



FINAL REPORT

A Cost Analysis of Key Population Interventions to Fast Track the End of the HIV Epidemic in Thailand



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Executive summary

Thailand is globally renowned for its achievements in reducing the spread of HIV. Despite these gains, epidemiologic and surveillance data point to the country's outstanding gaps in HIV prevention, care, and treatment, especially for members of key populations (KP).¹ HIV incidence and prevalence remain high among men who have sex with men (MSM), female sex workers (FSW), and people who inject drugs (PWID).² The need to reach these populations comes at a time of growing demand for services, but limited available funding. While the government has steadily increased domestic expenditures for HIV services, a significant proportion for programs addressing key populations comes from international donors.

In 2015, Thailand developed a comprehensive Operational Plan to Accelerating Ending AIDS by 2030, focused on effective interventions for key populations. The plan incorporates the reach, recruit, test, treat, prevent, and retain (RRTTPR) cascade as a programmatic framework for eliminating HIV transmission. In addition, the Government began exploring ways of optimizing resources to achieve epidemic control, including support for civil society engagement. Efforts encompass the provisioning of reimbursements for some RRTTPR activities by the National Health Security Office (NHSO) on a per capita basis. However, these are insufficient to meet the projected needs for epidemic control.

Under the Operational Plan, there are three modalities for RRTTPR service provision. They include a) Hospital-based model; b) Government facility-led health services with reach and recruit-led by CBOs; and c) Key population-led health services (KPLHS) in collaboration with government hospitals. Advocates of civil society engagement point to growing evidence of the added value community-based stakeholders bring across the services cascade.³ However, until recently, there had been no assessments about costs and benefits of the service models implemented in Thailand.

In support of optimization of strategic investments, the Health Intervention and Technology Assessment Program (HITAP) conducted a retrospective cross-sectional cost analysis with assistance from international partners. The purpose of this study was to estimate unit costs of service provision along the RRTTPR cascade for the three service delivery models and assess their efficiency. Data for this analysis, collected between October 2016 and September 2017, came from 13 study from 8 provinces (Roi Et, Bangkok, Tak, Samut Prakarn, Khon Kaen, Udonthani, Chonburi, and Song Kla), located in 4 regions of Thailand.

Results from the study suggest that unit costs are driven by multiple factors and vary depending on service, site, and model. Data also suggest that no single model is more cost-effective than another. While there is moderate variation in costs for reach and test activities (e.g. reach varies from approximately 327 Thai baht (THB) to 3,016 THB per case; testing from approximately 315 THB to 1,682 THB per case), unit costs between service models for these interventions do not differ substantially. Alternatively, case detection costs vary considerably, particularly by KP group, from as low as 13,859 THB to as high as 1.1 million

¹ 2014 Thailand National AIDS Response Report; Thai National AIDS Committee (2014)

² UNAIDS Prevention Gap Report (2016)

³ Coutinho A1, Roxo U, Epino H, Muganzi A, Dorward E, Pick B. *The expanding role of civil society in the global HIV/AIDS response*. J Acquir Immune Defic Syndr. 2012 Aug 15;60 Suppl 3:S152-7.

THB (per case detected among PWID). Variation in the cost of initiating treatment is also significant, ranging from 1,300 THB to 28,000 THB per client.

This report also includes an in-depth discussion of factors and variables that affect unit costs, including labor (the most prominent), fixed costs, and potential contribution to epidemic control (e.g. achievement of targets). Key factors impacting input costs include staffing number and type, and capital costs, output costs vary based on factors including number and type of activities, innovations, and capacity to achieve targets. However, assessment of technical efficiency by model and site posed challenges. Assessed sites provide different activities along the services cascade depending on KP group, geographical location, and other contextual factors. This variation also makes it difficult to determine specific drivers of unit costs. In addition, differences in number and type of program inputs and outputs for activities result in variations in unit costs.

Given global evidence that complementary community-based service delivery plays an important role in the HIV response, including advocacy, outreach, mobilization, testing, provision of pre-exposure prophylaxis (PrEP), and community delivery of treatment and care services, the timing for this analysis is critical. Ending the HIV epidemic in Thailand will likely require a sustainable approach that utilizes comparative advantages of both government and community-based stakeholders. With this in mind, and based on the findings from this analysis, we recommend the following:

- In designing activities and determining resource requirements, multiple factors must be considered, including the type of population served, geographical context, inputs (labor, materials, training), and projected outputs. Optimization of cost-effectiveness needs to factor costs in relation to benefits in achieving epidemic control, especially for those hardest to reach.
- Civil society organizations (particularly those led by members of key populations) are uniquely positioned to complement public sector providers in delivering services. However, they must have adequate, sustainable sources of financial, technical and managerial support to contribute to epidemic response.
- Capacity-building across sites and models will be critical to ensure that services for KP are client-centred and of high quality.
- The government should consider revising the payment mechanism to a per-piece payment or pay-per-activity instead of paying for the whole cascade. This mechanism should be combined with on-top incentives.
- Other aspects that lower unit costs per person reached are also important for the investment decision. Final outcomes alone should not be used to monitor activities, with outputs for evaluation indicated depending on each activity.
- Thailand will need to establish and implement a comprehensive monitoring and evaluation system with standard definitions for activities within the cascade, in order to inform, adjust, and pivot programs in a timely manner.
- Further study comparing costs and health outcomes between different types of activities along the RRTTPR cascade is recommended to determine optimal approaches for achieving epidemic control; a feasibility study on health financing for key activities as part of the strategic planning and prioritization process.

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List of abbreviations and acronyms

ACCs	Absorbing cost centers
AEM	AIDS epidemic model
AHF	AIDS Healthcare Foundation
AIDS	Acquired immune deficiency syndrome
ART	Antiretroviral therapy
ALT	Alanine Aminotransferase
BMA	Bangkok Metropolitan Administration
BMA-PHC28	Bangkok Metropolitan Administration-Public Health Center 28
C	Capital
CB	Capacity building
CBOs	Community-based organizations
CC	Capital cost
CD4	Cluster of differentiation 4
CPI	Consumer price index
DIC	Drop-in center
FSWs	Female sex workers
GDP	Gross domestic product
HITAP	Health Intervention and Technology Assessment Program
HIV	Human immunodeficiency virus
HTS	HIV testing service
IEC	Information, education, and communication
KPLHS	Key population-led health services
KPs	Key populations
L	Labor
LC	Labor cost
LINKAGES	Linkages across the Continuum of HIV Services for Key Populations Affected by HIV
M	Materials
MC	Material cost
MOPH	Ministry of Public Health
MSM	Men who have sex with men
MSWs	Male sex workers
MWs	Migrant workers
N/A	Not applicable
NGOs	Non-governmental organizations
NHSO	The National Health Security Office
nPEP	Non-occupational post-exposure prophylaxis
NSEPs	Needle and syringe exchange programs

oPEP	Occupational post-exposure prophylaxis
PEP	Post-exposure prophylaxis
PEPFAR	The U.S. President's Emergency Plan for AIDS Relief
PLHIV	People living with HIV
PPAT	Planned Parenthood Association of Thailand
PrEP	Pre-exposure prophylaxis
PSI	The Population Service International
PWID	People who inject drugs
RR	Reach-recruit
RRT	Reach-recruit-test
RRTTPR	Reach-recruit-test-treat-prevent-retain
RSAT	Rainbow Sky Association of Thailand
RTF	Raks Thai Foundation
STAR	Stop TB and AIDS through RTTR
STIs	Sexually transmitted infections
SWING	Service Workers in Group Foundation
SWs	Sex workers
TB	Tuberculosis
TCCs	Transient cost centers
TGs	Transgenders
TGW	Transgender women
THB	Thai baht
THE	Total health expenditure
The Global Fund	The Global Fund to Fight AIDS, Malaria, and Tuberculosis
TUC	The Thailand MOPH – U.S. CDC Collaboration
UIC	Unique identifier code
UNAIDS	The Joint United Nations Programme on HIV/AIDS
USAID	The United States Agency for International Development
VCT	Voluntary counseling and testing
VDRL	The venereal disease research laboratory test

Chapter 1: Introduction

1.1 Introduction

1.1.1 HIV epidemiology in Thailand

Thailand is globally renowned for its achievements in reducing the spread of HIV. Despite its progress, epidemiologic and surveillance data point to the country's significant gaps in HIV prevention, care, and treatment [1]. In 2016, there were approximately 450,000 people living with HIV (PLHIV). Nationally, while an estimated 94% of PLHIV are aware of their HIV, only 80% are on antiretroviral therapy (ART) of whom less than 95% are virally suppressed [2].

Members of key populations (KPs) are adversely affected by the epidemic. HIV incidence and

prevalence remain high among men who have sex with men (MSM), female sex workers (FSW), and people who inject drugs (PWID) [3, 4]. In 2017, UNAIDS estimated that nationwide, HIV prevalence among MSM was 9.15% [5]. However, in urban areas, prevalence estimates are much higher; in Bangkok, prevalence rose from 17.8% to 30.3% between 2003 and 2007 [6]. Surveillance data from then UNAIDS [7] suggests that key populations (MSM, SWs, and PWID) comprise roughly 14% of PLHIV in Thailand, although actual numbers may be significantly higher (Table 1).

Table 1. Estimated number of key populations living with HIV in 2019

Key populations (KPs)	Estimated population size*	HIV prevalence among KPs	Number of key populations living with HIV
Men who have sex with men	528,000	11.9	62,832
Female sex workers	129,000	1**	1,290
Male sex workers	26,000	11.7**	3,042
People who inject drugs	42,000***	20.5	8,610
Transgender people	-	11.9	-

* Data from 2016 ** Data from 2016

*** Year estimation was 2014

Source: www.aidsdatahub.org and UNAIDS data 2019

These data are corroborated by increasing HIV incidence among MSM and TGW [6]. More than half of the new, annual HIV infections in Thailand can be attributed to MSM and transgender women (TGW) [8]. Analysis using 'AIDS epidemic model' (AEM) for adults aged 15 and over suggested that among new HIV infections in Thailand in 2015, approximately 3,500 (43%) were among MSM, 240 (3%) were

among FSWs, and 880 (11%) were among PWID (Figure 1) [8].

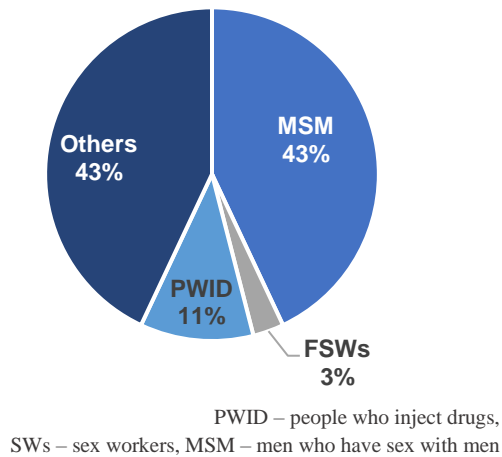


Figure 1. Proportion of new HIV infections in Thailand, 2016

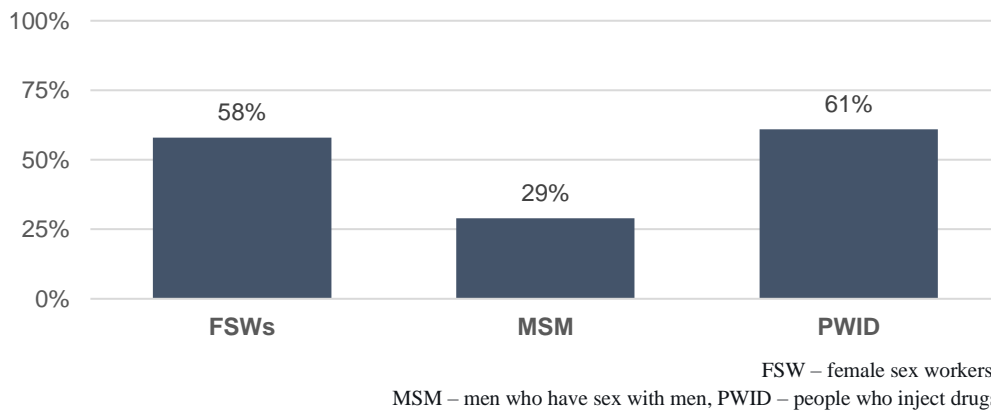


Figure 2. HIV testing coverage among key populations in Thailand, 2016

Current data also demonstrate an unmet need for HIV testing and treatment initiation among MSM, TGW, and people who inject drugs (PWID) in Thailand [9]. Yet many members of key populations are hesitant or unwilling to access government-led services for fear of stigma or incarceration. Furthermore, gains in prevention among female sex workers (FSW) and their clients are threatened by reductions in reported condom use [10]. In 2016, an estimated 29% of MSM reported having been tested and knowing their results in the preceding 12 months [11]. The same report also noted that HIV testing coverage was low among key populations (Figure 2).

1.1.2 Acceleration toward epidemic control

National plan and strategies

A 2014 study of the treatment cascade in Thailand demonstrated inadequate links between diagnosis and treatment, and insufficient retention across the prevention-to-treatment continuum [12]. The study pointed to several potential reasons for these gaps, including the

passive nature of HIV service delivery in the public healthcare system, and a paucity of services at provincial and tertiary healthcare settings where staff have limited time and resources to support adherence and follow-up.

Despite these findings, Thailand is committed to achieving epidemic control. As part of this effort, the Government developed a comprehensive Operation Plan (2015-2019) to Accelerating Ending AIDS by 2030, which focuses on interventions for KP in priority provinces/sites [12]. The plan aims to achieve epidemic control by reducing new HIV infections to less than 1,000 annually by 2030; virtually eliminating mother-

to-child transmission by 2020; and ensuring that all PLHIV initiate ART upon diagnosis to improve health outcomes and prevent onward transmission. It also provides a clear framework for service delivery that eliminates common barriers and addresses critical gaps by linking the critical components of services across the HIV continuum of prevention-to-treatment.

Reach-recruit-test-treat-prevent-retain (RRTTPR) cascade

Thailand’s Operational Plan incorporates the reach, recruit, test, treat, prevent, and retain (RRTTPR) cascade as a programmatic framework for eliminating HIV transmission.

The framework outlines key services along the cascade (Figure 3) including reaching those most-at-risk of HIV acquisition and/or transmission, recruiting them into the services continuum, regularly testing those most-at-risk, providing immediate treatment for all diagnosed with HIV, preventing onward infection for both HIV+ and HIV- individuals, and retaining all clients within the service network.

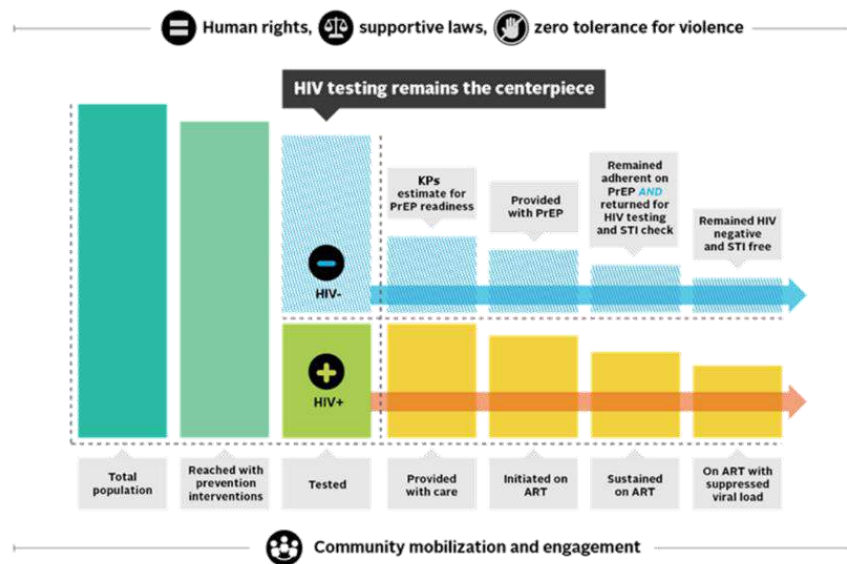


Figure 3. RRTTPR cascade [13]

Models of HIV service provision

Advocates of civil society engagement in the national response point to growing evidence of the added value community-based implementers bring to the services cascade [14]. Community-based organizations (CBOs) can play a leading

role in RRTTPR cascade implementation, including reach and recruitment of KPs, testing, provision of pre-exposure prophylaxis (PrEP), and community-based antiretroviral therapy (ART) delivery. This complementary support has

the potential to reach those hardest to reach, extend services deeper into marginalized communities, and accelerate achievement of the country's 2030 goals [15]. Yet the 2014 National AIDS Committee report noted that gaps in links between community- and facility-based programs have negatively affected cascade outcomes.

Under the Operational Plan, there are currently three modalities for RRTTPR service provision with varying levels of CBO engagement along the cascade (Figure 4).

1) Hospital-based model

RRTTPR services for KPs are provided or managed by the public sector through hospitals. Some hospitals use funding from the NHSO to support outreach workers to reach, recruit, and refer KPs to hospitals for services, including HIV testing service (HTS), ART, and PrEP.

2) Government facility-led health services with reach and recruit-led by CBOs

CBOs provide reach-recruit services to KPs and support them to access HTS in hospitals and/or at conveniently located mobile testing venues. ART and PrEP are offered in hospital settings.

3) Key population-led health services (KPLHS) in collaboration with government hospitals

CBOs conduct community-based face-to-face and social event/media outreach and recruitment to encourage KP to seek HTS at community-based clinics run by the CBOs, or at the site of their choice. They also provide community-based provision of PrEP. Peer navigators help KPLHIV access ART at hospitals and provide ongoing adherence support. Some community-based clinics also initiate clients on ART and collaborate with hospitals teams to manage complex cases.

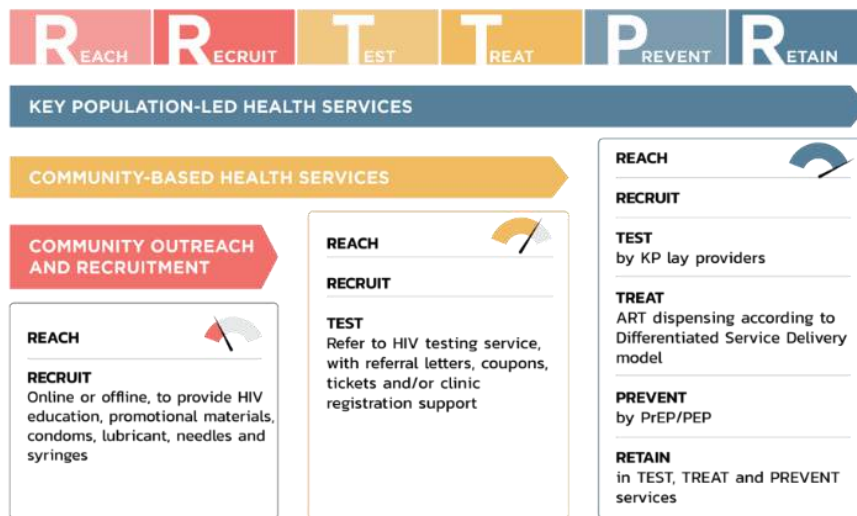


Figure 4. HIV service provision models in Thailand [16]

1.1.3 HIV/AIDS financing

Domestic and foreign investments in HIV/AIDS programming have undergone substantial shifts in the last decade. In 2010, roughly 90% of HIV-related expenditures in Thailand were funded domestically (Figure 5) [17]. Funds were routed primarily through the NHSO. In 2014, the total expenditure on HIV/AIDS was 9,742 million Thai baht (THB) or 150 THB per capita,

accounting for 0.07% of the gross domestic product (GDP), or 1.9% of the total health expenditure (THE). In 2015, total expenditure on HIV/AIDS reduced slightly to 8,248 million THB or 125 THB per capita. The total expenditure on HIV/AIDS in 2015 accounted for 0.06% of GDP, or 1.5% of THE [17].

