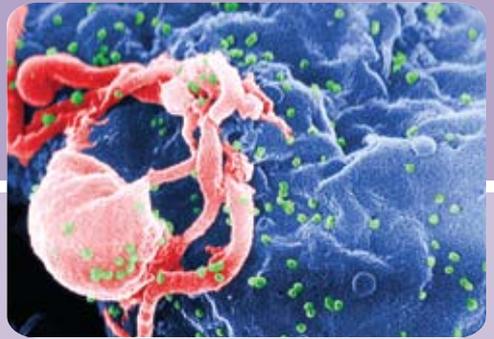


# Research Report

**Using capability index to determine a value for money of the AIDS Competence Process in Thailand**



# **Research Report**

## **Using capability index to determine a value for money of the AIDS Competence Process in Thailand**

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## EXECUTIVE SUMMARY

The scientific information to support the causal relationship between input/output and outcome/impact of HIV prevention is inadequate and fragmented. A properly conducted economic evaluation could present reasoned and justifiable arguments as to why more or fewer resources should be directed towards particular HIV prevention interventions. However, current economic evaluations have attempted to establish a mechanical relationship between a specific intervention and the outcome in individuals. None of the current economic evaluations have been adequate to capture the relationship between inputs and the increase in social capital resulting from these interventions. Therefore, there is a need for developing a more holistic framework for economic evaluations assessing interventions with complex, interrelated social outcomes.

This report responds to the request of the Asian Development Bank to conduct an economic evaluation on the AIDS Competence Process (ACP). This assessment aims to (i) develop a methodological framework for assessing the cost-effectiveness of the ACP and applying such a framework retrospectively to implementation in Asia and the Pacific; and (ii) provide capacity building recommendations to the Constellation to routinely measure and improve cost-effectiveness in its programmes, applying the methodological framework. This study was done with some constraints, as the ACP was not designed for economic appraisal and cost and outcome data appropriate for comprehensive cost-effectiveness or cost-utility analysis were lacking. Thus, this study rather aims to explore the information gap for future economic evaluation of the ACP, to guide the ACP's surveillance and monitoring system as well as to demonstrate the application of a newly developed methodological framework that could be applied for future evaluation of other social complex interventions.

In comparing costs and outcomes of the ACP using various scenarios, it is found that the ACP is likely to be very cost-effective in Thailand. The ACP saves one QALY using resources valued less than 1 Gross Domestic Product per capita (approximately 140,000 Baht), which is a cost-effectiveness benchmark defined by the National Health Security Office who manages the HIV prevention program in Thailand. The ACP is a cost-saving intervention if it increases condom use in FSWs or MSM by more than 10%. In addition, this assessment suggests that the higher the number of population reached by the ACP, the more cost-effective the results are, as does not only the ACP reduce HIV risk behaviours resulting in HIV infections averted,

but also improves individual capability resulting in increased quality of life among individuals. Although the evaluation shows that the ACP is likely to be very cost-effective in Thailand and other developing country settings, future research is needed to give reliable information regarding the intervention effectiveness, especially in relation to its ultimate goals, for example, number of HIV infections averted or QALYs gained. This report recommends actions on how to improve monitoring and evaluation, and possible tools for economic assessments for future design of new programmes supported by the Constellation.

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## I. INTRODUCTION

***“If you want to make a difference, you can’t avoid controversy”***

*Anonymous*

### **Overview of AIDS Competence Process**

The Constellation is a non-profit, non-governmental organization which envisions a world where “AIDS Competence” spreads faster than the virus. To achieve this, the Constellation stimulates and connects local responses to HIV/AIDS using the ACP, which is a process by which a community responds to the issue of HIV with the belief that communities have the capacity to solve their own problems. It provides a low-cost, high return possibility, since it is believed that when individuals, families and communities openly acknowledge that HIV/AIDS is a matter of concern, they act to prevent its effects, and mobilise in their environment the support they need to maintain the quality of their lives. In an AIDS-competent society, we - as people in families, in communities, in organisations and in policy making - act from strength:

- to acknowledge the reality of HIV and AIDS;
- to build our capacity to respond;
- to reduce our vulnerability and risk;
- to allow everyone to live out their full potential;
- to share our experience with others.

The Constellation, with support from the ADB, has implemented a 2-year project<sup>1</sup> aimed to build capacity of non-governmental organizations (NGO) to develop and implement AIDS Competence within communities for sharing and learning on AIDS Competence. The project involves partners from Cambodia, India, Indonesia, the Philippines, Papua New Guinea and Thailand. In all countries, the ACP methodology was presented and modified to respond to the threats of HIV/AIDS. Today, facilitators belonging to various organizations are establishing a National Support Team in each country, pools of 436 facilitators have been trained, and 543 communities have used the ACP in the abovementioned countries.

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<sup>1</sup> June 2007- June 2009

The work of the AIDS Constellation appears to have succeeded in the empowerment and mobilization of communities in responding to the challenges and opportunities related to the HIV/AIDS epidemic. Until today, two significant external evaluations have been conducted on the AIDS or Malaria Competence Process:

- The UNAIDS evaluation of AIDS Competence (UNAIDS/UNITAR 2005), which concluded that *"between 83% and 87% [of AIDS Competence Process users—members of local communities] are satisfied and confident that the program achieves impact within communities, based on the experiential outcomes that they see or perceive within their communities."*
- The WHO-UNICEF evaluation of AIDS Competence in Papua New Guinea (Morea, Kamasua et al. 2009), which concluded that *"the AIDS Competence Process is an effective approach in combating HIV/AIDS through local empowerment and should be continued and expanded. It meets local needs and its consistent support resulted in sustained local actions. For its low-cost but often labor intensive input of resources, the output has been substantial – awareness, empowerment, plans and actions regarding both HIV/AIDS and related social and other issues."*

However, the question whether the value for money of the transfer of the AIDS Competence Process to NGOs has not yet been assessed. The rationale behind this assessment is two-fold. Firstly, the Constellation is discussing collaboration with partners, such as UNAIDS and the HIV and AIDS Alliance. In order to go to scale in multiple regions, cost-effectiveness ratios are amongst the most important inputs for expanding the partnership. Secondly, the new organizational strategy of the Constellation is built around the establishment and strengthening of member organizations<sup>2</sup> in the world, including countries included in this assessment. Therefore, this review will provide further recommendations for the Constellation and its member organizations.

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<sup>2</sup> A Constellation member organization is any organization with a core business in connecting or facilitating the Competence Approach and its transfer to others. The organization fully subscribes to the mission and vision of the Constellation and applies the Community Life Competence Process in its specific context (national, sub-national, global).

### Scope of the evaluation

As for other social policy and development interventions, the ACP yields multi-dimensional benefits beyond the reduction of AIDS related illness and the increase in life expectancy. Those benefits span over a large spectrum, related to the response to AIDS and beyond. Not only does the ACP reduce risks of HIV infection or improves access to proper care among those who are HIV infected, but also enables communities to increase the quality of life of all its members, whether infected or not, through the reduction of stigma and discrimination and through action on various local factors of vulnerability and risk. Moreover, the ACP fosters sustainability of the response through its management by the community itself. Hence, the economic evaluation of the ACP will aim to obtain a correct estimate of the true benefits of the process.

First, the present study aims to offer methodological guidance for the future assessment of costs and outcomes of the ACP, through extensive document review, engagement with a wide range of stakeholders involved with the programme and participant observation of the process in the field. *Second*, this study is expected to generate a general framework that will be useful for conducting economic appraisal of complex social interventions<sup>3</sup>. *Third*, this study will give an estimate of the value for money of the ACP given a certain number of scenarios.

There is growing demand for evidence-based policy decision making and allocation of resources for cost-effective interventions targeting Asia's HIV epidemics. It is expected that this assessment will help the Constellation to improve their effectiveness in planning, implementation and monitoring of programmes related to HIV/AIDS to ensure impact and sustainability of their programmes.

The assessment will include:

- a better handle on the management of the ACP

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<sup>3</sup> According to the definition given by the Medical Research Council, the interventions engage a number of interacting components, which may act independently and inter-dependently. These components usually include behaviors, parameters of behaviors (e.g., frequency, timing) and methods of organizing and delivering those behaviors (e.g., type(s) of practitioner, setting and location). In addition, the interventions often target a number of groups or organizational levels as well as yield various potential outcomes.

- a raised awareness in the international community of the value for money of non biomedical interventions in general and of the ACP in particular
- a basis for its future evaluations
- a solid basis for the introduction of ACP into national and global strategy
- support for and improved management of social interventions beyond AIDS.

There are some limitations in this study, as follows:

- Although there are four types of economic evaluation used to compare alternative policy options<sup>4</sup>, cost-effectiveness and cost-utility analyses are among the most popular methods in real practice (Neumann 2005; Cooper, Coyle et al. 2005 Oct) and most recommended by national and international guidelines (Teerawattananon, Russell et al. 2007). Thus, this study focuses on the application of these two methods for estimating value for money of the ACP.
- Even if the ADB project was not designed with economic appraisal in mind, it is possible to estimate value for money (cost-effectiveness results or CE ratio) of the ACP using the best available data, although this is far from perfect information.
- The assessment only reviewed the Thai experience, which limits the outputs and recommendations.

## Approach

It was undertaken in close coordination with the CST, its member organizations, communities and other key stakeholders who are active in implementing HIV/AIDS programmes at community level. A wide range of activities were undertaken in this study, including:

1. Document review for better understanding of the stage of the art in measuring effectiveness and assessing value for money of social complex interventions;

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<sup>4</sup> (1) cost-minimization analysis, which assumes that each option is equally effective and then identifies the option associated with the least cost; (2) cost-effectiveness and (3) cost-utility analysis, which produce a ratio where the numerator presents programme cost and the denominator reflects the health gain. The difference between the two is that the former produces health outcomes in an original form (e.g., HIV infections prevented, or life years saved) while the latter expresses as common units (e.g., Quality Adjusted Life Year--QALY, Disability Adjusted Life Year—DALY); (4) cost-benefit analysis, which measures costs and consequences in the same monetary unit and assesses the net gain or loss and/or the ratio of costs to benefits.

2. Review of existing methodological guidelines for conducting economic evaluations, including those developed by governments and standard health economic evaluation textbooks. Moreover, review of published articles related to the comparison of health economic evaluation guidelines was also performed. The most prominent information are the reviews by Hjelmgren and colleagues (Hjelmgren, Berggren et al. 2001), Walker (Walker 2001), and Schulenburg and Hoffmann (Schulenburg and Hoffmann 2000). Finally, recommendations in this guideline were made regarding the appropriateness of techniques given the available resources and time limits of this study.
3. Document review and engagement with personnel involved with the CST, including local partners and community members, to obtain a better understanding of the ACP and its possible short-, intermediate-, and long-term outcomes;
4. Collecting cost and outcome data to conduct economic evaluation of the ACP;
5. Conducting a series of consultations with potential funders, Ministry of Health's personnel, academics, community leaders, programme managers and staff for comments on preliminary results;
6. Writing up the final report after taking into account all comments from experts and relevant stakeholders.

## II. METHODOLOGICAL FRAMEWORK

***“The danger is that we will measure what is easily evaluable  
and ignore what is valuable”***

*Yolande Coombes & Margaret Thorogood (Evaluating Health Promotion 2004)*

The term “economic evaluation” in the sense of this study refers to a study that considers both the comparative costs associated with the provision of the ACP and its counterfactual scenario, and the comparative outcomes. According to methodological standards (Gold, Siegal et al. 1996) National Institute for Clinical Excellence 2004), the key elements of the analysis include the following components:

- Defining the scope of the study
- Selection of comparator(s)
- Measurement of costs
- Measurement of effects
- Handling time in the economic evaluation studies
- Handling uncertainty and sensitivity analysis
- Presentation of data and results

The detailed information that is important in the interpretation and implementation of the guidelines is discussed in separate sections, each containing background knowledge, choice of techniques, and recommendations.

### 1. Defining the scope of the study

Most methodological guidelines indicate the need for clear statements of the decision problem leading to the evaluation (Hjelmgren, Berggren et al. 2001; Walker 2001) . It is recommended that the study description should be detailed enough to allow policy-makers or readers to assess the appropriateness of the method used, the validity of evidence and the generalisability of results across different settings. This was done in the first part of this report and also at the subsequent section where the economic evaluation of the ACP is presented.

The specification of the decision problem also guides and is guided by the viewpoint of the study, upon which costs and effectiveness of study interventions depend. The viewpoint for an analysis in this case study may be that of: (i) the ADB—a funder who made an investment on the ACP and wanted to learn about the efficiency of its investment; (ii) the Constellation—a budget holder responsible for managing the overall project; (iii) community groups who were responsible for the operation and running of community project and services, often involving local partnership funding; and (iv) the society as a whole.

Several reasons support the use of a societal viewpoint (Gold, Siegal et al. 1996). Firstly, decisions are most likely to be fair, because it is the only perspective that does not count net gain what is actually someone else's loss. Secondly, the societal viewpoint is closest to the model of welfare economics, which theoretically takes account of allocative efficiency within the whole economy, while the viewpoint of a specific sector only takes account of technical efficiency within the production of the product of that sector—it ignores the 'externalities'<sup>5</sup> created in other parts of the economy. Lastly, the use of a societal perspective does not constrain the separate analysis of results using other viewpoints.

## **2. Selection of comparator(s)**

Because economic evaluation helps consider how best to allocate scarce or limited resources to best satisfy often-unlimited demand, it is vital that the policy choice(s) or comparator(s) is clearly specified in the context of the analysis. The majority of methodological guidelines recommend the use of current or standard practice as a comparator (Drummond, O'Brien et al. 1997). It is relevant to this case study that attribution of the resources used and impact of the ACP are made in comparison with its counterfactual scenario or the situation where there was no ACP implementation.

## **3. Measurement of costs**

Cost is the numerator of economic evaluations and there are two main concerns in measurement of costs: (1) what types of resource used are relevant for the disease and the intervention studies; and (2) to what level of detail do they have to be measured and valued.

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<sup>5</sup> cost or benefit, not transmitted through prices, incurred by a party who did not agree to the action causing the cost or benefit.

To address the first issue, it is crucial to note that the perspective of costing must be the same as the study perspective and that determines the scope of costs covered in the analysis. Under a societal perspective all direct and indirect costs related to the ACP and its related activities born by the Constellation, other NGOs, local authorities, community groups, or other parties should always be included, except for some cost items that occurred similarly in the two policy options (with and without the ACP implementation) which can be omitted from the analysis as they do not represent an incremental cost.

Furthermore, it may be necessary to consider the estimation of productivity costs. In this case study, for example, due to life-years saved from getting access to proper treatment of HIV infected patients or HIV infections averted. The human capital approach is the most common recommendation for this purpose (Koopmanschap and van Ineveld 1992; Brouwer, van Exel et al. 2002). The estimation of productivity cost using the human capital approach is determined by multiplying wage rate by the number of work days missed.

This case study also raises a controversial costing issue regarding whether or not to include the cost offset of non-HIV related medical costs (e.g., reduction of treatment costs of other sexually transmitted infections as a result of increased capacity) (Meltzer 1997). The justification to support the inclusion of these unrelated medical costs is that all corresponding costs incurring after the intervention under study should be incorporated into the economic evaluation (van Baal, Feenstra et al. 2007). However, it has also been argued that it is in practice almost impossible to make a reliable estimation of all future medical costs of individuals, especially the young population who are the prime target of HIV prevention (Weinstein and Manning 1997).

In terms of measurement and valuation (the second issue) under a societal viewpoint, using tariffs or prices in the health and education sectors to estimate costs cannot perfectly represent opportunity costs, as the Thai government largely subsidize the costs of these services provided in the public sector. Thus, costs should be estimated by adjusting market prices (cost-to-charge ratios) or using shadow prices. Also, it is necessary to estimate the opportunity costs of volunteer workers.

