costs for establishing a community based friend center

$TC_{M.project1}$ = Total material costs for establishing a community based friend center

$TC_{TE.project1}$ = Total telephone costs for establishing a community based friend center

$TC_{UT.project1}$ = Total utilities costs for establishing a community based friend center

$TC_{ST.Project1}$ = Total staff training costs for establishing a community based friend center

$TC_{OA.Project1}$ = Total outreach activity costs for establishing a community based friend center

$TC_{AW.Project1}$ = Total awareness campaign costs for establishing a community based friend center

$TC_{CB.Project1}$ = Total community based friend activity costs for establishing a community based friend center

$TC_{B.CBF}$ = Total building costs for establishing a community based friend center

$TC_{E.CBF}$ = Total equipment costs for establishing a community based friend center

$TC_{V.CBF}$ = Total vehicle costs for establishing a community based friend center

The calculation is the same in first round and the second round.

Total Costs for implementing a training course (TC_{ITC}) (these are obtained by summing up equations 2, 4, 6, 8, 10, 12, 14 and 16)

$$TC_{ITC} = TC_{P.project2} + TC_{M.project2} + TC_{TE.project2} + TC_{UT.project2} + TC_{ST.Project2} + TC_{OA.Project2} + TC_{AW.Project2} + TC_{CB.Project2} + TC_{B.ITC} + TC_{E.ITC} + TC_{V.ITC} \quad (18)$$

Where: TC_{ITC} = Total costs for implementing a training course

$TC_{P.project2}$ = Total personnel costs for implementing a training course

$TC_{M.project2}$ = Total material costs for implementing a training course

$TC_{TE.project2}$ = Total telephone costs for implementing a training course

$TC_{UT.project2}$ = Total utilities costs for implementing a training course

$TC_{ST.Project2}$ = Total staff training costs for implementing a training course

$TC_{OA.Project2}$ = Total outreach activity costs for implementing a training course

$TC_{AW.Project2}$ = Total awareness campaign costs implementing a training course

$TC_{TC.Project2}$ = Total training course for MSM costs for implementing a training course

$TC_{B.ITC}$ = Total building costs for implementing a training course

$TC_{E.ITC}$ = Total equipment costs for implementing a training course

$TC_{V.ITC}$ = Total vehicle costs for implementing a training course

The calculation is the same in first round and the second round.

3.5.2.11 Unit Cost for establishing a community based friend center versus implementing a training course for men who have sex with men

A Unit cost is a kind of simple average: cost per unit output

Average Cost for establishing a community based friend center

$AC_{CBF} = TC_{CBF} / R_{CBF}$ ……..(19)

Where AC_{CBF} = Average Cost for establishing a community based friend center

TC_{CBF} = Total costs for establishing a community based friend center

R_{CBF} = Reach population of community based friend center (P1)

The calculation is the same in first round and the second round.

Average Cost for implementing a training course

$AC_{ITC} = TC_{ITC} / R_{ITC}$ ……..(20)

Where AC_{ITC} = Average Cost for implementing a training course

TC_{ITC} = Total costs for implementing a training course

R_{ITC} = Reach population of implementing a training course (P2)

The calculation is the same in first round and the second round.

3.5.2.12 Total Cost of sampling for establishing a community based friend center versus implementing a training course for men who have sex with men

Total Cost of sampling for establishing a community based friend center

$TCS_{CBF} = AC_{CBF} \times S_{CBF}$ …… (21)

Where TCS_{CBF} = Total Cost of sampling for establishing a community based friend center

AC_{CBF} = Average Cost for establishing a community based friend center

S_{CBF} = Sample size of MSM who participated of community based friend center

The calculation is the same in first round and the second round.

Total Cost of sampling for implementing a training course

$TCS_{ITC} = AC_{ITC} \times S_{CBF}$ ……..(22)

Where TCS_{ITC} = Total Cost of sampling for implementing a training course

AC_{ITC} = Average Cost for implementing a training course

S_{ITC} = Sample size of MSM who participated of implementing a training course

The calculation is the same in first round and the second round.

3.5.3 Cost-Effectiveness Analysis

From the above equations (1 to 22) costs for each interventions and effectiveness in term of increasing number of MSM with knowledge on HIV/AIDS and attitudes are calculated.

In this study, costs and effectiveness are calculated by dividing the total cost of sampling of each intervention divided by increasing number of MSM with knowledge on HIV/AIDS and attitudes from each intervention.

3.6 Ethical consideration

This research had been reviewed and approved by Ethics Committee for Human Research, Mahidol University, with the certificate of approval no. MUPH 2010-078 on 24 February, 2011.

Before asking any questionnaires, the respondents were adequately informed about this study including objectives, method, anticipated benefits and potential hazards. The participation of respondents was completely voluntary and they were allowed to quit or drop out during the survey. No incentives in cash were provided to all respondents.

The name of subject was not recorded in questionnaires and only the identification number was recorded. All information given by them was kept strictly confidential.

Human subjects' confidentiality and rights were maintained in this study. As described in the previous parts of data collection, informed consents were obtained from each individual respondents and informants. Prior to interview, the respondents and informants were explained in regard with various aspects of this study.

CHAPTER IV

RESULTS AND DISCUSSIONS

The study of "Cost-effectiveness analysis of establishing a community based friend center versus implementing a training course for MSM" was done by using both primary and secondary sources of data. Data were collected from two HIV prevention interventions for MSM. The project (HIV prevention intervention) have been supported or allocated **funds** from Health Systems Research Institute (HSRI) in 2008 - 2010 (first round from 2008-2009 and second round from 2009-2010). All results are summarized and presented as follows:

4.1 Characteristics of MSM in the study

4.2 Knowledge result

4.3 Attitudes result

4.4 Project cost data

4.4.1 Capital cost

4.4.2 Recurrent cost

4.5 Cost-effectiveness analysis

4.6 Incremental cost-effectiveness analysis

4.1 Characteristics of MSM in the study

The pattern of characteristic of MSM who are participated in project 1 in the first round is shown in Table 14. More than 80 percent of MSM who were participated in project 1 in the first round were 15-25 years old with the mean (sd) age of 21.79 (6.42) years. Only 1.4 percent had no education, followed by primary education 6.9 percent, junior high school 45.8 percent, senior high school 22.2 percent, vocational education or diploma 6.9 and bachelor's degree/higher was 16.7 percent. Half of them were students.

The pattern of characteristic of MSM who participated in project 1 in the second round were more than 80 percent of MSM who were participated in project 1 in the second round were 15-25 years old with the mean (sd) age of 23.12 (5.5) years. Most studied in junior high school and more than 60 percent were students.

Table 14 : Characteristics of MSM who are participated in project 1 (establishing a community based friend center) 1st round and 2nd round

Characteristics	Establishing a community based friend center 1st Round (n=72)	Percent	Establishing a community based friend center 2nd Round (n=72)	Percent
Age, years				
-15-25	58	80.6	63	87.5
-26-35	12	16.7	5	6.9
-36-45	1	1.4	1	1.4
-46-55	1	1.4	3	4.2
-Mean (S.D.)	21.79 (6.42)		23.12 (5.5)	
-Min-Max	15-46		15-40	
Educational level				
-No education	1	1.4	4	5.6
-Primary education	5	6.9	3	4.2
-Junior high school	33	45.8	24	33.3
-Senior high school	16	22.2	19	26.4
-Vocational education or Diploma	5	6.9	9	12.5
-Bachelor's degree or higher	12	16.7	13	18.1
Occupational				
-Student	38	52.8	48	66.7
-Housekeeper	1	1.4	8	11.1
-Farmer, agriculturist	5	6.9	0	0.0
-Temporary worker	15	20.8	0	0.0
-Trader	9	12.5	6	8.3
-Officer	3	4.2	7	9.7
-Others	1	1.4	3	4.2

The pattern of characteristic of MSM who participated in project 2 in the first round is shown in Table 15. More than 80 percent of MSM who were participated in project 2 in the first round were 15-25 years old with the mean (sd) age of 21.2 (7.4) years. Only 2.5 percent had primary education, followed by junior high school 7.5 percent, senior high school 37.5 percent, vocational education or diploma 25 and bachelor's degree or higher was 27.5 percent. Half of them were students. For MSM who participated in project 2 in the first round, more than 80 percent were 15-25 years old with the mean (sd) age of 22.3 (4.6) years. Most studied in Senior high school and half of them were students.