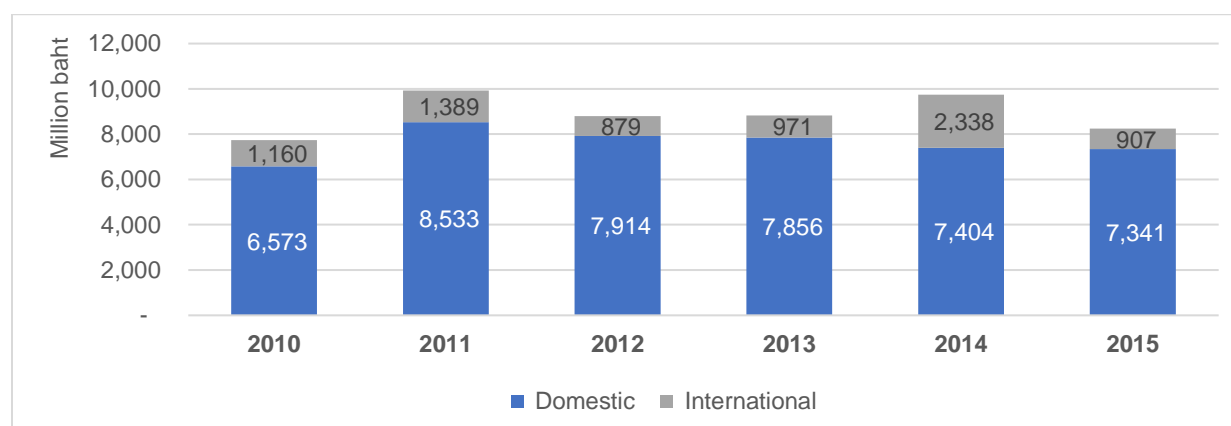


Figure 5. Trend and proportion international vs. domestic funding for the HIV response in Thailand, 2010-2015 [17]

However, in 2017, the NHSO launched a program to stimulate community-led HIV activities specifically for KPs by investing approximately 56 USD (1,800 THB) per retained case of MSM, TG, or SWs, and 125 USD (4,000

Table 2. Reimbursement rate by KPs and activity in 2018 (THB) [18]

	MSM/TG/SWs	PWID
Case recruited	800	1,800
Case tested	550	1,200
Case retained	450	1,000
Total	1,800	4,000

In addition, Thailand has received support from major donors including PEPFAR [19, 20] and the Global Fund to Fight AIDS, Malaria, and

THB) per retained case of PWID (Table 2) [18]. NHSO investments focused on behavior change communication on HIV and sexually transmitted infections (STIs), and recruitment into the services continuum through HIV testing. Tuberculosis (GF) [21]. Donor funding has complemented government efforts to extend reach and recruitment of KPs into the services continuum via HTS, referral to ART, and retention support. International donor contributions have differed, however, in that funding can be used for operational costs and staffing, strategic planning, capacity building, implementation, monitoring, and evaluation, as opposed to per capita reimbursements. This type of holistic support has enabled select CBOs to design and implement HIV programs along the RRTTPR cascade without needing additional

funding for extensive cost-recovery mechanisms or private donor support. Even though support from international donors have helped Thailand in promoting HIV transmission prevention in KPs, the proportion was still very small compared to other activities (Figure 6) [22].

However, in the last five years, financial support from international donors has been in steady decline. This is primarily due to the success of Thailand's HIV response, and its transition in status from lower-middle income to upper-middle income country. Global Fund support shifted from 39 million USD in 2014 to 14 million USD for the years 2015-2016, and was entirely phased out in 2017 [23, 24].

1.2 Rationale for the study

With current and anticipated declines in foreign investment across the RRTTPR cascade, and general consensus that sustained support for KP programming is critical for achieving epidemic control, the Government is exploring ways of ensuring seamless and strategic transition to domestic resources. However, there remain concerns about costs and optimal modalities for ending the AIDS epidemic by 2030. CBOs require sustained resources to ensure they meet staffing and operational costs, in addition to implementation costs. Despite this, advocates note the comparative advantage CBOs have in recruiting the most marginalized populations, that may be contributing disproportionately to HIV incidence, as well as in delivering accessible, tailored testing, prevention, and care and treatment services.

Government efforts to support CBOs are underway in the form of NHSO reimbursements on a per capita basis for select RRTTPR activities. However, current reimbursements do

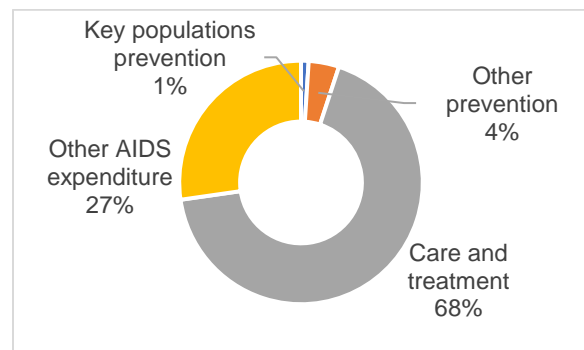


Figure 6. Proportion of national spending on HIV response in Thailand categorizing by type of activities, 2015 [22]

not reflect requirements in the absence of international support. Before the Government undergoes a strategic shift, more information is needed for planning and budgeting which takes into account the role of government and civil society stakeholders.

Until this analysis, there had been no comprehensive assessment of the cost of KP service delivery along the RRTTPR cascade. This study was designed to answer two fundamental questions: 1) what are the financial and economic unit costs along the RRTTPR cascade of select service delivery models for KP services currently implemented in the country - where unit cost is defined as the site-level average cost per service; and 2) is one service delivery model more technically efficient than another - where technical efficiency is defined as producing a service output at the lowest feasible cost while maintaining consistent quality and effectiveness (among other factors).

1.3 Objectives

1. Estimate financial and economic unit costs along the RRTTPR cascade for three key populations-specific service delivery models: Government facility-based health services, community-based health services, and key population-led health services (KPLHS)
2. Assess technical efficiency of the three service delivery models

Chapter 2: Methodology

2.1 Study design

This study employed a retrospective, cross-sectional, observational design to estimate empirical and unit costs of service provisioning across the RRTTPR cascade. The analysis utilized gross costing methods applying a top-down approach. The research team obtained cost

data from each site for the period October 1, 2016 through September 30, 2017 (referred to as fiscal year 2017 or FY17). Cost results are presented in the form of financial and economic costs converted into 2018 values using the consumer price index (CPI) [25].

2.2 Study population and selection techniques

2.2.1 Population

This study focused on services provided to MSM, SWs, TGW, and PWID based on priorities outlined in the “*Collaboration on the Costing of Key Population Interventions to Fast Track the*

End of HIV in Thailand” [16]. Data in Thailand suggest these populations have the highest rates of HIV infection among all KPs.

2.2.2 Study sites

Data were collected from 13 sites based that are engaged in one of the three RRTTPR models described earlier and in Table 3 below. The study conducted in a convenience sample of service delivery sites providing services to MSM, SW, TGW and PWID populations as per the recommendation of the “*Collaboration on the Costing of Key Population Interventions to Fast Track the End of HIV in Thailand*” for model 2 and 3. Study sites of model 2 and 3 needed to implement HIV activities as per the RRTTPR cascade and be successful in recruiting KPs for voluntary counseling and testing (VCT). FHI360 provided the information about study sites that

met the aforementioned criteria and, together with the research team, selected the study sites. For model 1, the study included one hospital receiving NHSO funds within the high burden areas serving KPs, Roi Et Hospital. The hospital was selected as it had the highest number of VCT services provided by government insurances according to the NAP Web Report data (VCT report), National Health Security Office (NHSO) (National Health Security Office, 2018). The research team also telephoned the hospital asking for more information about NGO-collaboration to ensure that these selected sites did not have any connection with CBOs.

Table 3. Study sites

Model	Study settings	Province	KP focus
1: Hospital-based	Roi Et Hospital	Roi Et	MSM
2: Government facility-led health services with reach and recruited by CBOs	Bangkok Metropolitan Administration-Public Health Center 28 (BMA-PHC28)	Bangkok	MSM
	Ozone Foundation	Tak	PWID
	Raks Thai Foundation	Samut Prakarn	PWID
	The Planned Parenthood Association of Thailand (PPAT)	Khon Kaen	FSWs
	M-Reach [†]	Khon Kaen	MSM & FSWs
	M-Friend [†]	Udonthani	MSM
3: KPLHS in collaboration with government hospitals	SISTERS Foundation	Chonburi	MSM, TGWs, & SWs
	Service Workers in Group (SWING)	Chonburi	MSM, TGWs, & SWs
	Service Workers in Group (SWING)	Bangkok	MSWs
	Rainbow Sky Association of Thailand (RSAT)	Bangkok	MSM & TGWs
	Rainbow Sky Association of Thailand (RSAT)	Song Kla	MSM & TGWs
	M-Plus	Chiang Mai	MSM & TGWs

[†]Collaboration between the Ministry of Public Health Thailand and the Centers for Disease Control and Prevention of the United States of America

2.3 Data collection

2.2.3 Recruitment and training of data collectors

The study team recruited 3 data collectors to compile data at the selected study sites. Recruitment was based on selection criteria developed by the HITAP research team. Hiring requisites included sufficient understanding of costing analysis; experience in data collection; ability to work for the entire study period; and computer literacy, especially with Microsoft Excel[®].

Recruits participated in two data collection trainings, at Health Intervention and Technology Assessment Program (HITAP), on 16 and 22 August 2018, which oriented them to the study framework and ensured they had requisite skills to undertake fieldwork. Trainings combined didactic discussions with participatory, practical

exercises. The first training focused on understanding KPs in the RRTTPR cascade, and the following skills: (1) organizational analysis and cost classification; (2) direct cost determination; (3) indirect cost determination; (4) full cost determination; and (5) calculating unit costs. The second training focused on applying practical skills and developing data collection forms. Recruits were trained on organizational structures, service systems, definitions of transient and absorbing cost centers, service outputs, and different type of costs (labor, material, and capital) and approaches to collect each of them. Data collectors also participated in stakeholder meetings with study sites to further their understanding of HIV services in the KPs context and build rapport.

2.2.1 Data collection

Type of costs

Labor, material, and capital costs

Three cost components were assessed in this study: a) **labor costs** (LC) – which included remuneration for work in the form of salary, wages, medical expenses, rent, or any other benefits; b) **material costs** (MC) – including cost of materials and consumable products related to HIV service provision that last for less than one year and must be regularly supplied; and **capital costs** (CC) – costs of durable goods that last one year or more.

Financial and economic costs

This retrospective study analyzed costs of services from the perspective of health care providers/facilities/sites, as opposed to costs incurred by recipients of services. The analysis

included both financial and economic costs. Financial costs capture resources incurred/spent to deliver goods and services. In this study, financial cost data was collected according to financial reports. Economic costs are based on the principle of opportunity costs [26] where resources might be incurred but hidden and normally not shown in the financial reports. Opportunity costs are those foregone by a particular use of resources [27], such as, the time that one spends for volunteering instead of regular work and receiving donated payments or goods instead of those purchased. As such, economic costs, in this study, included expenditure that was actually incurred and resources that have been used to provide or deliver services to KPs (e.g. donated goods or services, volunteer labor, etc.). Details for each type of cost are presented in Table 4.

Table 4. Type of cost by financial and economic category

Type of cost	Financial costs	Economic costs
Capital	<ul style="list-style-type: none"> Buildings (including costs for renovation) Assets (including investments such as capacity-building activities) <p>Adjusted by depreciation: purchasing price/useful years</p>	<ul style="list-style-type: none"> Buildings (including costs for renovation) Assets (including investments such as capacity-building activities) <p>Adjusted by annual economic costs + opportunity costs of future use</p>
Material	<ul style="list-style-type: none"> Medical and consumable products Utilities + rent (actual price) 	<ul style="list-style-type: none"> Medical and consumable products Utilities + rent (market price)
Labor	Salary + per diem	Salary + opportunity costs (OT and volunteer)

Direct and indirect costs

The unit cost for each activity is comprised of direct and indirect costs. Direct costs in this analysis include all costs that are fully attributable to HIV-related service provision,

while indirect costs are expenses incurred from activities that are not fully attributable to HIV service provision. Indirect costs also include materials, supplies, and activities provided by an entity other than the site assessed.

Data collection methods

Two costing methods were used in this study, standard costing and activity-based costing. Standard costing or sometimes referred to as a top-down approach is a total budget allocated to specific services by relying on existing records [28-30]. Standard costing comprises of five steps: cost center classification, direct cost determination, indirect cost determination, full cost determination, and unit cost calculation [30]. Activity-based costing is based on the idea of producing a product or providing a service that consumes activities which then consume resources [30, 31]. Activity-based costing is used to assign costs to each activity to understand the total costs and improve efficiency of activities. Standard costing was used to obtain unit costs of each activity. Unit costs will be calculated from total operational costs for HIV services from accounting ledgers collected at each site. However, with this approach, the study cannot perceive the differentiation of labor, material, and capital costs of each activity. To provide a more accurate picture, the team employed activity-based techniques to separate costs by type for each activity, and determined both financial and economic costs. The team assessed full costs at the service delivery site level, costs for training, support and oversight activities above the service delivery site, and costs for reach and recruitment activities that occur below (outside) service delivery sites (as relevant). The team also assessed cost drivers to determine resource allocation costs.

Gross costs were determined for FY17 using financial records of total expenditures and fixed

assets for each site including personnel, recurrent operating costs, and facilities. These records were also used for recurring costs associated with supplies, consumables, and equipment for each step of the RRTTPR cascade. Replacement costs were used to value equipment, other capital items, and building spaces. Allocations of total costs for each intervention area of the RRTTPR cascade for each site were based on inputs (i.e. personnel, supplies, operating costs, building spaces, and other capital items). The team measured and determined the proportions of space occupied for each step of the RRTTPR cascade to identify general building and operating costs.

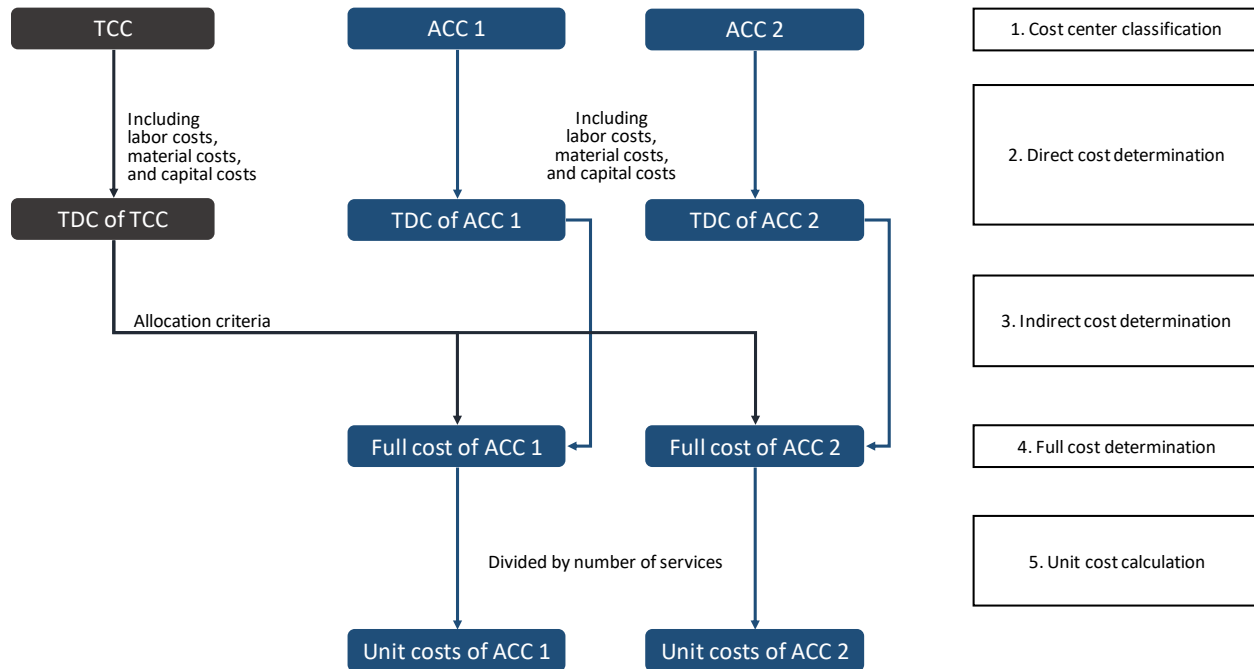
Personnel, supplies, consumables and equipment were allocated according to the steps to which they are associated. In cases where allocation could not easily be determined or resources were used along multiple steps, the team developed and employed rules for systematically allocating resources across all relevant steps in consultation with site staff. To estimate KP-specific costs at each step of the cascade, the team divided the number of clients in each KP by the total number of clients. In addition, the team obtained financial records from LINKAGES and the Thai Red Cross to estimate costs associated with technical and programmatic site support. Estimated costs for each activity were converted to local currency values (THB), for fiscal year 2018 using the consumer price index (CPI).

Cost calculations

Cost calculations were conducted using a standard approach incorporating both financial and economic costs. The process included five steps as follows (Figure 7):

1. Cost center classification
2. Direct cost determination
3. Indirect cost determination
4. Full cost determination

5. Unit cost calculation



TCC – transient cost center, ACC – absorbing cost center, TDC – total direct cost

Figure 7. Steps used for cost calculations

Step 1. Cost center classification

The first step included classification of the cost center for each organization. Cost centers were classified as one of two types: transient or absorbing. Transient cost centers (TCCs) provide services that support other cost centers, while absorbing cost centers (ACCs) help produce final outputs.

Step 2. Direct cost calculation

Direct costs were calculated and categorized by type for each cost center (Table 5), taking into account both financial and economic costs. Direct costs include labor costs, material costs, and capital costs of services provide by each cost center. Quantification of ‘useful years’ were applied to capital costs per recommendation from

the Department of the Comptroller General (Thailand).

Step 3. Indirect cost calculation

Indirect cost calculations were calculated in order to allocate costs from transient cost center to other cost centers as they related to outputs produced and activities conducted. This study applied the simultaneous equation method as this is most recommended.

Step 4. Full cost determination

Full costs for each cost center were determined by adding direct costs and indirect costs (results from steps 2 and 3).

Step 5. Unit cost calculation

Calculation of unit costs depended on whether cost centers had one or more type of output. For cost centers with only one type of output, an average method was applied (unit cost = full

costs/outputs). For cost centers with more than one type of output, a micro-costing method was applied (based on the actual resources used for a given output). Following these calculations, the costs of cascade outputs were classified by type of key population.

Table 5. Direct cost calculations by type and categorization (financial and economic)

Type of cost	Financial	Economic
Capital	Depreciation = purchase price/useful years where useful years are based on comptroller guidelines* * Excluding items used beyond useful years	Annual economic costs = current price/annuity factors where <ul style="list-style-type: none"> • current price = purchase price* (CPI of analysis year/CPI of purchasing year) • Annuity factors = $(1-(1+r)^{-n})/r$, where r is discount rate at 3% and n is useful years based on comptroller guidelines* * Including all items regardless the years of actual use
Material	Annual costs* = costs of purchased items + supplies + supported items * Assuming amount received is equal to amount used	Annual costs* = costs of purchased items + supplies + supported items * Assuming amount received is equal to amount used
Labor	Salary + Per diem Cost per day = monthly salary/22 Cost per hour = cost per day/6 Per diem = actual per diem	Salary + Opportunity costs Cost per day = monthly salary/22 Cost per hour = cost per day/6* Per diem = opportunity costs (market price of wages for the same position)

*twenty-two (22) are number of working days in a month and 6 are number of effective working hours in a day. Normally, in Thailand, working time is eight hours per days including lunch time. There are times that might be spent in other activities apart from work. Therefore, actual or effective working time remains six hours a day.

Data collection and analysis

Data were collected from November 2018 – May 2019 and analyzed using Microsoft Excel.

Chapter 3: Results

3.1 Service models and activities

Activities across the RRTTPR cascade vary by service model, depending on the KP(s) served, providers, service provision context, available resources, etc. Below is a list of the main activities classified by each step along the cascade and model (see table 6).