Costs can be measured prospectively in well-designed experimental prospective observational studies, or collected retrospectively through chart auditing, claim/reimbursement administrative data when the model-based estimation is applied. If applicable, it is possible to obtain cost

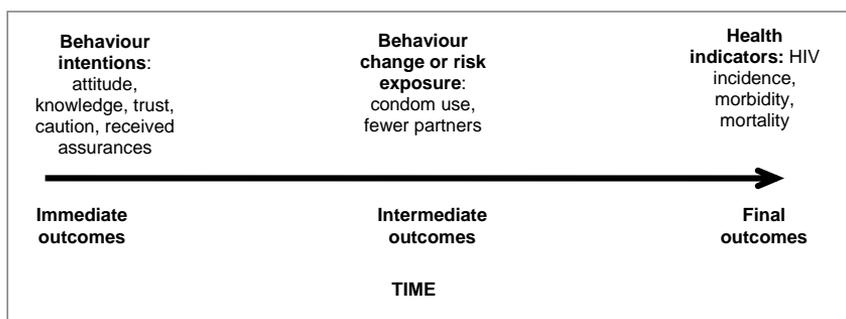
information from secondary sources (e.g., published literature). In the situation where information used in the evaluation is derived from studies with different price years, a healthcare specific inflation rate or the inflation rate prevailing in the general economy calculated by the government authorities (e.g., Bureau of Trade and Economic Indices in Thailand, available at [http://www.price.moc.go.th/web4\\_e/index.asp](http://www.price.moc.go.th/web4_e/index.asp)), should be used as a conversion rate.

#### 4. Measurement of intervention effects

The measurement of intervention effects constitutes a major component of economic evaluation as a numerical estimate in the denominator of cost-effectiveness or cost-utility ratios. Decision makers are interested in how a particular intervention works in everyday practice. Economic evaluation should therefore measure effectiveness rather than efficacy achieved in a well-controlled experimental setting.

Measurement of intervention effect can focus on one or more of three aspects of outcomes: immediate outcomes, intermediate outcomes, and final outcomes (see **figure 1**). The evaluation of immediate outcomes can be carried out immediately after an intervention is implemented. Not surprisingly, it is a popular method of evaluation because it is relatively low-cost and allows useful insights into the implementation process, for example, how interventions are interpreted and responded to by the target population.

**Figure 1: Outcome measures for HIV prevention interventions**



Intermediate outcome evaluation focuses on the change in behaviour or risk exposure, such as condom use or number of sex partners in case of HIV/AIDS prevention interventions. Because it is not always the case that changes in immediate outcomes lead to change in intermediate and

final outcomes, intervention effectiveness is, sometimes, only counted based on the change in immediate outcomes. Lastly, the final outcome evaluation is concerned with assessing the long-term effects or ultimate goal of the programme. Because of the time lag between implementation of the intervention and change in final outcome, this type of evaluation is complex to carry out and costly.

Because it is hard to identify a simple causal chain which link a social complex intervention to changes in intermediate and final outcomes, in assessing the outcome of an intervention it is essential to address a basic question—can this observed change be attributed to the intervention? It is suggested here that an evaluation should be carried out with a strong theoretical approach behind it. And if possible, the use of multiple methods or 'triangulation', including both qualitative and quantitative techniques, is recommended to improve confidence in research findings.

There are three different ways for gathering the effects of an intervention in economic evaluation (Gold, Siegal et al. 1996):

- incorporating economic evaluation within an experimental study;
- using information from observational cohort or case-control studies;
- combining or modelling data from a variety of studies

An advantage of this experiment is that the method allows prospective collection of cost and effectiveness data from a single source. However, results from an experimental study usually represent the efficacy of an intervention and not necessarily its effectiveness (Drummond, O'Brien et al. 1997). There are some exceptions to effectiveness studies using pragmatic designs in normal settings. In addition, the sample inclusion and exclusion criteria of the experiment may limit generalisability of the results; fully correcting these biases in economic evaluation is problematic (Gold, Siegal et al. 1996). In contrast to the experimental design, data from observational studies is more prone to confounding.

Synthesis methods are recommended as an alternative when there is insufficient data from any one source (Gold, Siegal et al. 1996; Canadian Coordinating Office for Health Technology Assessment 1997; Drummond, O'Brien et al. 1997; National Institute for Clinical Excellence 2004). Combining data from a variety studies can also increase the power to detect true effects, improve the precision of the estimate of effect size and increase generalizability for applying

results across settings (Drummond, O'Brien et al. 1997). However, it has been argued that there is potential for bias if the study is not based on the best available effectiveness data.

Modelling, including synthesising data from multiple sources, to estimate effectiveness in economic evaluation is often inevitable. Several guidelines support the use of modelling methods where: (i) trial samples are not consistent with the typical patients likely to use the intervention within the context of the economic evaluation; (ii) extrapolation of short term clinical trial to ultimate health affects is needed; and (iii) relevant comparators have not been used or the trial did not include evidence on the relevant subgroups (Gold, Siegal et al. 1996; Kristensen, Horder et al. 2001; Szende, Mogyor&oacute;sy et al. 2002; National Institute for Clinical Excellence 2004). Because of all the complexities and uncertainties between intermediate and (future) final outcomes listed above, by necessity, the evaluation of multi-dimensional interventions, such as ACP, requires mathematical models.

Furthermore, in cost-utility evaluation the clinical effects are a combination of changes in quality of life and mortality indicators. Quality Adjusted Life Year—QALY is the most commonly used utility unit under cost-utility analysis. Its value typically lies on a scale between 0 (death or worst possible health) and 1 (full health).

## 5. Handling time in economic evaluation studies

There is broad agreement among guidelines that the time horizon of a study should be long enough to capture all relevant outcomes and costs that are directly related to the intervention, and all future costs and consequences in the economic evaluation should be stated in terms of their 'present value' (Hjelmgren, Berggren et al. 2001). It is also recommended that in the case of a time horizon longer than one year, the opportunity costs of investments and their health consequences should be taken into account through discounting. The recommendation here is that both costs and benefits should be discounted at a common rate, 3.0%, similar to the recent recommendation for the Thai health care setting (Permsuwan, Guntawongwan et al. 2008). The reason for supporting the same discount rate for costs and benefits is to avoid potential bias from shortening or expanding the time horizon of a study.

The discounting formula is represented as follows:

$$\text{Present value} = \frac{\text{Future value in year } n}{(1+\text{discount rate})^{n-1}}$$

## 6. Handling uncertainty and sensitivity analysis

Uncertainty in economic evaluation is unavoidable, since data are more likely to be synthesised from a number of sources and uncertainty could be introduced at every stage of an evaluation.

Uncertainty of a study may arise through (1) natural variation in population and represent in uncertainty of parameter estimates, or through (2) between-subgroup variability, which reflects on generalisability or transferability of results applied into other settings (Briggs 2001). In addition, uncertainty may occur from (3) the modelling process, including extrapolation of data, choice of analytical model, or appropriate qualitative structure of the model (Briggs 2001). Lastly, uncertainty may relate to (4) analytical assumptions used in the model (e.g., rate of discounting) (Briggs 2001).

Briggs (Briggs 2001) offers a clear outline (**Table 1**) to handle different types of uncertainty that arise through the economic model approach. Firstly, to handle uncertainty in relation to the methods employed in an analysis, Briggs supports the use of a reference case (Drummond 2003). Univariate sensitivity analysis is also important for predicting this uncertainty.

**Table 1: Methods for handling uncertainty in modelling-based**

Type of uncertainty	Handling uncertainty
Methodological	Reference case/sensitivity analysis
Parameter uncertainty	Probabilistic sensitivity analysis
Modelling uncertainty	Sensitivity analysis
Generalisability/Transferability (between-subgroup variability)	Sensitivity analysis

Source: (Gold, Siegal et al. 1996)

Parameter uncertainty can be analysed by a technique known as 'probabilistic sensitivity analysis' which is based on simulation modelling techniques. It examines the effect on the results of an evaluation when the underlying variables are allowed to vary simultaneously across a plausible range according to predefined distributions. Briggs also recommends using univariate sensitivity analysis to handle issues of modelling uncertainty and generalisability.

## **7. Presentation of data and results**

Most guidelines demand a uniform approach to reporting the results from economic evaluation, since the requirement may increase the transparency of studies, facilitate comparison between studies, or improve the general quality of the evaluation undertaken. A common recommendation is that all key elements discussed earlier in this guideline should be clearly stated in the report. The guidelines also require more details on methodology, results and policy related issues in the technical report. The majority request a separate report of expected values for each component of costs and outcomes. The presentation of an incremental cost-utility ratio is also strongly recommended.

The discussion should also include limitations of the study, comparing results to relevant results from other studies, potential impact on other expenditures (budget impact analysis), and equity alongside policy recommendations for the interested intervention.

### III. ECONOMIC EVALUATION OF THE ACP

*“Excellence is not a skill. It is an attitude.”*

*Ralph Marston*

This section aims to apply the methodological framework for conducting the economic evaluation proposed in the previous section on the evaluation of the ACP. The ACP is a community competence building programme to respond to HIV/AIDS problems (Lamboray and Skevington 2001). It consists of a combination of process and knowledge management to make communities recognize the reality of HIV-AIDS, build their own capacity to respond to the disease, exchange and share knowledge and skills that are to reduce vulnerability and risks and live to their full potential. The ACP begins with training individuals who are working in community NGOs to adopt and adapt the AIDS Competence idea and approach. The trainees, hereafter facilitators, work with communities to help their members respond to their key concerns without any financial support from the CST, but from their own resources.

SALT and “self-assessment” are the key components of the ACP. SALT is a way of thinking and relating people in the communities to a situation. SALT stands for “Support and Stimulate”, “Appreciate and Analyse”, “Listen, Learn and Link”, and “Transfer” (knowledge and skills). SALT can be applied to all actions, such as home visits, meetings, or daily activities, undertaken by the people equipped with the ACP. Self-assessment is conducted through a set of indicators that are used to measure strengths and progress of AIDS activities within the local context to evaluate how well they perform in response to HIV/AIDS (details in **appendix 1**). Self-assessment can help communities increase awareness of the problems and is a catalyst for further action.

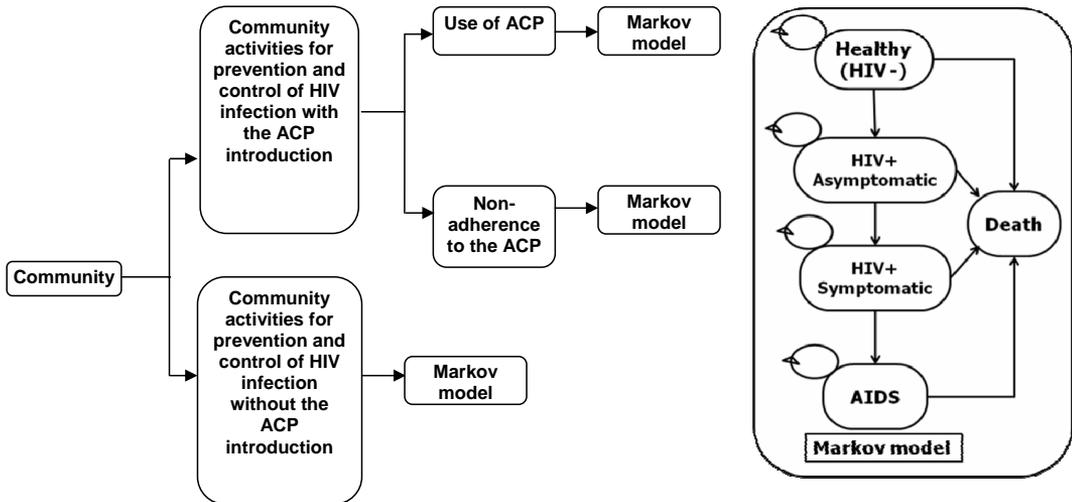
Nowadays, the ACP has been introduced in many countries, such as Cambodia, India, Indonesia, the Philippines, Papua New Guinea, Thailand and Uganda. It was also evaluated in terms of process, coverage and end-user satisfaction by the UNAIDS/UNITAR and WHO-UNICEF (UNAIDS/UNITAR 2005; Morea, Kamasua et al. 2009). However, the ACP has been criticised for lacking quantitative evidence on its ultimate outcomes, for example, the increase of people and community competence in fighting against HIV/AIDS or the reduction of HIV morbidity and mortality (UNAIDS/UNITAR 2005). Furthermore, a properly conducted economic

evaluation would present reasoned and justifiable arguments as to why more or fewer resources should be directed towards the ACP.

## **Methods**

This report illustrates an attempt to assess the value for money of the ACP conducted in Asian and Pacific regions during 2007-2009. The study adopted a societal viewpoint as perspective. Given that there is insufficient data from any one source (e.g., single cohort or observational study modelling, including synthesising data from multiple sources) the only available option was the hybrid model which was constructed to predict costs and outcomes of the ACP compared to a “null scenario”—a situation where there is no ACP implementation. Figure 2 depicts the decision tree and Markov model for the ACP evaluation. The population cohort in the selected community had two mutually exclusive options: (i) the introduction of the ACP through community facilitators who were trained by the Constellation coaches during 2007-2009; and (ii) a counterfactual scenario where there is no introduction of the ACP and only existing activities for prevention and control of HIV are available. The provision of the ACP was on a voluntary basis, so the trained community facilitators could accept or decline the application of the ACP to their usual practice depending on the acceptance rate.

Figure 2: Hybrid model for economic evaluation of the ACP



Based on a focus group discussion with seven former trainees who attended the “Kick Off” workshop—the introduction course of the ACP provided by the CST, not all trainees understood the concept of the ACP well and adopted the approach and tools for their regular work. Information from the CST indicated that during the past 2 years there were 28 Thai individuals working for NGOs who completed the workshop but only 16 of them (57%) still actively participate in the activities arranged by the CST. However, we did not include costs and outcomes of further training made by these 16 facilitators for others (second and third level facilitators) and assumed that this is the acceptance rate of the ACP introduction (with a mean of 0.57 and a standard error of 0.09, using beta-distribution of Bayesian statistics).

The health states of both comparable cohorts in the model consist of five states: (i) healthy or HIV negative, (ii) HIV positive without symptom or asymptomatic HIV infection, (iii) progression into symptomatic (e.g., opportunity infection), and (iv) late state of HIV infection or AIDS stage; and (v) death due to HIV infection and other mortality causes. For this study we assumed that the costs of ARV treatment were included in the AIDS patients’ treatment costs. The arrows represent the probability of transitions from one state to another. The time horizon was the estimated lifetime with one year cycles.

Table 2 presents epidemiological data used in the model. Age-specific incidence of HIV infection among general population in Thailand was used to estimate the probability of transition from HIV negative state to early-HIV positive state (i.e., asymptomatic state) (The Thai Working Group on HIV/AIDS Projection 2001) . The yearly probabilities to progress from HIV infection to the AIDS state were calculated from the data on HIV/AIDS projection using the Asian Epidemic Model (Wiwat Peerapatanapokin, Policy Research and Development Institute Foundation, personal communication, September 29, 2009). In this model it is assumed that all AIDS patients received antiretroviral treatment (ARV) once their CD4 was less than 250 cells/mm<sup>3</sup>, starting the first ARV regimen with GPO-vir®, the standard ARV treatment composed of nevirapine (NVP), stavudine (d4T), and lamivudine (3TC). The switching to another regimen may be caused by serious adverse drug reactions or evidence of drug-resistant HIV virus (Maleewong, Kulsomboon et al. 2008). The second regimen was through two nucleoside or reverse transcriptase (NRTI) plus a non-nucleoside reverse transcriptase inhibitor (NNRTI) regimen, and the third regimen was a protease inhibitor (PI)-based regimen. The annual mortality among HIV/AIDS patients was estimated from individual patient data and survival analysis of two cohort studies in Thailand (Maleewong, Kulsomboon et al. 2008; Leelukkanaveera 2009). In addition, the yearly probability of death from other causes was derived from age-adjusted mortality in Thailand (The Thai Working Group on Burden of Disease and Injuries November 2002).

