Thailand Country Development Partnership in Health (CDP-Health)

Component 1: Improving the Effectiveness of Thailand's HIV Response

"Revitalising HIV prevention in Thailand : a critical assessment" Final report

WORLD









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Component 1: Improving the Effectiveness of Thailand's HIV Response

Sub-component of

"Revitalising HIV prevention in Thailand" a critical assessment"

Final report

Collaborative works by International Health Policy Program (IHPP) Health Intervention and Technology Assessment Program (HITAP) Disease Control Department, Ministry of Public Health and Faculty of Public Health, Khon Kaen University THAILAND

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of

"Revitalising HIV prevention in Thailand: a critical assessment"

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Note: This report is one piece among three main components on HIV/AIDS, Healthcare Financing and Human Resource for Health under the Country Development Partnership in Health (CDP-Health) which was jointly signed by Thai MOPH and the World Bank.

International Health Policy Program (IHPP) has been assigned to be a focal point to work on CDP-Health.

EXECUTIVE SUMMARY

Background

The Thailand Government policy of universal access to Anti-retroviral therapy (ART), which was adopted in 2003, has seen a huge proportion of HIV program resources go to treatment. This resulted in reduced share of funding for prevention and mitigation interventions. Implementation of 100% condom use program has been successful in reducing HIV infections among venue based sex workers. However, infections among non-venue based sex workers have increased. The dynamic sex behaviour among the population requires country specific evidence on effective and cost effective interventions. Such interventions affect knowledge and attitudes and influence psychological and social correlates of risk to HIV in different population groups. Among high risk groups such as MSM, IDUs and female sex workers, there is a need for effective interventions and evidence based program re-orientation.

Objectives

The objective of this study is to systematically assess the coverage of cost effective HIV prevention interventions as well as the coverage of interventions proven to be ineffective and non cost effective in nine population risk groups. These are: (a) female sex workers (FSW), (b) men who have sex with men (MSM), (c) injecting drug users (IDUs), (d) sero-discordant couples, (e) pregnant women, (f) prison inmates, (g) healthcare workers, (h) young people and (i) general population. This information is vital for strengthening, scaling up or maintaining high coverage of proven effective and cost effective interventions and curtailing the ineffective and non-cost effective interventions.

Methods

We applied the evidence on effectiveness and cost effectiveness of HIV prevention interventions by Teerawattananon et al in chapter 3 which is categorized into four main groups: (1) interventions proven both effective and cost-effective, (2) interventions proven effective but without evidence on cost effectiveness, (3) interventions proven effective but not cost effective, and (4) interventions proven neither effective nor cost effective. Effectiveness and cost effectiveness of these interventions are specific for the nine different population groups. In the matrix of interventions, the most recent coverage rates were retrieved from reviews of relevant documents, published and unpublished grey literature in the Ministry of Public

Health, and other small programs/pilots. In-depth interviews of key informants were conducted where coverage data does not exist for the best expert estimates. Investment in different prevention interventions referred to various estimates in the National AIDS Spending Assessment.

Results

Based on a matrix of 25 prevention interventions in 4 clusters, nine tables, one for each of the nine population groups were produced. The table is a matrix of 4 levels of evidence on the effectiveness and cost effectiveness of interventions using the "traffic light colour" system and three stages of implementation: [a] no policy and interventions; [b] interventions exist but no coverage data; and [c] interventions exist with coverage data.

A conceptual approach of interpretation of mismatches of intervention was developed. Mismatches are defined as [1] interventions proven effective and cost effective but there is neither policy nor program implementation, and [2] interventions proven ineffective and not cost effective but there is program implementation.

Our critical assessment identified seven mismatches in [1]. Two interventions require further evidence on applicability, and acceptability to guide policy and programmatic designs. These are: [i] female condoms for FSWs where operational research to test acceptability and program feasibility in the Thai context is needed; and [ii] male circumcision in newborns needs to generate evidence on public acceptability in the Thai context. Two interventions require immediate policy actions: [i] free distribution of condoms to MSM and IDUs; and [ii] needle social marketing for IDUs. Three interventions require attention: [i] provider initiated counselling and testing (PICT) offered to pregnant women; [ii] abstinence plus in young people; and [iii] microfinance policies that are not applicable for the Thai settings, but microfinance combined with education which has been proved to be effective.

One mismatch was identified in [2] post exposure prophylaxis (PEP) for healthcare workers is neither effective nor cost effective and should be terminated. However, this is politically not easy on the grounds of occupational safety. It is recommended to keep it as the incidence of occupational injuries and their financial implications to the government are low. PEP should be modified towards a comprehensive prevention package.

The matches are [3] interventions proven effective and cost effective are being implemented and [4] interventions proven ineffective and not cost effective are not implemented.

Interventions under [3] should be strengthened and/or sustain the high performance. These include free condom distribution to female sex workers, methadone substitution treatment in public clinics, VCT and PMTCT for pregnant women, screening of HIV antigens, antibodies and others in all donated blood, and an increase in alcohol tax which has an indirect impact on vulnerability to HIV infections. Note that interventions under [4] must not be initiated.

Discussion and policy recommendations

Sero-sentinel reports of high prevalence in three population groups, female sex workers, MSM and IDUs, require priority attention. Evidence from the Behaviour Surveillance Survey indicates that young people are emerging as a new priority due to their vulnerability to HIV infection.

Inmates are the most vulnerable and socially disadvantaged group, often with repeated imprisonment, especially cases dealing with drugs. They are often IDUs with TB and HIV co-infections. As a captive population, there is a great opportunity to introduce and continue effective interventions in prisons and beyond when they are released back to society. Policy makers may consider offering an integrated package such as distribution of condoms, VCT services, provision of ART and TB treatment, and ensuring continued service beyond prisons after being released back to society.

Inadequate capacity to treat sexually transmitted infections (STIs) was identified as a major programmatic bottleneck resulting in a resurgence trend of STI incidence. This requires a major review of the STI program.

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ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ART	Anti-retroviral Therapy
ARV	Anti-retrovirals
ASO	AIDS-response Standard Organization
BATS	Bureau of AIDS, TB and STIs Department of Diseases Control,
	Ministry of Public Health
BOD	Burden of Disease
BSS	Behavioural Surveillance Surveys
CDP	Country Development Partnership
CSMBS	Civil Servant Medical Benefit Scheme
DALY	Disability Adjusted Life Year
FDA	Food and Drug Administration
FSW	Female Sex Workers
GDP	Gross Domestic Products
GPA	Gel Particle Agglutination
GF	Global Fund
GF RCC	Global Fund: Rolling Continuation Channel
Нер В-С	Hepatitis B and C
HIV	Human Immunodeficiency Virus
ICD	International Classification of Diseases
IDU	Injecting Drug User
IHPP	International Health Policy Program
IP	In-patient
KI	Key Informant
MOE	Ministry of Education
MOPH	Ministry of Public Health
MSM	Men who have Sex with Men
MTCT	Mother To Child Transmission
NASA	National AIDS Spending Assessment
NAT	Nucleic Acid Test
NHSO	National Health Security Office
NSBS	National Sexual Behaviour Survey
NGO	Non-Governmental Organisation
OP	Out-patient

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OOP	Out - of - pocket
PATH	Program for Appropriate Technology in Health
PEP	Post Exposure Prophylaxis
PEPFAR	The US President's Emergency Plan for AIDS Relief
PICT	Provider Initiated Counselling and Testing
PLHA	People Living with HIV/AIDS
PMTCT	Prevention of Mother to Child Transmission
PubMed	A service of the U.S. National Library of Medicine and the
	National Institutes of Health
RCTs	Randomised Controlled Trials
SDC	Sero- Discordant Couples
SR	Sub Recipients
SSO	Social Security Office
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
SW	Sex Workers
ТВ	Tuberculosis
TB-HIV	Tuberculosis and Human Immunodeficiency Virus
TEA	Total Expenditure on HIV/AIDS
TUC-MSM	Thailand MOPH - U.S. CDC Collaboration on MSM Project
TRUST	Toluidine Red Unheated Serum Test
UNAIDS	The Joint United Nations Programme on HIV/AIDS
UNFPA	United Nations Population Fund
UNGASS	United Nations General Assembly Special Session
US CDC	United States Center for Disease Control and Prevention
VCT	Voluntary Counselling Testing
WHO	World Health Organization

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CHAPTER 1

Revitalizing HIV Prevention in Thailand

Chapter 1 provides the background and rationale for revitalizing HIV prevention in Thailand and outlines the objectives and conceptual framework. Finally, it describes the structure of subsequent chapters.

1. Thailand's HIV/AIDS epidemic

Data compiled from the 2007 HIV infection surveillance system concludes that the present epidemic dynamic has evolved from a generalized to a combined generalized and concentrated epidemic. The trend of HIV prevalence in military conscripts and clients of antenatal care (ANC) clinics reached a peak at 3.40% and 2.29% in 1995 and 1992 respectively, and reduced to a plateau of 0.40% and 0.84% in 2007 and 2006 respectively [UNGASSS Thailand country report 2008].

The increasing trend of HIV prevalence in ANC clients at second and third pregnancies indicates that infections are spreading more deeply in families in general, and may remain at relatively high levels going forward.

For other groups, HIV prevalence has declined with the notable exception of IDUs and MSM. Data from ad hoc studies indicates linkages of infection among the most-at-risk populations including sex workers (SWs), MSM, and IDUs.

There is a continued downward trend of HIV prevalence in female sex workers and male sex workers at STI clinics, excluding Bangkok where the prevalence in male STI clinic clients has not declined. Despite the decline of HIV among IDUs in the North, overall prevalence remains high, with increasing trends in Bangkok and the central region.

Regional epidemic trends are most improved in the North, and lagging behind in the South.

1

The PMTCT policy and its implementation with high coverage could obviously reduce infections in children. In 2003, vertical transmission was at 6.4% before declining to 1.0% in 2006.

Estimates from the computer modelling software were applied to Thailand in 2000 (the Asian Epidemic Model - AEM). The HIV epidemiological database was updated in 2005. When controlling for the level of prevention efforts it was found that in 2007 the number of new infections was estimated at 13,936. This number is projected to decline to 10,097 in 2011. The total cumulative number of PLHA is expected to decline from 546,578 in 2007 to 481,770 in 2011.

Based on the above estimates (2007-2011), the proportion of new infections by population group and risk behaviour revealed that new infections in women infected by their husbands or sexual partners, and in MSM, are higher than through other routes of transmission.

This prompts two policy interventions: (a) identification and prevention of infections among discordant couples and (b) better effective interventions for MSM and IDUs.

2. Expenditure on HIV/AIDS

IHPP and its partner agencies in the BATS-MOPH, National Economic and Social Development Board, National Health Security Office, and NGOs estimated the total expenditure on HIV/AIDS, for 2007 as part of the UNGASS 2008 report.

Table 1.1: Bac	kground data on	healthcare	financing,	Thailand 200	7
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	2007
Population	64,197,000
THE / capita, Baht	3,876
THE/ capita, US\$	115

In 2007, Thailand spent 3,876 Baht per capita, or US\$ 115 per capita (exchange rate 33.7 Baht per US\$), on healthcare, see Table 1.1.

Table 1.2: Total AIDS expenditure, 2007

	2007
Total AIDS expenditure, Baht	6,728,020,682
Forecast Total Health Expenditure, (THE) Baht	248,852,400,000
Total AIDS expenditure 2007, as	
 per capita population, Baht 	105
 per capita PLHA, Baht 	11,600
• % GDP	0.08%
• % THE	2.7%

In 2007, total expenditure on HIV/AIDS was 6.728 billion Thai Baht. This is equivalent to 105 Baht per capita Thai population, or 11,600 Baht per capital PLHA (given the total number of 580,000 PLHA). Total expenditure on HIV/AIDS accounted for 0.08% of GDP in 2007, or equivalent to 2.7% of Total Health Expenditure as shown in Table 1.2.

Type of expenditure/Source of Finance	Total	%	Domestic	%	International	%
1. Prevention Sub-total	949,855,219	14.1	490,291,815	7.3	459,563,404	6.8
2. Care and Treatment	4,830,371,045	71.8	4,523,505,501	67.2	306,865,544	4.6
3. Orphans and Vulnerable Children	101,296,773	1.5	91,780,000	1.4	9,516,773	0.1
4. Program Management Administration Strengthening	655,446,352	9.7	337,516,200	5.0	317,930,152	4.7
5. Incentive Human Resources	89,696,764	1.3	29,870,051	0.4	59,826,713	0.9
 Social protection and social services excluding Orphans and vulnerable Children 	3,326,045	0.0	-	0.0	3,326,045	0.0
7. Enabling Environment and community Development	51,050,284	0.8	45,293,000	0.7	5,757,284	0.1
8. Research excluding operational research	46,978,200	0.7	45,630,600	0.7	1,347,600	0.0
Total	6,728,020,682	100.0	5,563,887,167	82.7	1,164,133,515	17.3

Table 1.3: Total expenditure on AIDS (TEA) by sources and functions, 2007

In 2007, domestic public financing amounted to 82.7% of TEA, whereas international financing constituted 17.3% of TEA. This finding indicates better self-reliance on HIV/AIDS program financing, and the Royal Thai Government's firm commitment to the Program.

In light of universal access to ART which was adopted by the Government in 2003, a lion share of TEA went to care and treatment (71.8%). Of this amount, ARVs and treatment for OI accounted for 92%. This was followed by HIV prevention at 14.1%, and program administration at 9.7%. See summaries in Table 1.3, and detailed expenditures across 8 large items in Table 1.4. A large share of expenditure on care and treatment would continue for some years, or would increase as a result of an introducing the more expensive 2nd line ART regimens when the first line failed. Approximately 10% per annum failed from the first line regimen.

	Category of healthcare function	Baht	Percent
1. Pr	evention Sub-total	949,855,219	14.1%
1.1	Mass media	6,322,000	1%
1.2	Community mobilization	10,691,291	
1.3	Voluntary Counselling and Testing	185,240,000	20%
1.4	Program for Vulnerable and special Populations	115,147,373	12%
1.5	Youth in school	46,370,545	5%
1.6	Youth out of school	89,460,554	
1.7	Prevention Program for PLHA	3,764,561	0%
1.8	Programs for sex workers and their clients	9,248,564	1%
1.9	Programs for MSM	8,149,570	1%
1.10	Harm Reduction Programs for IDU	17,268,414	2%
1.11	Workplace activities	16,611,941	2%
1.12	Condom social marketing	20,220,000	
1.13	Public and Commercial sector condom provision	65,021,724	7%
1.14	Female condom	-	
1.15	Microbicides	-	
1.16	Improving management of STIs	2,465,000	0%
1.17	Prevention of mother-to-child transmission	119,348,682	13%
1.18	Blood safety	-	
1.19	Post-exposure prophylaxis	-	
1.20	Safe medical injections	-	
1.21	Male Circumcision	-	

Table 1.4: Total Expenditure on HIV/AIDS, by detail healthcare functions, 2007

	Category of healthcare function	Baht	Percent
1.22	Universal Precautions	-	
1.99	Others / Not-elsewhere Classified	234,525,000	25%
2. Ca	are and Treatment (Sub-Total)	4,830,371,045	71.8%
2.1	Outpatient care	-	
2.2	Provider initiate testing	-	
2.3	Opportunistic Infection (OI) Prophylaxis	3,441,282	0%
2.4	Antiretroviral therapy	3,155,178,114	65%
2.5	Nutritional Support	61,440,000	1%
2.6	Specific HIV Laboratory monitoring	134,583,187	3%
2.7	Dental Care	-	
2.8	Psychological care	4,342,136	
2.9	Palliative Care	-	
2.10	Home-based Care	12,975,848	
2.11	Additional / Informal provider	30,832,197	
2.12	In-patient Care	-	
2.13	Opportunistic Infection (OI) Treatment	1,283,171,998	27%
2.99	Others / Not-elsewhere Classified	144,406,283	3%
3. O	rphans and Vulnerable Children	101,296,773	1.5%
3.1	Education	-	
3.2	Basic health care	2,947,661	
3.3	Family / Home support	-	
3.4	Community Support	6,569,112	
3.5	Administrative Cost	-	
3.99	Others / Not-elsewhere Classified	91,780,000	
4. Pr	ogram Management Administration Strengthening	655,446,352	9.7%
4.1	Programme Management	368,954,802	
4.2	Planning and coordination	1,454,522	
4.3	Monitoring and Evaluation	50,910,637	
4.4	Operation Research	139,875,965	
4.5	Sero-Surveillance	6,750,000	
4.6	HIV drug- resistance surveillance	-	
4.7	Drug Supply systems	-	
4.8	Information technology	1,174,679	
4.9	Supervision of Personnel	-	
4.10	Upgrading Laboratory infrastructure	80,112,604	
4.11	Construction of new Health centres	-	
4.99	Others / Not-elsewhere Classified	6,213,143	
5. In	centive Human Resources (Sub-total)	89,696,764	1.3%
5.1	Monetary incentive for physicians	-	
5.2	Monetary incentive for nurses	-	
5.3	Monetary incentive for other staffs	-	

	Category of healthcare function	Baht	Percent
5.4	Formative education and build-up of an AIDS Workforce	5,671,000	
5.5	Training	28,443,408	
5.99	Others / Not-elsewhere Classified	55,582,356	
6. S	ocial protection and social services excluding	3,326,045	0.05%
Οι	rphans and vulnerable Children(sub-total)		
6.1	Monetary Benefits	-	
6.2	In-Kind Benefits	-	
6.3	Social services	-	
6.4	Income generation	3,326,045	
6.99	Others / Not-elsewhere Classified	-	
7. Er	abling Environment and community Development	51,050,284	0.8%
7.1	Advocacy and Strategic Communication	2,680,927	
7.2	Human Rights	3,250,000	
7.3	AIDS-specific institutional development	5,119,357	
7.4	AIDS - specific program involving woman	-	
7.99	Others / Not-elsewhere Classified	40,000,000	
8. Re	esearch excluding operational research (sub-total)) 46,978,200	0.7%
8.1	Biomedical Research	28,561,700	
8.2	Clinical Research	17,068,900	
8.3	Epidemiological Research	-	
8.4	Social science research	-	
8.5	Behavioural research	1,347,600	
8.6	Research in economics	-	
8.7	Research capacity strengthening	-	
8.8	Vaccine related research	-	
8.99	Others / Not-elsewhere Classified	-	
	GRAND TOTAL	6,728,020,682	100%

3. Revitalizing HIV prevention

In the context of universal access to HIV treatment, a large part of the expenditure on AIDS goes to ART and OIs leaving a small amount for prevention. It is therefore important to identify and assess the main weaknesses in the HIV prevention program, and develop strategies and investment to revitalize and improve HIV prevention efforts in order to reduce the number of new infections.

To achieve this, the International Health Policy Program, jointly with other partners, drafted the Terms of Reference (TOR). The TOR was discussed with the World Bank team consisting of Dr David Wilson, Dr Toomas Palu, and Dr Sutayut Osornprasop in late 2007 and early 2008 through several

rounds via teleconference and email exchanges. It was finalized according to the objectives agreed upon by the World Bank and IHPP.

3.1 Objectives

- The objectives were: to assess the changing trends of HIV risk behaviour across population groups
- to identify the strengths and deficiencies of HIV prevention and ensure effective policy dialogue with the National AIDS Committee
- to reorient prevention efforts
- to provide policy recommendations on how to sustain the strengths and minimize programmatic deficiencies

3.2 Conceptual framework



Package C

Figure 1.1: Conceptual framework of the study

3.3 Terms of reference of this study

To achieve the goal of revitalizing HIV prevention, the following work is proposed:

CHAPTER 2

Chapter 2 reviews and updates HIV epidemiological profiles, trends and changes in risk behaviour across different population groups. This involved a survey of the knowledge, attitude, practices and risk behaviours of these groups through the National Behavioural Surveillance System [NBSS]¹ shown in Table 1.5. This survey also covered IDUs and MSM and was as executed by Dr Wongsa Laohasiriwong. The IDUs and MSM survey tools applied a comprehensive and comparable behavioural questionnaire.

The data pool was male and female students from Grades 8 and 11 and factory workers in the 21-49 years bracket. This made it possible to look at changing sexual and risk behaviours among young adolescents over the past 12 years. A primary survey of IDUs and MSM will provide additional information for this group.

Table 1.5: National Behavioral Surveillance System, population coverage by rounds

Round	Survey dates	Pregnancies	Conscript 21 year men	Male female factor workers 15-29 yr.	General pop, male and female 15-49	Grade 11 male and female students	Grade 8 male and female students	Sex workers	Vocational schools male and female students
1	1995	Х	Х	Х					
2-9	1996-2003	Х	Х	Х		Х			
10-	2004 to date	Х	Х		Х	Х	Х	Х	Х

Source: synthesis from MOPH Bureau of Epidemiology <u>http://203.157.15.12/</u> <u>centeraids/bss.php</u> retrieved 19 March 2008

Sentinel sites cover 24 provinces

- o Central: 8 provinces including Nonthaburi, Pathumtani, Lopburi, Nakorn Nayok, Chacherngsao, Trad, Ratchaburi, Samut Songkram.
- o North: 6 provinces including Chiangrai, Lampoon, Tak, Sukhothai, Phrae, Phitsanulok.
- o Northeast: 6 provinces: Korat, Buriram, Srisaket, Ubon Ratchatani, Udon Tani, Sakhon Nakorn.
- o South: 4 provinces including Surat Thani, Pang Nga, Trang and Songkhla.

¹ The first round of HIV Behavioural Sentinel Survey was initiated by the MOPH in 1995, and has been sustained to date. The sentinel applied an annual repeated (every June) self administered questionnaire survey in 24 sentinel provinces covering population groups and expanding to cover more target groups in the 10th round in 2004.

Expected outcomes of chapter 2 are:-

- 1. A better understanding of the trends of HIV risk and risk protection behaviours across population groups, including young adolescents,
- 2. Identification of risk groups including MSM and IDUs

CHAPTER 3

Chapter 3 reviews both global and Thai specific experiences of cost effective HIV/AIDS prevention interventions. It recommends a comprehensive list of preventive interventions that are likely to be effective and costeffective in the Thai health systems context. The list includes interventions that are currently available in Thailand as well as new ones that have not been tried before.

Special attention will be paid to identifying information gaps at the national and international levels on the effectiveness and/or cost-effectiveness of HIV/AIDS prevention in general. This will cover specific population groups such as IDUs, MSM, school children and/or teenagers.

Expected outcomes of chapter 3 are:-

- 1. A list of preventive interventions that are neither effective nor cost ineffective
- 2. A list of effective or cost effective preventive interventions

CHAPTER 4

The purpose of chapter 4 is to assess the nature of the current HIV/AIDS programmatic activities. The assessment will include coverage of target population groups (4c), effective coverage of interventions (4b), level of financial investment (from all sources: government, local governments and donors) in these activities (4a), and help to identify programmatic strengths and deficiencies.

When comparing results of the TOR with others, two types of mismatches were identified, mismatches in target population (4e) and in preventive interventions (4d).

- We compared the current target population with the emerging target population as recommended in chapter 2, and were able to identify the gaps in target population (4e).
- The current coverage of prevention interventions, when compared with interventions categorized by effectiveness or cost effectiveness, led to the identification of mismatches of program interventions (4d). See Figure 1.2.

Current coverage	Effective interventions and/or Cost effective interventions				
	Yes	Νο			
High	A. Sustain high coverage of these interventions	B. Discourage and scale down these interventions			
Low	C. Identification of demand and supply side bottle necks, rapid scale up of these interventions	D. Keep vigilance, not to initiate these interventions in prevention programs			

Figure 1.2: Assessment of effectiveness and/or cost effectiveness of prevention interventions

High coverage of cost effective interventions should be sustained (Box A). Interventions which are cost effective but ineffective in coverage should be reviewed to identify demand and supply bottle necks, and prioritize actions to scale them up. See Box C.

Interventions classified in Box B should be discouraged and scaled down as they are not cost effective.

Findings from the various activities will provide the basis of consultations with key stakeholders (4f) such as the National AIDS Committee, government sectors, and non-government organizations. The stakeholder consultations would ensure ownership of the findings and translate evidence into policy decisions and reorientation of the HIV prevention program.

Expected outcomes of chapter 4 are:-

- 1. The identification of mismatches, strengths and deficiencies of prevention interventions.
- 2. Policy recommendations on which programs should be maintained, scaling up or down.

CHAPTER 2

Trends of sex behaviour in Thailand: General and specific population subgroups

1. Review of HIV epidemics

The HIV epidemic in Thailand is relatively young, though quite mature, in comparison to the epidemics in Africa, Western Europe and North America. However, it is spreading very rapidly and has moved well beyond the initial high-risk populations into the general population¹⁻⁴. The first case of AIDS in Thailand was reported in 1984⁵ in a 28 year old bisexual male who had just returned from the United States. Progressive numbers of AIDS cases as well as asymptomatic HIV infections were reported over subsequent years. There have been more than 311,000 AIDS cases reported to the Ministry of Public Health (MOPH) since the epidemic began in Thailand⁶. Early cases were generally confined to homosexual males returning from abroad and members of the extensive network of gay bars and male prostitutes serving foreign men.

This was followed by an explosive spread of HIV infection among IDUs in 1988 and 1989⁷⁻⁸. HIV seroprevalence increased rapidly in this group, from about 1% in late 1987 to over 40% by August 1988 in some areas. National HIV seroprevalence surveys of IDUs since 1989 remain consistently high, with prevalence rates of 30-50% throughout the country⁴.

During the same period, another epidemic erupted among female sex workers (FSWs) in brothels throughout the country. Visits to FSWs were common and a somewhat socially acceptable practice among Thai men^{9, 10} which led to a rapid spread of HIV infections. As a result, heterosexual transmission has become the most important driver of HIV epidemics in Thailand^{4, 6}.

Soon after the epidemic spread among FSWs and their clients, infections started to be seen in low risk women. Data from the national HIV sero-surveillance shows that the HIV/AIDS epidemic in the general female population began in 1991. HIV prevalence increased from 0% in December 1990 to 1.78% in June 1994 among women attending antenatal clinics, a surrogate group for all women and the general population. HIV prevalence peaked at 2.29% in June 1995 before it declined to 0.8% in June 2007⁴.

Thailand's rapid government response in the 1990s helped to control the spread of the epidemic. However, complacency in prevention was observed from the mid 2000s when the government introduced universal access to anti-retroviral treatments (ART) which consumed most of the AIDS program budget.

As the focus has shifted from prevention there has been an increase in HIV incidence among pregnant women, army conscripts, direct and indirect female sex workers¹¹.

In a situation where most of the country's HIV resources are spent on treatment, there is a need to revitalize prevention efforts. The Royal Thai Government and the World Bank, through the Country Development Partnership, are taking a hard look at HIV prevention in order to strengthen the national response.

2. Intelligence on HIV dynamics

Thailand has made some progress in generating evidence to inform policy decisions on key public health problems.

The annual sero-sentinel surveillance has become a routine activity with a dedicated budget and staff in all provinces. This activity is conducted in June of each year. Evidence is gathered informs both the decision making and reporting of the Provincial Health Offices, the Bureau of Epidemiology of the Disease Control Department, and other stakeholders.

In addition, a National Behavioural Surveillance Systems (NBSS) annual survey employs a self-administered questionnaire in all provinces. Provincial Health Offices facilitate data collection, entry, analysis, and use for policy decisions at the local level.

1. National Behavioural Surveillance System (NBSS)

The NBSS applies a serial cross-sectional annual survey as its principal surveillance method. Each year, the respondents are selected from the same dynamic population (male and female students studying in Grades 8 and 11 and 2nd year vocational school students, female sex workers, male and female factory workers ages between 15-59 years).

Each sentinel population has different sampling strategies and data collection methods. The Bureau of Epidemiology recommends the data collection methods for each population are as follows:

Students

In general, two stage sampling is recommended for students. In the first stage, 10 schools are selected with the simple random sampling method. In each selected school, one classroom is selected at a time. Data is then collected from all students in the selected classroom until the pre-determined number of respondents for each school are reached.