Table 15 : Characteristics of MSM who are participated in project 2 (implementing a training course) 1st round and 2nd round

Characteristics	Implementing a training course 1st Round (n=40)	Percent	Implementing a training course 2nd Round(n=40)	Percent
Age, years				
-15-25	33	82.5	32	80.0
-26-35	6	15.0	7	17.5
-36-45	1	2.5	1	2.5
-46-55	0	0.0	0	0.0
-Mean (S.D.)	21.2 (7.4)		22.3 (4.6)	
-Min-Max	15-49		17-40	
Educational level				
- No education	0	0.0	0	0.0
-Primary education	1	2.5	0	0.0
-Junior high school	3	7.5	2	5.0
-Senior high school	15	37.5	21	52.5
-Vocational education or Diploma	10	25	4	10.0
-Bachelor's degree or higher	11	27.5	13	32.5

Characteristics	Implementing a training course 1st Round (n=40)	Percent	Implementing a training course 2nd Round(n=40)	Percent
Occupational				
-Student	21	52.5	22	55.0
-Housekeeper	1	2.5	12	30.0
-Harmer, agriculturist	0	0.0	0	0.0
-Temporary worker	7	17.5	0	0.0
-Trader	7	17.5	4	10.0
-Officer	3	7.5	1	2.5
-Others	1	2.5	1	2.5

MSM who participated in the establishing a community based friend center (project 1) and implementing a training course (project 2) were quite similar because almost all were students but in project 1 almost all graduated in junior high school and in project 2 almost all graduated in senior high school. From this result, low education of MSM in project 1 may be effect the risk factor to increasing HIV prevalence.

4.2 Knowledge result

Table 16 shows knowledge assessment score of MSM who participated in the establishing a community based friend center at the first round and at the second round. They can be explained as follows:

Most cases at the first round were scores 5 points. While cases scores 4, 3, 2 and 1 points were 18, 14, 2 and 1 cases respectively. There was no person who scored 0 point.

Most cases at the second round were scores 5 points. While cases scores 4, and 3 points were 15 and 10 cases respectively. There was no person who scored 2, 1, and 0 point.

Table 16 : Knowledge assessment of establishing a community based friend center

Establishing a community based friend center	Knowledge Assessment Score (Points)						Total (n)
	0	1	2	3	4	5	
First Round	0 (0.0 %)	1 (1.4 %)	2 (2.8 %)	14 (19.4 %)	18 (25.0 %)	37 (51.4 %)	72 (100%)
Second Round	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	10 (13.9 %)	15 (20.8 %)	47 (65.3 %)	72 (100%)

Table 17 shows knowledge assessment score of MSM who participated in the implementing a training course at the first round and at the second round. They can be explained as follows:

Most or 20 cases at the first round scored 4 points. While cases scores 5, 3, 2, 1 and 0 points were 8, 6, 1, 4 and 1 cases respectively.

Most cases at the second round were scores 4 points. While cases scores 5, 3 were 17 and 4 cases respectively. There was no person who scored 2, 1, and 0 point.

Table 17 : Knowledge assessment of implementing a training course

Implementing a training course	Knowledge Assessment Levels (Points)						Total (n)
	0	1	2	3	4	5	
First Round	1 (2.5 %)	4 (10.0 %)	1 (2.5 %)	6 (15.0 %)	20 (50.0 %)	8 (20.0 %)	40 (100%)
Second Round	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	4 (10.0 %)	19 (47.5 %)	17 (42.5 %)	40 (100%)

4.3 Attitudes result

Table 18 shows attitudes assessment score of MSM who participated in the establishing a community based friend center at the first round and at the second round. The difference of attitudes level between first and second round could be explained as follows:

Most cases in the first round were in better attitudes level which was accounted for more than half (79.20%). While cases in moderate attitudes level and worse attitudes level were 6 cases and 9 cases.

Most cases at the second round were in better attitudes level which was accounted for more than half (88.90%). While cases in moderate attitudes level and worse attitudes level were 7 cases and 1 case.

Table 18 : Attitudes assessment of establishing a community based friend center

Establishing a community based friend center	Attitudes Assessment Levels (Points)			Total (n)
	0-2	3-4	5-6	
First Round	9 (12.5 %)	6 (8.3 %)	57 (79.2 %)	72 (100%)
Second Round	1 (1.4 %)	7 (9.7 %)	64 (88.9%)	72 (100%)

Note: 5-6 points = Better Attitudes 3-4 points = Moderate Attitudes 0-2 = Worse Attitudes

Table 19 shows attitudes assessment score of MSM who participated in the implementing a training course at the first round and at the second round.

The difference of attitudes level between first and second round could be explained as follows:

Most cases at the first round were in better attitudes level which was accounted for more than half (77.5%). While cases in moderate attitudes level and worse attitudes level were 6 cases and 3 cases.

Most cases at the second round were in better attitudes level which was accounted for more than half (85.0%). While cases in moderate attitudes level and worse attitudes level were 5 cases and 1 case.

Table 19 : Attitudes assessment of implementing a training course

Implementing a training course	Attitudes Assessment Levels (Points)			Total (n)
	0-2	3-4	5-6	
First Round	3 (7.5 %)	6 (15.0 %)	31 (77.5 %)	40 (100%)
Second Round	1 (2.5 %)	5 (12.5 %)	34 (85.0 %)	40 (100%)

Note: 5-6 points = Better Attitudes 3-4 points = Moderate Attitudes 0-2 = Worse Attitudes

Assessment score of attitudes was observed higher than assessment score of knowledge, this might be explained that the scoring assessment of knowledge was “1” when all 5 answers (100%) were correct while the scoring assessment of attitudes was “1” when 5 (83%) or 6 (100%) of 6 answers were correct. In addition, the items of questions for the assessment of knowledge might not link or lead to the assessment of attitudes.

4.4 Project cost data

Cost data of each intervention shows capital and recurrent costs. The total costs are presented distinguishable by interventions as follows:

4.4.1 Capital Cost

Table 20 shows capital cost of establishing a community based friend center in first round and second round versus implementing a training course in the first round and the second round.

Total capital cost of establishing a community based friend center in the first round was 61,704.00 Baht/year in the first round the equipment cost was 55,488.00 Baht/year and vehicle cost was 6,216.00 Baht/year. Total capital cost of establishing a community based friend center in the second round had only the vehicle cost was 3,108.00 Baht/6 months.

Total capital cost of implementing a training course in the first round was 32,370.80 Baht/Year. In the first round the equipment cost was 27,398.00 Baht/Year and vehicle cost was 4,972.80 Baht/Year. Total capital cost of implementing a training course in the second round had only the vehicle cost was 2,486.40 Baht/6 months. The detailed calculation of total costs for each recurrent cost is shown in Appendix D

Table 20 : Total Capital Cost

Cost items	**Establishing a community based friend center**		**Implementing a training course**	
	1st Round	**2nd Round**	**1st Round**	**2nd Round**
	Baht/Year	Baht/6 months	Baht/Year	Baht/6 months
-Building	0	0	0	0
-Equipment	55,488	0	27,398	0
-Vehicle	6,216	3,108	4,972	2,486
Total (Baht)	**61,704**	**3,108**	**32,370**	**2,486**

From Table 20, buildings of both projects were used for more than 20 years so cost will not be included. In the first round, the total cost of establishing a community based friend center was higher than the total cost of implementing a training course

because establishing a community based friend center used the equipment to implement the project more than that used in implementing a training course. In the second round, the total cost of establishing a community based friend center was higher than the total cost of implementing a training course because they used more vehicles to fieldwork in the community more than intervention by implementing a training course.

4.4.2 Recurrent Cost

Table 21 shows recurrent cost of establishing a community based friend center in first and second rounds versus implementing a training course in the first and the second rounds. Total recurrent cost of establishing a community based friend center in the first round was 607,856 Baht/year. In the first round the personnel cost was 82,656 Baht/year, the material cost was 32,400 Baht/year, telephone cost was 7,200 Baht/year and utilities cost was 10,800 Baht/year. While staff training project, outreach activity, awareness campaign and community based friend center activity equal to 146,800, 51,600, 174,000 and 102,400 Baht/year respectively.

Total recurrent cost of establishing a community based friend center in the second round was 333,060 Baht/6 months. In the second round the personnel cost was 45,360 Baht/6 months, the material cost was 22,140 Baht/6 months, telephone cost was 3,600 Baht/6 months and utilities cost was 3,600 Baht/6 months. While staff training project, outreach activity, awareness campaign and community based friend center activity equaled to 43,060, 68,000, 30,500 and 116,800 Baht/6 months respectively.