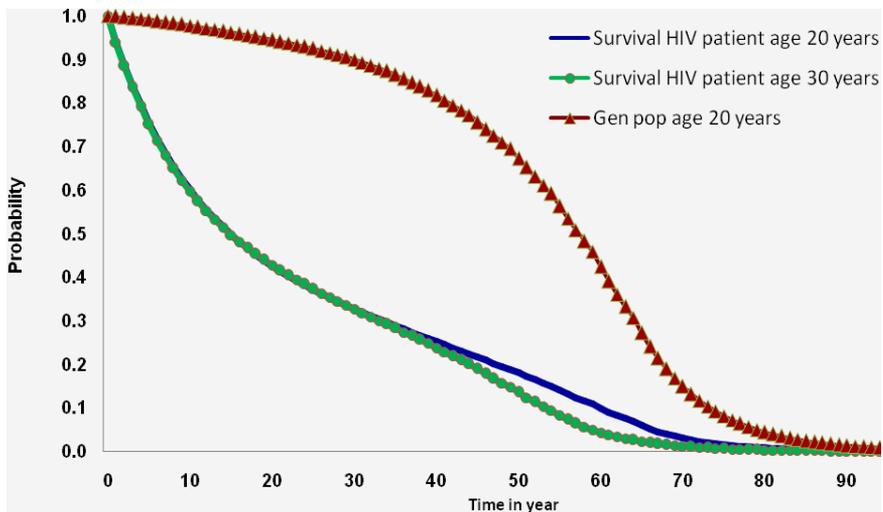
**Table 2: Epidemiological parameters used in the Markov model**

Parameters	Distribution	Mean	SE	Ref.
Annual incidence of HIV infected in general population	Beta	0.001	0.001	(The Thai Working Group on HIV/AIDS Projection 2001)
Annual progression risk from asymptomatic to symptomatic	Beta	0.865	0.047	(Sirivichayakul, Phanuphak et al. 1992)
Annual death risk of asymptomatic	Beta	0.058	0.008	(Pathipvanich, Ariyoshi et al. 2003)
Annual probability to progress from HIV to AIDS	Beta	0.087	0.0004	(Ono, Kurotaki et al. 2006; The Analysis and Advocacy Project (A2) in Thailand and The Thai Working Group on HIV/AIDS Projection (2005) 2008)
<b><i>Parametric form of survival data of symptomatic patients</i></b>				
Constant in survival analysis for baseline hazard	Lognormal	-8.38	1.44	(Leelukkanaveera 2009)
CD4 coefficient in survival analysis for baseline hazard	Lognormal	-0.01	0.001	(Leelukkanaveera 2009)
Ancillary parameter in Weibull distribution	Lognormal	0.04	0.19	(Leelukkanaveera 2009)
Average CD4 of patients	Lognormal	321	9.46	(Leelukkanaveera 2009)
<b><i>Parametric form of survival data of AIDs patients</i></b>				
Constant in survival analysis for baseline hazard	Lognormal	-4.81	0.86	(Maleewong, Kulsomboon et al. 2008)
Age coefficient in survival analysis for baseline hazard	Lognormal	-0.04	0.02	(Maleewong, Kulsomboon et al. 2008)
CD4 coefficient in survival analysis for baseline hazard	Lognormal	-0.02	0.00	(Maleewong, Kulsomboon et al. 2008)
Ancillary parameter in Weibull distribution	Lognormal	-0.33	0.11	(Maleewong, Kulsomboon et al. 2008)
Average CD4 of patients	Gamma	81.01	2.67	(Maleewong, Kulsomboon et al. 2008)

Parameters	Distribution	Mean	SE	Ref.
<b><i>Parametric form of NVP-based of switching first regimen to second regimen</i></b>				
Constant in survival analysis for baseline hazard	Lognormal	-6.17	0.52	(Maleewong, Kulsomboon et al. 2008)
CD4base coefficient in survival analysis for baseline hazard	Lognormal	0.00	0.00	(Maleewong, Kulsomboon et al. 2008)
Age coefficient in survival analysis for baseline hazard	Lognormal	0.03	0.01	(Maleewong, Kulsomboon et al. 2008)
Ancillary parameter in Weibull distribution	Lognormal	-0.49	0.07	(Maleewong, Kulsomboon et al. 2008)
<b><i>Parametric form of NVP-based of switching second regimen to third regimen</i></b>				
Constant in survival analysis for baseline hazard	Lognormal	-10.29	1.27	(Maleewong, Kulsomboon et al. 2008)
Age coefficient in survival analysis for baseline hazard	Lognormal	0.06	0.02	(Maleewong, Kulsomboon et al. 2008)
Ancillary parameter in Weibull distribution	Lognormal	0.01	0.14	(Maleewong, Kulsomboon et al. 2008)

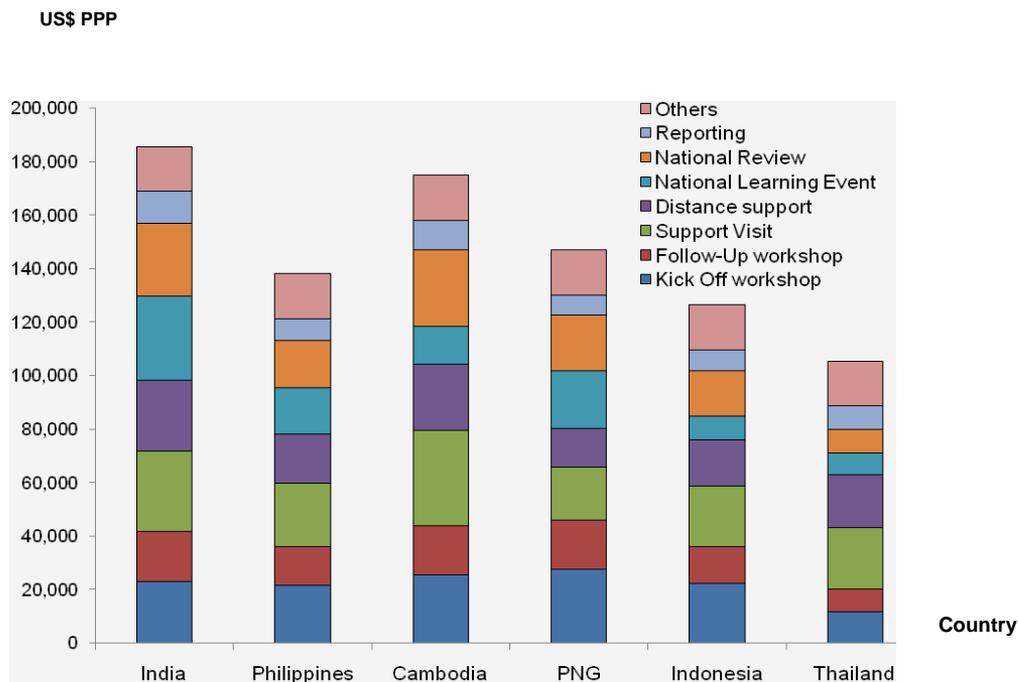
To verify the parameters used in this model, survival curves were plotted in **Figure 3**. This figure was presented and agreed by a group of HIV experts in Thailand.

**Figure 3: Survival graphs of HIV/AIDS patients with different age groups compared to the general population**



Under the societal perspective, all direct and indirect costs related to the ACP and its related activities born by the Constellation, community NGOs, other local authorities, and individuals in the community need to be included. The cost of the introduction of the ACP was collected from the CST and is presented in **Figure 4** in terms of international US dollars using Purchasing Power Parity Index from the International Monetary Fund (US\$ PPP) (International Monetary Fund 2010).

**Figure 4: Costs related to the ACP by the CST**



Because there was no reporting system to estimate the additional resources used and costs of the adoption of the ACP in community activities by facilitators, we assumed this cost component is minimum compared to the costs of the CST. There was also need to estimate cost offset and QALYs gained from HIV infections averted. We borrowed input parameters related to the health care costs and utility values for HIV/AIDS patients from a similar economic evaluation study on HIV vaccine in Thailand (Leelahavarong and Teerawattananon 2010), as shown in **Table 3**.

**Table 3: Cost and utility parameters used in the Markov model**

Parameters	Distribution	Mean	SE	Ref.
<b><i>Prevention program</i></b>				
Annual costs of existing prevention program	Gamma	24		(The Thai Working Group on National AIDS Spending Assessment (NASA) 2008; National AIDS Prevention and Alleviation Committee 2008)
Cost of ACP program in the first two years	Gamma	1,705,000		Financial report 2007-2009, The Constellation
<b><i>Costs of asymptomatic treatment</i></b>				
Lab test cost for asymptomatic patient	Gamma	8,155		(Revenga, Over et al. 2006)
Hospital service cost of asymptomatic patient	Gamma	2,502		(Revenga, Over et al. 2006)
OPD cost of asymptomatic patient	Gamma	2,502		(Revenga, Over et al. 2006)
Costs of symptomatic treatment				(Revenga, Over et al. 2006)
Lab test cost for symptomatic patient	Gamma	8,931		(Revenga, Over et al. 2006)
Opportunity infection treatment cost of symptomatic patient	Gamma	4,739		(Revenga, Over et al. 2006)
Hospital service cost of symptomatic patient	Gamma	9,104		(Revenga, Over et al. 2006)
OPD cost of symptomatic patient	Gamma	2,502		(Revenga, Over et al. 2006)
IPD cost of symptomatic patient	Gamma	6,227		(Revenga, Over et al. 2006)
<b><i>Costs of AIDS treatment</i></b>				
Opportunity infection treatment cost of AIDS patient	Gamma	4,739		(Revenga, Over et al. 2006)
Hospital service cost of AIDS patient	Gamma	9,104		(Revenga, Over et al. 2006)
OPD cost of AIDS patient	Gamma	2,502		(Revenga, Over et al. 2006)

Parameters	Distribution	Mean	SE	Ref.
IPD cost of AIDS patient	Gamma	6,227		(Revenga, Over et al. 2006)
Annual drugs costs of the first ARV regimen	Gamma	8,184	1,858	(Maleewong, Kulsomboon et al. 2008)
Annual drug costs of the second ARV regimen	Gamma	32,478 <sup>6</sup>	5,772 <sup>6</sup>	(Maleewong, Kulsomboon et al. 2008)
Annual drug costs of the third ARV regimen	Gamma	15,682 <sup>6</sup>	2,080 <sup>6</sup>	(Maleewong, Kulsomboon et al. 2008)
Annual costs of lab test of first ARV regimen in the first year	Gamma	7,671		(Kitajima, Kobayashi et al. 2003)
Annual costs of lab test of first ARV regimen in the subsequence years	Gamma	4,210		(Kitajima, Kobayashi et al. 2003)
Annual costs of lab test of the second ARV regimen	Gamma	4,140		(Kitajima, Kobayashi et al. 2003)
Annual costs of lab test of the third ARV regimen	Gamma	4,163		(Kitajima, Kobayashi et al. 2003)
<b>Utility parameters</b>				
Utility of healthy state		1		Authors' assumption
Utility of asymptomatic patients	Beta	0.86	0.01	(Leelukkanaveera 2009)
Utility of symptomatic patients	Beta	0.80	0.01	(Leelukkanaveera 2009)
Utility of AIDS patients	Beta	0.76	0.01	(Leelukkanaveera 2009)

According to **Figure 1**, the evaluation of immediate outcomes is the most feasible, as it is particularly useful for the implementation purposes but may not be attractive or meaningful for making resource allocation decisions. As a result, economic evaluation should report

<sup>6</sup> Thanapat Laowahutanon, AIDS office, Bureau of Disease Management, National Health Security Office, personal communication, August 20, 2009

effectiveness in terms of intermediate or final outcomes. Since the ACP aims to improve both individual and community capability to fight against HIV/AIDS, its intermediate and final outcomes can be measured in terms of “the change of capability of individual and community” and “number of HIV infections averted”, respectively.

Measuring intervention effectiveness in terms of “increased capability” is a very new concept and it has never been used in economic evaluation before. We reviewed and found only a few studies addressing this issue. Landmark studies are those presenting the recent development of the “capability index” by Anand et al (Anand P and M. 2006), and Lorgelly et al (Lorgelly PK, Lorimer K et al. 2008). This index has the potential to be applied to the ACP and other social complex interventions. Because this index is under development and has never been used in Asia and Pacific regions, we conducted a feasibility study to assess the potential of using the index for evaluating the ACP.

We started with translating the English version of the “capability index” questionnaire developed by Lorgelly and her team to a Thai version. The questionnaire was first tested by HITAP researchers. Then, the capability index questions were combined with the self-assessment form, HIV risk behaviour questions modified from the sentinel surveillance. Scoring for the capability questions, the self-assessment questions, and the HIV risk behaviour questions are described in **Appendix 2**.

This questionnaire was piloted in the general population at Amphawa District, Samut Songkhram Province, where 41 respondents completed the questionnaire (see Appendix 3).

**Table 4** summarises basic characteristics of respondents.

**Table 4: Characteristics of the first group of respondents (n=41)**

Variables	Count/Mean	Range/Percentage
Age (years)	31.2 (S.E. 1.73)	21-63
Male	18	43.9
<b>Marital status</b>		
Single	27	65.9
Married / Partnered	11	26.8
Divorced/Separated	3	7.3

<b>Variables</b>	<b>Count/Mean</b>	<b>Range/Percentage</b>
<b><i>Employment status</i></b>		
Student	4	9.8
Government officer	7	17.1
Private Organization Employee	20	48.8
Own business	3	7.3
Labourer/Workers	1	2.4
Unemployed	3	7.3
Others	3	7.3
<b><i>Monthly Household Income (Baht)</i></b>		
Less than 10,000	2	4.9
10,001 to 20,000	11	26.8
20,001 to 30,000	9	22.0
30,001 to 40,000	8	19.5
40,001 to 50,000	4	9.8
50,000 to 100,000	4	9.8
100,001 or more	2	4.9
Prefer not to answer	1	2.4
<b><i>Highest Educational Attainment</i></b>		
Uneducated	-	-
Primary school	1	2.4
Secondary school	4	9.8
High school	4	9.8
Bachelor degree	27	65.9
Post graduate	5	12.2
<b><i>Health insurance</i></b>		
Universal Coverage Scheme	6	14.6
Employer support	1	2.4
Social Security Scheme	19	46.3
Civil Servant Medical Benefit Scheme	7	17.1
Own pocket	3	7.3
Private Insurance	5	12.2

**Table 5** presents scores of the capability index (the higher, the more capable), quality of life using Visual Analogue Scale—VAS (the higher, the better quality of life), self-assessment (the higher, the more capable to respond to HIV/AIDS), and HIV risk score (the higher, the more vulnerable to HIV infection). It was found that only the “capability index” and quality of life have normal distribution whilst self-assessment skews toward the right side. The majority of samples (38/41, 93%) reported no risk behaviour of HIV infection.

**Table 5: Distribution of different types of outcome measures**

	Possible scores	Survey data		
		Range	Average	SE
“Capability index”	0-18	10-17	13.50	0.25
Quality of life	0-100	14-46	82.00	1.38
Self-assessment score	10-50	50-100	26.40	1.87
HIV risk score	0-7	0-3	0.15	0.89

Using Pearson’s correlation statistics, we explored the correlation among the three outcome measures (i.e., capability index, quality of life, and self-assessment score). Only the capability index and quality of life had significant correlation, as shown in **figures 5 and 6**. This result also confirms findings from the Glasgow’s survey (Lorgelly PK, Lorimer K et al. 2008)

Figure 5: Correlation between quality of life and “capability index”