PalmTM, a small handheld computer, is used for data collection through a self-administered process.

Female sex workers

A one-stage sampling technique is recommended for this population. A sex establishment is selected one at a time from a list of known sex establishments in each province, using simple random sampling. All female sex workers in the selected sex establishment are asked to participate in both the HIV sero-surveillance and HIV-related behavioural surveillance. If the number of respondents does not meet the number required in each round of surveillance, another sex establishment is selected until the sample size for each province is saturated. A self-administered questionnaire is used for data collection.

Factory workers

The sampling strategy and data collection method for factory workers is the same as that of the female sex worker population.

Note that in the NBSS, it is not possible to identify two other risk groups, namely IDUs and MSM in the samples. HIV prevalence among this group is so high that an additional survey is required.

2. National Sexual Behaviours Survey of Thailand 2006 (NSBS 2006)

The third national representative household survey on risk behaviour and ART knowledge was conducted in 2006. The purpose was to gather information related to knowledge and attitudes about HIV/AIDS, exposure to HIV/AIDS information, knowledge and attitudes about antiretroviral treatments, stigma and discrimination, sexuality and sexual behaviour, drug use, and voluntary counselling.

The sample was stratified into three residence categories (Bangkok, other urban areas, and rural areas), gender, and two age groups (18-24 and 25-59 years old).

Data was collected in Bangkok and 14 provinces out of 75 provinces in Thailand). Within each stratum (residential categories, gender and age groups) a sample size of 504 was identified.

In Bangkok, 63 election districts were randomly selected from the list of all election districts in Bangkok available from the civil registration. For each election district, four households were systematically sampled from the list, one household per one age/sex category. The selected households were the starting point of the data collection for one age/sex category. At the selected household, the interviewer listed all household members separately by sex and age groups, selected an eligible respondent in the appropriate age/sex category assigned to the household and interviewed the respondent. After the first randomly selected household, interviewers proceeded to the housing unit on the immediate left of the original household and repeated the process of listing all household members and selecting an eligible respondent to be interviewed. The process continued until eight respondents in that age/sex category were reached. Supervisors checked the progress to ensure no overlapping of households took place. If the selected respondents were not at home, an appointment to return for an interview was made.

In other provinces, the sampling strategy for each stratum was multi-stage. In the first stage, 14 provinces from the 75 provinces were randomly selected, using the probability proportional to population size.

For the 14 provincial urban areas, four election districts were randomly selected. For each district, the same method of sampling households and individuals were used. However, within each of the four age/sex categories, nine respondents were sampled for an interview.

For the 14 rural areas, two districts and then two sub-districts were randomly selected with the application of probability proportional to population size. Within each of the two sub-districts, three villages were randomly selected with probability proportional to the size of the population, the total number of villages selected was 168. For each village, households were systematically selected from the list of households. In each village, three respondents from each of the age/sex categories were interviewed. The total number of respondents in each village was 12.

Information was collected from a total of <u>6,048 respondents</u> using face-toface interviews. Female interviewers were responsible for interviewing female respondents and male interviewers for male respondents. Overall, response rates were between 71% (among male aged 25 - 59 years old) to 90% (among male aged 18 - 24 years old).

3. Objectives

The general objectives are to assess the trend of knowledge on HIV/AIDS, sex and other risk behaviours in the different population sub-groups and in two risk groups: MSM and IDUs.

Specific objectives

- 1. To use data from the NBSS to analyze the following:
 - 1.1. The trend of knowledge on HIV/AIDS among population sub-groups
 - 1.2. The trend of sex behaviour and other risk behaviour by population sub-groups and at the sub-national level
- 2. To conduct a parallel analysis as the BSS dataset, where data allows.
- 3. To assess the following in the two risk groups, MSM and IDUs.
 - 3.1. Risk behaviours leading to HIV infection
 - 3.2. The adequacy of existing HIV prevention interventions

4. Methodologies

Two main approaches were utilized:

- Using existing NBSS data from 1996 to 2007; trends among different sub-population groups were analyzed. Mahidol University Institute of Population and Social Research conducted a parallel analysis of the National Sexual Behaviour Survey (NSBS) data of 2006. Primary surveys of MSM and IDUs
- 2. As there are no secondary datasets, the researchers decided to conduct a primary survey among MSM and IDUs. Surveys of both groups were conducted during the months of March to July 2008.

2.1 MSM

MSM are a special group which seldom expresses their identity publicly. They are mostly open to their own group or to those they trust. Therefore, it is extremely difficult to identify a sampling frame for MSM and there are no name lists for systematic sampling. The study aimed to select the sample which includes MSM who were not younger than 15 years old, from all socio economic backgrounds in order to reflect the overall MSM population. Data was collected in 4 regions of Thailand. One province was selected from each region. The sampled provinces were Chonburi, Chiang Mai, Khon Kaen, and Surat Thani. A <u>sample size of 639</u> was calculated by estimating the population proportion (unknown population). The sample was allocated to each province randomly. In order to select samples which represent the general population of MSM in each province, the snowball technique was used.

The sampling process was as follows:

Researchers started by contacting persons who identified and contacted MSM in different groups including workers, staff in entertainment businesses, students, government officials and ordinary people. The interviewers were trained by the researchers who closely monitored the quality of the interviews. All question naires were checked for completeness and validity before data processing.

After the interviews were completed, the MSM participants were asked to identify other MSM they know. The MSM identified were approached and asked for an interview. They were in turn asked to introduce other MSM for the next interviews until enough samples were obtained.

During the process, the appropriate distribution of MSM participants (samples) across ages and socio economic status was ensured.

2.2 IDUs

IDUs are generally difficult to identify and contact due to stigma and legal issues. Some IDUs live in communities where they are under rehabilitation through drug dependence treatment centers, while others are confined in prisons. Therefore, we could not apply normal sampling techniques. As with MSM, the snowball technique was applied.

Focal points started from the staff in treatment institutions where the IDUs received services. These institutions included public treatment facilities such as drug dependence treatment clinics at hospitals. These were: Jana Hospital of Songkla, Drug Dependence Treatment Centers in Khon Kaen, Chiang Mai, Mae Hong Son, Songkla, Pattani and Thanyarak Institute in Pathumtani. Private services institutions such as Ban Ozone, Ban Pakjai and the IDU network were also involved. After contacting the focal points and explaining about this research, data were collected by trained interviewers with the supervision of the researchers. Participants were identified and encouraged by their IDU peers to join the research.

Data was collected from the <u>444 IDU samples</u> calculated by estimating population proportion (unknown population) and by randomly allocating a sample size to each province. Samples were distributed appropriately across the institutions, age and socioeco nomic groups to ensure the data was reliable.

5. Findings

Part I: Risk and sexual behaviors survey from the National Behavioral Surveillance System (NBSS)

1. Low knowledge of HIV prevention

Knowledge among the Thai population about HIV prevention when using the 5 UNGASS HIV prevention knowledge questions was low. Female sex workers were the only population group with more than 50% of respondents able to answer all five questions about prevention in the UNGASS HIV prevention knowledge questionnaire correctly.

The proportion of respondents who were able to answer all 5 UNGASS HIV prevention knowledge questions correctly declined in 2004 in almost every population sub-group except FSWs. The proportion of respondents who were able to answer all 5 UNGASS HIV prevention knowledge questions correctly among Grades 8 and 11 and second year vocational school students was very low.

The reduction in proportion of respondents who were able to answer all 5 UNGASS HIV prevention knowledge questions correctly was observed in all regions. There was no region that had consistent low proportions of respondents who were able to answer all 5 UNGASS HIV prevention knowledge questions correctly as shown in Figure 2.1.



Figure 2.1: Percentage of respondents who were able to answer all 5 UNGASS HIV prevention knowledge question correctly, 2004-07

Source: NBSS MOPH

2. Increasing trend of sexual intercourse experiences among students

However, the average age at first sexual intercourse varied by age, education level and residential type. Respondents with a bachelor's degree or higher had their first sexual intercourse when they were older. Respondents in the older age group had a higher average age for their first sex experience. Male respondents who lived in Bangkok had lower average age at the time of first sex than male respondents who lived in the other provinces.

The proportions of Grade 11 students in the regular school system who had sexual intercourse were low in 1996, around 10% in males and 4% in females. Unfortunately, these proportions increased over the last 10 years. In 2007, more than 20% of Grade 11 male students and 10% of Grade 11 female students had sexual experiences. The proportion of the 2nd year vocational school students, who had sexual intercourses, was much higher at almost 30% in females and 40% in males as shown in Figure 2.2.



Figure 2.2: Percentage of the respondents who had sexual intercourse experiences, Thailand 1995-2007

3. Low condom use rate among students

Students generally had sex with friends. Consistent condom use when having sex with friends in the past year was low as can be seen in Figure 2.3. Female students, especially those in second year vocational school, reported consistent low condom use rates when they had sex with a friend in the past year. Male and female vocational school students reported a consistently lower condom use rate when having sex with friends over the past year than students in grades 8 and 11.



Figure 2.3: Percentage of respondents who used condoms consistently when having sex with boy/girlfriends in the past year, Thailand 1995-2007
4. First sexual intercourse among the general population

Data from the National Sexual Behaviour Survey 2006 indicated that among the general population, the average age for first sexual intercourse was 18 years among men and 20 among women. It was found that average age for first sexual intercourse varied by age, education level and residential type and respondents who had a bachelor's degree or higher had their first sexual intercourse at an older age. Respondents in the older age group had a higher average age at first sex. Male respondents who lived in Bangkok had a lower average age at first sex than male respondents who lived in the other provinces.

Among males, only 6.9% had first sexual intercourse with their spouse (either registered or not registered), 53.6% had first sexual intercourse with girlfriends. Condom use rate during the first sexual intercourse was 28.2%. Among females, 55.5% had first sexual intercourse with their spouse.

5. Promiscuity and condom use among Thai men

Among the male population, the proportion of respondents who had sex with female sex workers in the past year was higher than that of respondents who had sex with non-regular sexual partners as shown in Figure 2.4.

Consistent condom use among men who had sex with female sex partners was around 60% in 2007. This proportion increased slowly over the last 10 years as shown in Figure 2.5.

The consistent condom use rate when men had sex with non-regular partners was low (20%-40%) between 1995 and 2003. However it increased to between 50 and 70% in 2007, a far cry from the low rates between 1995 and 2003 as shown in Figure 2.6.







Figure 2.5: The percentage of respondents who consistently used a condom when having sex with female sex workers in the past 1 year, Thailand 1995 - 2007



Figure 2.6: The percentage of respondents who consistently used a condom when having sex with non-regular sexual partners in the past 1 year, Thailand 1995 - 2007

6. Female sex workers: multiple partners and condom use

Female sex workers had sex with multiple partners. They mostly had sex with general clients and used condoms quite consistently. About 40% of female sex workers had sex with spouse/regular sexual partner and 23.4% had sex with non-client, non-regular sexual partners as shown in Figure 2.7.

Consistent condom use when having sex with non-clients, non-regular sexual partners was higher than 80%. However, consistent condom use when having sex with spouse/regular sexual partner was very low as shown in Figure 2.8.



Figure 2.7: The percentage of female sex workers who had sex with (1) general clients, (2) regular clients, (3) regular sexual partner/spouses and (4) non-regular sexual partners in the past month, Thailand 1995 - 2007



Figure 2.8: The percentage of female sex workers who consistently used condoms when having sex with (1) general clients,(2) regular clients, (3) regular sexual partner/spouses and (4) non-regular sexual partners in the past month, Thailand 1995 - 2007

Part II: Risk and sexual behaviour survey among MSM and IDUs in 2008

7. High risk of HIV infection among MSM

A total of 639 MSM who were over 15 years old and met inclusion criteria were selected through the snow ball technique. The highest proportion of MSM was from Khon Kaen at 28.6% followed by 27.7%, 25.5% and 18.2% from Chiangmai, Chonburi, and Surat Thani provinces respectively. This sample size was assigned in proportion to the size of the population in each province.

The average age was 24 ± 7.5 years; 34.7% finished high school or equivalent, 71.8% were employed, and 27.1% earned between 7,000 to 11,999 baht per month. Almost all (91.2%) had health insurance mostly covered by the Universal Coverage Health Insurance Scheme.

Almost half (46.2%) identified themselves as bisexual, 38.7% as homosexual and 15.2% heterosexual, as shown in Figure 2.9. The number of sex partners was alarmingly high. During the past year almost half of them had 1 to 9 sex partners, and 41% had 10-49 sex partners as shown in Figure 2.10.



Figure 2.9: Sexual orientation of MSM





During the last six months 41.9% (CI=38.1-45.9%) of the respondents had first sexual intercourse with women, 59% (CI=52.8-64.9%) of them used a condom for the first sexual intercourse with a woman as shown in Figure 2.14. At the last sexual intercourse, 23.5% (CI=20.2-27.0%) of the MSM did not use condoms as shown in Figure 2.11.



Figure 2.11: Condom use by MSM for the last sexual intercourse

The average age of their first sexual intercourse with men was 16.3 years old. About half (49.3%, CI=45.4-53.2%) had first sexual intercourse with an unfamiliar person, 24.7% (CI=21.4-28.3%) with a friend and 20.3% (CI=17.3-23.7%) with a boyfriend. The occasion for their first sexual intercourse was "being together" (41.5%), during a festival period at 23.2% (CI=19.9-26.6%) and joining the group tour or camp (20.3%, CI=17.3-23.7%) as shown in Figure 2.12 and Appendix C, Table 3.3. The common reasons for first sexual intercourse with men were being drunk (20.3%) and having sex for rewards (19.9%, CI=16.8-23.2) as shown in Figure 2.13. Only 36.3% (CI=32.7-40.4%) of the respondents used condoms during the first sexual intercourse with men, 31.1% (CI=27.7-35.1%) used oral sex as a protection measure whereas 27.7% (CI=24.4-31.5%) did not protect themselves.







Figure 2.13: MSM reasons for the first sexual intercourse with men





The majority of MSM identified close friends as having the highest influence on their sexual behaviours (53.5%, CI=49.6-57.4%). In terms of media channels, internet (39.7%, CI=35.9-43.7%) and television (32.2%, CI=28.6-36.0%) had high influences on their sex behaviour as shown in Figure 2.15 and Appendix C, Table 3.4.



Figure 2.15: Influences of person and media on sexual behavior of MSM

During the past year, 37.4% (CI=33.6-41.3%) of the MSM received HIV/ AIDS information from television, 22.7% (CI=19.5-26.1%) from internet and 12.8% (CI=10.3-15.7%) from advertising billboards. They acquired most of the HIV/AIDS information from colleagues (35.7%, CI=32.0-39.5%) and health personnel (23.2%, CI=19.9-26.6%).

Hospitals were identified as a major HIV/AIDS information source for 40.2% (CI=36.4-44.1%) of the MSM, followed by health centres (22.8%, CI=19.6-26.3%).



Figure 2.16: Most important information sources/channels on HIV/AIDS for MSM during the past year

Most of the MSM (69.8%) had a high level of knowledge about HIV/AIDS. They had average scores of 15.2?2.0 from the total score of 18. Almost half of them did not know that oral sex could not help prevent HIV infection * (45.5%, CI=41.6-49.5%), that taking addictive substances could increase the risk of HIV/AIDS infection (31.1%, CI=27.6-34.9%), and that

external ejaculation could not prevent HIV/AIDS (30.4%, CI=26.8-34.1%). Some 24.7% (CI=21.4-28.3%) did not know that touching, hugging and holding hands could not transmit HIV/AIDS, and people could not get HIV/ AIDS from some types of mosquitoes (22.5%, CI=19.4-26.0%) as shown in Figure 2.17 and Appendix C, Table 3.6.



Figure 2.17: HIV/AIDS transmission and preventive measures unknown to MSM

In terms of attitude, most MSM had many false or misleading beliefs. For example, more than 66.2% (CI=62.4-69.9%) believed that blood tests for HIV should be done immediately after risky behaviours. Most of them admitted that expecting a reward or something in return is one of the main reasons for them to have sex with men (57.6%, CI=53.7-61.5%).

Further, many of them consider having a higher number of sex partners than their peers as a source of pride (40.4%, CI=36.5-44.3%). Having many male lovers or partners makes one accepted by friends (34.1%, CI=30.4-37.9%), and considered healthy or HIV negative (26.9%, CI=23.5-30.5%). They also believe that practicing penetrative anal sexual intercourse will not lead to contraction of HIV/AIDS (21.6%, CI=18.5-25.0%).

A high proportion of MSM have inappropriate attitudes regarding condom use. Almost half (46.3%, CI=42.4-50.3%) believe that using condoms when having sexual intercourse reduces pleasure, and is a sign of distrust between them and their partners (34.6%, CI=30.9-38.4%). Telling partners to use condoms is not appropriate since it shows distrust (30.7%, CI=27.1-34.4%). More than one in five are shy to buy condoms (23.8%, CI=20.5-27.3%). Buying condoms is a burden which they should not pay for (55.2%, CI=51.3-59.1%) as shown in Figure 2.18 and Appendix C, Table 3.7. The majority (84.7%, CI=81.6-87.4%) thought condoms should be free for those in need.



Figure 2.18: Percentage of inappropriate attitudes MSM have on condom use and practice

The findings revealed irregular use of condoms over the past year. For example while MSM who always or usually use condoms when having sex with their male lovers were 56.7% (CI=52.4-60.2%), fewer (38%, CI=34.2-41.9%) never or seldom use condoms when having sex with male sex workers, and about a third of them (32%, CI=28.3-35.7%) usually or often have sexual intercourse with others who are not their regular partners.

Almost half of MSM never or seldom use condoms when having sex with women (47.3%, CI=43.3-51.2%), 26.5% (CI=23.1-30.0%) never or seldom use condoms when having sex with their partners. An almost similar number do not use condoms with others who were not their partner (23.5%, CI=20.2-27.0%). Most MSM often watch or read pornographic material which stimulate their sexual desires (66.1%, CI=62.2-69.7%). Almost half of them are unable to refuse when asked to have sex (47.8%, CI=43.8-51.7%), while 42.6% (CI=38.7-46.5%) usually have sex for rewards or expected something in return. Some 30.2% (CI=26.7-33.9%) never or seldom bring condoms when they go out at night, and 28.3% (CI=24.9-32.0%) have sex with many men to compete with their MSM peers as shown in Figure 2.19 and Appendix C, Table 3.8.



Figure 2.19: MSM condom use and sexual behaviors

8. High risk of HIV infection among IDUs

A total of 444 samples of IDUs from four provinces participated in face to face interviews. Most of them were male (76.1%) aged between 15-65 years with a median age of 31 years. Almost all (91.2%) were Buddhists, 97.7% attended school and 33.1% finished secondary school. The majority of them (54.7%) were single, and approximately 29.3% were married. Some 42.6% had temporary odd-jobs, while 23.9% were unemployed. About 35.1% of the respondents had an average monthly income between 3,500 to 6,999 Baht, while 18.9% had no income. Almost all of them (91.1%) had health insurance, 72.7% through the Universal Coverage Scheme.

These IDUs started injecting drugs when they were between 9 and 30 years old or a median age of 16 years. The drugs they took for the first time were injecting heroin (38.1%) and amphetamine and amphetamine derivatives (30.0%). They took the drugs out of curiosity (71.2%) or persuasion by friends (18.5%). Some 45.5% of them used to share needles with other IDU peers and almost all of them (82.9%) bought needles and syringes from drug stores. More than half 56.3% have reused needles for injection. About 40% have washed needles and syringes with clean tap water and dried them, while only 21.8% boil them as shown in Figures 2.20 and 2.21, and Appendix D, Table 4.3.



Figure 2.20: Substance types and reasons of the first drug taken by IDUs



Figure 2.21: Sources of needles and syringes, and methods used to clean reused needles

Most of the IDUs identified themselves as heterosexual (83.1%) whereas 11.7% were homosexual as shown in Figure 2.22. Over the past year, they had 1 to 120 partners with the mode of one partner as shown in Figure 2.23. Over the last 6 months, 62.6% (CI=57.9-67.1%) of the respondents had sexual intercourse (either with men or women) and 37.6% (CI=33.1-42.3%) of them used condoms (Figure 2.24). However, only about half (45.7%, CI=41.0-50.5%) of them used condoms during the last sexual intercourse as shown in Figure 2.25 and Appendix D, Table 4.4.



Figure 2.22: Sexual orientation of IDUs







Figure 2.24: HIV/AIDS preventive practices by IDUs over the last six months



Figure 2.25: IDUs condom use for the last sexual intercourse

Television (78.4%, CI=74.3-82.1%) had the highest influence on their sex behaviour as shown in Figure 2.26 and Appendix D, Table 4.5, followed by close friends (39.9%, CI=35.3-44.6%) and parents (39.4%, CI=34. 8-44.1%). IDUs identified television (68%) and campaigns (9.9%) as having had the greatest influence on their knowledge, attitude and practices in AIDS prevention as shown in Figure 2.27 and Appendix D, Table 4.6.



Figure 2.26: Person and media which had highest influence on IDU sex behavior

Over the past year, 68.0% (CI=63.5-72.3%) of the IDUs received HIV/ AIDS information from television, less from campaigns such as World AIDS Day and leaflets and brochures. They acquired most of the HIV/AIDS information from health personnel (56.3%) and less from other sources such as village health volunteers and neighbours. Hospitals were identified as a major source of HIV/ AIDS information for them as shown in Figure 2.27 and Appendix D, Table 4.6.



Figure 2.27: Most important IDU information channels on HIV/AIDS over the past year

Most IDUs had a high level of knowledge of HIV/AIDS (73.2%) with an average score of 15.1 ± 2.1 out of the total score of 18. About 95.7% (CI=93.4-97.4%) knew about the causes of HIV infection. However 41.2% (CI=36.6-46.0%) did not know that taking addictive substances contributed to higher risks for HIV/AIDS infection, and oral sex could not prevent HIV infection **(31.1%, CI=26.8-35.6%), and that external ejaculation could not prevent HIV/AIDS (31.1%, CI=26.8-35.6%). A small number knew that presently there is no vaccine to prevent HIV/AIDS (27.9%, CI=23.8-32.4%), touching, hugging and holding hands could not transmit HIV/AIDS (24.5 %, CI=20.6-28.8%), and people could not get HIV/AIDS infection from some types of mosquitoes (21.8%, CI=18.1-26.0%) as shown in Figure 2.28 and Appendix D, Table 4.7.





These IDUs believed that blood tests should be done immediately after unprotected sex (83.8%, CI=80.0-87.1%). The majority of the IDUs believed that HIV is mostly spread by sex workers and MSM (68.7%, CI=64.2-73.0%). Just over half 55.0% (CI=50.2-59.6%) reasoned that married men should not use a condom when having sex with their wives and that it was normal for men to obtain services from sex workers (50.6%, CI=45.9-55.4%) as shown in Figure 2.29.

^{**} Oral sex can also spread HIV/ AIDS when one partner is HIV positive and another had a lacerated in his/her mouth. In this study about 31 % of IDUs believed that they could not contract HIV through oral sex.

Close to half of the IDUs 45.9% (CI=41.2-50.7%) thought that using condoms when having sex resulted in less pleasure, and using condoms meant distrust between them and their partners (27.3%, CI=23.2-31.6%). Most IDUs thought condoms should be free for those in need (85.1%, CI=81.5-88.3%) as shown in Appendix D, Table 4.8.



Figure 2.29: Common attitudes of IDUs on condom use and sexual practices

IDU practices over the past year were as follows: The majority had either never or seldom used condoms when having sex with their husband/wife (70%, CI=65.5-74.2%), never or seldom used condoms when having sex with male/female sex workers (62.8%, CI=58.2-67.3%), and never or seldom used condoms when having sex with their lovers (61.1%, CI=56.3-65.6%) or girlfriends (60.8%, CI=56.1-65.4%). See Figure 2.30.

The majority never or seldom carried condoms with them when going out at night (65.1%, CI=60.5-69.5%). Just over half or 51.8% (CI=47.0-56.5%) had injected drugs during the past year. Of these, 19.8% (CI=16.2-23.8%) often or usually injected drugs and 20.0% (CI=16.4-24.1%) shared needles. About a third or 30% (CI=26.2-34.9%) had participated in a "joint party" where they used drugs and had sex under the influence. Another 30.3 % (CI=25.9-34.7%) had sex after taking drugs as shown in Appendix D, Table 4.9.



Figure 2.30: Risky behavior by IDUs

9. HIV/AIDS information channels should be developed

MSM and IDUs received most of their knowledge and information on HIV through television (79.8%, with CI=75.9-83.3% for MSM, and 87.8%, with CI=84.1-90.9% for IDUs), and campaigns such as World AIDS Day (50.4% with CI=45.8-55.0% for MSM, and 70.5%, with CI=65.7-75.0% for IDUs). In addition, the internet was also a fairly effective source of information for MSM (45.4%, CI=40.8-50.0%) in providing appropriate knowledge, and influencing their attitude and practices as shown in Figure 2.31 and Appendix E, Tables 5.1-5.2.





10. Limited access to VCT

The study revealed generally low usage of counselling and sex education services among MSM and IDUs. Only 27.7% (CI=24.3-31.3%) of MSM and 42.1% (CI=37.5-46.9%) of IDUs had received counselling services on sex education or sexually transmitted infections.

Of those who accessed VCT services, 80.2% of MSM (CI=73.6-85.8%) and 89.8% of IDUs (CI=84.6-93.8%) received counselling on AIDS and STI prevention, overall knowledge on AIDS, STIs and sex education (78.5%, with CI=71.7-84.3% of MSM and 86.1%, with CI=80.3-90.7% of IDU), and treatment of AIDS (43.5%, with CI=36.1-51.1% of MSM and 68.4%, with CI=61.3-75.0% of IDU). See Figure 2.32 and Appendix E, Tables 5.3-5.4.



Figure 2.32: Profile of counseling services for MSM and IDU who accessed VCT

6. Summary and conclusions

The HIV epidemic analysis of the NBSS applied a serial cross-sectional survey. Data on male and female students, grades 8 and 11, second year vocational school students, FSWs, and male and female factory workers were collected as recommended by the Bureau of Epidemiology. Each sentinel population had different sampling strategies and different data collection methods. Overall, 7,131 respondents were used to collect information using face-to-face interviews. Trend analyses were conducted on NBSS information among different sub-population groups. The primary survey of HIV risk behaviour of MSM and IDUs was conducted in 4 regions of Thailand. It employed the snowball technique to select the samples. The results are presented in proportions with a 95% confidence interval (CI).

Trend analysis of the 1995 to 2007 National Behaviour Surveillance Survey conducted by the Ministry of Public Health, and the primary survey of MSM and IDUs, indicates the following:

Part I: the risk and sexual behaviours survey from the NBSS

Knowledge about HIV prevention when using the 5 UNGASS HIV prevention knowledge questions among Grades 8 and 11, and second year vocational school students was very low. Unlike all other sub groups, more than 50% of FSWs were able to answer all 5 UNGASS HIV prevention knowledge questions correctly.

Average age at first sexual intercourse varied by age, education level, and residential types. Respondents in older age groups, respondents who had a bachelor's degree or higher, and male respondents who did not live in Bangkok had a higher average age at first sexual intercourse than other groups. The proportion of grade 11 students in the regular school system and second year vocational school who had sexual intercourse increased. In 2007, more than 20% of male and 10% of female students in regular schools and 40% of male and 30% of female vocational students had sexual experiences. For the general population, the average age at first sexual intercourse was 18 years among men and 20 years among women.

About half of the general male sample had their first sexual intercourse with girlfriends. Only 6.9% had their first sexual intercourse with their spouse. The condom use rate during the first sexual intercourse was 28.2%. Students generally had sex with friends and consistent condom use over the past year was low. The consistent condom use rate among Thai males when having sex with female sex workers, commercial sex partners, and non-regular sexual partners increased slowly over the past years. The consistent condom use rate for FSWs when having sex with non-clients, non-regular sexual partners was very high, but consistent condom use when having sex with spouse/regular sexual partner was very low.

