

Costs and cost-effectiveness of HIV prevention and impact mitigation interventions in Cambodia



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Costs and cost-effectiveness of HIV prevention and impact mitigation interventions in Cambodia

Cambodia is undergoing a transition to lower HIV prevalence rates in the population and facing significant downscaling of resources for HIV. The report analyses scenarios for costs and cost-effectiveness of HIV prevention interventions for entertainment-workers who sell sex, men who have sex with men, injecting drug users and of impact mitigation activities in Cambodia, to inform the decision making process.

Foreword

The Royal Government of Cambodia has proven their commitment to eradicating HIV infections in the country; this is evidenced by the drop in HIV prevalence in the country from a high of 1.7 % in 1998 to 0.7 % in 2012. This impressive decline in HIV prevalence is due, not only to dedicated political leadership, but also to ongoing donor support and the diligent work of civil society.

In recent times increasing emphasis is being placed on ensuring that HIV funds are being used in an efficient and effective manner, guaranteeing not only quality but also value for money. The new investment framework for the global HIV response introduced by UNAIDS urges countries to adopt a more strategic approach to investments. Funds should be spent where they are most needed and where they can avert the most new infections and AIDS related deaths. “Low cost, high impact” approaches need to be adopted as recommended in 2008 by the Commission on AIDS in Asia.

The cost-effectiveness analyses presented in this report are another critical piece of the work that began in 2010 with Cambodia’s Study on the Long Run Costs and Financing of HIV/AIDS. This study examined different scenarios to assess if and how Cambodia will be able to finance the measures that are needed to successfully address the epidemic. Estimates were run until 2031, 50 years from the time the HIV virus was discovered.

The aids2031 study concluded that greater efficiencies, cost-effectiveness and predictable and sustainable financial resources are required for the national response. This need was emphasised again in Cambodia’s 2011 National Ownership Consultation which called for the development of a Fiscal Management Plan and cost-effectiveness analyses to more carefully prioritise interventions and implement a better focused and more effective response to the epidemic.

Innovations are continuously being made in the response, and changes in approaches, such as introducing point of care rapid testing and treatment as prevention, can have a significant effect on increasing cost-efficiencies. The Cambodia 3.0 strategy aimed at achieving the virtual elimination of HIV by 2020 encompasses these advances and is currently being modelled and costed also to ascertain its cost-effectiveness.

Donors are increasingly looking to invest in efforts that are demonstrated to be cost-effective and value for money. The cost-effectiveness analyses undertaken so far can provide a point of departure for informing the choices and the innovations and approaches that will need to be adopted as Cambodia takes increasing responsibility for the financing of the response and continues its march towards the Three Zeros.



H.E. Dr Teng Kunthy
Secretary General
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Table of Contents

i.	Acknowledgements	1
ii.	Abbreviations	2
iii.	Synthesis of Main Findings	4
iv.	Executive Summary	6
1.	Introduction	10
2.	Background	12
2.1	Purpose of the cost- and cost-effectiveness analyses	13
2.2	Methodology of analyses	13
2.2.1	INPUT model for the costing	13
2.2.2	Process of the revision of NSP III costing	14
2.2.3	Scope and focus of cost-effectiveness analyses	16
2.3	Findings of the cost-effectiveness analyses: reliability and validity	17
2.4	Limitations of the costing	18
2.5	Ethical considerations	19
3.	Findings	20
3.1	Overview of costing results	20
3.2	Overview of cost-effectiveness results	20
3.3	Cross-cutting issues	21
3.4	EWs who sell sex, costing and cost-effectiveness results	22
3.4.1	Costing analysis of interventions for EWs who sell sex	23
3.4.2	Cost-effectiveness of interventions for EWs who sell sex	25
3.5	MSM/TG costing and cost-effectiveness results	27
3.5.1	Costing analysis of MSM/TG prevention interventions	28
3.5.2	Cost-effectiveness of MSM interventions	29
3.6	IDU costing and cost-effectiveness results	31
3.6.1	Costing analyses of NSP and MMT	31
3.6.2	Cost-effectiveness of NSP and MMT	34
3.7	Impact mitigation – costs and priority issues	37
3.7.1	Needs for impact mitigation	37
3.7.2	Costs of impact mitigation	38
4.	Conclusions	42
5.	Recommendations	45
6.	References	48

Appendix 1. Terms of reference	53
Appendix 2. Cost-effectiveness analysis assumptions for high risk EW and MSM/TG interventions	56
Appendix 3. Cost -effectiveness analysis assumptions for IDU interventions	57
Appendix 4. Saved costs from ART provision	58
Appendix 5. Revision of the costing of NSP III 2012-2015	59

i. Acknowledgements

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ii. Abbreviations

AEM	Asia Epidemic Model
AIDS	Acquired immune deficiency syndrome
ART	Antiretroviral treatment
ATS	Amphetamine-Type Stimulants
BCC	Behaviour change communication
CABA	Children affected by AIDS
CER	Cost-Effectiveness Ratio
CoC	Continuum of Care
CoPCT	Continuum of Prevention to Care and Treatment
DALY	Disability Adjusted Life Years (outcome measure)
DIC	Drop-in center
FHI	Family Health International
EW	Entertainment Workers
FSW	Female Sex Workers
GFATM	Global Fund for HIV/AIDS, Tuberculosis, and Malaria
HAARP	HIV/AIDS Asia Regional Programme (funded by AusAid)
HBC	Home Based Care
HSS	HIV Sentinel Surveillance
HIV	Human Immunodeficiency virus
IDU	Injecting Drug User
IGA	Income Generating Activities
LSHSE	Law on Suppression of Human Trafficking and Sexual Exploitation
MARP	Most-At-Risk-Population
M&E	Monitoring and Evaluation
MDG	Millennium Development Goals
MMT	Methadone Maintenance Treatment
MoH	Ministry of Health
MoI	Ministry of Interior
MSM	Men who have Sex with Men
MSMO	Men who have Sex with Men Only
MSMW	Men who have Sex with Men and Women
MSW	Men who have Sex with Women
NAA	National AIDS Authority
NCHADS	National Centre for HIV/AIDS Dermatology and STDs
NSA	National Strategy Application
NSP	National Strategic Plan (for HIV)
NGO	Non-Governmental Organisation
NSP	Needle and Syringe (Exchange) Programme
OI	Opportunistic Infections
PLHIV	People living with HIV
PPP	Positive Prevention Package
PSI	Population Services International
PWID	People Who Inject Drugs

PWUD	People Who Use Drugs
QA	Quality Assurance
QALY	Quality Adjusted Life Years
STI	Sexually transmitted infections
SOP	Standard Operating Procedure
SPP	Social Protection Programmes
SW	Sex worker
TB	Tuberculosis
TG	Transgender
TI	Targeted Interventions
ToR	Terms of reference
TWG	Technical Working Group
VCCT	Voluntary Confidential Counselling and Testing
UA	Universal Access
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNGASS	United Nations General Assembly Special Session (on HIV and AIDS)
WFP	World Food Programme
WHO	World Health Organisation

iii. Synthesis of Main Findings

The overall findings of the cost-effectiveness analyses of EW who sell sex, MSM, and IDU interventions include:

EW who sell sex, interventions targeting high-risk populations: “Best Buy”

- The scale-up of interventions from 80-85% coverage would be expected to avert 75-150 new HIV infections amongst high risk entertainment workers (EW) and their clients from 2012-17. For interventions to become cost-saving, the savings on ART because of HIV averted must exceed the costs of the prevention interventions.
- The threshold for interventions for high risk EW and their clients to become cost-saving in Cambodia over the next six years, is estimated to be reached at 102 HIV infections averted.
- Reaching the cost-saving threshold is thought to be feasible, based on figures from the first run of AEM to reach Universal Access (UA) targets.

Scale-up of MSM interventions: “Not Cost Effective”

- The present level of intervention coverage for high-risk men who have sex with men (MSM) is estimated to be 29% and for transgender people (TG) to be 18%. UA targets are 60% coverage for high-risk MSM by 2015 and 80% coverage for TG, who have the highest prevalence rate of the two groups.
- The AEM projection of November 2011 indicates that very few HIV infections in MSM/TG will be averted over the period 2012-17.
- The cost-effectiveness works with a range of 25-50 HIV averted if the UA targets are reached.
- An investment of USD 4.1 million to reach the UA target for MSM and TG will not pay off, and therefore is not cost-effective.
- The threshold for MSM scale up to become cost-saving is 774 HIV infections averted, which is an unrealistic level to expect to achieve for this MARP.
- However, focusing on a much smaller group of the MSM/TG who are at the highest risk for new infection has the potential to be cost effective.
- Although among some groups of MSM and certainly among TG prevalence rates are considered to be high, as a percentage of the overall number of infections occurring annually only a relatively small number of the total are attributable to MSM and TG. The scale-up of interventions for these groups therefore has particularly high costs. An investment of USD 680,000 on average per year would be required to achieve MSM/TG coverage targets which makes MSM and TG prevention programmes in Cambodia not targeting those at highest risk ineffective in terms of cost.

Increasing coverage of IDU interventions: “Very Cost Effective”

- The analysis for injecting drug users (IDU) interventions shows that an increase in coverage from approximately 570 to 1,520 IDU in the period 2012-17, receiving either services from a Needle and Syringe Programme (NSP) or Methadone Maintenance Programme (MMT), can become very cost-effective and potentially cost-saving.

- Reaching this point will require the scale-up of an appropriate mix of NSP and MMT services which will result in a reduction of unit costs and a better cost-effectiveness of IDU prevention, provided there is an enabling environment for these programs to grow in coverage.
- By operating under the assumption that the NSP programme scale-up is effective and costs of the MMT programme decrease as capacity is reached, the IDU interventions hold the potential to become cost-saving over time.
- The cost-effectiveness analysis works with an assumption that 75-100 HIV infections are averted by a mix of NSP (67%) and MMT (33%) from 2012-17. In order to become cost-saving, the threshold for HIV averted is estimated to be 182.

iv. Executive Summary

1. This report presents and discusses the results of the cost-effectiveness analyses and of the costing of impact mitigation strategies and key HIV prevention interventions, targeting Most-At-Risk Populations (MARPs) including Entertainment Workers (EW) who sell sex, Men who have Sex with Men (MSM) and Transgender (TG) and Injecting Drug Users (IDUs). The initiative was led by the National AIDS Authority (NAA) with the aim of identifying the most cost-effective interventions within the framework of the National Strategic Plan (NSP III) that should be given high priority in Cambodia during the period 2012-17, in order to achieve Universal Access (UA) targets for 2013 and 2015.
2. The background of the report is founded in the changes the global, regional, and national HIV field is experiencing. In particular, financial resources for HIV are in decline and therefore there are increased demands to demonstrate the cost-effectiveness of investments to achieve the Three Zeros – zero new HIV infections, zero stigma and discrimination and zero AIDS related deaths.
3. The number of new HIV infected people in Cambodia is decreasing and so is the number of AIDS related deaths, as over 90% of people living with HIV (PLHIV) in need of treatment are receiving it. In the past years there has been a steady increase in the number of PLHIV in need of treatment and those receiving it. Keeping these people on treatment in the long run has major financial implications that need to be carefully considered in programming and resource mobilization efforts.
4. Globally, new technologies are entering the HIV field including the introduction of microbicides that can prevent HIV infections in women; the use of antiretroviral treatment (ART) as a strategy for preventing HIV infections, especially among discordant couples; and the provision of rapid (prick) HIV tests. Rapid tests are very useful as they help to increase the testing frequency amongst MARPs and their partners and to identify and put people on treatment at an earlier stage of their infection when they are most likely to transmit the virus.
5. The process that led to the results included in this report included two national consultation workshops, organized by the NAA, to set Cambodia's new Universal Access (UA) indicators and targets for 2015 and prioritise NSP III interventions in line with its commitment to the Political Declaration made at the Special Sessions of the United Nations (UN) General Assembly. A compilation, review and triangulation of data from different sources was carried out in addition to an epidemiological modelling and scenario building exercise conducted by a group of specialists led by the National Center for HIV/AIDS, Dermatology and STDs (NCHADS). Finally, several meetings were arranged with the technical working groups (TWG) on Prevention and Impact Mitigation and sub-groups of the Prevention TWG facilitated by the NAA and by the National OVC Task Force.
6. The cost-effectiveness analyses utilised HIV Averted (HIVA) as general outcome measure as did the Asian Epidemic Model (AEM) run by NCHADS to estimate and project HIV prevalence in the next six years, as well as the new infections and modes of transmission under different assumptions and scenarios. Revised unit costs of targeted interventions for MARPs were produced using the ingredient approach, which involved data collection and analysis in cooperation with relevant service providers. To analyse the cost-effectiveness of impact mitigation activities, information was utilised from a new report published by the Asia Development Bank (ADB) in November 2011.

7. The revised unit costs for MARPs interventions that were produced in this exercise and used to estimate the cost of interventions whose cost-effectiveness was examined deviate substantially from what is actually spent on these interventions as shown by the third National AIDS Spending Assessment (NASA III) focusing on 2009 and 2010. Furthermore, what is actually spent in Cambodia on these interventions is much more than what is spent on them in other countries. This means that cost of these interventions in Cambodia are comparatively speaking very high and that there is significant room for a reduction of costs.

8. This report presents the outcome of cost-effectiveness analyses of EW who sell sex, MSM/TG and IDU prevention, and of impact mitigation interventions. It also discusses how future strategies of HIV prevention and of impact mitigation might be led in a more cost-effective manner. The cost-effectiveness analyses assessed the outcome of interventions within a threshold framework. The cost-effectiveness results are presented in ratios: cost in USD per HIV averted (HIVA) or cost per Disability Adjusted Life Years (DALYs). DALYs are estimated based on HIVA. To supplement the data available in Cambodia comparative studies in cost-effectiveness and in costing using identical outcome measures were collected and used in this exercise.

9. The results of the cost-effectiveness analyses presented in this report show that overall it pays off to invest in reaching UA and Political Declaration targets for MARPs prevention. The most cost-effective option is to invest in high risk EW interventions, targeting those who are at the highest risk of HIV infection and their clients. A scale-up from 80 to 85% of coverage of this kind of prevention effort is expected to avert 75-150 new infections amongst EW who sell sex and their clients during the period 2012-17. The threshold for these interventions to become cost-saving (meaning they off-set the costs related to treatment of those who would become infected) is estimated to be reached when 102 new HIV infections will be averted. Achievement of this objective is deemed feasible.

10. The analysis regarding MSM and TG prevention interventions shows that these are much less cost-effective, if at all. The AEM projection shows that only very few new infections would be averted from 2012 to 2017 and at a very high cost by scaling up prevention interventions among these two groups from an estimated coverage of 29% for MSM and 18% for TG to the UA target of 60% and 80% respectively. An investment of approximately USD 4 million to reach the UA target for MSM and TG cannot be considered cost-effective. In addition, MSM interventions will only become cost-saving when they are scaled up to a level allowing averting 774 new HIV infections. This aim will be very difficult to achieve, but there is still a need to focus on MSM and TG who are at highest risk of getting infected with HIV as this represents the best value for money.

11. The analysis of the cost-effectiveness of IDU interventions shows that an increase in the coverage of services from either the Needle and Syringe Programme (NSP) or the Methadone Maintenance Treatment (MMT) Programme from approximately 570 to 1,520 IDUs over the next six years would make these interventions very cost-effective and perhaps even cost-saving. However, this will only be the case if the NSP starts to work more efficiently and if the costs of the MMT programme decrease significantly as it expands. The cost-effectiveness analysis acknowledged that IDU would either be getting services from the NSP or from the MMT programme (and not from both at once) and worked with an assumption that 75-100 new HIV infections will be averted by a mix of NSP (67%) and MMT (33%) in the years 2012-17. The threshold that needs to be achieved for the programme to become cost-saving is estimated at 182 new HIV infections averted, this figure falls if the NSP programme or a proportion of the programme is carried out through pharmacies. However, it will not be able to reach the upper limit cost-saving threshold at 100 HIVA unless the unit cost of MMT decreases significantly or the proportion of 67% NSP and 33% MMT shifts towards higher proportion of NSP.

12. A lack of data made it difficult to assess if Cambodia is doing the right things right in impact mitigation or is service delivery covering the poorest and those with the highest need. NASA III shows that more than USD 5 million has been spent in 2009 and 2010 on various activities, with the aim to mitigate the impact of HIV and AIDS. The highest proportion has been spent on OVC activities (more than USD 4 million) for which also most data and information are available. Of the total spent on OVC support 45% was spent on food and nutrition services; 24% on education services and 12% on psychosocial support. Approximately USD 1.2 million has been spent on Home-based Care services. A comparison with the estimated costs of the OVC support package recommended by the Commission on AIDS in Asia (2008) reveals that Cambodia's expenditures in this area match Asia's average. In Cambodia the very high proportion of PLHIV receiving ART is expected to decrease the future need for OVC services.

13. In general, this exercise proved very useful to stimulate thoughts and discussions on how to improve the national response to HIV in Cambodia and to make it more effective while paying greater attention to costs and quality. It is recommended that Cambodia make use of the results of the analyses to improve the relevance and quality of MARPs prevention services which are a critical component of the national response. It is evident that more needs to be done to improve strategies targeting spouses and partners (especially 'sweethearts') of MARPs and discordant couples in general.