Total recurrent cost of implementing a training course in the first round was 395,381 Baht/year. In the first round the personnel cost was 29,446 Baht/Year, the material cost was 836 Baht/year, telephone cost was 7,200 Baht/Year and utilities cost was 2,160 Baht/year. While staff training program, outreach activity, awareness campaign and implementing a training course equaled to 63,340, 98,737, 88,265 and 105,397 Baht/year respectively.

Total recurrent cost of implementing a training course in the second round was 287,863 Baht/6 months. In the second round the personnel cost was 10,244 Baht/6 months, the material cost was 600 Baht/6 months, telephone cost was 3,600 Baht/6

months and utilities cost was 1,080 Baht/6 months. While staff training program, outreach activity, awareness campaign and implementing a training course equal to 57,125, 54,300, 68,150 and 92,764 Baht/6 months respectively. The detailed calculation of total costs for each recurrent cost is shown in Appendix E.

Table 21 : Total Recurrent Cost

Cost items	Establishing a community based friend center		Implementing a training course	
	1st Round (Baht/Year)	**2nd Round** (Baht/6 months)	**1st Round** (Baht/Year)	**2nd Round** (Baht/6 months)
-Personnel	82,656	45,360	29,446	10,244
-Material	32,400	22,140	836	600
-Telephone	7,200	3,600	7,200	3,600
-Utilities	10,800	3,600	2,160	1,080
-Staff Training program	146,800	43,060	63,340	57,125
-Outreach Activity	51,600	68,000	98,737	54,300
-Awareness Campaign	174,000	30,500	88,265	68,150
-Community Based Friend Center Activity	102,400	116,800	-	-
-Training Course for MSM	-	-	105,397	92,764
Total Cost (Baht)	**607,856**	**333,060**	**395,381**	**287,863**

4.5 The Cost-effectiveness analysis of establishing a community based friend center versus implementing a training course

Table 22 shows Cost-effectiveness analysis of establishing a community based friend center versus implementing a training course. The cost-effectiveness ratio calculated by divided the total costs for each intervention by increasing number of MSM with knowledge on HIV/AIDS and attitudes.

Table 22: Cost-effectiveness of establishing a community based friend center versus implementing a training course

Variables	Establishing a community based friend center		Implementing a training course	
	1st Round (1 year)	2nd Round (6 months)	1st Round (1 year)	2nd Round (6 months)
• **Effectiveness (Number)**				
- Reach population*	1,500	755	560	360
- Enrolled population**	125	100	50	50
- Increasing number of MSM with knowledge on HIV/AIDS.	37 (n=72)	47 (n=72)	8 (n=40)	17 (n=40)
- Increasing number of MSM with attitudes.	57 (n=72)	64 (n=72)	21 (n=40)	34 (n=40)
• **Cost (Baht)**				
- Total Capital Cost	61,704	3,108	32,370	2,486
-Total Recurrent Cost	607,856	333,060	395,381	287,863
- Total Cost of population (Baht/year)	669,560	336,168	427,751	290,349
- Unit Cost (Baht/year)	446	445	764	807
- Total Cost of sampling (Baht/month)	2,678 (n=72)	5,343 (n=72)	2,546 (n=72)	5,377 (n=72)

Variables	Establishing a community based friend center		Implementing a training course	
	1st Round (1 year)	2nd Round (6 months)	1st Round (1 year)	2nd Round (6 months)
• **Cost-effectiveness (Baht)**				
C/E ratio of knowledge (Baht/month)	72	114	318	316
C/E ratio of attitudes (Baht/month)	47	83	82	158

*Reach population or target population was population that both projects planned to recruit

** Enrolled population was population that both projects recruit into the study

From Table 22 the total cost of establishing a community based friend center in the first and second rounds was higher than the total cost of implementing a training course. Data showed that cost per increasing number of MSM with knowledge on HIV/AIDS of establishing a community based friend center in the first and second rounds was 72 Baht/month and 114 Baht/month respectively and cost per increasing 1 case of MSM with knowledge on HIV/AIDS of implementing a training course in the first and second round was 318 Baht/month and 316 Baht/month respectively. It means implementing a training course was more costly and less effective and establishing a community based friend center was less costly and more effective for increasing number of MSM with knowledge on HIV/AIDS.

When we analyzed the cost-effectiveness ratio for attitudes, the cost-effectiveness of establishing a community based friend center in the first and second rounds, it was 47 Baht/month and 83 Baht/month respectively and the cost-effectiveness of implementing a training course in the first and second rounds was 82 Baht/month and 158 Baht/month respectively. It means that establishing a community based friend center was more

effective than implementing a training course for increasing 1 case of MSM with attitudes.

This result is similar to the study by Kahn, K. et al. (2001), who studied a cost-effectiveness of the Mpowerment Project, a community-level intervention for young gay men in mid-sized city (Eugene, OR), with a second mid-sized community (Santa Barbara, CA), U.S.A. They concluded that “a community-level HIV prevention strategy is cost-effective compared with many other HIV prevention strategies”. (Kahn, K. et al., 2001)

4.6 Incremental cost-effectiveness analysis of establishing a community based friend center versus implementing a training course

The incremental cost-effectiveness analysis calculated by dividing the total cost of establishing a community based friend center second round minus total cost of establishing a community based friend center first round by increasing number of MSM with knowledge on HIV/AIDS and attitudes of establishing a community based friend center second round minus increasing number of MSM with knowledge on HIV/AIDS and attitudes of establishing a community based friend center first round.

The incremental cost-effectiveness analysis calculated by dividing the total cost of implementing a training course second round minus total cost of implementing a training course first round by increasing number of MSM with knowledge on HIV/AIDS and attitudes of implementing a training course second round minus increasing number of MSM with knowledge on HIV/AIDS and attitudes of implementing a training course first round. It is shown in Table 23

Table 23 : Incremental cost-effectiveness analysis of establishing a community based friend center versus implementing a training course

Intervention	1st Round			2nd Round			ICEA Knowledge (Baht)	ICEA Attitudes (Baht)
	Total cost	increasing number of MSM with knowledge	increasing number of MSM with attitudes	Total cost	increasing number of MSM with knowledge	increasing number of MSM with attitudes		
Establishing a community based friend center	2,678	37 (n=72)	57 (n=72)	5,343	47 (n=72)	64 (n=72)	266	315
Implementing a training course	2,546	8 (n=40)	31 (n=40)	5,377	17 (n=40)	34 (n=40)	381	944

The result in Table 23 shows ICEA ratio of knowledge of establishing a community based friend center was 266 Baht/month. It means that if the HIV prevention project wants to increase 1 MSM with knowledge, they would need to pay 266 Baht less than implementing a training course that needs to pay 315 Baht/month.

ICEA ratio of attitudes of establishing a community based friend center was 381 Baht/month. It means that if the HIV prevention project wants to increase 1 MSM with more attitudes, they would need to pay 381 Baht/month less than implementing a training course that needs to pay 944 Baht/month.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This is the cost-effectiveness analysis of establishing a community based friend center versus implementing a training course in Ubonratchathani province, Thailand. Both projects implemented the first round from 2008 to 2009 and the second round from 2009 to 2010. The objectives were to assess the cost-effectiveness among alternatives of different intervention to prevent HIV/AIDS among men who have sex with men.

The result showed that establishing a community based friend center was more cost-effective than implementing a training course. In the first round, the cost-effectiveness ratio of increasing 1 case of MSM with knowledge on HIV/AIDS of project 1 was 4.4 times more cost-effective than project 2 and the cost-effectiveness ratio of increasing 1 case of MSM with attitudes of project 1 was 2.7 times more cost-effective than project 2.

So, in the second round, the cost-effectiveness ratio of increasing 1 case of MSM with knowledge on HIV/AIDS of project 1 was 1.7 times more cost-effective than project 2 and the cost-effectiveness ratio of increasing 1 case of MSM with attitudes of project 1 was 1.9 times more cost-effective than project 2.

Analyzing of the incremental cost-effectiveness of project 1 versus project 2 to increase number of MSM with knowledge on HIV/AIDS showed the result that the incremental cost-effectiveness ratio of project 2 was higher than incremental cost-effectiveness ratio of project 1 that used only 266 Baht/increasing 1 case of MSM with knowledge on HIV/AIDS.

Incremental cost-effectiveness of establishing project 1 versus project 2 to increased number of MSM with attitudes, the result showed that incremental cost-effectiveness ratio of project 2 was higher than incremental cost-effectiveness ratio of project 1.

According to the result, for prevent HIV/AIDS among MSM in Thailand, the project manager should provide intervention by establishing a community based friend center for the effectiveness could increase.