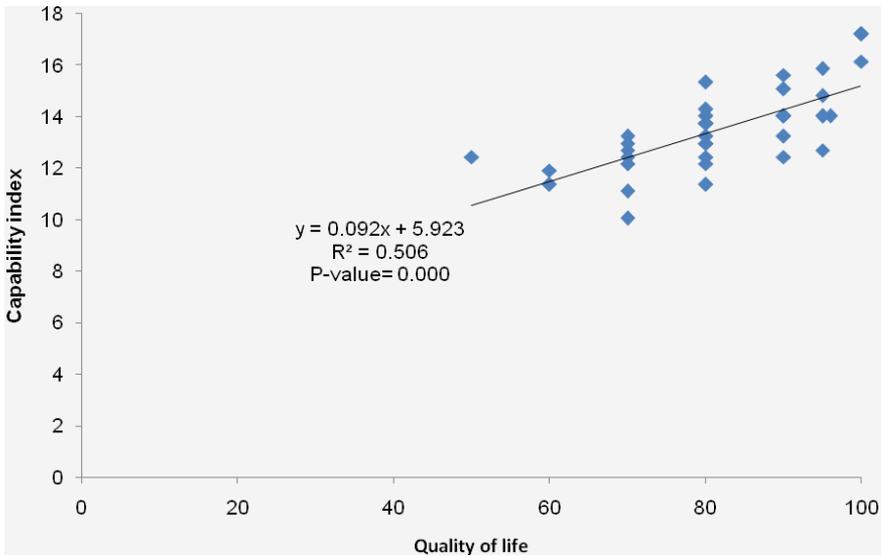
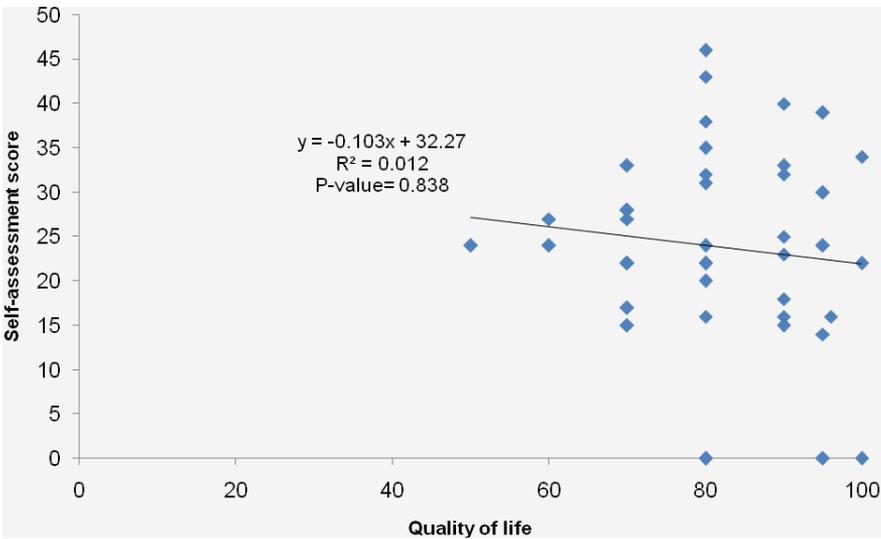
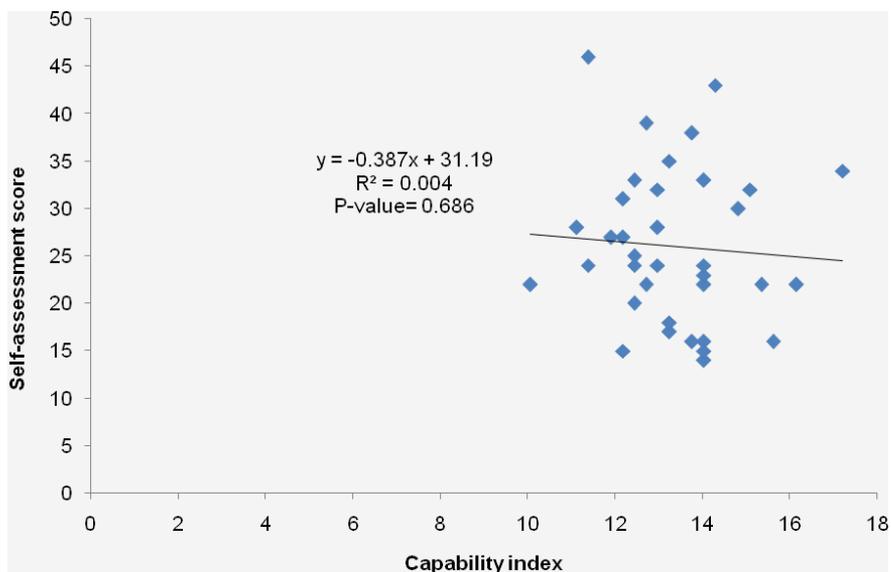


Figure 6: Correlation between self-assessment score and quality of life



**Figure 7: Correlation between self-assessment score and “capacity index”**

Using Cronbach's alpha, the reliability of the capacity index and the self-assessment was acceptable at the level of 0.72 and 0.84, respectively. However, the results show no correlation between these two outcome measures. In addition, several respondents complained about difficulties in completing the self-assessment. The self-assessment was developed for use at community level, for which individuals come together to assess the current situation of HIV/AIDS in the community. Thus, this self-assessment is not suitable for individual use. As a result, we decided to modify the survey questionnaire by removing the self-assessment and including the HIV attitude questions which were modified from the original self-assessment. In addition, the questions assessing HIV knowledge were added in the new survey questionnaire (see **Appendix 4**). The explanation for calculating HIV knowledge score and HIV attitude score are given in **Appendix 5**.

The new questionnaire was tested and used to collect information from general and high-risk populations (i.e., men who have sex with men, MSM) in Nakorn Nayok and Chiang Mai Provinces in September 2010. **Table 6** shows characteristics of 91 respondents, of which 31 (34%) expressed themselves as MSM. A reason that we purposely included MSM in our sample population is that we wanted to test the relationship between capability, quality of life,

and HIV risk behaviors. Given that HIV risk behaviors among the general population are much lower than that in MSM, if we would have not included MSM in our survey, we would have needed a considerably large sample size (of the general population) to have enough power for detecting the relationship between capability, quality of life, and HIV risk behaviors.

**Table 6: Characteristics of the second group of respondents (n=91)**

Variables	Count/Mean	Range/Percentage
Age (years)	34.6 (SE 1.53)	15-68
Male (MSM=31)	61	67
<b>Marital status</b>		
Single		
Married / Partnered	35	38.5
Divorced/Separated	49	53.8
<b>Employment status</b>		
Student		
Government officer	13	14.3
Private organization employee	1	1.1
Own business	4	4.4
Agriculture	11	12.1
Housewife	1	1.1
Labour/day workers	2	2.2
Not working for other reason	39	42.9
Other	8	8.8
<b>Monthly Household Income</b>		
Less than 10,000 per month	49	53.8
10,001 to 20,000 per year	23	25.3
20,001 to 30,000 per year	11	12.1
30,001 to 40,000 per year	3	3.3
40,001 to 50,000 per year	1	1.1
50,000 to 100,000 per year	1	1.1
100,001 or more per year	3	3.3
Prefer not to answer	1	1.1

Variables	Count/Mean	Range/Percentage
<b><i>Highest Educational Attainment</i></b>		
Uneducated	4	4.4
Primary school	35	38.5
Secondary school	44	48.4
High school	3	3.3
Bachelor degree	5	5.5
<b><i>Health insurance</i></b>		
Universal Coverage Scheme	65	71.4
Employer support	1	1.1
Social Security Scheme	19	20.9
Own pocket	5	5.5
Private Insurance	1	1.1

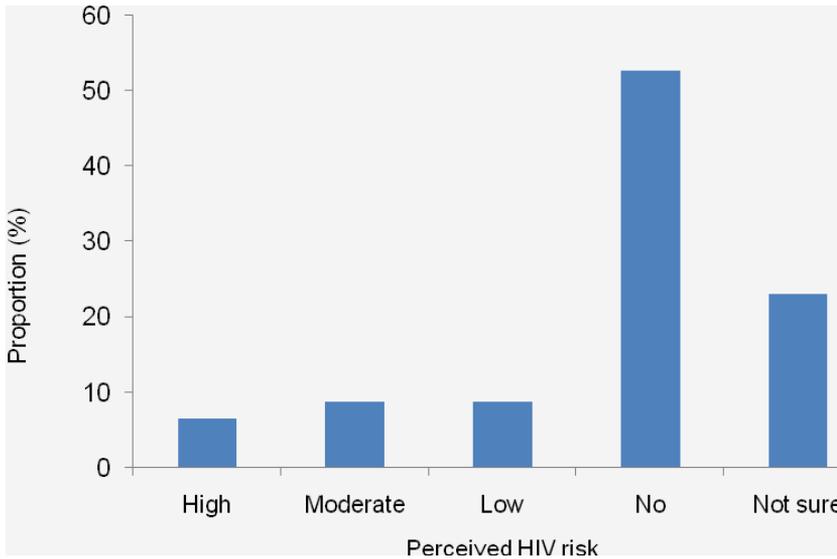
**Table 7** depicts the scores of “capability index”, quality of life, HIV knowledge (the higher score, the better knowledge), HIV attitude (the higher score, the better attitudes towards HIV), and HIV risk behaviour. We found that “capability index”, quality of life, and HIV attitude scores were distributed normally and HIV risk behaviour scores of this group of samples were much higher (mean = 1.27, SE = 0.19) than the first survey (mean = 0.15, SE = 0.89).

**Table 7: Distribution of different types of outcome measures**

	Possible score	Survey data		
		Range	Average	SE
“Capability index”	0-18	7.5-17	12.26	0.18
Quality of Life	0-100	40-100	76.59	1.64
HIV knowledge	0-13	5-13	10.20	0.18
HIV attitude	0-9	1-9	6.07	0.18
HIV risk	0-10	0-6	<b>1.27</b>	<b>0.19</b>

**Figure 8** illustrates the distribution of respondents according to their perceived risk of HIV infection. Around half of the respondents believed that they had no chance of getting infected, followed by 23% of respondents who were uncertain about their own HIV risk. Only 7% perceived themselves at high risk of contracting HIV infection.

**Figure 8: Perceived HIV risk among survey respondents (n=91)**



**Table 8** shows the results from Pearson correlation test between different outcome measures used in our survey. "Capability index" had a positive relationship with quality of life and perceived HIV risk and had a negative relationship with HIV risk. Quality of life had a negative relationship with HIV risk. HIV knowledge had a positive relationship with HIV risk and HIV attitude and a negative relationship with perceived HIV risk. HIV risk had a negative relationship with perceived HIV risk.

**Table 8: Correlation matrix among different outcome measures**

	Capability index	Quality of life	HIV knowledge	HIV risk	Perceived risk
Quality of life	0.471** (p< 0.00)	-			
HIV knowledge	-0.059 (p= 0.58)	-0.116 (p=0.27)	-		
HIV risk	-0.298** (p< 0.00)	-0.318* (p=0.02)	0.384** (p=0.01)	-	
Perceived risk	0.252* (p=0.02)	0.176 (p=0.10)	-0.302** (p=0.00)	-0.398** (p<0.00)	-
HIV attitude	0.004 (p= 0.96)	-0.140 (p=0.17)	0.426** (p=0.00)	0.221* (p=0.03)	-0.21* (p=0.05)

\* 0.05 significant level (2-tailed), \*\* 0.01 significant level (2-tailed).

Taking into account all related parameters, **Table 9** presents results of linear regression for predicting quality of life (ranging 0-100). The model was fitted with R Square of 0.53 and indicated that only “capability index” was a significant determinant on quality of life, that is, the higher capability, the better quality of life.

**Table 9: Multivariate analysis of quality of life scores**

	Coefficient	SE	P-value
Constant	41.85	13.34	.002
Gender Female	4.72	3.40	.169
Age	-0.12	0.11	.265
Education			
Uneducated	-10.38	7.40	.166
Capability index	4.27	0.84	.000
HIV attitude score	-0.82	0.89	.359

Using multivariate analysis, ordinal regression model was constructed to predict HIV risk score. Table 10 shows that “no education” and capability index attributed to HIV risk score. The higher capability the lower HIV risk and “no education” was also related to the lower HIV risk score.

This model did not include gender as an independent variable because we selected MSM to represent high risk population, and so inclusion of gender in the model is not appropriate.

**Table 10: Multivariate analysis of HIV risk score (R<sup>2</sup>=0.44)**

	<b>Coefficient</b>	<b>SE</b>	<b>P-value</b>
Constant	2.61	1.62	.112
Age	-.05	0.01	.000
Education			
Uneducated	0.14	0.78	.859
Capability index	-0.25	0.09	.007
HIV knowledge score	0.31	0.09	.001

We classified our respondents into three groups based on their HIV risk behavior, i.e., first level (HIV risk score= 0), second level (HIV risk score =1-2), and third level (HIV risk score = 3-6). Multinomial logistic regression model was constructed to predict HIV risk level. The model was fitted well with an R Square of 0.5. It was found that the “capability index” is a good predictor for the highest risk level. An increase of 1 unit of the capability index will result in a decrease of the log of the ratio between the two probabilities,  $P(\text{risk of high risk group})/P(\text{risk of non-risk group})$ , of about 0.67. In other words, an increase of one unit in the “capability index” will decrease the relative risk of HIV for the highest risk group (over non-risk group) by around 0.51.

**Table 11: Multinomial logistic analysis by different risk group (reference category is no risk)**

Risk group		B	Std. Error	Sig.	Exp(B)
Moderate risk (HIV risk score 1-2)	Intercept	-6.98	4.68	.136	-
	Age	-0.02	0.04	.620	0.98
	Education	1.03	0.84	.218	2.80
	“Capability index”	-0.21	0.20	.297	0.81
	HIV knowledge score	0.61	0.25	.016	1.85
High risk (HIV risk score 3-6)	Intercept	-4.83	5.70	.397	-
	Age	-0.07	0.05	.153	0.93
	Education	2.56	1.00	.010	13.17
	“Capability index”	<b>-0.67</b>	0.28	.015	<b>0.51</b>
	HIV knowledge score	0.63	0.32	.053	1.87

In conclusion, we demonstrated the possibility of measuring intermediate and final outcomes of the ACP using the “capability index”. This index is an appropriate measure because it was strongly associated with quality of life of population and HIV risk behavior score. The detection of the change in the “capability index” among population affected by the ACP will help estimate the change of quality of life in population (due to the enhancement of individual and community capability—suggesting that a community-focused capability approach has an impact on individual quality of life), and the reduction of HIV risk behaviors, which will result in reduction of HIV infections (or number of HIV infections averted).

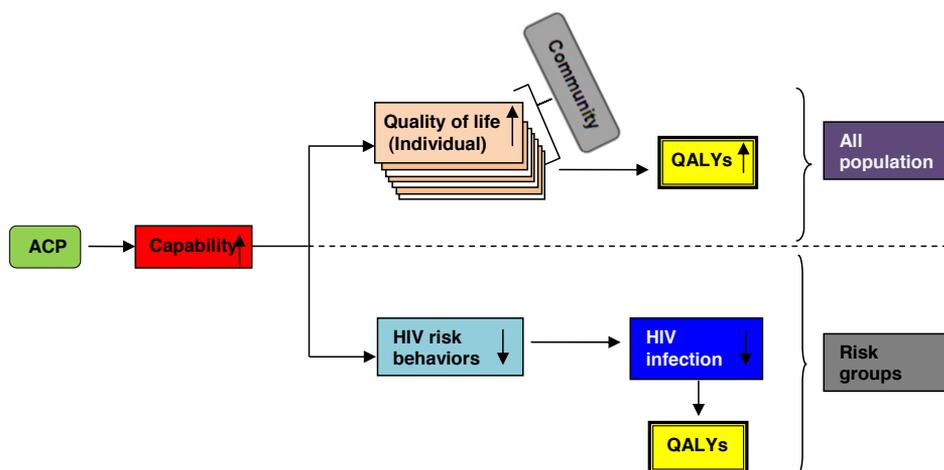
**Figure 9** illustrates the conceptual framework for measuring effectiveness of the ACP. The effectiveness of the ACP can be measured in terms of improvement of individual and community capability. The individual capability can be measured using the “capability index” questions, whilst the community capability can be measured by self-assessment. The change of individual capability can be used to estimate the increase of quality of life among people with and without HIV risk behavior (as a result of their increased functioning<sup>7</sup>)(Lorgelly PK, Lorimer K et al. 2008). The increased capability will reduce HIV risk behavior among risk groups and result

<sup>7</sup> Based on Amartya Sen: functionings represent parts of the state of a person - in particular the various things that he or she manages to do or be in leading a life. The capability of a person reflects the alternative combinations of functionings the person can achieve, and from which he or she can choose one collection.

in subsequent reduction of HIV infections. The decreased incidence of HIV infections means that quality of life and life years (QALYs) were saved.

Without empirical evidence on the change of “capability index” attributable to the ACP, we assumed that the ACP increased the “capability index” score by 1, which is equal to the increased quality of life of 0.04 (utility unit ranges from 0 to 1—see details in page 12).

**Figure 9: The conceptual framework for measuring effectiveness of the ACP**



**Table 12** presents results from the cost-effectiveness model. The first scenario assumed that the facilitators were working with 5,500 community members. These community members then increased the “capability index” score by 1 unit and also increased condom use by 1%. For the null scenario or no ACP introduction the estimated lifetime cost of HIV prevention programme plus treatment for those with HIV infection (estimating that there were 9.72 infected cases) for 5,500 populations is 3.4 million Baht. When the ACP is introduced for this population and condom use increases by 1%, the estimated cost is 9.6 million Baht and the number of HIV infection decreases to 9.49 cases. Life years (LYs) and QALYs of these 5,500 people for the null scenario are 120,238 and 98,595, respectively. It can be seen that LYs and QALYs of the ACP with 1% increased condom use are more than in the null scenario. This is because of the increase in quality of life due to the increase in individual capability and the reduction of number of HIV infections among these population.

The estimated costs and outcomes of various programmes among general population with FSW (the prevalence of FSW is 594 for 5,500 and 162 for 1,500 Thai population) and among general population with MSM (the prevalence of MSM is 66 for 5,500 and 18 for 1,500 Thai population) are also shown in table 12.