Part II: the risk and sexual behaviours survey among the MSM and IDU on HIV/AIDS in 2008

From the primary surveys for MSM sexual behaviour, almost half the MSM surveyed identified themselves as bisexual (46.2%) and homosexual (38.7%). The average age of first sexual intercourse with men was 16.3 years. About half had first sexual intercourse with an unfamiliar person (49.3%); the occasion for their first sexual intercourse was mostly "being together" (41.5%); the most common reasons for first sexual intercourse

was being drunk (20.3%). Number of sex partners was alarmingly high (1-9 persons).

The proportion of condom use for the first sexual intercourse with men (36.3%) was lower than first sexual intercourse with women (59.0%). The majority of MSM reported that close friends, the internet, and television had the highest influence on their sexual behaviour. They also received appropriate knowledge, attitude and practices from these sources/channels which included advertising billboards.

Most MSM had a high level of knowledge on HIV/AIDS but did not know some key issues, for example that oral sex could not help prevent HIV infection (45.5%), taking addictive substances contributed to higher risks for HIV/AIDS infection (31.1%), and external ejaculation could not prevent HIV/AIDS (30.4%). They had an inappropriate attitude regarding condom use. Almost half believed that using condoms when having sexual intercourse reduced pleasure (46.3%), using condoms meant distrust between them and their partners (34.6%), and telling partners to use condoms is not appropriate as it shows distrust (30.7%).

More than one in five were shy to buy condoms (23.8%), and thought that condoms should be free for those who need them (84.6%), and that buying condoms is a burden they should not pay for (55.2%). Over the past year, almost half of them never or seldom used condoms when having sexual intercourse with male lovers (43.3%), women (47.3%), male sex workers (38.0%), and partners (26.5%). Almost half did not refuse when asked to have sex (47.8%) and many of them had sex for rewards or expected something in return (42.6%). The majority watched or read material which simulated their sexual drive (66.1%).

The IDUs began injecting drugs when they were very young (median age of 16 years). The most common first drugs taken were heroin, amphetamines and amphetamine derivatives. The reasons they took the drugs were wanting to try (71.2%) and persuasion by friends (18.5%). Almost half of them used to share needles with other IDU peers (45.5%) and almost all of them bought needles and syringes from drug stores (82.9%). Half of them reused needles for injection (56.3%). The most common methods of cleaning before reuse were washing needles and syringes with tap water and drying them (40%), only 21.8% boiled them. Most of them identified themselves as heterosexual (83.1%). Over the past year, 37.6 % used condoms when having sexual intercourse. About half of them used condoms during the last sexual intercourse (45.7%). Close friends, parents, and television had the highest influence on their sexual behaviour. They identified television, the internet, AIDS campaigns, leaflets and brochures, as major sources of appropriate knowledge, attitude, and practices in HIV/AIDS prevention.

Most IDUs had a high level of knowledge of HIV/AIDS. However, they still had some knowledge gaps. For example, they did not know that taking addictive substances contributes to higher risks for HIV/AIDS infection (41.2%); that oral sex could not prevent HIV infection (31.1%); and that external ejaculation could not prevent HIV/AIDS (31.1%). Most of them believed that using condoms during sexual intercourse reduced pleasure (45.9%), and that condoms signified distrust between them and their partners (27.3%). Most of them thought condoms should be free for those who needed (85.1%) them.

In the past year, most of the IDUs never or seldom used condoms when having sex with their husband/wife (70.0%), male/female sex workers (62.8%), their lovers (61.1%) and girlfriends (60.8%).

Not many MSM and IDUs access counselling services on sex education or sexually transmitted infections (STIs). Most of those who accessed VCT, received counselling on AIDS and STI prevention, overall knowledge on AIDS, STI and sex education, and treatment of AIDS.

7. Policy recommendations

1. School based HIV prevention program and/or life skills program.

The results of this analysis show that knowledge of HIV prevention in the Thai population is low, even among population groups that are easy to reach such as students. For harder to reach teenagers and youth, knowledge about HIV prevention is thought to be even lower. Second year vocational school students who had higher risk of contracting HIV had lower knowledge about HIV prevention when compared with grade 11 students. The proportion of students who had basic knowledge about HIV prevention was very low among grade 8 students.

School based HIV prevention and life skills programs have been discussed and planned for quite some time in Thailand but have never been seriously implemented. With changes in social norms and beliefs and increased diversity in life style, these programs need to be more intensified and developed innovations to counteract the spread of the epidemic.

2. New strategies to increase condom use.

Consistent condom use among men who had sex with female sex workers showed somewhat different results. Data from the 2006 National Sexual Behaviour Survey of Thailand showed higher condom use among men who had sex with FSWs than data from the National Behavioural Surveillance System. Data from the general population also showed a significant increase of consistent condom use (when comparing the data with the previous round of surveying). Consistent condom use with commercial partners of students, and male workers were far lower than the general population. The low level of consistent condom use with commercial partners is worrisome and suggests gaps in Thailand's condom campaign and the need for strengthening.

Our analysis suggests that condom use with non-commercial partners, which is the more frequently reported type of partner, needs to be seriously addressed. Condom use with casual partners has generally been lower than with commercial partners. However, the increasing prevalence of casual partners needs serious attention.

3. Appropriate HIV prevention services for sex workers

The lower demand for commercial sex and high rates of condom use by brothel-based sex workers helped Thailand reverse its epidemic in the early 1990s. Maintaining pressure on brothel-based HIV transmission needs to be continued. The structure of a successful HIV prevention program for commercial sex and sexually transmitted infections clinics, needs to be sustained. This was a very important channel which delivered the 100% condom use program, HIV prevention services and also provided a strong link between sex workers and the health care system. The health care system itself also needs to adapt to work with the new environment of emerging new types of commercial sex workers. Efforts to prevent HIV transmission in commercial sex should be extended to the informal or non-venue-based or non-visible type of commercial sex.

4. HIV prevention services for teenage and youth

While the majority of Thai students are exposed to media with sexual content through internet, books, VDOs, VCDs, DVDs and other types of media, it is estimated that less than 5% of young people are being reached by adequate HIV prevention services. Public awareness campaigns have faded away. Urgent actions required now include programs that match

the diversity of risk behaviours of youth. A number of models have been tested with promising results. These need to be continued and expanded in order to reach the youth who need them.

5. Urgent need for appropriate HIV prevention programs for MSM and IDUs

Both MSM and IDUs are vulnerable to HIV infection as a result of their risk behaviours. A high proportion of both MSM and IDUs do not use condoms. MSM mostly have unprotected sex with multiple partners. Many of them believe condoms reduce sexual pleasure. IDUs still share needles. Harm reduction could help minimize their risk of contracting HIV.

Health education through appropriate channels such as television and the internet for MSM, and television and peers for IDUs, could help them gain more knowledge. A clearer message on HIV prevention should be emphasized to correct the wrong perceptions on transmission and prevention.

Counselling is needed for adolescents on sex education and HIV prevention. Training on life skills, especially on how to say no to temptations such as "having sex" and "drugs" should be regularly organized both in schools and communities.

Not many MSM (27.7 %) and IDUs (42.1%) had access to VCT. However, more than 80 % of those who got VCT received counselling on HIV/AIDS and STI prevention. Therefore, VCT should be made available and accessible for MSM and IDUs and it should focus on changing their attitude and practices.

Appropriate HIV awareness and prevention campaigns targeting IDUs and MSM are needed. In particular, campaigns during special events and in night life areas are necessary to prevent HIV/AIDS among MSM and their clients. The government should allocate more resources such as health personnel to combat the HIV epidemic.

Condoms should be free and easily accessible to all in need. Better attitudes towards MSM are needed. Stressing that they are normal but have different sexual preferences should be emphasized to include them in society in order for them to have a normal life and access to information and services. IDUs are also not criminals and need special care in order to return to normal life. Harm reduction should be emphasized for them. Prevention for adolescents in not becoming involved in drugs should require collaboration among all sectors, including the government, NGOs, communities, schools and families. "Revitalising HIV prevention in Thailand: a critical assessment"

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Appendix A

Table AA 2.1: Demographic characteristics of respondents, male students grade 11, Thailand 1996 - 2007

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Number of respondents	6,486	5,886	5,827	6,168	6,838	6,478	5,842	4,867	5,746	5,893	5,707	6,370
Average age	17	17	17	17	17	17	17	17	17	17	17	17
Currently living with												
Parents	ł	1	!	!	!	!	!	!	75.6	73.5	75.1	75.6
Either father or mother	!	1	!	!	!	!	!	!	12.3	11.0	11.4	10.8
Friend	ł	1	!	ł	1	!	!	!	0.7	0.0	0.5	0.4
Boy/girlfriend	ł	1	!	1	!	!	!	!	0.4	0.0	0.0	0.1
Relative	ł	1	!	ł	1	!	!	!	8.1	9.4	8.4	9.9
Living alone	ł	1	!	ł	1	!	!	!	0.8	0.9	0.8	0.4
Students who had experiences	!	1	1	!	{	!	ł	!	!	53.0	62.8	63.2
surfing pornograpic websites Students who had experiences using pornograpic media, (books, video, VCD)	-	1	1	ł	ł	ł	ł	ł	1	81.7	82.4	36.3
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Table AA 2.2: Demographic characterist	tics of res	pondent	s, femal	e studer	its grade	e 11, Thi	ailand 19	96 - 20	07			
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Number of respondents	7,161	6,463	6,715	6,871	7,350	7,104	6,293	5,182	6,496	8,074	7,713	9,734
Average age	17	17	17	17	17	17	17	17	17	17	16	16
Currently living with												
Parents	ł	ł	{	ł	ł	!	ł	ł	74.0	73.7	70.9	73.1
Either father or mother	ł	ł	{	ł	ł	!	ł	ł	12.8	11.8	12.6	12.5
Friend	ł	ł	{	ł	ł	!	!	ł	0.7	0.3	0.4	0.6
Boy/girlfriend	!	;	}	ł	{	{	{	ł	0.2	0.0	0.0	0.1
Relative	!	;	}	ł	{	{	{	ł	0.0	9.4	10.0	10.1
Living alone	ł	ł	{	ł	ł	{	}	ł	0.4	0.3	0.2	0.5
Students who had experiences	1	ł	{	ł	ł	{	ł	ł	ł	17.9	25.8	26.0
surfing pornographic websites												
Students who had experiences using	;	;	!	ł	;	!	;	1	ł	48.3	54.4	53.6
pornographic media, (books, video, [\]	VCD)											



Table AA 2.3: Demographic characteristics of respondents, se	cond year voca-
tional school students, Thailand 1996 - 2007	

		Ма	le			Fem	ale	
	2004	2005	2006	2007	2004	2005	2006	2007
Number of respondents	6524	7668	7054	8296	6730	7063	7611	8396
Average age	17.0	16.9	16.8	17.0	16.7	16.6	16.6	16.6
Currently living with								
Parents	69.5	70.5	71.3	71.9	67.2	65.8	67.6	66.6
Either father or	11.5	9.8	9.5	10.4	9.0	12.1	12.1	11.2
mother								
Friend	4.0	3.8	3.9	2.7	4.0	3.6	4.0	2.3
Boy/girlfriend	1.2	0.8	1.0	0.9	0.7	0.8	1.6	1.4
Relative	10.1	9.7	9.1	8.9	9.2	10.8	10.2	10.7
Living alone	0.8	1.4	1.6	1.3	1.6	0.8	1.0	0.9
Students who had		56.8	61.0	67.7		24.6	26.0	31.5
experiences of surfing								
pornographic websites								
Students who had		89.1	87.1	89.4		58.8	59.4	64.5
experiences using								
pornographic media,								
(books, video, VCD)								

"Revitalising HIV prevention in Thailand: a critical assessment"

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Number of respondents	3,926	4,863	4,306	4,604	4,285	4,858	4,796	4,142	3,899	6,716	6,240	5,642	4,287
Age (Years)													
15-19	24.0	21.2	20.8	18.6	20.3	15.1	14.5	14.5	11.3	7.2	5.2	5.8	5.1
20-24	38.1	38.7	41.5	37.9	41.1	39.3	40.1	38.9	42.9	24.7	21.9	22.1	20.1
25-29	35.7	37.0	34.5	41.9	41.9	42.2	44.2	45.1	44.3	28.9	28.8	29.8	30.8
30-34	ı	ı	ı	ı	ı	ı	ı	ı	ı	15.0	17.8	19.5	20.9
35-39	ı	ı	ı	ı	ı	ı	ı	ı	ı	11.3	11.8	12.4	13.2
40-44	ı	ı	ı	ı	I	ı	ı	I	I	6.1	6.4	6.6	6.6
45-49	ı	ı	ı	ı	I	ı	ı	I	I	1.8	2.9	3.8	3.3
Marital status													
Single	56.7	57.8	59.0	55.9	55.9	54.5	54.1	56.5	55.4	41.7	38.8	37.2	38.7
Married	39.0	36.9	36.3	40.4	39.3	41.4	40.2	40.4	41.5	52.7	55.5	56.6	55.0
Divorced/separated	1.8	1.9	1.8	1.5	1.9	1.6	2.2	1.7	1.7	4.7	4.3	5.5	5.6
Widowed	0.7	0.9	0.3	0.6	0.6	0.4	0	0.6	0.3	0.7	0.5	0.7	0.7
Highest grade of													
education completed													
Primary school	49.4	38.6	39.5	32.8	33.1	32.7	26.1	20.9	16.9	22.6	19.4	19.1	20.0
Secondary school 1-3 years	23.6	24.3	24.6	25.3	25.7	29.4	28.9	27.8	22.8	24.5	24.4	24.8	23.1
Secondary school 4-6 years	10.1	10.8	13.7	16.1	13.4	14.5	17.2	19.8	26.8	23.0	24.1	25.9	22.9
Vocational/diploma	8.4	15.2	15.0	11.5	14.7	13.9	16.7	18.5	19.3	16.1	21.6	19.7	22.1
Higher than bachelor's degree	2.1	1.9	1.7	3.0	2.3	4.5	4.1	4.9	5.7	7.9	10.7	10.4	11.9

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	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Number of respondents	4,911	5,299	4,918	5,182	5,467	5,617	5,618	4,824	3,800	4,903	6,078	5,854	4,732
Age (Years)													
15-19	26.2	26.5	21.8	21.6	19.1	18.5	15.7	13.1	I	6.4	5.6	6.0	4.8
20-24	38.2	38.5	42.1	39.7	41.5	40.9	41.7	50.0	ı	27.4	21.1	21.6	19.9
25-29	35.6	35.0	36.2	38.8	39.4	40.6	42.6	46.0	ı	33.4	27.9	26.5	27.3
30-34	ı	ı	ı	ı	ı	ı	ı	ı	ı	19.9	19.8	20.1	20.7
35-39	ı	ı	ı	ı	ı	ı	ı	ı	ı	14.0	14.4	14.2	14.6
40-44	ı	ı	ı	ı	ı	ı	ı	ı	ı	7.2	7.9	8.0	8.7
45-49	ı	ı	ı	ı	ı	ı	ı	ı	ı	3.2	3.4	3.5	4.0
Marital status													
Single	28.6	31.0	11.4	43.8	40.6	39.0	40.6	37.8	35.8	62.0	27.5	28.3	30.3
Married	51.4	47.9	50.8	48.0	47.6	53.3	54.1	56.2	58.2	25.6	63.0	60.7	58.8
Divorced/separated	3.6	4.1	4.4	4.0	4.9	5.6	4.8	4.9	4.6	8.3	7.1	8.5	8.5
Widowed	1.1	1.1	1.1	1.5	1.4	1.4	1.3	1.1	1.1	2.0	1.8	2.5	2.4
Highest grade of													
education completed													
Primary school	62.3	51.1	43.8	46.3	41.1	38.4	32.9	29.9	24.0	27.1	23.4	25.3	24.3
Secondary school 1-3 years	22.7	26.9	49.9	26.0	30.6	31.2	30.3	30.5	25.8	19.5	20.7	22.1	19.9
Secondary school 4-6 years	7.7	9.7	4.5	12.1	15.3	17.3	20.5	20.8	24.3	19.8	19.7	23.5	20.2
Vocational/diploma	3.9	7.3	1.1	6.5	7.8	8.0	10.4	11.8	13.9	14.8	14.6	15.2	18.0
Higher than bachelor's degree	1.6	1.5	0.2	3.4	2.6	2.6	3.8	4.3	6.4	10.3	13.3	14.0	17.7

male workers. Thailand 1996 - 2007 Table AA 2.5: Demographic characteristics of respondents, **Table AA 2.6:** Demographic characteristics of respondents, female sex workers,Thailand 2004 - 2007

General information	2004	2005	2006	2007
Total number of respondents	2,749	3,499	2,092	1,351
Age (Mean)	27	29	28	27
Marital status				
Single	30.9	25.7	33.3	32.8
Married	16.3	18.8	17.5	15.7
Separated	17.6	19.6	18.2	21.1
Divorced	28.7	28.6	26.8	26.2
Widowed	4.2	5.2	2.9	3.5
Highest grade of education completed				
Primary school	57	52.5	48.9	41.6
Secondary school 1-3 years	24.7	26.8	27.3	31.8
Secondary school 4-6 years	10.3	10.5	9.9	19.0
Vocational/diploma	3.4	3.4	2.9	4.7
Higher than bachelor's degree	0.2	0.6	0.5	1.2
Age at first sexual intercourse	18.0	18.4	18.3	18.0
Age at first sex work	23.7		24.0	25.0
Duration which involved in				
commercial sex				
Less than 1 year	2.2	6.1	9.7	38.9
1-2 years	47.1	46.2	44.8	13.6
3-4 years	18.5	16.6	11.4	14.0
5-9 years	18.1	16.4	14.5	16.7
More 10 years	14.1	14.7	19.5	13.8
Income before becoming sex worker				
Less than 5,000 Baht	69.1	68.2	75.2	70.0
5,000 - 14,999 Baht	26.4	26.2	22.8	24.6
15,000 - 19,999 Baht	0.6	0.6	0.6	1.9
More than 20,000 Baht	3.9	5.0	0.0	2.6
Current income				
Less than 5,000 Baht	24.5	25.0	27.0	31.5
5,000 - 14,999 Baht	38.2	16.4	56.9	38.9
15,000 - 19,999 Baht	5.7	4.8	5.9	6.8
More than 20,000 Baht	7.7	9.5	9.2	12.0

Table AA 2.7: Demographic characteristics of respondents from National SexualBehaviour Survey of Thailand 2006

Demographic Characteristics	Male (%)	Female (%)	Total (%)
Age (Years)			
18-19	19.7	19.0	19.4
20-24	30.3	31.0	30.6
30-34	7.7	7.0	7.3
35-39	8.4	8.8	8.6
40-44	8.9	8.1	8.5
45-49	7.4	7.4	7.4
50-54	5.7	7.6	6.6
55-59	3.9	4.8	4.4
Marital status			
Single	51.3	32.6	41.9
Married	45.7	59.6	52.6
Widowed/divorced/separated	3.1	7.8	5.5
Highest grade of education completed	ted		
Never attended school	0.3	1.7	1.0
Primary school	33.0	37.9	35.5
Secondary (G1-3)	28.2	23.3	25.7
Secondary (G 4-6)	26.1	26.1	26.1
Vocation/Diploma	6.7	5.2	6.0
Bachelor's degree	5.4	5.5	5.5
Higher than bachelor's degree	0.2	0.2	0.2
Religion			
Buddhism	93.8	93.2	93.5
Islam	5.0	5.7	5.4
Christianity	1.1	1.1	1.1

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Appendix B



Grade 11 students





Figure AB 2.2: Proportion of Grade 11 male and female students who were exposed to pornography, Thailand 2005-2007



2nd year vocational school students

Figure AB 2.3: Proportion of second year vocational school male and female students living conditions, Thailand 2004-2007



Figure AB 2.4: Proportion of second year vocational school male and female students, who were exposed to pornography, Thailand 2005-2007

Worker



Figure AB 2.5: Proportion of male and female workers in each age group, Thailand 2004-2007



Figure AB 2.6: Proportion of married and unmarried male and female workers, Thailand 2004-2007



Figure AB 2.7: Male and female workers' educational attainment, Thailand 2004-2007



Figure AB 2.8: Marital status of female sex workers, Thailand 2004-2007






Figure AB 2.10: Average age (years) at first sexual intercourse and first sex work of female sex workers, Thailand 2004-2007



Figure AB 2.11: Duration as sex work for female sex workers, Thailand 2004-2007



Figure AB 2.12: Proportion of income before becoming sex worker of female sex workers, Thailand 2004-2007



Figure AB 2.13: Percentage of current income of female sex workers, Thailand 2004-2007

Appendix C

Table AC 3.1: Number and percentage distribution of sample size of MSM in all regions (n=639)

Province	Region	Number	Percent
Khon Kaen	Northeast	183	28.6
Chiang Mai	North	177	27.7
Chonburi	Central	163	25.5
Surat Thani	South	116	18.2
Total		639	100.0

Table AC 3.2: Number and percentage of demographic and socio-economics characteristics of MSM (n=639)

Demographic and Socio-economics Data	Number	Percent
Age		
<20 yrs	199	31.1
20-29 yrs	316	49.5
30-39 yrs	91	14.2
40-49 yrs	24	3.8
50-59 yrs	9	1.4
Mean (SD)	24.0	(7.5)
Median (Min-Max)	22.0	(15-57)
Education attainment		
No formal education	5	0.8
Primary school (grade 6-7)	55	8.6
Secondary school (grade 9)	201	31.5
High school or equivalent (grade 12/basic		
vocational school)	222	34.7
Certificate/higher vocational school	77	12.1
Bachelor degree	70	11.0
Master degree	9	1.4
Higher than master degree	5	0.8
Marital status		
Single	477	74.6
Married with man	79	12.4
Married with woman	34	5.3
Divorced	28	4.4
Separate	21	3.3

Demographic and Socio-economics Data	Number	Percent
Religion		
Buddhism	608	95.1
Christian	22	3.4
Muslim	9	1.4
Staying		
Parents	178	27.9
Shared apartment with friend	134	21.0
Alone	125	19.6
Relative/siblings	73	11.4
Colleague	85	13.3
Spouse	44	6.9
Occupation		
Do not work	180	28.2
Temporary job	162	25.4
Waiter in the restaurant/bar beer	144	22.5
Private business	96	15.0
Temporary employee in government sectors	29	4.5
Employee in private sectors, company or shop	23	3.6
Agriculturist	5	0.8
Estimate monthly family income		
< 3500 Baht/month	37	5.8
3,500 - 6,999 Baht/month	129	20.2
7,000 - 11,999 Baht/month	173	27.1
12,000 - 19,999 Baht/month	110	17.2
20,000 - 29,999 Baht/month	77	12.1
30,000 - 39,999 Baht/month	42	6.6
40,000 - 49,999 Baht/month	27	4.2
50,000 - 59,999 Baht/month	15	2.3
60,000 - 79,999 Baht/month	12	1.9
> 80,000 Baht/month	8	1.3
No income	9	1.4
Extra job		
No extra job	303	47.4
Waiter in the restaurant/bar beer	128	20.0
Temporary work	112	17.5
Private business/freelance	80	12.5
Employee in private sectors, company or shop	16	2.5
Health insurance		
Universal coverage health insurance	348	54.5
Social security/workman compensation	157	24.6
Private health insurance	45	7.0
Civil servant medical benefit	33	5.2
No health insurance	56	8.8

Sexual Behaviour	Number	Percent
Sexual orientation		
Bisexual (Sex with either women and men)	295	46.2
Homosexual (Sex with men)	247	38.7
Heterosexual (Sex with women)	97	15.2
Sexual partner (both with men and women)		
during the past 1 year		
None	11	1.7
1-9	299	46.8
10-49	262	41.0
50-99	44	6.9
> 100	23	3.6
Mean (SD)	19.0	(29.3)
Median (Min-Max)	10.0	(0-200)
Age at the first sexual intercourse with men		
< 15 yrs	190	29.7
15-19 yrs	363	56.8
20-30 yrs	86	13.5
Mean (SD)	16.3	(3.0)
Median (Min-Max)	22.0	(9-30)
First sexual intercourse partner		
Unfamiliar person	315	49.3
Friend	158	24.7
Boyfriend or lover	130	20.3
Male sex worker	36	5.6
Occasion for the first sexual intercourse		
with men		
Just being together	265	41.5
Festival	148	23.2
Group tour/camp	130	20.3
Party	96	15.0
Protection for the first sexual intercourse		
with men		
Using condom	232	36.3
Oral sex	199	31.1
Unprotected	177	27.7
External ejaculation	31	4.9

Table AC 3.3: Number and percentage of sexual behaviour of MSM (n=639)

Sexual Behaviour	Number	Percent
Reason for first sexual intercourse with men		
Drunk	130	20.3
Want reward	127	19.9
Like the appearance	90	14.1
Love	83	13.0
Group's fashion	59	9.2
Got opportunity	54	8.5
Persuasion	47	7.4
Innocent	36	5.6
Coercion	13	2.0
First sexual intercourse with women		
during the last 6 months		
No	371	58.1
Had	268	41.9
Protection for first sexual intercourse		
with women		
Using condom	158	59.0
External ejaculation	55	20.5
Oral sex	2	0.7
Unprotected	53	19.8
Using condom for the last sexual intercourse		
Did not use	150	23.5
Used	489	76.5

Table AC 3.4: Number and percent of person and media had highest influence on sexual behaviour of MSM (n=639)

Item	Number	Percent
Person who had highest influence on		
MSM sexual behaviour		
Closed friend	342	53.5
Superstar/ Singers/Actor/Actress	100	15.6
Colleague	94	14.7
Family's Member	52	8.1
Health worker	14	2.2
None	26	4.1
Teacher/lecturer	11	1.7
Media which highest influence on		
MSM sexual behaviour		
Internet	254	39.7
Television	206	32.2
Book/journal	109	17.1
Electronic media (VCD, DVD, Clip video)	64	10.0
Radio	6	0.9

Table AC 3.5: Number and percentage of channels through which MSM attain information on HIV/AIDS during the past 12 months (n = 639)

Channel	Number	Percent
Television	239	37.4
Internet	145	22.7
Advertising cutout	82	12.8
Campaign such as Global AIDS Day	44	6.9
Leaflet, brochure, letter	29	4.5
Newspapers	23	3.6
Journal / magazine	21	3.3
Community radio broadcasting	15	2.3
Training material	14	2.2
Radio	12	1.9
Exhibition	8	1.3
Never get information	7	1.1
Person	Number	Percent
Colleague	228	35.7
Health personnel (doctor, nurse,		
public health staff)	148	23.2
Parents / siblings	48	7.5
Teacher / lecturer	42	6.6
Classmate	41	6.4
Neighbour	30	4.7
Relatives	26	4.1
Village health volunteer	25	3.9
Husband/ wife	14	2.2
Student	12	1.9
Social welfare worker	1	0.2
Never get information	24	3.8
Institutions	Number	Percent
Hospital	257	40.2
Health centre / Primary care unit	146	22.8
School	62	9.7
District health centre/ Provincial health centre	40	6.3
Health promotion centre	31	4.9
Private clinic	30	4.7
Foundation	23	3.6
Municipality / local administration organization	7	1.1
Temple	3	0.5
Never get information	25	3.9

Questions		Kn	Know		Did not know	
	Questions	Number	Percent	Number	Percent	
1.	AIDS causes by virus resulted in immune deficiency.	601	94.1	38	5.9	
2.	HIV can be transmitted through sexual intercourse, from mother to child, and through blood.	616	96.4	23	3.6	
3.	An HIV infected person can spread the disease even when he/she tests negative for HIV.	538	84.2	101	15.8	
4.	Oral sex could not prevent HIV infection.	348	54.5	291	45.5	
5.	People could not get HIV/ AIDS infection from some types mosquitoes.	495	77.5	144	22.5	
6.	Touch, huge and hold hand could not transmit HIV/AIDS.	481	75.3	158	24.7	
7.	AIDS could transmit when sharing syringe among injection drug users.	596	93.3	43	6.7	
8.	There is no vaccine to prevent HIV/AIDS at present.	518	81.1	121	18.9	
9.	Appropriate self-care could help PLWHA could live normal life and delayed showing AIDSí symptoms.	600	93.9	39	6.1	
10.	At present, there is no drug which could cure AIDS.	581	90.9	58	9.1	
11.	External ejaculation could not prevent HIV/AIDS.	445	69.6	194	30.4	
12.	HIV/AIDS could spread from male to male or female to female.	547	85.6	92	14.4	
13.	Having multiple sex partners are risk for HIV infection.	546	85.4	93	14.6	
14.	AIDS patients might have chronic diarrhoea, common cold, loose weight, oral thrush and lymph node enlargement.	610	95.5	29	4.5	
15.	Taking antibiotics before sexual intercourse could not prevent HIV/AIDS infection.	574	89.8	65	10.2	
16.	Using condom for every sexual intercourse could prevent HIV/AIDS	588	92.0	51	8.0	
17.	Taking Addicting substance contributing to higher risks for HIV/AIDS infection	440	68.9	199	31.1	
18.	Sexual intercourse through anus also have possibility to get HIV/AIDS infection	600	93.9	39	6.1	

Table AC 3.6: Number and percentage of MSM's knowledge on HIV/AIDS (n=639)

П

	Your Opinion	Totally disagree	Disagree	Indifferent	Agree	Totally agree
1.	Using condom when having	72	116	155	199	97
	sexual intercourse caused	(11.3)	(18.2)	(24.3)	(31.1)	(15.1)
	less pleasure.					
2.	You are shy to buy condom.	118	105	264	111	41
		(18.5)	(16.4)	(41.3)	(17.4)	(6.4)
3.	Using a condom means	115	169	134	121	100
	distrust between you and	(18.0)	(26.5)	(20.9)	(18.9)	(15.7)
	your partner.					
4.	Having sex with a permanent	237	209	72	101	20
	male partner will not lead	(37.1)	(32.7)	(11.3)	(15.8)	(3.1)
	to HIV infection					
5.	Should use condom every	11	15	38	196	379
	time of having sex with	(1.7)	(2.4)	(5.9)	(30.7)	(59.3)
	male sex worker.					
6.	Had sex with a male is less	228	236	100	52	23
	likely to get HIV infection	(35.7)	(36.9)	(15.7)	(8.1)	(3.6)
	than having sex with a female					
7.	Being the incentive partner	231	221	49	71	67
	in anal sexual intercourse	(36.1)	(34.6)	(7.7)	(11.1)	(10.5)
	will not get HIV/AIDS					
8.	Sex without a condom or if a	30	29	45	239	296
	condom slips off during	(4.7)	(4.5)	(7.0)	(37.5)	(46.3)
	intercourse increases the risk					
	of HIV infection.					
9.	A healthy looking person	191	174	102	123	49
	cannot be HIV positive	(29.9)	(27.2)	(15.9)	(19.3)	(7.7)
10.	At present we should not	373	190	34	31	11
	give priority to HIV	(58.4)	(29.7)	(5.3)	(4.9)	(1.7)
	prevention since there is					
	anti retroviral therapy.					
11.	It is not necessary to get	237	172	74	93	63
	blood test even though you	(37.1)	(26.9)	(11.6)	(14.6)	(9.8)
	ever have sexual intercourse					
	with men, since you will not					
	have any change to get infected					
12.	Blood test should be done	45	85	86	227	196
	immediately after having	(7.0)	(13.3)	(13.5)	(35.5)	(30.7)
	risking behaviour.					