14. The expenditure review and costing of current MARPs prevention interventions revealed that these include activities that are not strictly speaking HIV interventions, meaning they do not make a direct impact on averting new HIV infections, or they do not meet the recommendations of the Commission on AIDS in Asia. Asking whether HIV funds should be used to address broader development issues is a legitimate question.

15. A plan is needed to reach the poorest PLHIV and their families and OVC through social protection programmes and schemes. Progress in this area needs to be accelerated. Until social protection programmes are fully operational to respond to the needs of the poor and vulnerable groups affected by HIV, there is a need to allocate adequate resources to provide well targeted services. The need for OVC services is expected to decrease significantly in the future due to parents living longer and being able to take care of their offspring.

16. The recommendations of the Commission on AIDS in Asia, endorsed by Prim Minister Samdech Hun Sen, are not yet fully implemented in Cambodia. During the implementation process, costs need to be cut radically and some recipients of HIV services today will no longer be recipients in the future – either because they are not at high-risk or because the services they receive should be delivered by other providers (e.g., social protection programmes or community development efforts) or in cooperation with other providers (e.g., income-generation activities, food support).

17. The analyses have helped to identify several issues that require attention to ensure effectiveness of the national response. An effective strategy to prevent HIV transmission to spouses and partners (in particular 'sweethearts') and among discordant couples still needs to be devised. The VCCT rates remain low amongst MARPs, demonstrating that the quality of prevention programs and access to services requires strengthening. Also, Cambodia is only now introducing HIV prevention in prisons. It is important that progress be made on these issues in the coming years.

18. Service providers will need to improve their monitoring and evaluation (M&E) and quality assurance (QA) systems to meet national standards and fit the new global requirements on performance and quality of services delivered. Of particular importance will be investments in the strengthening of routine monitoring systems generating data that is standardised and can easily be aggregated to assess coverage of MARPs prevention and impact mitigation interventions. In addition, efforts will need to be focused

on developing a unique identifier system and on improving population size estimates. These are needed to obtain meaningful and reliable data through the routine monitoring system allowing assessment of the coverage of interventions and progress made towards achievement of targets.

19. Cambodia should undertake cost-effectiveness analyses any time it revises HIV related strategies, in order to generate evidence of value for money when undertaking fundraising efforts. This will help Cambodia to demonstrate that it is doing the right things, right. It will also facilitate the identification and justification of gaps and preparation of sound funding proposals which will be successful in mobilizing the financial resources that are required for the national response.

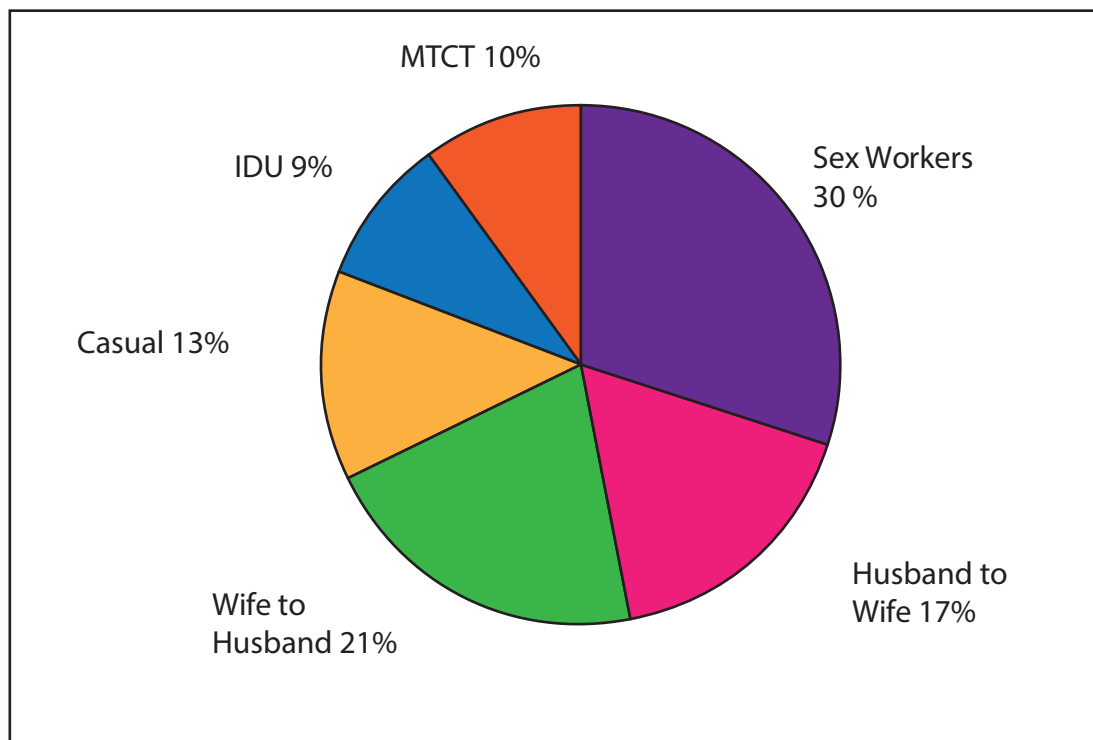
20. Finally, Cambodia needs to develop a fiscal management plan to ensure both predictability of financial sustainability over time. In the past five years only 4% of total spending on HIV and AIDS has been sourced from the government budget. The remainder has been sourced from external sources making Cambodia heavily dependent on donor support. Now that the resources of development partners are declining, there needs to be an instrumental increase in domestic spending as a share of the total resource envelope for HIV and AIDS. The cost-effectiveness analyses and costing work, whose main results are outlined in this report, can provide a starting point and facilitate the discussion of moving towards an improved investment approach to Cambodia's national response to the HIV epidemic.

1. Introduction

The face of the HIV epidemic is undergoing rapid contextual changes at national, regional, and global level. Despite global decreases in HIV prevalence and incidence, new sub-populations are demanding increased attention from the HIV response and the global financial context will require more targeted, efficient, and effective use of funding. Existing and emerging technologies, including VCCT rapid tests and treatment as prevention are coming forth as promising evidence-based interventions for prevention, treatment, care, and impact mitigation. National responses to HIV need to be able to adapt to these changing contexts with proven cost-effective and quality programs that target the sub-populations most likely to have the greatest impact on HIV incidence.

In Cambodia, as in much of Asia, the HIV epidemic manifests as a concentrated epidemic among Most-At-Risk-Populations (MARPs), including Sex Workers (SWs), Men who have Sex with Men (MSM) and transgender people (TG), and Injecting Drug Users (IDUs). Clients and partners of MARPs are also now becoming a key area of focus for HIV services. In 2012, 38% of new infections are estimated to occur among low risk populations that are sexually linked to MARPs, including spouses, partners, or sweet-hearts; however, the largest proportion of new infections from a single group is found among sex workers (30%)(See Figure 1). Additionally, the needs of discordant couples are emerging as a challenge for programming in Asia and in Cambodia.

Figure 1: Modes of transmission in 2012, Cambodia



Source: NCHADS (slides), October 2011

Cambodian HIV/AIDS funding has historically been heavily reliant on external resources, particularly on the Global Fund to fight AIDS, TB, and Malaria (GFATM). The current global financial context is concerning for the future of Cambodia's HIV epidemic but also offers stakeholders in Cambodia's HIV response the opportunity to promote targeted, evidence-based spending that is more efficient and effective, and to work towards increasing domestic ownership of HIV funding.

Cambodia will be able to apply for new money from the GFATM at the earliest in 2013. At that time, Cambodia's application will need to be able to meet the requirements for GFATM's newly introduced "performance-based approach" and "cost-share" (5%) conditionalities. This interim period represents a good opportunity for Cambodia to lead a thorough preparatory process that will strengthen its prospects of mobilizing new financial resources from GFATM and from other sources. In particular there is a need to reach agreement among stakeholders on the strategic mix of interventions that are required to achieve Cambodia's UA targets by 2013 and 2015.

To achieve this aim a road map was developed by the NAA in collaboration with UNAIDS that involved various steps as follows:

1. Set national UA indicators and targets in line with the Political Declaration and the NSP III
2. Undertake a cost-effectiveness analysis to determine the most critical NSP III interventions that need to be prioritized in 2012-2017
3. Cost prioritized interventions and establish a financial gap analysis for the next GFATM grant application.
4. Development of a costed Technical Support Plan (2012-2015) to support implementation of prioritized interventions.

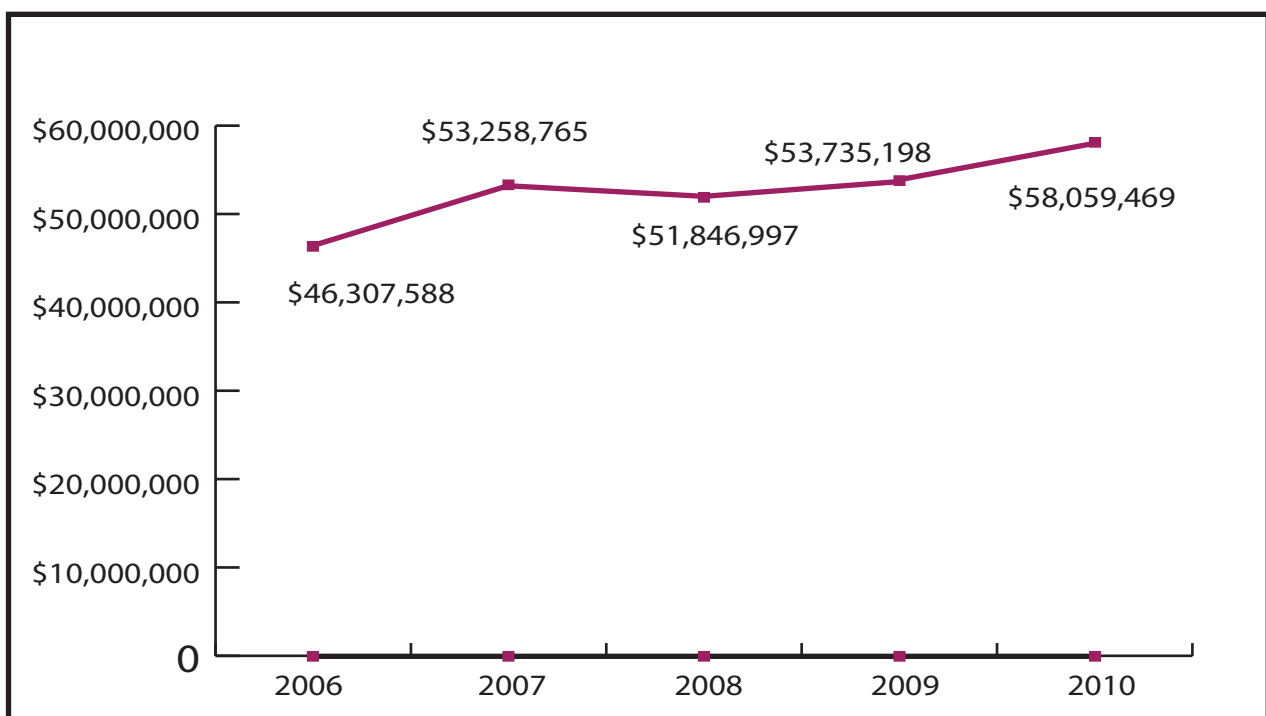
Progress made through the first three steps is reflected in this report. The process so far has included the compilation and triangulation of data from different sources and their use to estimate and project modes of HIV transmission and to develop different scenarios and estimate their impact on averting new HIV infections and AIDS related deaths. This data was used to conduct cost- and cost-effectiveness analyses on HIV prevention and impact mitigation interventions. The results of this endeavour and the revised costs of interventions that have been developed on the basis of the analyses are presented in this report.

This report is aimed at assisting in building the case for the need for significant improvements across prevention and impact mitigation interventions leading to a "value for money", cost-effective national response. Each of the main sections in this report are focused on key affected populations—Entertainment Workers (EW) who sell sex, men who have sex with men (MSM) and transgender people (TG) and injecting drug users (IDUs). Each population section goes through the assumptions and results of both the costing and cost-effectiveness analyses for each group.

2. Background

The most recent National AIDS Spending Assessment (NASA III) estimated that a total of USD 53,735,198 has been spent in 2009 and USD 58,059,469 in 2010 on HIV and AIDS (See Figure 2). Spending per capita was USD 3.95 in 2009 and USD 4.20 in 2010. Spending per person living with HIV in Cambodia remained more or less the same at USD 334 in 2009 and USD 331 in 2010. Only 4% of total spending in the past years was financed from domestic resources. The remaining was financed with external resources making Cambodia heavily reliant on international aid to implement the national response to HIV.

Figure 2. Total spending on HIV and AIDS in Cambodia, 2006-2010



Source: NASA III (2011)

Funding for HIV in Cambodia is predicted to decrease as major bilateral donors such as the US Government decrease their support to the HIV sector and the present GFATM SSF grant concludes in 2014. It is unlikely that the current high level of investment in the national response will continue, noting also a reform of the GFATM's future priorities including:

- Investing more strategically in areas with high potential for impact and strong value for money; funding based on countries' national strategies;
- Evolving the funding model to provide funding in a more proactive, flexible, predictable and effective way;
- Actively supporting grant performance success through active grant management with a focus on evidence based quality programming;

- Demanding national cost-sharing of all grants.

The GFATM is thus encouraging the use of cost-effectiveness analysis to ensure increased value for money by using more targeted and strategic approaches that will yield long-term dividends as advocated by the revised priorities (Schwartländer et al 2011).

2.1 Purpose of the cost- and cost-effectiveness analyses

The main aim of the exercise whose results are included in this report was to:

- Conduct cost- and cost-effectiveness analyses of HIV prevention interventions focusing on high risk EW, MSM and TG, and IDUs (including Methadone Maintenance Treatment and Needle and Syringe programmes) and of impact mitigation interventions, using available data to prioritize interventions and revise NSP III costing
- Report on discussions by the Technical Work Groups (TWGs) on prevention and impact mitigation and present possible strategies for Cambodia to improve the cost-effectiveness and quality of prevention care and impact mitigation interventions
- Prepare for prioritised financial and programmatic gap analysis, particularly focusing on the contributions and effectiveness of previous GFATM grants and SSF in demonstrating the ability to fill strategic programme and resource gaps
- Ensure Cambodia's readiness to prepare and submit a realistic GFATM concept note for the next grant that demonstrates quality, is evidence-informed and focuses on priority interventions helping to reach UA targets.¹

2.2 Methodology of analyses

A range of methodologies have been used in order to obtain the data necessary for the cost- effectiveness analyses of HIV prevention and impact mitigation interventions. These have included a review of available documentation and literature on costing and cost-effectiveness studies in Asia, data triangulation and modelling/scenario building, collection and analyses of quantitative data including up-to-date cost data and available activity/output/outcome data concerning MARPs prevention interventions, interviews with key stakeholders implementing or facilitating implementation of selected interventions, and discussions with members of TWGs and partner communities.

The new HIV estimates and projections, including those on the modes of HIV transmission and the results of the data triangulation/scenario building exercise, were used as the basis for the cost-effectiveness analyses. The AEM was used to estimate the number of HIV infections under different scenarios, using different sets of interventions and intervention coverage levels.

2.2.1 INPUT model for the costing

The UNAIDS-recommended INPUT model was used to cost HIV interventions for EW who sell sex,

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¹. The road map and terms of reference that have led to the results presented in this report are in the Annex.

MSM and TG, and IDUs. Impact mitigation interventions for children made vulnerable by HIV were costed with this model as well. The INPUT model is an application used for costing assessments; it generates local data on unit costs for strategic considerations and planning purposes. The INPUT model involves identifying target populations and estimating population size, assessing programme coverage, and costing appropriate interventions based on current programme implementation and international best practice².

2.2.2 Process of the revision of NSP III costing

Population size estimates for MARPs are crucial for estimating current programme coverage and future targets for programme scale up. Population sizes were discussed in TWG meetings with service providers and experts in HIV/AIDS. The Prevention TWG came to the consensus that there are approximately 42,000 high risk EW in Cambodia, including those working at venues such as karaoke bars, beer gardens, massage parlours, beer promoters, in addition to street-based or freelance EW selling sex. However, the official figure from NCHADS Q1 of 2009 is 34,193 EW, which is the number that has been recommended for use in the cost analyses. In the past, high risk EW were mostly brothel-based, and estimating the population size of this group was relatively straightforward. As a result of changes in male social and sexual networking combined with the 2007 suppression of trafficking campaign and subsequent promulgation of the 2008 Law on the Suppression of Human Trafficking and Sexual Exploitation, brothels have closed and sex workers have dispersed to work in a number of different venues, mostly entertainment establishments, which complicates obtaining accurate population size estimations.

Due to the uncertainty of the population size estimate, it is also difficult to determine the proportion of high-risk (sex workers with more than 2 clients per day) and low risk (sex workers with less than two clients per day) sex workers, since many high-risk sex workers were not reached with the research sample. However, since no other data is available, these estimates are used in the cost-effectiveness analysis and in the AEM.

Service providers working with MSM met in a TWG to come to consensus about the population size estimation for this group. The TWG members agreed with the national estimate of approximately 21,400 self-identified MSM as mapped by KHANA and FHI in 2009. The number of transgender was estimated to be 28% of the total MSM population, based on the recent Bros Khmer study and the service providers' experience with this group.