**Table 12: Costs and outcomes of the ACP under various scenarios (based on the increase in condom use among general population, female sex workers and men who have sex with men in Thailand)**

	Cost	HIV infected cases	Life Years	QALYs
<b>General population</b>				
Existing HIV prevention programme in 5,500 population	3,381,751	9.72	120,238	98,595
Plus the ACP with increased condom use by 1%	9,598,466	9.49	120,240	103,867
Plus the ACP with increased condom use by 5%	9,337,466	8.66	120,245	103,872
Plus the ACP with increased condom use by 10%	9,058,787	7.79	120,250	103,877
Existing HIV prevention programme in 1,500 population	1,250,799	3.34	34,689	28,445
Plus the ACP with increased condom use by 1%	5,475,504	3.27	34,690	29,966
Plus the ACP with increased condom use by 5%	5,388,951	3.01	34,691	29,967
Plus the ACP with increased condom use by 10%	5,294,446	2.74	34,693	29,969
<b>Men who have Sex with Men</b>				
Existing HIV prevention programme in 5,500 population with 594 female sex workers	13,868,893	29.60	12,838.90	10,525.55
Plus the ACP with increased condom use by 1%	16,686,659	27.77	13,355.65	11,519.95
Plus the ACP with increased condom use by 5%	14,105,538	22.29	13,406.23	11,567.12
Plus the ACP with increased condom use by 10%	11,069,134	15.86	13,465.83	11,622.70
Existing HIV prevention programme in 1,500 population with 162 female sex workers	6,640,919	13.89	3,689.22	3,024.01
Plus the ACP with increased condom use by 1%	9,757,910	13.12	3,801.17	3,275.24
Plus the ACP with increased condom use by 5%	8,524,798	10.55	3,825.52	3,297.94
Plus the ACP with increased condom use by 10%	7,055,217	7.49	3,854.57	3,325.02

	<b>Cost</b>	<b>HIV infected cases</b>	<b>Life Years</b>	<b>QALYs</b>
<b>Female Sex Workers</b>				
Existing HIV prevention programme in 5,500 population with 66 MSM	15,211,092	55.86	1,059.48	868.09
Plus the ACP with increased condom use by 1%	18,089,386	54.71	1,125.05	952.44
Plus the ACP with increased condom use by 5%	15,861,793	49.18	1,168.27	992.75
Plus the ACP with increased condom use by 10%	13,126,050	40.67	1,220.72	1,041.71
Existing HIV prevention programme in 1,500 population with 18 MSM	4,493,115	15.40	307.72	252.07
Plus the ACP with increased condom use by 1%	7,756,970	15.11	322.14	272.51
Plus the ACP with increased condom use by 5%	7,139,044	13.68	334.22	283.78
Plus the ACP with increased condom use by 10%	6,362,774	11.43	349.24	297.79

**Table 13** presents ICERs of the ACP with different levels of increased condom use in general population, FSWs, and MSM. ICERs of the ACP introduced in 5,500 of the general population range from 1,075 Baht per QALY to 1,179 Baht per QALY. ICERs of the ACP introduced in 1,500 of the general population is relatively higher than that for a population of 5,500 because the ACP cost was fixed. ICERs of the ACP in FSW and MSM range from cost-saving (if the ACP increases the condom use in FSW or MSM by 10%) to 159,000 Baht per QALY (if the ACP increases the condom use in MSM by 1% for a general population of 1,500).

**Table 13: Incremental costs and outcomes, and incremental cost-effectiveness ratios (ICERs) of the ACP among general population in Thailand**

	General population 5,500 people increased condom use			General population 1,500 people increased condom use		
	1%	5%	10%	1%	5%	10%
Incremental cost	6,216,714	5,955,715	5,677,036	4,224,705	4,138,153	4,043,647
Incremental HIV averted	0.23	1.06	1.93	0.07	0.33	0.61
Incremental LYs	1.34	6.24	11.49	0.44	2.08	3.87
Incremental QALYs	5,272	5,277	5,281	1,521	1,522	1,524
ICER per HIV averted	27,007,311	5,612,565	2,946,546	59,470,471	12,538,352	6,682,351
ICER per QALY gained	1,179	1,129	1,075	2,778	2,718	2,653

**Table 14: Incremental costs and outcomes, and incremental cost-effectiveness ratios (ICERs) of the ACP among female sex workers and men who have sex with men in Thailand**

	FSW 594: general population 5,500 people increased condom use			FSW 162: general population 1,500 people increased condom use			MSM 66: general population 5,500 people increased condom use			MSM 18: general population 1,500 people increased condom use		
	1%	5%	10%	1%	5%	10%	1%	5%	10%	1%	5%	10%
Incremental cost	2,817,766	236,645	-2,799,758	3,116,992	1,883,879	414,299	2,878,294	650,702	-2,085,041	3,263,855	2,645,930	1,869,659
Incremental HIV averted	1.83	7.31	13.74	0.77	3.34	6.40	1.14	6.68	15.18	0.29	1.72	3.97
Incremental LYs	517	567	627	112	136	165	66	109	161	14	26	42
Incremental QALYs	994	1,042	1,097	251	274	301	84	125	174	20.45	31.71	45.72
ICER per HIV averted	1,537,410	32,373	-203,723	4,052,149	564,014	64,733	2,515,329	97,366	-137,310	11,160,562	1,534,666	471,102
ICER per QALY gained	2,834	227	-2,552	12,407	6,877	1,376	34,122	5,220	-12,009	159,637	83,435	40,897

## Discussion

This study was conducted with some constraints. The ACP was not designed for economic appraisal and, therefore, the availability and quality of cost and outcome data for comprehensive cost-effectiveness or cost-utility analysis were limited. For example, it was difficult to identify information of additional resources used and costs of communities' responses to the ACP. There was no information on how much population was reached by the ACP in Thailand in total and how much the "capability index" score improved as a result of the ACP among those reached by the ACP. Thus, this economic evaluation is rather to explore the information gap for future economic evaluation of the ACP and should guide the ACP's monitoring framework.

Comparing ICERs of the ACP with other HIV prevention programmes from the systematic review carried out by Pattanapasaj and Teerawattananon (Pattanapasaj, Teerawattananon et al. 2008), we found that the ACP is highly cost-effective. The ACP saves one QALY using resources valued less than 1 Gross Domestic Product per capita in Thailand (approximately 140,000 Baht). The ACP is a cost-saving intervention if it increases condom use in FSWs or MSM by more than 10%. In addition, this study suggests that the higher the number of the population reached the ACP, the more cost-effective it is as the ACP not only averts HIV infection in the population, but also improves individual capability resulting in increased quality of life among individuals.

#### **IV. RECOMMENDATIONS FOR MEASURING IMPACT AND IMPROVING EFFICIENCY OF THE ACP**

*“Experience is a hard teacher because she gives the test first  
the lessons afterwards.”*

*Vernon Saunders Law*

Given the challenges of the complexities in decision making and the limitations of currently available tools that cannot measure all relevant benefits of public health interventions, there was an increasing recognition of the need for a better understanding of cross-sectoral impact evaluation (i.e., non-health effects of health care interventions or health impact of programmes in social, education, or environmental protection) (Drummond, Brixner et al. 2009). In other words, it is particularly important for scholars to develop a new, broader, and more valid outcome measure that encompass all aspect of well-being rather than illness-related issues (e.g., disease absence). This is to improve acceptability, transparency and efficiency of public spending, particularly in policy areas using social complex interventions.

This report illustrates methodological challenges in assessing impact and value for money of the ACP, which has multi-dimensional benefits. We explored the feasibility and demonstrated the potential of the “capability index” for measuring effectiveness of the ACP and use in health economic evaluation. It shows how to measure and value the benefits of human capacity development programmes, such as the ACP, for informing policy decisions regarding the allocation of public resources across different health care programmes. This last section aims to provide capacity building recommendations to the CST for routinely measuring impact and improving cost-effectiveness of the ACP. However, these recommendations can also be applied by other agencies who wish to evaluate and value benefits of other social complex interventions.

#### **RECOMMENDATIONS FOR MEASURING IMPACT AND IMPROVING EFFICIENCY OF THE ACP**

The ACP of the Constellation is seen by the evaluation team as a human capacity development activity. Ideally, it should be implemented with close monitoring and evaluation, so that data gathered from the evaluation can feed back for further improvement. These include parameters discussed in the previous chapter, such as population reached by the

ACP, “capability index” score improved as a result of the ACP, resources used and costs of communities’ responses to the ACP. This process should not be seen as a linear or a one-off event but a circular process (i.e., as a research and development loop). As a result, an important function of evaluation is to provide a means to detect problems, identify solutions, and plan for future actions. Although this current evaluation concentrated mainly on the outcome evaluation of the ACP, it is recommended here that there are three important components of the evaluation that are needed for the ACP:

### **1. Formative research**

This involves exploratory work to guide the design of the intervention or implementation activities. This includes pre-testing materials used in the ACP and selection criteria of facilitators to offer the ACP training. As it was emerging during the focus group discussion conducted by the evaluation team, many key informants who were trained by the CST about the ACP raised concerns about the purposive selection of the ACP trainees biased towards those working in the (non-profit) private sector. The awareness of the ACP among public sector employees, such as those in health centres, community hospitals, and district and provincial health offices, would not only offer substantial benefit to the ACP activities, but also benefit their community works by applying the ACP concept. Their inclusion would allow public sector officers to understand and provide appropriate support to the ACP works carried out by facilitators and community members as a whole.

Furthermore, we recommended that the training and subsequent collaboration between the ACP and community facilitators should be more targeted. The training and collaboration should be offered strategically to multi-partners working in the same geographical or similar technical areas. For example, the Constellation may initiate the support for those different stakeholders working in the same province or for those working with youth-related HIV/AIDS programmes in Northern Thailand. This is to ensure that individual, institutional and network capability are all promptly enhanced, which will enable collegial and institutional support to those working in the ACP.

### **2. Process evaluation**

It is important that the evaluation is capable of informing not only whether has the intervention achieved its aims or not but also why, so that the findings can be used to guide further improvement. Whilst outcome/impact evaluation focuses on the ultimate goals of the

programme, this process evaluation is able to provide insights into what factors may hinder or facilitate desirable achievements. Based on our findings, we recommended that the process evaluation is conducted at various levels. First, it is necessary to evaluate the training and supervision processes which are currently carried out by the CST. This evaluation should focus on identifying the most effective and efficient way (of training and supervision) to achieve immediate outcomes among the community facilitators (see **figure 1**). It is possible that this evaluation is performed in a form of experimental design, which is the most robust method of preventing the selection bias that occurs whenever those who are exposed to the intervention differ systematically from those who do not, in ways likely to affect outcomes of interest.

Second, the process evaluation focusing on the applications of the ACP in community engagement among community facilitators is another challenging issue. This evaluation aims to understand how the ACP has been used by facilitators when they work in the community. Qualitative research methods such as focus group discussion, individual interview or observational study can play an important role in this type of evaluation. To our knowledge this evaluation is in line with the current event conducted by the Constellation named “the Knowledge Fair”, where the Constellation provides opportunity for facilitators and other relevant stakeholders to share their experience and expertise working in the communities.

Third, local responses towards human capacity development should be qualitatively and quantitatively assessed in order to demonstrate both desirable and unintended consequences of the ACP. Examples of outcomes to be measured in this process include number of community members aware of the importance of HIV/AIDS and willing to contribute to community activities that aim to prevent or mitigate the HIV/AIDS impact, or case studies that show significant change in community members’ attitude towards HIV/AIDS problems. It may be possible that some of these indicators (e.g., number of those undertaking premarital HIV counseling) be captured through routine administrative data sources, especially when a relatively large population is under evaluation.

### **3. Outcome/impact evaluation**

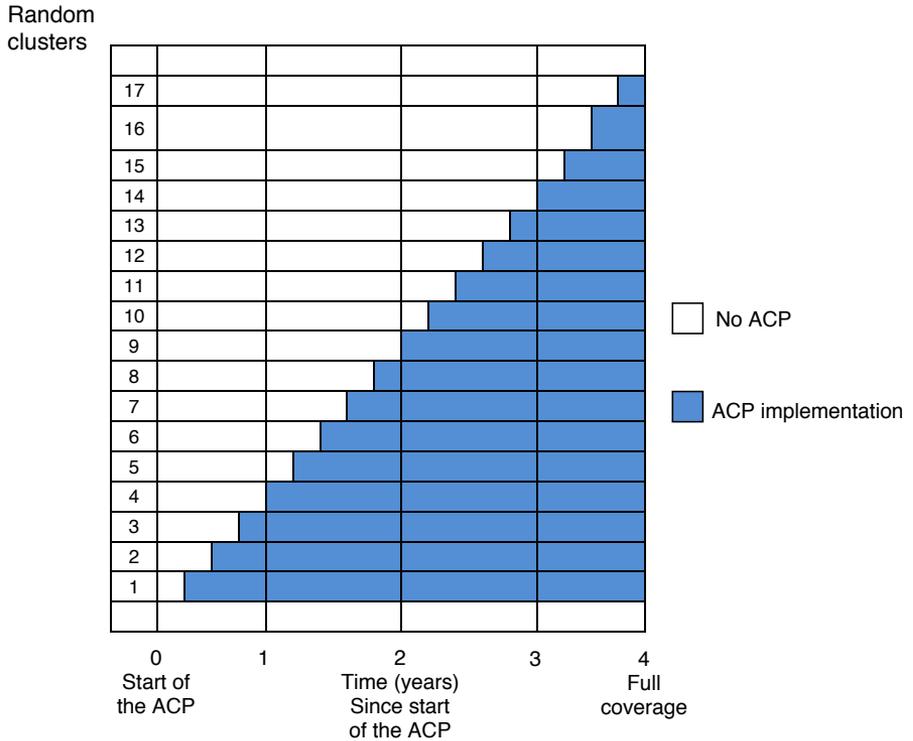
Outcome evaluation aims to examine whether the intervention achieves its pre-defined ultimate goals. This requires the use of indicators by which the outcomes can be measured and reflect the objectives of the intervention. Most of this report devotes to this type of evaluation by identifying appropriate indicators for measuring outcomes of the ACP. It also

offers methodological guidance for and a preliminary example of conducting economic evaluation. However, we strongly suggest conducting further research in this area. Economic evaluation of the ACP should be conducted alongside an assessment of its effectiveness, so its findings are much more acceptable and useful for policy decisions. In addition, the use of modeling in economic evaluation is acceptable for extrapolation of short term outcomes collected from the field to ultimate impact, as shown in an example of economic evaluation in the previous chapter. We recommend that the model should be used in a transparent way but not as a replacement for scientific evidence. Transparency of selection and a clear statement describing the choice of input parameters in a model are very important.

Future research is needed to confirm the usefulness of this newly developed tool for assessing outcomes and impact of the ACP. Nevertheless, due to several limitations, including a multidimensional focus on developing human capacity using knowledge management tools rather than illness and biomedical interventions, the impossibility of imposing tight environmental controls when implementing the intervention, or time and resource limits to evaluate the long-term effects, the methodological standard technique for impact evaluation—randomised controlled trial (RCT) — is inappropriate and potentially misleading. RCTs are most appropriate and effective when the intervention can be delivered and received in a standard way, that is, when variations in delivery and acceptance are minimised.

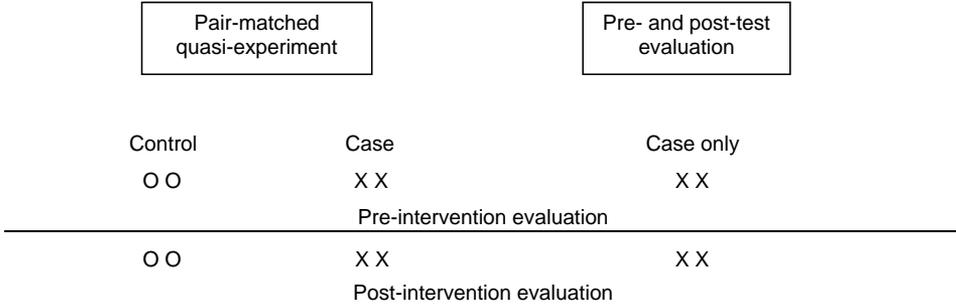
A randomised stepped wedge design allows a randomised controlled trial to be conducted into the phasing (for some populations) before the whole population receives the intervention (see **figure 10**).

**Figure 10: A randomised stepped wedge design**



Alternatively, pair-matched cluster quasi-experiment, or pre- and post test evaluation are among the potential candidates (see **figure 11**). An advantage of pair-matched cluster quasi-experiment over pre- and post- test evaluation is that the former has control group, which is useful for adjusting some confounding, especially those changing overtime. However, a pair-matched cluster quasi-experiment is likely to be more costly than pre- and post test evaluation, because it needs to gather similar data from the control cluster.