Table AC 3.7: Number and percent of MSM's attitude on HIV/ AIDS (n= 639)

	Your Opinion	Totally disagree	Disagree	Indifferent	Agree	Totally agree
13.	Having many male lovers,	104	114	203	112	106
	or male partners make one	(16.3)	(17.8)	(31.8)	(17.5)	(16.6)
	getting acceptance from friends					
14.	Having more sex partners	82	109	190	110	148
	than other mean superb.	(12.8)	(17.1)	(29.7)	(17.2)	(23.2)
15.	Having sex is both sides	234	195	75	107	28
	pleasure, therefore should	(36.6)	(30.5)	(11.7)	(16.7)	(4.5)
	not use prevention.					
16.	Having rewards or something	63	87	121	136	232
	in return is one of a major	(9.9)	(13.6)	(18.9)	(21.3)	(36.3)
	reason for you to have sex					
	with male.					
17.	Having sex with many people	87	110	196	142	104
	mean you are superb	(13.6)	(17.2)	(30.7)	(22.2)	(16.3)
18.	Telling one 's partner to use a	173	157	113	145	51
	condom is not appropriate	(27.1)	(24.6)	(17.7)	(22.7)	(7.9)
	since it shows distrust.					
19.	There is no need to use a	70	73	143	214	139
	condom when having sex	(10.9)	(11.4)	(22.4)	(33.5)	(21.8)
	with one's wife					
20.	Condoms should be free for	8	15	75	213	328
	all need them.	(1.3)	(2.4)	(11.7)	(33.3)	(51.3)
21.	Access to condoms is difficult	115	175	164	123	62
	when about to have sex.	(18.0)	(27.3)	(25.7)	(19.3)	(9.7)
22.	Buying condom is a burden	64	104	118	156	197
	which you should not pay for.	(10.0)	(16.3)	(18.5)	(24.4)	(30.8)

Table AC 3.8: Number and percent of MSM's practice related to HIV/ AIDS (n = 639)

Never	Seldom	Some times	Often	Usually
124	151	160	102	102
(19.5)	(23.7)	(25.0)	(15.9)	(15.9)
316	129	77	58	59
(49.4)	(20.2)	(12.1)	(9.1)	(9.2)
80	89	110	116	244
(12.5)	(13.9)	(17.2)	(18.2)	(38.2)
	Never 124 (19.5) 316 (49.4) 80 (12.5)	Never Seldom 124 151 (19.5) (23.7) 316 129 (49.4) (20.2) 80 89 (12.5) (13.9)	Never Seldom Some times 124 151 160 (19.5) (23.7) (25.0) 316 129 77 (49.4) (20.2) (12.1) 80 89 110 (12.5) (13.9) (17.2)	Never Seldom Some times Often 124 151 160 102 (19.5) (23.7) (25.0) (15.9) 316 129 777 58 (49.4) (20.2) (12.1) (9.1) 80 89 110 116 (12.5) (13.9) (17.2) (18.2)

During the last 12 months	Never	Seldom	Some times	Often	Usually
4. You used a condom when	80	70	82	139	268
you had sex with others	(12.5)	(10.9)	(12.8)	(21.9)	(41.9)
who are not your partner.					
5. You used a condom when	209	34	69	92	235
you had sex with male sex	(32.7)	(5.3)	(10.8)	(14.4)	(36.8)
workers.					
6. You used a condom when you	272	30	79	83	175
had sex with women	(42.6)	(4.7)	(12.4)	(12.9)	(27.4)
7. You are an injection drug user.	517	81	30	8	3
	(80.9)	(12.7)	(4.7)	(1.3)	(0.4)
8. You were drunk and had	266	193	136	28	16
unprotected sex	(41.6)	(30.2)	(21.3)	(4.4)	(2.5)
9. You brought condoms with	158	35	125	109	212
you when you went out	(24.6)	(5.5)	(19.6)	(17.1)	(33.2)
at night.					
10. You had sex with many	492	67	44	8	28
people at the same time	(//.0)	(10.49)	(6.89)	(1.25)	(4.38)
without changing a condom.	262	100	100	47	10
11. You did not use a condom	362	139	102		19
when you had sex with	(56.7)	(21.8)	(15.9)	(2.7)	(2.9)
your male lover.	E 4 1	70	10	7	2
12. You had STI such as	541 (04 0)	(10.0)	(2.0)		2 (0,2)
13 You got treatment for STI	(04.0)	(10.9)	(2.9)	27	(0.3)
from a reliable doctor	(63.2)	(17.7)	(11.4)	(4.2)	(3.5)
14 During the last 12 months	430	116	75	(+.2)	11
had you every joint any	(67.3)	(18.2)	(11.7)	(1.1)	(1.7)
party using drug and	(0).0)	(10)-)	()	(=)	(=)
unconsciously had sex.					
15. Were you able to refuse	201	104	215	79	40
when asked for sex?	(31.4)	(16.3)	(33.6)	(12.4)	(6.3)
16. Did you or your partner	230	120	203	61	25
practice external ejaculation.	(35.9)	(18.8)	(31.8)	(9.6)	(3.9)
17. Your male partner used	489	65	54	16	15
microbicides after sexual	(76.5)	(10.2)	(8.5)	(2.5)	(2.3)
intercourse.					
18. You had sex for a reward or	168	79	120	72	200
something in return	(26.3)	(12.3)	(18.8)	(11.3)	(31.3)
19. Your male partner received	389	111	90	22	27
a reward after sex	(60.9)	(17.4)	(14.1)	(3.4)	(4.2)
20. You had sex with many men	238	85	135	108	73
to compete who will have more	(37.3)	(13.3)	(21.1)	(16.9)	(11.4)
21. You have watched or read	28	57	132	159	263
ponographic material to	(4.4)	(8.9)	(20.6)	(24.9)	(41.2)
stimulate your sex drive.					

Appendix D

Table AD 4.1: Number and percentage distribution of sample size for IDUs in allRegions (n=444)

Site / Region	Number	Percent
North	159	35.8
Central	118	26.6
Northeast	104	23.4
South	63	14.2
Total	444	100.0

Table AD 4.2: Number and percent of demographic and Socio-economics Characteristics of IDU (n=444)

Demographic and Socio-economics Data	Number	Percent
Sex		
Male	338	76.1
Female	106	23.9
Age		
<20 yrs	16	3.6
20-29 yrs	161	36.3
30-39 yrs	204	45.9
40-49 yrs	49	11.0
50-59 yrs	13	2.9
> 60 yrs	1	0.2
Mean (SD)	31.8	(7.7)
Median (Min-Max)	31.0	(15-65)
Education attainment		
No formal education	10	2.3
Primary school (grade 6-7)	140	31.5
Secondary school (grade 9)	147	33.1
High school or equivalent (grade 12/basic		
vocational school)	112	25.2
Certificate/higher vocational school	21	4.7
Bachelor's degree	13	2.9
Master's degree	1	0.2
Marital status		
Single	243	54.7
Married	130	29.3
Separate	31	7.0
Divorced	32	7.2
Widow	8	1.8

Demographic and Socio-economics Data	Number	Percent
Religion		
Buddhism	405	91.2
Muslim	30	6.8
Christian	9	2.0
Dependents under responsibility in family		
None	121	27.3
Children < 15 years	68	15.3
Elderly > 60 years	186	41.9
Both	69	15.5
Children < 15 years old		
1 child	95	21.4
2 children	55	12.4
> 3 children	37	8.3
Mean (SD)	1.8	(1.2)
Median (Min-Max)	1	(1-7)
Elderly > 60 years		
1 elder	96	21.6
2 elders	33	7.4
\geq 3 elders	8	1.8
Mean (SD)	1.4	(0.8)
Median (Min-Max)	1.0	(1-6)
Occupation		
Do not work	106	23.9
Temporary job (workers)	189	42.6
Private business	66	14.9
Employee in a private company or shop	29	6.5
Temporary government employee	29	6.5
Agriculturist	21	4.7
Employee in government/state enterprises	3	0.7
Fisherman	1	0.2
Average monthly family income		
< 3500 Baht/month	74	16.7
3,500 - 6,999 Baht/month	156	35.1
7,000 - 11,999 Baht/month	88	19.8
12,000 - 19,999 Baht/month	18	4.1
20,000 - 29,999 Baht/month	12	2.7
30,000 - 39,999 Baht/month	4	0.9
40,000 - 49,999 Baht/month	3	0.7
50,000 - 59,999 Baht/month	2	0.5
60,000 - 79,999 Baht/month	2	0.5
> 80,000 Baht/month	1	0.2
No income	84	18.9
	-	

Demographic and Socio-economics Data	Number	Percent
Health insurance		
Universal coverage health insurance	323	72.7
Social security/workman compensation	56	12.6
Private health insurance	14	3.2
Civil servant medical benefit	7	1.6
No health insurance	44	9.9

Table AD 4.3: Number	and percent	of Drug Use	Practices of	of IDU (n=444)
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Substances used	Number	Percent
Type of addicting substance ever used (could answer more than 1)		
Injection	444	100.0
Amphetamine and amphetamine derivative	72.3	72.3
Inhalation substance	253	57.0
Type of addicting substance in last 1 year		
(could answer more than 1)		
Amphetamine and amphetamine derivative	249	56.1
Injection	172	38.7
Inhalation substance	161	36.3
Age at first drug use		
<10 yrs	2	0.5
10-19 yrs	338	76.1
20-29 yrs	98	22.1
> 30 yrs	6	1.4
Mean (SD)	17.4	(3.6)
Median (Min-Max)	16.0	(9-34)
Type of first drug taken		
Heroine	169	38.1
Amphetamine and amphetamine derivative	133	30.0
Marihuana	84	18.9
Inhalation substance; glue	58	13.1
Reasons of the first attempt at taking drugs		
Want to try	316	71.2
Persuaded by a friend	82	18.5
To deal with sadness	26	5.9
For happiness	11	2.5
To be able to work harder	9	2.0

Substances used	Number	Percent
Have you shared a needle with other IDUs?		
Never shared a needle	242	54.5
Shared needle sometimes	177	39.9
Often shareds a needle with others	21	4.7
Always shareds a needle with others	4	0.9
Source of syringe and needle		
(could answer more than 1)		
Buy from drug store	368	82.9
Friend	108	24.3
Private clinic	46	10.4
Got from local health care facility	17	3.8
Provided by employer	2	0.5
Reuse the needle		
Yes	250	56.3
None	194	43.7
How do you clean needles before reusing		
them? (could answer more than 1)		
Wash with clean water and dry it	176	39.6
Boil	97	21.8
Soak it in disinfectants	23	5.2
Wash with soap/ detergent, and then dry it	5	1.1
Never cleaned it at all	6	1.4

Table AD 4.4: Number and percentage distribution of sexual behaviour of IDU (n=444)

Sexual Behaviours	Number	Percent
Group of sexual		
Heterosexual	369	83.1
Homosexual	52	11.7
Bisexual	23	5.2
Sexual partner (both with men and women)		
during last 1 year		
Never have	35	21.4
Yes	349	78.6
1	198	56.7
2-5	118	33.8
6-9	9	2.6
10-49	21	6.0
<u>></u> 50	3	0.9
Mean (SD)	2.8	(8.2)
Median (Min-Max)	1.0	(1-120)

Sexual Behaviours	Number	Percent
Sexual intercourse (with men and women)		
during the last 6 months		
Yes	278	62.6
No	166	37.4
Protection during sexual intercourse		
during last 6 months		
Using condom	167	37.6
External ejaculation	16	3.6
Oral sex	6	1.4
Unprotected	94	21.2
Using a condom during the last sexual intercourse		
Used	203	45.7
None use	241	54.3

Table AD 4.5: Person and Media which had highest influence on IDUs' sex behaviour

 (n=444)

Person influenced their sex behavior	Number	Percent
Closed friend	177	39.9
Parent/ Relative/siblings	175	39.4
IDU group	44	9.9
Colleague	24	5.4
Hyper self-confidence	13	2.9
Health worker	10	2.3
Teacher	1	0.2
Media influenced behaviour	Number	Percent
Television	348	78.4
Book/journal	54	12.2
Internet	30	6.8
Radio	12	2.7

Table AD 4.6: Number and percentage of channels through which IDUs attain information on HIV/AIDS during the past one year (n = 444)

Attaining information on HIV/AIDS	Number	Percent
Channel		
Television	302	68.0
Campaigns such as WORLD AIDS Day	44	9.9
Leaflet, brochure, letter	37	8.3
Newspapers	13	2.9
Advertisement	12	2.7
Journal/ magazine	9	2.0
Training material	7	1.6
Internet	8	1.8
Radio	6	1.4
Community radio broadcasting	5	1.1
Exhibition	1	0.2
Person		
Health personnel (doctor, nurse, others)	250	56.3
Village health volunteer	44	9.9
Neighbour	42	9.5
Parents/ siblings	29	6.5
Classmate	28	6.3
Student	20	4.5
Social welfare worker	10	2.3
Relatives	7	1.6
Husband/ wife	7	1.6
Colleague	5	1.1
Teacher / lecturer	2	0.5
Institutions		
Hospital	248	55.9
Foundation	87	19.6
Health centre / Primary care unit	50	11.3
District health centre/ Provincial health centre	26	5.9
Health promotion centre	15	3.4
School	8	1.8
Municipality / local administration organization	5	1.1
Temple	3	0.7
Private clinic	2	0.5

		Know		Did no	not know	
	Questions	Number	Percent	Number	Percent	
1.	AIDS causes by virus resulted in immune deficiency.	425	95.7	19	4.3	
2.	HIV/ AIDS could infect people through sexual intercourse, from mother to child and blood.	429	96.6	15	3.4	
3.	HIV infected person could spread the disease even the test for HIV is - ve.	401	90.3	43	9.7	
4.	The oral sex could not prevent HIV infection.	306	68.9	138	31.1	
5.	People could get HIV/ AIDS infection from some types mosquitoes.	347	78.2	97	21.8	
6.	Touch, huge and hold hand could not transmit HIV/AIDS.	335	75.5	109	24.5	
7.	AIDS could transmitted when sharing syringe among injection drug users.	418	94.1	26	5.9	
8.	There is no HIV/AIDS prevention vaccine at present.	320	72.1	124	27.9	
9.	Appropriate self-care could help PLWHA could live normal life and delayed showing AIDS' symptoms	426	95.9	18	4.1	
10.	At present, there are drugs which could cure AIDS	392	88.3	52	11.7	
11.	External ejaculation could prevent HIV/AIDS	306	68.9	138	31.1	
12.	HIV/AIDS could spread from male to male or female to female	369	83.1	75	16.9	
13.	Having multiple sex partners are risk for HIV infection.	414	93.2	30	6.8	
14.	AIDS patients might have chronic diarrhea, common cold, loose weight, oral thrush and lymph node enlargement	425	95.7	19	4.3	
15.	Taking antibiotics before sexual intercourse could prevent HIV/AIDS infection	424	95.5	20	4.5	
16.	Using condom at every sexual intercourse could prevent HIV/AIDS	383	86.3	61	13.7	
17.	Using Addicting substance contributing to higher risks for HIV/AIDS infection	261	58.8	183	41.2	
18.	Sexual intercourse through anus also have possibility to get HIV/AIDS infection	413	93.0	31	7.0	

Table AD 4.7: Number and percentage of IDUs' knowledge on HIV/AIDS (n= 444)

	Your Opinion	Totally disagree	Disagree	Indifferent	Agree	Totally agree
1.	Using a condom when	23	73	144	148	56
	having sex reduces	(5.2)	(16.4)	(32.4)	(33.3)	(12.6)
	pleasure.					
2.	You are shy to buy condom.	44	106	171	96	27
		(9.9)	(23.9)	(38.5)	(21.6)	(6.1)
3.	Using a condom means	58	173	92	92	29
	distrust between you and	(13.1)	(39.0)	(20.7)	(20.7)	(6.5)
	your partner.					
4.	Using injecting narcotic drug,	210	134	34	29	37
	could not get HIV infection	(47.3)	(30.2)	(7.7)	(6.5)	(8.3)
5.	It is normal for men to go to	41	60	118	172	53
	brothel or getting services	(9.2)	(13.5)	(26.6)	(38.7)	(11.9)
	from sex worker.					
6.	Husband should use condom	28	127	45	166	78
	when having sex with other	(6.3)	(28.6)	(10.1)	(37.4)	(17.6)
	women but no need to use					
	it with his wife.					
7.	Spreading of HIV/AIDS is	14	97	28	167	138
	mostly caused by commercial	(3.2)	(21.9)	(6.3)	(37.6)	(31.1)
	sex workers and men having					
	sex with men.					
8.	Sexual intercourse without	14	22	22	221	165
	using condom or slip off	(3.2)	(5.0)	(5.0)	(49.8)	(37.2)
	condom could have chances					
	to get HIV infection.					
9.	Looking healthy person	61	196	63	85	39
	should not be HIV +.	(13.7)	(44.1)	(14.2)	(19.1)	(8.8)
10.	At present we should not	167	200	29	30	18
	give priority to HIV/ AIDS	(37.6)	(45.1)	(6.5)	(6.8)	(4.1)
	prevention since there are					
	anti retroviral therapy.					
11.	We should not take blood	127	185	55	52	25
	test before getting married	(28.6)	(41.7)	(12.4)	(11.7)	(5.6)
	since it shows distrust.					
12.	Blood test should be done	18	29	25	189	183
	immediately after having	(4.1)	(6.5)	(5.6)	(42.6)	(41.2)
	risk behavior.					

Table AD 4.8: Number and percentage of IDU's attitude on HIV/ AIDS (n= 444)

	Your Opinion	Totally disagree	Disagree	Indifferent	Agree	Totally agree
13.	Having sex with friend	97	227	58	43	19
	will not get HIV infection.	(21.9)	(51.1)	(13.1)	(9.7)	(4.3)
14.	It is not necessary to use	129	238	41	28	8
	condom from having sex	(29.1)	(53.6)	(9.2)	(6.3)	(1.8)
	with friend.					
15.	Having many lovers, or	94	166	105	60	19
	partners make one getting	(21.2)	(37.4)	(23.7)	(13.5)	(4.3)
	acceptance from friends.					
16.	Having more sex partners	122	154	103	47	18
	than other mean superb.	(27.5)	(34.7)	(23.2)	(10.6)	(4.1)
17.	Having sex is both sides	33	91	142	136	42
	pleasure; therefore it is not	(7.4)	(20.5)	(32.0)	(30.6)	(9.5)
	necessary to wait until					
	getting married.					
18.	Having rewards or something	85	182	96	63	18
	in return is one of a major	(19.1)	(41.0)	(21.6)	(14.2)	(4.1)
	reason for you to have sex.					
19.	Having sex at young age	92	185	91	92	185
	mean attractive.	(20.7)	(41.7)	(20.5)	(15.5)	(1.6)
20.	Shared needle with familiar	175	179	33	42	15
	people will not get AIDS	(39.4)	(40.3)	(7.4)	(9.5)	(3.4)
21.	To live together before	19	39	187	162	162
	getting married is normal.	(4.3)	(8.8)	(42.1)	(36.5)	(8.3)
22.	Condom should be free for	7	19	40	206	172
	anyone who needed.	(1.6)	(4.3)	(9.0)	(46.4)	(38.7)
23.	It is difficult for you to	51	147	119	102	25
	access to condom when you	(11.5)	(33.1)	(26.8)	(23.0)	(5.6)
	want to have sexual					
	intercourse.					
24.	Buying condom is a burden	73	120	90	116	42
	which you should not pay for it.	(16.4)	(27.0)	(21.0)	(26.1)	(9.5)

Table AD 4.9: Number and percent of IDU's practice related to HIV/ AIDS risk and prevention (n= 444)

Practice during the last one year	Never	Seldom	Some times	Often	Usually
 You had sex with someone who is not your husband or wife. 	239 (53.8)	102 (23.0)	62 (14.0)	25 (5.6)	16 (3.6)
2. You had sex with male and female sex workers	295	89	38	13	9
	(66.4)	(20.0)	(8.6)	(2.9)	(2.0)
3. You had sex with a person who is the same sex as you	350	40	27	12	15
	J. (78.8)	(9.0)	(6.1)	(2.7)	(3.4)
 You used a condom when you had sex with your husband/wife. 	242 (54.5)	69 (15.5)	65 (14.6)	25 (5.6)	43 (9.7)
5. You used a condom when you had sex outside your marriage	207 (46.6)	63 (14.2)	62 (14.0)	27 (6.1)	85 (19.1)
 You used a condom when yo had sex with male/female sex workers. 	u 243 (54.7)	36 (8.1)	33 (7.4)	28 (6.3)	104 (23.4)
7. You use a condom when havir sex with a person of the same se	ng 344	17	26	16	41
	ex. (77.5)	(3.8)	(5.9)	(3.6)	(9.2)
8. How often do you	214	89	53	39	49
inject drugs?	(48.2)	(20.0)	(11.9)	(8.8)	(11.0)
9. You share needles with other	s. 287	68	62	19	8
	(64.6)	(15.3)	(14.0)	(4.3)	(1.8)
 You bring a condom with you each time you go out at night 	229 (51.6)	60 (13.5)	57 (12.8)	27 (6.1)	71 (16.0)
11. You go out for night life.	148	142	98	26	30
	(33.3)	(32.0)	(22.1)	(5.9)	(6.8)
12. You do not change your behaviour after knowing tha your colleague is HIV positiv	147 (33.1) /e	50 (11.3)	50 (11.3)	48 (10.8)	149 (33.6)
13. You use a condom when having sex with your lover.	205	66	60	29	84
	(46.2)	(14.9)	(13.5)	(6.5)	(18.9)

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Practice during the last one year	he	Never	Seldom	Some times	Often	Usually
14. You have ever had a	an STI	398	26	12	4	4
such as Syphilis, Go	norrhoea	(89.6)	(5.9)	(2.7)	(0.9)	(0.9)
15. You got treatment f	or an	266	61	53	19	45
STI from a reliable	doctor.	(59.9)	(13.7)	(11.9)	(4.3)	(10.1)
16. You used a condom	when you	202	68	75	26	73
had sex with your g	irlfriend.	(45.5)	(15.3)	(16.9)	(5.9)	(16.4)
17. During the last 12 r	nonths,	225	84	85	23	27
how often had you e	ever joint	(50.7)	(18.9)	(19.1)	(5.2)	(6.1)
any party using dru	g and					
unconsciously had s	sex?					
18. You had sex after		240	70	78	30	26
taking a drug.		(54.1)	(15.8)	(17.6)	(6.8)	(5.9)
19. You had sex with m	ore	397	26	13	3	5
than one person at	the	(89.4)	(5.9)	(2.9)	(0.7)	(1.1)
same time.						