The Prevention TWG discussed the population size estimate of IDUs in Cambodia and came to consensus that the national figure of 1,900 IDUs (NCHADS 2007) is the best estimate available.

In order to cost impact mitigation interventions, the number of households with OVC receiving a package of minimum support needed to be estimated. In the 2010 UA Report, HACC reported that 58,138 OVC households received the minimum support package in 2010. The 2010 Socioeconomic Impact Study (SEIS) estimated that 85,921 OVC were affected by HIV and AIDS in 2010. Estimations from NCHADS' modelling and projection exercise predict that the number of OVC will decrease over time, as people live longer healthier lives on ART and HIV prevalence in the general population continues to decline. The Prevention TWG recognised the need to prioritize impact mitigation interventions to target only those households most in need of support if funding will decline in the future. For costing purposes, the Prevention TWG suggested the targeting of 40% of the 85,921 affected by HIV and AIDS, living below the poverty line which amounts to 34,368 OVC.

² Further information on the INPUT model can be found here in Alban, Hahn et al 2004.

Coverage targets for programme scale-up from 2012-15 were determined by consensus in TWG meetings held in November 2011, as a follow up to the NSP III Review and Prioritization National Consultation Workshop held October 28, 2011. IDU coverage targets were based on the current coverage of MMT and NSP, on the capacity of MMT programme to expand, and on demand for MMT services. It was agreed that IDU services would be provided as a combination of MMT (33%) and NSP (67%). By the end of 2011, there will be 107 patients enrolled in MMT with a waiting list of approximately 30 individuals. Based on this information, coverage for 2012 was agreed to be 171 patients with scale up to 422 patients by 2015 (this figure surpasses the full operating capacity of the current MMT clinic). It is estimated from programme reporting data that NSPs are currently covering 300 clients (16% of IDU). With improvements in the enabling environment the TWG agreed that NSPs could be scaled up to reach 718 clients by 2015.³ By 2015 the combination of MMT and NSP is targeted to cover 1,140 (60%) IDU. By 2017 the target coverage is 1,520, 510 individuals benefiting from MMT programmes and 1,110 from NSP. It is anticipated that some IDU will be covered by both programmes and therefore fewer than 1,520 individuals may be reached in total.

Table 1. Coverage targets for MARP prevention and OVC support 2012 – 2017

Interventions	2012	2013	2014	2015	2016	2017
Prevention						
IDU						
IDU MMT	171	250	333	422	445	510
IDU NSP	399	509	618	718	885	1,010
EW who sell sex	27,750	28,000	28,000	28,209	28,600	29,064
MSM	7,500	9,000	11,500	14,040	14,040	14,040
OVC Impact Mitigation						
Education	17,200	16,856	16,519	16,325	16,325	16,325
Health	4,800	4,700	4,600	4,671	4,671	4,671
Food & Nutrition	19,952	18,514	16,519	15,672	15,672	15,672
Psychosocial Support	27,520	25,000	22,500	20,640	20,640	20,640
Community-based Care	1,725	1,725	1,380	774	774	774
IGA	6,880	5,697	4,660	3,867	3,867	3,867

Source: ADB, November 2011

Current coverage (2011) of EW who sell sex was estimated at 27,500 (79%) based on service provider data. Target coverage is to increase to 28,209 high risk EW (82%) by 2015, and to increase to 29,064 by 2017, covering an additional 1,564 EW who sell sex. Based on service provider information, 2011 coverage of MSM is estimated at 6,500 (30%) including TG. By 2015, the TWG agreed that programme coverage should increase to cover 14,040 MSM (66%) and that this coverage level should be maintained until 2017.

Coverage of impact mitigation interventions was discussed and consensus was reached in the National Task Force on OVC (NOVCTF). The target of OVC in need of support was reduced from 60% of the

³. See Appendix 5 - Revision of the costing of NSP III 2012-2015

85,921 OVC reported by the SEIS to target only those OVC living below and around the poverty line (40% of all OVC, or 34,400). Operating under the assumption that there will be a 5% reduction in poverty, there will be 32,680 OVC in need of support by 2015. This coverage in the analyses was kept constant until 2017. The NOVCTF revised previous coverage targets for food and nutrition, education assistance, health assistance, income generation and economic assistance, psychosocial support, and shelter support. The group chose to omit legal assistance support for OVC, as it was previously included to assist families in obtaining birth certificates, but this service is now provided free by the Government. The targets were reduced as the number of new HIV infections is decreasing over time and people are living healthier and longer lives with availability of ART, meaning fewer children will be made vulnerable due to the impact of HIV/AIDS.

2.2.3 Scope and focus of cost-effectiveness analyses

Analyses done in order to ascertain methods of improving quality and efficiency of service delivery can generally take two forms: an allocative efficiency analysis or a technical efficiency analysis. An analysis of allocative efficiency poses the question “are we doing the right things to get the results that we want?” and examines cross-cutting HIV interventions or prevention interventions and then ranks the interventions according to their relative efficiency. Technical efficiency asks “is there a less costly way of achieving the outcome or could we achieve more by using the budget we have in an alternative way?” and analyses the data to determine whether or not we are doing the right things in the right way.

The analyses carried out for this report are based on cost-effectiveness and costing best practices and include analyses of the following prevention interventions: IDU (MMT and NSP interventions), interventions targeting high risk EW, MSM/TG interventions, and finally a discussion of how to achieve improved efficiency and equity in the allocation of resources for impact mitigation. The focus of the cost-effectiveness analyses documented in this report is technical efficiency. Allocative efficiency is discussed in the conclusions.

All results reported here use the World Health Organisation’s (WHO) threshold definition for the categories of “very cost-effective” and “cost-effective”.⁴ The definition of the threshold for “very cost-effective”^{5&6} is:

$\frac{\text{Cost}}{\text{Disability Adjusted Life Years (DALYs)}} < \text{National GDP per capita (PPP)}^3 \text{ (measured in International Dollars)}$
--

4. These originally have been suggested by the Commission of Macro-Economics as the fore-runner of introducing the Millennium Development Goals (MDGs) for health.

5. DALY: Disability Adjusted Life Years is an outcome measure used by WHO in cost-effectiveness analyses. It incorporates a value from 0 (dead) to 1.00 (normal health) of health status in a given year. Life Years gained are thus multiplied with the value of health status to get the DALY gained.

6. International Dollar is a hypothetical unit of currency that has the same purchasing power that the U.S. dollar has in the United States at a given point in time, i.e. it means the U.S. dollar converted at Purchasing Power Parity (PPP) exchange rates (used in economic analyses to compare outcome of interventions across countries).

For an intervention to be considered “cost-effective” it must meet the threshold of:

$$\frac{\text{Cost}}{\text{Disability Adjusted Life Years (DALYs)}} < 3 \times \text{National GDP per capita (PPP)}^3 \text{ (measured in International Dollars)}$$

The GDP per capita in Cambodia is USD 1,739, therefore a “very cost-effective” intervention would cost less than USD \$1739 and a “cost effective” intervention would cost less than USD \$5217 (UNDP/HDR 2011). The number of DALYs gained by an intervention is estimated based on the number of HIV infections averted (HIVA) by increasing coverage of services. For the cost-effectiveness analyses of interventions in Cambodia, preliminary results of a first run of the AEM in November 2011 have been used as an indicative measure of effectiveness for what can be achieved by reaching UA targets, for the different targeted interventions.

For all cost-effectiveness analyses, comparison has been measured between “no change” (which is defined as maintaining the present coverage of intervention) and “reaching UA targets” as set by the NAA led process from September to November 2011. The number of HIVA has been measured from 2012-17 and has been used to calculate DALYs gained by reaching UA targets for different interventions. The costs of these interventions originate from the revised costing carried out concurrently in November-December 2011 (See Appendix 5). All cost-effectiveness results are presented as cost-effectiveness ratios (CER) which are equal to cost of interventions 2012-17 per DALYs gained. All costs and benefits (for example, HIVA and DALYs) are discounted to present values that are set to 2012. For example the value of DALYs in 2017 is discounted with 3% to 2012.

2.3 Findings of the cost-effectiveness analyses: reliability and validity

For the cost-effectiveness analyses to be reliable a number of assumptions need to be fulfilled and barriers to be overcome. For example, that the prevalence rates and population sizes included in the analyses are correct or “as good as it gets”. For the costs to be reliable the MARPs interventions implemented over 2012-17 must be implemented as service packages recommended by the Commission on AIDS in Asia.

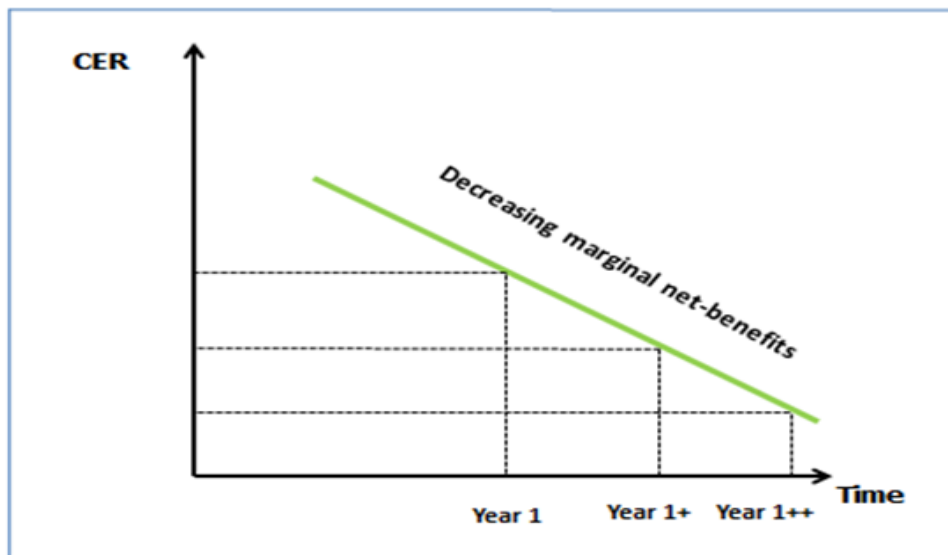
A review of NASA III data shows that twice as much was spent in 2010 in Cambodia on HIV interventions, compared to what was estimated by the revised costing whose results are presented in this report, which was informed by the recommendations of the Commission on AIDS in Asia (2008). One of the reasons for this is that HIV finances in Cambodia pay for more than interventions focusing on high(er)-risk population groups as recommended by the Commission. Had 2010 expenditures, as identified by NASA III, been used as proxy for calculation of unit costs or of total costs of MARPs prevention interventions in the cost-effectiveness analyses, the CER would have been much less favourable. In fact, this would have doubled the cost of each HIVA presented in this report.

The effectiveness estimations are based on the outcome measure HIVA, that is then turned into DALYs gained using health status weights from the literature. Since the reliability and validity of using AEM as a measure for individual population groups’ numbers of HIV averted hold uncertainties, the analyses work with ranges of HIVA. The AEM results are used as a guide or indication as to what can be achieved. Further, it is assumed that quality of services is of such value that the required behaviour change (expected use of condoms/lubricants and clean needles) actually happens.

Finally, an assumption is made that ART policies for adults will not change radically, since this will influence the relative CER of prevention vs. treatment and the strengths of the CER to reach the cost-saving level of HIV prevention interventions. The longer people infected with HIV live and are taking ART on average– the more expensive the bill for ART becomes. The more expensive drug regimens become, with more people using second, third or even fourth line regimen drugs, the more it pays to undertake targeted prevention of HIV.

Generally, the CER depends on the size of the cost estimates and numbers of HIVA over the years. The cost-effectiveness analyses use six years, 2012-17, as a timeframe although the UA targets are to be reached by 2015. This has implications for the CER; had the analyses used a timeframe of four years, 2012-15, the CER would have been more favourable. This is caused by the rule of decreasing marginal benefit as illustrated in Figure 3.

Figure 3. Illustration of decreasing cost-effectiveness ratio over the years



However, it should be recalled that all MARPs prevention interventions will have to reach minimum 60% coverage before the prevalence rates decrease. It is therefore not recommended to stop scale up until this point is reached even if the CER is marginally less favourable. The UA targets are designed to ensure that this happens. The results of cost-effectiveness analyses assessing impact of scaling up MARP prevention interventions should therefore only be compared if they cover the same time range measured in years.

2.4. Limitations of the costing

There are several limitations in this costing exercise. The first is in regards the population size estimates. The official size estimate for EW who sell sex (34,000) is significantly lower than the size estimated by the TWG (42,000). This has implications for coverage, as programme coverage may not be as high as reported, if the size of this group is underestimated. The official size estimate for IDU is 1,900, but, when calculating HIV infections averted, AEM uses the size estimate of 3,346, which is thought to be a gross overestimation of IDU population size. Without accurate size estimations programme coverage cannot be reliably reported. It is therefore important that accurate size estimates for MARPs be conducted in the near future and that more accurate methods for obtaining size estimations are explored.

In terms of costing, staff costs and training take up a significant portion of each unit cost (42% for EW who sell sex, 18% for MSM, 60% for NSP and 50% for MMT). In comparison, in Myanmar the share of staff cost was 29% for the high risk EW programme, 13% for the NSP programme, and 33% for the MMT programme. Management efficiencies need to be improved in Cambodia so that more clients can be reached with the current number of staff at lower unit costs. Monitoring programme coverage, quality and effectiveness also needs to be improved. In order to understand who is being covered by what services and how frequently services are used, a monitoring system needs to be in place that captures more than frequency of contact with clients.

2.5. Ethical considerations

Ethical considerations in this analysis process include potential confidentiality and security issues with interviews and communication with various stakeholders. The cost-effectiveness analyses were carried out in close cooperation with TWGs, NAA, NCHADS, and their partners in a transparent process and do not have any known ethical issues.

3. Findings

Reporting on the cost- and cost-effectiveness analyses has been structured by type of intervention. Revision of unit costs and cost-effectiveness analyses used national data. The cost-effectiveness analyses indirectly use the effectiveness results (measured as HIVA) of the first run of the Asia Epidemic Model data by NCHADS in November 2011, as a guide to form the expected effectiveness range of feasible values for marginal costs per HIVA or DALY. Cost effectiveness analyses can report outcome ranges that allow for analytical freedom to discuss what is needed to provide services that are very cost-effective or even cost-saving when the cost of ART saved for each HIV averted is included. For more technical explanations, refer to chapter 2.3 and appendices 2-4.

3.1 Overview of costing results

The total cost of the implementation of the prevention interventions for IDUs, EW who sell sex, MSM/TG and impact mitigation services for OVC households are presented in the Table 2 below.

Table 2. Total revised cost of the implementation of key NSP III interventions for 2012-2017 (in 2012 USD)

Interventions	2012	2013	2014	2015	2016	2017
EW who sell sex	3,663,000	3,696,000	3,696,000	3,723,588	3,775,200	3,836,448
MSM	1,065,000	1,278,000	1,633,000	1,993,680	1,993,680	1,993,680
IDU MMT	125,697	183,768	130,815	165,948	172,676	197,344
IDU NSP	81,979	104,621	126,873	147,563	180,355	206,120
OVC	4,752,516	4,425,512	4,016,387	3,754,114	3,754,114	3,754,114
Total	10,048,942	10,051,901	9,967,075	10,151,643	9,876,025	9,987,706

3.2 Overview of cost-effectiveness results

The coverage increase, cost increase, HIVA, and cost savings thresholds for prevention interventions for high risk EW, MSM/TG, and IDUs are presented in Table 3.

Table 3. Reaching UA Targets (2012-2017): Coverage, Costs, HIVA and Cost-Saving threshold

Intervention	Coverage Increase	Cost Increase in US\$	HIVA	C-S Threshold**
EW	1,314	547,482	75-150	102 HIVA
MSM & TG	6,540	4,161,541	25-50	774 HIVA
IDU*	950	976,793	75-100	182 HIVA

* Mix of NSP (67%) and MMT (33%)

**C-S: Cost-Saving;

3.3 Cross-cutting issues

Table 3 shows that investments required to reach UA targets are very different for high risk EW, MSM/TG, and IDU interventions. The range of potential gains made measured by HIVA is highest for EW who sell sex (including their clients), followed by IDUs, with MSM and TG last.

The cost-effectiveness analyses of interventions for the three MARPs in Cambodia (high risk EW, MSM/TG, IDUs) revealed a number of common themes and cross-cutting issues. For each of the MARPs groups substantial differences were noticed between the cost of interventions as reflected in NASA III and the cost of best practice service packages given by the recommendations of the Commission on AIDS in Asia in 2008. The cost of most interventions assessed by NASA III was twice as high or more compared to the cost calculated on the basis of recommendations by the Commission. Further analysis of these discrepancies is warranted to determine whether improvements in efficiency of service delivery can be made.

In this analysis, the AEM results have been used to determine what gains can be achieved (measured in HIVA) by scaling up from present intervention delivery (2012) to UA targets for 2012-17. Since the AEM is widely used in Cambodia by NCHADS for projection purposes, it was decided to use this model as a guide for the cost-effectiveness analyses.

The preliminary results from the first run of the AEM for UA targets were used to develop a realistic range of HIVA for each MARPs group based on the proposed increases in coverage and costs (ranges for HIVA are given in Table 3). The CER was then estimated based on the cost of best-practice MARPs interventions as recommended by the Commission and the HIVA range. Every HIVA results in savings from not having to pay for lifetime costs for treatment, so the net costs include the (discounted) cost of prevention minus the (discounted) cost of ART. The revised unit costs for MARPs and ART (adults only) services that were derived from discussions in TWG and interviews with service providers were used.