Table 6. Service activities by model

Cascade step	Model 1: Hospital-based model	Model 2: Government facility-led health services with reach and recruit-led by CBOs	Model 3: Key population-led health services (KPLHS) in collaboration with government hospitals
Reach	<ul style="list-style-type: none"> • Peer-driven social behavior change communication (SBCC) and education coupled with mobile VCT services. • Community-based outreach (limited mostly to ad hoc activities requested by public schools) 	<ul style="list-style-type: none"> • CBO-led peer-driven community outreach including SBCC, provision of commodities including condoms and lubricants, and promotion of HIV-related services; comprehensive harm reduction including distribution of clean needles and syringes (for PWID) • Outreach activities are broken down by individual and small group: • Individual: Used for all KPs, especially for those harder-to-reach <ul style="list-style-type: none"> - One-on-one outreach in entertainment venues, hotspots - Personal/private chat through social and online media channels • Small group: Includes different approaches <ul style="list-style-type: none"> - Reach only - Reach-Recruit-Test via mobile VCT: CBOs cooperate with nurses and medical technologists from public hospitals to provide mobile VCT services for the KPs. 	<ul style="list-style-type: none"> • CBO-led peer-driven outreach including SBCC, provision of commodities including condoms and lubricants, and promotion of HIV-related services via three different modalities • Individual: Used for all KPs, especially for those harder-to-reach <ul style="list-style-type: none"> - One-on-one outreach in entertainment venues, hotspots - Personal/private chat through social and online media channels • Small group: less than or equal to 25 individual attendees in one setting • Events/campaigns: more than 25 individual attendees (i.e. annual events coupled with mobile VCT services such as. Valentines' Day, seasonal event, VCT Day, World AIDS Day, etc.)
Recruit	Hospital-based outreach workers refer clients to HTS; recruitment is complete when the nurse conducts pre-test counselling at hospital or at the mobile VCT unit.	CBO outreach workers funded by Stop TB and AIDS through RTTR (STAR) refer clients for pre-HIV test counselling conducted by a nurse at government clinics; outreach workers receive financial incentives for successful referrals	CBO-led outreach workers refer clients to HTS using vouchers, coupons, or referral slips; recruit activities are intrinsically linked with reach activities

Cascade step	Model 1: Hospital-based model	Model 2: Government facility-led health services with reach and recruit-led by CBOs	Model 3: Key population-led health services (KPLHS) in collaboration with government hospitals
Test	<p>Test is conducted via two modalities depending on where the test takes place: facility-based or mobile. Both modalities are applied across all three models but vary in terms of CBO participation. Services include:</p> <ol style="list-style-type: none"> 1. Pre-test counselling 2. Testing: Rapid test by medical technologist; oral fluid tests provided under LINKAGES program 3. Additional services: Hormone level testing for TGs by medical technologist 4. Syphilis testing by medical technologist 5. Post-test counselling <p>In Models 1 and 2, all test services are provided by civil servants from hospitals (nurse for counselling, medical technologist for testing). In Model 3, CBO hire counselors to provide counselling, and part- or full-time medical technologists to provide testing.</p>		
Treat	<p>Cluster of differentiation 4 (CD4) testing for positive clients, conducted by medical technologists at government clinics</p>	<p>CBOs collaborate with hospitals to provide the following:</p> <ol style="list-style-type: none"> 1. Referral of positive clients to receive CD4 testing and immediate/access to ART (CBOs) 2. CD4 testing for positive clients at government clinics (medical technologists) 3. Case management services including counselling, HIV information, education, and communication (IEC), timely enrollment in care and initiation of ART (case managers funded by the Thailand MOPH – U.S. CDC Collaboration or TUC program). 	<p>Hospitals and CBOs collaborate to provide full-cascade services:</p> <ol style="list-style-type: none"> 1. CD4 testing at clinics by medical technologist for clients who test positive by HIV rapid test 2. Immediate/early referral of positive clients to ART at hospitals 3. Case management services including counselling, HIV IEC, timely enrollment in care, and initiation of ART at care and support units within CBOs
Prevent	<p>Pre-exposure prophylaxis (PrEP) and non-occupational post-exposure prophylaxis (nPEP) services:</p> <ol style="list-style-type: none"> 1. Pre-counselling 2. PrEP dispensary at months 1, 3, 6, 12 3. Associated laboratory diagnostics: HIV, creatinine, hepatitis B screening prior to PrEP initiation and monitoring during PrEP use 4. Pre-counselling for nPEP before dispensation 5. nPEP dispensation 6. Associated nPEP lab services: HIV, creatinine, alanine aminotransferase (ALT) 		

Cascade step	Model 1: Hospital-based model	Model 2: Government facility-led health services with reach and recruit-led by CBOs	Model 3: Key population-led health services (KPLHS) in collaboration with government hospitals
Retain	There are no retain activities in this model	Hospitals implement: <ol style="list-style-type: none"> 1. Engagement with HIV-negative clients (e.g. utilization of mobile technology for HTS reminders) 2. Support for HIV-positive clients to adhere to treatment (e.g. home visits, A mobile phone counselling service) 	Retain activities include: <ol style="list-style-type: none"> 1. Engagement with HIV-negative clients (e.g. utilization of mobile technology for HTS reminders) 2. Engagement with HIV-positive clients (e.g. appointment reminders, adherence counseling)

3.2 Summary of site information

3.2.1 Model 1: Government facility-based

Roi-Et Hospital

General information	Roi Et hospital is a regional hospital located in Roi Et province, in the northeast region of Thailand. Roi Et Hospital is capable of tertiary care and advanced medicine. It includes a hospital and medical education center, with a capacity of 820 beds.
Focus populations	MSM
Other populations served	FSWs, General population
RRTTPR Activities	Reach/Recruit (school-based HIV educational program) Test (mobile and in-clinic VCT) Treat
Major HIV funder, 2017	NHSO
Remarks	Counselling nurses provide a school-based program for MSM including reach-recruit-test (RRT) and HIV education. VCT is provided at both mobile and in-clinic sites for MSM and other individuals at risk.

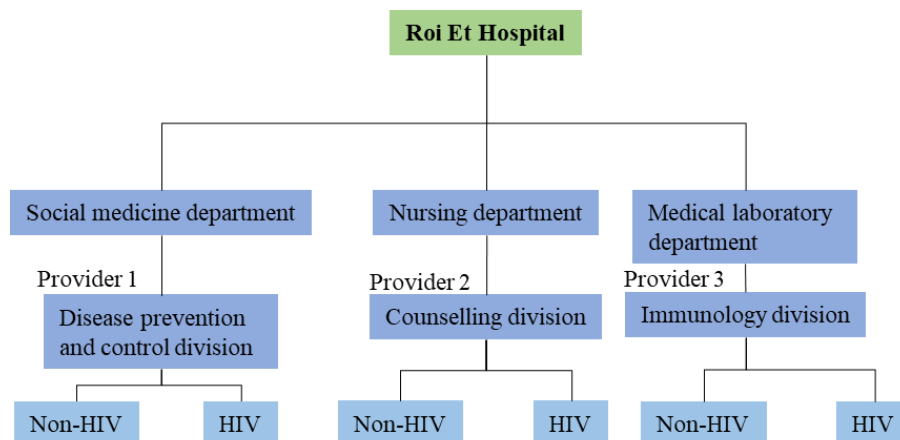


Figure 8. Cost center chart for Roi-Et Hospital

3.2.2 Model 2: Government facility-led health services with reach and recruit led by CBOs

Bangkok Metropolitan Administration-Public Health Center 28 (BMA-PHC28)

General information	Bangkok Metropolitan Administration-Public Health Center 28, Krung Thonburi (BMA-PHC28) is one of 68 health centers located in the Bangkok metropolitan area. Health centers are managed by the Health Department of the Bangkok Metropolitan Administration (BMA). Located in Khlong San District, BMA-PHC28 is responsible for 4 sub-district areas including Somdej Chaopraya, Khlong San, Khlong Ton Sai, and Bang Lumpoo Lang, serving residents spanning 6.87 square kilometers including 44 communities, 5 public schools, and 15 private schools. There are 79,659 residents (37,392 males and 42,267 females) in the catchment area, living in 15,100 houses. BMA-PHC28 offers one-stop-shop services for HIV and other STIs under the name of the Safe Love Clinic (formerly the STI Clinic).
Focus populations	MSM, TG, FSWs, MSWs
Other populations served	General population
RRTTPR activities	Test (mobile and in-clinic VCT) Treat Prevent (PrEP)
Major HIV funder, 2017	AIDS, Tuberculosis and Sexually Transmitted Disease Control, Division of the Health Department (BMA)
Remarks	BMA-PHC28 was initially classified in Model 1. However, the team discovered that NGOs provide reach and recruitment activities for BMA-HCs with support from the NHSO. BMA-PHC28 is one of 9 Health Centers to which NGOs refer clients to get tested. In addition, NGOs also support mobile VCT in collaboration with BMA-HCs including BMA-PHC28. Most outreach activities are conducted by NGOs for areas outside of the BMA-PHC28 catchment area.

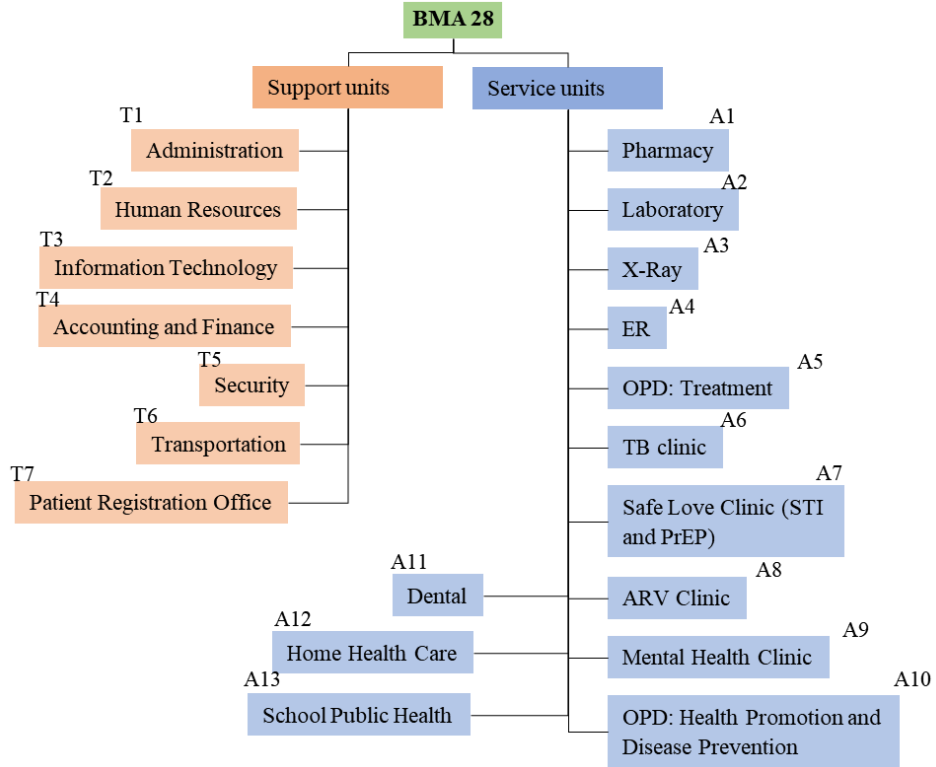


Figure 9. Cost Center chart for BMA-PHC28

Mfriend Udonthani + Udonthani Hospital

Name	Mfriend
General information	Mfriend is supported collaboratively by the Napha Clinic (Udonthani Hospital), Udonthani Provincial Public Health Office, and the Thailand MOPH – U.S. CDC Collaboration (TUC). The CBO provides HIV prevention and sexually-transmitted infection prevention interventions for MSM and TG in Udonthani Province.
Focus populations	MSM, TG
Other populations served	N/A
RRTTPR activities	Reach/Recruit (refer to test) Test (mobile VCT) Treat (refer to treat)
Major HIV funder, 2017	Global Fund/STAR
Remark	Mfriend provides reach, recruit, and mobile VCT services with in collaboration with health professionals from Udonthani Hospital (HIV pre and post-test counselling and testing).
Partner organization (Government facility)	
Name	Napha Clinic (affiliate unit of Udonthani Hospital)
General information	Napha Clinic functions as a one-stop-shop clinic for HIV/STI and outpatient services under the guidance of Udonthani Hospital. The clinic offers counselling, testing, ART, PrEP and PEP by health professionals. Trained KP case managers provide care and support services for PLHIV clients.
RRTTPR activities	Mobile VCT, in-clinic VCT, treat, prevent (PrEP & PEP), retain (since 2018)

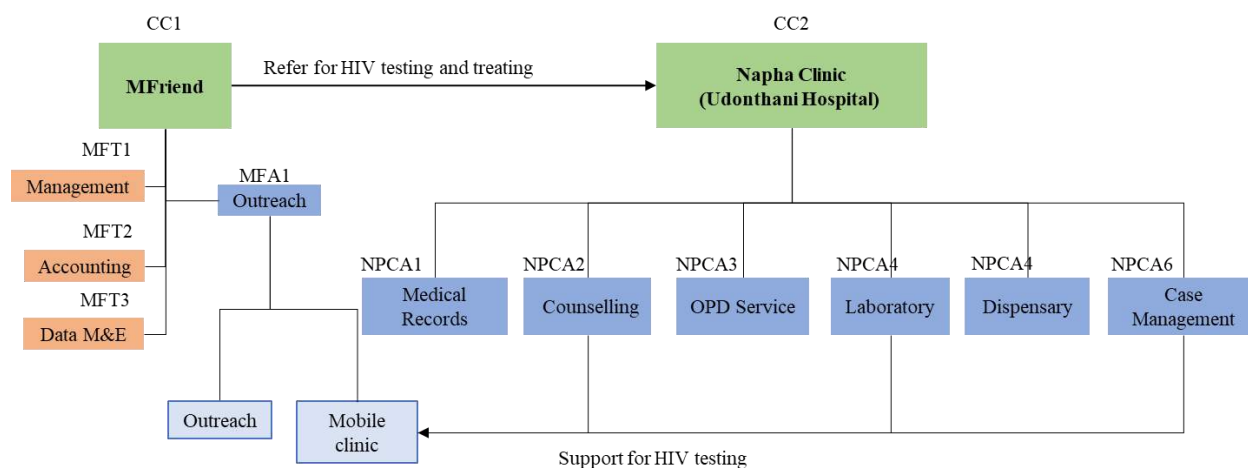


Figure 10. Cost center chart for Mfriend and Napha Clinic (Udonthani Hospital)

PPAT Khon Kaen + Khon Kaen Hospital

Name	The Planned Parenthood Association of Thailand (PPAT)
General information	PPAT provides family planning and reproductive health services including education, family planning, and prevention of STIs. PPAT has service centers throughout Thailand, including Khon Kaen. In Khon Kaen, PPAT focuses on HIV prevention among FSWs.
Focus populations	FSWs
Other populations served	N/A
RRTTPR activities	Reach/Recruit Test (mobile VCT)
Major HIV funder, 2017	NHSO
Remark	PPAT provides reach to test services (mobile VCT) in collaboration with Khon Kaen Hospital (for HTS).
Partner organization (Government facility)	
Name	Plai Fa Clinic, Chata Padung Medical Center, (primary care service affiliate of Khon Kaen Hospital)
RRTTPR activities	Plai Fa clinic provides HTS and PrEP; HIV-positive cases are referred to the HIV/AIDS clinic at Khon Kaen Hospital.

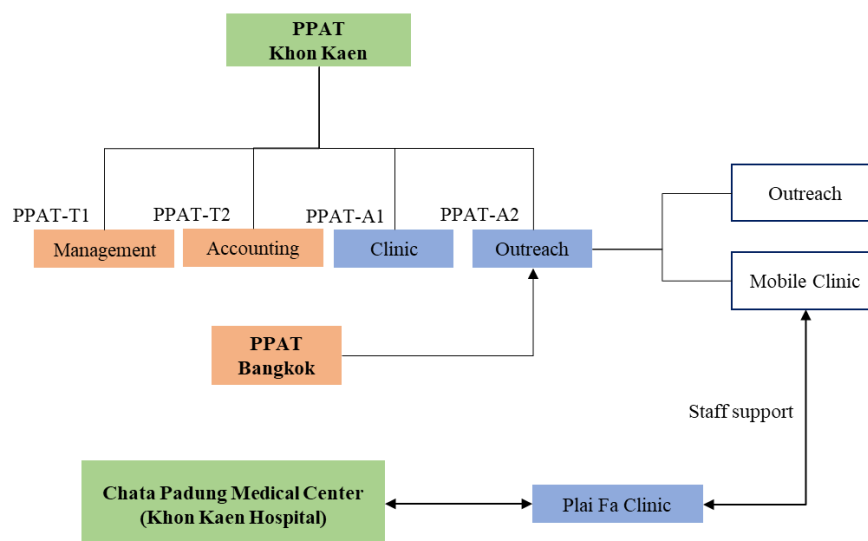


Figure 11. Cost center chart for PPAT Khon Kaen and Plai Fa Clinic (Khon Kaen Hospital)

Mreach Khon Kaen + Khon Kaen Hospital

Name	Mreach
General information	Mreach, a non-government organization (NGO), specializing in sexually transmitted diseases (STDs) among MSM is supported by Plai Fa clinic (Khon Kaen Hospital), and the Thailand MOPH – U.S. CDC Collaboration (TUC).
Focus populations	MSM
Other populations served	N/A
RRTTPR activities	Reach Recruit (refer to test) Test (mobile VCT) Treat (refer to treat)
Major HIV funder, 2017	Global Fund/STAR
Remark	Mreach provides reach, recruit, and mobile VCT services with in collaboration with health professionals from Plai Fa clinic (HIV pre and post-test counselling and testing).
Partner Organization (Government facility)	
Name	Plai Fa clinic, Chata Padung Medical Center, (primary care service affiliate unit of Khon Kaen Hospital)
RRTTPR activities	Plai Fa clinic provide HIV testing, counselling and PrEP, and HIV positive case is referred to HIV/AIDS clinic in Khon Kaen Hospital.

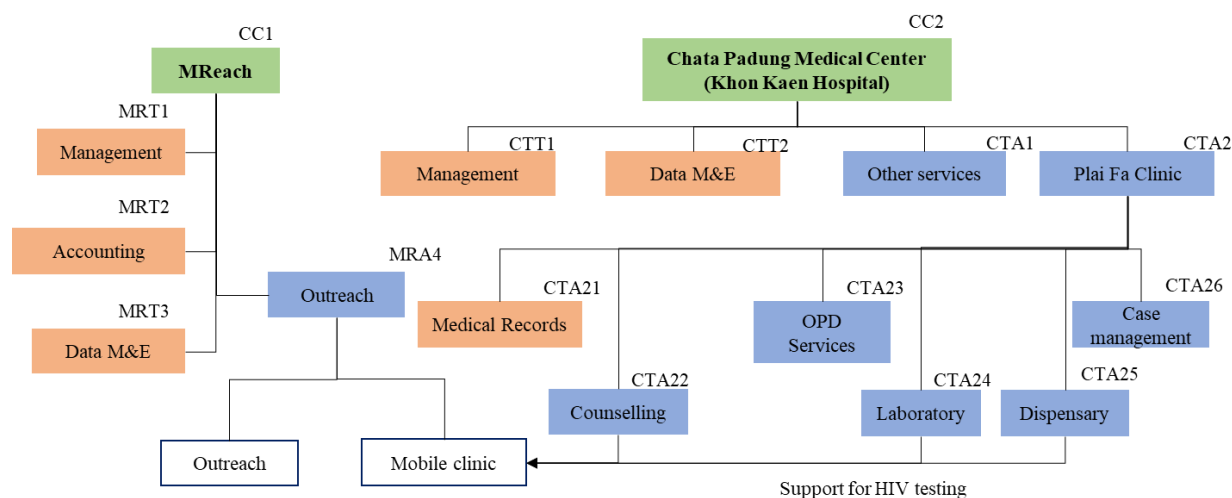


Figure 12. Cost center chart for Mreach and Chata Padung Medical Center (Khon Kaen Hospital)

Ozone Tak + Mae Ramard Hospital

Name	Ozone Tak
General information	Ozone principally works in harm reduction with PWID, and provision of (or referral to) full HIV cascade services.
Focus populations	PWID
Other populations served	N/A
RRTTPR activities	Reach/Recruit (refer to test) Test (mobile VCT) Treat (refer to treat) Retain
Major HIV funder, 2017	Global Fund/STAR
Remark	Reach and recruit provided by Ozone; clients referred to test/treat at Mae-Ramard Hospital. Ozone Tak also provides home visits to support retention for clients both living with and without HIV.