Appendix E

Table AE 5.1: Number and percentage of channels for information on HIV/AIDS of MSM (n = 639)

Channela	Yes		Never	
Channels	Number	Percent	Number	Percent
Television	380	79.8	96	20.2
Advertising Cutout	252	52.9	224	47.1
Newspapers	250	52.5	226	47.5
Campaign such as WORLD AIDS Day	240	50.4	236	49.6
Leaflet, brochure, letter	223	46.8	253	53.2
Internet	216	45.4	260	54.6
Journal/ magazine	212	44.5	264	55.5
Radio	195	41.0	281	59.0
Exhibition	148	31.1	328	68.9
In-service training	85	17.9	391	82.1
Community Broadcasting	79	16.6	397	83.4

Table AE 5.2: Number and percent of channel for attaining information on HIV/ AIDS of IDU (n = 444)

Channels	Yes		Never	
Channels	Number	Percent	Number	Percent
Television	345	87.8	48	12.2
Leaflet, brochure, letter	181	78.0	51	22.0
Campaign such as WORLD AIDS Day	277	70.5	116	29.5
Advertisement	255	64.9	138	35.1
Newspaper	233	59.3	160	40.7
Radio	206	52.4	187	47.6
Journal/ magazine	172	43.8	221	56.2
Exhibition	153	38.9	240	61.1
In-service training	131	33.3	262	66.7
Community radio broadcasting	95	24.2	298	75.8
Internet	70	17.8	323	82.2

Table AE 5.3: Number and percentage of counselling services including sex education and information on sexually transmitted infections (STI) of MSM (n = 639)

Counselling services including sex	Yes		Never	
transmitted infections (STI) and HIV/AIDS	Number	Percent	Number	Percent
HIV and STI prevention	142	80.2	35	19.8
Overall knowledge on HIV and STIs	139	78.5	38	21.5
Sex education	127	71.8	50	28.2
VCT and STI check up	77	43.5	100	56.5
Treatment of HIV and STIs	77	43.5	100	56.5

Table AE 5.4: Number and percentage of counselling services including sex education and information on sexually transmitted infections (STI) of IDU (n = 187)

	Yes		Never	
	Number	Percent	Number	Percent
Causes of HIV and STIs	170	90.9	17	9.1
AIDS and STI prevention	168	89.8	19	10.2
Sex education	161	86.1	26	13.9
VCT and STI check up	137	73.3	50	26.7
Treatment of HIV and STI	128	68.4	59	34.6

CHAPTER 3

Identifying information regarding effectiveness and cost-effectiveness of policy and strategies reorientation to mitigate the impact of HIV/ AIDS in Thailand

1. Background

In Thailand in recent years, as in other developing countries, there has been an increasing impetus to justify resource allocation decisions in the health sector, especially after the introduction of the universal health insurance coverage policy in 2001.[1] The term "evidence-based decision making" was, therefore, introduced to ensure that decisions about health and health care are based on the best available knowledge. To use such an approach it is necessary to appraise what constitutes evidence in relation to health-enhancing interventions. While it is still a common practice to use data on effectiveness to justify health care resource allocation, decision makers, academics and health care professionals are becoming more interested in health economic evaluation, which is designed to guide explicit health resource allocation decisions. This is done by comparing the marginal costs and consequences of alternative health care interventions.[2]

The second edition of "Disease Control Priorities in Developing Countries" hereafter "DCP2", aims to support a World Bank initiative in the late 1980s which sought informative evidence to guide policy makers in identifying cost-effective interventions for combating major health problems.[3] This is important because evidence suggests that proven effective and cost-effective interventions could save millions of lives in developing countries.

However, the prioritisation of strategies for dealing with sexually transmitted infections and HIV/AIDS, which are among the highest disease burdens in Thailand and many other developing countries, appeared in chapters 17 and 18 of the DCP2 respectively, and was done with several limitations.[3] Firstly, a lack of reliable evidence regarding the effectiveness and cost-effectiveness of many potential strategies was

addressed throughout the chapters. This underlines the fact that many HIV/AIDS programs have been carried out without close monitoring, and rarely incorporated well-defined control groups necessary to show the effectiveness of the intervention. In addition, the authors did not comprehensively and systematically search for evidence, which resulted in the exclusion of a number of published and unpublished literature.

Secondly, the book provides policy recommendations across health care settings which raise concerns about the transferability of the findings from one setting to another. For example, the infrastructure, social and cultural issues that are specific to the Thai health care system may not be well recognised. Lastly, there were no clearly defined strategic plans for the implementation of the recommendations. Some of the recommendations such as school-based education or peer-based programs are too broad, and would need fine tuning before implementation.

This project therefore aims to elaborate on the achievement of DCP2 by offering precise information about the effectiveness and cost-effectiveness of HIV/AIDS interventions that are specific to the Thai setting. This information will be crucial for guiding public investment to lessen both the short and long-term impact of HIV/AIDS in Thailand.

In addition, in the context of universal access to ART, evidence from the National AIDS Spending Assessment indicates a decreasing proportion of expenditure on prevention interventions, hence the need to revitalize HIV prevention. By assessing the effectiveness and cost-effectiveness of prevention interventions, this paper provides useful data that will hopefully guide policy makers in their resource allocation decisions.

2. Objectives

- To produce a comprehensive list of prevention interventions that are likely to be cost-effective under the Thai setting (the list will include both interventions that are currently available and not available in Thailand);
- To identify information gaps at the national and international levels concerning the effectiveness and/or cost-effectiveness of HIV/AIDS prevention interventions in general and/or in relation to specific population groups.

3. Methodology

A. Criteria for considering studies for this review

The primary criteria for selection of studies was that they report the effectiveness or cost effectiveness of HIV prevention intervention(s). Nevertheless, the effectiveness of such interventions can be measured in a number of ways. Figure 3.1 shows the concept of outcome hierarchies that emphasize the difference between 'proximal', 'intermediate' and 'distal' outcomes of HIV interventions. It can be seen that the scale of immediate measures of effectiveness of HIV intervention are characterised by the change in knowledge, attitude, perception and skills of the individuals. In many HIV programs, the changes were reported in terms of trust, caution and received assurances. Further along the continuum, these immediate changes can subsequently affect the determinants of health or health behavior, for example, condom use, abstinence or fewer partners in the case of HIV/AIDS interventions. Finally, changes in incidence or morbidity or mortality should be evaluated as the final or ultimate goal of the program.

Behavior intentions: attitude, knowledge, Trust, Caution, Received assurances	Behavior change or Risk exposure: condom use, fewer partners	Health indicators: HIV incidence, morbidity, mortality
Immediate Outcomes	Intermediate Outcomes TIME	Final Outcomes



As it is not always the case that changes in immediate outcomes lead to changes in intermediate and final outcomes, this study considered only the effectiveness of interventions in terms of the changes in HIV risk behaviour (intermediate outcomes) and HIV incidence (final outcomes). Furthermore, the review included only economic evaluation studies that presented the results in terms of cost per HIV infection averted, or cost per Quality-Adjusted Life Year (QALY) gained, or cost per Disability- Adjusted Life Year (DALY) gained.

B. Sources of information

The review gave a higher priority to studies conducted within the Thai setting. These studies better recognise the limitations of resources and

infrastructure that are specific to the health care system in Thailand, and the effectiveness of the many interventions which are determined by different context specific factors. The review of the Thai literature, therefore, included both published and unpublished (grey) literature such as research reports, Master's dissertations or Ph.D. theses, which are considered to be important in the Thai context. If the local data on the effectiveness or cost-effectiveness of interventions were available, then no further search for international evidence was made. For interventions with no supporting local evidence, a systematic search for evidence from international databases was done. Box 3.1 provides detailed information of data sources used for the review.

Box 3.1: A list of databases that were used for reviewing information on the effectiveness and cost-effectiveness of HIV/AIDS prevention.

Domestic databases:

- Thai HTA database (<u>http://www.db.hitap.net/</u>);
- Health Systems Research Institute database (http://www.hsri.or.th)
- Journal of Health Science (<u>http://pubnet.moph.go.th</u>)
- Thai thesis database (<u>http://thesis.tiac.or.th</u>)
- Thai Index Medicus (http://161.200.96.194)
- The Thailand Research Fund (<u>http://www.trf.or.th</u>)
- International Health Policy Program (<u>http://ihpp.thaigov.net</u>)
- Research Library of National Research Council of Thailand (<u>http://www.riclib.nrct.go.th</u>)
- Raks Thai Foundation
- PHAMIT
- International Organization for Migration (IOM)

International databases:

- Pubmed;
- Cochrane library:

Because the Thai databases were quite small and the intent was to include as many studies as possible in the review, only 'AIDS' OR 'HIV' were used as keywords for searching from Thai databases.

For international databases, various keywords and search strategies were used to identify the relevant papers. Table 3.1 reveals keywords and search strategies used for the Pub Med database. For Cochrane, we used 'searched by topic' by selecting 'HIV/AIDS'.

Sear	ch 1 : International evidence for cost-effectiveness analysis	abstracts
#7	#4 AND #6 Limits: Publication Date from 1997/01/01 to	236
	2008/04/30, English	
#6	#4 AND Review	444
#5	#4 Limits: Publication Date from 2005/01/01 to 2008/04/30, English	513
#4	#3 AND economics	3660
#3	#1 AND #2 NOT Vertical Transmission	41452
#2	Prevention and Control OR Primary Prevention OR	722080
	Intervention Studies OR Early Intervention	
#1	Acquired Immunodeficiency Syndrome OR HIV	220908
Sear	ch 2 : International evidence of effectiveness	
#8	#7 Limits: Publication Date from 1997/01/01 to 2008/04/30, English	102
#7	#5 AND Review	126
#6	#5 Limits: Publication Date from 2005/01/01 to 2008/04/30, English	373
#5	#4 NOT Vertical transmission	1288
#4	#1 AND #2 AND #3	1482
#3	Randomized Controlled Trial	302239
#2	Prevention and Control OR Primary Prevention OR Intervention	785868
	Studies OR Early Intervention	
#1	Acquired Immunodeficiency Syndrome OR HIV	221573
Sear	ch 3 : International evidence by risk group	
#23	#22 Limits: Publication Date from 2005/01/01 to 2008/07/31, English	4
#22	#1 AND #2 AND #5 AND #21	5
#21	migrant worker	6549
#20	#19 Limits: Publication Date from 2005/01/01 to 2008/07/31, English	50
#19	#1 AND #2 AND #5 AND #18	163
#18	iv drug user	10036
#17	#16 Limits: Publication Date from 2005/01/01 to 2008/07/31, English	49
#16	#1 AND #2 AND #5 AND #15	130
#15	Search Male Homosexuality OR gay	19013
#14	#13 Limits: Publication Date from 2005/01/01 to 2008/07/31, English	35
#13	#1 AND #2 AND #5 AND #12	107
#12	prostitution OR "sex workers"	5017

Table 3.1: Keywords and search strategies used for Pub Med

Sear	ch 3 : International evidence by risk group	abstracts
#11	#10Limits: Publication Date from 2005/01/01 to 2008/07/31, English	8
#10	#1 AND #2 AND #5 AND #9	18
#9	discordant*	12552
#8	#7 Limits: Publication Date from 2005/01/01 to 2008/07/31, English	22
#7	#1 AND #2 AND #5 AND #6	77
#6	breast feeding	23834
#5	#3 OR # 4	688368
#4	observation	161732
#3	Randomized Controlled Trial	305945
#2	Prevention and Control OR Primary Prevention OR	
	Intervention Studies OR Early Intervention	903379
#1	Acquired Immunodeficiency Syndrome OR HIV	225001

C. Types of studies

For the purpose of this review, studies were identified as being one of the following design types:

- 1. Systematic review and meta-analysis of randomised controlled trials (RCTs)
- 2. Systematic reviews of case controls or cohort studies
- 3. Case control studies
- 4. Cohort studies

Descriptive or qualitative reports were deliberately excluded from the review. Because the above information is vulnerable to different degrees of bias, systematic review and meta-analysis of high quality RCTs are the most favourable data sources [2].

The advantages of using systematic reviews of clinical effects are two fold: First, a more precise estimate can be attained from combining the outcome data from a number of studies. Second, by using the results from studies carried out in a range of settings, assuming that these studies are sufficiently homogenous to be comparable, the estimate can then be applied to a more general patient population with different baseline risks, rather than specifically for a population group selected for an individual trial. In cases where a meta-analysis of RCT(s) was not available for particular reasons, then evidence available in a higher hierarchy, based on Table 3.2, which presents a broad agreement on the level of clinical evidence, was considered.

Table 3.2: Levels of clinical evidence

1++	Systematic reviews & meta-analyses of RCTs or RCT(s) conducted
	in Thailand with a very low risk of bias.
1+	Systematic reviews & meta-analyses of RCTs or RCT(s) conducted
	internationally with a very low risk of bias.
1-	Systematic reviews & meta-analyses of RCTs or RCT(s) conducted
	in Thailand with a high risk of bias.
1	Systematic reviews & meta-analyses of RCTs or RCT(s) conducted
	internationally with a high risk of bias.
2++	Systematic reviews of case control or cohort studies conducted
	in Thailand with a very low risk of confounding, bias, or chance
	and a high probability that the relationship is causal.
2+	Systematic reviews of case control or cohort studies conducted
	internationally with a very low risk of confounding, bias, or chance
	and a high probability that the relationship is causal.
2-	Case control or cohort studies conducted in Thailand with a high
	risk of confounding, bias, or chance and a significant risk that the
	relationship is not causal.
2	Case control or cohort studies conducted internationally with
	a high risk of confounding, bias, or chance and a significant risk
	that the relationship is not causal

Adapted from [2]

Economic evaluation can be carried out using a number of different perspectives. These range from the broadest societal perspective, which includes all health and non-health care expenses paid by health providers, health insurers, patients' employers and households, to a narrow individual patient perspective, which only includes expenses paid by patients. As there is general consensus among health economists that the societal perspective is the most useful for priority setting in health care, this review compared the value for money of different HIV/AIDS preventive interventions using a societal viewpoint. However, if the economic evidence of the societal viewpoint was not provided, only the health care provider perspective was used.

In addition, different monetary currencies and unit costs associated with particular resources between locations and overtime are among the most commonly cited obstacles to applying economic evaluation findings across settings. This study adjusted all cost-effectiveness ratios in a common currency, the international dollar, and at present value-2008, using the local Consumer Price Index (CPI) from the study country and Purchasing Power Parity (PPP) information from the World Bank (12.609 National currency per current international dollar).

D. Scope and types of interventions

Interventions under this investigation were those that showed evidence of reducing HIV incidence or risk behaviour likely to affect horizontal and vertical HIV transmission. The set of interventions was not restricted to those in practice in Thailand or funded by the Thai government. It also covered interventions provided at all levels, i.e. individuals, groups, and communities, which are likely to be beneficial in the reduction of the HIV/ AIDS epidemic worldwide.

Given that a wide range of interventions were included in this study, it is vital that they have clear definitions and detailed information. This would help to ensure better understanding of each specific intervention, its delivery mode, and target population group. A lack of clarity and descriptive detail of specific interventions makes it difficult to assess and/ or compare their effectiveness and cost-effectiveness in different settings. It is also impossible to make sensible recommendations for policy decision making if there are no concise definitions for commonly implemented intervention approaches.

It is necessary that this study establish or adopt a standard structure on how to define and classify interventions for the prevention of HIV/AIDS. Fortunately, a recent framework for classifying HIV prevention interventions proposed by UNAIDS serves this purpose well. The UNAIDS framework recommends that an intervention should be defined based on: i) foundation of brief description including descriptions of activities or services and commodities provided in the intervention and, when relevant, key message content included with the intervention, and ii) detail codified in quality standards namely message content, the method of delivery, target population, setting and the desirable outcomes, and its theoretical ground (see Figure 3.2).





The same UNAIDS report also provides guidance for classifying HIV prevention interventions. Based on its recommendations, interventions are grouped into five broad categories as follows:

- 1. interventions that affect knowledge, attitude and beliefs and influence psychological and social correlates of risk;
- 2. harm reduction interventions that lower the risk of a behaviour, but do not eliminate the behaviour;
- 3. biological/biomedical interventions that strive to reduce HIV infection and transmission risk;
- mitigation of barriers to prevention and negative social outcomes of HIV infection; and
- 5. mitigation of biological outcomes of HIV infection. However, as the fifth category was not related to HIV prevention interventions, it was not included in the review.

From the above recommendations, we provide a definition and classification of each HIV prevention intervention in Table 3.3. Table 3.3: Classification and definition of HIV prevention interventions under the review

Name of intervention	Activities, services, commodity	Message content (if relevant)	Delivery mode	Target population/ setting	Outcomes/ theory
I. Intervention.	s affecting knowledge, attitudes and	beliefs and influencing	ı psychological	and social risk co	orrelates
Abstinence	Abstinence-only programs often target family involvement and community norms, as well as individual behaviour by addressing multiple influences on knowledge, attitudes, and values. Abstinence-plus program promote sexual abstinence as the best means of preventing HIV, but also encourage condom use and other safer-sex practices for sexually active participants.	the social, health- related, and psychological benefits of abstaining from sexual activity-most of them note the potential harm of sexual activity outside marriage	Varies	young people (10-24 years) who may not yet have initiated sexual activity	to encourage both primary abstinence (remaining a virgin) and secondary abstinence (returning to abstinence after sexual activity) to refrain from sexual activity/ theoretical underpinnings include social learning theory, the health- belief model, cognitive-behavioural theory, the theory of social inoculation, the culture of poverty perspective, and utility maximization perspectives
Community- based education (including opinion leader programs)	This program affects community-wide behaviour change. In this approach, popular opinion leaders are trained to disseminate risk reduction messages to their peers, and thereby influence other group members to re-evaluate their own HIV risk, modify their attitudes toward safer sexual practices, and change their behaviour.	Varies	Varies	Broad population base	Social change theory

Outcomes/ theory	Varies: includes diffusion-based interventions that strive to affect behaviour through the dynamics of social networks	Enhanced self-efficacy	Varies: reduced HIV-related risk behaviour, changes in social norms	To increase uptake of VCT and early recruit to ART if positive, or maintain low risk behavior in the population when detected negative
Target population/ setting	Typically targeted to smaller, unique populations	Young people (10-24 years)	Typically large segments of the population, but content can be targeted to subpopulations	People visiting health care facilities for any purpose
Delivery mode	Peer educators, trained outreach workers	Varies	Television, radio, public events	Healthcare providers
Message content (if relevant)	Varies: e.g. mitigation of stigma and discrimination towards people living with HIV	It is being adopted as a means to empower young people in challenging situations.	Varies e.g. people in the community are at risk of HIV infection through sexual behaviour	e.g. Uptake of client-initiated HIV testing and counselling has been hampered by many of the same factors that limit uptake of other HIV-related services,
Activities, services, commodity	The peer education intervention is a model of training that supports participants to develop and then deliver information to their peers.	LSBE refers to an interactive process of teaching and learning which enables learners to acquire knowledge and to develop attitudes and skills which support the adoption of healthy behaviour.	Mass communication potentially to influence social norms, expectation and behaviour related to HIV/AIDS	All patients are offered HIV testing and consent to be tested is implied as with any other clinically indicated laboratory test; patients may opt out if they do not want to be tested.
Name of intervention	Peer education intervention	Life Skills- Based Education (LSBE)	Mass media campaigns	Provider- initiated HIV counselling and testing (PICT)

Name of intervention	Activities, services, commodity	Message content (if relevant)	Delivery mode	Target population/ setting	Outcomes/ theory
		including stigma and discrimination, limited access to treatment, care and health services in general, as well as gender issues.			
School- based education	School-based education programs, an aspect of information, education, and communication, provide information to young people and reinforce healthy norms in a school setting.	Varies	Teacher, healthcare provider	School children	Varies
Voluntary counselling (with/ without HIV testing)	Individual or group of people are taught about HIV/AIDS. When HIV testing is performed, counsellors notify their clients of their HIV status and provide counselling support to help them cope with the outcome. This intervention must be performed on a voluntary basis.	Causes and risk factors of AIDS, the steps necessary to prevent HIV infection, and how to prevent the spread of the disease for those who have already been infected with HIV	Trained counsellor	Varies	Varies
Workplace- based education (including prison-based education)	This program communicates HIV pre- vention messages to employees in ei- ther formal or informal settings, acts as a role model for behaviour change, and distributes and demonstrates the correct use of condoms.	Varies	healthcare provider, peer- educator, trainer	Varies	Varies
Name of intervention	Activities, services, commodity	Message content (if relevant)	Delivery mode	Target population/ setting	Outcomes/ theory
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Workplace- based education (including prison-based education)	This program communicates HIV prevention messages to employees in either formal or informal settings, acts as a role model for behaviour change, and distributes and demon- strates the correct use of condoms.	Varies	healthcare provider, peer- educator, trainer	Employee	It induced changes in knowledge, attitudes, and risk behaviour.
II. Harm reduc	tion interventions that lower the risk	of a behaviour, but do	not eliminate	the behaviour	
Male and female condom use and/or distribution	This program provides free condoms in readily visible and accessible sites through health care facilities and private businesses (through social marketing) serving populations at high risk of STIs and HIV.	1	Varies, but typically free distribution in public settings	Sexually active at-risk in dividuals	Decrease risk from unprotected sexual intercourse
Needle and syringe exchange	This program provides a way for those IDUs who continue to inject to safely dispose of used needles and syringes and to obtain drug injection equipment at no cost. It provides a range of related prevention and care services that are vital to helping IDUs reduce their risks of acquiring and transmitting blood-borne viruses as well as maintain and improve their overall health.		Most typically community- based	Injecting drug users	Decrease use of contaminated injection equipment
Needle social marketing	The intervention aimed to reach all IDUs at both detoxification centres and local health institutions e.g. drug stores, community hospitals and private clinics. In detoxification centres, the intervention mainly consisted of health education provided by health workers. In the community, health workers or peer educators visited drug users'		Most typically community- based	Injecting drug users	Decreased use of contaminated injection equipment

Name of intervention	Activities, services, commodity	Message content (if relevant)	Delivery mode	Target population/ setting	Outcomes/ theory
	homes or places where they gathered. The Intervention included face-to- face health education, dispensing and recalling needles. Drug users could also collect materials/needles from the local hospitals or Centres from the local hospitals or Centres from peer educators.				
III. Biological	/biomedical interventions that strive	to reduce HIV infectio	n and transmi.	ssion risk	
Anti- retroviral prophylaxis for vertical HIV transmission	It is a combination between HIV counselling and testing, anti-retroviral prophylaxis and breastfeeding substitution. The Thai PMTCT program provides free services for voluntary HIV counselling and testing (VCT) for all pregnant women (approximately 0.8 million per annum), at first antenatal visit and at 28 weeks. HIV infected pregnant women receive free antiretroviral drugs, breast milk substitutes for 12 months and counselling with their partner to test their newborn babies at 12 and 18 months, and recruit them into universal ART programs when CD4 counts indicate the necessity.		Primarily clinic-based, which is linked to antenatal services	Infants born to HIV-positive mothers	Reduction in mother-to-child transmission and prevalence/ incidence of HIV positive infants
Breastfeeding substitution for HIV positive mothers	Require access to clean water for feeding preparation	1	Via distribution of feeding substitutes	HIV-positive mothers and their infants	Reduction in mother-to-child transmission and prevalence/ incidence of HIV positive infants

Name of intervention	Activities, services, commodity	Message content (if relevant)	Delivery mode	Target population/ setting	Outcomes/ theory
Diagnosis and treatment of sexually transmitted infections	The process should be confidential, voluntary and non-coercive and include all sexual partners involved with each STI patient.	1	healthcare provider, typically clinic-based	Varies	Reduced prevalence of sexually transmitted infections-thought to also reduce HIV incidence
Drug treatment including drug substitution treatment	Methadone administered orally as syrup is the pharmacological agent that is most commonly used for substitution treatment of opioid dependence worldwide. There are two types of interventions. 1) Methadone maintenance treatment (60 mg/day or more) 2) Detoxification, the schedule is completed in 90 days. Data about HIV risk behaviour was reported for weeks one and two of treatment while participants were stabilised on methadone (40 mg/day) and weeks five and six at the commencement of the dose taper		healthcare provider	Injecting drug users/specialist drug and alcohol treatment program	Decreased dependence on injecting drugs and therefore minimize use of contaminated injecting equipments
HIV vaccine	The first efficacy trial (Phase III) in Thailand of an HIV candidate vaccine (containing gp120 B and E subtypes) was initiated in 1999. It was conducted among injection drug users attending 17 Bangkok Metropolitan Administration (BMA) drug-treatment clinics. Eligibility criteria were: aged 20-60 years, drug injection during the previous year, being negative for HIV-1 by	,	healthcare provider	varies	Reduced incidence of HIV infection

Name of intervention	Activities, services, commodity	Message content (if relevant)	Delivery mode	Target population/ setting	Outcomes/ theory
	ELISA at screening and baseline. Vaccine or placebo was injected intramuscularly at months 0, 1, 6, 12, 18, 24, and 36 (36 months of follow-up). The primary end point for vaccine efficacy was HIV-1 infection.				
Male circumcision	Male circumcision is the surgical removal of all or part of the foreskin of the penis.	1	healthcare provider	Males/typically clinic-based	Reduced biological risk of HIV acquisition
Mass or community treatment of sexually transmitted infections	The treatment consisted of azithromycin (1,000 mg single dose oral), ciprofloxacin (250 mg single dose oral) and metronidazole (2.0 g oral). Ciprofloxacin (FDA category C) was not given to pregnant women, who instead received cefixime 400 mg oral. Metronidazole (2.0 g oral) is the recommended single-dose regimen for trichomoniasis and provides short-term remission in 70-85% of cases of bacterial vaginosis; it is safe in pregnancy (FDA category B). Benzathine benzylpenicillin (2.4 million IU intramuscular injection) was given in the home to TRUST (Toluidine Red Unheated Serum Testthe syphilis screening)-positive intervention-group participants		healthcare provider	All consenting adults aged 15-59 years were given directly observed treatment of STI at home every ten months, irrespective of laboratory testing results or the presence of symptoms.	Reduced prevalence of sexually transmitted infections-thought to also reduce HIV incidence

Name of intervention	Activities, services, commodity	Message content (if relevant)	Delivery mode	Target population/ setting	Outcomes/ theory
	within 24 hr of serum collection; treatment was based on serological findings, since the administration of injections to uninfected individuals would be unacceptable. The drug regimen was given over 2 days (azithromycin and ciprofloxacin in day 1; metronidazole and intramuscular benzathine benzylpenicillin on day 2).				
Microbicides	Microbicides are compounds formulated as gels, films, foams, suppositories, or creams and which, when inserted into the vagina, will prevent male-to-female transmis sion of HIV and other STIs. Nonoxynol-9, one potential vaginal microbicide, is widely used spermicide. The dosage ranged from 70 to 1,000 mg depending on the dosage form.	1	Varies, but typically free distribution in public settings	All women were advised to use vaginal microbicides prior to each episode of intercourse.	One of the important concepts in vaginal microbicide development is that it is a female-controlled method that does not necessarily require negotiation with a male sexual partner for use especially in the context of lower power relationship.
Post- exposure prophylaxis	Two or more antiretroviral drugs are recommended for duration of 4 weeks to reduce the likelihood of HIV infection after potential exposure, either occupationally or through sexual intercourse.	1	healthcare provider	Healthcare workers, rape victims and others exposed to bio hazardous material	Reduced incidence of HIV infection

Outcomes/ theory	Reduction in iatrogenic transmission of HIV through transfusion of blood/and blood products		Economic empowerment. May also reduce secondary transmission of HIV	A more restrictive alcohol policy through supply and dem- and side interventions reduces alcohol consumption, which in turn decreases risky sexual activity.
Target population/ setting	Recipients of blood products/and donated organs		Individuals and families economically affected by AIDS	Legislators, politicians decision-makers
Delivery mode	healthcare provider	HIV infection	Varies, individuals, microfinance and microcredit, social protection, insurance	Legal system
Message content (if relevant)	1	e social outcomes of h	1	
Activities, services, commodity	Blood screening should be anonymous, the test result cannot be linked with the person whose blood has been tested, other than by the person themselves or a counselor. Normally the blood sample is given a number or code, so that the person can be contacted if their results are positive.	of barriers to prevention and negative	The intervention employs such assets as savings accounts, family microenterprises, and scholarships to fight poverty and promote health and social functioning. For example; loans were administered for the development of income generating activities with a group lending model.	1
Name of intervention	Screening blood products and donated organ for HIV	IV. Mitigation	Microfinance	Increases in alcohol taxes

E. Description of studies

A search of Thai databases was carried out and a total of 932 abstracts were initially identified (see Figure 3.3). Of these, 890 abstracts were excluded based on our exclusion criteria namely: i) publications of the same study, ii) descriptive studies, iii) assessment of satisfaction, knowledge and attitude towards HIV/AIDS, risk behaviour and program activities (not outcomes), iv) reports of case studies, v) unit cost analysis.

Of the 42 papers reviewed, only 14 were found to be relevant and included in the analysis. Of the 28 papers excluded, 25 reported only immediate outcomes of the HIV prevention programs. For example, two papers which reported the effectiveness of the distribution of condom vending machines in the communities, only used numbers of condoms sold per machine and/or customer's satisfaction as their outcome measures. [6, 7] Three other papers that evaluated drug regimens for the prevention of vertical HIV transmission were excluded because the regimen under investigation, i.e. AZT only regimens, is now not in clinical practice in Thailand. [8-10]



A total of 1392 abstracts were identified through international searches (see Figure 3.4). Of these, 1203 studies were eliminated because they were editorials, descriptive, or qualitative reports. Also excluded were a number of studies that assessed the effectiveness and cost-effectiveness of programs for the prevention of mother-to-child HIV transmission because Thai studies had already been identified. The full text of the remaining 189 studies was reviewed and 71 studies were found to be relevant and included in the analysis in the final stage.