A potential issue in this analysis is the differences in official figures given for population sizes—the TWG provided figures that were significantly lower for IDUs and EW who sell sex, than those given in the official statistics. These disparate estimations are problematic because these estimates constitute a crucial contribution for accurately estimating the UA targets – and thus for estimating the cost-effectiveness. For IDUs, the official population estimate used by the AEM is 3,200 while the TWG suggested that the maximum IDU prevalence in Cambodia was 1,900. If the cost-effectiveness analysis of IDU interventions uses 3,200 as the IDU population estimate rather than 1900 then the costs shoot up dramatically. A coverage level of 60% using 3,200 as the IDU population estimate would suggest that 1,920 IDUs should be covered by 2015 with NSP and MMT services, while the analysis using the TWG estimate of 1,900 as the IDU population estimate only targets reaching 1,520 IDUs by 2017 (80% coverage). If the official IDU population estimate is more accurate than the TWG estimate, the result would be suboptimal coverage based on the current estimations.

Programmatic data on relevant output and outcome measures, at the service delivery level, is sparse and tends to be suboptimal for cost-effectiveness analyses. Monitoring of performance and effectiveness indicators needs to be used by implementers to ensure effective and efficient use of resources. This task is complicated by different or overlapping MARPs groups presenting for services at different delivery points, which makes the disaggregation of data for analysis and ensuring provision of services more difficult. For example, DUs and IDUs regularly access similar services, but are not necessarily targeted with different interventions; additionally, low and high-risk groups both access service delivery points but there are no guarantees that the high-risk groups are getting appropriate attention and services. The common issue here is the problem of obtaining accurate data on each of the MARPs groups and on providing targeted services to high risk groups and ensuring that they have access to those services that will have the biggest

impact in preventing new HIV infections.

Finally, the analyses assume that HIV interventions that are targeting MARPs are having a positive effect. This assumption is based on trend data from documents like the Behavioural Sentinel Surveillance (BSS) surveys that provide self-reported data on measures such as condom use. If quality services are not implemented and VCCT rates are not improved, the analyses given here may be providing overly optimistic cost-effectiveness ratio estimates.

The type, quality, consistency and frequency of the delivery of HIV services, especially for MSM, require close scrutiny and reform. It would seem that outreach services and drop-in centres are not reaching clients efficiently, especially those that are hardest to reach. HIV financing should no longer pay for drug treatment/harm reduction for ATS users/PWUD.

3.4 EW who sell sex, costing and cost-effectiveness results

The official size estimation of the high risk EW population in Cambodia is 34,193, however the TWG (which includes service providers to EW who sell sex), estimates that the population size is minimum 42,000.⁷ EW who sell sex are projected to constitute 30% of new HIV infections in 2012 – the highest proportion of new infections for one population group. Additionally, many of the projected new infections pathways are from husbands (many of whom have had informal or EW partners) to wives/girlfriends (17% of new infections) and from wives to husbands/partners (21%). This may reflect a new wave of transmissions from EW who sell sex to male partners to their female spouses and of EW exiting sex work trajectories and subsequently transmitting to male spouses or partners.

Because of the widespread closure of brothels, resulting from a number of factors including implementation of an anti-trafficking campaign and the Law for the Prevention of Human Trafficking and Sexual Exploitation in early 2008, it was not possible for the 2010 HIV Sentinel Surveillance (HSS) survey to distinguish between brothel-based/direct FSW and non-brothel based/in-direct FSW as it has in the past. A distinction is now being made between females working in the entertainment industry (entertainment workers or EW) who are at low risk and those who are at high risk. This distinction is based on their number of clients.

HSS 2010 found that HIV prevalence amongst female entertainment workers is 14% in the high-risk group (more than fourteen clients per week) and is 4.1% for the low-risk group (less than fourteen clients per week). Some studies continue to disaggregate EW based on their place of work, including karaoke bars, massage parlours, casinos, beer gardens, the street and hotels (often former brothel workers). This disaggregation provides a snapshot of the transition of some EW (mainly former brothel-based workers) moving to new venues (primarily entertainment venues such as karaoke parlours or beer gardens), although it is difficult to make definitive observations based on this data. This venue-based data may additionally give us an idea of where targeted interventions will be the most effective and of where to develop interventions that target specific risk behaviours, such as drug use. A recent publication investigating females who sell sex in Phnom Penh revealed that freelancing FSWs and FSWs using drugs had the highest risk for HIV infection (Couture et al 2011).

⁷ The size of EW is estimated at 34,193 – with 80% being covered by services; however, not all sell sex. The exact numbers of FSW operating from hotels, streets or free-lancing is unknown. Chhorvann and Vonthanak (October 2011) estimate the number of FSW in Cambodia to be approx. 22,000 in 2010. 27,500 EWs are covered with EW services according to the MARP TWG in November 2011 – but it is not known how many of those sell sex – or sell sex twice per day. Based on these uncertainties in data, it was decided to go by the estimates provided by the TWG on prevention that includes providers of FSW services.

It was not possible to perform a cost-effective analysis for street-based and hotel-based EW who sell sex in Cambodia, because recent surveys have not provided disaggregated venue-based results, although this information has been collected. Consequently the TWG working on EW issues has not yet been able to discuss and analyse the prevalence data from these sub-groups and the distribution of high risk EW across venues. This is both an information and analytical gap that needs to be filled to better determine the coverage and needs of these women. Additionally, there seems to be an issue with mixing definitions of EW and SW, which has the potential to lead to poor service delivery/monitoring of the most vulnerable EW. Uncertainties within the coverage data for EW who sell sex may influence the robustness of the findings of the cost-effectiveness analysis.

3.4.1 Costing analysis of interventions for EW who sell sex

The revised unit cost for delivering services to high risk EW is USD 132 (including services for clients of EW in entertainment venues), based on the current service delivery mode of outreach and DIC, an increase in number of condoms distributed, and the addition of rapid testing. The revised cost includes the use of rapid tests according to indication (rapid tests should be administered 2-4 times per year for high risk groups) and provision of condoms to achieve 100% condom utilisation. The unit cost in the original NSP III costing was estimated at USD 477, with condom distribution taking up a large share of the cost, while the actual service delivery was estimated at just USD 55 per high risk EW per year. The unit cost in NASA III for service delivery in 2010 was twice as high as the currently estimated unit cost (USD 132) – USD 280 per high risk EW per year.

The recent NASA study which reports on expenditures for high risk EW interventions in 2009 and 2010 (NASA III 2011) revealed an estimated average unit cost of USD 280 for high risk EW interventions in 2010. The figure is only an approximation since many NGOs providing services to EW who sell sex (and clients) also provide services for other MARPs groups and do not make a distinction between different MARPs clients. The approximation is based on the conclusion that 46% of the total MARP expenditures can be ascribed to high risk EW and client activities (see NASA III). The revised unit cost of USD 132 includes rapid tests and condom provision as part of a best practice package for high risk EW recommended by Commission on AIDS in Asia (2008). The unit cost of USD 280 is also double the price of similar services in Bangladesh, Myanmar (see Table 5). It is likely that expenditures captured by NASA III include much more than what it takes to create effective behaviour change and cover EW who sell sex and their clients with necessary and appropriate HIV prevention services. Presently, a unit cost of USD 280 is not competitive on the Asian market.

At present (2011) it is estimated that prevention interventions cover 27,500 EW/FSW in Cambodia. The biggest service providers in this field are FHI360 and Population Services International (PSI). Presently FHI360 carries out activities for EW including counselling, referrals, and limited condom distribution (12 per year). Additionally, PSI provides subsidized condoms as a part of their condom social marketing programme. Limited condom distribution is contradictory to the recommendations of the Commission on AIDS in Asia, so the revised unit cost of USD 132 includes sufficient resources for adequate condom coverage. Both FHI360 and PSI programming use a social networking approach to encourage EW to increase condom use with sweethearts and develop condom persuasion skills. PSI and FHI360 additionally carry out interventions targeting high risk men (sexual partners of EW) using a social networking approach to encourage condom use. It was not possible in the time available for this analysis to produce costs for hotel-based or street-based EW separately. The report also falls short of information on how high-risk EW who sell sex from hotels, streets, or entertainment establishments will be covered with HIV prevention services.

To revise the high risk EW unit cost for 2011, FHI360 provided a project budget(Smart Girl) for outreach and drop-in centre (DIC) services for EW who sell sex, which includes staffing costs, operational costs,

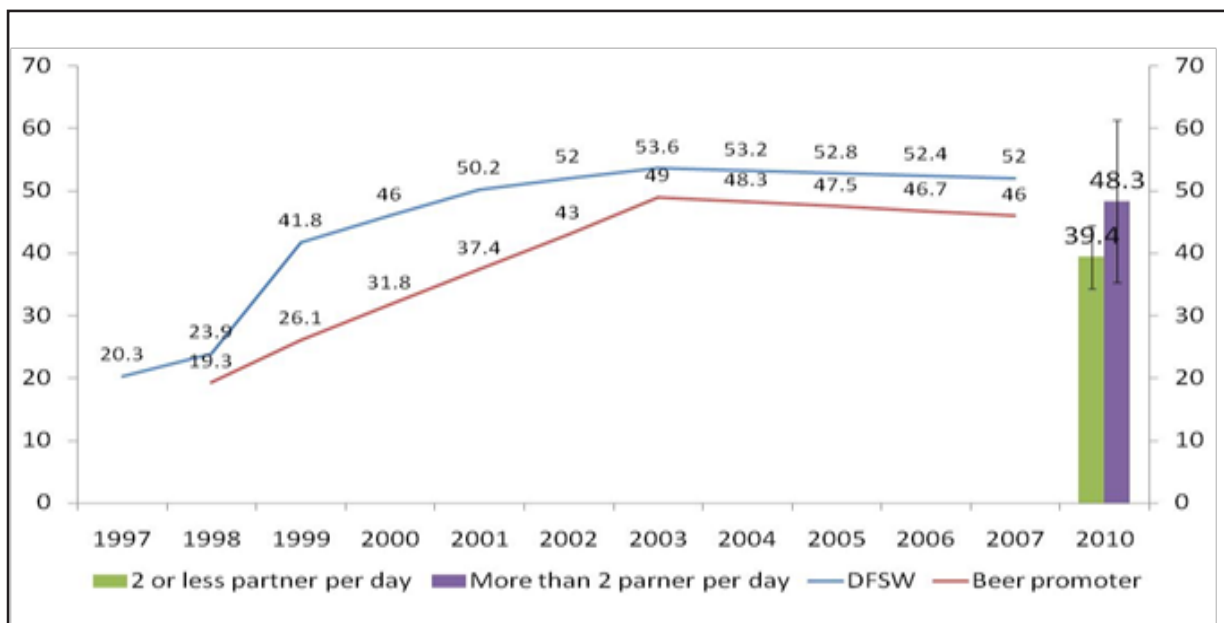
peer outreach and education, condom distribution, support group for high risk EW who inject or use drugs, and fostering an enabling environment. Based on best practices, rapid HIV testing was also costed for 50% of EW twice per year. This project also has an outreach component for clients of sex workers. The salaries of staff (including management and administrative staff) account for 15% of the total programmes and 43% of the unit cost. 28% goes for the activities targeting EW and approximately 10% goes to targeting their clients. Both activities include a condom distribution component. Referrals to VCCT, STI and RH services are a little over 6% of the total unit cost.

Table 4. Comparison of unit costs of interventions for EW who sell sex in countries using similar costing methodologies.

HIV Intervention	Nepal 2010	Cambodia 2011	Bangladesh 2011	Myanmar 2010
EW who sell sex-DIC	95	132	SBSW 106 HB-FSW 140	124
EW who sell sex-Clients	4.44	Included in the cost for EW who sell sex	8.03	6.88

While the condom use of EW with clients is relatively high (82-89%)⁸, EW condom use with sweethearts is substantially lower (46%-52%). This is worrying since the number of new infections from wife to husband is increasing (see Figure 1) and is expected to have reached 21% of total new cases in 2012 (NCHADS October 2011).⁹ This calls for renewed strengthening of high risk EW interventions – with stronger sexual reproductive health interventions.

Figure 4. Trends in consistent condom use with sweethearts, 1997-2010



Source: Chhorvann and Vonthanak 2011

⁸ The condom use of female entertainment workers with more than two clients per day have the highest condom use = 89.2 while the female entertainment worker with less than two clients per day have the lowest condom use = 81.5.

⁹ Wife to husband transmission may occur because the HIV-positive wife is a former FSW, and has now passed the infection on to her husband. Alternatively, the HIV-positive wife may have been infected by her first husband who either died of AIDS or they divorced, and the wife then remarried and infected her new husband.

Indicators that are successful in measuring effective high risk EW programme include the number of referrals to VCCT and level of STI treatment services. The use of VCCT by EW is disappointingly low in Cambodia. The expected level of HIV tests per year should be around 1-2, especially for the highest risk groups (more than two partners per day), but available data indicates only 40-50% of EW who sell sex receive one HIV test per year. The 2010 BSS indicates that 81% of EW who have more than two clients per day take at least one HIV test per year—these testing levels are not satisfactory. This poor coverage suggests that attention should be given to improvements in quality and effectiveness of the current programmes covering high risk EW with services. One potentially effective strategy would be to implement rapid tests among high risk EW communities – both for EW who sell sex and their clients. This will increase number of VCCT for this high-risk group and it will increase efficiency of service delivery since only those clients who are in need of treatment services will be referred.

There are a number of prioritization issues for sex workers that arose in the costing process. Firstly, there is the issue of categorizing entertainment workers versus sex workers – not all EW sell sex (13.3% of EW surveyed in the BSS 2010 had never had sex). From the programme perspective it is not clear if programmes are reaching these low-risk EW or if programmes are reaching the higher-risk EW (EW with more than two clients per day). To ensure that programmes are targeted appropriately to avert the maximum number of new infections, the most-at-risk EW who sell sex, such as street-based, freelance, former brothel workers and low range hotel-based EW, should be identified. These high-risk EW may be more expensive to reach, but the pay of reaching them will be higher due to their higher HIV prevalence and higher number of partners.

There is an additional need to introduce an effective client component of current high risk EW interventions, as implementing organisations have reported low uptake of VCCT among clients of EWs. HIV testing and condom promotion among partners and sweethearts of EW should be enhanced, as only 39.4% of low-risk EW who sell sex and 48.3% of high-risk EW who sell sex always used a condom with sweethearts in the past three months (NCHADS 2011). The proportion using condoms with husbands is even lower. The revised unit cost includes increased condom distribution based on need, rapid tests, and referral to STI services. Programme delivery should include these components as well as syndromic treatment of STIs for EW to minimise loss to follow up in STI treatment. To ensure EW who sell sex are accessing services, the enabling environment needs to be strengthened, especially among police, in health facilities, and in prisons.

3.4.2 Cost-effectiveness of interventions for EW who sell sex

The cost-effectiveness analysis of high risk EW interventions in Cambodia reveals that scale-up of interventions is very cost-effective, and has the potential to be cost-saving, meaning that the costs of preventing a new infection are smaller than those that would have to be paid if one had to provide long-term treatment. Interventions for EW who sell sex constitute a “best buy” solution for the HIV response in Cambodia.

The cost-effectiveness of high risk EW interventions in Cambodia is based on the following assumptions:

- Interventions target clients in addition to high risk EW (which results in a unit cost of USD 132 for a combined programme)
- The benefits of the programme are expressed in HIVA and DALYs and cover both population groups.

The marginal cost – the additional costs needed to increase coverage from 27,500 to 29,064 (corresponding to the 85% UA target) by 2017 - is given in Table 5. The total marginal cost (MC) over six years is USD

547,482.

The DALY assumptions are taken from studies on HIV health status that give similar values and best practice of cost-effectiveness analysis to the Cambodian context.¹⁰

Table 5. Discounted cost of scale up of EW who sell sex and client interventions 2012-17

EW who sell sex	2012	2013	2014	2015	2016	2017
Coverage (27,500)	27,750	28,000	28,000	28,209	28,600	29,064
Unit cost	132	132	132	132	132	132
Cost/year	3,663,000	3,696,000	3,696,000	3,723,588	3,775,200	3,836,448
MC/year	33,000	66,000	66,000	93,588	145,200	206,448
MC/discounted	33,000	64,020	62,040	85,165	127,776	175,481

The cost-effectiveness analysis of interventions for high risk EW shows that the net cost would be USD 144,018 (USD 547,482 minus USD 403,464 in saved ART costs¹¹) to increase coverage to reach an additional 1,314 EW who sell sex by 2017. If the high risk EW programme averts 102 HIV infections the programme would become cost-saving. Based on the first run of AEM in November 2011, the proposed EW intervention programme will avert 75-150 HIVA amongst high risk EW and their clients. The cost per DALY gained would be USD 134 based on 75 HIVA. If the upper limit of the HIVA range (150) was used, the proposed high risk EW interventions would become cost-savings and would result in a net financial gain of USD 259,447.

Table 6 shows results from a review of cost-effectiveness ratios (CER) of interventions for EW who sell sex in the region.