**Figure 11: A comparison between pair-matched quasi-experiment and pre- and post-test evaluation**



The ACP does not only affect individuals by directly influencing individuals to change their risk behaviours, but also the community. If the ACP is effective in prevention and control of HIV/AIDS, it is likely that the ACP also changes social norms/context to affect the favourable climate in which desirable outcomes can be achieved. Thus, it is very important for monitoring and evaluation, and improving efficiency of the ACP, that the characteristics and causal relationship between the changes of individuals and their community norms/context are determined. As a result, we recommend that future research should help identify the relationship between the community indicator, self-assessment, and an aggregate indicator, the “capability index”. This would facilitate a better understanding of the importance of community norms/context on the change in individual behaviour and its application to other development projects.

## **CONCLUDING REMARKS**

The scientific information to support the causal relationship between input/output and outcome/impact of HIV prevention is inadequate and fragmented, which results in decision makers currently taking the risk of scaling up HIV prevention interventions of uncertain effectiveness (Antonica Hembe, Innocent Modisaotsile et al. 2006). Properly conducted economic evaluation would present reasoned and justifiable arguments as to why more or less resources should be directed towards particular HIV prevention interventions.

This report presents an attempt to assess the value for money of one of several complex HIV prevention interventions, the ACP. The CST do not directly provide HIV education, condom or clean needles and syringes, but build up individual and community competence to respond to HIV epidemic using their own approaches and resources. Although the evaluation shows that the ACP is likely to be very cost-effective under the Thai and other developing country settings, future research is needed to give reliable information regarding the intervention effectiveness, especially in relation to its ultimate goals (e.g., number of HIV infection averted or QALYs gained). This report recommends effective methods for future monitoring and evaluation, including economic assessment that might be applicable for the evaluation of the ACP as well as other complex social interventions.

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**APPENDIX 1: Self Assessment Framework developed by the Constellation Support Team**

	<b>Level 1. Indicators that show us we are aware</b>	<b>Level 2. We react</b>	<b>Level 3. We act</b>	<b>Level 4. Continuous action, systematizing what we do</b>	<b>Level 5. The practice is part of our life-style</b>
<b>1. Acknowledgement and Recognition</b>	We know that HIV and AIDS exist.	We know enough about HIV/AIDS to respond when something happens.	We publicly recognize that HIV/AIDS is affecting us as a group/community and take occasional action	We regularly discuss AIDS, and have a common program of action to respond.	Our response to AIDS is part of our daily life. We know our own HIV status and act from strength.
<b>2. Inclusion</b>	We are aware of the importance of involving others. - those affected and infected	We co-operate with some people to resolve common issues.	We in our separate groups meet to resolve common issues (e.g. PLWA, youth, women).	Various groups share common goals and define each member's contribution.	Because we work together on HIV/AIDS we can address and resolve other challenges facing us.
<b>3. Linking care and prevention</b>	We have the basic knowledge for prevention and care.	We understand the link between care and prevention.	some of our actions link care and prevention	We systematically link care and prevention activities.	Care strengthens our relationships and helps us to change our behaviour
<b>4. Access to Treatment</b>	We access basic medicines	We have access to simple treatment.	We access treatment for more opportunistic infections, but not ARV.	Some of us are using ARVs regularly.	All those in need of ARV drugs are using them effectively.
<b>5. Identify and address vulnerability</b>	We know who is most vulnerable within our community	We help those more vulnerable to HIV than ourselves.	Our response includes some specific actions to address our own vulnerability to HIV.	We systematically address our own factors of vulnerability	Our actions to address vulnerability to HIV strengthens us in addressing other challenges.

	<b>Level 1. Indicators that show us we are aware</b>	<b>Level 2. We react</b>	<b>Level 3. We act</b>	<b>Level 4. Continuous action, systematizing what we do</b>	<b>Level 5. The practice is part of our life-style</b>
<b>6. Gender</b>	We are aware of gender issues and how they are related to HIV/AIDS	We notice gender issues in our HIV/AIDS work and respond to them	We have started to address gender issues in some of our AIDS work	We regularly consider gender in our HIV/AIDS prevention, care and support	We have mainstreamed gender issues in all our HIV/AIDS work.
<b>7. Learning and transfer</b>	We want to learn and share with others	We adopt good practice from outside.	We sometimes share our points of view to draw lessons from our actions.	We learn, share and apply what we learn regularly, and seek people with relevant experience to help us.	We continuously learn how we can respond better to HIV/AIDS and share our experiences with others.
<b>8. Measuring change and adapting our response</b>	We are aware of the importance of measuring change and adapting our response.	We begin consciously to self measure but we do not yet adapt the result for improvement.	We adapt our response and occasionally measure the improvement	We systematically adapt and can demonstrate measurable improvement	We see implications for the future and continuously adapt to meet them while measuring the change process
<b>9. Ways of working</b>	We are aware that AIDS challenges our ways of working.	We focus on our own strengths to respond.	We work as teams to use our collective strengths and resolve problems as we recognize them	We regularly find our own solutions to access experiences and lessons learnt from others.	We continuously seek to improve our ways of working and share our experience with others.
<b>10. Mobilizing resources</b>	We wait for resources from others who tell us how to use them.	We act when resources are provided to us.	We take some initiatives based on our own resources.	We regularly identify and access additional sources of support to complement our own strengths.	We continuously use our own resources and access other resources to achieve more, and have plans for the future.

## APPENDIX 2: SCORING FOR CAPABILITY INDEX (DEVELOPED BY LORGELLY ETAL), SELF-ASSESSMENT, AND HIV RISK SCORE

- *Capability index*

The capability approach suggests that wellbeing should be measured not according to what individuals actually do (functioning) but what they can do (capabilities). The capability index includes 18 specific questions related to capability (Q11-Q24) which map onto one of Nussbaum's Ten Capabilities: life, bodily health, bodily integrity, senses imagination and thought, emotions, practical reason, affiliation, other species, play, and control over one's environment(Nussbaum 2003).

To estimate the index of capability in this study, the same weight was given to each question, and an index generated by aggregating the scores for all questions. Table I shows how to recode the capability in the binary responses. For example, was capable, recoding 1, if a respondent expected to live their life up to or beyond their estimated life expectancy, their health did not limit their daily activities, and they were able to meet socially with friends, colleagues and family.

**Table 15: Binary responses recoding**

Capabilities	Question	Scoring	
		Yes	No
<b>Bodily health</b>	11. Does your health in any way limit your daily activities, compared to most people of your age?	Yes	No
		0	1
<b>Affiliation</b>	12. Are you able to meet socially with friends, relatives or work colleagues?	Yes	No
		1	0
<b>Life</b>	21. Until what age do you expect to live, given your family history, dietary habits, life style and health status?	S.D > average are coded as a 1, S.D < average are coded as a 0	

Five scale responses were coded as 1, 0.75, 0.5, 0.25 or 0 as shown in table II.

**Table 16: Five scale recoding**

Capabilities	Question	Scoring				
		Very easy	Fairly easy	Neither easy nor difficult	Fairly difficult	Very difficult
Emotions	13. At present how easy or difficult do you find it to enjoy the love care and support of your family and friends?	Very easy	Fairly easy	Neither easy nor difficult	Fairly difficult	Very difficult
		1	0.75	0.5	0.25	0
Emotions	14. In the past 4 weeks, how often have you lost sleep over worry?	Always	Most of the time	Some of the time	Hardly ever	Never
		0	0.25	0.5	0.75	1
Play	15. In the past 4 weeks, how often have you been able to enjoy your recreational activities?	Always	Most of the time	Some of the time	Hardly ever	Never
		1	0.75	0.5	0.25	0
Bodily Health	16. How suitable or unsuitable is your accommodation for your current needs	Very suitable	Fairly suitable	Neither suitable nor unsuitable	Fairly unsuitable	Very unsuitable
		1	0.75	0.5	0.25	0
Bodily Integrity	17. Please indicate how safe you feel walking alone in the area near your home?	Very safe	Fairly safe	Neither safe nor unsafe	Fairly unsafe	Very unsafe
		1	0.75	0.5	0.25	0
Bodily Integrity	18. Please indicate how likely do you believe it to be that you will be assaulted in the future (including sexual and domestic assault)?	Very likely	Likely	Neither likely nor unlikely	Unlikely	Very unlikely
		0	0.25	0.5	0.75	1
Control over one's life	19. In your current or future employment, how likely do you think it is that you will experience discrimination? (e.g. because of your race, gender, religion, sexual orientation, age, or health)?	Very likely	Likely	Neither likely nor unlikely	Unlikely	Very unlikely
		0	0.25	0.5	0.75	1
Affiliation	20. Outside of any employment, in your everyday life, how likely do you think it is that you will experience discrimination?	Very likely	Likely	Neither likely nor unlikely	Unlikely	Very unlikely
		0	0.25	0.5	0.75	1

**Table 17: Five scale recoding (continue)**

Capabilities	Questions	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
<b>Control over one's life</b>	22.1 I am able to influence decisions affecting my local area.	1	0.75	0.5	0.25	1
<b>Sense, Imagination and Thought</b>	22.2 I am able to express my views, including political and religious views	1	0.75	0.5	0.25	1
<b>Species</b>	22.3 I am able to appreciate and value plants, animals and the world of nature	1	0.75	0.5	0.25	1
<b>Affiliation</b>	22.4 I am able to respect value and appreciate people around me.	1	0.75	0.5	0.25	1
<b>Practical Reason</b>	22.5 I am free to decide for myself how to live my life.	1	0.75	0.5	0.25	1
<b>Sense, Imagination and Thought</b>	22.6 I am free to use my imagination and to express myself creatively (e.g. through art, literature, music etc).	1	0.75	0.5	0.25	1

- *Self-assessment*

This diagram (see appendix 1) is used to follow up the process of capability of HIV/AIDS management in one's own community. This is an instrument to evaluate where one stands in the evaluation process. Each line treats an aspect of the mainstreaming process. Each column shows the level of one's perception of the HIV/AIDS competence of their own community. The score is valued by level of each aspect of HIV/AIDS competence i.e. level 1 is valued as 1 while level 5 is valued as 5. The maximum score is 40 and the minimum score can be zero.

- *HIV risk score*

HIV risk score was calculated according to five domains as shown in **table IV**. For the general population, the HIV risk score ranges from 0-7 and 3-9 for commercial sex workers who are men who have sex with men.

**Table 18: Scoring system of HIV risk score**

Items	Response	General population	Commercial sex workers who are MSM
• MSM	Yes	2	2
	No	0	NA
• Using condom every time having sex with clients	Yes		1*
	No		2
• Sharing needle with others	Yes	2	2
	No	0	0
• Using condom every time having sex with extra-marital or non-regular partner	Yes	0	0
	No	2	2
• Has ever been diagnosed with a sexually transmitted disease	Yes	2	2
	No	0	0
minimum-maximum score		0-8	3-9

\* more likely that condoms were broken sometime

### APPENDIX 3: FIRST VERSION OF THE SURVEY QUESTIONNAIRE

No.....

#### **Life competence and HIV/AIDS management questionnaire**

**All questions contained in this questionnaire are strictly confidential**

#### **OBJECTIVE**

This survey aims to measure participants' quality of life and their ability to cope with HIV/AIDS, which is considered the one of the most severe diseases in Thailand. This *survey will be kept strictly confidential*, and individuals will not be identified. The results of this study will be used for academic purposes. Also, it will help in identifying and developing mechanisms for preventing HIV at the community level.

#### **HOW TO COMPLETE THIS QUESTIONNAIRE:**

There are no right or wrong answers, and we are only interested in your own views. Please try to answer every question. Most questions ask you to tick a box like this ; others ask you to circle a number or a choice. Please only provide one answer, unless the question states 'Please tick all that apply', in which case you should tick all boxes that are relevant. If you wish to change your answer, put a large cross through it and clearly mark your preferred answer.

If you have any questions about this questionnaire or this study please contact Inthira Yamabhai at the address below.

Inthira Yamabhai

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<b>PART I: PERSONAL background</b>	
<b>1. Are you:</b> (Please tick one) <input type="checkbox"/> M <input type="checkbox"/> F	<b>2. How old are you?</b> (Please give age in years) <input style="width: 40px;" type="text"/>
<b>3. Which of these best applies to you?</b> [Please tick one] <input type="checkbox"/> Student <input type="checkbox"/> Government officer <input type="checkbox"/> Private Organization Employee <input type="checkbox"/> Own business <input type="checkbox"/> Agriculture <input type="checkbox"/> Housewife <input type="checkbox"/> Labourer/day worker <input type="checkbox"/> Not working for other reason <input type="checkbox"/> Others:.....	
<b>4. Marital status:</b>	<input type="checkbox"/> Single <input type="checkbox"/> Married / Partner <input type="checkbox"/> Divorced/Separated
<b>5. How many dependent children do you have-that are dependent on your income?</b> (Please circle one number) None                      1                      2                      3                      4                      More than 4	
<b>6. What is the highest educational qualification you have?</b> (Please tick one)	<input type="checkbox"/> Uneducated <input type="checkbox"/> Bachelor degree
	<input type="checkbox"/> Primary school <input type="checkbox"/> Post graduate degree
	<input type="checkbox"/> Secondary school <input type="checkbox"/> Prefer not to answer
	<input type="checkbox"/> High school
<b>7. What is your gross household income?</b> <i>Gross household income is the combined money earned from wages, salaries, benefits or rents and BEFORE tax and contributions to national insurance are deducted. (Please tick one)</i>	<input type="checkbox"/> less than 10,000 Baht <input type="checkbox"/> 40,001-50,000 Baht
	<input type="checkbox"/> 10,001 to 20,000 Baht <input type="checkbox"/> 50,001-100,000 Baht
	<input type="checkbox"/> 20,001-30,000 Baht <input type="checkbox"/> more than 100,001 Baht
	<input type="checkbox"/> 30,001-40,000 Baht <input type="checkbox"/> Prefer not to answer
<b>8. What are/is your health insurance?</b> (Please tick all that apply)	<input type="checkbox"/> Universal Coverage Scheme <input type="checkbox"/> Employer support
	<input type="checkbox"/> Social Security Scheme <input type="checkbox"/> Civil Servant Medical Benefit Scheme
	<input type="checkbox"/> Own pocket <input type="checkbox"/> Private Insurance
	<input type="checkbox"/> Others.....
<b>9. Do you have life insurance?</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>10. Which of these applies to your home?</b> (Please tick one)	<input type="checkbox"/> I own my home outright/or on a mortgage <b>→ Please go to next page (Question 11)</b>
	<input type="checkbox"/> I rent a house
	<input type="checkbox"/> I live with my parents/family
	<input type="checkbox"/> Other..... <b>→ Please go to next question (Question 10.1)</b>
<b>10.1. For which of the following reasons, if any, have you NOT bought your home? (Please tick ALL that apply)</b>	<input type="checkbox"/> I cannot afford to buy
	<input type="checkbox"/> I cannot obtain a mortgage
	<input type="checkbox"/> I think it is a bad time to buy
	<input type="checkbox"/> There is a lack of available housing to buy
	<input type="checkbox"/> Some other reasons

## PART II: CAPABILITY

Please tick one box of each statement.