Partner organization (Government facility)

Name	Piumsook Clinic - affiliate unit of Mae-Ramard Hospital
General information	Piumsook Clinic at Mae-Ramard Hospital is the primary collaborating partner. In contrast to Ozone, Piumsook Clinic offers services to everyone including PWID, MSM and the broader populations. It provides HIV/AIDS testing, prevention, and ARV treatment.
RRTTPR activities	Mae-Ramard Hospital receives NHSO funds for mobile VCT among MSM

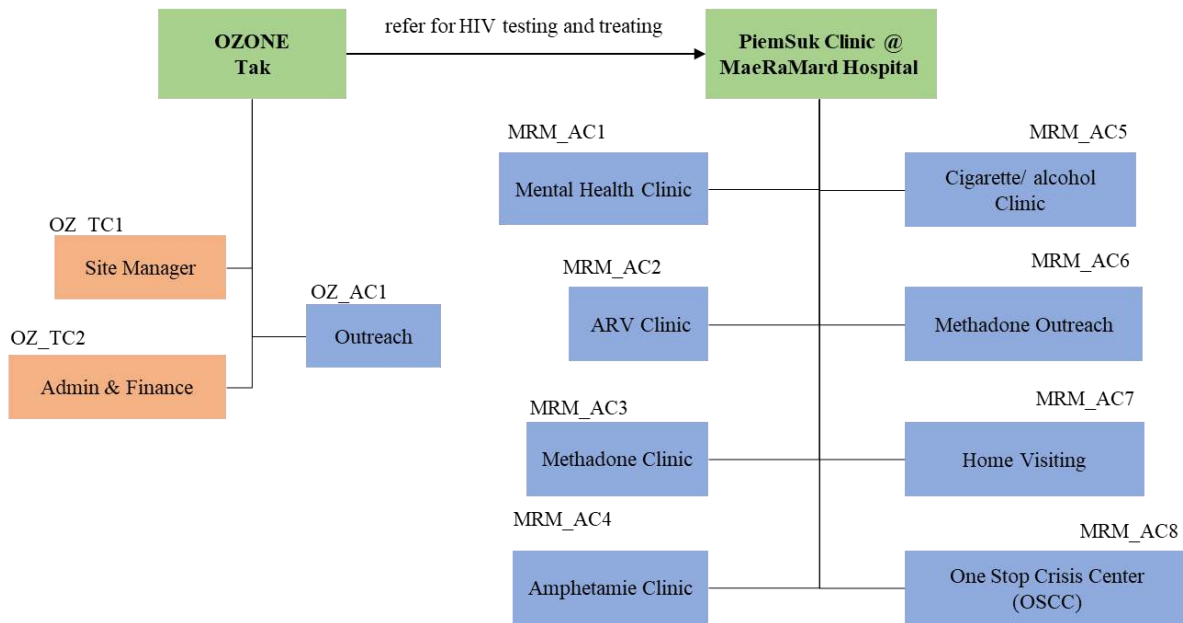


Figure 13. Cost center chart for Ozone Tak and MaeRaMard Hospital

Raks thai Samutprakarn + Samutprakarn Hospital

Name	Raks Thai foundation
General information	The Raks Thai Foundation (RTF) was established in 1997 as a successor to CARE International (Thailand). Its mission is to build stronger communities and assist those most disadvantaged.
Focus populations	PWID and migrant workers (MWs)
Other populations served	N/A
RRTTPR activities	Reach/Recruit (refer to test), mobile VCT (MWs) Retain
Major HIV funder, 2017	Global Fund/STAR
Remark	Reach and recruit provided by Raks Thai; clients are referred to test/treat at Samutprakran Hospital. No mobile VCT for PWID. Home visits to support retention for PLHIV.

Partner Organization (Government facility)

Name	Samutprakarn Hospital
RRTTPR activities	HIV counselling services for KPs supported by the Psychiatric Clinic - affiliate unit of Samutphakarn Hospital.

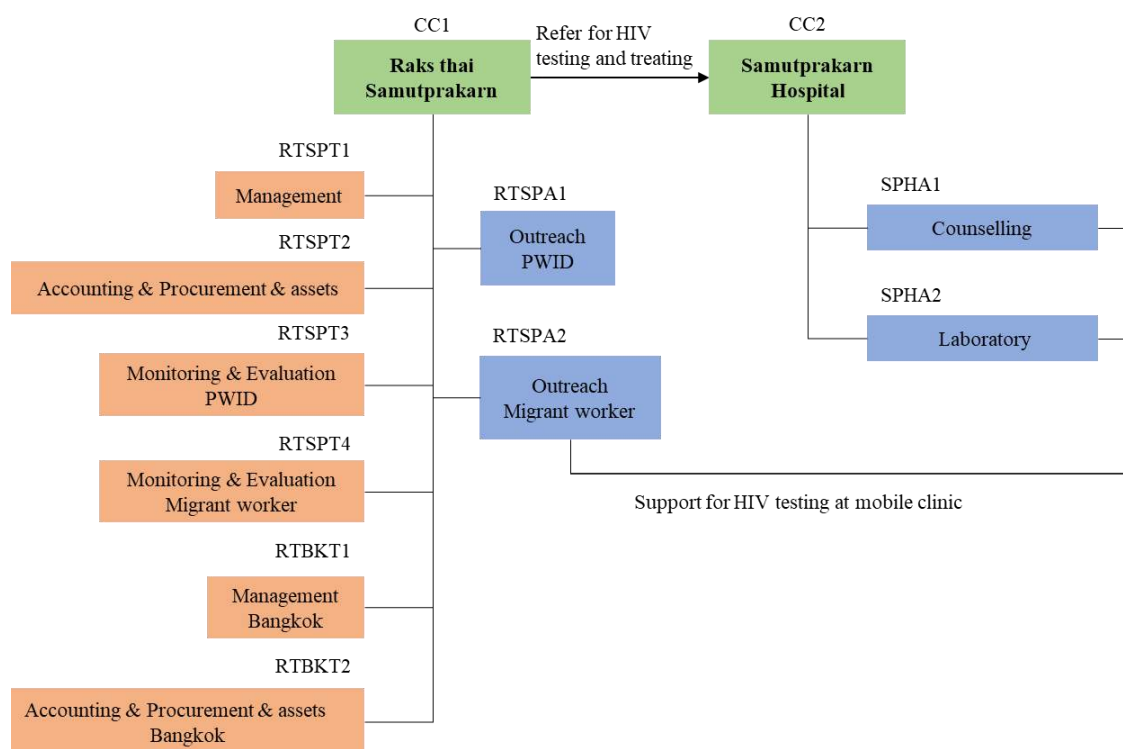


Figure 14. Cost center chart for Raks Thai Samutprakarn and Samutprakarn Hospital

3.2.3 Model 3: KPLHS in collaboration with government hospitals

Mplus Chiang Mai

Name	Mplus foundation
General information	Mplus was established in 2011 with a focus on HIV prevention, human and sexual rights, sexual health, and stigma reduction. The foundation supports HIV-related interventions for MSM, MSWs, and TG individuals in Chiang Mai via drop-in center and outreach activities. It doses also provide support for HTS and referral to ARV treatment in collaboration with local treatment centers/hospitals.
Focus populations	MSM, MSWs, TGs, FSWs
Other populations served	N/A
RRTTPR activities	Reach/Recruit (assignment of UICs) Test (mobile VCT, oral fluid) Treat (CD4, refer to treat) Prevent (PrEP) Retain - for positives, negatives, and inconclusive individuals (e.g. via phone)
Major HIV funder, 2017	USAID/ LINKAGES Thailand and Global Fund/STAR
Remark	Outreach staff provide reach and recruit interventions and mobile VCT for KPs. HTS and CD4 are provided by staff at collaborating health centers (in clinic). PrEP is also offered for those at risk. Positive cases are referred to treatment and follow-up services (via phone and in person) by care and support staff. All the activities are provided by Mplus staff at the Mplus clinic.

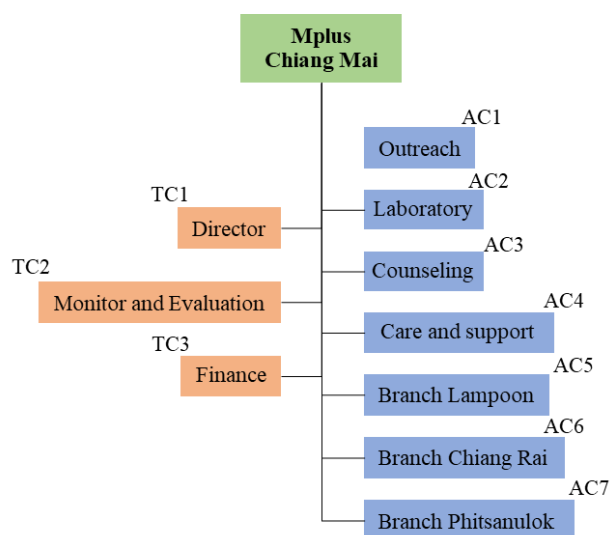


Figure 15. Cost center chart for Mplus Chiang Mai

RSAT Bangkok

Name	Rainbow Sky Association of Thailand (RSAT)
General information	RSAT was established in 2003 with a focus on HIV prevention, human and sexual rights, sexual health, and stigma reduction. The foundation supports HIV-related interventions for MSM and TG individuals via drop-in center and outreach activities. It is also providing support for HTS and referral to ARV treatment in collaboration with local treatment centers/hospitals.
Focus populations	MSM, MSWs, TGs
Other populations served	FSWs
RRTTPR activities	Reach/Recruit (assignment of UICs) Test (mobile VCT) Treat (CD4, referral to ART) Prevent (PrEP) Retain – for PLHIV (via phone)
Major HIV funder, 2017	USAID/ LINKAGES Thailand and Global Fund/STAR
Remark	Outreach staff provide reach and recruit interventions and mobile VCT for KPs. HTS and CD4 are provided by staff at collaborating health centers (in clinic). PrEP is also offered for those at risk. Positive cases are referred to treatment and follow-up services (via phone) by care and support staff. All the activities are provided by RSAT staff at the RSAT clinic.

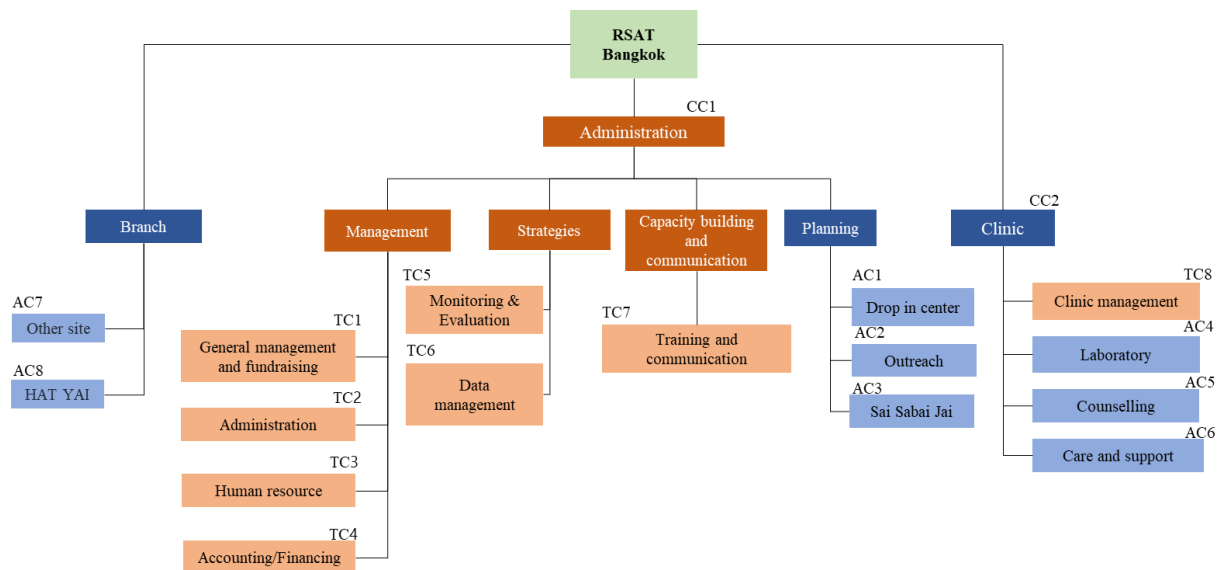


Figure 16. Cost center chart for RSAT Bangkok

RSAT Songkla (Hat Yai)

Name	Rainbow Sky Association of Thailand Songkla (Hat Yai)
General information	RSAT Songkla Hay Yai, a branch of RSAT, focuses on HIV prevention, human and sexual rights, sexual health, and stigma reduction in Songkla province. The foundation supports HIV-related interventions for MSM, MSW, and TG individuals via drop-in center and outreach activities. It also provides support for HTS and referral to ARV treatment in collaboration with local treatment centers/hospitals.
Focus populations	MSM, MSWs, TGs
Other populations served	FSWs
RRTTPR activities	Reach/Recruit (assignment of UICs) Test (mobile VCT) Treat (CD4, referral to ART) Prevent (PrEP) Retain – for PLHIV (via phone)
Major HIV funder, 2017	USAID/LINKAGES Thailand and Global Fund/STAR
Remark	Outreach staff provide reach and recruit interventions and mobile VCT for KPs. HTS and CD4 are provided by staff at collaborating health centers (in clinic). PrEP is also offered for those at risk. Positive cases are referred to treatment and follow-up services (via phone) by care and support staff. All the activities are provided by RSAT staff at the RSAT clinic.

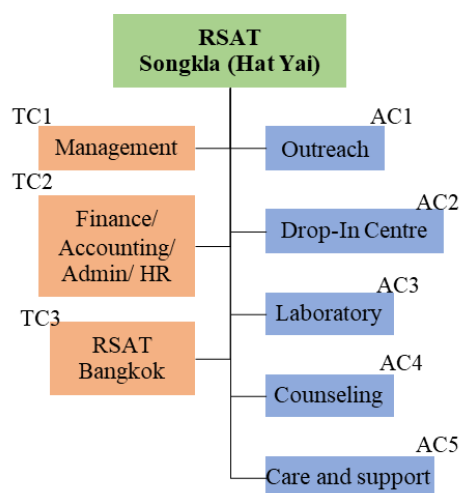


Figure 17. Cost center chart for RSAT Songkla (Hat Yai)

SWING Chonburi (Pattaya)

Name	SWING Chonburi (Pattaya)
General information	SWING Chonburi (Pattaya) is a branch of SWING foundation that provides full services along the HIV cascade including reach, recruit, mobile VCT, in-clinic VCT, prevention through PrEP, referral to ART, and retention for PLHIV. Chonburi (Pattaya) services are focused on FSWs and MSWs.
Focus populations	FSW, MSW
Other populations served	N/A
RRTTPR activities	Reach/Recruit (assignment of UICs) Test (mobile VCT) Treat (CD4, referral to ART) Prevent (PrEP) Retain – for PLHIV (via phone)
Major HIV funder, 2017	USAID/LINKAGES Thailand, AIDS Healthcare Foundation (AHF), Global Fund/STAR
Remark	Outreach staff provide reach and recruit interventions and mobile VCT for KPs. HTS and CD4 are provided by staff at collaborating health centers (in clinic). PrEP is also offered for those at risk. Positive cases are referred to treatment and follow-up services (via phone) by care and support staff. All the activities are provided by SWING staff at the SWING clinic.

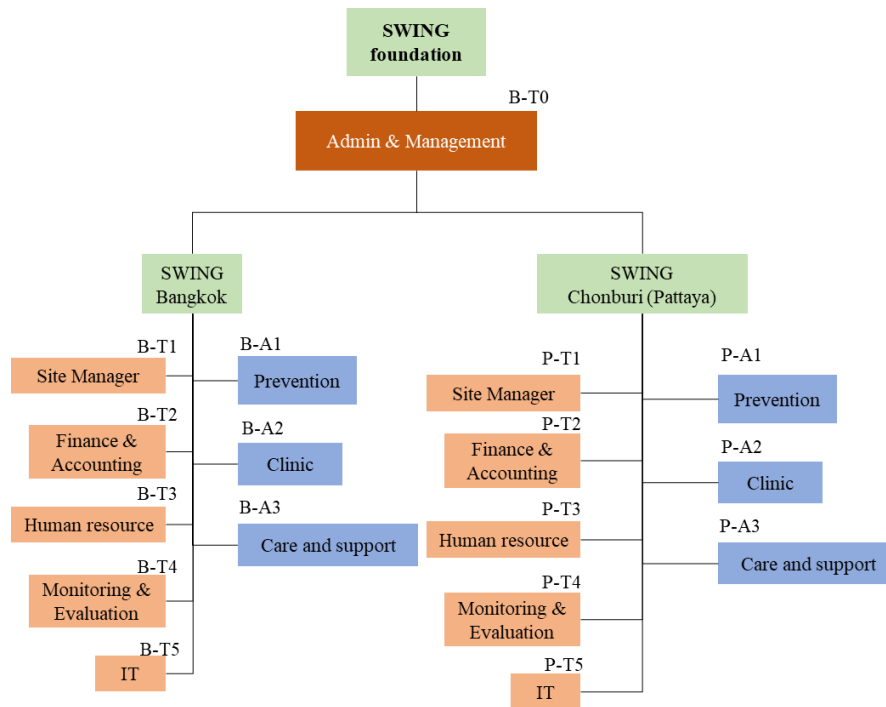


Figure 18. Cost center chart for SWING Chonburi (Pattaya)

SWING Bangkok

Name	SWING Foundation
General information	SWING foundation provides full services along the HIV cascade including reach, recruit, mobile VCT, in-clinic VCT, prevention through PrEP, referral to ART, and HIV retention for PLHIV.
Focus populations	FSW, MSW, MSM, TG
Other populations served	N/A
RRTTPR activities	Reach/Recruit (assignment of UICs) Test (mobile VCT) Treat (CD4, referral to ART) Prevent (PrEP) Retain – for PLHIV (via phone)
Major HIV funder, 2017	USAID/LINKAGES Thailand, AIDS Healthcare Foundation (AHF), Global Fund/STAR
Remark	Outreach staff provide reach and recruit interventions and mobile VCT for KPs. HTS and CD4 are provided by staff at collaborating health centers (in clinic). PrEP is also offered for those at risk. Positive cases are referred to treatment and follow-up services (via phone) by care and support staff. All the activities are provided by SWING staff at the SWING clinic.

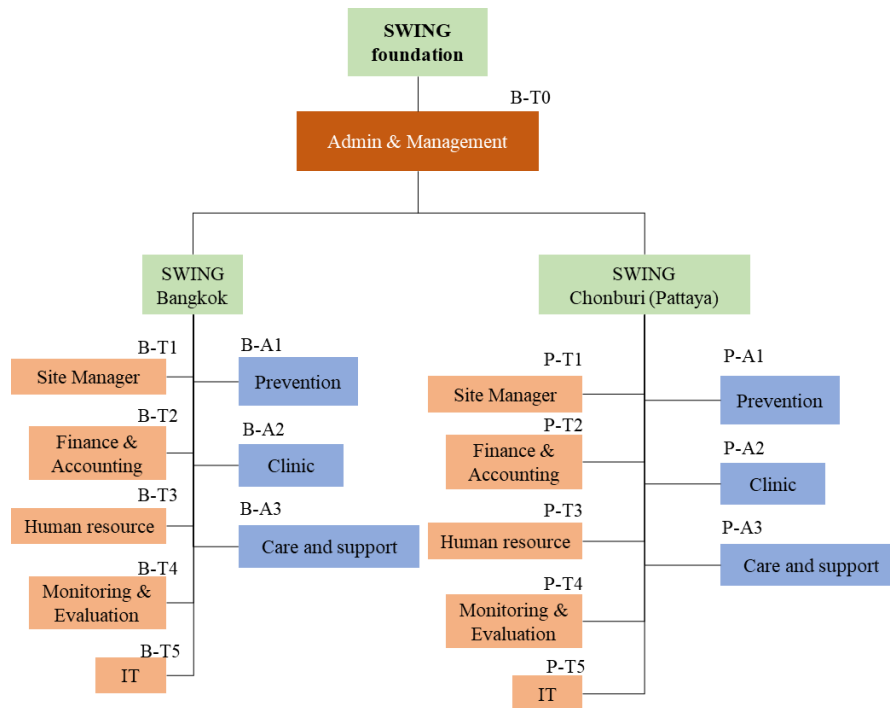


Figure 19. Cost center chart for SWING Bangkok

SISTERS Chonburi (Pattaya)

Name	Sisters Foundation
General information	Sisters foundation was established in 2004 with support of Population Services International (PSI). It is now an independent organization working in HIV prevention with support from the government, the private sector, and USAID. Sisters is a TG-led organization based in Pattaya, Chonburi that provides sexual health and human rights services with a focus on TGW. It is the first counselling center to cater exclusively to the TG community in Thailand.
Focus populations	TGs
Other populations served	MSW, MSM
RRTTPR activities	Reach/Recruit (assignment of UICs) Test (mobile VCT, oral fluid, hormone levels) Treat (CD4, referral to ART) Prevent (PrEP, PEP) Retain – for PLHIV (via phone)
Major HIV funder, 2017	USAID/LINKAGES Thailand and Global Fund/STAR
Remark	Sisters has a drop-in center that provides social activities (e.g. makeup, cooking, and other classes) and health services. It also has an outreach team to reach and recruit members of the TGW community in Pattaya. Sisters also provides counseling on gender affirming healthcare, HIV testing, screening for other STIS, point-of-care CD4, and PrEP. Positive cases are referred to treatment and follow-up (via phone) by care and support staff.