Table 6. Comparison of cost-effectiveness ratios of interventions on behalf of EW who sell sex in Cambodia and India

Intervention	MC/HIVA	MC/DALY	CER	Country and Source
FSW	USD (2011) 2640-saving	USD (2011) 134-savings		Cambodia (2011)*
	USD (2008) 105.5	USD (2008) 10.9		India (Prinja et al 2011)
	USD (2006) 984	USD (2006) 38		India (Dandona et al 2010)
	USD (2004) 59-98	USD (2004) 3.3-5.5		India (Fung et al 2007)

* Includes cost and benefits of client programme

¹⁰ The assumptions for DALY estimations are in Appendix 2.

¹¹ USD 403,464 is USD 5,379.53 (see Appendix 4) multiplied by 75 HIVA.

It is clear from Table 6, presenting the results of cost-effectiveness analyses from Cambodia and India, that interventions for high risk EW in these two countries are value for money. The prevalence rate of HIV is high among EW who sell sex, and even with a relatively high unit cost in Cambodia the programme will pay off if it successfully manages to avert 102 HIV infections. It is thought to be very likely that this level of HIVA can be reached given the relatively high prevalence rates: 4.1% (14 or less clients per week) and 14% (more than 14 clients per week)¹² and the relatively high condom use amongst EW (assuming that interventions are effective and are reaching high-risk EW). The higher prevalence rates the more you gain by effective prevention programs – and high(er) condom use amongst EW who sell sex increases program efficiency. The low use of VCCT amongst this group points to the need for strengthening provision of such services to achieve best value for money.

When compared to regional cost-effective analyses for high risk EW programmes, Cambodia's CER is relatively low, although favourable. However, unit costs in programmes for EW who sell sex in India are much lower and prevalence higher, while in Cambodia the cost-effectiveness analysis is for the scale up from 80% coverage to 85% coverage. This smaller interval of scale up to meet UA targets in Cambodia means that marginal costs are much higher.

3.5 MSM/TG costing and cost-effectiveness results

The cost-effectiveness analysis of interventions targeting MSM/TG in Cambodia suggests that scale-up of these interventions is not cost-effective because the unit cost of MSM/TG interventions in Cambodia is very high, while the number of infections averted is very small, as a result of their relatively small population size and the low HIV prevalence used to estimate the HIV infections averted in AEM (2.1%).¹³ The number of MSM including TG who can be reached with prevention interventions is estimated to be 21,327. Out of these, 6,184 (29%) are considered to be at high risk for HIV infection.¹⁴ In the latest projection and estimations on HIV and AIDS compiled by NCHADS new HIV infections among MSM (including TG) represent a very small proportion of the total of new infections in 2012-17 (Chhorvann and Vonthanak 2011).

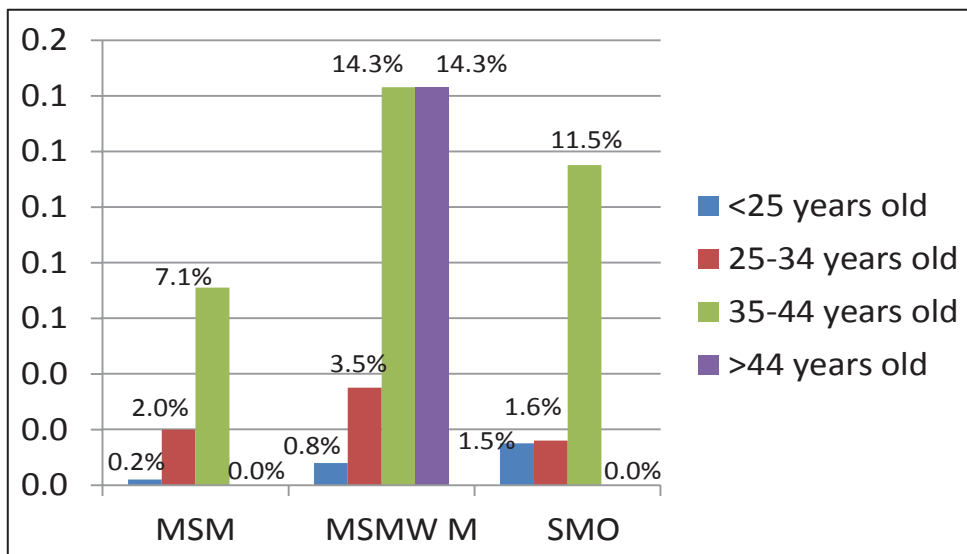
Figure 5 includes HIV prevalence rates for different age groups of men who have sex with women (MSW); men who have sex with men and women (MSMW), and men who have sex with men only (MSMO). In general the table illustrates that HIV prevalence among MSW is lower than among the other two categories. It also shows that prevalence rates among the youngest MSMW and MSMO are the lowest, which might explain why this group is estimated to have an insignificant impact on new HIV infections in the next five years provided that this trend continues.

¹² HSS 2010.

¹³ The source of this rate is the 2010 Bros Khmer Study. The 2005 SSS found an HIV prevalence among MSM of 2.6% in the three cities covered compared to the 9.8% among Transgender people. It should be noted however that the data collection methods in these two surveys was not identical making comparisons or assessment of trends difficult.

¹⁴ This figure was provided by the TWG on Prevention in November 2011.

Figure 5. HIV prevalence rates for MSM, MSMW, and MSMO by age group



Source: Bros Khmer 2010

These prevalence rates are from the recent Bros Khmer Study, which samples high-risk men at hotspot venues. The HIV prevalence rates in this study are similar to the 2.6% prevalence found among MSM by the 2005 SSS in three surveillance sites (Phnom Penh, Siem Reap and Battambang). The 2005 SSS found that in Phnom Penh TG had a higher HIV prevalence rate of 17%, compared to MSM whose prevalence was 5.1%. TGs are estimated at nearly 6,000 persons and the MSM population at 15,400 (21,400 total). Based on these numbers, member of the TWG decided there is a need to scale up TG interventions to reach 80% (approximately 4,800 persons) by 2015 (as the UA target). MSM interventions are targeted to reach 60% coverage (approximately 9,200 persons) by 2017 which reflects the differences in risk of infection for each group.

3.5.1 Costing analysis of MSM/TG prevention interventions

The revised unit cost for MSM is USD 142, which is greater than the USD 104 unit cost in the original NSP III costing but less than half of the unit cost from the NASA III (USD 300). The revised costs developed in this exercise are based on the current service delivery mode of outreach and DIC, with additional condoms that were costed based on need and best practices, and with rapid tests. FHI360 provided a budget for the costing exercise from one agency implementing the MStyle Programme in two locations. Between the two locations 1,856 MSM were covered, with the entire MStyle Programme covering 8,210 MSM. The budget includes costs of staffing, training, operational costs, and DIC costs. The MStyle programme provides 12 condoms per MSM per year. Based on best practice guidelines, five condoms per MSM per day were included in the costing.

Currently there are no specific services targeting TGs. TGs who are identified by MSM programming staff receive the same services as MSM. This is the reason why the unit cost is assumed to be the same for the two populations. To ensure that services are reaching the most-at-risk MSM, targeted programming should be aimed at TGs, including effective condom promotion and distribution, as this group has the highest HIV prevalence and its members the highest number of partners. TGs may be more expensive to reach than lower-risk MSM, but increased investment will pay off in DALYs saved and HIVA.

Specific services should also be developed for high-risk MSM who sell sex and inject drugs. Syndromic treatment of STIs and rapid HIV testing should be included in service delivery to minimise loss to follow up among this group. Testing and condom promotion among partners and clients of MSM and TGs needs

to be enhanced, in the Bros Khmer study 66% of MSM surveyed said they had used a condom the last time they had sex. Investments should be made to strengthen the enabling environment for MSM interventions to ensure that beneficiaries can and do access services easily.

As was the case for high risk EW interventions, NASA data shows that the amount that is spent on MSM/TG interventions is twice as high as the amount estimated in the revised costing. The reasons are probably the same. The spending includes many interventions that are not strictly in line with what the Commission on AIDS in Asia recommends as best practice prevention package for MSM/TG. Also, MSM/TG programs seem to be more generously staffed than similar programs in Bangladesh, Myanmar and Nepal.

Table 7. Comparison of unit costs of interventions for MSM and TG in countries using similar costing methodologies

HIV Intervention	Nepal 2010	Cambodia 2011	Bangladesh 2011	Myanmar 2010
MSM	56	142	67	84
TG/Hijras	N/A	142	142	84

The comparison given in Table 7 shows that the unit cost for interventions targeting MSM in Cambodia is much higher than that in other Asian countries using a comparable methodology. The unit cost for targeting the highest-risk group - TGs (labelled Hijras in Bangladesh) - is on par with that in Bangladesh but higher than that in Myanmar. In Cambodia, as already indicated, there are no interventions specifically targeting TGs and therefore the cost of these are assumed to be the same as those targeting MSM.

3.5.2 Cost-effectiveness of MSM interventions

Cost-effectiveness analysis of MSM interventions shows that scale-up of these programs is not cost-effective in the Cambodian context. The cost-effectiveness analysis is based on the following assumptions:

- The size of the population of MSM is 15,400 and that of TG 6,000 with a total of 21,400 and the population sizes do not change from 2012 to 2017
- Currently approximately 30% (5,250) MSM and 20% (1,222) TG are covered by interventions
- The unit cost of USD 142 for prevention interventions remains unchanged from 2012 to 2017

The newly published World Bank report entitled “The Global HIV Epidemics among Men Who Have Sex with Men” concludes that in order to reduce HIV infections among MSM, the promotion and distribution of condoms with lubricants is generally the most cost-effective use of resources (Beyrer et al 2011).

In Cambodia the total marginal cost (the cost of scaling up services) from 2012-2017 of increasing the coverage of MSM/TG to reach an extra 6540 MSM/TG is (discounted) USD 4,161,541. The cost estimations are presented in Table 8.

Table 8. Discounted cost of scale up of MSM and TG interventions 2012-17

MSM and TG	2012	2013	2014	2015	2016	2017
Coverage (6,200)	7,500	8,599	11,500	14,040	14,040	14,040
Unit cost	142	142	142	142	142	142
Cost/year	1,065,000	1,278,000	1,633,000	1,993,680	1,993,680	1,993,680
MC/year	184,600	340,658	752,600	1,113,280	1,113,280	1,113,280
MC/discounted	184,600	330,438	707,444	1,013,085	979,686	946,288

The assumptions for the DALY estimations are assumed to be identical to those for EW who sell sex.¹⁵

The outcome ranges resulting from the cost-effectiveness analysis of MSM/TG interventions show that these interventions are not cost-effective. The net costs for MSM/TG intervention scale up in Cambodia would be USD 3.9 or 4.0 million assuming 25 or 50 HIV infections, respectively, are averted and including the gains from the costs of ART that will be saved from these averted HIV infections.

The aim of averting 25-50 new HIV infections by investing an extra USD 3.9-4.0 million (net at 2012 prices) is an overly optimistic goal. The first run of AEM shows very little benefit from the projected investment to reach the 2015 UA targets for MSM/TG, because the costs of MSM/TG interventions are very high. This is mainly because of the very small numbers of MSM/TG in Cambodia, the low prevalence rate used in AEM (2.1%) and the prohibitively high unit cost of MSM prevention interventions.

The gross programme cost without including savings of ART of (discounted) USD 4.1 million over 2012-17 includes the provision of prevention services to an extra 6,540 MSM/TG per year starting in 2015 which is almost double the current coverage. The cost per new HIV infection averted is USD 77,851-161,082 and the cost per DALY is estimated at USD 6,445-13,335. A threshold analysis shows that for the programme to become cost-saving it will require that the investment yields 774 new HIV infections averted, which is an unrealistic target. In order to avert this number of new infections, the HIV prevalence rate in these groups would have to reach 10% or more, and/or the costs of MSM/TG prevention interventions would have to be significantly reduced.

This finding calls for a strategy that scales up interventions that target MSM and TG who are at the very highest risk of HIV infection. Such a strategy will gather the greatest impact and will require that service providers move away from a “one approach fits all” mode of operation. Reaching UA targets concerning MSM and TG definitely represents a challenge if the aim is to attain value for money. From an allocative efficiency point of view, the money in Cambodia is better spent on high risk EW and IDU prevention interventions.

Table 9 presents cost-effectiveness analyses from the region, and demonstrates that MSM/TG interventions in Cambodia are not cost effective. They have the lowest cost effectiveness ratio with cost per HIV infection averted (HIVA) many times higher than that found in other countries. Possible explanations for this were provided earlier. However, if the future MSM and TG program focus only on those with the highest risk, at the same time resolving unit costs with a focus on quality in the package delivered, the costs and cost-effectiveness will change and the program has the potential to become cost-effective.

¹⁵ See Appendix 2.

Table 9. Review of cost-effectiveness ratio of MSM/TG interventions in Cambodia and other Asian studies

Intervention	MC/HIVA	MC/DALY	CER	Country and Source
MSM	USD (2011) 77,851-16,1082	USD (2011) 6,445 - 13,335		Cambodia (2011)
	USD (2008) 1,592-1,497	N/A		Thailand (Beyrer et al 2011)
MSM/VCT	I\$ (2002) 14,197	I\$(2002) 695		China (Wang et al 2011)
	USD (2006) 232	USD (2006) 9		India (Dandona et al 2010)

3.6 IDU costing and cost-effectiveness results

In 2007 HIV prevalence amongst IDUs was 24.4%, representing the highest prevalence among all of the MARPs in Cambodia (NCHADS 2007). TWG participants estimated that presently there are approximately 1,900 IDUs in Cambodia. Of these 1,900, approximately 300 are covered by the Needle and Syringe Programme (NSP) and 107 by the Methadone Maintenance Treatment (MMT) programme.

Over the past year the MMT programme has been significantly scaled up. It is expected to provide services to 510 (former) IDUs by 2017, while the NSP programme will cover 1,010 IDU¹⁶. If the population of IDUs in Cambodia remains constant at 1,900 from 2012-17, IDU interventions will have reached 60% of all IDUs by 2015 and 80% by 2017. 60% coverage represents the epidemiological threshold to halt and decrease the HIV epidemic amongst IDUs and is considered feasible by TWG members.

During the period covered (2012-17), it is assumed that approximately two thirds of the total IDU population should be receiving benefits from NSP services (best practice for preventing new HIV infections and the cheapest) and one third should benefit from MMT services. This division of targeting operates under the assumption that no IDU uses both services at the same time, although this assumption fails to address IDUs who are in transition to non-use or who are relapsing and may be accessing both NSP and MMT services simultaneously. However, these proportions can be calibrated in the future.

3.6.1 Costing analyses of NSP and MMT

MMT Programme

The MMT Programme unit costs of USD 735 for 2012-13 and USD 393 after 2014 were calculated based on the current operation with only 105 patients. It is based on the current service delivery package with some added components - VCCT with rapid tests, STI treatment, and NSP for newly enrolled patients who do not give up injecting during the first 2 months.

For comparison, here are some results from the most recent study on the costing of the MMT Programme in Cambodia which was conducted by HLSP for HAARP (AusAid) in August 2011. The author came up

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¹⁶ Former IDU who received methadone treatment are presumed not to inject concurrently and therefore not to require sterile needles and syringes although in reality there may be such cases.

with five different scenarios for the unit cost:

1. USD 1,169 per patient per year = MMT clinic unit cost (107 patients)
2. USD 1,271 per patient per year = MMT clinic + technical assistance (TA)(107 patients)
3. USD 1,695 per patient per year = MMT clinic + TA + NGO referral cost (107 patients)
4. USD 876 per patient per year = MMT clinic + TA + NGO referral cost (250 patients)
5. USD 760 per patient per year = MMT clinic + TA + NGO referral cost (300 patients)

The new costing was developed for the NSP III revision based on the current MMT service delivery. Some components of the above mentioned unit costs were reduced by the cost of technical assistance, training, and transport costs (these cost components were reduced, not deleted from the calculations). Instead, as mentioned earlier, new components were introduced: VCT, STI, and NSP. It was also estimated that if the clinic operates at its full capacity (=250 MMT patients) the unit cost will go down to USD 393 per patient per year. For the purpose of costing the resources needed for the NSP III revision we assumed the higher unit cost for 2012-2013 and the (much) lower unit cost (when more patients are expected to be enrolled) for 2014-2017.

The high cost of MMT programme implementation is driven by the cost of staff and its capacity building (technical assistance + training) which all together represents 67% of the unit cost. With the scale-up and expansion of the MMT services, staff functions and involvement can be optimized, in addition to the TA and training, which can also significantly reduce the future unit cost.

NSP Programme

An average unit cost of providing NSP was developed based on data from two of the main providers of harm reduction in Cambodia: Korsang and MithSamlanh. Programme budgets were provided by Korsang and MithSamlanh. Korsang provided their scope of work for the Korsang Community MMT Support Project including project objectives, activities, work plan, and annual project budget for 2011. MithSamlanh provided a monthly expenditure report for their drug programme, which reflects current expenditure. The expenditure report contains information on spending in three categories: personnel, direct costs for beneficiaries and indirect programme costs. The expenditure report combined spending on both DUs and IDUs. In the costing we have used 100% of the IDU-specific costs, such as needles and syringes. Based on the current practice and clients coverage it was agreed with the MithSamlanh staff that only 10% of the managerial cost should be allocated to IDUs.