Most NGOs who worked with the hard to reach population had its strategy as major standpoint. Project on establishing a community based friend center, local governments were becoming important on resources so capacity enhancement was needed. Special permissions to conduct the study were obtained from corresponding local authorities, in which the projects operated.

5.2 Policy implication

The study results, suggest that Project 1 was more cost-effective than Project 2. Therefore, the HIV prevention program for MSM should focus on establishing a community based friend center rather than implementing a training course.

A key measure for this project 1 is the development of a system of client-friendly health care that is MSM specific, and remove obstacles to access by:

- Increase participation of the MSM to address service problems and to help refine the service model so that it is more of a client-based service and based on a foundation of respect for and protection of rights.
- Developing client-friendly services that are tailored to the MSM can be done by adjusting existing services so that they are more appropriate to the lifestyle of the beneficiaries. Examples include opening after-hours clinics in locations that are easy to access; adjustment of attitudes and develop the capacity of service providers; coordination with civil society allies to establish links in the outreach program and referral to clinic services; consider one-stop services by, for example, offering STI treatment in ART clinics.

The Thai government, Ministry of Public Health and funding organization should use the information and baseline data from the study to make the decision on how much cost to provide the HIV prevention project in MSM and adopted to be used in planning

information to expand or modify existing HIV prevention projects to other group in Thailand.

5.3 Limitation of the study

- Impact of other possible interventions (i.e. error from study population, the situation has changed) could not be controlled and might interfere effectiveness in some level.
- The two compared project were carried out under different setting (urban and rural areas) because they were different in context and life style so one should be careful in interpretation.
- In this study effectiveness was only proximate measured from knowledge and attitudes.
- The study had been conducted in district level, it should be carefully applied or linked the findings of the study with current national policies/activities (National AIDS Plan).

5.4 Possible Extensions

The following studies are recommended to fill the gap of information and to strengthen research activity.

- Study cost-effectiveness analysis by using prevention of HIV cases, to measure of the health status.
- Study factors affecting the cost-effectiveness by qualitative research.

REFERENCES

amfAR foundation for AIDS Research. 2006. MSM and HIV/AIDS Risk in Asia: What Is Fueling the Epidemic Among MSM and How Can It Be Stopped?. [Online] Available from: http://www.amfar.org/ [2011, May]

Creese, A., and Parker, D. 1994. *Cost analysis in primary health care: A training Manual for Program managers.* World Health Organization

Baral, S. et al. 2007. Elevated Risk for HIV Infection among Men Who Have Sex with Men in Low- and Middle-Income Countries 200-2006 A Systematic Review. BMC Medical Education 4(12): 339.

Bureau of Epidemiology. 2011. *HIV/AIDS surveillance report in Thailand*. Nonthaburi, Ministry of Public Health.

CDC National Prevention information network. 1999. HIV and Its Transmission. [Online] Available from http://www.cdc.gov [2011, January]

CDC National Prevention information network. 2010. HIV among Gay, Bisexual and Other Men Who Have Sex with Men (MSM). [Online] Available from: http://www.cdc.gov/hiv/topics/msm/ [2010, December]

Cohen, D.A., Wu, S.Y., and Farley, T.A. 2004. Comparing the Cost-Effectiveness of HIV Prevention Interventions. JAIDS Journal of Acquired Immune Deficiency Syndromes 37(3): 1404-1414.

Drummond, M.F. et al. 1997.*Methods for the economic evaluation of health care programmes* (2nd ed.). New York: Oxford University Press, Inc.

Fisher, A., and Foreit J. 2002. Designing HIV/AIDS Intervention Studies: An Operations Research Handbook.

Griensven, V. et al. 2005. *Evidence of a previously undocumented epidemic of HIV infection among men who have sex with men in Bangkok, Thailand.* 19(5): 521-526.

Griensven, V. et al. 2009. The Global Epidemic of HIV Infection among Men Who Have Sex with Men. Curr Opin HIV AIDS 4(4): 300-307.

Herbst, J. et al. 2005. A Meta-Analytic Review of HIV Behavioral Interventions for Reducing Sexual Risk Behavior of Men Who Have Sex With Men. Journal of Acquired Immune Deficiency Syndromes 39(2): 228-241.

Kaewsonthi, S., and Kamolrattanakul, P. 1991. Health Economics: Analysis and Evaluation of Health Care Service. Bangkok : Chulalongkorn University Publishing.

Kahn, K. et al. 2001. Cost-effectiveness of the Mpowerment Project, a community-level intervention for young gay men. Journal of Acquired Immune Deficiency Syndromes 27(5): 482–491.

Karnjanawasri, S. et al. 2008. การเลือกใช้สถิติที่เหมาะสมสำหรับการวิจัย. Bangkok: บุญศิริการพิมพ์.

Kelly, J. et al. 1999. HIV risk behavior reduction following intervention with key opinion leaders of population: an experimental analysis. American Journal of Public Health 81(2): 168-171.

Kelly, J. et al. 1989. Behavioral Intervention to Reduce AIDS Risk Activities. Journal of Consulting and Clinical Psychology 57(1): 60 - 67.

Koblin, B.A. et al. 2006. Risk factors for HIV infection among men who have sex with men. Official journal of the international AIDS society 20(5): 731-739.

Ministry of Public Health. 2005-2007. *Thailand Health Profile Report*. Bangkok.

National AIDS Prevention and alleviation Committee . 2007. *UNGASS country progress report*, Thailand. Nonthaburi: 27.

Pattanaphesaj, J., and Teerawattananon, Y. 2010. Reviewing the evidence on effectiveness and cost-effectiveness of HIV prevention strategies in Thailand. BMC Public Health. ;10:401. 10: 40.

Pinkerton S.D. et al. 2004. *Cost effectiveness of HIV prevention and Treatment interventions, Center for Interdisciplinary Research on AIDS.*

Pinkerton S.D. et al. 1997. Cost-effectiveness of HIV-prevention skills training for men who have sex with men. Official journal of the international AIDS society 11(3): 347-357.

Sangrujee, N., Alkenbrack, S., and Martin, G. 2005. *Technical Note: Data collection and methodology for unit cost estimation of MSM Package of Services*.

Silvia, M., and Thomas, D. 2002. Economic Evaluation of Immunization Strategies. Oxford Journals 35(3): 294-297.

Sovannara, K., and Ward, C. 2004. *Men Who Have Sex with men in Cambodia: HIV/AIDS Vulnerability, Stigma and Discrimination Phnom Penh.*

Suk, K. 2005. 20 Year AIDS in Thailand. Mor Chao Bann 320: 66-67.

United Nations Development Programme (UNDP) and United States Agency for International Development (USAID) 2009. *Asia Reginal Consultation on MSM HIV Care and Support Bangkok.*

United Nations Programme on HIV/AIDS (UNAIDS) and World Health Organization (WHO). 2009. AIDS Epidemic Update. Geneva.

United States Agency for International Development. 2008. Health Profile: Thailand.

APPENDICES

Appendix A: Background information

The HIV prevention intervention project for MSM that receiving funds from Health Systems Research Institute (HSRI) in Thailand from 2008 to 2010 (2 phases: phase 1 from 2008 to 2009 and phase 2 from 2009 to 2010) had 2 projects as follows:

1. Prevention of AIDS in men who have sex with men along the border Project

This project implemented in Ubonratchathani province (Det-Udom District). In these districts there was a rural area that had limit access to health and social services. In rural area, people stuck in traditional and stigmatization of HIV and MSM.

The project was implemented starting from searching and meeting with MSM who were the leaders of the groups in the communities and asking them to be the key person during implementation. Next, the training was organized to give general knowledge and build the leaders in the communities among the volunteers who were persuaded by the key person. Through the training the ones who were talented and ready to devote their time or those who tended to be good leaders would be selected to spread the knowledge. When the project had implemented to a certain level they would be developed to be speakers and advisers to educate the members in the groups. In summary the steps of the project were as follows:

1. Setting up the peer group in the communities to be used as the source of knowledge and, training and counseling center. It was a center providing the public health services to the communities. It did not specifically focus on only the homosexual males but it was an activity serving a particular group i.e. teenager women elderly to train about HIV/AIDS prevention
2. Training by giving general knowledge.
3. Educating about AIDS (communication skill) and concepts on developing the human potential.
4. Training on how to be speaker about AIDS.