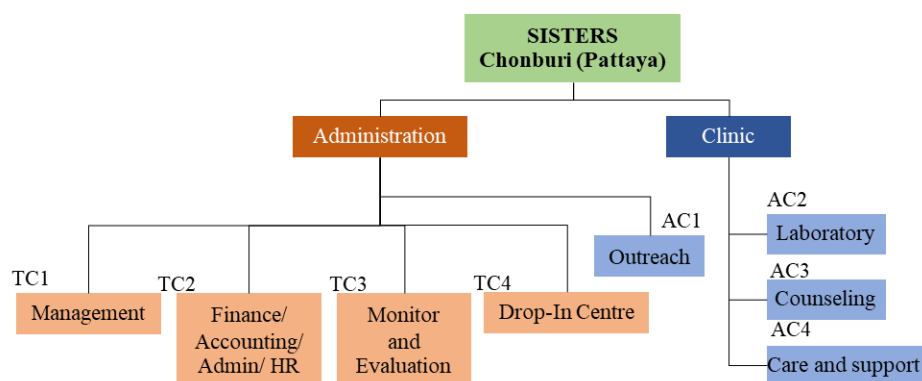


Figure 20. Cost center chart for SISTERS Chonburi (Pattaya)

3.3 Unit costs for activities in the RRTTPR cascade

3.2.4 Model 1: Government facility-based

Unit costs - Roi-Et Hospital

Reach/Recruit

The total financial and economic costs for reach and recruitment activities (including mobile outreach at pubs/bars and sentinel surveillance) was 2,918 and 3,016 THB per visit, respectively. During FY17, the hospital recruited 205 KPs.

Test

The total financial and economic cost of clinic-based testing was 315 THB per visit, and the total cost of mobile testing was 281 THB per visit. Unit cost for counselling at the clinic (121 THB per visit) was lower than at the mobile clinic (2,447 THB per visit) due to the time required for each. While lab testing at the hospital is routine, lab technicians who conduct testing during outreach receive extra compensation. HIV/STI testing at the hospital is automated (no rapid tests). All routine lab diagnostics were calculated using the Standard Cost Lists for Health Technology, and disaggregation of labor, material, and capital costs was not possible.

Maximum time allowance for post-counselling during mobile VCT is 15 minutes regardless of the test result. In contrast, post-test counselling at the clinic for those diagnosed positive can last up to 60 minutes.

Treat

The cost of a CD4 count was 723 THB per visit. At the time of this study, the hospital did not yet provide case management service for clients who tested positive, PrEP, or PEP.

The site provides routine follow-up of HIV-positive clients via telephone and mobile applications, managed by a different division. However, because this division did not keep records of retention activities, retention costs had to be excluded from the results. In addition, the hospital did not keep a record of capacity-building activities, hence those costs were also not included.

Unit costs for all RRTTPR activities at Roi-Et Hospital are provided in Table 7.

Table 7. Unit costs - Roi-Et Hospital: MSM

Cascade	n	Financial costs (THB/visit)				Economic costs (THB/visit)			
		M+L	M+L+C	CB	Total M+L+C+CB	M+L	M+L+C	CB	Total M+L+C+CB
Reach + Recruit									
Reach + Recruit	205	2,864	2,918	0	2,918	2,864	3,016	0	3,016
Test									
Clinic (Lab)	1,332†	315	315	0	315	315	315	0	315
Mobile (Lab)	2,144†	281	281	0	281	281	281	0	281
Clinic (Counselling)	1,332	2,365	2,384	0	2,384	2,365	2,447	0	2,447
Mobile (Counselling)	2,144	117	118	0	118	117	121	0	121
Treat									
Case management for ART initiation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (CD4 test)	231	N/A*	723	N/A*	723	N/A*	723	N/A*	723
Counselling by case manager	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent									
PrEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PrEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: (not applicable) indicates when there is no activity for this site

N/A*: indicates when the cost is derived from a standard cost list that could not be disaggregated by labor, capital, and material costs

† indicates when the cost includes general population

3.3.1 Model 2: Government facility-led health services with reach and recruit led by CBOs

Unit costs - Bangkok Metropolitan Administration Public Health Center (BMA 28)

BMA-HC28 was initially classified as a Model 1 service site. However, the team discovered that NGOs provide reach and recruitment activities for BMA health centers (HCs) with support from the NHSO. As a result, the site was reclassified as a Model 2 site. However, costs associated with NGO services were not collected. Services at the Safe Love Clinic include STI diagnosis and treatment, VCT, and PrEP service for those eligible. ARV services were added to the TB clinic toward the end of FY2017. Financial and economic costs across the board were similar.

Reach/Recruit

The total unit costs for reach/recruitment (both financial and economic) were 327 THB per visit. Unit costs for reach/recruit were calculated based on direct costs for NGOs.

Test

Unit costs for in-clinic VCT lab diagnostics were nearly twice as high than those for mobile VCT, and almost five times as high for counseling. At the clinic, which serves as a one-stop-shop service site, Safe Love Clinic staff require more time (about 45 minutes from registration through post-counseling). Conversely, the time spent during mobile VCT is about 20 minutes for pre- and post-test counselling; registration is conducted by NGO staff and testing conducted by a lab technician.

Treat

The unit cost for providing CD4 testing was included under the referral to treatment category.

There were 19 clients who tested positive by the end of FY17.

Prevent

The unit cost of PrEP was defined as the average of the unit costs of all visits from the first HIV test to the month-three visit. The visits in the unit cost include those up to month three due to the timeframe for this costing study (FY17). Labor and material costs accounted for over 90% of unit costs, and the costs were similar at both

Capacity-building activities were provided by the AIDS, TB, and STI Control Division of the Health Department of the Bangkok Metropolitan Administration. Unfortunately, BMA28 did not keep records of the number of trainings, individuals who attended, and associated costs. As a result, capacity-building information could not be included as part of this costing study.

The unit costs for all RRTTPR activities at BMA28 are provided in Table 8.

Table 8. Unit costs - Bangkok Metropolitan Administration Public Health Center (BMA 28): MSM, TGs, FSWs, MSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach + Recruit									
Reach + Recruit	2,138	327	327	0	327	327	327	0	327
Test									
Clinic (Lab)	644	602	612	0	612	602	644	0	644
Mobile (Lab)	2,637	322	322	0	322	322	323	0	323
Clinic (Counselling)	644	1,165	1,200	0	1,200	1,165	1,316	0	1,316
Mobile (Counselling)	2,637	251	257	0	257	251	278	0	278
Treat									
Case management for ART initiation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (CD4 test)	19	N/A*	689	N/A*	689	N/A*	689	N/A*	689
Counselling by case manager	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent									
PrEP (Lab + Counselling)	91	2,792	2,837	0	2,837	2,792	2,985	0	2,985
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates when there is no activity for this site

N/A*: not applicable indicates when the cost is derived from a standard cost list that could not be disaggregated by labor, capital, and material costs

Unit costs - Mfriend Udonthani + Udonthani Hospital

Reach/Recruit

Reach activities at Mfriend include face-to-face, one-on-one meetings, small-group sessions, and personal/private chats through social and online media channels. In FY17, Mfriend conducted 2,969 outreach sessions. Financial and economic unit costs for each reach were similar (558 vs. 573 THB respectively).

For recruitment, clients are referred to pre-test counselling at the hospital through incentivized referral chain recruitment. Monetary incentives are paid to mobilizers for successful referrals. Mfriend conducted 235 successful recruitments in FY17. The financial and economic unit costs for recruitment were 2,782 and 2,881 THB per visit, respectively. Labor comprised a large proportion of unit costs. Mfriend staff accompany clients to pre-test counselling at the hospital, which on average takes about 3-4 hours per visit.

Test

Napha Clinic serves as the outpatient clinic of Udonthani hospital and provides HIV services for all visitors. The total number of tests at the clinic thus includes all client visits for VCT at the hospital (7,983), which is greater than the number of KP clients reached/recruited by Mfriend. Conversely, mobile VCT includes only KP clients reached/recruited by Mfriend. As a result, mobile testing was lower (471 tests). Because of the higher number of visits for VCT at the clinic, the unit cost for HIV testing (363 THB per test) was much lower than that of mobile VCT (1,311 THB per test).

Similarly, the unit cost for mobile counselling was higher than at the clinic due to the lower number of clients. In addition, mobile testing requires the provision of allowances for civil servants from the Napha Clinic, including senior nurses and medical technologists, to conduct testing in the community.

Treat

While Mfriend provides case management support for ART initiation, no clients were provided this support in FY17. The cost for conducting a CD4 count was 723 THB/visit. It was not possible to separate labor, capital, and material costs because the cost is based on a standard cost. Napha Clinic case managers provide care and support counselling for HIV positive clients at approximately 157 THB per visit (economic cost).

Prevent

The unit cost for PrEP (lab) was defined as the average unit cost for all visits including laboratory and drug costs per client/year. Seventy-eight KPs received PrEP in FY17, at 1,907 THB per client/year. There were no retention activities in FY17 either at Napha Clinic or Mfriend.

The unit costs for all RRTTPR activities at Mfriend Udonthani + Udonthani Hospital are provided in Table 9.

Table 9. Unit costs - Mfriend Udonthani + Udonthani Hospital: MSM, TGs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach									
Reach	2,969	553	554	4	558	553	569	4	573
Recruit									
Refer to test	235	2,747	2,754	28	2,782	2,747	2,852	29	2,881
Test									
Clinic (Lab)	7,983 [†]	345	347	0	347	345	363	0	363
Mobile (Lab)	467	1,260	1,262	10	1,272	1,260	1,300	11	1,311
Clinic (Counselling)	7,983 [†]	246	248	2	250	246	253	3	256
Mobile (Counselling)	471	533	537	5	542	533	549	4	553
Treat									
Case management for ART initiation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (CD4 test)	668 [†]	N/A*	723	N/A*	723	N/A*	723	N/A*	723
Counselling by case manager	668 [†]	145	146	6	152	145	152	5	157
Prevent									
PrEP (Lab)	78	1,907	1,907	0	1,907	1,907	1,907	0	1,907
PrEP (Counselling)	7,431 [†]	189	190	3	193	189	193	3	196
PEP (Lab + Counselling)	22	1,053	1,054	1	1,055	1,053	1,057	1	1,058
Retain									
Positive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates when there is no activity for this site

N/A*: not applicable indicates when the cost is derived from a standard cost list that could not be disaggregated by labor, capital, and material cost

† indicates when the cost includes general population

Unit costs - PPAT Khon Kaen + Khon Kaen Hospital

Reach/Recruit

PPAT Khon Kaen primarily provides family planning and reproductive health services, of which HIV/AIDS is a secondary focus. In FY17, PPAT Khon Kaen provided outreach for FSWs, and recruit-to-test activities. The unit cost for reach and recruit-to-test was 1,251 THB per visit

(economic). The unit cost of HIV testing and counselling at clinic was 1,682 THB per visit (economic).

The unit costs for RRTTPR activities at PPAT Khon Kaen + Khon Kaen Hospital are provided in Table 10.

Table 10. Unit costs - PPAT Khon Kaen + Khon Kaen Hospital: FSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach + Recruit									
Reach + Recruit	675	1,230	1,230	0	1,230	1,230	1,251	0	1,251
Test									
Clinic (Lab + Counselling)	675	1,653	1,654	0	1,654	1,653	1,682	0	1,682
Mobile (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mobile (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Treat									
Case management for ART initiation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (CD4 test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by case manager	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent									
PrEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PrEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates when there is no activity for this site

Unit costs - Mreach Khon Kaen + Khon Kaen Hospital

Reach/Recruit

Mreach reach activities include one-on-one outreach, and small-group sessions. In FY17, Mreach conducted 5,304 reach sessions. Financial and economic unit costs were similar, at 440 THB and 451 THB per reach respectively.

Recruitment activities are similar to those at Mfriend, and are based on successful referrals for pre-test counselling at hospitals through incentivized referral chain recruitment. The unit cost of recruitment was 270 THB per visit based on a total of 1,553 recruitments in FY17. Similar to Mfriend, labor costs factored significantly in recruitment because an Mreach staff member is required to escort each client to pre-test counselling at a hospital.

Treat

The unit cost for case management for ART initiation provided by Mreach was 2,543 THB per visit; 41 cases were referred to ART at a hospital. The cost for conducting a CD4 count was 723 THB/visit; it was not possible to separate labor, capital, and material costs given the cost is based on a standard cost.

Prevent

The unit cost for PrEP (lab) was defined as the average of unit costs for all visits including associated tests and PrEP drugs per client/year. During the fiscal year, Mreach provided PrEP services to 31 KPs, at a cost of 2,456 THB per client/year (economic cost).

The unit costs for RRTTPR activities at Mreach Khon Kaen + Khon Kaen Hospital are provided in Table 11.

Table 11. Unit costs - Mreach Khon Kaen + Khon Kaen Hospital: MSM, TGs, FSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach									
Reach	5,304	438	438	0	438	440	448	0	448
Recruit									
Refer to test	1,553	269	270	0	270	269	270	0	270
Test									
Clinic (Lab)	128	562	614	0	614	562	799	0	799
Mobile (Lab)	306	1,695	1,717	0	1,717	1,695	1,831	0	1,831
Clinic (Counselling)	128	388	399	0	399	388	477	0	477
Mobile (Counselling)	306	1,759	1,778	0	1,778	1,759	1,957	0	1,957
Treat									
Case management for ART initiation	41	2,541	2,541	0	2,541	2,541	2,543	0	2,543
Clinic (CD4 test)	41	N/A*	723	N/A*	723	N/A*	723	N/A*	723
Counselling by case manager	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent									
PrEP (Lab + Counselling)	31	2,113	2,180	0	2,180	2,113	2,456	0	2,456
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates when there is no activity for this site

N/A*: not applicable indicates when the cost is derived from a standard cost list that could not be disaggregated by labor, capital, and material cost

Unit costs - Ozone Tak + Mae Ramard Hospital

Ozone primarily provides harm reduction services for PWID. As HIV acquisition is one of the harms associated with injecting drug use, HIV-related services are included as part of a comprehensive package provided to all beneficiaries. In FY17, Ozone Tak provided support to 607 beneficiaries.

Reach/Recruit

Reach activities for PWID include one-on-one outreach that often require more than one visit to generate a UIC. Referral for testing has been challenging for Ozone; in FY17, Ozone conducted 6,872 reach interventions and successfully referred 206 cases to HIV testing. The unit cost of reach was 537 THB per visit. The unit cost for recruitment was 1,326 THB per visit (economic). Clients are referred for pre-test counselling at Piumsook Clinic, Mae Ramard Hospital.

Treat

The unit cost for case management for ART initiation was 1,286 THB per visit. The cost of conducting a CD4 count was 689 THB/visit, based on the standard cost determined by the hospital.

Retain

Ozone provides home visits and group meetings to support PLHIV clients to remain within the services continuum. Staff at Piumsook Clinic, Mae Ramard Hospital also conduct home visits. However, unlike Ozone, home visits include all clients (not just PWID). As a result, those costs have been excluded from calculations for unit costs for retention of positives.

The unit costs for RRTTPR activities at Ozone Tak + Mae Ramard Hospital are provided in Table 12.

Table 12. Unit costs - Ozone Tak + Mae Ramard Hospital: PWID

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach									
Reach	6,872	522	526	4	530	523	533	4	537
Recruit									
Refer to test	206	1,274	1,288	12	1,300	1,277	1,312	14	1,326
Test									
Clinic (Lab)	116	819	820	0	820	819	821	0	821
Mobile (Lab)	223	909	911	1	912	909	913	1	914
Clinic (Counselling)	116	1,216	1,323	0	1,323	1,216	1,373	0	1,373
Mobile (Counselling)	223	220	232	1	233	221	239	1	240
Treat									
Case management for ART initiation	12	1,139	1,239	0	1,239	1,139	1,286	0	1,286
Clinic (CD4 test)	12	N/A*	689	N/A*	689	N/A*	689	N/A*	689
Counselling by case manager	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent									
PrEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PrEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	56	509	514	5	519	510	524	5	529
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates when there is no activity for this site

N/A*: not applicable indicates when the cost is derived from a standard cost list that could not be disaggregated by labor, capital, and material cost

Unit costs - Raks thai Samutprakarn + Samutprakarn Hospital

Raks Thai provides services primarily for PWID.

Reach/recruit

While Raks Thai conducted 1,606 reach sessions in FY17, only 34 cases were successfully referred for testing. The cost of recruitment was 3,175 THB per visit (economic). Recruitment was defined as a successful client referral for pre-test counselling at a hospital via incentivized referral chain recruitment.

Test

The total number of tests conducted at the clinic (both counselling and lab costs) included all clients at the hospital, not only those KP reached/recruited by Raks Thai. This resulted in low unit costs per test. The unit costs for HTC at the clinic were 425 THB (lab) and 881 THB (counseling) per visit. Raks Thai and Samutprakarn Hospital do not provide mobile VCT services for PWID.

Treat

CD4 lab costs were derived from standard costs determined by the hospital (723 THB each).

Prevent

In FY17, Samutprakarn Hospital did not provide PrEP services due to limited human resources.

Retain

Raks Thai provides retention support for PLHIV through home visits, costing 2,807 THB per visit in FY17.

Of note, Raks Thai also provides needle/syringe distribution for PWID, which likely increased the unit costs for reach, recruit, and retention services for PLHIV clients as compared to programs that do not provide this service.

The unit costs for RRTTPR activities at Raks thai Samutprakarn + Samutprakarn Hospital are provided in Table 13.

Table 13. Unit costs - Raks thai Samutprakarn + Samutprakarn Hospital: PWID

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach									
Reach	1,606	1,470	1,471	0	1,471	1,568	1,603	0	1,603
Recruit									
Refer to test	34	2,944	2,943	0	2,943	3,134	3,175	0	3,175
Test									
Clinic (Lab)	13,390 [†]	424	425	0	425	424	425	0	425
Mobile (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (Counselling)	5,392	879	880	0	880	879	881	0	881
Mobile (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Treat									
Case management for ART initiation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (CD4 test)	2,295 [†]	N/A*	723	N/A*	723	N/A*	723	N/A*	723
Counselling by case manager	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent									
PrEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PrEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client*	17	2,570	2,573	0	2,573	2,741	2,807	0	2,807
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates when there is no activity for this site

N/A*: not applicable indicates when the cost is derived from a standard cost list that could not be disaggregated by labor, capital, and material cost

† indicates when the cost includes general population

Unit costs - Mplus Chiang Mai

Reach/Recruit

Mplus reach/recruit activities were implemented in unison and cost data could not be disaggregated. The organization conducted 10,523 reach/recruit events with a total unit cost of 939 THB each.

Test

Unit cost for HTC at the clinic per visit was higher than that of mobile VCT. This was because counselors tended to take 20 minutes on average for counseling at the clinic versus 10 minutes during mobile VCT. The unit costs per session were 1,137 THB for clinic-based HTC and 658 THB for mobile HTC. The unit cost for counselling at the clinic was 648 THB versus 414 THB per session during mobile HTC.

Mplus also provided oral fluid screening during mobile HTC as part of a research project. The unit cost for oral fluid testing was 743 THB per test.

Treat

Unit cost for case management for ART initiation at Mplus was considerably higher compared to those at other sites in Model 3 at 7,364 THB per link. The higher cost was due to the amount of labor (time) required for linkage. Mplus staff members often spend up to two full days to initiate one client on ARV treatment at a hospital. The cost also included travel and food expenses of Mplus staff to take one client to receive ARV treatment at a hospital. CD4 testing is provided at the Mplus clinic, which employs a single-use test cartridge conducted by a medical technologist. The unit cost of a CD4 test was 747 THB per test. PLHIV clients are provided additional counselling services by trained staff in the care and support unit, at a cost of 69 THB per session.

Prevent

PrEP services include counselling, associated lab tests, and prophylaxis. However, due to a lack of data recorded at Mplus, the unit cost for PrEP only includes first month of services: approximately 2,000 THB per first month of services.

Retain

Retain activities are limited to a phone call to support retention for HIV positive, HIV negative, and inconclusive clients. Unit cost for retaining positive and inconclusive clients was 35 THB per call, and for retaining HIV negative clients 46 THB per call. The unit cost of retention of HIV negative clients was higher than positive clients due to longer calling time. Mplus staff needed more time to explain the importance of maintaining high levels of condom use, and to assure clients are periodically re-tested in order to not become infected.

The unit costs for RRTTPR activities at Mplus Chiang Mai are provided in Table 14.