4. Results

Table 3.4 Summarizes the effectiveness and cost-effectiveness of each HIV prevention intervention based on the review of domestic and international studies. It was not surprising that a much larger proportion of effectiveness and cost-effectiveness studies were conducted in international settings, mainly the US followed by Sub-Saharan Africa. There were more effectiveness studies than cost-effectiveness studies conducted for HIV prevention within the Thai setting (11 effectiveness studies vs. 3 cost-effectiveness studies). More effectiveness studies were identified than cost-effectiveness studies from international settings (45 effectiveness studies vs. 26 cost-effectiveness studies).

Furthermore, most of the assessments focused on interventions affecting knowledge, attitudes and beliefs (48/95 or 51%), followed by biological/ biomedical interventions (28/95 or 29%), harm reduction interventions (16/95 or 17%) and, lastly, mitigation of barriers to prevention and negative social outcomes of HIV infection (3/95 or 3%).

Table 3.4: Summary of the effectiveness and cost-effectiveness evidence of HIV prevention interventions

Population .			Eff	ectiveness		° –	st-effectiven	- SS:
Population Level of Settings evidence	Level of Settings evidence	Settings		Findings	Perspective	Setting	Comparators	Incremental cost- effectiveness ratio(
ions affecting knowledge, attitude	ing knowledge, attitude	dge, attitude	Ö	s and beliefs and influencir	ig psycholog	iical and	social risk o	orrelates
Young people 1+ High-income No countries can	1+ High-income No countries can	High-income No countries can	No can	evidence that the programs reduce HIV risk. [11]	NA	NA	NA	NA
Young people 1+ High-income It f effe countries inci ung of s of 5	1+ High-income It f countries effe ung of s on l	High-income It f countries effe inci unp of s on l	It f effé inci unç of s use use on l on l	ound a significantly protective ect on sexual risky behaviours i.e. dence and frequency of protected/protected sex; number exual partners; increased condom .: However, no significant effect biological outcomes i.e. incidence 3TI and pregnancy. [12, 13]	NA	NA	NA	М
Young girls 1 US Durin a hea interv behav use o and a and a [14,:]	1 US Durin a hea interv behav use o and a and a	US Durin a hea interv behav use o and a and a	Durin a hea interv behav use o use o and a and a	g 3-12 months of follow-up at Ith care setting, the rention reduced sexual risk <i>i</i> or (e.g., vaginal sex without f condom, giving oral sex, lcohol and drug use before sex). L5]	NA	AN	NA	N
Young 1 South Africa Ther people in impr rural areas of fo	1 South Africa Ther impr and s of fo	South Africa Ther- impr and s of fo	Ther impr and s of fo	e was no significant ovement for HIV sero-status exual risk behavior after 2 years llow-up. [16]	NA	AN	NA	A
Injecting 2- Thailand Drug drug users drug users signif	2- Thailand Drug equip signif	Thailand Drug equip signifi montl	Drug equip signifi month	use and sharing injection ment with others was not cantly decreased after 1 h follow-up. [17]	NA	Ч	NA	МА

"Revitalising HIV prevention in Thailand: a critical assessment"

			Effe	ectiveness		ő	st-effectivene	SS
Interventions	Population	Level of evidence	Settings	Findings	Perspective	Setting	Comparators	Incremental cost- effectiveness ratio(s)
Community- based education	Women living in low income housing developments	<u>+</u>	sn	The intervention improved HIV knowledge, partner communication, risk-reduction behavioral intentions, and condom use, and decreased perceived barriers to condom use after 6-12 months follow-up. [18, 19]	Societal	S	'do nothing'	ICER is PPP\$ 2,551,240 per HIV infection averted. [19]
Community- based inter vention (Sonagachi)	Female sex worker	2+	India	HIV prevalence among sex workers (< 10%) had been lower than the national average (~30%). [20]	NA	NA	NA	NA
Community- based education (including opinion leader program)	Men who have sex with men	+	Various	The interventions were effective in reducing unprotected sex by 35% at follow-up intervals ranging from 4 months to 1 year. They were also effective in increasing reported condom use during anal intercourse by 59 %. [21, 22]	Societal	SU	'do nothing'	ICER is PP\$ 165,346 per HIV infection averted [23]
Mass media campaigns	general population aged 17-45 years	2	SN	The media campaign would increase condom use from 48 to 57%. [24]	Health care provider's	US	'do nothing'	ICER is PPP\$ 87,124 per HIV infection averted. [24]
Peer education intervention	Injecting drug users		Sn	After 6 months of follow-up, the intervention produced a 29% greater decrease in overall injection risks relative to the control (OR 0.71; 95%CI 0.52- 0.97), and a 76% decrease compared with baseline. Sexual risk behaviour and safe injection were also decreased from baseline, but they did not differ between trial arms. [25, 26]	٩ ٧	٩.	Ą	٩

SSS	Incremental cost- effectiveness ratio(s)	A	A	МА
ost-effectivene	Comparators	Ч	NA	NA
Ŭ	Setting	A N	NA	NA
	Perspective	A	Ч. Х	Ŋ
ectiveness	Findings	Peer-mediated interventions were associated with an increase in protected sex after 5 years follow-up. Female sex workers (FSW) who received peer interventions had more consistent condom use with clients compared with unexposed FSW (86.2% vs 64.0%; adjusted odds ratio = 3.6, 95% CI = 2.1-6.1). These differences were larger among female sex workers with greater peer- intervention exposure. HIV prevalence was 25% (17/69) in FSW attending \geq 4 peer-education sessions, compared with 34% (25/73) in those attending 1-3 sessions (P= 0.21). [27]	Peer education was less effective in sexual behaviour change among MSM. No significant difference between control and intervention group in the proportion reporting unprotected anal intercourse (OR = 1.12, 95%CI 0.81- 1.55) and negotiated safety (OR = 1.11, 95% CI 0.79-1.57). [28-30]	The intervention improved neither condom use nor number of sexual partners after 2 years follow-up. The percentage of
Eff	Settings	Kenya	UK Scotand	Italy, US, Kenya
	Level of evidence	2+	2+	2+
	Population	Female sex worker	Men who have sex with men	Young people
	Interventions	Peer education intervention	Peer education intervention	Peer educa- tion interven- tion

			Effe	ctiveness		ů	st-effectivene	SS
rventions	Population	Level of evidence	Settings	Findings	Perspective	Setting	Comparators	Incremental cost- effectiveness ratio(s)
				students reporting condom use during the most recent sexual intercourse slightly decreased from 55.1% to 49.7% in intervention arm, though the decrease was not significant. The percentage of students with more than one partner was increased. [31-33]				
itine ovider- iated) untary 'screening nealthcare tings	Adults aged 15-65 years	+ +	Thailand	Routine provider initiated HIV screening significantly increased the acceptance rate of HIV testing and the number of HIV infection detected, compared to the standard practice of patient-initiated HIV testing (5.59% VS 0.32%) and (23 VS 10 HIV detection within 2 months in 8/8 case and control community hospitals), respectively. [34]	Healthcare provider's	Thailand	'no screening'	ICER is PPP\$ 22,899.16 per HIV infection averted [34]
ool-based education gram mbined nlife skills)	Young people	2-	Thailand	Three studies show improvements in AIDS preventive behavior i.e. decreased number of visits to night clubs, decreased incidence of watching arousal media, increased sporting activities, decreased consumption of alcohol , decreased number of sex partners, and number of sex partners, and increased condom use in the experimental group. However, these changes were not significant after 4-6 weeks of follow-up. [35-37] One study found that the sexual risk behavior was significantly improved after 4 month follow-up. [38]	Å	Υ N	Å	Å

	:		Effe	sctiveness		Ŭ	st-effectivene	SS
pula	ation	Level of evidence	Settings	Findings	Perspective	Setting	Comparators	Incremental cost- effectiveness ratio(s)
	people		Mexico Mexico	The results of meta-analysis of 12 controlled studies in the US indicated that the overall mean effect size for abstinent behaviour was very small (effect size=0.05, 95%cCI 0.01-0.09). [39] In addition, the intervention targeted to improve sexual risk behavior did not induce change in condom use or number of sexual partners after 1-year follow-up. The only apparent benefit was a greater improvement in knowledge of HIV. [40]	Societal	India / US / Cameroon	'standard practice'	ICERs ranged from PPP\$ 4,853 [41] to 137,950,790 [42, 43] per HIV infection averted.
	egative yvee	÷	Zimbabwe	Highly acceptable VCT did not reduce HIV incidence at 2-year follow-up. HIV incidence was higher in the intensive VCT arm (mean per-site HIV incidence 1.37 per 100 person-years follow-up (PYFU) than in the standard VCT arm (mean per-site HIV incidence 0.95 per 100 PYFU), but the difference was not significant (adjusted rate ratio 1.49; 95%CI, 0.79-2.80). [44]	Ϋ́	ΥΥ Υ	AN	۶.
	n tes at or their of se	ΥN	ΥN	ΥY	Societal	US prisons	'no HIV counselling and testing provided at Prisons'	ICER of offering VCT at prisons was PPP\$ 508,651 per HIV case averted. [45]

		Effe	ectiveness		Ŭ	st-effectivene	SS
Population	Level of evidence	Settings	Findings	Perspective	Setting	Comparators	Incremental cost- effectiveness ratio(s)
Men who have sex with men	+	Various	Interventions delivered at the individual level were effective in reducing unprotected anal intercourse (UAI) by 43% OR=0.57, 95% CI=0.37-0.87). These effects were significant in both the short- (median 6 months) and long- term (median 12 months). It also improves sexual risk behavior: condom use with anal intercourse (OR=1.55, 95%CI 0.73-3.29), number of sex partners (OR=0.97, 95%CI 0.45-2.06), unprotected oral sex (OR=0.58, 95%CI 0.28 -1.24), incident HIV (OR=0.62, 95%CI 0.36- 1.06). [22]	A	AN M	A	Ą
HIV sero- discordant couples	2	Zambia	Proportion of reported condom use increased from <3% to >80% and remained stable through > 12 months of follow-up. Since underreporting was common, HIV transmission was still detected when couples had reported always using condoms. DNA sequencing confirmed that 87% of new HIV infections were acquired from spouses. [46]	NA	A	A	A
 Male conscripts in military camps	2++	Thailand	Intensive workplace-based education programs for male conscripts (over 15 months) successfully decreased incidence of HIV infection by 50% during the period of two years but not statistically significant (RR 0.49, 95%CI 0.11-2.26). [47]	Ч.	ę.	Å	Ą

SS	Incremental cost- effectiveness ratio(s)	NA	ICER of the mixed interventions targeted sex workers ranged from PPP\$ 279 to 566 per HIV infection averted. [53, 54]		A	Increase availability / accessibility of condoms in low HIV prevalence population (1.6% in men and 0.6% in women) appears to be cost- effective with ICER ranged from PPP\$ 7669 to 247,775 per case of HIV averted [42, 57] or about PPP\$ 22,065 per QALY saved. [58]
ost-effectivene	Comparators	A	`do nothing'		Υ N	`do nothing`
Ŭ	Setting	AN	India/ Cameroon		A N	SD
	Perspective	Ϋ́	Health care provider's	e behaviour	A	Healthcare provider's
ectiveness	Findings	Risky sexual behavior significantly decreased in the intervention group compared to the control group after 1-week follow up. [48, 49]	Interventions were effective in increasing condom use (from 55-60% to 67-85%, $p<0.01$) and reducing 5TIs among sex workers at 12 months evaluation. Prevalence of gonorrhea fell from 26% to 4%, and Chlamydia fell from about 41 to 26%. [50, 51] The prevalence of HIV remained low throughout the study. [52]	a behaviour, but do not eliminate th	The data suggests that increased condom use along with some decrease in the frequency of commercial sex among military conscripts led to a marked decline in STI and also to a subsequent reduction in HIV incidence. [55]	HIV incidence in the 'always' condom user group was 1.14 (95% CI 0.56-2.04) per 100 person-years. The HIV incidence in 'never' condom user group was 5.75 (95%CI 3.16- 9.66) per 100 person-years. Proportionate reduction in HIV seroconversion with condom use was approximately 80%. [56]
Eff	Settings	Thailand	Indonesia, China	ver the risk of a	Thailand	Various (reviewed evidence)
	Level of evidence	2-	2+		'n	2+
	Population	Female sex workers	Female sex workers	ction intervent	Male conscripts	Sexually active heterosexual couples
	nterventions	Workplace- based education condom distribution	Workplace- based education/ condom distribution/ free STD clinic visits	II. Harm reduv	100% condom orogram'	Condom use (availability and accessibility)

SSS	Incremental cost- effectiveness ratio(s)	М	ICER ranged from PPP\$ 934 to 7,863 per HIV infection averted [41, 53]	ΥN
ost-effectivene	Comparators	AN	`do nothing'	۲Z
Ŭ	Setting	A N	South Africa/ Kenya	۲
	Perspective	A	No specify/ Health care provider's	۲ Z
ectiveness	Findings	Condom use with regular partner reached 100% at one-month follow-up visit. At three-month follow up, more than 90% of the participants reported having been able to communicate and felt more comfortable discussing AIDS with their partner, and very confident that they could refuse sex if their partner refused to use a condom (an increase from 70% at baseline, p=0.0001). [59]	The introduction of female condoms led to a small, but significant, increase in consistent condom use with all partners. Adjusted odd ratio for consistent condom use after female condom introduction was 1.7 (95% CI: 1.4 to 2.2). [60]	Needle social marketing can reduce risky injecting behavior and HIV transmission among injecting drug users after 12-month follow-up. Needle sharing reduced significantly from 68.4% to 35.3%. However, the number of needle-sharing partners and sharing of water was unchanged. The HIV infection rate decreased but was not statistically significant. [61]
Effe	Settings	Thailand, India, Uganda	Kenya	China
	Level of evidence	2-	2-	
	Population	HIV sero- discordant couples	Female sex workers	Injecting drug users
	Interventions	Condom use and sex education	Introduction of Female condom	Needle social marketing

-		Effe	ectiveness		Ŭ	st-effectivene	SS
5	Level of evidence	Settings	Findings	Perspective	Setting	Comparators	Incremental cost- effectiveness ratio(s)
ν	÷	Canada	At the 6 months follow-up, it was found that more consistent use of a supervised safer injecting facility (SIF) was associated with positive changes in injecting practices, including less reuse of syringes, increased use of sterile water, cleaning of injection sites and filtering of drugs (OR 2 - 3, 95%CI 1.38 - 4.37). [62]	Societal	S	`do nothing′	ICER is PPP\$ 53,285 per HIV infection averted [63]
м м	5+	Various	Injecting drug users changed their baseline drug-related and sex- related risk behaviour. Significant reductions in drug injection, multi- person reuse of syringes and needles and other injection equipment was found. The studies also showed a significant growth in promoting entry into drug treatment and incr- easing needle disinfection. However, although there was a reduction among drug users concerning sex- related risks and an increase in condom use, the majority still practiced unsafe sex. Regarding dosage effects, the longer the exposure to outreach-based in- terventions, the greater the reductions in drug injection frequency. [64, 65] At cross border	Health care provider's	Ukraine	`do nothing`	ICER is PPP\$ 309 per HIV infection averted [67]

			Eff	ectiveness		ö	st-effectivene	SS
Interventions	Population	Level of evidence	Settings	Findings	Perspective	Setting	Comparators	Incremental cost- effectiveness ratio(s)
				areas between China and Vietnam, new injectors declined 3-14% after 36-month follow-up. HIV prevalence and estimated incidence fell by approximately half at the 24-month survey and by approximately three quarters at the 36-month survey in both areas (P<0.01). [66]				
III. Biological	/biomedical in	Iterventions t	hat strive to r	educe HIV infection and transmissio	nn risk			
HIV vaccine	Injecting drug users	1+++	Thailand	The phase III HIV vaccine trial in Thailand demonstrated that the vaccines are safe and well tolerated. However, after 36-month follow up, there was no difference in new HIV infection between the vaccine and placebo arms (vaccine efficacy was estimated at 0.1%, 95% CI -30.8% to 23.8%). [68]	Not clearly specify	Thailand	'do nothing'	At the assumption of 30% vaccine efficacy, the ICER of vaccination, HAART, and their combination were about PPP\$ 265, PPP\$ 2,158, and PPP\$ 944 per DALY averted compared with the do-northing strategy. [69]
Improved STI treatment services	Persons with suspected STI	1+	various	Improved STI treatment services significantly reduced HIV incidence. The two large systematic reviews indicated odd ratios ranging from 0.58 (95%CI 0.42-0.70) to 0.77 (95%CI 0.68-0.87). [70]	Healthcare provider's	Tanzania /US	`standard practice'	ICERs is PPP\$ 916 per HIV infection averted. [41]
Male circumcision	Heterosexual		Various (mainly Africa)	Results from the review of existing observational studies demonstrated a strong association between male circumcision and prevention of HIV, especially among high-risk groups [71-73].	Health care provider's	South Africa/ US	`do nothing'	Male circumcision appears to be very cost-effective in areas with high HIV prevalence (PPP\$ 1,668 per HIV infection averted in areas with HIV

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ess	Incremental cost- effectiveness ratio(s)	prevalence of 8.4% and PPP\$ 548 per HIV infection averted in areas with HIV prevalence of 25.6%). [75] However, this intervention is unlikely to be cost- effective in the US where baseline HIV prevalence is relatively lower (2%) and homosexual and infection from needle sharing were major causes of HIV infection. [42, 71]	ICERs is PPP\$ 694,605 per HIV infection averted. [42]	Υ
ost-effectivene	Comparators		`standard practice'	МА
Ŭ	Setting		Tanzania /US	A
	Perspective		Healthcare provider's	٩
ectiveness	Findings	Moreover, a randomized trial in Uganda showed that male circumci- sion reduced HIV incidence in men without behavioral disinheriting after 24-month follow-up. HIV incidence was 0.66 cases per 100 person-years in the intervention group and 1.33 cases per 100 person-years in the control group (estimated efficacy of intervention 51%, 95% CI 16-72; p=0.006). [74]	After three rounds of mass treatment (30 months) there was no evidence indicating that universal treatment of STIs reduced new HIV infections (rate ratio of 0.97% with 95%CI = 0.81 to 1.16). [76]	There is no evidence that nonoxynol- 9 protects against vaginal acquisition of HIV infection (RR 1.12, 95%CI 0.88-1.42). Nevertheless, the risk of genital lesions was significantly greater among women receiving nonoxynol-9 (RR 1.18, 95%CI 1.02- 1.36). [52]
Eff	Settings		Rural areas in Uganda with high rates of HIV and STI	Various
	Level of evidence		1+	+
	Population		Adults aged 15-59 years	Female sex workers
	Interventions		Mass or community treatment of sexually transmitted infections (STI)	Microbicides

			Effe	ectiveness		ő	st-effectiven	SS
Interventions	Population	Level of evidence	Settings	Findings	Perspective	Setting	Comparators	Incremental cost- effectiveness ratio(s)
Post-exposure prophylaxis	Healthcare workers	2+	Various (reviewed evidence)	No evidence suggests that offering post-exposure prophylaxis with Zidovudine lowers the rate of HIV infection compared to 'no intervention'. Please note that no studies were found that evaluated the effect of two or more antiretroviral drugs. [65, 77]	٩	NA	A	٩
Post-exposure prophylaxis (using two antiretroviral drugs for 28 days and if subject reported having recently had a detectable plasma HIV RNA level, then a protease inhibitor was also offered	Men and women with a potential sexual or injection drug use exposure to HIV in the previous 72 hrs	2	SU	There was not a significant difference in the proportions of sero-converters (85.7%) and non sero-converters (94.1%) who were initially prescribed antiretroviral therapy (P=.4). [78]	۲.	۲. ۲	۲	ž
Prevention of mother- to-child transmission of HIV	Pregnant women	+++	Thailand	A randomized clinical trial demon- strated that a combination of Zidovudine (AZT) and a single dose of Nevirapine (NVP), administered both to the mother during labour and to the newborn, is highly effective in prevention of HIV vertical transmis- sion, resulting in only 2.2 (± 0.6) % of children being born with HIV compared to 6.9 (± 1.4)% in the AZT-only arm. [79, 80] *	Healthcare providerís	Thailand	'do nothing'	Combining the administra- tion of AZT and NVP is the most cost-effective drug option. Cost-effectiveness ratio per averted infection of single VCT (1D) is PPP\$ 1,938. Cost-effectiveness ratio per averted infection of double VCT (2D) is PPP\$ 4,412. [79]

			Eff	ectiveness		C	st-effectivene	SS
nterventions	Population	Level of evidence	Settings	Findings	Perspective	Setting	Comparators	Incremental cost- effectiveness ratio(s)
Screening blood products and donated organs for HIV	Blood donations	AN	Ч.	۲	Healthcare provider's	US/ Sub- Saharan Africa	'no test'	HIV antibody testing for donated blood is a <u>cost-saving</u> intervention in the US [81] and very cost-effective in Sub- Saharan Africa (ICER PPP\$ 64-870 per HIV infection averted). [41, 53]
Substitution treatment	Injecting drug users	+	Various	Follow-up interviews from one month to 18 to 24 months found that the intervention was associated with statistically significant reductions in illicit opioid use, injecting use and sharing of injection equipment. It was also associated with reductions in multiple sex partners or exchange of sex for drugs or money, but had little effect on condom use. The reporting period for assessment of HIV risk behavior ranged from 2 weeks to 6 months. Reductions in risk behavior relating to drug use translated into reductions in cases of HIV infection.[82-84]	ž	۲.	ę.	۶
Using nucleic acid test screening (NAT) of volunteer blood donations	Blood donations	5	Thailand	It was estimated that there were approximately 38 to 155 additional units of donated blood detected with hepatitis B and C and HIV compared to the current practice (serology screening without NAT). [85]	Healthcare provider's	Thailand	'serology test without NAT'	ICER of providing NAT for blood donations was PPP\$ 100,923 - 404,498 per hepatitis B or C or HIV detection PPP\$ 36,897 - 129,181 per QALY. [85]

Interventions	Population		Eff	ectiveness		Ŭ	st-effectivene	SS.	
		Level of evidence	Settings	Findings	Perspective	Setting	Comparators	Incremental cost- effectiveness ratio(s)	
IV. Mitigation	of barriers to	prevention ar	nd negative so	cial outcomes of HIV infection					
Increased alcohol tax	General population	NA	NA	NA	Health care provider's	NS	`current practice′	ICER is PPP\$ 5,484 [42]	
Microfinance	Community		Africa	The intervention did not affect HIV incidence (adjusted RR 1.06, 95% CI 0.66-1.69) or rate of unprotected sexual intercourse with a non-spousal partner (adjusted RR 0.89, 95% CI 0.66-1.19). Experience of intimate-partner violence was reduced by 55% (adjusted RR 0.45, 95% CI 0.23-0.91; adjusted risk difference -7.3%, -16.2 to 1.5).[86]	МА	NA	A	A	
Microfinance (combined with training intervention)	female aged 14-35 year	2-	Africa	Young participants were less likely to have unprotected sex at last intercourse with a non-spousal partner (adjusted risk ratio 0.76, 95% CI 0.60-0.96) after 2 years of follow-up when compared with controls. In addition, they had higher levels of HIV-related communication (adjusted risk ratio 1.46, 95%CI 1.01-2.12) and were more likely to have accessed voluntary counseling and testing (aRR 1.64, 95% CI 1.06-2.56). [87]	NA	NA	Ą	Ą	
RR = relative ris RCT = randomis	k ed controlled tri	ials							

*We did not report results from another observational study because it would not change the overall conclusion but provide weaker evidence. [88]

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There were thirteen interventions where effectiveness and costeffectiveness information were both available for the same population groups. These included:

- Community-based education among MSM and women living in low income housing developments;
- Improved sexually transmitted infection treatment services;
- Male and female condom use;
- Mass media campaign;
- Mass treatment of sexually transmitted infections;
- Male circumcision;
- Needle and syringe exchange;
- Nucleic acid test for voluntary blood donations;
- Program for PMTCT prevention of mother-to-child HIV transmission;
- Provider-initiated HIV screening at health care settings;
- School-based education;
- Street outreach program for IDUs;
- Workplace-based education for FSWs.

Five of the above thirteen interventions, namely (1) male condom use, (2) street outreach program for UDUs, (3) male circumcision, (4) needle and syringe exchange, and (5) PMTCT through a combination of antiretroviral drugs and breastfeeding substitutes, showed significant benefits in reducing HIV incidence among target populations. In addition, although there was no reduction in HIV incidence, community-based education among MSM and workplace-based education for FSWs showed a reduction in HIV risk behaviour than the school-based education program. Only mass treatment of STIs showed no evidence of reducing either risk behaviour or HIV incidence in clinical studies. Economic modelling, however, indicated a range of 916 to 695,000 PPP\$ per HIV infection averted.

Twelve interventions had information on effectiveness but lacked cost-effectiveness evidence. These are:

- Abstinence only program;
- Abstinence-plus program;
- Community-based education among young people, IDUs and FSWs.;
- Drug substitution treatment;
- HIV vaccine for IDUs.
- Microbicides;

- Microfinance;
- Needle social marketing;
- Peer education intervention;
- Post-exposure prophylaxis;
- Voluntary counselling and HIV testing for HIV-negative employees, MSM and HIV serodiscordant couples;
- Workplace-based education among male conscripts.

Overall, treatment of STIs was the only intervention that showed a significant reduction in HIV incidence. There were some indications that abstinence-plus programs, community-based education, drug substitution treatment, needle social marketing, peer education, and VCT reduced HIV risk behaviour among the target populations. However, their respective studies were not designed to assess reduction in HIV incidence. In comparison to 'standard' or 'current' practice, there was no evidence of better effectiveness (i.e. reduction of HIV incidence and HIV risk behaviour) for the following interventions: i) abstinence only program, ii) single ante-retroviral drug for post-exposure prophylaxis, iii) HIV vaccine for IDUs, iv) microfinance, and v) workplace-based education among male conscripts.

There were four interventions where only cost-effectiveness information was available through the use of mathematical estimations. These were:

- HIV vaccine for ten-year-old uninfected children;
- Increased alcohol tax;
- Screening blood products and donated organs;
- Voluntary counselling and HIV testing for prison inmates;

Notably, the cost-effectiveness of the HIV vaccine was based on the assumption that the vaccine would be available at 30% efficacy.

Figure 3.5 compares the cost per HIV infection averted of each HIV prevention intervention. Cost-effectiveness ratios vary largely, ranging from 70 PPP\$ per HIV infection averted for screening blood products, to 2,000,000 PPP\$ per HIV infection averted for community-based education for women living in low income housing. It is likely that biological/biomedical interventions (highlighted in blue) are more cost-effective than those interventions affecting knowledge, attitudes and beliefs (highlighted in pink).



Figure 3.5: Summary of cost-effectiveness data for HIV prevention interventions (PPP\$ 2008 per HIV infection averted)

Table 3.5 Summarises the findings from the reviews. It prioritises HIV prevention interventions based on effectiveness and cost-effectiveness evidence. The table presents results by target population including FSWs, IDUs, MSM, and sero-discordant couples, who are currently the major sources of HIV infection in Thailand.

Interventions proven to be both effective and cost-effective for FSWs were: VCT, workplace-based education, and male and female condom use. Community-based education and improvement of STI services proved to be effective, but no evidence regarding the value for money among FSWs was found. The study found that microbicides were not effective in preventing HIV transmission amongst FSWs.