Bodily health	11. Does your health in any way limit your daily activities, compared to most people of your age? [Please tick one]	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Affiliation	12. Are you able to meet socially with friends, relatives or work colleagues? [Please tick one]	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Emotions	13. At present how easy or difficult do you find it to enjoy the love, care and support of your family and friends? [Please tick one]	Very easy <input type="checkbox"/>	Fairly easy <input type="checkbox"/>	Neither easy nor difficult <input type="checkbox"/>	Fairly difficult <input type="checkbox"/>	Very difficult <input type="checkbox"/>
Emotions	14. In the past 4 weeks, how often have you lost sleep over worry? [Please tick one]	Always <input type="checkbox"/>	Most of the time <input type="checkbox"/>	Some of the time <input type="checkbox"/>	Hardly ever <input type="checkbox"/>	Never <input type="checkbox"/>
Play	15. In the past 4 weeks, how often have you been able to enjoy your recreational activities? [Please tick one]	Always <input type="checkbox"/>	Most of the time <input type="checkbox"/>	Some of the time <input type="checkbox"/>	Hardly ever <input type="checkbox"/>	Never <input type="checkbox"/>
Bodily Health	16. How suitable or unsuitable is your accommodation for your current needs	Very suitable <input type="checkbox"/>	Fairly suitable <input type="checkbox"/>	Neither suitable nor unsuitable <input type="checkbox"/>	Fairly unsuitable <input type="checkbox"/>	Very unsuitable <input type="checkbox"/>
Bodily Integrity	17. Please indicate how safe you feel walking alone in the area near your home? [Please tick one]	Very safe <input type="checkbox"/>	Fairly safe <input type="checkbox"/>	Neither safe nor unsafe <input type="checkbox"/>	Fairly unsafe <input type="checkbox"/>	Very unsafe <input type="checkbox"/>
Bodily Integrity	18. Please indicate how likely you believe it to be that you will be assaulted in the future (including sexual and domestic assault)? [Please tick one]	Very likely <input type="checkbox"/>	Likely <input type="checkbox"/>	Neither likely nor unlikely <input type="checkbox"/>	Unlikely <input type="checkbox"/>	Very unlikely <input type="checkbox"/>
Control over one's life	19. In your current or future employment, how likely do you think it is that you will experience discrimination? (e.g. because of your race, gender, religion, sexual orientation, age, or health)? [Please tick one]	Very likely <input type="checkbox"/>	Likely <input type="checkbox"/>	Neither likely nor unlikely <input type="checkbox"/>	Unlikely <input type="checkbox"/>	Very unlikely <input type="checkbox"/>
Affiliation	20. Outside of any employment, in your everyday life, how likely do you think it is that you will experience discrimination? [Please tick one]	Very likely <input type="checkbox"/>	Likely <input type="checkbox"/>	Neither likely nor unlikely <input type="checkbox"/>	Unlikely <input type="checkbox"/>	Very unlikely <input type="checkbox"/>
21. Until what age do you expect to live, given your family history, dietary habits, lifestyle and health status? [Please enter a number]						<input style="width: 50px; height: 20px;" type="text"/>

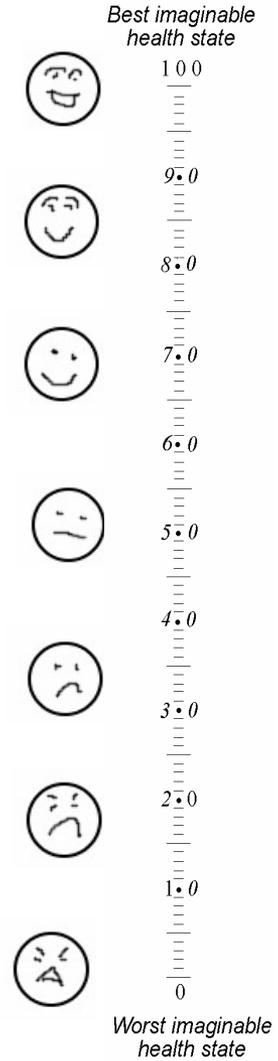
**22. Please indicate how strongly you agree or disagree with the following statements:**

(Please tick one box for each statement)

		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
<b>Control over one's life</b>	22.1 I am able to influence decisions affecting my local area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Sense, Imagination and Thoughts</b>	22.2 I am able to express my views, including political and religious views	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>The environment</b>	22.3 I am able to appreciate and value plants, animals and the world of nature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Affiliation</b>	22.4 I am able to respect, value and appreciate the people around me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Freedom</b>	22.5 I am free to decide for myself how to live my life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Sense, Imagination and Thoughts</b>	22.6 I am free to use my imagination and to express myself creatively (e.g. through art, literature, music etc).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**PART III: Visual Analogue Scale**

23. Please note the card with a vertical scale ranging from 0 to 100, with the 0 referring to your worst imaginable health state and 100 referring to your best imaginable health state. Please write any number between 0 and 100 that describes your quality of life today:



## PART IV: HIV/AIDS Assessment

24. Please tick one box  for each item that is the most suitable for you.

	Level 1	Level 2	Level 3	Level 4	Level 5
<b>24.1 Acknowledgement and Recognition</b>	I know the basic facts about HIV/AIDS, how it spreads and its effects. <input type="checkbox"/>	I recognise that HIV/AIDS is more than a health problem alone. <input type="checkbox"/>	I recognise that HIV/AIDS is affecting us as a group/ community and I discuss it amongst neighbors. Some of us get tested. <input type="checkbox"/>	I acknowledge openly our concerns and challenges of HIV/AIDS. I seek others for mutual support and learning. <input type="checkbox"/>	I go for testing consciously. I recognise our own strength to deal with the challenges and anticipate a better future. <input type="checkbox"/>
<b>24.2 Inclusion</b>	I don't involve those affected by the problem. <input type="checkbox"/>	I co-operate with some people who are useful to resolve common issues. <input type="checkbox"/>	I in our separate groups meet to resolve common issues (e.g. PLWA, youth, and women). <input type="checkbox"/>	Separate groups share common goals and define each member's contribution. <input type="checkbox"/>	Because I work together on HIV/AIDS I can address and resolve other challenges facing our community. <input type="checkbox"/>
<b>24.3 Care and prevention</b>	I relay externally provided messages about care and prevention. <input type="checkbox"/>	I look after those unable to care for themselves (sick, orphans, elderly). I discuss the need to change behaviors. <input type="checkbox"/>	I take action because I need to and I have a process to care for others long term. <input type="checkbox"/>	As a community I initiate care and prevention activities, and work in partnership with external services. <input type="checkbox"/>	Through care I see changes in behavior which improve the quality of life for all. <input type="checkbox"/>
<b>24.4 Access to Treatment</b>	I don't aware and want any treatment for HIV/AIDS <input type="checkbox"/>	I am aware of the treatments available but don't know how and where to get them. <input type="checkbox"/>	I know how to get the treatment for opportunity infections but not anti-retroviral drugs (ARVs) <input type="checkbox"/>	I know how and where to access anti-retroviral drugs (ARVs) <input type="checkbox"/>	ARV drugs are available to all who need them, are successful procured and effectively used. <input type="checkbox"/>
<b>24.5 Identify and address vulnerability</b>	I am aware of the general factors of vulnerability and the risks affecting us. <input type="checkbox"/>	I have identified our areas of vulnerability and risk. (e.g. using mapping as a tool) <input type="checkbox"/>	I have a clear approach to address vulnerability and risk, and I have assessed the impact of the approach. <input type="checkbox"/>	I implement our approach using accessible resources and capacities. <input type="checkbox"/>	I am addressing vulnerability in other aspects of the life of our group. <input type="checkbox"/>
<b>24.6 Learning and transfer</b>	I learn from our actions. <input type="checkbox"/>	I share learning from our successes but not our mistakes. I adopt good practice from outside. <input type="checkbox"/>	I am willing to try out and adapt what works elsewhere. I share willingly with those who ask. <input type="checkbox"/>	I learn, share and apply what I learn regularly, and seek people with relevant experience to help us. <input type="checkbox"/>	I continuously learn how I can respond better to HIV/AIDS and share it with those I think will benefit. <input type="checkbox"/>
<b>24.7 Measuring change</b>	I are changing because I believe it is the right thing to do but do not measure the impact. <input type="checkbox"/>	I begin consciously to self measure. <input type="checkbox"/>	I occasionally measure our own group's change and set targets for improvement. <input type="checkbox"/>	I measure our change continuously and can demonstrate measurable improvement. <input type="checkbox"/>	I invite others ideas about how to measure change and share learning and results. <input type="checkbox"/>
<b>24.8 Adapting our Response</b>	I see no need to adapt, because I am doing something useful. <input type="checkbox"/>	I am changing our response as a result of external influences and groups. <input type="checkbox"/>	I am aware of the change around us and I take the decision to adapt because I need to. <input type="checkbox"/>	I recognise that I continually need to adapt. <input type="checkbox"/>	I see implications for the future and adapt to meet them. <input type="checkbox"/>

	Level 1	Level 2	Level 3	Level 4	Level 5
<b>24.9 Ways of working</b>	I wait for others to tell us what to do and provide the resources to do so. <input type="checkbox"/>	I work as individuals, attempting to control the situation, even when I feel helpless. <input type="checkbox"/>	I work as teams to solve problems as I recognise them. If someone needs help I share what I can. <input type="checkbox"/>	I find our own solutions and access help from others where I can. <input type="checkbox"/>	I believe in our own and others capacity to succeed. I share ways of working that help others succeed. <input type="checkbox"/>
<b>24.10 Mobilising resources</b>	I know what I want to achieve but don't have the means to do it. <input type="checkbox"/>	I can demonstrate some progress by our own resources. <input type="checkbox"/>	I have prepared project proposals and identified sources of support. <input type="checkbox"/>	I access resources to address the problems of our community, because others want to support us. <input type="checkbox"/>	I use our community's resources, access other resources to achieve more and have planned for the future. <input type="checkbox"/>

### PART V: Risk Factors

In order to understand your risk factors for HIV, we have to ask you some very personal questions. You may be embarrassed but your answers are very important. Knowing your risk factors for HIV may help keep you and others you care about healthier. We encourage you to talk to the medical staff about your concerns and ask any questions you may have. All information is kept strictly confidential. Be sure to answer each question using a check mark.

1. During 12 months, did you have sex with a male?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. During 12 months, did you have sex with a female?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Did you use needles to inject heroin, cocaine, steroids or any other drug that was not prescribed by a doctor? <input type="checkbox"/> Yes <input type="checkbox"/> No		
4. During 12 months, have you ever had extra-marital sexual relationship? If <u>yes</u> did you use condom every time when you had a sexual intercourse?	<input type="checkbox"/> Yes <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> No
5. Have you ever been diagnosed with sexually transmitted diseases?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
6. Have you ever had HIV/AIDS test?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
7. At present, what are your chances of getting infected with HIV, the virus that causes AIDS? (Please circle)		
High      Medium      Low      None      Don't know/Not sure		

-----Thank you for your cooperation-----

**APPENDIX 4: FINAL VERSION OF THE SURVEY QUESTIONNAIRE**

No.....

**Life competence and HIV/AIDS management questionnaire**

**All questions contained in this questionnaire are strictly confidential**

**OBJECTIVE**

This survey aims to measure participants' quality of life and their ability to cope with HIV/AIDS, which is considered the one of the most severe diseases in Thailand. This *survey will be kept strictly confidential*, and individuals will not be identified. The results of this study will be used for academic purposes. Also, it will help in identifying and developing mechanisms for preventing HIV at the community level.

**HOW TO COMPLETE THIS QUESTIONNAIRE:**

There are no right or wrong answers, and we are only interested in your own views. Please try to answer every question. Most questions ask you to tick a box like this ; others ask you to circle a number or a choice. Please only provide one answer, unless the question states 'Please tick all that apply', in which case you should tick all boxes that are relevant. If you wish to change your answer, put a large cross through it and clearly mark your preferred answer.

If you have any questions about this questionnaire or this study please contact Inthira Yamabhai at the address below.

Inthira Yamabhai

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Ministry of Public Health  
Tiwanon Rd. Nonthaburi 11000

Tel. 02-590-4549  
Fax. 02-590-4369  
Email: inthira.y@hitap.net

<b>PART I: PERSONAL background</b>	
<b>1. Are you:</b> (Please tick one) <input type="checkbox"/> M <input type="checkbox"/> F	<b>2. How old are you?</b> (Please give age in years) <input style="width: 40px;" type="text"/>
<b>3. Which of these best applies to you?</b> [Please tick one]	
<input type="checkbox"/> Student <input type="checkbox"/> Government officer <input type="checkbox"/> Private Organization Employee <input type="checkbox"/> Own business <input type="checkbox"/> Agriculture <input type="checkbox"/> Housewife <input type="checkbox"/> Labourer/day worker <input type="checkbox"/> Not working for other reason <input type="checkbox"/> Others:.....	
<b>4. Marital status:</b>	<input type="checkbox"/> Single <input type="checkbox"/> Married / Partner <input type="checkbox"/> Divorced/Separated
<b>5. How many dependent children do you have-that are dependent on your income?</b> (Please circle one number)	
None      1      2      3      4      More than 4	
<b>6. What is the highest educational qualification you have?</b> (Please tick one)	<input type="checkbox"/> Uneducated <input type="checkbox"/> Bachelor degree
	<input type="checkbox"/> Primary school <input type="checkbox"/> Post graduate degree
	<input type="checkbox"/> Secondary school <input type="checkbox"/> Prefer not to answer
	<input type="checkbox"/> High school
<b>7. What is your gross household income?</b> <i>Gross household income is the combined money earned from wages, salaries, benefits or rents and BEFORE tax and contributions to national insurance are deducted. (Please tick one)</i>	<input type="checkbox"/> less than 10,000 Baht <input type="checkbox"/> 40,001-50,000 Baht
	<input type="checkbox"/> 10,001 to 20,000 Baht <input type="checkbox"/> 50,001-100,000 Baht
	<input type="checkbox"/> 20,001-30,000 Baht <input type="checkbox"/> more than 100,001 Baht
	<input type="checkbox"/> 30,001-40,000 Baht <input type="checkbox"/> Prefer not to answer
<b>8. What are/is your health insurance?</b> (Please tick all that apply)	<input type="checkbox"/> Universal Coverage Scheme <input type="checkbox"/> Employer support
	<input type="checkbox"/> Social Security Scheme <input type="checkbox"/> Civil Servant Medical Benefit Scheme
	<input type="checkbox"/> Own pocket <input type="checkbox"/> Private Insurance
	<input type="checkbox"/> Others.....
<b>9. Do you have life insurance?</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>10. Which of these applies to your home?</b> (Please tick one)	<input type="checkbox"/> I own my home outright/or on a mortgage <b>Please go to next page (Question 11)</b>
	<input type="checkbox"/> I rent a house
	<input type="checkbox"/> I live with my parents/family
	<input type="checkbox"/> Other..... <b>Please go to next question (Question 10.1)</b>
<b>10.1. For which of the following reasons, if any, have you NOT bought your home?</b> (Please tick ALL that apply)	<input type="checkbox"/> I cannot afford to buy
	<input type="checkbox"/> I cannot obtain a mortgage
	<input type="checkbox"/> I think it is a bad time to buy
	<input type="checkbox"/> There is a lack of available housing to buy
	<input type="checkbox"/> Some other reasons

## PART II: CAPABILITY

Please tick one box of each statement.