5. Training on the developing in the management, knowledge and skill of working as a team. Providing the arena for the leaders to share the experience starting from their own peer group on one to one basis and among friends at drop-in centers and meeting points of people in the communities.
6. Approaching the leaders of men who have sex with men in the communities.

Distinctive Characters of Prevention of AIDS in men who have sex with men along the border Project

1 Leading by person in the communities who involved in various structures of the communities such as being volunteers, community vice chairperson, temple committee, member of board of network to drive the AIDS work in the district, and integrating the AIDS work into the way of life in the communities to ensure that the work was continuous

2 Raising fund, and setting up the condom and lubricant fund, and network within and outside the area to continuously drive the AIDS work in the communities

3 The leaders were very well recognized by people in the communities. This made them proud of themselves. Moreover, the training, the leadership, and directives from the coordination among the health organizations have enhanced the knowledge, awareness, the ability to assess risks, negotiation skill, interpersonal skill, and training skill. The results were well expanded and the confidence was built up.

4 The target groups had knowledge, access to the condoms and lubricant, and awareness of using condom when they had sexual intercourse. This was due to the good management.

5 There was an access to the services and the treatment. The referral from the leaders in conjunction with the hospital is developed to test for VCT and STI. The treatment was done at the district service centers.

Innovation of the Prevention of AIDS in men who have sex with men along the border Project

The innovation which was the guideline was the model that was created and stressed on the participation of the community, creation of the consciousness of the service receivers, active action focusing on the clear specific targets, definition of work without overlapping, and coordination on referral among responsible networks. The services were provided based on the marketing principle. That was to concentrate on handing out and distributing the condoms in the seasons or condition that there were gatherings of people or in the event prone to the behavioral risk. In summary:

1. The leader would give out knowledge, work continuously and stress on voluntarily participation.
2. The leader worked proactively in educating peers one on one or in a group about AIDS and men having sex with men, teenagers in peer group in the community (beauty salon), spots people normally gathered such as along the Maekong river, and paddy field edge. The leader could create area the peers could gather and share their experiences and the leader could share his knowledge to the group at beauty salon or community based friend center. That was to blend with the way of life of the leader and schedule the AIDS activities in the community calendar.

2. Project on AIDS prevention to reduce the new infections and promote the living with the infected among groups of men who have sex with men.

This project implemented in 8 provinces in Thailand (Bangkok, Chonburi, Rachaburi, Chaing Mai, Phuket, Ubonratchatanee, Khon Kaen and Udonthanee) all these studies were conducted in urban area. In Ubonratchathani province they implemented in Meang district. There was an urban area with more density of human-created structures and grew as the core population/economic. Acceptance of homosexual was available in this area.

The implementation was done by building the key people to work as a team in the area (The team consisted of personnel from Rainbow Sky of Lower North-East of Thailand) to stimulate and promote the project to cover the entire target groups in the direct sale approach. Those who gained enough experience were promoted to group head and team leaders to educate people in the dedicated responsible areas. This gave each team flexibility and agility. Moreover, there was the management to support in supplies, equipment and prints enough for the implementation. The reporting and assessing system was tangibly created. In summary the implementation is as follows:

1. Approaching the key people by searching among men who have sex with men to be trained as person who were volunteers to lead the education system to be trained as the key people to work in the field. The training topics included HIV, STI, skill in working in the communities which stressed on passing on the knowledge in the communities, and refusing skill. This curriculum was called Life Skill Defeating AIDS Camp.
2. Implementing based on working as a team. A team comprises of a project head and a field staff working in the responsible area and within a certain specified activities. The team leader was a mentor advising the team in counseling, suggesting and training.
3. Organizing activities periodically by cooperating with the local organization, communities and other involved people
4. Developing the service system together with staffs in the brothels and providing the special clinic volunteers to provide the consultation, satisfactory services and friendship to the target groups.
5. Developing the supporting system and giving out condoms by setting up the condom fund by collaborating with other organizations to back up condom and provide for the reimbursement of the necessary areas.

Distinctive Characters Project on AIDS prevention to reduce the new infections and promote the living with the infected among groups of males having sex with males, male prostitutes, male transvestite, and transvestite prostitutes

1. Empowering the staffs by educating them and providing them with suggestions by having consultation team help them work continuously. Working voluntarily also helped them feel proud of themselves. The organization was tangibly created. The working network system was developed. The coordination among organization was clear. There was a cooperation of the health service centers in the Bangkok Metropolitan areas with Bangrak Hospital, Silom Community Clinic, Bangkok Christian Hospital, Public Health Center numbers 2, 3, 8, 9 and non-profit Thai Red Cross's anonymous clinics. All of this helped enhance the work efficiency.
2. Having a good follow-up and assessment system helps enhancing work flexibility, clarity, and scope. It was easier to set the goal. Moreover, gaining the acceptance from the community enabled the team to work more effectively.
3. The leaders had chance to develop themselves to the quality outreach worker.
4. The training gave the organization chance to develop their own knowledge. The networks helped each other. Training the leaders to work in the field sustained the number of staffs.

The management system with clear structure and scope of works enabled the operation in the network to be systematically connected. The operation with the clear objectives built the team work. The staffs were taught to be able to transfer the knowledge and be encouraged to work and continuously acquire new knowledge. The curriculum and manual of acquiring leaders in the communities were created to be used in the future. There was the coordination among local organizations, community leaders and leaders of men having sex with men in the community, who were recognized by the target groups, to be a change agent. There was a teaching system and working consultation which helped the work to move on and embedded in the community.

Innovation of the project

1. The innovation was a specific model that was created based on the direct sale approach. In a team there were the team leader and the network of team members. The target was clearly set just like the direct sale. There was the system to share the knowledge, advice and work. There was the system to provide support of work and services including the continuous education to the members according to the events and time.
2. The innovation in management, network coordination and organization establishment was setup in a clear format from the principle organization in conjunction with the regional organization to develop the work systematically. In the network, the work structure was setup and the scope of work and line of coordination were systematically defined. The reporting system was created and the supporting system was efficiently setup.[5]

Source: The final report of monitoring and Evaluation Research on Model Development and Redefine Mechanisms for AIDS Prevention and Alleviation in Youth and other Most at Risk Population Project, 2010

Table 24 Key differences between the two interventions

Round	Key differences	Establishing a community based friend center	Implementing a training course
1st Round	**Area**	Rural area	Urban area
	Delegate	Delegate stay in the community	Delegate traveling from community
	Time spent	4 times per month	1 time per month
	Place	Community (Beauty salon)	NGO Office in the city
	Leader	Held by MSM peer leader in the community	Held by NGO
	General content	Specific to local community	Not specific to local community
	Activity	The leader worked proactively in educating peers one on one or in a group about AIDS to MSM and teenagers in peer group in the community (beauty salon). The leader could share their experiences with the way of life of the leader and schedule the AIDS activities in the community calendar. Outreach activity and awareness campaign was performed.	Project staffs are selecting the persons who were volunteers to be trained as the key person. The training topics included HIV, STI. This curriculum was called Life Skill Defeating AIDS Camp. Outreach activity and awareness campaign was performed.
2nd Round	**Area**	Rural area	Urban area
	Delegate	Delegate stay in the community	Delegate traveling from community
	Time spent	4 times per month	1 time per month
	Place	Community (Beauty salon)	NGO Office in the city
	Leader	Held by MSM peer leader in the community	Held by NGO
	General content	Specific to local community	Not specific to local community
	Activity	The leader worked proactively in educating peers one on one or in a group about AIDS to MSM and teenagers in peer group in the community (beauty salon). The leader could share their experiences with the way of life of the leader and schedule the AIDS activities in the community calendar. Outreach activity and awareness campaign was performed.	Project staffs are selecting the persons who were volunteers to be trained as the key person. The training topics included HIV, STI. This curriculum was called Life Skill Defeating AIDS Camp. Outreach activity and awareness campaign was performed.

Appendix B: Check List for Determining Costs

Part 1 Check list for data collection at project office

(A) Cost for Building

1. Building price ……..….Baht
2. Expected years of useful life ……..Years
3. Maintenance costs for building ……..….Baht/Year

(B) Cost for Equipment

4. Equipment price ……..….Baht
5. Expected years of useful life ……..Years
6. Maintenance costs for Equipment ……. Baht/Year

(C) Cost for Vehicle

7. Equipment price ……..….Baht
8. Expected years of useful life ……..Years
9. Maintenance costs for Vehicle ……. Baht/Year

Part 2 Personnel Costs

1. How much salary have you received? ……..….Baht/Month
2. How much fringe benefit have you got other than salary?…..Baht/Year
3. How many hours have you spent for doing community ……hr./Year based friend center?
4. How many hours have you spent for doing implementing ….hr./Year training courses?