MithSamlanh is the single biggest provider licensed to deliver the complete NSP package in Cambodia. MithSamlanh operates its NSP through a combined program with a fixed location drop-in centre (DIC), and through outreach and mobile DICs for IDUs. Services offered to IDUs were discussed with programme managers, and DIC and outreach sites were visited. Staff salaries and operational costs were provided by MithSamlanh. Rapid VCCT tests are not currently offered but were included in costing based on best practice service delivery for IDUs. MithSamlanh provides services to both DUs and IDUs. Through discussion with programme staff it was determined that approximately 20% of operational costs and 10% of staff costs are spent on IDU service delivery. Referral to STI care and limited on-site STI treatment were included in costing based on discussions with staff physicians, who reported seeing 5-10 IDUs per month.

Data from Korsang's past NSP was reviewed to get the average IDU NSP unit cost.¹⁷ The NSP component was added to the unit cost estimation, as well as rapid testing, condoms, and STI treatment referrals.

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¹⁷ Korsang does not currently deliver NSP because it does not have a license.

The IDU NSP prevention package includes cost estimations for staff (including management cost), the operational cost of DICs and mobile clinics, needles and syringes (including hygiene kits), condoms, STI treatment and STI referral, rapid testing and referral to VCCT clinics, development of an enabling environment, and M&E. The staff costs are the largest cost component representing 53% of the Korsang's and 58% of MithSamlanh's NSP unit costs. The second largest component – needles, syringes, and safe injecting equipment – constitutes 19% of the NSP cost. Sufficient transportation was included in the costing for NSP as these organizations provide so-called “assisted referral” to make sure that the clients in their programmes actually reach the services they have been referred to.

Although the current cost of the implementation of IDU interventions is very high, changing the NSP service delivery mode can optimize the outcomes of the programme and reduce the unit cost. Needle and syringe exchange programme costs may be reduced to USD 177 per person per year (from average USD 205) if at least 20% of NSPs are implemented through pharmacies. Compared to the current service delivery mode (reaching clients through the combined Outreach and DIC approach) where the cost ranges from USD 117 (mainly DU-targeted interventions, Korsang) to USD 293 (IDU-targeted interventions, MithSamlanh) per IDU per year. Pharmacy-based service delivery will cost USD 62 per IDU per year.

Discussion and prioritization issues

The most recent data from the HAARP Cambodia progress report shows that in the first half of 2010 there were 941 IDUs reached by prevention interventions. When combined with the figures from the second half of 2010 – 867 IDUs, it gives an annual average of 904 IDUs reached. Not many details are available on the actual coverage of IDUs and the definition of the coverage is not clear in the report. It seems that an IDU is counted as covered if he/she receives any service (even just a consultation, without any condoms, NSP, etc.) once a quarter or once a semester.

A potential difficulty for prioritization and costing efforts is the overlap in programming for non-injecting DUs and IDUs. According to the HAARP Progress report, 5,162 and 4,003 DUs (the first and the second half of 2010 respectively) were reached by the programme. Assuming that the services delivered to DUs and to IDUs cost the same (even considering an NSP component for IDUs, DUs are assumed to access more services more often as they are less marginalized compared to IDUs), DUs had benefitted from almost 84% share of the HAARP harm reduction funds. From the perspective of the effectiveness of the HIV interventions for various MARPs, interventions among IDUs have much higher impact in averting HIV infections compared to DU-targeted services. Future programming aimed at IDUs in Cambodia needs to be targeted specifically at IDUs and programming data needs to be able to be disaggregated by different types of drug users to ensure accurate estimations for service delivery and cost estimations.

This point is further driven home by the recent NASA III showing that an average of USD 547 has been spent in 2010 on interventions for DUs and IDUs. The unit cost equals the total amount spent for DU/IDU (as spending is not disaggregated) under the category of “harm reduction” divided by the number of DUs and IDUs reached. The cost is extremely high and includes much more than interventions targeted at IDUs. This cost estimation will need to be discussed by the TWG because of the high costs of these interventions and how beneficial it is to cover non-injectors when they do not have a direct impact on averting new infections.

Discussions with stakeholders have helped with revising the cost of NSP interventions to an estimated USD 205 per user per year, which includes services delivered via a mix of outreach and drop-in-centres (DIC) as recommended by the Commission on AIDS in Asia (2008). The unit cost is assumed to remain constant from 2012 to 2017. The unit cost of MMT has been estimated at USD 735 for 2012-13 and at USD 393 for 2015-17.

Table 10. Comparison of unit costs of IDU interventions in countries using similar costing methodology

HIV Intervention	Nepal 2010	Cambodia 2012-2013/2014-2017	Bangladesh 2011	Myanmar 2010
IDU - NSP	147	205	183	206
IDU - MMT	335	735/393	464	298

The unit costs presented here are from recent cost estimations in Nepal, Bangladesh, and Myanmar. The unit costs were calculated by using the INPUT model and are based on the average costs borne by service providers for the delivery of these programmes (Alban, Hahn et al 2004). A comparison of the unit costs shows that Cambodia’s costs for NSP interventions per year per IDU are similar to those in Myanmar. Cambodia’s unit cost for MMT, from 2012-2013, of USD 735 is the highest in the region. It is twice the price of that in Myanmar and in Nepal.

The environmental and political contexts for IDU interventions present some concerns for the effectiveness of such programmes. Some police activities actively target IDUs and are counterproductive for carrying out effective HIV prevention amongst this marginalised and vulnerable population. These activities can significantly affect reaching IDUs with prevention interventions, which is problematic considering that one in four IDUs is HIV positive and that IDUs could potentially be the source of a new rise in the epidemic. Attitudes and activities of important public and private actors, including the police, prison officials, and others, need to be addressed to create an enabling environment where HIV prevention for IDUs can be facilitated rather than inhibited.

3.6.2 Cost-effectiveness of NSP and MMT

The cost-effectiveness analysis shows that the scale up of IDU interventions to cover an additional 950 IDU is very cost effective in Cambodia if 75–100 new HIV infections are averted. Furthermore, scale up can become cost-saving if 182 new HIV infections are averted.

The cost-effectiveness analysis of IDU interventions is based on the following assumptions:

- The total IDU population is estimated to be 1,900 in Cambodia and will remain stable over 2012-17.
- IDU prevention interventions are estimated to cover 570 IDU in 2012 and coverage will reach 1,520 IDU (80% of total in need) by 2017.
- The MMT programme will account for one third of IDU prevention interventions and the NSP programme will account for two thirds.
- The cost of providing a NSP intervention to one IDU per year is USD 205 from 2012-17.
- The cost per year for the provision of MMT to one IDU is USD 735 until 2014. From 2014 to 2017 it is estimated to drop to USD 393 as the programme is scaled up.

Based on these assumptions, if an additional 950 IDUs receive either NSP or MMT interventions, each DALY gained will cost USD 328-571.¹⁸ This is within a very cost-effective range. However, the cost-

¹⁸ The assumption for IDU DALY are included in Appendix 3. The assumptions build on similar studies for health status values and best practice in the field.

effectiveness could be further improved if the unit cost of MMT interventions would be reduced, which could be accomplished by enrolling more IDUs in MMT programmes to benefit from economies of scale. It could also be improved by opting for a mix consisting of 90% of IDU being targeted by the NSP programme and 10% by the MMT as the NSP unit costs are much lower than the MMT unit costs.

The cost of NSP could be further decreased, and the NSP cost-effectiveness ratio improved, if a larger share of sterile needles and syringes would be provided through pharmacies. If 20% of the total provision would occur via pharmacies and no longer through NGOs, costs could be significantly reduced. The delivery of sterile needle and syringes to one IDU through NGOs costs USD 205 per year while it costs only USD 62 through pharmacies.

A significant assumption made in this analysis is that NSP and MMT interventions are sufficiently effective to avert 75-100 new HIV infections from 2012-17. The first run of the AEM indicates that this is a realistic assumption. It will cost approximately USD 1.8 million over six years to extend intervention coverage to an extra 950 IDU by 2017. The extra cost of going to (80%) scale is below USD 1 million. The cost is reduced by a range of USD 403,464–537,953 if 75-100 new HIV infections are averted because each HIVA will save USD 5,380 (discounted) in prospective treatment costs for an average of 20 years.

If the value for unit cost is closer to the NASA III estimate for what is currently being spent on DU and IDU prevention in Cambodia (USD 547), the cost-effectiveness of these interventions would be substantially lower. Despite this lowered cost-effectiveness ratio, the unit cost value will remain cost effective up to USD 5,217 per DALY.¹⁹

Table 11 presents the results of cost-effectiveness studies on IDU interventions undertaken in several countries in the region. These studies are not comparable since they use different time frames (from 1 to 6 years) and do not all focus on the same set of interventions. Cambodia is the only study focusing on a mix of NSP and MMT interventions. Since the objective of the Vietnam study was to analyse the cost-effectiveness ratio of MMT to HIV positive (former) IDU it used Quality Adjusted Life Years (QALY) whereas the other studies used DALYs.

Table 11. Comparison of cost-effectiveness of IDU prevention interventions in Cambodia and other countries in the region

Intervention	MC/DALY	CER	Country and Source
NSP+MMT	USD (2011) 845-1261	6 years	Cambodia (2011)
MMT	USD (2009) 3550-QALY!	1 year	Vietnam (Tran et al 2011)
NSP	I\$ (2007) 57-82	6 years	China (Zhang et al 2011)
NSP	USD (2003) 81-207	3 years	Nepal (Alban et al 2008)
NSP	I\$ (2006) 411-867	3 years	Pakistan (Alban et al 2007)
NSP	I\$ (2002) 74	2 years	Bangladesh (Guinness et al 2006)

Note: thresholds for Cambodia are < I\$ 1769 = very cost-effective; < I\$ 5217 = cost-effective

¹⁹ See Appendix 4 for further explanations.

The light green colour for CER indicates that the results are very cost-effective using the WHO threshold criteria. The red colour indicates that the intervention is not cost-effective (exceeds three time the GDP per capita for Vietnam).

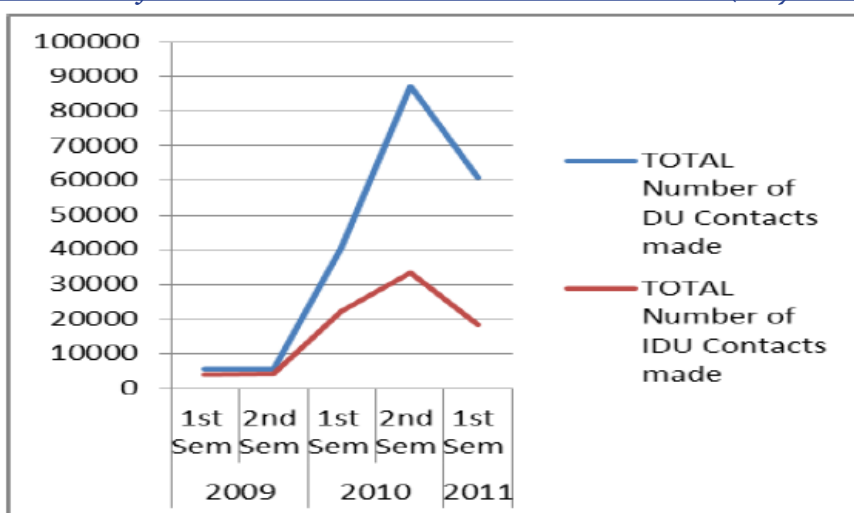
For a number of reasons a much better cost-effectiveness ratio (CER) was found in China than in Cambodia. First of all, in China the NSP programme benefits a much larger number of IDUs, and as a result many more DALYs are gained. Secondly, the unit cost of the NSP in China is very low compared to that in Cambodia and in other countries of the region. Thirdly, the costs saved for each HIV averted on what would have to be spent on treatment is much higher in China than that estimated in this exercise for Cambodia.

The cost-effectiveness analysis in Cambodia revealed that IDU interventions in this country would become cost-saving if 182 new HIV infections would be averted over the coming six years. This could be achieved by covering an additional 950 IDU with an effective mix of NSP and MMT services. If the unit cost of NSP is further reduced by providing sterile needles and syringes through pharmacies, the cost-saving threshold will decrease from 182 to 134 HIVA.

From the analysis of data from NASA III is clear that the resources being spent on IDUs and DUs cover interventions that go far beyond HIV prevention. Information collected by the HIV/AIDS Regional Programme (HAARP) suggests that among the programme beneficiaries in 2009-2010 only about 30-50% were IDUs. The remaining beneficiaries were DUs receiving services for general harm reduction.²⁰ This raises the question of whether more general harm reduction services should be financed by HIV funds or whether they should come from other financing sources.

Evidence collected by HAARP suggests that up to half of the resources allocated to prevent HIV among people who use drugs are spent on DU, despite the fact that the provision of sterile needles and syringes (an intervention targeted solely at IDUs) is the most effective way of preventing new HIV infections. The amount of time and funding dedicated to IDU-specific interventions in Cambodia is disproportionately low considering the evidence that IDU-specific interventions result in greater cost-effectiveness.

Figure 6 Number of contacts made with DU and IDU 2009-2011 (only 6 months for 2011)



Source: HAARP December 2011 (personal communication)

²⁰ The source of this information is a personal communication with HAARP staff in December 2011. The data concerns 2009 and the first 6 months only of 2010.

Targeting DUs and IDUs equally is not a cost-effective way of using limited HIV resources unless there is evidence that a very high percentage of DUs transition into IDUs in the absence of these interventions. There seems to be much room in this area for an improved prioritization of interventions targeted at IDUs. In particular, the NSP programme will need to be expanded and the enabling environment will need to be improved. This is by far the most cost-effective way to prevent HIV transmission among IDU and their partners.

3.7 Impact mitigation – costs and priority issues

The analysis of impact mitigation deviates significantly from the analyses of MARP interventions. No cost-effectiveness analyses could be carried out and the analyses are only informed by (rather limited) cost data. The lack of data made it difficult to carry out an analysis of technical efficiency and to answer the question of whether service delivery is actually covering the poorest and those with the highest need. The most prominent impact mitigation strategy in Cambodia is for Orphans and Vulnerable Children (OVC). This area has received much attention and a substantial amount of money over the past years has been spent on OVC support. According to NASA III, this area received USD 4.1 and 4.4 million in 2009 and 2010, respectively.

3.7.1 Needs for impact mitigation

A Study on the Socio-Economic Impact of HIV at the Household Level has recently been conducted (UN 2010a) including a macro-economic analysis (UN 2010b). This latter analysis delineated (separately) resources spent from 1993-2010 on health and on ART. Between 2003 and 2007, public health expenditure averaged 1.9% of GDP, while spending on HIV averaged 0.9%. This shows that spending on HIV is relatively large.

The socio-economic impact study demonstrated that families with one or more HIV-positive members generally had a lower income than other families, including families affected by other illnesses. AIDS widows were also poorer than other widows as a consequence of HIV. Children were impacted by HIV and AIDS in their families through decreased household consumption and decreased schooling. The recommendations from the study included introducing targeted HIV impact mitigation programmes where needed, a redefinition of the Home-Based Care (HBC) approach and increased coverage in areas that are not reached. To this list it is important to add increased partner testing and targeting of discordant couples with HIV prevention strategies (treatment as prevention).

We do not conclusively know what happens to these parents who have been disproportionately affected by HIV/AIDS in their children. In 2006 a study in Cambodia investigated a socio-economic group of people impacted severely by HIV and AIDS: parents of AIDS deceased or sick adult children (Knodel et al 2006). The study documented that 40% of deceased adult children were the main supporters of a parental household – a widespread phenomenon in low income countries without social protection systems. After the adult child had died, the parents experienced much economic and personal difficulty similar to that of AIDS widowers and widows. In the time available it has not been possible to identify any CBOs/NGOs targeting this group of AIDS affected people and it is unclear if the social protection policies allow for any special activities to cater for parents whose children have died from AIDS, and who have consequently often spent their savings and incurred debts to care for their child during illness. This group of affected people are potentially becoming less significant, since ART is provided free of charge, people live almost normal lives with HIV and are living much longer than before ART. Alternatively, this group of elder parents may receive support from the social protection system; this however, is unlikely in Cambodia where the new social protection strategy still has a limited coverage.

The socio-economic impact study recommends the HBC approach be changed into a program that is better suited to a context where there is widespread ART. In 2010 NCHADS disseminated a guide for a Positive Prevention Package (PPP)(NCHADS 2010) including the following components:

- Counselling and condom promotion
- Referral to STI prevention and case management
- Adherence to ART
- Reproductive health services including mother-and child activities
- TB screening and control.

The only component that is missing from a comprehensive HBC programme is palliative care. In principle the HBC activities include counselling and condom promotion, referrals to STI prevention, VCCT of partners, and TB screening and control. The quality and effectiveness of the HBC activities presently being implemented are not widely known. The expenditures on HBC activities according to NASA were nearly USD 2 million in 2009 and USD 1.5 million in 2010. This includes spending on palliative care for PLHIV which was about USD 0.4 million per year.²¹ In this costing exercise it is assumed that this amount of money will be used to meet PPP objectives. In NASA III positive prevention spending was estimated at less than USD 40,000 per year in 2009 and 2010. Other spending on impact mitigation was estimated at USD 3.5 million in 2009 and USD 4.3 million in 2010. These amounts excluded spending on OVC, HBC, palliative care and PPP and other support targeting PLHIV, such as food support, other in-kind or monetary support, income generation activities (IGA), legal support, and other social services.