Bodily health	11. Does your health in any way limit your daily activities, compared to most people of your age? [Please tick one]	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Affiliation	12. Are you able to meet socially with friends, relatives or work colleagues? [Please tick one]	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Emotions	13. At present how easy or difficult do you find it to enjoy the love, care and support of your family and friends? [Please tick one]	Very easy <input type="checkbox"/>	Fairly easy <input type="checkbox"/>	Neither easy nor difficult <input type="checkbox"/>	Fairly difficult <input type="checkbox"/>	Very difficult <input type="checkbox"/>
Emotions	14. In the past 4 weeks, how often have you lost sleep over worry? [Please tick one]	Always <input type="checkbox"/>	Most of the time <input type="checkbox"/>	Some of the time <input type="checkbox"/>	Hardly ever <input type="checkbox"/>	Never <input type="checkbox"/>
Play	15. In the past 4 weeks, how often have you been able to enjoy your recreational activities? [Please tick one]	Always <input type="checkbox"/>	Most of the time <input type="checkbox"/>	Some of the time <input type="checkbox"/>	Hardly ever <input type="checkbox"/>	Never <input type="checkbox"/>
Bodily Health	16. How suitable or unsuitable is your accommodation for your current needs	Very suitable <input type="checkbox"/>	Fairly suitable <input type="checkbox"/>	Neither suitable nor unsuitable <input type="checkbox"/>	Fairly unsuitable <input type="checkbox"/>	Very unsuitable <input type="checkbox"/>
Bodily Integrity	17. Please indicate how safe you feel walking alone in the area near your home? [Please tick one]	Very safe <input type="checkbox"/>	Fairly safe <input type="checkbox"/>	Neither safe nor unsafe <input type="checkbox"/>	Fairly unsafe <input type="checkbox"/>	Very unsafe <input type="checkbox"/>
Bodily Integrity	18. Please indicate how likely you believe it to be that you will be assaulted in the future (including sexual and domestic assault)? [Please tick one]	Very likely <input type="checkbox"/>	Likely <input type="checkbox"/>	Neither likely nor unlikely <input type="checkbox"/>	Unlikely <input type="checkbox"/>	Very unlikely <input type="checkbox"/>
Control over one's life	19. In your current or future employment, how likely do you think it is that you will experience discrimination? (e.g. because of your race, gender, religion, sexual orientation, age, or health)? [Please tick one]	Very likely <input type="checkbox"/>	Likely <input type="checkbox"/>	Neither likely nor unlikely <input type="checkbox"/>	Unlikely <input type="checkbox"/>	Very unlikely <input type="checkbox"/>
Affiliation	20. Outside of any employment, in your everyday life, how likely do you think it is that you will experience discrimination? [Please tick one]	Very likely <input type="checkbox"/>	Likely <input type="checkbox"/>	Neither likely nor unlikely <input type="checkbox"/>	Unlikely <input type="checkbox"/>	Very unlikely <input type="checkbox"/>
21. Until what age do you expect to live, given your family history, dietary habits, lifestyle and health status? [Please enter a number]						<input style="width: 50px; height: 20px;" type="text"/>

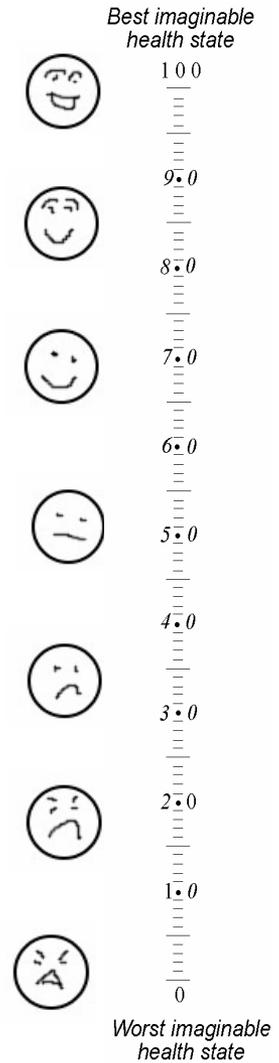
**22. Please indicate how strongly you agree or disagree with the following statements:**

(Please tick one box for each statement)

		<b>Strongly agree</b>	<b>Agree</b>	<b>Neither agree nor disagree</b>	<b>Disagree</b>	<b>Strongly disagree</b>
<b>Control over one's life</b>	22.1 I am able to influence decisions affecting my local area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Sense, Imagination and Thoughts</b>	22.2 I am able to express my views, including political and religious views	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>The environment</b>	22.3 I am able to appreciate and value plants, animals and the world of nature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Affiliation</b>	22.4 I am able to respect, value and appreciate the people around me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Freedom</b>	22.5 I am free to decide for myself how to live my life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Sense, Imagination and Thoughts</b>	22.6 I am free to use my imagination and to express myself creatively (e.g. through art, literature, music etc).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**PART III: Visual Analogue Scale**

23. Please note the card with a vertical scale ranging from 0 to 100, with the 0 referring to your worst imaginable health state and 100 referring to your best imaginable health state. Please write any number between 0 and 100 that describes your quality of life today:



**PART IV: HIV/AIDS Awareness**

24. Please tick one box  for each item that is the most suitable for you.

Questions	Yes	No	Not sure
1. HIV/AIDS a sexually transmitted disease			
2. HIV/AIDS can be passed on from mother to child during pregnancy and childbirth			
3. A person can get HIV/AIDS from pets or insects i.e. mosquitoes, ticks			
4. A person can get HIV/AIDS by transmission through the air, by coughing, or by touching someone who is infected			
5. A person can get HIV/AIDS by sharing a meal or belongings with someone who is infected			
6. A person runs the risk of contracting HIV/AIDS by getting injections with a shared needle			
7. A healthy-looking person can be infected with HIV, the virus that causes AIDS			
8. In general, a blood test is the only way to check for the AIDS virus (HIV)			
9. HIV/AIDS is not a curable disease.			
10. At present, there are anti-virus medicines.			
11. Using condoms can protect against HIV/AIDS infection			
12. A blood test before getting married or pregnant can protect against HIV/AIDS dissemination			
13. An HIV/AIDS infected man, if sterilized, cannot pass on the disease to his partner			
14. You do not want to interact with HIV/AIDS infected persons			
15. A person who has many partners or often has sex with sex-workers, but shows no symptoms of infection, might be immune to HIV/AIDS			
16. There is no need to use a condom every time you have sex with casual partner			
17. Your community is not at risk of HIV/AIDS			
18. HIV/AIDS is a private issue, and is not your problem			
19. You agree with free treatments for HIV/AIDS infected people supported by the government			
20. Males should play a dominant role in solving the HIV/AIDS problem or in protecting against HIV/AIDS			
21. HIV/AIDS is an important problem, and organizations at both the provincial and national levels should take responsibility to solve this problem. It is no need to share resources from community			
22. HIV/AIDS problem is complex, and community members are the most important people to solve the problem.			

### PART V: Risk Factors

In order to understand your risk factor for HIV, we have to ask you some very personal questions. You may be embarrassed, but your answers are very important. Knowing your risk factor for HIV may help keep you and others you care about healthier. We encourage you to talk to the medical staff about your concerns and ask any questions you may have. All information is kept strictly confidential. Be sure to answer each question using a check mark.

1. Think about the sexual partners you've had in the last 3 months. Have you had sex with : Please put ✓ in <input type="checkbox"/> (can select more than one)	
<input type="checkbox"/> Commercial partners (whom you had sex in exchange for money) <input type="checkbox"/> Regular partners (Your spouse(s) or live-in sexual partners) <input type="checkbox"/> Non-regular partners (Sexual partners that you are not married to and have never lived with and did not pay) <input type="checkbox"/> No one (Skip to question 26)	
2. Your sex partner is <input type="checkbox"/> Man <input type="checkbox"/> Woman <input type="checkbox"/> Both sexes	
<b>Part 1</b>	
<b>HAD SEX WITH COMMERCIAL PARTNER (S) DURING THE PAST WEEK</b> <div style="text-align: center;">↓</div> <b>Please answer question 3</b>	<b>DID NOT HAVE SEX WITH COMMERCIAL PARTNER(S) DURING LAST 1 WEEK</b> <div style="text-align: center;">↓</div> <b>Skip to Part2</b>
3. At what age did you first have sexual intercourse with any commercial partner? (Sexual intercourse is defined here as penetrative vaginal or anal sex)	Age in completed years <input type="checkbox"/> <input type="checkbox"/>
4. Do you generally use condoms with your commercial partners?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Others (Specify) _____
5. In general, with what frequency do you use a condom with your commercial partners?	<input type="checkbox"/> Every time..... <input type="checkbox"/> Sometimes..... <input type="checkbox"/> Never..... <input type="checkbox"/> Others (Specify) _____
6. How many clients did you have for your last working day?	<input type="checkbox"/> <input type="checkbox"/>
7. The last time you had sex with a commercial partner, did you use a condom?	<input type="checkbox"/> Yes (answer question 8) <input type="checkbox"/> No (answer question 10) <input type="checkbox"/> Not aware of condom <input type="checkbox"/> Others (Specify) _____

8. Who suggested condom use that time?	<input type="checkbox"/> Myself <input type="checkbox"/> My partner <input type="checkbox"/> Joint decision <input type="checkbox"/> Others (Specify)_____
9. From where did you get this condom? <input type="checkbox"/> Person had sex with <input type="checkbox"/> Friend <input type="checkbox"/> Others (Specify)_____	<input type="checkbox"/> Health worker/ clinic <input type="checkbox"/> Purchased at other type of outlet(grocery)
10. Why didn't you use a condom that time? <input type="checkbox"/> Too expensive <input type="checkbox"/> Don't like them <input type="checkbox"/> Didn't think it was necessary <input type="checkbox"/> Didn't think of it <input type="checkbox"/> Others (Specify)_____	<input type="checkbox"/> Client objected <input type="checkbox"/> Used other contraceptive <input type="checkbox"/> Decreases pleasure <input type="checkbox"/> Not available
11. In case of client refusal, what do you do? <input type="checkbox"/> Refuse to have sex with them <input type="checkbox"/> Negotiate until customer agrees <input type="checkbox"/> Others (Specify)_____	<input type="checkbox"/> Charge a higher price <input type="checkbox"/> Agree with client
<b>Part 2</b>	
<b>HAD SEX WITH REGULAR PARTNER DURING LAST 12 MONTHS</b> ↓ <b>Please answer question 12</b>	<b>DID NOT HAVE SEX WITH REGULAR PARTNER DURING LAST 12 MONTHS</b> ↓ <b>Skip to part 3</b>
12. Do you generally use a condom with your regular partner?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Others (Specify)_____
13. In general, with what frequency did you use a condom with your regular partner?	<input type="checkbox"/> Every time..... <input type="checkbox"/> Sometimes..... <input type="checkbox"/> Never..... <input type="checkbox"/> Others (Specify)_____
14. The last time you had sex with a regular partner, did you use a condom?	<input type="checkbox"/> Yes (answer question 22) <input type="checkbox"/> No (answer question 17) <input type="checkbox"/> Not aware of condom <input type="checkbox"/> Others (Specify)_____

15. Who suggested condom use that time?	<input type="checkbox"/> Myself <input type="checkbox"/> My partner <input type="checkbox"/> Joint decision <input type="checkbox"/> Others (Specify)_____
16. From where did you get this condom?  <input type="checkbox"/> Person you had sex with <input type="checkbox"/> Friend <input type="checkbox"/> Others (Specify)_____	<input type="checkbox"/> Health worker/ clinic <input type="checkbox"/> Purchased at other type of outlet(grocery)
17. Why didn't you use a condom that time?  <input type="checkbox"/> Too expensive <input type="checkbox"/> Used other contraceptive <input type="checkbox"/> Decreases pleasure <input type="checkbox"/> Not available	<input type="checkbox"/> Don't like them <input type="checkbox"/> Didn't think it was necessary <input type="checkbox"/> Didn't think of it <input type="checkbox"/> Others (Specify)_____
18. In cases where your partner refuses, what do you do?  <input type="checkbox"/> Refuse to have sex with him/her <input type="checkbox"/> Agree with partner	<input type="checkbox"/> Negotiate until partner agrees <input type="checkbox"/> Others (Specify)_____
<b>Part 3</b>	
<b>HAD SEX WITH NON-REGULAR PARTNER</b> DURING PAST WEEK     ↓ <b>Please answer question 19</b>	<b>DID NOT HAVE SEX WITH NON-REGULAR PARTNER</b> DURING PAST WEEK     ↓ <b>Skip to question 26</b>
19. Do you generally use condoms with your non-regular partner(s)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Others (Specify)_____
20. In general, with what frequency did you use a condom with your non-regular partner(s)?	<input type="checkbox"/> Every time..... <input type="checkbox"/> Sometimes..... <input type="checkbox"/> Never..... <input type="checkbox"/> Others(Specify)_____
21. The last time you had sex with a non-regular partner, did you use a condom?	<input type="checkbox"/> Yes (answer question 22) <input type="checkbox"/> No (answer question 17) <input type="checkbox"/> Not aware of condom <input type="checkbox"/> Others (Specify)_____
22. Who suggested condom use that time?	<input type="checkbox"/> Myself <input type="checkbox"/> My partner <input type="checkbox"/> Joint decision

		<input type="checkbox"/> Others (Specify) _____	
23. From where did you get this condom?			
<input type="checkbox"/> Person had sex with		<input type="checkbox"/> Health worker/ clinic	
<input type="checkbox"/> Friend		<input type="checkbox"/> Purchased at other type of outlet(grocery)	
<input type="checkbox"/> Others (Specify) _____			
24. Why didn't you use a condom that time?			
<input type="checkbox"/> Too expensive		<input type="checkbox"/> Client objected	
<input type="checkbox"/> Don't like them		<input type="checkbox"/> Used other contraceptive	
<input type="checkbox"/> Didn't think it was necessary		<input type="checkbox"/> Decreases pleasure	
<input type="checkbox"/> Didn't think of it		<input type="checkbox"/> Not available	
<input type="checkbox"/> Others (Specify) _____			
25. In cases of partner refusal, what do you do?			
<input type="checkbox"/> Refuse to have sex with them		<input type="checkbox"/> Negotiate until partner agree	
<input type="checkbox"/> Agree with partner		<input type="checkbox"/> Others (Specify) _____	
<b>Part 4</b>			
26. Have you ever shared needles to inject heroin, cocaine, steroids or any other drug that was not prescribed by a doctor?			
<input type="checkbox"/> Yes		<input type="checkbox"/> No	
27. Have you ever been diagnosed with a sexually transmitted disease?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
28. Have you ever had an HIV/AIDS test?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
29. At present, what are your chances of getting infected with HIV, the virus that causes AIDS? (Please circle)			
High	Medium	Low	None
			Don't know/Not sure

-----Thank you very much for your cooperation-----

**APPENDIX 5: Scoring for HIV knowledge and HIV attitude scores**

- HIV knowledge score

HIV knowledge score was calculated according to 13 questions as shown in **table V**. The HIV knowledge score ranges from 0-13.

**Table 19: HIV knowledge scoring**

Questions	Yes	No	Not sure
1. HIV/AIDS a sexually transmitted disease	1	0	0
2. HIV/AIDS can be passed on from mother to child during pregnancy and childbirth	1	0	0
3. A person can get HIV/AIDS from pets or insects i.e. mosquitoes, ticks	0	1	0
4. A person can get HIV/AIDS by transmission through the air, by coughing, or by touching someone who is infected	0	1	0
5. A person can get HIV/AIDS by sharing a meal or belongings with someone who is infected	0	1	0
6. A person runs the risk of contracting HIV/AIDS by getting injections with a shared needle	1	0	0
7. A healthy-looking person can be infected with HIV, the virus that causes AIDS	1	0	0
8. In general, a blood test is the only way to check for the AIDS virus (HIV)	1	0	0
9. HIV/AIDS is not a curable disease.	1	0	0
10. At present, there are anti-virus medicines.	1	0	0
11. Using condoms can protect against HIV/AIDS infection	1	0	0
12. A blood test before getting married or pregnant can protect against HIV/AIDS dissemination	1	0	0
13. An HIV/AIDS infected man, if sterilized, cannot pass on the disease to his partner	0	1	0

- *HIV attitude score*

HIV attitude score was calculated according to 9 questions as shown in **table VI**. The HIV attitude score ranges from 0-9.

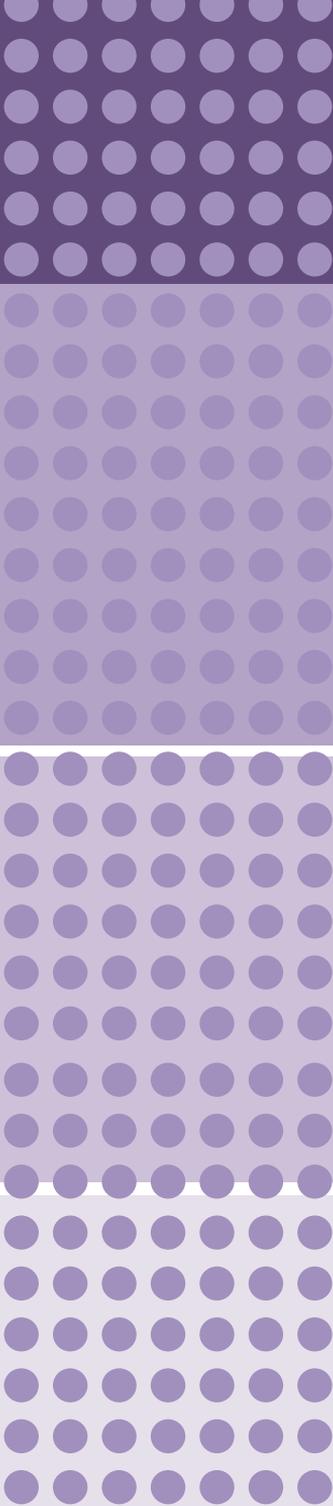
**Table 20: HIV attitude scoring**

Questions	Yes	No	Not sure
1. You do not want to interact with HIV/AIDS infected persons	0	1	0
2. A person who has many partners or often has sex with sex-workers, but shows no symptoms of infection, might be immune to HIV/AIDS	0	1	0
3. There is no need to use a condom every time you have sex with casual partner	0	1	0
4. Your community is not at risk of HIV/AIDS	0	1	0
5. HIV/AIDS is a private issue, and is not your problem	0	1	0
6. You agree with free treatments for HIV/AIDS infected people supported by the government	1	0	0
7. Males should play a dominant role in solving the HIV/AIDS problem or in protecting against HIV/AIDS	0	1	0
8. HIV/AIDS is an important problem, and organizations at both the provincial and national levels should take responsibility to solve this problem. It is no need to share resources from community	0	1	0
9. HIV/AIDS problem is complex, and community members are the most important people to solve the problem.	1	0	0









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