Part 3 Material Costs

1. How many numbers of material used for doing community based friend center 1st round?
   - 1.1 Condom ……..……..No./Year
   - 1.2 Lubricant ……..……..No./Year
   - 1.3 Brochure ……..……..No./Year
   - 1.4 Paper ……..……..No./Year
   - 1.5 Pen ……..……..No./Year

2. How many numbers of material used for doing community based friend center 2nd round?
   - 2.1 Condom ……..….No./6 months
   - 2.2 Lubricant ……..….No./6 months
   - 2.3 Brochure …….…….No./6 months
   - 2.4 Paper ……..…….No./6 months
   - 2.5 Pen ……..…….No./6 months

3. How many numbers of material used for doing implementing a training courses 1st round?
   - 3.1 Condom ……..……..No./Year
   - 3.2 Lubricant ……..……..No./Year
   - 3.3 Brochure ……..……..No./Year
   - 3.4 Paper ……..……..No./Year
   - 3.5 Pen ……..……..No./Year

4. How many numbers of material used for doing implementing a training courses 2nd round?
   - 4.1 Condom …….…….No./6 months
   - 4.2 Lubricant …….…….No./6 months

4.3 Brochure ……..….No./6 months

4.4 Paper ……..…. No./6 months

4.5 Pen ……..…..No./6 months

Part 4 Telephone Cost

Telephone Cost (1st Round)

1. How much telephone bill that you paid? …..….Baht/Month
2. How many hour have you spent for doing community…… hr./Year based friend center?
3. How many hours have you spent for doing implementing a…….hr./Year training courses?

Telephone Cost (2st Round)

1. How much telephone bill that you paid? …..…Baht/Month
2. How many hour have you spent for doing community … hr./6 Months based friend center?
3. How many hours have you spent for doing implementing ….hr./ 6 Months training courses?

Part 5 Utilities cost

Utilities cost (1st Round)

1. How much utilities bill that you paid? …..….Baht/Month
2. How many hour have you spent for doing community …… hr./Year based friend center?
3. How many hours have you spent for doing implementing …….hr./Year training courses?

Utilities cost (2nd Round)

1. How much utilities bill that you paid? …..…Baht/Month
2. How many hour have you spent for doing community …… hr./6 Months based friend center?
3. How many hours have you spent for doing implementing ….hr./ 6 Months training courses?

Part 6 Cost for staff training program

1. Costs for per diem (person x days) ……..….Baht/Year
2. Traveling allowance ……..….Baht/Year
3. Costs for material ……..….Baht/Year

Part 7 Cost for Outreach Activity

1. Costs for per diem (person x days) ……..….Baht/Year
2. Traveling allowance ……..….Baht/Year
3. Costs for material ……..….Baht/Year

Part 8 Cost for Awareness campaign

1. Costs for per diem (person x days) ……..….Baht/Year
2. Traveling allowance ……..….Baht/Year
3. Costs for material ……..….Baht/Year

Part 9 Cost for establishing a community based friend center

1. Costs for per diem (person x days) ……..….Baht/Year
2. Traveling allowance ……..….Baht/Year
3. Costs for material ……..….Baht/Year

Part 10 Cost for implementing a training course

1. Costs for per diem (person x days) ……..….Baht/Year
2. Traveling allowance ……..….Baht/Year
3. Costs for material ……..….Baht/Year

Appendix C: Questionnaire for MSM interview

Code.....

Date.....

District.....

Part 1 Personal Data

Please mark in the 1 (only one mark) and fill answers in the blank

1. Age.....year	
2. Hometown □ Ubonratchathani □ other.....	
3. Duration of being stay in the current area.....year	4. Number of person in your family ……..... person

5. Education □ No education background □ Primary education
□ Junior high school □ Senior high school
□ Vocational education or Diploma
□ Bachelor's degree or higher

6. Occupational □ Student □ housekeeper □ farmer, agriculturist
□ Temporary worker □ Trader □ Officer
□ Others.....

Part 2 5 indicators from UNGASS (Knowledge Assessment)

Item	Indicator	YES	NO
1.	Can a person reduce the risk of getting HIV infection by using a condom during sexual intercourse?		
2.	Can the risk of HIV transmission be reduced by having sex with only one uninfected partner who has no other partners?		
3.	Can a person get HIV infection from mosquito bites?		
4.	Can a person get HIV infection by sharing food with someone who is infected?		
5.	Can a healthy-looking person have HIV?		

Part 3 Attitudes Assessment

Please mark √ in the ☐ from your opinion only one mark.

Item	Question	Yes	No	Not Sure
1.	Kissing has less risk of getting HIV	☐	☐	☐
2.	Having sex with healthy-looking person can also get HIV infection	☐	☐	☐
3.	changing partners often can getting HIV	☐	☐	☐
4.	Everyone Should using a condom when having sex for reducing the risk of getting HIV	☐	☐	☐
5.	testing for HIV before marry can reduce the risk of getting HIV	☐	☐	☐
6.	Sharing needle for injecting drug use have risk of getting HIV infection	☐	☐	☐

รหัส.....

วันที่ตอบ .....

อำเภอ.....

ส่วนที่ 1 ข้อมูลทั่วไป

โปรดทำเครื่องหมาย √ ลงในช่อง ☐ ตามความเห็นของท่านเพียงคำตอบเดียว และกรุณาเติมคำลงในช่องว่าง

1. ปัจจุบันท่านมีอายุ.....ปี (เต็ม)	
2. ภูมิลำเนาเดิม ☐ เกิดที่นี่ ☐ อพยพจากที่อื่น ระบุ.....	
3. ระยะเวลาที่อยู่ในพื้นที่ปัจจุบัน..... ปี	4. จำนวนสมาชิกในครอบครัว ..... คน

5. ท่านจบการศึกษาชั้นใด? ☐ ไม่ได้เรียน ☐ ประถมศึกษา ☐ มัธยมศึกษาตอนต้น
☐ มัธยมศึกษาตอนปลาย ☐ อาชีวศึกษาและอนุปริญญา
☐ ปริญญาตรี หรือ สูงกว่า

6. ท่านมีอาชีพ ☐ นักเรียน/นักศึกษา ☐ แม่บ้าน/ไม่มีอาชีพ ☐เกษตรกรรม
☐ รับจ้างทั่วไป ☐ ค้าขาย/ธุรกิจ ☐ พนักงานบริษัทห้างร้าน
☐ อื่นๆ ระบุ.....

ส่วนที่ 2 แบบประเมินความรู้ในการป้องกันโรคเอดส์

ข้อที่	คำถาม	ใช่	ไม่ใช่
1.	การใช้ถุงยางอนามัยสามารถป้องกันการติดเชื้อเอดส์ได้	☐	☐
2.	การมีคู่นอนเพียงคนเดียวที่ไม่มีเชื้อเอดส์ เป็นวิธีหนึ่งที่สามารถป้องกันการติดเชื้อเอดส์ได้	☐	☐
3.	ยุงสามารถเป็นพาหะนำเชื้อเอดส์มาสู่คนได้	☐	☐
4.	การกินอาหารร่วมกับผู้ติดเชื้อเอดส์สามารถติดเชื้อเอดส์ได้	☐	☐
5.	คนที่เรามองเห็นว่ามีสุขภาพร่างกายแข็งแรงดี อาจจะเป็นคนที่มีเชื้อเอดส์ได้	☐	☐

ส่วนที่ 3 ความรู้เกี่ยวกับความตระหนักและการป้องกันการติดเชื้อโรคเอดส์

โปรดทำเครื่องหมาย √ ลงในช่อง ☐ ตามความเห็นของท่านเพียงคำตอบเดียว

ข้อที่	คำถาม	ใช่	ไม่ใช่	ไม่แน่ใจ
1.	การจูบปากเสี่ยงต่อการติดเชื้อเอดส์น้อยมาก	☐	☐	☐
2.	การมีเพศสัมพันธ์กับคนที่เราเห็นว่ามีสุขภาพแข็งแรงดี อาจติดเชื้อเอดส์ได้	☐	☐	☐
3.	การมีเพศสัมพันธ์กับคู่นอนหลายคนเสี่ยงต่อการติดเชื้อเอดส์	☐	☐	☐
4.	ควรใช้ถุงยางอนามัยทุกครั้งเมื่อมีเพศสัมพันธ์ เพื่อป้องกันเอดส์	☐	☐	☐
5.	การตรวจหาเชื้อเอดส์ก่อนแต่งช่วยลดความเสี่ยงต่อการติดเชื้อเอดส์	☐	☐	☐
6.	การใช้สารเสพติดโดยการฉีดร่วมกับผู้อื่น เสี่ยงต่อการติดเชื้อเอดส์	☐	☐	☐

Appendix D: Capital costs for establishing a community based friend center and implementing a training course

The total cost for each intervention was calculated as explain in Chapter 3. The total cost for establishing community based friend center and implementing a training course could be found out by using equations 17 and 18 respectively. In this study, we calculated the capital cost only on equipment and vehicle costs because the buildings of both projects were used more than 20 years so cost will not be included.