3.7.2 Costs of impact mitigation

A draft report on resource needs of OVC services from November 2011 (ADB 2011) estimated the costs of various activities in Cambodia. These unit costs were reviewed and adjusted by the TWG in December 2011. The results are presented in Table 12. The highest proportion of 2012 costs for OVC activities are for food and nutrition support (USD 2.1 million), education support (USD 1.1 million) and psychological support (USD 0.55 million). The total costs are estimated at USD 4.8 million.

The unit costs and targets used in this exercise were discussed and agreed on within the National OVC Task Force and may differ from the ones suggested in the ADB resource needs study. For example IGA, which are not recommended to be included in best practice HIV impact mitigation packages by the Commission on AIDS in Asia (2008), were included on the recommendation of the TWG. They are meant to target only the poorest OVC households, once in 5 years. As recommended by the Commission more general development interventions, such as those aimed at reducing poverty, eliminating gender inequality and life-skills education, were not included in the costing because of they do not have a documented impact on the HIV epidemic.

²¹ It should be noted that NASA did not disaggregate in detail all the spending inside the “Treatment and Care” category, meaning that more HBC-related expenditure may be found in USD 3 million in 2009 and USD 5 million in 2010 in the .98 categories. This contains all the expenses that could not be disaggregated.

Table 12. Unit costs of OVC activities in Cambodia 2012-2017

Year	2012	2013	2014	2015	2016	2017
Estimated # OVC in need	34,400	33,712	33,038	32,650	32,650	32,650
Education, target	17,200	16,856	16,519	16,325	16,325	16,325
Education, unit cost	\$65	\$65	\$65	\$65	\$65	\$65
Education, total cost	\$1,118,000	\$1,095,640	\$1,073,735	\$1,061,125	\$1,061,125	\$1,061,125
Health, target	4,800	4,700	4,600	4,671	4,671	4,671
Health, unit cost	\$43	\$43	\$43	\$43	\$43	\$43
Health, total cost	\$206,400	\$202,100	\$197,800	\$200,853	\$200,853	\$200,853
Food and nutrition, target	19,952	18,514	16,519	15,672	15,672	15,672
Food and nutrition, unit cost	\$108	\$108	\$108	\$108	\$108	\$108
Food and nutrition, total cost	\$2,154,816	\$1,999,512	\$1,784,052	\$1,692,576	\$1,692,576	\$1,692,576
Psychosocial support, target	27,520	25,000	22,500	20,640	20,640	20,640
Psychosocial support, unit cost	\$20	\$20	\$20	\$20	\$20	\$20
Psychosocial support, total cost	\$550,400	\$500,000	\$450,000	\$412,800	\$412,800	\$412,800
Community-based care, target	1,725	1,725	1,380	774	774	774
Community-based care, unit cost	\$100	\$100	\$100	\$100	\$100	\$100
Community-based care, total cost	\$172,500	\$172,500	\$138,000	\$77,400	\$77,400	\$77,400
IGA, target	6,880	5,697	4,660	3,867	3,867	3,867
IGA, unit cost	\$80	\$80	\$80	\$80	\$80	\$80
IGA, total cost	\$550,400	\$455,760	\$372,800	\$309,360	\$309,360	\$309,360
OVC, total cost	\$4,752,516	\$4,425,512	\$4,016,387	\$3,754,114	\$3,754,114	\$3,754,114

Source: ADB 2011 with adjustments using estimations developed by the Futures Group in 2007²²

It has not been possible to identify published studies on OVC costs in the region. Therefore the unit costs of OVC services in Cambodia are compared with cost estimates provided in the report of the Commission. Unit costs were estimated differently by the Commission than in this exercise because the latter only distinguishes between cost per year for OVC (USD 100) and cost per lifetime for widows (USD 1,000). If we assess that OVC in Cambodia on average receive support for 10 years, the total expenditures for approximately 20,000 to 25,000 HIV affected families in need of support would be USD 40-45 million. This is approximately the same amount as has been estimated for Cambodia (USD 4.2 million per year) by the Commission, which means costs match the Asian average.

A rapid analysis of the relevance of OVC activities in Cambodia reveals that most of the service package includes highly relevant activities as documented by the recent resource need report for this field (ADB

²² See Appendix 5 for further information.

2011). The NSP 2012-15 calls for mainstreaming of most interventions into the national Social Protection Programme (SPP). IGA should therefore, in the future, not be featured as a cost of the OVC programme. Instead, referral to IGA organisations should be part of the SPP activities. TWG discussions have suggested that identification of poor households (ID Poor) be used as a mechanism to target the HIV affected households with the greatest need.

The key issue, both currently and in the future, is whether Cambodia is reaching the OVC in greatest need across all geographic areas. In principle only those children affected by AIDS (CABA) that reside in lower wealth quintile households, which cannot cope with AIDS related financial shocks, should receive priority targeting. According to the ADB study on OVC resource needs (ADB 2011), the number of CABAs falling below or hovering around the poverty line is unknown. Women and men in the highest wealth quintile had higher rates of HIV infection than those in other wealth quintiles (3:1). The higher prevalence amongst wealthier quintiles suggests that AIDS-affected households are not likely to be concentrated in the poorest quintiles. Unfortunately, due to lack of data, it has not been possible to determine the number of OVCs and/or allocated resources to the poorest OVCs, or the number of OVC living in areas with highest HIV prevalence. Such information could assist in assessing programme effectiveness and coverage of those most in need. The availability of such information will become even more important for future resource allocation and priority setting when funding shrinks. The good news is that a relatively high proportion of HIV infected persons are receiving ART in Cambodia, which will decrease future need for OVC services: parents live longer and the majority of them will be able to continue their work lives and provide for their families. Very little is known on the impact of ART on the need for OVC services – and the recent ADB report on resource needs does not consider the consequences of this development (ADB 2011).

In the transition from a relatively high level of resources for OVC and a relatively high level of coverage of adults on ART, the question arises: what will happen to OVC service provision if HIV funding is significantly reduced? The NOVCTF has started to facilitate a discussion on what Cambodia should do differently if only half of the funding currently available (approximately USD 4 million per year) is available in the future. The preliminary discussion on future priorities revealed the following suggestions that remain under debate:

- Shift from 'hand-out' types of support to sustainable livelihood generation activities
- Ensure HIV affected households in need are covered by mainstream social protection interventions that do not use HIV funding
- Ensure that HIV-related OVC or impact mitigation programmes focus on communes in urban/high-prevalence settings only
- Re-assess the target goals accordingly – (e.g. increase to 90% coverage)
- NCHADS has identified 23 hot spot Operational Districts (OD) to prioritise HIV services
- Use ID Poor Plus approach to prioritise the most vulnerable OVC and their households

This is an important step in a process of prioritization that needs to be undertaken to ensure an approach that targets the most vulnerable PLHIV who are in the greatest need of support. The results of this important prioritization process will become available in early 2012.

As can be gathered from Table 15 above, the weighted average unit cost to support one OVC household per year is USD 126. Total resources needed for the proposed OVC impact mitigation interventions from 2012-15 is USD 16.9 million, which is half the funding proposed under the original NSP III costing (USD 32.3 million). The difference in estimated costs is primarily due to the lower targets that have been used in the revised costing. Despite the fact that costs for impact mitigation are relatively high, targeting the most vulnerable HIV affected OVC in the 23 prioritized OD remains an option that can enhance cost-effectiveness. With a move from HIV-specific programmes to HIV-sensitive programmes, there needs to be

a focus on linking the most vulnerable HIV-affected households to existing social protection mechanisms and programmes, as well as using existing social service delivery schemes to support children and orphans made vulnerable by HIV.

4. Conclusions

The analyses of costs and cost-effectiveness of HIV prevention and impact mitigation interventions turned out to be a useful exercise. The results presented in this report provide important insights that can help decision-makers to prioritize interventions under NSP III that will avert the greatest number of new HIV infections and of AIDS-related deaths in a cost-effective manner. The work in national consultation meetings and in TWG sessions has helped to make progress towards a consensus amongst stakeholders on the priorities, based on comparative efficacy and cost-effectiveness of interventions. The new HIV estimates and projections and the results of the data triangulation and scenario building exercise focusing on the modes of transmission of HIV have proven invaluable for this work.

The three cost-effectiveness analyses of MARPs interventions demonstrate that new knowledge for intelligently calibrating the future of HIV prevention can be obtained from such a costing and cost-effectiveness analyses exercise. The results allow decision-makers to address technical, quality and allocative inefficiencies in service delivery and provide insights that can guide decision-makers to do the right things, right.

The results show that investments will need to be made to sustain and better target HIV prevention at key MARPs groups such as FSW/EW, MSM and IDU, as most new infections will occur among their members. However, the cost-effectiveness analyses show that such investments will have to be carefully calibrated to achieve the best possible results, in a context of decreasing HIV resources.

The outcome of the cost-effectiveness analysis of high risk EW prevention interventions shows that scaling up from 80% to 85% in 2012-17 is a very cost-effective option in Cambodia. It is a 'best buy' also, because the probability of the interventions becoming cost-saving is very high. However, more will need to be done to reach out to street- and hotel-based freelance EW who sell sex, who are at the highest risk of HIV infection. The analysis of the cost-effectiveness of scaling up IDU interventions to reach 1,520 individuals, with a mix of NSP and MMT, shows that these have good prospects of becoming successful and very cost-effective. Meanwhile, the analysis reveals that prevention interventions for MSM/TG are not cost-effective and unlikely to become so in the future, unless only those at the highest risk within the two groups are targeted.

The analyses show that the recommendations of Commission on AIDS in Asia have not been fully adopted in Cambodia. A relatively large share of interventions falls outside the MARPs-targeted intervention packages as defined by the Commission. This is why Cambodia has much higher unit cost compared to those of other countries in the region. Because of high unit costs the cost-effectiveness of MARPs prevention interventions is lower in Cambodia than that assessed in countries.

The analyses also point to a number of cross-cutting concerns. First of all, HIV testing across all MARPs groups remains too low. This is expected to change over the coming years with widespread implementation of rapid tests, which has been included in the revised costing of the three MARPs prevention intervention packages. In particular it is important to strengthen the focus on prevention among discordant couples. The lack of an effective partner and sweetheart (of MARPs) strategy has been identified as a major challenge that will need to be dealt with if the aim of zero new HIV infections is to be achieved. It should be noted that costs for these kinds of interventions have not been included in the resource needs estimates for the next six years. This is because a clear decision on whether these will need to be prioritised has yet

to be made.

In the next years it will be absolutely crucial to reach the most at risk of the most at risk of HIV infection. In particular, EW who sell sex and IDUs have to be targeted with appropriate HIV prevention services, as this will be most cost-effective. HIV prevention for MSM and TG will need to be focused to target only those at highest risk.

Targeting IDUs will only be a worthwhile option to avert new infections if the NSP and MMT programmes are improved and taken to larger scale. Currently, a major barrier to an effective implementation of NSP programmes for IDUs is the reluctance of relevant authorities to provide NSP licences to service providers. This means that the number of sterile needles distributed is largely insufficient for effective HIV prevention among IDUs. The lack of licenses is problematic also because MMT programmes which are instead being promoted are much more costly than NSP programmes. The village and commune safety policy has made it more difficult to reach out with HIV prevention to IDUs. Many of them prefer to avoid contact with service providers as they are worried of arrests or sanctions for their use of drugs.

The environment in which HIV prevention is conducted is clearly less enabling than it used to be in the past. The 2008 anti-trafficking legislation also continues to be an obstacle to effective implementation of HIV prevention amongst MARPs, this, together with the village and commune safety policy, has drastically reduced outreach activities and service coverage for MARPs. Further, prisons and correction centres are still not covered with relevant and appropriate HIV prevention (and AIDS treatment) interventions. This ignores the fact that in prisons all MARPs come together and same-sex sex and rape in prisons are reported all over Asia.

Overall, monitoring of MARP interventions does not use indicators that are relevant enough for the analysis of cost-effectiveness and the assessments of quality, efficiency and impact of programmes. Service providers are held more accountable for their spending than for their performance. This has two severe implications: the providers lose sight of their objective to prevent new HIV infections and the information that could have guided service improvements remains unavailable.

HIV prevention service quality remains a significant area for concern. Inconsistent quality and intervention relevance (e.g. DIC for MSM) impact on cost-effectiveness.

Assessing the cost-effectiveness of impact mitigation intervention has not been possible because of a lack of data. It also was not possible to assess if Cambodia is reaching the PLHIV and OVC that are in greatest need. Ensuring that these kinds of data will become available in the future and will effectively be used to assess cost-effectiveness and to guide resource allocation and priority setting is a critical priority.

The present analysis of impact mitigation interventions in Cambodia showed that expenditures on OVC support matched the Asia average. Cambodia's OVC support package corresponded to the one that was recommended by the Commission on AIDS in Asia (2008). This mainly consists of food and nutrition, education and psychosocial support. The very high proportion of PLHIV receiving ART in Cambodia is expected to decrease the future need for OVC services, because parents will live longer and many will be able to continue their lives as breadwinners. This is a positive development considering the need to find sustainable ways to mitigate the impact of HIV at the household level.

Presently, the impact of HIV is still largely mitigated by support for PLHIV through HBC services including palliative care, which are relatively costly. In the context of decreasing resources, this strategy will need to be replaced by a more cost-effective and sustainable approach. HBC services have already started to be turned into an effective Positive Prevention Package (PPP). The only HBC intervention not covered by the newly implemented PPP is palliative care, which will need its own strategy to supplement the ART

and PPP. HBC services are currently financed by GFATM SSS/HIV which finishes in 2014. At that time Cambodia will need to be ready with an effective impact mitigation approach that is much less costly.

In light of this future challenge, members of the NOVCTF recommended accelerating adoption and implementation of an AIDS-sensitive social protection approach. This measure will need to be taken to ensure that PLHIV and OVC meeting ID Poor eligibility criteria receive services and support that they need to satisfy their own needs and those of other members of their family.

5. Recommendations

Costing and cost-effectiveness analyses proved an effective tool to raise awareness among stakeholders on the need of evidence-based decision making and on ensuring better quality and value for money in the national response. Such instruments should continue to be used to select the mix of strategies that avert the greatest number of new HIV infections and AIDS related deaths. They help to prioritize interventions of the NSP III and make the best use of limited resources. They are also very useful to demonstrate programmatic and financial gaps and to improve fund raising efforts, making it more likely that new resources can be obtained.

This exercise will need to be complemented in the near future, by an assessment of costs and cost-effectiveness of interventions in the area of treatment and care. This will provide a comprehensive picture of priority needs across all interventions areas, to allow decision makers to ensure that all key areas requiring financing are covered.

In order to improve results of cost-effectiveness analyses, better coverage indicator data and population size estimations need to be produced. This means more will need to be invested in the strengthening of M&E and continuous quality assurance (CQA) systems, to monitor the coverage of interventions and to evaluate their performance and impact. Some of the routine monitoring indicators that presently are used are not useful for generating information on the effectiveness of specific interventions. For example, the number or percentage of “people reached by prevention interventions”, of “contacts” and of “services” do not provide enough information on whether these are the right contacts or the right services that will change behaviour and eventually avert HIV.

The results of the costing and cost-effectiveness analysis show that HIV prevention interventions among high risk EW should further be scaled up because of their high cost-effectiveness. These are the most cost-effective among all of the MARPs prevention interventions and will have to include a targeting of clients and partners including sweethearts. It is evident that in Cambodia more needs to be done to improve prevention strategies for partners and sweethearts of MARPs and for discordant couples in general. A lot more attention will, in the future, also need to be focused on expanding HIV prevention for freelance EW, who sell sex on the street or in hotels. This group is at much higher risk of infection than other categories of entertainment workers selling sex and among them a larger share practises multiple risk behaviours such as selling sex and using drugs. Scale up of prevention interventions for freelance sex workers is an imperative in the current context.

The low cost-effectiveness of MSM and TG prevention interventions found by this exercise are a key concern. This is due to the low HIV prevalence rate used in AEM which, together with the small population size estimate, results in only a very small number of new infections averted in this group in the coming years. To ascertain the validity of this result it is recommended to review the data inputted into AEM and to run the model again to estimate costs and evaluate cost-effectiveness of MSM/TG interventions. In any case it is recommended to target MSM/TG who are at highest risk of HIV infection and to better tailor interventions to these groups. A rigorous population size estimation and IBBS for MSM and TG is recommended, together with a review of the intervention package, quality, mode of delivery and audiences. Additionally, a dynamic mapping of urban venues needs to be conducted regularly, to inform targeting of the hardest to reach/highest risk MSM and TG.

With regard to IDUs, the first challenge is to ensure that the distribution of sterile needles and syringes in sufficient number to all those in need happens without obstacles. NSP interventions cost much less than MMT interventions and have proven much more effective. Consideration needs to be given to a mixed approach for NSP delivery (e.g. outreach, pharmacies and designated local health facilities). NSP will have to be taken to scale in Cambodia and this scale up of NSP interventions will reduce their unit cost and make them more cost-effective over time, so that they become more competitive on the regional level. It will also be necessary to ensure that funding and spending data for DU and IDUs are separated. This will help in ensuring that HIV funds will principally be invested in prevention programmes targeted at IDUs. There is no evidence showing that DU interventions have an impact on averting new HIV infections and therefore these are not cost-effective from an HIV perspective. The only exception are people who practise multiple high risk behaviours such as EW who sell sex and take drugs regularly and high-risk MSM/TG who use drugs. The EW and MSM prevention programmes should pay special attention to ensuring that such multiple risk taking people are covered by their targeted interventions.