Table 14. Unit costs - Mplus Chiang Mai: MSM, MSWs, TGs, FSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach + Recruit									
Reach + Recruit	10,523	910	918	19	937	910	918	21	939
Test									
Clinic (Lab)	2,376	1,070	1,098	34	1,132	1,070	1,101	36	1,137
Mobile (Lab)	926	621	637	18	655	621	638	20	658
Clinic (Counselling)	2,376	606	622	23	645	606	623	25	648
Mobile (Counselling)	1,196	388	398	15	413	388	399	15	414
Hormone	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mobile (Oral fluid)	270	699	718	22	740	699	719	24	743
Treat									
Case management for ART initiation	116	6,706	6,913	408	7,321	6,706	6,931	433	7,364
Clinic (CD4 test)	169	721	732	13	745	721	733	14	747
Mobile (CD4 test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by care & support	188	63	65	4	69	63	65	4	69
Prevent									
PrEP (Lab)	52	1,084	1,107	26	1,133	1,084	1,109	28	1,137
PrEP (Counselling)	52	919	927	12	939	919	927	13	940
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	3,376	31	32	2	34	31	32	3	35
Negative client	116	42	43	3	46	42	43	3	46
Inconclusive client	8	31	32	2	34	31	32	3	35

N/A: not applicable indicates when there is no activity for this site

Unit costs - RSAT Bangkok

Reach/Recruit

RSAT Bangkok implemented and cataloged reach and recruit activities in unison. In FY17, the organization conducted 28,050 reach/recruitments. Unit cost for each recruitment was 429 THB (financial and economic).

Test

Unit cost for HTC at the clinic per test was slightly higher than that of mobile HTC due the time required for each kind of service. Unit cost for HTC at the clinic was 685 THB and for mobile HTC 464 THB per test. The unit cost for counselling at the clinic was 397 THB, and during mobile HTC 298 THB per session.

Treat

Labor, in terms of time, was the main cost driver for case management for ART initiation. The cost included the process of linking each new client to ART at the hospital and helping to ensure clients who are eligible could receive health insurance. The unit cost for linkage was approximately 5,000 THB per link. CD4 testing is provided at the RSAT clinic, which employs a single-use test

cartridge conducted by a medical technologist. The unit cost of a CD4 test was 590 THB per test.

Prevent

The unit cost for PrEP was defined as the average of the unit costs of all visits from the first HIV test to the month-six visit. The unit cost for PrEP, which included lab diagnostics and prophylaxis, was 851 THB, and the unit cost for PrEP counselling was 1,544 THB per complete service from month one to month 6 visit.

Retain

An RSAT staff member spends approximately 30 minutes per session retaining positive clients via telephone. The service includes informal post-test counselling by a trained staff member. The unit cost for this service depends primarily on the cost of labor (in time) for the trained staff member plus telephone charges, costing as much as 390 THB per session.

The unit costs for RRTTPR activities at RSAT Bangkok are provided in Table 15.

Table 15. Unit costs - RSAT Bangkok: MSM, MSWs, TGs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach + Recruit									
Reach + Recruit	28,050	416	423	6	429	416	424	6	429
Test									
Clinic (Lab)	4513	640	673	6	679	640	679	6	685
Mobile (Lab)	741	439	457	4	461	439	461	3	464
Clinic (Counselling)	4513	367	387	7	394	367	390	7	397
Mobile (Counselling)	741	275	291	5	296	275	292	6	298
Clinic (Hormone)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (Oral fluid)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Treat									
Case management for ART initiation	392	4,742	4,904	69	4,973	4,742	4,924	73	4,997
Clinic (CD4 test)	413	572	585	2	587	572	587	3	590
Mobile (CD4 test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by care & support	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent									
PrEP (Lab)	1616	770	800	6	806	810	845	6	851
PrEP (Counselling)	1064	1,529	1,539	4	1,543	1,529	1,540	4	1,544
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	2760	370	383	5	388	370	384	6	390
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates when there is no activity for this site

Unit costs - RSAT Songkla (Hat Yai)

The unit costs for RRTTPR activities at RSAT Songkla were similar to those at RSAT Bangkok.

Reach/Recruit

During FY17, RSAT Songkla conducted 6,631 recruitments. The unit cost for each recruitment was 462 THB.

Test

Similar to other sites, the unit cost for HTC at the clinic was higher than that of mobile HTC because of time required for counseling at the clinic. Clinic-based HTC costed 1,175 THB versus 659 THB for mobile HTC. The unit cost for counselling at the clinic was 502 THB versus 373 THB per session during mobile HTC.

Treat

The principle cost driver for case management to support ART initiation was the time and labor required for linkage. The cost included the process of escorting each client to the hospital to initiate treatment and helping to ensure eligibility for health insurance. The unit cost for managing

each linkage was approximately 4,000 THB per visit.

Prevent

The unit cost for PrEP was the average cost of all visits for one year. The unit cost of lab diagnostics associated and prophylaxis was 1,355 THB per person, and PrEP counselling cost 1,482 THB per year. The total cost of PrEP service provision including lab diagnostics, prophylaxis, and counselling was approximately 3,000 per year.

Retain

An RSAT staff member spends approximately 30 minutes per session retaining positive clients via telephone. The service includes informal post-test counselling by a trained staff member. The unit cost for this service depends primarily on the cost of labor (in time) for the trained staff member plus telephone charges, costing as much as 252 THB per session.

The unit costs for RRTTPR activities at RSAT Songkla are provided in Table 16.

Table 16. Unit costs - RSAT Songkla (Hat Yai): MSM, MSWs, TGs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach + Recruit									
Reach + Recruit	6,631	419	435	24	459	420	437	25	462
Test									
Clinic (Lab)	1,237	999	1,101	62	1,163	999	1,111	64	1,175
Mobile (Lab)	225	571	622	31	653	571	627	32	659
Clinic (Counselling)	1,237	416	443	55	498	416	445	57	502
Mobile (Counselling)	225	309	329	41	370	309	330	43	373
Clinic (Hormone)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (Oral fluid)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Treat									
Case management for ART initiation	153	3,378	3,597	257	3,854	3,378	3,612	270	3,882
Clinic (CD4 test)	51	772	818	27	845	772	822	28	850
Mobile (CD4 test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by care & support	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent									
PrEP (Lab)	232	1,189	1,285	58	1,343	1,189	1,294	61	1,355
PrEP (Counselling)	150	1,439	1,453	27	1,480	1,439	1,453	29	1,482
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	510	219	233	17	250	219	234	18	252
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates when there is no activity for this site

Unit costs - SWING Chonburi (Pattaya)

SWING provides full cascade services including reach, recruit, mobile VCT, in-clinic VCT, prevention through PrEP, referral to treatment, and retention for PLHIV beneficiaries. SWING has offices in two locations (Bangkok and Pattaya). SWING Pattaya operated for 10 months during FY17 due to the relocation of its office. The majority of the costs associated with SWING services are due to labor and material costs, accounting for over 90% of all unit costs.

Reach/Recruit

The unit cost for reach and recruitment (combined) was 1,030 THB per recruitment. SWING recruited a total of 8,456 reaches/recruits in FY17.

Test

The unit cost for providing mobile HTC was higher than that of in-clinic HTC due to the cost of renting a space for mobile service provision, and the cost of staff labor/time. The unit costs for testing and counselling at the clinic were 554 and 557 THB per test, respectively (1,111 THB total). The unit costs for testing and counselling during mobile HTC were 926 THB for each service (1,852 THB total).

SWING also provide an oral fluid testing as an option. The unit cost for the oral fluid test was the average of the three types of oral fluid tests offered to clients. These included self-testing,

peer-mediated, and oral fluid testing at the clinic. The first two types were provided by the prevention team. The third type was provided by the clinic team. The average unit cost of oral fluid testing was 1,787 THB per test.

Treat

The cost of linking a client to treatment was 3,686 THB per linkage. Linkage primarily requires staff time to accompany clients to register for insurance benefits, support for obtaining ARVs, and food and travel expenses. SWING also offers informal post-test counselling services by trained staff from the care and support team for PLHIV clients. The unit cost for counselling was 285 THB per session.

Prevent

The unit cost for PrEP service provision included the average of unit costs for all visits from the first HIV test to the month-twelve visit, including testing and counselling (2,488 THB per visit).

Retain

SWING employs specific guidelines to support retention for HIV-positive clients, primarily by phone. The unit cost for retention for PLHIV clients was 158 THB per session.

The unit costs for RRTTPR activities at SWING Chonburi are provided in Table 17.

Table 17. Unit costs - SWING Chonburi (Pattaya): FSWs, MSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach + Recruit									
Reach + Recruit	8,456	962	984	37	1,021	962	992	38	1,030
Test									
Clinic (Lab)	762	473	482	40	522	473	512	42	554
Mobile (Lab)	1,085	702	725	113	838	934	966	151	1,117
Clinic (Counselling)	762	436	451	71	522	436	504	73	577
Mobile (Counselling)	1,085	702	725	113	838	934	966	151	1,117
Clinic (Hormone)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (Oral fluid)	210	1,458	1,504	168	1,672	1,458	1,615	172	1,787
Treat									
Case management for ART initiation	264	2,985	3,017	646	3,663	2,985	3,020	666	3,686
Clinic (CD4 test)	213	521	524	14	538	521	534	14	548
Mobile (CD4 test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by care & support	182	231	233	50	283	231	234	51	285
Prevent									
PrEP (Lab + Counselling)	56	2,267	2,291	110	2,401	2,267	2,374	114	2,488
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	924	128	130	27	157	128	130	28	158
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates when there is no activity for this site

Unit cost at SWING Bangkok

SWING Bangkok conducts similar activities along the HIV cascade as SWING Pattaya. However, SWING Bangkok is the only NGO that conducts reach and recruitment for FSWs. Similar to SWING Pattaya, the overwhelming proportion of unit cost included labor and material costs, at over 90% of unit costs.

Reach/Recruit

The unit cost for reach/recruit was 447 THB per individual reached, with a total of 29,375 recruitments in FY17.

Test

The unit cost for providing mobile HTC was higher than that of in-clinic HTC due to the cost of renting a location, incentives provided to clients, and the cost of labor for mobile staff. The unit costs for testing and counselling at the clinic were 515 and 568 THB per test, respectively. Conversely, the unit costs for testing and counselling at mobile HTC were 927 and 927 THB per test, respectively.

SWING also provides oral fluid testing as an option. The unit cost for the oral fluid test was the average of the three types of oral fluid tests offered to clients. These included self-testing, peer-mediated, and oral fluid testing at the clinic. The first two types were provided by the prevention team. The third type was provided by the clinic team. The average unit cost of oral fluid testing was 709 THB per test.

Treat

The cost of linking a client to treatment was 4,277 THB per linkage. Linkage primarily requires staff time to accompany clients to register for insurance benefits, support for obtaining ARVs, and food and travel expenses. SWING also offers informal post-test counselling services by trained

staff from the care and support team for PLHIV clients. The unit cost for counselling was 282 THB per session.

Prevent

The unit cost for PrEP service provision included the average of unit costs for all visits from the first HIV test to the month-twelve visit, including testing and counselling (2,562 THB per visit).

Retain

SWING employs specific guidelines to support retention for HIV-positive clients, primarily by phone. SWING Bangkok held one get-together meeting for PLHIV clients during the fiscal year. The unit cost for retention for PLHIV clients was 216 THB per session.

The unit costs for RRTTPR activities at SWING Bangkok are provided in Table 18.

Table 18. Unit costs - SWING Bangkok: FSWs, MSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach + Recruit									
Reach + Recruit	29,375	431	433	10	443	431	437	10	447
Test									
Clinic (Lab)	981	492	495	16	511	492	499	16	515
Mobile (Lab)	2,508	862	871	43	914	862	882	45	927
Clinic (Counselling)	981	527	532	28	560	527	539	29	568
Mobile (Counselling)	2,508	862	871	43	914	862	882	45	927
Hormone	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oral fluid	328	673	678	24	702	673	684	25	709
Treat									
Case management for ART initiation	450	3,854	3,875	357	4,232	3,854	3,909	368	4,277
Clinic (CD4 test)	63	466	467	3	470	466	467	4	471
Mobile (CD4 test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by care & support	280	254	256	23	279	254	258	24	282
Prevent									
PrEP (Lab + Counselling)	671	2,498	2,506	44	2,550	2,498	2,517	45	2,562
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	1,200	195	196	18	214	195	198	18	216
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates when there is no activity for this site

Unit costs - SISTERS Chonburi (Pattaya)

Reach/Recruit

SISTERS conducts reach and recruit activities jointly through individual meetings, small-group, and event-based sessions, the latter being the most costly in terms of individuals recruited. Despite the cost, event-based reach/recruitment outputs are relatively low compared to the other approaches. SISTERS uses event-based reach/recruitment as a social marketing technique to encourage transgender individuals to attend. During these events, SISTERS does not employ a unique identifier coding system. As a result, the unit cost for reach/recruit was approximately 1,000 THB per recruitment, with a total of 2,278 recruitments.

Test

The unit cost for providing in-clinic HTC was higher than mobile HTC due to the time required to provide the service during mobile HTC. The unit costs for HIV testing were 644 THB for clinic-based, and 525 THB for mobile-based HTC. Counselling at the clinic was 1,137 THB per visit, while counseling during mobile HTC was 568 THB per visit. Sisters also provides estradiol and testosterone hormone testing at the clinic, with an average unit cost of 891 THB per visit. Oral fluid screening is provided both at clinic and mobile settings. The unit cost for oral fluid testing was 508 THB per visit at the clinic, and 257 THB per visit for mobile testing due to the shorter amount of time required.

Treat

The cost of linkage to ART at SISTERS was the highest among all sites, at 28,113 THB. Labor/time for staff were the major cost drivers for this activity. Care and support staff require significant time to help clients register for insurance benefits and accompany them to a hospital to obtain ARVs. The process generally

takes six hours. There is only one staff member responsible for case management and ART linkage. Thus, the total direct and indirect costs were fully allocated to this activity. In addition, SISTERS only counted the number of successfully linked clients who started ART. Costs related to supporting HIV-positive patients who were not successfully referred were not included. There were 46 clients who initiated ARV treatment in FY17. This relatively low number contributed to relatively high costs for linkage as compared to other organizations.

Prevent

SISTERS offers PrEP and PEP services via a registered nurse. The unit cost for PrEP service delivery was the average of all visits from the first HIV test to the month-twelve visit. The unit cost was 1,657 THB for PrEP diagnostics, and 1,773 THB for counselling per visit. The unit cost of PEP services was approximately 2,500 THB per visit including testing and counselling.

Retain

SISTERS staff follow up all positive cases via telephone, LINE, and other social media apps. These costs have been excluded from the study because the labor and related costs associated with this support were relatively small. In addition, Sisters did not keep a record of retention support.

The unit costs for RRTTPR activities at SISTERS Chonburi are provided in Table 19.

Table 19. Unit costs - SISTERS Chonburi (Pattaya): TGs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach + Recruit									
Reach +	2,278	937	971	21	992	937	971	21	992
Recruit									
Test									
Clinic (Lab)	791	601	631	6	637	601	637	7	644
Mobile (Lab)	785	478	510	7	517	478	517	8	525
Clinic (Counselling)	791	1,033	1,089	19	1,108	1,033	1,116	21	1,137
Mobile (Counselling)	785	517	544	10	554	517	558	10	568
Hormone	328	810	862	13	875	810	877	14	891
Clinic (Oral fluid)	130	472	496	6	502	472	502	6	508
Mobile (Oral fluid)	72	241	248	4	252	241	251	6	257
Treat									
Case management for ART initiation	46	24,963	26,933	637	27,570	24,963	27,314	799	28,113
Clinic (CD4 test)	67	760	785	6	791	760	791	6	797
Mobile (CD4 test)	37	1,711	1,812	22	1,834	1,711	1,834	25	1,859
Counselling by care & support	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent									
PrEP (Lab)	208	1,541	1,620	18	1,638	1,541	1,637	20	1,657
PrEP (Counselling)	129	1,721	1,749	10	1,759	1,721	1,763	10	1,773
PEP (Lab)	22	1,082	1,136	12	1,148	1,082	1,148	13	1,161
PEP (Counselling)	11	1,303	1,331	10	1,341	1,303	1,345	10	1,355
Retain									
Positive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates when there is no activity for this site

3.4 Cost Effectiveness Analysis

The cost-effectiveness analysis is classified by cost per case recruited, cost per case tested, cost

per case detected, and cost per client initiated on ART.

Table 20. Cost effectiveness analysis for Models 1 and 2

	Model 1	Model 2						
	Roi-Et Hospital	BMA 28	Mfriend Udonthani/ Udonthani Hospital	Ozone Tak/ Mae Ramard Hospital	PPAT Khon Kaen/ Khon Kaen Hospital	Mreach Khon Kaen/ Khon Kaen Hospital	Raks Samutprakarn/ Samutprakarn Hospital	Thai
Reach and Recruit* (THB/ KP recruited)	1,312 (n=205)	588 (n=2,637)	13,595 (n = 583)	9,325 (n = 429)	1,251 (n = 675)	1,764 (n = 1,963)	80,368 (n = 34)	
Reach Recruit and Test** (THB/case tested)	1,383 (n=3,673; incl. gen pop)	1,081 (n=3,281; incl. gen pop)	1,115 (n = 8,450; incl. gen pop)	13,208 (n = 339)	2,934 (n=675)	8,389 (n = 465)	675 (n = 13,514; incl. gen pop)	
Reach Recruit and Test** (THB/ case detected)	21,996 (n=231; incl. gen pop)	107,474 (n=33)	13,859 (n = 680; incl. gen pop)	1,119,343 (n=4)	220,036 (n=9)	95,140 (n = 41)	19,929 (n = 457; incl. gen pop)	
Treat *** (THB/case treated)	723 (n=231; incl. gen pop)	689 (n=19)	2,124 (n = 671; incl. gen pop)	1,975 (n=12)	N/A	3,267 (n = 41)	723 (n = 2,295; incl. gen pop)	

N/A = There is no activity for this site

Incl. = Including

*Reach to pre-test counselling

**Reach to post-test counselling

***Positive test to initiate ART

Table 21. Cost effectiveness analysis for Model 3

	Mplus Chiang Mai	RSAT Bangkok	RSAT Songkla	SWING Bangkok	SWING Pattaya	SISTERS Pattaya
Reach and Recruit* (THB/KP recruited)	3,191 (n = 3,302)	2,486 (n = 5,254)	2,335 (n = 1,462)	5,699 (n=2,508)	8,494 (n=1,085)	1,969 (n = 1,576)
Reach and Recruit Test** (THB/case tested)	4,541 (n = 3,302)	3,341 (n = 5,254)	3,675 (n = 1,462)	5,400 (n=3,489)	6,272 (n=1,847)	3,201 (n = 1,576)
Reach and Recruit Test** (THB/case detected)	88,723 (n = 188)	36,497 (n = 481)	105,340 (n = 51)	113,501 (n=161)	63,650 (n=182)	48,502 (n = 104)
Treat *** (THB/case treated)	8,241 (n = 116)	5,618 (n = 392)	12,496 (n = 51)	13,557 (n=150)	8,649 (n=132)	29,440 (n = 46)

N/A = There is no activity for this site

Incl. = Including

*Reach to pre-test counselling

**Reach to post-test counselling

***Positive test to initiate ART

Chapter 4: Discussion

4.1 Methodological challenges

This is the first study in Thailand to have examined unit costs for HIV cascade services for KPs. Data from this study are expected to be used to support policymakers establish appropriate and consistent rates for reimbursement of HIV interventions in conjunction with an analysis of costs and benefits. However, the study is retrospective and provides data over one single fiscal year, often relying on interviewee recall. Some participants may not have been able to provide the level of detail and accuracy required to conduct a rigorous analysis.

1. There were high staff turnover rates at some sites especially under Model 3. Newer staff had difficulty understanding some questions regarding activities, especially specific to the time and/or resources required for each activity during the FY. Moreover, some information was could not be traced or verified due to staff transitions.
2. eCascade management information systems are limited in terms of information on inputs and outputs for each activity. For example, for inputs, information on structures and assets were not complete and/or updated. For outputs, there was significant variety in definition of units. Some sites recorded service provision by case, while others recorded by visit.

4.1.1 Costing techniques

Standard costing and activity-based costing techniques were used towards data collection in this study. In a general costing study, only one among these two is chosen. Combination of the two techniques provide us more accurate data in terms of actual costs spent on HIV activities. As mentioned above, inaccuracy of interviewee recalls could create errors, especially when collecting data using the activity-based costing technique, for example a higher or lower estimation of time and cost of HIV-related activities which might be created. The combination techniques were to prevent activity-based total cost calculations from being higher or lower than actual total costs.

One prominent benefit of using an activity-based costing technique is to help audiences using results of the study to better allocate the budget in line with the activities, specifically also resource used in those activities.

4.1.2 Ability to be adequately representative

Although the study sites from three different service delivery models were selected from all regions across Thailand, they were not selected to be nationally representative or representative of their own models; the criteria of selecting study sites was not statistically designed to select them to be representative. In addition, information about the actual number of organizations that operated to provide HIV activities under RRTTPR framework was not available, and to the best knowledge of the research team, there is no

such information collected in Thailand. As such, the results of this study only provide patterns and compositions of unit costs for each activity at selected sites. They do not represent precise unit costs for specific activities across models due to aforementioned reasons and other limitations, including study duration, number of sites, and study design.