Equipment Cost Calculation

The proportion used equipment for doing community based friend center activity

In the project they had 5 works;

- Administrative
- Staff training program
- Outreach Activity
- Awareness Campaign
- Community based friend center activity

They used the equipment in equal proportions and the proportion used equipment for doing community based friend center activity was calculated by following:

$$\text{The proportion used equipment for doing community based friend center} = \frac{1}{5} = 0.2$$

Table A1: Equipment allocated cost calculation; for establishing community based friend center activity (P1) in the first round

Cost item	**Number**	**Prices (Baht/unit)**	**Total cost**	**Allocation prop.**	**Allocated cost**
Computer	3	40,000	120,000	0.2	24,000
Printer	2	17,990	35,980	0.2	7,196
Shelves	8	5,000	40,000	0.2	8,000
Desk	2	40,730	81,460	0.2	16,292
Total					**55,488**

The proportion spent equipment for implementing a training course

In the project they had 5 works;

- Administrative
- Staff training program
- Outreach Activity
- Awareness Campaign
- Implementing a training course

They used the equipment in equal proportions and the proportion used equipment for implementing a training course was calculated by following:

$$\text{The proportion used equipment for implementing a training course} = \frac{1}{5} = 0.2$$

Table A2: Equipment allocated cost calculation; for implementing a training course (P2) in the first round

Cost item	Number	Prices (Baht/unit)	Total cost	Allocation prop.	Allocated cost
Computer	2	38,000	76,000	0.2	15,200
Printer	1	9,990	9,990	0.2	1,998
Shelves	4	5,250	21,000	0.2	4,200
Desk	2	15,000	30,000	0.2	6,000
Total					**27,398**

Vehicle Cost Calculation

The proportion used vehicle for doing community based friend center

In the project they had 5 works;

- Administrative
- Staff training program
- Outreach Activity
- Awareness Campaign
- Community based friend center activity

They used the vehicle in equal proportions and the proportion used vehicle for doing community based friend center activity was calculated by following:

$$\text{The proportion used vehicle for doing community based friend center} = \frac{1}{5} = 0.2$$

Table A3: Vehicle allocated cost calculation; for establishing community based friend center (P1) in the first round

Cost item	Number	Prices (Baht/unit)	Total cost	Allocation prop.	Allocated cost
Motorcycle	5	35,000	240,000	0.2	48000
Total					**48000**

Table A4: Summary of annual vehicle costs of establishing community based friend center (P1) in the first round

Cost item	Allocate cost	Life Time[2] (Year)	Discount rate	Annuallization	Annual cost
Motorcycle	48,000	10	5	7.722	6,216
Total					**6,216**

Table A5: Vehicle allocated cost calculation; for establishing community based friend center (P1) in the second round

Cost item	Number	Prices (Baht/unit)	Total cost	Allocation prop.	Allocated cost
Motorcycle	5	35,000	240,000	0.2	48,000
Total					**48,000**

Table A6: Summary of annual vehicle costs of establishing community based friend center (P1) in the second round

Cost item	Allocate cost	Life Time[2] (Year)	Discount rate	Annualization	Annual cost	6 mth. cost
Motorcycle	48,000	10	5	7.722	6,216	3,108
Total					**6,216**	**3,108**

The proportion used vehicle for implementing a training course

In the project they had 5 works;

- Administrative
- Staff training program
- Outreach Activity
- Awareness Campaign
- Implementing a training course

They used the vehicle in equal proportions and the proportion used vehicle for implementing a training course was calculated by following:

$$\text{The proportion used vehicle for implementing a training course} = \frac{1}{5} = 0.2$$

Table A7: Vehicle allocated cost calculation; for implementing a training course (P2) in the first round

Cost item	**Number**	**Prices (Baht/unit)**	**Total cost**	**Allocation prop.**	**Allocated cost**
Motorcycle	4	48,000	192,000	0.2	38,400
Total					**38,400**

Table A8: Summary of annual vehicle costs of implementing a training course (P2) in the first round

Cost item	**Allocate cost**	**Life Time[2] (Year)**	**Discount rate**	**Annuallization**	**Annual cost**
Motorcycle	38,400	10	5	7.722	4,972.80
Total					**4,972.80**

Table A9: Vehicle allocated cost calculation; for implementing a training course (P2) in the second round

Cost item	Number	Prices (Baht/unit)	Total cost	Allocation prop.	Allocated cost
Motorcycle	4	48,000	192,000	0.2	38,400
Total					**38,400**

Table A10: Summary of annual vehicle costs of implementing a training course (P2) in the second round

Cost item	Allocate cost	Life Time[2] (Year)	Discount rate	Annualization	Annual cost	6 mth. cost
Motorcycle	38,400	10	5	7.722	4,972.80	2,486.40
Total						**2,486.40**

Appendix E: Recurrent costs for doing community based friend center and implementing a training course

Personnel costs for doing community based friend center round 1 and round 2

The total annual income of personnel was gotten from summation of annual salary (no fringe benefit). The data of annual salary and the number of personnel were available from secondary data sources. The calculated time spent is following:

The proportion time spent on doing community based friend center and implementing a training courses were calculated by following:

Total working hour for one year

6 hours x 22 days x 12 month = 1584 hours

For intervention by community based friend center

The personnel of project spent only 1 time per week, 6 hours per time = 288 hours per year.

$$\text{Proportion time spent on doing community based friend center} = \frac{288}{1584} = 0.18$$

For intervention by implementing a training courses

The personnel of project spent only 1 time per month, 8 hours per time = 96 hours per year.

$$\text{Proportion time spent on implementing a training courses} = \frac{96}{1584} = 0.06$$

Table A11: Personnel costs for doing community based friend center

Establishing a community based friend center (Project 1)	No. of personnel	Personnel Cost / year	Fringe benefit	Total	Time spent / year	Proportion time spent on doing intervention	Total Cost
First Round	4	459,200	0	459,200	288	0.18	82,656
Second Round	4	252,000	0	252,000	288	0.18	45,360

Table A12: Personnel costs for implementing a training courses

Establishing a community based friend center (Project 1)	No. of personnel	Personnel Cost / year	Fringe benefit	Total	Time spent / year	Proportion time spent on doing intervention	Total Cost
First Round	4	490,760	0	490,760	96	0.06	29,446
Second Round	4	170,725	0	170,725	96	0.06	10,243.5

Telephone Cost Calculation for doing community based friend center

The proportion used telephone for doing community based friend center

In the project they had 5 works;

- Administrative
- Staff training program
- Outreach Activity
- Awareness Campaign
- Community based friend center activity

They used the telephone in equal proportions and the proportion used telephone for doing community based friend center activity was calculated by following:

$$\text{The proportion used telephone for doing community based friend center} = \frac{1}{5} = 0.2$$

Table A13: Total telephone cost for establishing a community based friend center in the first round

Month	Total telephone bill	Proportion of time spent for doing a community based friend center (Project 1)	Total telephone cost for doing a community based friend center (Project 1)
January	3,000	0.2	600
February	3,000	0.2	600
March	3,000	0.2	600
April	3,000	0.2	600
May	3,000	0.2	600
June	3,000	0.2	600
July	3,000	0.2	600
August	3,000	0.2	600
September	3,000	0.2	600
October	3,000	0.2	600
November	3,000	0.2	600
December	3,000	0.2	600
Total	**36,000**	**0.2**	**7,200**

Table A14: Total telephone cost for establishing a community based friend center in the second round

Month	Total telephone bill	Proportion of time spent for doing a community based friend center (Project 1)	Total telephone cost for doing a community based friend center (Project 1)
January	3,000	0.2	600
February	3,000	0.2	600
March	3,000	0.2	600
April	3,000	0.2	600

Month	Total telephone bill	Proportion of time spent for doing a community based friend center (Project 1)	Total telephone cost for doing a community based friend center (Project 1)
May	3,000	0.2	600
June	3,000	0.2	600
Total	**18,000**	**0.2**	**3,600**