Condom use was proven to be the only effective and cost-effective intervention for MSM, while VCT and improved STI treatment services demonstrated effectiveness but lacked cost-effectiveness information. Community-based education was clinically effective but not cost effective. For IDUs <u>condom use</u>, VCT and street outreach were shown to be both effective and cost-effective. Needle social marketing, improved STI treatment services and substitution treatment demonstrated clinical effectiveness but were not supported by economic evidence. Needle and syringe exchange under the supervision of medical staff was proven to be effective but not cost effective. Community based education; HIV vaccines and post-exposure prophylaxis were shown to be ineffective in the prevention of HIV transmission amongst IDUs.

Condom use was the only intervention proven to be both effective and cost-effective for sero-discordant couples. Voluntary HIV counselling and testing, and improvement of STI treatment services were amongst the interventions proven clinically effective but no cost-effectiveness information was available.

Overall, VCT and condom use were the only interventions where extensive evaluations of the effectiveness and cost-effectiveness across population groups were done. Meanwhile, improved STI treatment service was proven to be clinically effective across most target populations. However, no economic evaluation study was conducted for the intervention. It can be observed that in the information gap for 1) many interventions, including routine (provider-initiated) voluntary HIV screening at healthcare settings, introduction of female condoms, HIV vaccine, male circumcision, microbicides, and post-exposure prophylaxis, and 2) some targeted populations, namely sero-discordant couples, prison inmates, health care workers both effectiveness and cost-effectiveness studies need to be conducted to provide proper evidence to guide resource allocation decisions regarding HIV prevention and control.

Table 3.3. Summary of minungs by much vention and target population	Table	3.5:	Summary	of findings	by	intervention	and	target population	n
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Interventions	FSW	MSM	IDU	SDC	Preg	PI	нсw	Young	G pop
I. Interventions that affect knowledg social correlates of risk	e, attit	ude ar	nd beli	efs and	l influe	ence ps	sycholo	ogical a	and
Abstinence-only programs									
Abstinence-plus programs									
Community-based education									
Mass media campaigns									
Peer education									
Routine (provider-initiated) voluntary HIV screening at healthcare settings									
School-based sex education programs (combined with life skills)									
Voluntary HIV counselling and testing (VCT) (\pm STI clinic and condom distribution)									
Workplace-based education $(\pm condom distribution / free STI clinic)$									
II. Harm reduction interventions that the behaviour	lower	the ris	sk of a	behav	iour, b	ut do i	not elii	minate	<u> </u>
Condom use (availability and accessibility)									
Introduction of female condoms									
Needle and syringe exchange									
Needle social marketing									
Street outreach									
III.Biological/biomedical intervention risk	ns that	strive	to red	uce HI	V infe	ction a	nd tra	nsmiss	ion
HIV vaccine									
Improved STI treatment services									
Mass or community treatment of sexually transmitted infections									
Male circumcision									
Microbicides									
Post-exposure prophylaxis									
Prevention of mother-to-child transmission of HIV									
Screening blood products and donated organs for HIV									
Substitution treatment									
Using nucleic acid test screening (NAT) of volunteer blood donations									
IV. Mitigation of barriers to prevention	on and	negati	ve soc	ial out	comes	of HIV	infect	tion	
Increased alcohol tax									
Microfinance									
Microfinance (combined with education)									

Abbreviations

- FSW Female sex worker
- MSM Men who have sex with men
- IDU Injecting drug user
- SDC Serodiscordant couples
- Preg Pregnant women
- PI Prison inmate
- HCW Healthcare worker
- Young People aged 10-24 years old
- G pop General people

Colours	Effectiveness	Cost- effectiveness	Description
	Yes	Yes	The intervention is proven to be effective and cost-effective
	Yes	Data not available	The intervention is proven to be effective but no evidence regarding cost-effectiveness
	Yes	No	The intervention is proven to be effective but not cost-effective
	No	No, data not available	The intervention is proven to be neither effective nor cost-effective
	Data not available	Data not available	No evidence concerning effectiveness or cost-effectiveness of the intervention
			The intervention is not relevant or used for a particular target population

The colour of effectiveness and cost-effectiveness

In general, decision makers prefer to use local evidence over international information when making policy decisions. However, the study found a glaring lack of local information on the effectiveness and cost-effectiveness of HIV prevention among the groups most at risk of HIV infection in Thailand namely, young people, MSM, IDUs, FSWs, and sero-discordant couples. See Table 3.6.

Target populations	Int	erventions
rarget populations	Domestic studies	International studies
Young people	- School-based education	 Abstinence programs School-based education Community-based education Peer education intervention
Men who have sex with men	NA	 Community-based education Voluntary HIV counselling and testing Peer education intervention
Injecting drug users	 Community-based education HIV vaccine 	 Street outreach Drug substitution treatment Community-based education Needle social marketing Needle and syringe exchange Post-exposure prophylaxis Peer education intervention
Female sex workers	- Workplace-based education	 Workplace-based education / condom distribution/free STI clinic visits Community based intervention (Sonagachi) Microbicide Introduction of female condom Peer education intervention
HIV sero-discordant couples	NA	 Increase condom use Voluntary HIV counselling and testing/STI services/free condoms
Male	 Workplace-based education 100% condom program 	Condom distributionCircumcision
Prison inmates	NA	- HIV screening
Pregnant women	 Program for prevention of mother-to-child transmission 	NA (stop the search)
Health care workers	NA	- Post-exposure prophylaxis
General population	 Provider-initiated HIV screening HIV screening for blood donations 	 Mass media campaign Mass treatment of STI Community-based education Microfinance Voluntary HIV counselling and testing
Infrastructure	NA	 Increased alcohol tax Improvement of STI treatment services

Table 3.6: Summar	y of interventions	conducted for	each target	population
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5. Discussion and conclusion

The review highlighted several limitations in using effectiveness and costeffectiveness evidence for HIV/AIDS policy decision making or program reorientation. First, the lack of proper assessment of effectiveness and/or cost-effectiveness outcomes of many interventions poses a significant challenge in making evidence-informed health policy decisions. During the review, we found that most domestic studies evaluated the effectiveness or cost-effectiveness of interventions using measures such as knowledge, attitudes, perception, and skills. The use of such measures will severely limit the usefulness of the evaluations because they do not allow for the comparison of value for money across different types of interventions due to variation in outcome measurement. In addition, the outcomes of such measures may not be of primary interest to decision makers or health care planners in considering health resource allocation.

Second, although evidence for assessing the effectiveness of interventions was found to be of high quality, a major concern was the strength of evidence used to generate information on cost-effectiveness. For example, many cost-effectiveness studies did not obtain intervention effectiveness from data sources that minimized the potential for bias such as systematic reviews or experimental studies. Rather, they obtained data from expert opinions with unconvincing assumptions.[69] Economic evaluations can be useful for guiding policy decisions only when performed correctly and reported accurately; these findings clearly depict barriers that would diminish the use of cost-effectiveness evidence to inform policy decisions.

Third, given that a lot was invested in determining local information for HIV prevention, the majority of studies reporting the effectiveness and cost-effectiveness of HIV interventions were identified from international publications rather than domestic journals or grey literature (see Table 3.7). This reflects the fact that good quality studies are likely to be published in international journals. Thus, it is sensible to recommend that international databases are still major sources of information, and can be used to inform decision making about the effectiveness and cost-effectiveness of HIV prevention interventions.

Type of literature	Initial search	Review of full text	Final inclusion
Articles published in domestic journals	528	16	1
Articles published in international journals	111	11	5
Theses/dissertations	99	11	5
Research reports	24	3	2
Conference proceedings	170	1	1
Total	932	42	14

Table 3.7: Review profile of domestic literature

This study found that male/female condoms, street outreach programs, programs for the prevention of mother-to-child HIV transmission, improvement of STI treatment services and circumcision, were the only interventions that showed strong evidence of reducing HIV infection among target populations. The DCP2 also included these four interventions, excluding circumcision, in its recommendations for concentrated epidemic areas in the East Asia and the Pacific region. [3] [note that Thailand is now classified as a concentrated epidemic] [89] The differences between recommendations from the DCP2 and our findings are as follows:

- Although it was recommended in the DCP2, lack of strong evidence proved that community-based education offers good value for money in the prevention of HIV infections in either low or high HIV prevalence settings.
- There were consistent results showing that screening blood products and donated organs for HIV is very cost-effective, while there was little reference made to this intervention in the DCP2.
- This study found that there was potential for interventions that aim to mitigate barriers to prevention and negative social outcomes of HIV infection such as higher alcohol tax and micro financing. These interventions should be carefully considered in the future.

It is interesting to note that very limited local information was found about HIV interventions for the populations most at risk of HIV infection in Thailand. These include: IDUs, MSM, FSWs, and young people. Of the nine interventions identified from our review, only one study on an HIV vaccine

for IDUs was conducted in Thailand with an usual assumption of vaccine efficacy. Moreover, HIV preventive vaccines are not available on the global market. These findings underline the urgent need to prioritize health research in resource allocation in order to assess the effectiveness and cost-effectiveness of HIV interventions that could curb infections among high risk groups.

Caution should be made when applying the effectiveness and costeffectiveness data from this study to inform policy decision making. Firstly, because many studies were conducted in various settings with target populations of different sizes, different HIV prevalence, different attitudes towards HIV/AIDS and socio-economic and cultural determinants of risk behaviours responses to interventions, these factors would greatly affect not only the effectiveness of the intervention but also its value for money. Furthermore, we would argue that this matter is rather more important because almost all preventive interventions need to be delivered on a population basis.

Secondly, although we have made explicit criteria to judge whether the effectiveness studies/data are good enough to be used in decision making, there was no standard to measure the quality of cost-effectiveness studies. While we found most effectiveness studies to be of good quality (mainly in the 1^{st} or 2^{nd} hierarchy), we were unsure of the quality of data used in many of the cost-effectiveness studies.

Lastly, it is important to recognise that several factors and not only effectiveness or cost-effectiveness information guide a country's health care decisions. Other factors including political and ethical issues, and societal values such as equity, also play a significant role in the decision making processes. However, these issues were not taken into consideration in this study.

6. References

- Tangcharoensathien V, Tantivess S, Teerawattananon Y, Auamkul N, Jongudoumsuk P: Universal coverage and its impact on reproductive health services in Thailand. *Reprod Health Matters* 2002, 10:59-69.
- 2. Teerawattananon Y, Russell S, Mugford M: A systematic review of economic evaluation literature in Thailand: are the data good enough to be used by policy-makers? *Pharmacoeconomics* 2007, **25**:467-479.
- Bertozzi S, Padian NS, Wegbreit J, DeMaria LM, Feldman B, Gayle H, Gold J, Grant R, Isbell MT: HIV/AIDS Prevention and Treatment. In *Disease control priorities in developing countries.* 2nd edition. Edited by Jamison DT, Breman JG, Measham AR, Alleyne G, Claeson M, Evan DB, Jha P, Mills A, Musgrove P. New York: Oxford University Press; 2006
- 4. Thorogood M, Coombes Y: *Evaluating health promotion: practice and methods.* New York: Oxford University Press Inc; 2006.
- 5. Sweat M: *A framework for classifying HIV prevention interventions.* USA: Joint United Nations Programme on HIV/AIDS (UNAIDS); 2008.
- Kaeodumkoeng N, Lertpiriyasuwat C, Chawanangkul V, Sukhonthaman C, Jantharathaneewat K, Chanthongkum N, Thanprasertsuk S: Model Development of Condom Accessibility by Condom Vending Machine. *Thai Aids* J 2007, 19:73-84.
- Umsuriya S, Srisawang O, Pibaljommee T, Unnanan M, Netthip N: Evaluation of condom use accession by condom teller machine, Ayutthaya province 2006. *Disease Control Journal* 2006, 10:103-108.
- Kanshana S, Thewanda D, Teeraratkul A, Limpakarnjanarat K, Amornwichet P, Kullerk N, Akksilp S, Sereesittipitak V, Mastro TD, Simonds RJ: Implementing short-course zidovudine to reduce motherinfant HIV transmission in a large pilot program in Thailand. Aids 2000, 14:1617-1623.
- Kongsin S, Kongsin P, Jiamton S, Intraprasong B, Boonthum A, Tarunothai U, Chumthong P: Pilot Study Potential Benefit of AZT Preventive Therapy in Perinatal HIV Transmission and Its Costeffectiveness Analysis: A Case Study of BMA Medical College and Vajira Hospital. Bangkok; 2004.
- Chantanakorn N, Weerawongphom R: The Prevention of Mother-to-Child Transmission Project (PMTCT) of Phichit Province FY 2001-2004. Thai Aids J 2006, 18:214-225.

- Underhill K, Operario D, Montgomery P: Abstinence-only programs for HIV infection prevention in high-income countries. *Cochrane Database Syst Rev* 2007:CD005421.
- 12. Underhill K, Montgomery P, Operario D: Abstinence-plus programs for HIV infection prevention in high-income countries. *Cochrane Database Syst Rev* 2008:CD007006.
- Di Noia J, Schinke SP: Gender-specific HIV prevention with urban early-adolescent girls: outcomes of the Keepin' It Safe Program. *AIDS Educ Prev* 2007, 19:479-488.
- 14. Morrison-Beedy D, Carey MP, Kowalski J, Tu X: Group-based HIV risk reduction intervention for adolescent girls: evidence of feasibility and efficacy. *Res Nurs Health* 2005, **28**:3-15.
- 15. Jemmott JB, 3rd, Jemmott LS, Braverman PK, Fong GT: **HIV/STD** risk reduction interventions for African American and Latino adolescent girls at an adolescent medicine clinic: a randomized controlled trial. Arch Pediatr Adolesc Med 2005, **159**:440-449.
- 16. Jewkes R, Nduna M, Levin J, Jama N, Dunkle K, Khuzwayo N, Koss M, Puren A, Wood K, Duvvury N: A cluster randomized-controlled trial to determine the effectiveness of Stepping Stones in preventing HIV infections and promoting safer sexual behaviour amongst youth in the rural Eastern Cape, South Africa: trial design, methods and baseline findings. *Trop Med Int Health* 2006, 11:3-16.
- 17. Wongjak T, Wibulnuttakul K, Wichacharn M, Tejafong k, Cheewawat W, Saokaew P, Taecharoenkun S: A study of behaviour post intervention on reducin HIV risk in intravenous drug users in Northern drug dependence treatment center and community clinic Chiangmai. Chiang Mai: Research Institute for Health Sciences, Chiang Mai University; 2004.
- Peragallo N, Deforge B, O'Campo P, Lee SM, Kim YJ, Cianelli R, Ferrer L: A randomized clinical trial of an HIV-risk-reduction intervention among low-income Latina women. Nurs Res 2005, 54:108-118.
- Johnson-Masotti AP, Pinkerton SD, Sikkema KJ, Kelly JA, Wagstaff DA: Cost-Effectiveness of a Community-Level HIV Risk Reduction Intervention for Women Living in Low-Income Housing Developments. *The Journal of Primary Prevention* 2005, 26:345-362.

- 20. Shahmanesh M, Patel V, Mabey D, Cowan F: Effectiveness of interventions for the prevention of HIV and other sexually transmitted infections in female sex workers in resource poor setting: a systematic review. *Trop Med Int Health* 2008, **13**:659-679.
- Johnson WD, Hedges LV, Ramirez G, Semaan S, Norman LR, Sogolow E, Sweat MD, Diaz RM: HIV prevention research for men who have sex with men: a systematic review and meta-analysis. J Acquir Immune Defic Syndr2002, 30 Suppl 1:S118-129.
- 22. Herbst JH, Beeker C, Mathew A, McNally T, Passin WF, Kay LS, Crepaz N, Lyles CM, Briss P, Chattopadhyay S, Johnson RL: The effectiveness of Individual-, group-, and community-level HIV behavioural risk-reduction interventions for adult men who have sex with men: A systematic review. Am J Prev Med 2007, 32:S38-67.
- Pinkerton SD, Holtgrave DR, DiFranceisco WJ, Stevenson LY, Kelly JA: Cost-Effectiveness of a Community-Level HIV Risk Reduction Intervention. *Am J Public Health* 1998, 88:1239-1242.
- Cochen DA, Wu S-Y, Farley TA: Structural Interventions to Prevent HIV/ Sexually Transmitted Disease: Are They Cost-Effective for Women in the Southern United States? Sex Transm Dis 2006, 33:S46-49.
- 25. Garfein RS, Golub ET, Greenberg AE, Hagan H, Hanson DL, Hudson SM, Kapadia F, Latka MH, Ouellet LJ, Purcell DW, et al: A peer-education intervention to reduce injection risk behaviours for HIV and hepatitis C virus infection in young injection drug users. Aids 2007, 21:1923-1932.
- 26. Weeks MR, Li J, Dickson-Gomez J, Convey M, Martinez M, Radda K, Clair S: Outcomes of a peer HIV prevention program with injection drug and crack users: the Risk Avoidance Partnership. Subst Use Misuse 2009, 44:253-281.
- 27. Luchters S, Chersich MF, Rinyiru A, Barasa MS, King'ola N, Mandaliya K, Bosire W, Wambugu S, Mwarogo P, Temmerman M: Impact of five years of peer-mediated interventions on sexual behaviour and sexually transmitted infections among female sex workers in Mombasa, Kenya. BMC Public Health 2008, 8:143.
- Elford J, Bolding G, Sherr L: Peer education has no significant impact on HIV risk behaviours among gay men in London. *Aids* 2001, 15:535-538.

- 29. Williamson LM, Hart GJ, Flowers P, Frankis JS, Der GJ: **The Gay Men's Task Force: the impact of peer education on the sexual health behaviour of homosexual men in Glasgow.** *Sex Transm Infect* 2001, **77:**427-432.
- Flowers P, Hart GJ, Williamson LM, Frankis JS, Der GJ: Does bar-based, peer-led sexual health promotion have a communitylevel effect amongst gay men in Scotland? Int J STD AIDS 2002, 13:102-108.
- 31. Borgia P, Marinacci C, Schifano P, Perucci CA: **Is peer education the best approach for HIV prevention in schools? Findings from a randomized controlled trial.** *J Adolesc Health* 2005, **36**:508-516.
- 32. Mahat G, Scoloveno MA, De Leon T, Frenkel J: Preliminary evidence of an adolescent HIV/AIDS peer education program. J PediatrNurs 2008, 23:358-363.
- 33. Miller AN, Mutungi M, Facchini E, Barasa B, Ondieki W, Warria C: An outcome assessment of an ABC-based HIV peer education intervention among Kenyan university students. J Health Commun 2008, 13:345-356.
- 34. Teerawattananon Y, Hiransuthikul N, Hanvoravongchai P, Tantivess S, Lertpiriyasuwat C, Chaikledkaew U, Thavorncharoensap M, Youngkong S, Leelukkanaveera Y, Mohara A, et al: Effectiveness of routine offer of HIV counseling and testing at community hospitals in Thailand. Nonthaburi: Health Intervention and Technology Assessment Program; 2008.
- 35. Nilabut S: Achievement of integrated teaching using the applied protection motivation theory on AIDS prevention among informal education students in Saraburi. *Master of Science (Public Health)*. Mahidol University, Faculty of Public Health; 1999.
- Sunsiri M: An application of life skills to AIDS prevention among grade 9 junior high school students in Burirum province. *Master of Science (Public Health).* Mahidol University, Faculty of Public Health; 2002.
- 37. Nobnorb S: **The effectiveness of health education program on AIDS prevention among vocational male students in Krabi province.** *Master of Science (Public Health).* Mahidol University, Faculty of Public Health; 2002.
- 38. Simtaraj P: Effects of skills development for prevention of sexual risk behaviour on perceived self-efficacy and sexual risk behaviour among male vocational students. Chiang Mai University, Department of Medical and Surgical Nursing; 2001.
- Silva M: The effectiveness of school-based sex education programs in the promotion of abstinent behaviour: a meta-analysis. Health Education Research 2002, 17:471-481.
- Walker D, Gutierrez JP, Torres P, Bertozzi SM: HIV prevention in Mexican schools: prospective randomised evaluation of intervention. *Bmj* 2006, 332:1189-1194.
- 41. Walker D: Cost and cost-effectiveness of HIV/AIDS prevention strategies in developing countries: is there an evidence base? *Health Policy Plan* 2003, **18:**4-17.
- Cohen DA, Wu SY, Farley TA: Comparing the cost-effectiveness of HIV prevention interventions. J Acquir Immune Defic Syndr 2004, 37:1404-1414.
- Wang LY, Davis M, Robin L, Collins J, Coyle K, Baumler E: Economic Evaluation of Safer Choices. Arch Pediatr Adolesc Med 2000, 154:1017-1024.
- 44. Corbett EL, Makamure B, Cheung YB, Dauya E, Matambo R, Bandason T, Munyati SS, Mason PR, Butterworth AE, Hayes RJ: HIV incidence during a cluster-randomized trial of two strategies providing voluntary counselling and testing at the workplace, Zimbabwe. *Aids* 2007, 21:483-489.
- 45. Varghese B, Peterman TA: Cost-effectiveness of HIV counseling and testing in US prisons. J Urban Health 2001, 78:304-312.
- Allen S, Meinzen-Derr J, Kautzman M, Zulu I, Trask S, Fideli U, Musonda R, Kasolo F, Gao F, Haworth A: Sexual behaviour of HIV discordant couples after HIV counseling and testing. *Aids* 2003, 17:733-740.
- Celentano DD, Bond KC, Lyles CM, Eiumtrakul S, Go VF, Beyrer C, na Chiangmai C, Nelson KE, Khamboonruang C, Vaddhanaphuti C: Preventive intervention to reduce sexually transmitted infections: a field trial in the Royal Thai Army. Arch Intern Med 2000, 160:535-540.
- Yotruean K: Using acitivities to promote self-prevention of HIV infection female sex workers, Chiang Mai Province. Chiang Mai University.
- 49. NaThalang D: The effectiveness of a health education program on AIDS prevention through behaviour modification among traditional massage working girls in Satun province. *Master of Science (Public Health).* Mahidol University, Faculty of Public Health; 2001.

- 50. Wu Z, Rou K, Jia M, Duan S, Sullivan SG: The first communitybased sexually transmitted disease/HIV intervention trial for female sex workers in China. *Aids* 2007, **21 Suppl 8:**S89-94.
- Rou K, Wu Z, Sullivan SG, Li F, Guan J, Xu C, Liu W, Liu D, Yin Y: A five-city trial of a behavioural intervention to reduce sexually transmitted disease/HIV risk among sex workers in China. *Aids* 2007, 21 Suppl 8:S95-101.
- 52. Wilkinson D, Ramjee G, Tholandi M, Rutherford G: Nonoxynol-9 for preventing vaginal acquisition of HIV infection by women from men. Cochrane Database Syst Rev 2002:CD003936.
- Creese A, Floyd K, Alban A, Guinness L: Cost-effectiveness of HIV/ AIDS interventions in Africa: a systematic review of the evidence. *Lancet* 2002, 359:1635-1642.
- 54. Fung IC-H, Guinness L, Vickerman P, Watts C, Vannela G, Vadhvana J, Foss AM, Malodia L, Gandhi M, Jani G: Modelling the impact and cost-effectiveness of the HIV intervention programme amongst commercial sex workers in Ahmedabad, Gujarat, India. BMC Public Health 2007, 7:195.
- 55. Celentano DD, Nelson KE, Lyles CM, Beyrer C, Eiumtrakul S, Go VF, Kuntolbutra S, Khamboonruang C: Decreasing incidence of HIV and sexually transmitted diseases in young Thai men: evidence for success of the HIV/AIDS control and prevention program. *Aids* 1998, 12:F29-36.
- 56. Weller S, Davis K: **Condom effectiveness in reducing hetero sexual HIV transmission.** *Cochrane Database Syst Rev* 2002:CD003255.
- 57. Chesson HW, Greenberg JB, Hennessy M: **The cost-effectiveness of the WINGS intervention: a program to prevent HIV and sexually transmitted diseases among high-risk urban women.** *BMC Infect Dis* 2002, **2**:24.
- Bedimo AL, Pinkerton SD, Cohen DA, Gray B, Farley TA: Condom distribution: a cost-utility analysis. Int J STD AIDS 2002, 13:384-392.
- 59. McGrath JW, Celentano DD, Chard SE, Fullem A, Kamya M, Gangakhedar RR, Khamboonruang C, Joglekar N, Malhotra-Kohli R, Kiwanuka A, Sirirojn B: A group-based intervention to increase condom use among HIV serodiscordant couples in India, Thailand, and Uganda. AIDS Care 2007, 19:418-424.

- 60. Thomsen SC, Ombidi W, Toroitich-Ruto C, Wong EL, Tucker HO, Homan R, Kingola N, Luchters S: A prospective study assessing the effects of introducing the female condom in a sex worker population in Mombasa, Kenya. Sex Transm Infect 2006, 82:397-402.
- 61. Wu Z, Luo W, Sullivan SG, Rou K, Lin P, Liu W, Ming Z: **Evaluation of** a needle social marketing strategy to control HIV among injecting drug users in China. *Aids* 2007, **21 Suppl 8:**S115-122.
- Stoltz JA, Wood E, Small W, Li K, Tyndall M, Montaner J, Kerr T: Changes in injecting practices associated with the use of a medically supervised safer injection facility. J Public Health (Oxf) 2007, 29:35-39.
- 63. Laufer FN: Cost-effectiveness of syringe exchange as an HIV prevention strategy. J Acquir Immune Defic Syndr 2001, **28**:273-278.
- Coyle SL, Needle RH, Normand J: Outreach-based HIV prevention for injecting drug users: a review of published outcome data. *Public Health Rep* 1998, 113 Suppl 1:19-30.
- 65. Young TN, Arens FJ, Kennedy GE, Laurie JW, Rutherford G: Antiretroviral post-exposure prophylaxis (PEP) for occupational HIV exposure. Cochrane Database Syst Rev 2007:CD002835.
- 66. Des Jarlais DC, Kling R, Hammett TM, Ngu D, Liu W, Chen Y, Binh KT, Friedmann P: Reducing HIV infection among new injecting drug users in the China-Vietnam Cross Border Project. *Aids* 2007, 21 Suppl 8:S109-114.
- Vickerman P, Kumaranayake L, Balakireva O, Guinness L, Artyukh O, Semikop T, Yaremenko O, Watts C: The Cost-Effectiveness of Expanding Harm Reduction Activities for Injecting Drug Users in Odessa, Ukraine. Sex Transm Dis2006, 33:S89-102.
- 68. Pitisuttithum P, Gilbert P, Gurwith M, Heyward W, Martin M, van Griensven F, Hu D, Tappero JW, Choopanya K: Randomized, doubleblind, placebo-controlled efficacy trial of a bivalent recombinant glycoprotein 120 HIV-1 vaccine among injection drug users in Bangkok, Thailand. J Infect Dis 2006, 194:1661-1671.
- Ono S, Kurotaki T, Nakasone T, Honda M, Boon-Long J, Sawanpanyalert P, Kimura K: Cost-Effectiveness Analysis of Antiretroviral Drug Treatment and HIV-1 Vaccination in Thailand Jpn J Infect Dis 2006, 59:168-173.