The analyses have identified a number of cross-cutting issues that need to be addressed to enhance the cost-effectiveness and efficiency of service delivery for MARPs prevention. These include:

- MARPs prevention should only include activities that are recommended by the Commission on AIDS in Asia (2008) based on cost-effectiveness considerations
- MARPs HIV testing requires significant improvement in uptake, by enhancing the approach and quality of programmes
- Partner, spouse and sweetheart components of MARPs prevention interventions need strengthening and the discordant couple strategy has to be taken to larger scale
- HIV prevention, care and treatment in prisons need to be expanded.

In general, it will be critical to work to create a better enabling environment for MARPs prevention. The implementation of some laws and policies continues to hamper MARPs prevention interventions. This has negative effects on programme impact and on costs which will need to be addressed through the scaling up of the MARPS Community Partnership Initiative (MCPI). The MCPI will need to be rolled out to create an enabling environment, especially in all of the hot spots.

Interventions in the area of mitigation will become more cost-effective once the recommendations of the Commission on AIDS in Asia are applied. This will help decrease the funding required to meet targets in this area of intervention. Also, the need for OVC support is expected to decrease significantly due to parents living longer and being able to take care of their children. In the future, the needs of PLHIV and AIDS affected OVC will increasingly be addressed through national social protection programmes whose implementation will improve over time. Direct support to meet the needs of these groups through HIV funding is therefore expected to reduce over time. HBC services, which originally were conceived as support to very sick persons in their homes, are presently being transformed into positive prevention services. This is a positive development, which will also help to mainstream HIV into sexual and reproductive health and mother- and child health services. Palliative care will need to be delivered as part of the continuum of care.

While the cost of impact mitigation interventions correspond to the regional average and to those estimated by the Commission of AIDS in Asia, the cost of MARPs prevention interventions is far higher in Cambodia than in other countries of the region. This discrepancy is clearly reflected in the NASA III spending assessment and will need to be explored more in depth to better understand why interventions in Cambodia are so costly. Based on the analyses conducted so far, it seems that the higher MARPs prevention costs are largely due to inclusion of activities which are not strictly speaking helping to avert new HIV infections, in the interventions package. These activities may be very useful but they should not be paid for by HIV funds. For instance, DU harm reduction programmes should be financed by resources other

than HIV funds, for example mental health or drug treatment programmes. If instead they are financed and implemented in an integrated fashion together with IDU interventions, the cost-effectiveness of these latter programmes will be very low. This is because of the high cost of DU interventions paired with their very low impact on averting new HIV infections.

The cost-effectiveness analyses whose results are presented in this report are the first attempt in Cambodia to examine both performance and costs of key interventions. Cost-effectiveness analyses like this one are important analytical tools to ascertain what are 'best buys' and alternatively what is not worthwhile investing in. Equity objectives often compete with efficiency; for example, for specific interventions it may not be cost-effective to achieve UA of all those in need, limited resources may be better used to improve the quality of services. This trade-off between equity and efficiency requires that choices are made. Cost-effectiveness analyses can help to make these choices based on information on opportunity costs in the form of benefits forgone.

It is important that the methodology and tools used for costing and cost-effectiveness analyses and especially their underlying assumptions are clearly understood and critically reviewed by stakeholders. In this case a number of technical issues have emerged from the analyses:

- The results of the cost-effectiveness analyses for MSM/TG will need to be verified by running AEM again, with better calibrated data inputs into the model.
- HIV infections averted due to different MARPs prevention interventions were projected with the AEM. Whether this model or another model should be used for this purpose in the future will need to be discussed.
- Population size estimates will need to be improved as well as coverage and performance indicators.
- It remains problematic that AEM for IDUs dictates a much higher number of IDUs in Cambodia than the number suggested by service providers.
- AEM should be run again once better population size estimates, prevalence and programme coverage data become available and the costing and cost-effectiveness analyses updated.

On impact mitigation, studies are needed to determine the magnitude and geographic location of those most in need of OVC services. A study to investigate if parents of very sick or deceased adult children, who have provided main support to their household and/or who have lost their savings trying to support their adult child, are sufficiently covered by social protection programmes needs to be undertaken. This will provide knowledge on the size of the problem and what needs to be done to mitigate it.

Looking to the future, Cambodia has been selected as a pilot country for the improved investment framework approach to HIV and AIDS. The improved investment approach aims to improve efficiencies and support the better management of the national and international HIV response. To move towards a sustainable HIV response, it is recommended that Cambodia develops a fiscal management plan, which manages an increase in domestic spending as a share of total spending on HIV and AIDS as external resources decline over time. This exercise should be seen as an important milestone in the process to develop an improved investment approach, which guarantees predictable and sustained financing for priority interventions that avert the most new infections and AIDS related deaths in the national response.

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Appendix 1. Terms of Reference



Concept Note and Road Map

Establishing Prioritization within NSP III to meet Universal Access and Political Declaration Targets

I. Background:

Cambodia's National Strategic Plan for a Comprehensive and Multisectoral Response to HIV/AIDS (2011-2015) (NSP III) has been developed in 2010 on the basis of a new Situation and Response Analysis (SRA). The comprehensive plan has been costed and will be used as a foundation for strategic operational planning and for resource mobilization including through the Global Fund to Fight AIDS, TB and Malaria (GFATM).

The NSP III aims to guide the efforts of all stakeholders who are involved with the national response to the epidemic in view of achieving zero new infections, zero AIDS deaths and zero discrimination. It seeks to achieve this ambitious goal through the promotion of universal access (UA) to prevention and to care and treatment of all those in need.

Cambodia's UA indicators and targets need to be revised to reflect the Political Declaration on HIV/AIDS adopted in June 2011 at the General Assembly of the United Nations (UN). In the light of this resolution partners are compelled to revisit the NSP III as well to establish priority interventions that in a cost-effective manner can help averting the greatest number of new HIV infections and of AIDS-related deaths.

Proposed consensus building efforts in quarter 3 and 4 of this year will allow to make meaningful progress toward the aims of getting to zero new infections and to zero AIDS-related deaths through the delivery of treatment to all those who need care. Consensus will need to be reached among different stakeholders based on evidence that shows the comparative efficacy and cost-effectiveness of interventions. Only a truly transparent, inclusive and technically sound process can ensure that widespread consensus and ownership will be created and can translate into concrete action through successful mobilization of resources and coherently concerted actions.

On the basis of the priorities identified in the NSP III, technical assistance needs will need to be determined as well as technical assistance providers and recipients, delivery mechanisms and timelines and included in the Technical Support Plan (2012-2015). The plan will also need to be costed and include an M&E framework.

II. Objectives:

The main objective of this initiative is to reach agreement among all relevant stakeholders on the strategic mix of interventions that are required to achieve universal access targets by 2013 and 2015.

III. Activities:

Four main activities will help attaining the above-mentioned objective:

1. Select universal access indicators and targets in line with Political Declaration and NSP III indicators
 - 1.1 Hold national consultation to review progress made against 2010 UA targets and to discuss the selection of a new set of UA indicators and targets for 2013 and 2015 in line with NSP III indicators and 2011 Political Declaration.
 - 1.2 Review and refine UA indicators and targets in M&E and GDJ TWGs and in national consultation meetings.
 - 1.3 Present UA indicators and targets to NAA's Technical and Policy Boards for formal endorsement and approval.
 - 1.4 Use UA indicators and 2013 and 2015 targets as starting point for NSP III prioritization.
2. Review NSP III to determine the most critical interventions that need to be prioritized in 2012-2017
 - 2.1 Review and compile strategic information and data from different sources and prepare working documents and presentations to facilitate cost-effectiveness analysis and prioritization work in consultation and TWG meetings.
 - 2.2 Hold national consultation meeting to present and discuss new UA indicators and targets and to introduce NSP III prioritization exercise and cost-effectiveness analysis.
 - 2.3 Hold national TWG meetings to deepen cost-effectiveness analyses and further refine NSP III prioritization.
3. Undertake programme and financial gap analysis and costing of interventions for GFATM Round 12
 - 3.1 Costprioritised interventions by sector and by year for the next 6 years (2012-2017).
 - 3.2 Conduct gap and cost-effectiveness analysis and priority setting for inclusion in GFATM Round 12 proposal.
 - 3.3 Cost priority interventions to be included in Round 12 proposal.
4. Production of programme documents and reports
 - 4.1 Compile results of cost-effectiveness analysis and prioritization in report and programmatic documents.
 - 4.2 Commission translation and layout of documents produced.
 - 4.3 Print and disseminate documents produced in Khmer and in English.
5. Development of a costed Technical Support Plan (2012-2015)
 - 5.1. Development of Technical Support Plan including an M&E framework.
 - 5.2. Costing the Technical Support Plan 2012-2015.
 - 5.3. Print and disseminate the document as part of the NSP III.

IV. Expected outcomes:

The expected outcomes of this assignment include as follows:

1. A report on progress against 2010 UA targets.

2. A list of new UA indicators and targets for 2013 and 2015 that are aligned with Political Declaration.
3. An agreed set of costed priority interventions and specific costed priority interventions to be included in GFATM Round 12 proposal.
4. A report with the results of cost-effectiveness analysis, prioritization and costing as well as of gap analysis for Round 12.
5. A costed Technical Support Plan (2012-2015) including an M&E framework.

V. Supervision and technical assistance:

The NAA will lead and coordinate the process with support from the UNAIDS Country Office. Consultants will be contracted to assist the NAA with the cost-effectiveness analysis and with the costing of interventions and plans.

VI. Timeframe:

This initiative will last from September to December 2011.

Appendix 2. Cost-effectiveness analysis assumptions for high-risk EW, MSM & TG interventions

Assumptions for the cost-effectiveness analysis of scaling up high risk EW (including clients) and MSM interventions:

- The cost-effectiveness model includes two scenarios for EW who sell sex: The benefit of scaling up over 6 years is 1) 50 or 2) 100 HIVA.
- The cost-effectiveness model includes two scenarios for clients of EW: The benefit of scaling up over 6 years is 1) 25 or 2) 50 HIVA.
- The cost-effectiveness model includes two scenarios for MSM: The benefit of scaling up over 6 years is 1) 25 or 2) 50 HIVA.
- The benefits measured in HIVA (and then translated to DALYs) are based on the results of the modelling led by NCHADS in November 2011 which used the Asia Epidemic Model (AEM). The AEM model will need to be run again as the MSM data that was inputted requires better calibration (e.g., HIV prevalence).

General Comments

*The model operates with two ART scenarios: HIV+ persons being targeted by the interventions are either

1) receiving ART (80%) or 2) not (20%)

*Cost of the provision of ART to EW and MSM is not included in this model - it is part of the treatment budget

*Costs included for extra coverage of EW and MSM interventions to reach UA targets are built on the costs that were revised under this initiative in December 2011.

Item	Assumed value	Notes
Age on onset (EWs who sell sex, their clients and MSM)	25	CAM studies to revise this?
Age of death - w/o ART	36	
Age of death - w ART	45	
Discount rate	0.03	DALYs to present value
Age weight	0.04	Not used in this CE round
Disability weight (HIV) included in DALY	0.233	Used by Fung et al
<u>Duration of HIV disability</u>		
w/o ART	9	
w ART	18	
Disability weight (AIDS) included in DALY	0.505	
<u>Duration of AIDS disability</u>		
w/o ART	2	
w ART	2	

Sources: Fung et al 2007, Fox-Ruxby and Hansson 2001

Appendix 3. Cost -effectiveness analysis assumptions for IDU interventions

Assumptions for the cost-effectiveness analysis of scaling up IDU interventions including NSP and MMT programmes:

- Generally it is assumed that reaching 80% of 2,000 IDUs by 2017, meaning 1,520 individuals, will significantly decrease the trajectory of the epidemic.
- The number of IDUs receiving NSP is expected to be 1,010 and the number receiving MMT to be 510 by 2017.
- The cost-effectiveness model analyses two scenarios to generate a range of cost-effectiveness ratios: 1) 75 HIV averted and 2) 100 HIV averted
- The benefits measured in HIVA (and then translated to DALYs) are based on the results of the modelling led by NCHADS in November 2011, which used the Asia Epidemic Model (AEM). These will need revisions as the population sizes are likely to be overestimated.

General Comments:

*The model operates with two ART scenarios: HIV+ persons being targeted by the interventions are either

1) receiving ART (80%) or 2) not (20%)

*As a consequence of ART provision, the survival rates and DALYs lost to HIV infection will be different

*The cost of provision of ART to IDUs is not included in this model - costs for ART are part of the treatment budget

*Costs are included for scaling interventions 14-80% to reach UA coverage targets for IDU (NSP and MMT) and are built on recent MTT costing (December 2011)

Item	Assumed value	Notes
Age on onset (IDU)	28	CAM studies to revise this?
Age of death - w/o ART	39	
Age of death - w ART	48	
Discount rate	0.03	DALYs to present value
Age weight	0.04	Not used in this CE round
Disability weight (HIV) included in DALY	0.233	Used by Fung et al
<u>Duration of HIV disability</u>		
w/o ART	9	Might be less for IDUs w hepatitis
w ART	18	Might be less for IDUs w hepatitis
Disability weight (AIDS) included in DALY	0.505	Might be less for IDUs w hepatitis
<u>Duration of AIDS disability</u>		
w/o ART	2	Might be less for IDUs w hepatitis
w ART	2	Might be less for IDUs w hepatitis

Appendix 4. Saved costs from ART provision

Saved costs of 1 HIVA over 20 years (present value 2012)

The information provided below are the assumptions used to estimate savings on ART every time one HIV infection is averted for use in the cost-effectiveness analyses of EWs who sell sex, MSM/TG, and IDU interventions.

No.	Components and issues	Value	Unit cost USD	Costs USD	Discounted USD	Comments
A	80% of PLHIV receive ART	0.80				
B	Discount rate	0.03				
1	HIV+ no interventions	2.00	0	0	0	
2	Pre-ART monitoring years	2.00	64.85	129.7	120.20	2011 AN
3	ART 1 line, years	8.00	232	1,856	1,480.55	2011 AN
4	ART 2 line, years	8.00	824	6,592	4,121.32	2011 AN
5	OI, years (OP and IP)	5.00	55	275	164.00	Alban 2007
6	Adherence support	16.00	35	560	398.41	Clinic. and social programme
7	Proportion of programme	0.07			439.91	Coordination, training etc.
Total cost 2011 (80%)					5,379.53	Discounted to 2011

Threshold analysis ART	USD saved on ART
25 HIVA	134,488
50 HIVA	268,976
75 HIVA	403,464
100 HIVA	537,953
150 HIVA	806,929

Appendix 5. Revision of the costing of NSP III 2012-2015

1. INPUT model for the costing

The UNAIDS-recommended INPUT model was used to cost HIV interventions for Most-at-Risk Populations (MARPs), including entertainment workers (EWs) who sell sex, men who have sex with men and transgender people (MSM and TG) and injecting drug users (IDUs); impact mitigation interventions for children made vulnerable by HIV/AIDS were costed as well. The INPUT model is an application used for costing assessments; it generates local data on unit costs for strategic considerations and planning purposes. The INPUT model involves identifying target populations and estimating population size, assessing programme coverage, and costing appropriate interventions based on current programme implementation and international best practice. Further information on the INPUT model can be found in Alban, Hahn et al 2004.

2. Process of the revision of NSP III costing

Population size estimates for MARPs are crucial for estimating current programme coverage and future targets for programme scale up. Population sizes were discussed in technical working group (TWG) meetings with service providers and experts in HIV/AIDS. The Prevention TWG came to the consensus that there are approximately 42,000 EWs who sell sex in Cambodia, including sex workers at venues such as karaoke bars, beer gardens, massage parlours, beer promoters, in addition to street-based or freelance sex workers. However, the official figure from NCHADS Q1 of 2009 is 34,193 SWs, which is the number that has been recommended for use in the cost analyses. In the past, female sex workers were mostly brothel-based, and estimating the population size of this group was relatively straightforward. Since implementation of the 2008 Law on Suppression of Human Trafficking, brothels have been closed and sex workers have dispersed to work in a number of different venues, mostly entertainment establishments, which complicates obtaining accurate population estimations.

Due to the uncertainty of the population size estimation it is also difficult to estimate the proportion of high-risk (more than 2 clients per day) and low risk (less than two clients per day) EW since many of those at high-risk were not reached with the research sample. However, since no other data is available, these estimates are used in the cost-effectiveness analysis and in the Asian Epidemic Model (AEM).

Service providers working with MSM met in a TWG to come to consensus about the population size estimation for this group. The TWG members agreed with the national estimate of approximately 21,400 MSM as mapped by KHANA and FHI in 2009. The number of transgender was estimated to be 28% of the total MSM population based on the recent Bros Khmer study and the service providers' experience with this group.

The Prevention TWG discussed the population size estimate of IDUs in Cambodia and came to consensus that the national figure of 1,900 IDUs (NCHADS 2007) is the best estimate available.

In order to cost Impact Mitigation interventions, the number of households with OVC receiving a package of minimum support needed to be estimated. In the 2010 Universal Access Report, HACC reported that 58,138 OVC households received the minimum support package in 2010. The 2010 Socioeconomic Im-