4.1.3 The population

Although all four KP groups in this study can be distinguished based on their definitions in Thailand, their information records are incoherent and inconsistent. Confusions in data recording could be found in TGs and MSM (TGs were recorded as MSM), MSWs and MSM (MSWs were recognized to be MSM), or TGs who were SWs and MSM (TGs were either recorded as TGs, MSM, or SWs). Besides, population in some study sites of Model 2 included general population information which could not be distinguished from KPs. This was a result of poor recording systems in the hospitals. Also, in some sites, hospitals considered recording details on sexual orientation or gender identity of the clients unethical and could make for discrimination in health facilities. As a result, unit costs of some study sites in Model 2 were overestimated.

4.1.4 Costs of capacity building activities

Despite unavailable information on organizations implementing HIV activities according to RRTTPR cascade, it still appears to be a promising approach for accelerating the end of HIV in Thailand; more new organizations are required to work with KPs on training, workshops, and other capacity building activities to achieve the ultimate goal. Capacity building

costs can be considered from two different perspectives: trainers and trainee. If we consider capacity building costs from trainer perspective, cost should be detailed and categorized to correspond with the different type of costs (labor, material, or capital costs). However, most CBOs in Thailand did not place themselves in a position of trainers. On the contrary, as CBOs in Thailand are not health or HIV-related experts, they need to seek capacity building activities to gain competence to work with KPs. Costs of capacity building incurred at trainee sites are registration fees, traveling costs, or accommodation fees. These costs, many times, are categorized as material costs because they match those definitions, such as cost of materials or consumable products that equal or last for less than year and must be regularly supplied. However, costs of capacity building in this study were categorized as both material costs and capital costs depending on the characteristics of these activities.

We believe that benefits gained from building capacities of CBOs should be treated same as other resources. If knowledge gained from any capacity building activities can be of benefit beyond one year, then those activities should be counted as capital costs. On the other hand, if benefits can be used just for only one year or less, the money expended for those activities should be classified as material costs. The period of using benefits gained from capacity building activities may not be easy to calculate, which makes it difficult to assign type of costs to activities. However, identifying the categorization of these activities based on their timely recurrence has been suggested. For instance, if the staff of CBOs are required to attend capacity building activities every year or more than once a year, those activities should be categorized as materials. If frequency of activity is more than once a year or one-time events, activities should be identified as assets or capital.

In the study results, costs of capacity building activities are distinguished from other type of costs, in order to guide audiences who needs to establish new HIV activities or programs. Nonetheless, there are some concerns about capacity building costs in this study. As the study was designed to be a cross sectional study that collected only data occurring in the fiscal year 2017 and the study sites were selected based on their work and outcomes, most CBOs were established before fiscal year 2017 and costs of capacity building activities are not usually required when establishing a new organization. In addition, not all sites accurately recorded capacity building costs, as a result, the study lacks data on costs for capacity building among sites under Model 1, and for some sites under Model 2. As a result, costs of capacity building activities were relatively underestimated.

4.1.5 Definition of RRTTPR

The definitions for activities across the RRTTPR cascade were different across sites, especially recruit activities. Most of the sites in Model 2 defined recruitment as referral of clients to pre-test HIV counselling by a nurse at a hospital. Therefore, the number of clients who received counselling was recorded as an output of recruitment. However, for most sites under Model 3, reach and recruit activities were conducted jointly and it was more challenging to disaggregate outputs. This may have resulted in different unit costs for recruitment in Models 2 and 3.

Diverse understanding of activities across the RRTTPR affected data collection. Each site had its own management structure and diverse sub-activities, as some activities according to the RRTTPR cascade cannot be separated from the other activities. For example, activities for HIV

prevention such as condom distribution and prescription of PrEP and PEP. In real practice, condoms and lubricants were provided to KPs through many approaches – give them to KPs when reaching or recruiting them or after counseling is finished, leave them in a jar at the office of each study site for KPs to collect at any time, or give a large number of them to any place where staff of study sites visit (e.g. school and night club). With this practice, activities for prevention, especially condom distribution cannot be and should not be separated from other activities. In addition, as seen in the results, unit costs of prevention include only prescription of PrEP and PEP, as the exact number of KPs who received condoms and lubricants could not be calculated.

The other example is activities for retention. Activities for retention can be separated into two activities: one is for HIV positive patients and the other for those HIV negative. In retention activities for HIV positive patients, the main idea was to ensure treatment adherence, however, this activity is normally included in and cannot be excluded from treatment. In the case of HIV negative patients, various approaches, e.g. telephoning KPs to come back and receive testing in a periodical manner were used to encourage them to continue testing regularly. However, it was found in real practice that the retention activity for HIV negative was not a standout activity, and merged with reach and recruit activities, on many occasions.

4.2 Unit costs

4.2.1 Financial and economic costs

Conceptual differences between financial and economic costs have been described in Chapter 2. In this study, the major difference between

financial and economic costs is the capital costs. It was found that buildings and assets of most study sites had been fully depreciated, so financial costs were recorded as zero, but opportunity costs or economic costs were substantial.

These substantial economic costs can also be found in labor and material costs, if there were many volunteers, working overtime, public goods, or donated products. Nevertheless, it was found from study sites that there was no real *volunteer*. Payment was made for those who worked on HIV activities, even though the payment was fairly less than the market price. However, the market price was not brought to the calculation in order to find the actual economic costs in this study. In terms of material costs, only *rent* made a difference a financial and economic costs. Generally, economic cost of materials includes any public goods or donated stuff. However, this study was conducted to generate supporting information to policy makers and as a result converted into monetary units actual costs of products that were sometimes received for free, counting them as both financial and economic costs. This is to avoid misleading the audience when using financial information to assist budgeting.

4.2.2 Cost drivers

Unit costs are driven by many factors. Resource items, likely to form the largest components of total cost, are usually considered cost drivers, frequently involving only a few resource items. Cost drivers can be resources activities which can be directly linked to changes in costs. Identification of costs drivers make it possible to improve technical efficiency. Results from the study sites suggest that labor is a significant driver of unit costs. However, it is difficult to disaggregate other key drivers because activities

at sites vary considerably. The discussion below provides some possible factors that affect unit costs.

Activity types

Activities differed based on the type of KPs they served. As an example, reach and recruit activities differed considerably among PWID and TGW. Normally, reach and recruit activities consist of an individual or group education/peer-education. However, PWID require more time to gain trust before initiating behavior change interventions. CBOs working with PWID implement reach and recruit activities jointly with needle and syringe programs (NSEPs). Reach and recruit activities geared toward TGW have benefited from social events that bring the community together to build trust, such as pageant contests that are costly but help with recruitment in the long-run. In addition, differences in the content and mechanics of activities affect unit costs. These include time, number of staff, required materials, and number of KPs recruited.

Fixed costs

There are some fixed costs for each activity that can generally be divided into capital and labor costs. Sites that own their own buildings tend to have higher unit costs compared to sites that do not. This is because the values of buildings have been counted as capital costs, while rents were counted as material costs. Asset costs also play a role in increasing unit costs.

Staffing characteristics also affected fixed costs. Idle staff in a testing facility, such as sites in Model 3, weighs into unit costs very differently as compared to staff employed at a health care site doing multiple activities. However, staff who work for government hospitals as civil servants

are likely to have significantly higher salaries than those who work for CBOs. This results in higher unit costs for some activities, especially outreach.

Calculation of unit costs requires costing direct and indirect costs. Indirect costs consist of multiple costs at each organization. One important factor is the cost of support staff who do not directly work with KPs. These indirect costs depend on two factors: (1) full cost for support units, which are higher for units with many staff, and (2) support unit contributions to service units. Service units requiring extensive support require a larger proportion of indirect costs associated with support units.

Achievement of targets

Type of organization and activity timelines are two key factors that play a role in achievement of targets. Some hospitals do not provide reach and recruit activities regularly throughout the year. Thus, the number of KPs recruited for testing may be limited. In addition, for some sites, total number of outputs include all clients, thus, unit costs and cost-effectiveness, especially with respect to testing services, may be relatively lower than those of other sites (and thus do not reflect KPs-specific activities and costs). In addition, some KPs are more difficult to reach than others, making it challenging to achieve ambitious targets.

Technical efficiency of the three service delivery models

One of the objectives of this study was to determine the cost of HIV interventions per case. However, costs per case at each site presented in

Chapter 3 are difficult to compare because of significant variation in the types and content of activities. For example, cost per case detected may be very high at one site, (e.g. Ozone) due to limited number of cases detected and types of activities provided. Average cost-effectiveness analyses based on this study can be used as a guide to design or indicate the amount of money that can be reimbursed for each service provider. However, authors of this study recommend caution in using this analysis alone, without a further analysis of the types of services provided, and cost of doing business with each specific KP group.

4.3 Further studies

Continuing, the study team recommends a cost-effectiveness analysis comparing costs and health outcomes between different types of activities to determine the best approaches for achieving epidemic control. In addition, it would be beneficial to funders if the comparison can show the effectiveness of activities across the RRTTPR cascade and HIV activities under other frameworks. Given the time constraint, this study has many uncertainties which should be addressed in future studies using either a statistical analysis or sensitivity analysis in order to gain greater understanding about cost drivers and how to save cost during implementing of activities.

Studies for baseline information should be considered important as well. For example, a survey to identify the number and status of CBOs and other organizations working on HIV activities in Thailand, development of definition for KPs, or clarity on information recording systems are necessary.

Chapter 5: Conclusion and Recommendations

Costing information can assist policymakers develop accurate and efficient frameworks for planning, budgeting, implementing, and evaluating strategic plans. This is especially important for countries looking to implement social contracting mechanisms to optimize reach, recruitment, linkage, and retention of services using both government and community stakeholders. Evidence suggests that community service providers can play a key role obtaining global epidemic control, including statutory and informal community-based services across the prevention to treatment cascade. In order to optimize cost-effectiveness, activity content must be catered to the needs and wants of populations served.

Human resources, training, test kits, and other consumables serve as key drivers of costs. Unit costs in this study were especially low at larger health facilities that have larger client loads. These facilities also provide a broader range of services. This suggests potential economies of scale are at play where inputs may be more efficiently used due to the spread of fixed costs over a larger number of outputs, and/or economics of scope, where fixed costs are spread across a greater number of services, both leading to lower unit costs. Capacity-building programs are needed to improve quality of services for KPs and should be designed based on their individual service delivery needs.

The government should consider revising the payment mechanism. Per-piece payment or pay-per-activity should be adopted as a payment mechanism instead of paying for the whole cascade. This mechanism should be combined

with on-top incentives, for example, when testing and consulting services are given to beneficiaries or once a positive case steps into a treatment service. The per-piece payment will help the government focus on activities in RRTTPR cascade that appear to be bottlenecks and invest or rearrange money towards the most needed program. This will help CBOs suit activities to their areas and patients. In terms of management, the government or authorized organization can request CBOs submit their proposals on definitive outcomes for receiving funds. The proposals can be different and varied by areas and KPs. Different activities matching the areas and KPs will increase the efficiency of using funds as well as ensure successful implementation. However, it should be noted that the per-piece payment might create some negative effects where the ultimate expected outcome of having KPs in the service continuum is neglected. As such, other incentive programs, especially incentives for achieving the service continuum, needs to be consider establishment.

In a unit cost study, audiences tend to pick the activities with the lowest unit to implement, however, it is recommended that other aspects are also considered for investment decisions, such as test yield as a function of test targeting, and long-term ART retention as a function of high-quality ART initiation procedures. Therefore, when evaluating activities, the government or authorized organization should not only use final outcomes to evaluate activities. Every output for each activity or significant processes which might have value for recruiting and retaining patients in the continuum of care should be well monitored. Along with the monitoring process, there should

be a study to explore conducive factors that may improve an implementation of HIV activities.

To improve evaluations of this kind, it is critical to establish and implement a comprehensive

monitoring and evaluation system and standard definitions of activities across the RRTTPR cascade. Information gathered from such a system could be used to compare efficiency and effectiveness of activities across sites.

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Appendix 1: Unit costs for activities across RRTTPR cascade - excluding external support

External support: Material, labor, or assets supported by external organizations. These are used in activities within the RRTTPR cascade (e.g. condoms, lubricants, HIV rapid test kits, needle and syringe packages, etc.)

1. Roi-Et Hospital: MSM

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	205	2,844	2,898	0	2,898	2,844	2,996	0	2,996
Recruit										
Test										
Clinic (Lab)		1,332	315	315	0	315	315	315	0	315
Mobile (Lab)		2,144	281	281	0	281	281	281	0	281
Clinic (Counselling)		1,332	2,298	2,316	0	2,316	2,298	2,380	0	2,380
Mobile (Counselling)		2,144	111	112	0	112	111	115	0	115
Treat										
Case management for ART initiation		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (CD4 test)		231	N/A*	723	0	723	N/A*	723	0	723
Counselling by case manager		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent										
PrEP (Lab)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PrEP (Counselling)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Lab)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain										
Positive client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

N/A*: not applicable indicates the cost is derived from a standard cost list that could not be disaggregated by labor, capital, and material cost

2. Bangkok Metropolitan Administration Public Health Center (BMA 28): MSM, TGs, FSWs, MSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Recruit										
Test										
Clinic (Lab)		644	323	332	0	332	323	365	0	365
Mobile (Lab)		2,637	6	6	0	6	6	6	0	6
Clinic (Counselling)		644	1,165	1,200	0	1,200	1,165	1,316	0	1,316
Mobile (Counselling)		2,637	209	216	0	216	209	236	0	236
Treat										
Case management for ART initiation		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (CD4 test)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by case manager		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent										
PrEP (Lab + Counselling)		91	1,488	1,532	0	1,532	1,488	1,681	0	1,681
PEP (Lab)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain										
Positive client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

3. Mfriend Udonthani + Udonthani Hospital: MSM, TGs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach									
Reach	2,969	386	387	4	391	386	402	4	406
Recruit									
Refer to test	235	2,580	2,587	28	2,615	2,580	2,685	30	2,715
Test									
Clinic (Lab)	7,983	187	189	0	189	187	204	0	204
Mobile (Lab)	471	986	988	10	998	986	1,026	11	1,037
Clinic (Counselling)	7,983	246	248	2	250	246	253	3	256
Mobile (Counselling)	467	503	507	5	512	503	519	5	524
Treat									
Case management for ART initiation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (CD4 test)	668	N/A*	723	0	723	N/A*	723	0	723
Counselling by case manager	668	144	146	5	151	144	151	6	157
Prevent									
PrEP (Lab)	78	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PrEP (Counselling)	7,431	71	72	2	74	71	74	3	77
PEP (Lab + Counselling)	22	123	124	1	125	123	127	1	128
Retain									
Positive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

N/A*: not applicable indicates cost is derived from a standard cost list that could not be disaggregated by labor, capital, and material cost

4. PPAT Khon Kaen + Khon Kaen Hospital: FSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	675	1,230	1,230	0	1,230	1,230	1,251	0	1,251
Recruit										
Test										
Clinic (Lab + Counselling)	+	675	1,653	1,654	0	1,654	1,653	1,682	0	1,682
Mobile (Lab)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mobile (Counselling)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Treat										
Case management for ART initiation		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (CD4 test)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by case manager		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent										
PrEP (Lab)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PrEP (Counselling)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Lab)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain										
Positive client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

5. Mreach Khon Kaen + Khon Kaen Hospital: MSM, TGs, FSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach									
Reach	5,304	380	380	0	380	380	391	0	391
Recruit									
Refer to test	1,553	212	212	0	212	212	218	0	218
Test									
Clinic (Lab)	128	127	140	0	140	127	238	0	238
Mobile (Lab)	280	183	202	0	202	183	343	0	343
Clinic (Counselling)	128	522	575	0	575	522	760	0	760
Mobile (Counselling)	306	1,655	1,677	0	1,677	1,655	1,792	0	1,792
Treat									
Case management for ART initiation	41	91	91	0	91	91	94	0	94
Clinic (CD4 test)	41	N/A*	723	0	723	N/A*	723	0	723
Counselling by case manager	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent									
PrEP (Lab + Counselling)	31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

N/A*: not applicable indicates cost is derived from a standard cost list that could not be disaggregated by labor, capital, and material cost

6. Ozone Tak + Mae Ramard Hospital: PWID

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach									
Reach	6,872	376	380	4	384	377	387	4	391
Recruit									
Refer to test	206	1,274	1,288	12	1,300	1,277	1,312	14	1,326
Test									
Clinic (Lab)	116	19	21	0	21	19	22	0	22
Mobile (Lab)	223	69	71	0	71	69	73	0	73
Clinic (Counselling)	116	1,216	1,323	0	1,323	1,216	1,373	0	1,373
Mobile (Counselling)	223	216	228	1	229	217	235	1	236
Treat									
Case management for ART initiation	12	1,139	1,239	0	1,239	1,139	1,286	0	1,286
Clinic (CD4 test)	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by case manager	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent									
PrEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PrEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	56	509	514	5	519	510	524	5	529
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

7. Raks thai Samutprakarn + Samutprakarn Hospital: PWID

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach									
Reach	1,606	1,449	1,450	0	1,450	1,547	1,583	0	1,583
Recruit									
Refer to test	34	2,817	2,816	0	2,816	3,007	3,048	0	3,048
Test									
Clinic (Lab)	13,390	62	64	0	64	63	64	0	64
Mobile (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (Counselling)	5,392	879	880	0	880	879	881	0	881
Mobile (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Treat									
Case management for ART initiation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (CD4 test)	2,295	N/A*	723	0	723	N/A*	723	0	723
Counselling by case manager	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent									
PrEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PrEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	17	2,523	2,525	0	2,525	2,693	2,759	0	2,759
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

N/A*: not applicable indicates cost is derived from a standard cost list that could not be disaggregated by labor, capital, and material cost

8. Mplus Chiang Mai: MSM, MSWs, TGs, FSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	10,523	860	868	19	887	860	868	21	889
Recruit										
Test										
Clinic (Lab)	2,376	877	906	34	940	877	909	36	945	
Mobile (Lab)	926	476	492	18	510	476	493	20	513	
Clinic (Counselling)	2,376	606	622	23	645	606	623	25	648	
Mobile (Counselling)	1,196	388	398	15	413	388	399	15	414	
Hormone	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Oral fluid	270	581	600	23	623	581	602	24	626	
Treat										
Case management for ART initiation	116	6,706	6,913	408	7,321	6,706	6,931	433	7,364	
Clinic (CD4 test)	169	335	346	13	359	335	347	14	361	
Mobile (CD4 test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Counselling by care & support	188	63	65	4	69	63	65	4	69	
Prevent										
PrEP (Lab)	52	700	723	26	749	700	725	28	753	
PrEP (Counselling)	52	319	327	12	339	319	327	13	340	
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Retain										
Positive client	116	42	43	3	46	42	43	3	46	
Negative client	3,376	31	32	2	34	31	32	3	35	
Inconclusive client	8	31	32	2	34	31	32	3	35	

N/A: not applicable indicates there is no activity for this site

9. RSAT Bangkok: MSM, MSWs, TGs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	28,050	394	400	6	406	394	401	6	407
Recruit										
Test										
Clinic (Lab)		4,513	451	484	7	491	451	490	7	497
Mobile (Lab)		741	249	267	4	271	249	270	4	274
Clinic (Counselling)		4,513	367	387	7	394	367	390	7	397
Mobile (Counselling)		741	275	291	5	296	275	292	6	298
Hormone		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oral fluid		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Treat										
Case management for ART initiation		392	4,742	4,904	69	4,973	4,742	4,924	73	4,997
Clinic (CD4 test)		413	172	185	2	187	172	187	3	190
Mobile (CD4 test)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by care & support		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent										
PrEP (Lab)		1,616	407	437	6	443	407	442	6	448
PrEP (Counselling)		1,064	183	194	3	197	183	195	3	198
PEP (Lab)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain										
Positive client		2,760	370	383	5	388	370	384	6	390
Negative client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