Telephone Cost Calculation for implementing a training course

The proportion used telephone for implementing a training course

In the project they had 5 works;

- Administrative
- Staff training program
- Outreach Activity
- Awareness Campaign
- Implementing a training course

They used the telephone in equal proportions and the proportion used telephone for implementing a training course was calculated by following:

$$\text{The proportion used telephone for implementing a training course} = \frac{1}{5} = 0.2$$

Table A15: Total telephone cost for implementing a training course in the first round

Month	Total telephone bill	Proportion of time spent for doing an implementing a training course (Project 2)	Total telephone cost for doing an implementing a training course (Project 2)
January	3,000	0.2	600
February	3,000	0.2	600

Month	Total telephone bill	Proportion of time spent for doing a community based friend center (Project 1)	Total telephone cost for doing a community based friend center (Project 1)
March	3,000	0.2	600
April	3,000	0.2	600
May	3,000	0.2	600
June	3,000	0.2	600
July	3,000	0.2	600
August	3,000	0.2	600
September	3,000	0.2	600
October	3,000	0.2	600
November	3,000	0.2	600
December	3,000	0.2	600
Total	**36,000**	**0.2**	**7,200**

Table A16: Total telephone cost for implementing a training course second round

Month	Total telephone bill	Proportion of time spent for doing an implementing a training course (Project 2)	Total telephone cost for doing an implementing a training course (Project 2)
January	3,000	0.2	600
February	3,000	0.2	600
March	3,000	0.2	600
April	3,000	0.2	600
May	3,000	0.2	600
June	3,000	0.2	600
Total	**18,000**	**0.2**	**3,600**

Utilities Cost Calculation for community based friend center activity

The proportion used utilities for community based friend center activity

In the project they had 5 works;

- Administrative
- Staff training program
- Outreach Activity
- Awareness Campaign
- Community based friend center activity

They used the utilities in equal proportions and the proportion used utilities for implementing a training course was calculated by following:

$$\text{The proportion used utilities for community based friend center} = \frac{1}{5} = 0.2$$

Table A17: Total utilities cost for establishing a community based friend center in the first round

Month	Total utilities bill	Proportion of time spent for doing a community based friend center (Project 1)	Total utilities cost for doing a community based friend center (Project 1)
January	4,500	0.2	900
February	4,500	0.2	900
March	4,500	0.2	900
April	4,500	0.2	900
May	4,500	0.2	900
June	4,500	0.2	900
July	4,500	0.2	900
August	4,500	0.2	900
September	4,500	0.2	900
October	4,500	0.2	900
November	4,500	0.2	900
December	4,500	0.2	900
Total	**54,000**	**0.2**	**10,800**

Table A18: Total utilities cost for establishing a community based friend center in the second round

Month	Total utilities bill	Proportion of time spent for doing a community based friend center (Project 1)	Total utilities cost for doing a community based friend center (Project 1)
January	3,000	0.2	600
February	3,000	0.2	600
March	3,000	0.2	600
April	3,000	0.2	600
May	3,000	0.2	600
June	3,000	0.2	600
Total	**18,000**	**0.2**	**3,600**

Utilities Cost Calculation for implementing a training course

The proportion used utilities for implementing a training course

In the project they had 5 works;

- Administrative
- Staff training program
- Outreach Activity
- Awareness Campaign
- Implementing a training course

They used the utilities in equal proportions and the proportion used utilities for implementing a training course were calculated by following:

$$\text{The proportion used utilities for implementing a training course} = \frac{1}{5} = 0.2$$

Table A19: Total utilities cost for implementing a training course in the second round

Month	Total utilities bill	Proportion of time spent for doing an implementing a training course (Project 2)	Total utilities cost for doing an implementing a training course (Project 2)
January	900	0.2	180
February	900	0.2	180
March	900	0.2	180
April	900	0.2	180
May	900	0.2	180
June	900	0.2	180
July	900	0.2	180
August	900	0.2	180
September	900	0.2	180
October	900	0.2	180
November	900	0.2	180
December	900	0.2	180
Total	**10,800**	**0.2**	**2,160**

Table A20: Total utilities cost for implementing a training course in the second round

Month	Total utilities bill	Proportion of time spent for doing an implementing a training course (Project 2)	Total utilities cost for doing an implementing a training course (Project 2)
January	900	0.2	90
February	900	0.2	90
March	900	0.2	90
April	900	0.2	90
May	900	0.2	90
June	900	0.2	90
Total	**5,400**	**0.2**	**1,080**

Total cost for staff training program

Project/Round	Item	Cost
Project 1 / Round 1	- materials - traveling allowance - per diem	10,800 50,000 86,000
Total		**146,800**
Project 1 / Round 2	- materials - traveling allowance - per diem	4,960 15,500 22,600
Total		**43,060**
Project 2 / Round 1	- materials - traveling allowance - per diem	2,580 18,760 42,000
Total		**63,340**
Project 2 / Round 2	- materials - traveling allowance - per diem	4,750 18,375 34,000
Total		**57,125**

Total cost for outreach activity

Project/Round	Item	Cost
Project 1 / Round 1	- materials - traveling allowance - per diem	1,600 14,000 36,000
Total		**51,600**
Project 1 / Round 2	- materials - traveling allowance - per diem	5,000 25,000 38,000
Total		**68,000**

Project/Round	Item	Cost
Project 2 / Round 1	- materials - traveling allowance - per diem	7,187 31,550 60,000
Total		**98,737**
Project 2 / Round 2	- materials - traveling allowance - per diem	4,580 15,720 34,000
Total		**54,300**

Total cost for awareness campaign

Project/Round	Item	Cost
Project 1 / Round 1	- materials - traveling allowance - per diem	88,000 30,000 56,000
Total		**174,000**
Project 1 / Round 2	- materials - traveling allowance - per diem	19,500 8,000 3,000
Total		**30,500**
Project 2 / Round 1	- materials - traveling allowance - per diem	54,340 7,925 26,000
Total		**88,265**
Project 2 / Round 2	- materials - traveling allowance - per diem	8,150 20,000 40,000
Total		**68,150**

Total cost for establishing community based friend center

Project/Round	Item	Cost
Project 1 / Round 1	- materials - traveling allowance - per diem	8,400 18,000 76,000
Total		**102,400**
Project 1 / Round 2	- materials - traveling allowance - per diem	8,550 24,250 84,000
Total		**116,800**

Total cost for implementing a training course

Project/Round	Item	Cost
Project 2 / Round 1	- materials - traveling allowance - per diem	5,142 15,255 85,000
Total		**105,397**
Project 2 / Round 2	- materials - traveling allowance - per diem	10,464 18,300 64,000
Total		**92,764**

Appendix F: Certificate of Approval

Certificate of Approval (Renewal)
Ethics Committee for Human Research
Faculty of Public Health, Mahidol University

COA. No. MUPH 2010-078

Protocol Title :	MONITORING AND EVALUATION RESEARCH ON MODEL DEVELOPMENT AND REDEFINE MECHANISMS FOR AIDS PREVENTION AND ALLEVIATION IN YOUTH AND OTHER MOST AT RISK POPULATION
Protocol No. :	219/2552
Principal Investigator :	Asst. Prof. Sukhontha Kongsin
Affiliation :	Department of Public Health Administration Faculty of Public Health, Mahidol University
Date of Renewal (1st) :	24 February 2011
Date of Expiration :	23 August 2011

The aforementioned project and informed consent have been reviewed and approved by Ethics Committee for Human Research, according to the Declaration of Helsinki.

(Assoc. Prof. Sunee Lagampan)
Chairman of Ethics Committee for Human Research

(Assoc. Prof. 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:	**Mr. Sittikorn Rongsumlee**
Date of Birth:	**August, 28, 1985**
Place of Birth:	**Ubonratchathani**
Citizenship:	**Thailand**
Position:	**Researcher**
Address:	**Research Centre: Health Economics and Evaluation, Building 7th, Floor 8th. 420/1 Rajvithee Road, Faculty of Public Health, Mahidol University, Bangkok 10400, Thailand.**

Education:

Degree obtained		
1. Bachelor of Public Health	**Faculty of Public Health, Mahidol University**	**2004**
2. M.Sc. Health Economics	**Faculty of Economics, Chulalongkorn University**	**2010**
Research and Publication	**- Monitoring and Evaluation Research on Model Development and Redefine Mechanisms for AIDS Prevention and Alleviation in Youth and other Most at Risk Population Project (2010)**	