10. RSAT Songkla (Hat Yai): MSM, MSWs, TGs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	6,631	366	383	23	406	367	385	24	409
Recruit										
Test										
Clinic (Lab)	1,237	837	939	62	1,001	837	949	64	1,013	
Mobile (Lab)	225	418	469	31	500	418	474	32	506	
Clinic (Counselling)	1,237	412	439	55	494	412	441	57	498	
Mobile (Counselling)	225	309	329	41	370	309	330	43	373	
Hormone	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Oral fluid	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Treat										
Case management for ART initiation	153	3,378	3,597	257	3,854	3,378	3,612	270	3,882	
Clinic (CD4 test)	51	372	418	27	445	372	422	28	450	
Mobile (CD4 test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Counselling by care & support	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Prevent										
PrEP (Lab)	232	184	207	13	220	184	209	14	223	
PrEP (Counselling)	150	207	221	27	248	207	221	29	250	
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Retain										
Positive client	510	219	233	17	250	219	234	18	252	
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

N/A: not applicable indicates there is no activity for this site

11. SWING Chonburi (Pattaya): FSWs, MSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	8,456	647	669	38	707	647	677	39	716
Recruit										
Test										
Clinic (Lab)	762	245	254	41	295	245	284	42	326	
Mobile (Lab)	1,085	681	705	113	817	681	789	116	905	
Clinic (Counselling)	762	425	440	70	510	425	493	72	565	
Mobile (Counselling)	1,085	681	705	113	817	681	789	116	905	
Hormone	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Oral fluid	210	1,335	1,382	168	1,549	1,335	1,492	173	1,665	
Treat										
Case management for ART initiation	264	2,985	3,017	646	3,663	2,985	3,020	666	3,686	
Clinic (CD4 test)	213	81	84	13	98	81	94	14	108	
Mobile (CD4 test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Counselling by care & support	182	231	233	50	283	231	234	51	285	
Prevent										
PrEP (Lab + Counselling)	56	670	694	111	805	670	777	115	892	
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Retain										
Positive client	924	128	130	28	157	128	130	28	158	
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

N/A: not applicable indicates there is no activity for this site

12. SWING Bangkok: FSWs, MSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	29,375	383	386	9	395	383	389	10	399
Recruit										
Test										
Clinic (Lab)	981	295	298	16	314	295	302	16	318	
Mobile (Lab)	2,508	825	833	44	877	825	844	45	889	
Clinic (Counselling)	981	527	532	28	560	527	539	29	568	
Mobile (Counselling)	2,508	825	833	44	877	825	844	45	889	
Hormone	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Oral fluid	328	542	547	25	572	542	554	25	579	
Treat										
Case management for ART initiation	450	3,854	3,875	357	4,232	3,854	3,909	368	4,277	
Clinic (CD4 test)	63	66	67	3	70	66	67	4	71	
Mobile (CD4 test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Counselling by care & support	280	254	256	23	279	254	258	24	282	
Prevent										
PrEP (Lab + Counselling)	671	822	830	44	874	822	841	45	886	
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Retain										
Positive client	1,200	195	196	18	214	195	198	18	216	
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

N/A: not applicable indicates there is no activity for this site

13. SISTERS Chonburi (Pattaya): TGs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	2,278	876	911	20	931	876	927	26	953
Recruit										
Test										
Clinic (Lab)	791	429	459	7	466	429	466	7	473	
Mobile (Lab)	785	462	494	7	501	462	501	8	509	
Clinic (Counselling)	791	1,033	1,089	19	1,108	1,033	1,116	21	1,137	
Mobile (Counselling)	785	517	544	10	554	517	558	10	568	
Hormone	328	810	862	13	875	810	877	14	891	
Clinic (Oral fluid)	130	355	379	6	385	355	385	6	391	
Mobile (Oral fluid)	72	180	187	5	192	180	191	5	196	
Treat										
Case management for ART initiation	46	24,963	26,933	637	27,570	24,963	27,314	799	28,113	
Clinic (CD4 test)	67	360	385	6	391	360	391	6	397	
Mobile (CD4 test)	37	1,452	1,553	22	1,575	1,452	1,575	24	1,599	
Counselling by care & support	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Prevent										
PrEP (Lab)	208	1,138	1,217	18	1,235	1,138	1,235	19	1,254	
PrEP (Counselling)	129	517	544	10	554	517	558	10	568	
PEP (Lab)	22	784	838	12	850	784	850	13	863	
PEP (Counselling)	11	517	544	10	554	517	558	10	568	
Retain										
Positive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

N/A: not applicable indicates there is no activity for this site

**Appendix 2: Unit cost of activities under
RRTTPR cascade (Exclude Rapid HIV test,
Syphilis test, CD4 test, PrEP test, PrEP drugs,
PEP test, PEP drugs)**

1. Roi-Et Hospital: MSM

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	205	2,864	2,918	0	2,918	2,864	3,016	0	3,016
Recruit										
Test										
Clinic (Lab)		1,332	315	315	0	315	315	315	0	315
Mobile (Lab)		2,144	281	281	0	281	281	281	0	281
Clinic (Counselling)		1,332	2,365	2,384	0	2,384	2,365	2,447	0	2,447
Mobile (Counselling)		2,144	117	118	0	118	117	121	0	121
Treat										
Case management for ART initiation		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (CD4 test)		231	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by case manager		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent										
PrEP (Lab)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PrEP (Counselling)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Lab)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain										
Positive client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

2. Bangkok Metropolitan Administration Public Health Center (BMA 28): MSM, TGs, FSWs, MSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Recruit										
Test										
Clinic (Lab)	644	352	361	0	361	352	394	0	394	
Mobile (Lab)	2,637	181	183	0	183	181	188	0	188	
Clinic (Counselling)	644	1,165	1,200	0	1,200	1,165	1,316	0	1,316	
Mobile (Counselling)	2,637	141	146	0	146	141	162	0	162	
Treat										
Case management for ART initiation		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (CD4 test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by case manager	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent										
PrEP (Lab + Counselling)	91	1,517	1,561	0	1,561	1,517	1,710	0	1,710	
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain										
Positive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

3. Mfriend Udonthani + Udonthani Hospital: MSM, TGs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach									
Reach	2,969	553	554	4	558	553	569	4	573
Recruit									
Refer to test	235	2,747	2,754	28	2,782	2,747	2,852	29	2,881
Test									
Clinic (Lab)	7,983	187	189	0	189	187	204	0	204
Mobile (Lab)	471	1,125	1,128	10	1,138	1,125	1,166	10	1,176
Clinic (Counselling)	7,983	246	248	2	250	246	253	3	256
Mobile (Counselling)	467	268	270	2	272	268	275	3	278
Treat									
Case management for ART initiation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (CD4 test)	668	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by case manager	668	145	146	6	152	145	152	5	157
Prevent									
PrEP (Lab)	78	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PrEP (Counselling)	7,431	72	73	3	76	72	76	2	78
PEP (Lab + Counselling)	22	123	124	1	125	123	127	1	128
Retain									
Positive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

4. PPAT Khon Kaen + Khon Kaen Hospital: FSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	675	1,230	1,230	0	1,230	1,230	1,251	0	1,251
Recruit										
Test										
Clinic (Lab + Counselling)	+	675	1,653	1,654	0	1,654	1,653	1,682	0	1,682
Mobile (Lab)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mobile (Counselling)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Treat										
Case management for ART initiation		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (CD4 test)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by case manager		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent										
PrEP (Lab)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PrEP (Counselling)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Lab)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain										
Positive client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

5. Mreach Khon Kaen + Khon Kaen Hospital: MSM, TGs, FSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach									
Reach	5,304	440	440	0	440	440	451	0	451
Recruit									
Refer to test	1,553	272	272	0	272	272	278	0	278
Test									
Clinic (Lab)	128	127	140	0	140	127	238	0	238
Mobile (Lab)	280	183	202	0	202	183	343	0	343
Clinic (Counselling)	128	562	614	0	614	562	799	0	799
Mobile (Counselling)	306	1,750	1,772	0	1,772	1,711	1,847	0	1,847
Treat									
Case management for ART initiation	41	2,541	2,541	0	2,541	2,541	2,543	0	2,543
Clinic (CD4 test)	41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by case manager	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent									
PrEP (Lab + Counselling)	31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

6. Ozone Tak + Mae Ramard Hospital: PWID

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach									
Reach	6,872	522	526	4	530	523	533	4	537
Recruit									
Refer to test	206	1,274	1,288	12	1,300	1,277	1,312	14	1,326
Test									
Clinic (Lab)	116	19	21	0	21	19	22	0	22
Mobile (Lab)	223	104	106	1	107	104	108	0	108
Clinic (Counselling)	116	1,216	1,323	0	1,323	1,216	1,373	0	1,373
Mobile (Counselling)	223	219	231	1	232	219	238	1	239
Treat									
Case management for ART initiation	12	1,139	1,239	0	1,239	1,139	1,286	0	1,286
Clinic (CD4 test)	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by case manager	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent									
PrEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PrEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	56	509	514	5	519	510	524	5	529
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

7. Raks thai Samutprakarn + Samutprakarn Hospital: PWID

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)			
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB
Reach									
Reach	1,606	1,470	1,471	0	1,471	1,568	1,603	0	1,603
Recruit									
Refer to test	34	2,944	2,943	0	2,943	3,134	3,175	0	3,175
Test									
Clinic (Lab)	13,390	62	64	0	64	63	64	0	64
Mobile (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (Counselling)	879	880	0	880	879	881	0	881	879
Mobile (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Treat									
Case management for ART initiation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clinic (CD4 test)	2,295	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by case manager	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent									
PrEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PrEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain									
Positive client	17	2,570	2,573	0	2,573	2,741	2,807	0	2,807
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

8. Mplus Chiang Mai: MSM, MSWs, TGs, FSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	10,523	910	918	19	937	910	918	21	939
Recruit										
Test										
Clinic (Lab)		2,376	927	956	34	990	927	959	35	994
Mobile (Lab)		926	476	492	18	510	476	493	20	513
Clinic (Counselling)		2,376	606	622	23	645	606	623	25	648
Mobile (Counselling)		1,196	388	398	15	413	388	399	15	414
Hormone		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oral fluid		270	581	600	23	623	581	602	24	626
Treat										
Case management for ART initiation		116	6,706	6,913	408	7,321	6,706	6,931	433	7,364
Clinic (CD4 test)		169	335	346	13	359	335	347	14	361
Mobile (CD4 test)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by care & support		188	63	65	4	69	63	65	4	69
Prevent										
PrEP (Lab)		52	700	723	26	749	700	725	28	753
PrEP (Counselling)		52	319	327	12	339	319	327	13	340
PEP (Lab)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain										
Positive client		116	42	43	3	46	42	43	3	46
Negative client		3,376	31	32	2	34	31	32	3	35
Inconclusive client		8	31	32	2	34	31	32	3	35

N/A: not applicable indicates there is no activity for this site

9. RSAT Bangkok: MSM, MSWs, TGs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	28,050	416	423	6	429	416	424	6	430
Recruit										
Test										
Clinic (Lab)		4,513	451	484	7	491	451	490	7	497
Mobile (Lab)		741	249	267	4	271	249	270	4	274
Clinic (Counselling)		4,513	367	387	7	394	367	390	7	397
Mobile (Counselling)		741	275	291	5	296	275	292	6	298
Hormone		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oral fluid		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Treat										
Case management for ART initiation		392	4,742	4,904	69	4,973	4,742	4,924	73	4,997
Clinic (CD4 test)		413	172	185	2	187	172	187	3	190
Mobile (CD4 test)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Counselling by care & support		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent										
PrEP (Lab)		1,616	407	437	6	443	407	442	6	448
PrEP (Counselling)		1,064	183	194	3	197	183	195	3	198
PEP (Lab)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PEP (Counselling)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Retain										
Positive client		2,760	370	383	5	388	370	384	6	390
Negative client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

10. RSAT Songkla (Hat Yai): MSM, MSWs, TGs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	6,631	419	435	24	459	420	437	25	462
Recruit										
Test										
Clinic (Lab)	1,237	837	939	62	1,001	837	949	64	1,013	
Mobile (Lab)	225	418	469	31	500	418	474	32	506	
Clinic (Counselling)	1,237	416	443	55	498	416	445	57	502	
Mobile (Counselling)	225	309	329	41	370	309	330	43	373	
Hormone	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Oral fluid	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Treat										
Case management for ART initiation	153	3,378	3,597	257	3,854	3,378	3,612	270	3,882	
Clinic (CD4 test)	51	372	418	27	445	372	422	28	450	
Mobile (CD4 test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Counselling by care & support	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Prevent										
PrEP (Lab)	232	786	882	58	940	786	891	61	952	
PrEP (Counselling)	150	207	221	27	248	207	221	29	250	
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Retain										
Positive client	510	219	233	17	250	219	234	18	252	
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

N/A: not applicable indicates there is no activity for this site

11. SWING Chonburi (Pattaya): FSWs, MSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	8,456	962	984	37	1,021	962	992	38	1,030
Recruit										
Test										
Clinic (Lab)	762	245	254	41	295	245	284	42	326	
Mobile (Lab)	1,085	628	652	113	765	628	736	116	852	
Clinic (Counselling)	762	436	451	70	522	436	504	73	577	
Mobile (Counselling)	1,085	628	652	113	765	628	736	116	852	
Hormone	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Oral fluid	210	1,335	1,382	168	1,549	1,335	1,492	173	1,665	
Treat										
Case management for ART initiation	264	2,985	3,017	646	3,663	2,985	3,020	666	3,686	
Clinic (CD4 test)	213	81	84	13	98	81	94	14	108	
Mobile (CD4 test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Counselling by care & support	182	231	233	50	283	231	234	51	285	
Prevent										
PrEP (Lab + Counselling)	56	670	694	111	805	670	777	115	892	
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Retain										
Positive client	924	128	130	28	157	128	130	28	158	
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

N/A: not applicable indicates there is no activity for this site

12. SWING Bangkok: FSWs, MSWs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	29,375	431	433	10	443	431	437	10	447
Recruit										
Test										
Clinic (Lab)	981	295	298	16	314	295	302	16	318	
Mobile (Lab)	2,508	774	782	44	826	774	793	45	838	
Clinic (Counselling)	981	527	532	28	560	527	539	29	568	
Mobile (Counselling)	2,508	774	782	44	826	774	793	45	838	
Hormone	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Oral fluid	328	550	555	24	579	550	562	25	587	
Treat										
Case management for ART initiation	450	3,854	3,875	357	4,232	3,854	3,909	368	4,277	
Clinic (CD4 test)	63	66	67	3	70	66	67	4	71	
Mobile (CD4 test)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Counselling by care & support	280	254	256	23	279	254	258	24	282	
Prevent										
PrEP (Lab + Counselling)	671	853	861	44	905	853	872	45	917	
PEP (Lab)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
PEP (Counselling)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Retain										
Positive client	1,200	195	196	18	214	195	198	18	216	
Negative client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Inconclusive client	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

N/A: not applicable indicates there is no activity for this site

13. SISTERS Chonburi (Pattaya): TGs

Cascade	n	Financial cost (THB/visit)				Economic cost (THB/visit)				
		M+L	M+L+C	CB	M+L+C+CB	M+L	M+L+C	CB	M+L+C+CB	
Reach + Recruit										
Reach	+	2,278	937	971	21	992	937	987	27	1,014
Recruit										
Test										
Clinic (Lab)		791	429	459	7	466	429	466	7	473
Mobile (Lab)		785	462	494	7	501	462	501	8	509
Clinic (Counselling)		791	1,033	1,089	19	1,108	1,033	1,116	21	1,137
Mobile (Counselling)		785	517	544	10	554	517	558	10	568
Hormone		328	810	862	13	875	810	877	14	891
Clinic (Oral fluid)		130	355	379	6	385	355	385	6	391
Mobile (Oral fluid)		72	241	248	4	252	241	251	6	257
Treat										
Case management for ART initiation		46	24,963	26,933	637	27,570	24,963	27,314	799	28,113
Clinic (CD4 test)		67	360	385	6	391	360	391	6	397
Mobile (CD4 test)		37	1,452	1,553	22	1,575	1,452	1,575	24	1,599
Counselling by care & support		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prevent										
PrEP (Lab)		208	1,138	1,217	18	1,235	1,138	1,235	19	1,254
PrEP (Counselling)		129	517	544	10	554	517	558	10	568
PEP (Lab)		22	784	838	12	850	784	850	13	863
PEP (Counselling)		11	517	544	10	554	517	558	10	568
Retain										
Positive client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Negative client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inconclusive client		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: not applicable indicates there is no activity for this site

Appendix 3 Data collection forms

Costing Analysis Study of key population interventions to fast track the end of HIV in Thailand

Section 1: General information

1. Name of the organisation.....
2. Location.....
3. Organisational structure/ chart (please provide the printed version, if available)

Department/ division/ unit	Role & responsibilities

4. Cost centres details

Cost centre	Code of cost centre	Role & responsibilities	Outputs	Client receiving service from the cost centre	Allocation criteria

Section 2: Information of RRTTPR services (Jan-Dec 2017)

Section 2.1: Output(s) provided by the service centre(s)

Cost centre	Code of cost centre	Unit of output	Total output by key-populations

Section 3: Labor cost (Jan-Dec 2017)

Name	Cost centre	No. of working time (month)	Annual salary	Bonus	Social insurance	Other income	Proportion of working by cost centre*

* if a person is working for more than one cost centre, please indicate percentage of working in each cost centre (in annual average).

Section 4: Materials cost (Jan-Dec 2017)

List of materials/supplies	Annual cost	Source of budget/ provider	Allocation criteria	Proportion of usage by cost centre
Electricity				
Telephone				
Water				
Maintenance of				
Internet bill				
Cleaning				
Patrol				
Office supplies				
Laboratory materials				
Parcel				
Materials in clinic				
Travel/accommodation				
Other fees				
Office rental				
Others (please indicate)				

* if each material or supply item is using for more than one cost centre, please indicate percentage of usage in each cost centre (in annual average).

Section 5: Capital cost (Jan-Dec 2017)

List of Equipment/ vehicles/building	Acquisition price/ unit (THB)	Quantity	Supported by	Registration date	Useful life (year)	Location equipment (cost centre)	Status (Active / Obsolete / Lost)	Proportion of usage by cost centre

*Remark:

- If an equipment or a vehicle is being used by more than one cost centre, please indicate percentage of usage in each cost centre (in annual average).

Section 6: Training (Jan 2013-Dec 2017)

List Training of	Training date	Number of Participants in total	Number of participants from selected organisation	Total cost of training*	Sponsor/ host	Useful year (Frequency of training)	Number of selected Organisation by cost centre

* Total cost of training includes all logistic costs (e.g. travel, accommodation, meeting package), registration fee and Per diem, etc.

Section 7: Micro-costing by cascade

Section 7.1: Reach activities

List of activities	Output (time)	Output (person)	Resource used per time (within organisation)							Resource used per time (from external support)				
			Cost centre	Number of staffs	Service time (minute)	Per Diem/OT (THB)	Material cost (THB)	Travel cost (THB)	Other costs	Number of staffs	Per Diem/OT (THB)	Material cost (THB)	Travel cost (THB)	Other costs

Section 7.2: Recruit activities

List of activities	Output (time)	Output (person)	Resource used per time (within organisation)							Resource used per time (from external support)				
			Cost centre	Number of staffs	Service time (minute)	Per Diem/OT (THB)	Material cost (THB)	Travel cost (THB)	Other costs	Number of staffs	Per Diem/OT (THB)	Material cost (THB)	Travel cost (THB)	Other costs

Section 7.3: Test activities

List of activities	Output (time)	Output (person)	Resource used per time (within organisation)							Resource used per time (from external support)				
			Cost centre	Number of staffs	Service time (minute)	Per Diem/OT (THB)	Material cost (THB)	Travel cost (THB)	Other costs	Number of staffs	Per Diem/OT (THB)	Material cost (THB)	Travel cost (THB)	Other costs

Section 7.4: Treat activities

List of activities	Output (time)	Output (person)	Resource used per time (within organisation)							Resource used per time (from external support)				
			Cost centre	Number of staffs	Service time (minute)	Per Diem/OT (THB)	Material cost (THB)	Travel cost (THB)	Other costs	Number of staffs	Per Diem/OT (THB)	Material cost (THB)	Travel cost (THB)	Other costs

Section 7.5: Prevent activities

List of activities	Output (time)	Output (person)	Resource used per time (within organisation)							Resource used per time (from external support)				
			Cost centre	Number of staffs	Service time (minute)	Per Diem/OT (THB)	Material cost (THB)	Travel cost (THB)	Other costs	Number of staffs	Per Diem/OT (THB)	Material cost (THB)	Travel cost (THB)	Other costs

Section 7.6: Retain activities

List of activities	Output (time)	Output (person)	Resource used per time (within organisation)							Resource used per time (from external support)				
			Cost centre	Number of staffs	Service time (minute)	Per Diem/OT (THB)	Material cost (THB)	Travel cost (THB)	Other costs	Number of staffs	Per Diem/OT (THB)	Material cost (THB)	Travel cost (THB)	Other costs