- Sangani P, Rutherford G, Wilkinson D: Population-based interventions for reducing sexually transmitted infections, including HIV infection. *Cochrane Database Syst Rev* 2004:CD001220.
- 71. Siegfried N, Muller M, Volmink J, Deeks J, Egger M, Low N, Weiss H, Walker S, Williamson P: Male circumcision for prevention of heterosexual acquisition of HIV in men. Cochrane Database Syst Rev 2003:CD003362.
- 72. Weiss HA, Quigley MA, Hayes RJ: Male circumcision and risk of HIV infection in sub-Saharan Africa: a systematic review and metaanalysis. *Aids* 2000, **14**:2361-2370.
- 73. Weiss HA: Male circumcision as a preventive measure against HIV and other sexually transmitted diseases. *Curr Opin Infect Dis* 2007, 20:66-72.
- 74. Gray RH, Li X, Kigozi G, Serwadda D, Nalugoda F, Watya S, Reynolds SJ, Wawer M: The impact of male circumcision on HIV incidence and cost per infection prevented: a stochastic simulation model from Rakai, Uganda. *Aids* 2007, **21:**845-850.
- Kahn JG, Marseille E, Auvert B: Cost-Effectiveness of Male Circumcision for HIV Prevention in a South African Setting. *Plos Medicine* 2006, 3:2349-2358.
- 76. Wawer MJ, Sewankambo NK, Serwadda D, Quinn TC, Paxton LA, Kiwanuka N, Wabwire-Mangen F, Li C, Lutalo T, Nalugoda F, et al: Control of sexually transmitted diseases for AIDS prevention in Uganda: a randomised community trial. Rakai Project Study Group. Lancet 1999, 353:525-535.
- 77. Crepaz N, Horn AK, Rama SM, Griffin T, Deluca JB, Mullins MM, Aral SO: The efficacy of behavioural interventions in reducing HIV risk sex behaviours and incident sexually transmitted disease in black and Hispanic sexually transmitted disease clinic patients in the United States: a meta-analytic review. *Sex Transm Dis* 2007, **34**:319-332.
- 78. Roland ME, Neilands TB, Krone MR, Katz MH, Franses K, Grant RM, Busch MP, Hecht FM, Shacklett BL, Kahn JO, et al: Seroconversion following nonoccupational postexposure prophylaxis against HIV. Clin Infect Dis 2005, 41:1507-1513.
- 79. Teerawattananon Y, Vos T, Tangcharoensathien V, Mugford M: Cost-effectiveness of models for prevention of vertical HIV transmission - voluntary counseling and testing and choices of drug regimen. Cost Eff Resour Alloc 2005, 3:7.

- 80. Lallemant M, Jourdain G, Le Coeur S, Mary JY, Ngo-Giang-Huong N, Koetsawang S, Kanshana S, McIntosh K, Thaineua V: Single-dose perinatal nevirapine plus standard zidovudine to prevent motherto-child transmission of HIV-1 in Thailand. N Engl J Med 2004, 351:217-228.
- AuBuchon JP, Birkmeyer JD, Busch MP: Cost-effectiveness of expanded human immunodeficiency virus-testing protocols for donated blood. *Transfusion* 1997, 37:45-51.
- Gowing L, Farrell M, Bornemann R, Ali R: Substitution treatment of injecting opioid users for prevention of HIV infection. Cochrane Database Syst Rev 2004:CD004145.
- Wong KH, Lee SS, Lim WL, Low HK: Adherence to methadone is associated with a lower level of HIV-related risk behaviours in drug users. J Subst Abuse Treat 2003, 24:233-239.
- 84. Pang L, Hao Y, Mi G, Wang C, Luo W, Rou K, Li J, Wu Z: Effectiveness of first eight methadone maintenance treatment clinics in China. *Aids* 2007, 21 Suppl 8:S103-107.
- Lertiendumrong J, Techakehakij W, Pongpirul K, Tangcharoensathien
 V, Srirattana S: Using nucleic acid testing in screening donated
 blood in Thailand :a policy analysis. 2007.
- 86. Pronyk PM, Hargreaves JR, Kim JC, Morison LA, Phetla G, Watts C, Busza J, Porter JD: Effect of a structural intervention for the prevention of intimate-partner violence and HIV in rural South Africa: a cluster randomised trial. *Lancet* 2006, 368:1973-1983.
- 87. Pronyk PM, Kim JC, Abramsky T, Phetla G, Hargreaves JR, Morison LA, Watts C, Busza J, Porter JD: A combined microfinance and training intervention can reduce HIV risk behaviour in young female participants. *Aids* 2008, 22:1659-1665.
- Sirikwin S, Kuntiranant K, Waradejwinyoo S, Buaraj S, Boonterm B, Likanonsakul S: Efficacy of zidovudine plus single dose nevirapine for prevention fo perinatal HIV transmission. Bull Dept Med Serv 2002, 27:47-55.
- 89. National AIDS Prevention and Alleviation Committee: UNGASS COUNTRY PROGRESS REPORT THAILAND. 2008.

CHAPTER 4

Revitalizing HIV Prevention Interventions

1. Background

1.1 HIV epidemic situation

UNAIDS and WHO^[1] categorize HIV epidemics as low level, concentrated or generalized scenarios. Low-level scenarios are those with HIV prevalence levels of below 1% and where HIV has not spread to significant levels within any subpopulation group. Concentrated scenarios are those where HIV prevalence is high in one or more sub-population such as men who have sex with men, injecting drug users or sex workers and their clients, but the virus is not circulating in the general population. Generalized scenarios are those where HIV prevalence is 1% to 15% among pregnant women attending antenatal clinics. This indicates that HIV prevalence is present among the general population at sufficient levels to enable sexual networks that drive the epidemic. Finally, hyper-endemic scenarios refer to those areas where HIV prevalence exceeds 15% in the adult population driven through extensive heterosexual multiple concurrent partner relations with low and inconsistent condom use.

In past years, Thailand was classified as a generalized epidemic, with prevalence among pregnant women at more than 1%. Recently, the epidemic has evolved from a generalized to a concentrated epidemic in specific population groups. High HIV prevalence of over 15% has been observed among MSM, while prevalence among pregnant women has gone down to 0.8%. ^[2]

However, some experts in the HIV control program contend that the epidemic has not yet fully evolved to a concentrated scenario. They argue that at 0.8%, prevalence among pregnant women is marginal, and could move up to more than 1%. Thus there is no room for complacency and revitalizing HIV prevention is critical.

As a starting point in revitalizing HIV prevention, it is vital to acknowledge that the situation in Thailand is a mixture of both concentrated and

generalized epidemics. See Table 4.1 on HIV prevalence estimates from the annual National Sero-Sentinel Survey, every June, for rounds 13 to 24 $(1995 to 2006)^{[3]}$, which are similar to other countries such as South Africa, Egypt, Russia, and Papua New Guinea ^[4]. The survey clearly indicates program failure in bringing down prevalence among IDUs (33%) and the continuing high prevalence among direct female sex workers (4.59%) and indirect female sex workers (2.27%). The only exception was the prevalence among pregnant women which decreased steadily to 0.87% in 2006.

Year	Round	Blood donor	IDU	ANC	Male STI clinics	FSW direct	FSW indirect
1995	13	0.63	37.00	2.29	8.16	NA	17.19
1996	14	0.56	43.26	1.81	8.00	27.78	10.14
1997	15	0.56	40.00	1.71	7.07	26.14	8.22
1998	16	0.39	46.88	1.53	9.30	21.13	6.74
1999	17	0.44	50.77	1.74	8.71	16.00	6.56
2000	18	0.31	47.17	1.46	5.96	18.46	5.51
2001	19	0.30	50.00	1.37	5.08	16.56	5.03
2002	20	0.24	44.91	1.39	4.76	12.34	4.07
2003	21	0.27	46.80	1.18	4.00	10.63	3.67
2004	22	0.23	42.22	1.04	5.00	7.36	4.00
2005	23	0.22	37.64	1.01	4.13	6.80	3.37
2006	24	0.29	33.33	0.87	3.39	4.59	2.27
2007	25	0.21	25.62	0.76	4.55	5.57	3.23
2008	26	0.18	48.15	0.72	3.19	4.67	2.64

Table 4.1: Median HIV prevalence in specific population groups by percentage, Thailand sero-sentinels round 13 (1995) to 24 (2006)

Source: Bureau of Epidemiology [4]

1.2 Why HIV/AIDS matters?

Table 4.2: Share of DALY loss, curative expenditure, and productivityloss in terms of premature death and absenteeismfrom 12 leadingburden of disease, 2004

	ICD	Burden of	DALY	Curativ	Curative expenditure		Premature	Abs	senteeis	m
	code	diseases	loss	ОР	IP	Total	death	ОР	IP	OP+IP
1	A3	HIV/AIDS	19%	28%	4%	17%	35%	6%	8%	6%
2	F5	Liver cancer	8%	1%	2%	1%	10%	1%	3%	1%
3	н	DM	9%	31%	4%	18%	4%	35%	9%	32%
4	J1	Depression	7%	1%	0.1%	0.4%	0%	1%	1%	1%
5	J4	Alcohol	7%	0.4%	1%	1%	1%	2%	5%	2%
6	L2	Cataracts	2%	3%	8%	6%	0%	5%	4%	5%
7	М3	IHD	7%	7%	11%	9%	6%	5%	6%	5%
8	M4	CVD	13%	4%	10%	7%	9%	4%	9%	5%
9	N1	COPD	6%	3%	5%	4%	3%	8%	6%	7%
10	02	Cirrhosis	3%	1%	2%	1%	6%	2%	3%	2%
11	R2	Osteoarthritis	3%	7%	3%	5%	0%	5%	1%	4%
12	U	Traffic accidents	15%	14%	50%	31%	26%	28%	45%	30%
Total from 12 leading BOD			100%	100%	100%	100%	100%	100%	100%	100%
Million Baht, except DALY loss in years			4,780,000	32,452	29,484	61,936	208,287	9,836	1,437	11,273

Source: A report on "Investment in health sector in the 10th National Socio-Economic Development Plan 2007-2011 (2550-2554 BE)" by the International Health Policy Program^[6]

Note: DM = Diabetic Mellitus, IHD = Ischemic Heart Disease, CVD = Cerebo-Vascular Disease, COPD = Chronic Obstructive Pulmonary Disease

A major study by the International Health Policy Program^[5] assessed the economic loss due to the top ten priority burden of diseases in Thai men and women. Among the twelve disease groups which were selected from the top ten diseases selected in men and women, Table 4.2 clearly indicates that HIV/AIDS is responsible for the highest DALY loss or 19% of total DALY loss. HIV/AIDS registered the third highest curative expenditure or 17% of total spending. HIV/AIDS was also responsible for causing the highest economic loss (35%) due to premature deaths, and the fourth highest cause of economic loss due to absenteeism (6% of total OP and IP absenteeism loss).

Economic loss due to premature mortality in adults is a major policy concern for which the universal ART policy was introduced in 2003. The policy was found to be cost effective due to Thailandís capacity to produce low cost combination triple antiretroviral therapy, programmatic feasibility, and the role of state and non-state actors ^[6], though ex-post evidence found to be ART cost effective ^[7]. This evidence supports the notion that HIV/AIDS is one of the key national health agendas.

1.3 Why revitalizing HIV prevention matters?

Thailand launched a universal ART program in 2001 and today close to 150,000 individuals are on regular treatment. A National AIDS Spending Assessment ^[8] report indicates that the proportion of spending on treatment and care increased from 64.3% in 2000 to 84.6% 2004 while spending on prevention decreased from 18.4% in 2000 to 13% in 2004, as shown in Table 4.3. A 2008 UNGASS report indicated that spending on prevention had insignificantly increased to 14.1% ^[9] in 2007. The decreasing trend of prevention spending is worrisome.

Activities	2000	2001	2002	2003	2004
1. Prevention	18.4%	21.9%	24.5%	14.7%	13.0%
2. Treatment and care components	64.3%	59.5%	66.9%	74.2%	84.6%
3. Orphans and Vulnerable Children	3.2%	3.3%	2.6%	2.3%	0.8%
4. Program cost	14.0%	15.4%	5.9%	8.8%	1.6%
Total spending on HIV/AIDS, %	100%	100%	100%	100%	100%
Total spending on HIV/AIDS,					
million Baht	2,623.3	2,5/1.8	3,1/4.2	3,549.4	4,943.3
Total spending on HIV/AIDS,	65.4		70.0	05.6	100.0
million US\$	65.4	57.9	/3.9	85.6	122.9

Table fibr manana Macional Albo Spending Assessment, 2000 200	Table 4.3:	Thailand Nationa	I AIDS spending	Assessment,	2000-2004
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Source: A National AIDS Spending Assessment report [9]

To sustain past achievements on HIV prevention, two policy concerns can be raised. Does Thailand spend enough on prevention in light of the ever increasing fiscal demand for treatment? Does Thailand spend limited resources on prevention wisely to realize value for money?

This study attempts to answer the second question through a critical assessment of the performance of prevention interventions. Special focus is given to the effectiveness and cost effectiveness of prevention interventions, in the context of sex behaviour among young adolescents, MSM and IDUs.

1.4 Dynamic of risk behaviour in general population

A report by the Commission on AIDS in Asia does not show that casual sex among the youth is a major risk factor. This is largely because of socio-cultural restrictions on women's sexual freedom. Increases in unprotected casual sex are unlikely to lead to a larger HIV epidemic in the future, as shown in Figure 4.1. A large proportion of those at a high risk of HIV infection are young, but this does not mean that large numbers of young people are at high risk of HIV infection in every country in Asia. More than 98% of young women and 90% of young men neither sell nor buy sex, and neither inject drugs. Finally, the Commission on AIDS in Asia concludes that there is not a high risk of HIV infection ^[10].

However, this study shows that the changing sexual behavior of young people in Thailand is worrisome. The Bureau of Epidemiology ^[11] of the Ministry of Public Health conducted a review of risk behaviour based on: (1) the 1996 to 2007 National Behavioural Surveillance Surveys - BSS data, and (2) trend analysis among different sub-population groups using the National Sexual Behaviour Survey (NSBS) datasets 2006, conducted by Mahidol University, Institute of Population and Social Research. Results of this assessment are highlighted below.

- Knowledge on HIV prevention was low among adolescents in Grades 8 (14 years old) and 11 (17 years old). Less than 20% and 30% respectively had an accurate understanding of the five UNGASS HIV prevention questions. Complacency is the enemy of successes; these findings call for effective HIV learning and awareness programs among these young people who are most vulnerable to HIV infections.
- In the general population, the average age of first sexual intercourse was 18 years among men and 20 among women. This information is vital for intervention design well before the age of sexual debut.
- 3. Over the last 12 years, an increasingly high proportion of students, especially from vocational schools, had sexual intercourse experiences; men had more experiences than women. Vocational school students had more sex experiences than Grade 11 students; and again men had more sex experiences than women, as shown in Figure 4.2.

- 4. Condom use among students when having sex with boyfriends or girlfriends was low (less than 30% in most groups). Although a slight increase over the last 12 years was observed, overall condom use levels were worrisome, as shown in Figure 4.3.
- Consistent condom use among male workers (15 to 49 years old) and students when having sex with sex workers and non-regular partners were low, around 60% or less, though an increase was observed in 1995-2007, Figures 4.4 and 4.5.
- 6. Among female sex workers, consistent condom use varied by types of their partners. Condom use was lowest when having intercourse with a regular partner or spouse. Condom use was high, around 90% to 95%, when intercourse was with general and regular clients, and 80% for non-regular partners in 2007, Figure 4.6.



Figure 4.1: Estimated number of annual new infections and proportion of casual sex in a typical 100-million population setting in Asia

Source: Asia Commission estimate based on Asian Epidemic Model, using regional averages.



Figure 4.2: Percentage of the respondents who had sexual intercourse experiences, Thailand 1995-2007



Figure 4.3: Percentage of respondents who used condoms consistently when having sex with boy/girlfriend in the past 1 year, Thailand 1995-2007



Figure 4.4: The percentage of respondents who consistently used condoms when having sex with female sex workers in the past 1 year, Thailand 1995 - 2007



Figure 4.5: The percentage of respondents who consistently used condoms when having sex with non-regular partners in the past 1 year, Thailand 1995 - 2007



Figure 4.6: The percentage of female sex workers who consistently use condoms when having sex with general clients in the past month, with regular clients in the past week, with regular partner/spouse in the past month, and with non-regular partners in the past month in Thailand 1995 - 2007

1.5 Dynamics of risk behaviour in MSM and IDU

The annual sero-sentinel survey results alarmed policy makers over the consistent high and increasing trend of HIV prevalence among MSM and IDUs in the Bangkok Metropolitan area. HIV prevalence in MSM increased from 17% in 2003 to 30% in 2007^[12], while among IDUs prevalence was at 33.3% in 2006 ^[13]. To better understand the risk behaviour of these two groups, a special survey was conducted by Laohasiriwong ^[14] from March to July of 2008. A sample of 639 adult MSM (over 15 years old) was identified from 4 provinces (Chonburi, Chiang Mai, Khon Kaen, and Surat Thani) using the snow ball approach.

A sample of 444 adult IDUs was identified from treatment clinics and through the snow ball approach in Jana Hospital of Songkla, Drug Dependence Treatment Center in Khon Kaen, Chiang Mai, Mae Hong Son, Songkla, Pattani and Thanyarak Institute in Prathumtani. Others were identified in Baan Ozone, Baan Pakjai and IDU networks. Face to face interview questionnaires, approved by the National Ethical Review Committee, were used for both groups.

1.5.1 MSM

Six months prior to the survey, 42% of MSM respondents had sex with women, and 59% used condoms while having sex with women. At the last sexual intercourse, 23.5% of these MSM did not use condoms. Many of them perceived that having more sex partners than peers means being superb (40.4%), having many male lovers, or male partners makes one accepted by friends (34.1%), the outlook of being a healthy person should not be HIV+ (26.9%) and having penetrative anal sexual intercourse will not result in getting HIV/ AIDS (21.6%).

A high proportion of MSM who were surveyed had inappropriate attitudes on condom use. Almost half (46.3%) believed that using condoms when having sex reduces pleasure, and one in three (34.6%) believed that using condoms means distrust between them and their partners. Close to a third (30.7%) of them believed that telling partners to use condoms is not appropriate since it shows distrust. Almost one in five (23.8%) said they were shy to buy condoms and more than half (55.2%) reasoned that buying condoms is a burden they should not pay for. However, the majority (84.7%) thought condoms should be free for those who need them. See Annex 1.

Finally, during the past year, slightly more than half of MSM (56.4%) always or usually used condoms when having sex with their male partners, 38% never or seldom used condoms when having sex with male sex workers, and 32% often had sex with non-regular partners.

1.5.2 IDUs

Most IDUs (70%) had never or seldom used condoms when having sex with their husband/wife, 63% never or seldom used condoms when having sex with male/female sex workers, and 61% never or seldom used condoms when having sex with their lovers and girlfriends.

Only 51.8% had injected drugs during the past year, of which 19.8% often injected drugs, and 20.1% had shared needles with others. About 30% participated in a 'party' of sharing needles for injecting drugs and had sex under the influence, and 30.3% had sex after injecting drugs.

Not many MSM and IDUs access counselling services on sex education or sexually transmitted infections. In this study, only 27.7% of MSM and 42.1% of IDUs had received counselling services on sex education or sexually transmitted infections.

In summary, this survey highlights a gloomy situation for MSM and IDUs, though their population size is not large. MSM are estimated at 0.1-0.3% of male adults between the ages of 15-49 in Thailand. Therefore there are approximately 0.53 million MSM, of which 60% (0.32 million) engaged in risky behaviour. The number of IDUs is unknown, but both groups have extremely high HIV prevalence which warrants immediate policy attention.

1.6 Thailand's expenditure on HIV/AIDS

In 2007, total health expenditure in Thailand was 3,876 Baht per capita population, or US\$ 115 per capita (exchange rate 33.7 Baht per US\$), see Table 4.4.

Population	64,197,000
Total Health Expenditure	
 per capita, Baht 	3,876
 per capita, US\$ 	115
• % GDP 2007	3.4%

Table 4.4: Background data on healthcare financing, 2007

Source: Estimates by the Thai working group on NASA - Thursday, January 24, 2008. Note that IHPP developed and maintained the National Health Account in a long series from 1994 to 2005. To comply with the UNGASS 2008 reporting requirements, IHPP estimated total health expenditure per capita based on the 1994 to 2005 series of National Health Account.

According to the UNGASS report ^[9], in 2007 total expenditure on HIV/ AIDS was 6.728 billion Thai Baht. This is equivalent to 105 Baht per capita, or 11,600 Baht per capital PLHA, given the total number of 580,000 PLHA. Total expenditure on HIV/AIDS accounted for 0.081% of GDP in 2007, or was equivalent to 2.7% of Total Health Expenditure as shown in Table 4.5.

Table 4.5: Key parameters of expenditure on HIV/AIDS, 2007

Total Expenditure on HIV/AIDS, million Baht	6,728.0
Estimated Total Health Expenditure, Baht	248,852.4
Total Expenditure on HIV/AIDS,	
 per capita population, Baht 	105
 per capita PLHA, Baht 	11,600
• % GDP	0.081%
% of Total Health Expenditure	2.7%

Source: Estimated by the Thai working group on NASA - Thursday, January 24, 2008

With regard to sources of financing for HIV/AIDS programs in 2007, it was indicated that domestic public financing had the highest share or 82.7% of Total Expenditure on HIV/AIDS (TEA). International resources accounted for 17.3% of TEA. This finding indicates better self-reliance for HIV/AIDS program financing, and reflects the firm commitment of the Royal Thai Government to the fight against HIV.

In light of the universal access to ART which was adopted by the Government in 2001, a huge share of total expenditure on HIV/AIDS (71.8%) went to care and treatmen . HIV prevention activities accounted for 14.1%^[3], and program administration, 9.7% of total spending on HIV/AIDS (Table 4.6).

Financing HIV/AIDS programs in Thailand relies mostly on domestic resources, 82.7% of total expenditure, as shown in Table 4.6. This clearly reflects the government's financial commitment and little external donor influence in program direction. This is different from countries in the Asia Pacific Region where financing HIV/AIDS programs relies solely on external donor resources, and is vulnerable to fragmentation and lack of harmonization across programs and projects ^[9]

Type of expenditure	Domestic	International	Total
1. Prevention	7.3%	6.8%	14.1%
2. Care and Treatment	67.2%	4.6%	71.8%
3. Orphans and Vulnerable Children	1.4%	0.1%	1.5%
4. Program Management			
Administration Strengthening	5.0%	4.7%	9.7%
5. Other related work e.g. research,			
social services, incentive human	1.80%	1.04%	2.84%
resources			
Total, row percent	100%	100%	100%
Total, million Baht	5,563.9	1,164.1	6,728
Total, column percent	82.7%	17.3%	100.0%

Table 4.6: Total Expenditure on HIV/AIDS by sources of finance and functions,current year price, 2007

Source: UNGASS report ^[9]

1.7 Effectiveness and cost effectiveness of prevention interventions

A study by Teerawatananon et al ^[1] assesses the effectiveness and cost-effectiveness of prevention interventions in Thailand through a review of published and unpublished grey literature. In addition, a systematic search for evidence from international databases was conducted.

In this study, a total of 932 Thai abstracts were identified through search definitions, of which 890 were excluded as irrelevant. Some 42 full papers were reviewed, 28 were excluded after reading the full texts, and only 14 were included in the analysis. Additionally, a total of 1,395 international abstracts were identified through search definitions, of which 1,213 were found to be irrelevant and excluded. Overall, 182 full papers were reviewed, of which only 63 were included in the analyses. The 63 included 15 systematic reviews or meta-analysis, 17 economic evaluations, 18 randomized control trials, and 13 observational studies.

Findings indicated that the interventions that showed strong evidence of reducing HIV infection among the target populations were: (1) male/ female condoms for female sex workers, (2) a street outreach program for IDUs, (3) a program for prevention of mother-to-child HIV transmission in pregnant women, (4) improvements in sexually transmitted infections treatment services and (5) male circumcision.

A key finding echoed a recommendation in Disease Control Priorities in Developing Countries.^[15] the lack of significant evidence indicated that community-based education for various target groups e.g. FSW, MSM, IDUs, young and general population, offer good value for money in prevention of HIV infection either in low or high HIV prevalence settings. This review found potential for interventions that aim to mitigate barriers to prevention and minimize the negative social outcomes of HIV infection such as increased alcohol tax, financial and in-kind support.

The review further highlighted serious limitations of local evidence on the effectiveness of HIV interventions among high risk populations in Thailand such as IDUs, MSM, FSW and young people. Thus international experiences on effectiveness and cost effectiveness may not be applicable for the local Thai context and call for prioritizing local research to assess the effectiveness and cost effectiveness of prevention interventions.

2. Goal and objectives

The goal of this study is to provide policy recommendations on revitalizing HIV prevention interventions in the context of universal ART and increasing expenditure on treatment.

Based on reviews of the effectiveness and cost effectiveness of prevention interventions, this study aims to assess the coverage of these interventions among nine risk population groups: (a) FSW, (b) MSM, (c) IDUs, (d) sero-discordance couples, (e) pregnant women, (f) prison inmates, (g) healthcare workers, (h) young people, and (i) the general population. The study seeks to: (1) assess the adequacy of prevention programs in population coverage and program spending in order to scale up or maintain high coverage of proven effective and cost effective interventions, and (2) to assess the coverage of interventions proven to be ineffective and not cost effective that could be scaled down or terminated.

3. Methodologies

We apply the evidence on effectiveness and cost effectiveness of HIV prevention intervention by Teerawattananon et al in chapter 3 which can be categorized into four main groups: (1) interventions proven both effective and cost-effective, (2) interventions proven effective but with no evidence on cost effectiveness, (3) interventions proven effective but not cost effective, and (4) interventions proven neither effective nor cost effective.

Effectiveness and cost effectiveness of these interventions are specific to the nine different population groups. In the matrix of 25 interventions accross the nine target groups, the most recent coverage rates were selected from relevant documents, published and unpublished grey literature in the Ministry of Public Health and other small scale program/ pilot information.

In-depth interviews of key informants were conducted where coverage data does not exist for the best expert estimates. Investment in different prevention interventions referred to various estimates in the National AIDS Spending Assessment.

Where appropriate in the results section of IDUs, MSM, young adolescents and the general population, comments refer to reports by the Bureau of Epidemiology and a special survey by Laohasiriwong in chapter 2.

4. Results

4.1 Convention on colour

Table 4.7: convention on colour

Colour	Description
	Intervention proven both effective and cost-effective
	Intervention proven effective but with no evidence on cost-effectiveness
	Intervention proven effective but not cost-effective
	Intervention proven neither effective nor cost-effective
	No evidence on effectiveness and cost-effectiveness
	Intervention does not match with target group

Table 4.7 Aids the colour interpretation of effectiveness and cost effectiveness of interventions. This colour convention, a traffic-light system, used by the study of Teerawattananon et al ^[1], will be applied throughout the rest of this report. For example, dark green refers to interventions proven to be both effective and cost-effective; and red refer to interventions proven neither effective nor cost effective. Table 4.8 shows the results of the Teerawattananon et al study^[1].

Note that the study by Teerawattananon et al ^[1] assesses both Thai published and grey literatures from all possible sources; whereby internationally published literatures were systematically searched from Pub Med and Cochrane library. However, that study was dominated by international publications whereby local Thai evidence on the effectiveness of interventions among high risk populations such as IDUs, MSM, female sex workers and young people are very limited.

Interventions	FSW	MSM	IDU	SDC	Preg	PI	нсw	Young	G pop
I. Interventions that affect knowledg social correlates of risk	e, attil	tude ar	nd beli	efs and	d influe	ence p	sychol	ogical a	and
Abstinence-only programs [16]									
Abstinence-plus programs [17,18]									
Community-based education [19,20,21,22,23,24,25]									
Mass media campaigns ^[26]									
Peer education [27,28,29,30,31,32,33,34,35]									
Routine (provider-initiated) voluntary HIV screening at healthcare settings [36]									
School-based sex education programs (combined with life skills) ^[37,38,39,40,41,42]									
Voluntary HIV counselling and testing (VCT) (± STI clinic and condom distribution) [43,44,45,46,47,48]									
Workplace-based education (+condom distribution / free STI clinic) ^[49,50,51,52,53,54,55,56]									
II. Harm reduction interventions that the behaviour	lower	the ris	sk of a	behav	iour, b	ut do i	not eli	minate	
Condom use (availability and accessibility) [57,58,59,60,61]									
Introduction of female condoms [44,56, 62]									
Needle and syringe exchange [63,64]									
Needle social marketing [65]									
Street outreach [66,67,68,69]									
III. Biological/biomedical intervention risk	ns that	strive	to red	uce HI	V infe	ction a	nd tra	nsmiss	ion
HIV vaccine ^[70,71]									
Improved STI treatment services [44, 72]									
Mass or community treatment of sexually transmitted infections ^[45, 73]									
Male circumcision ^[45, 74,75,76,77,78]									
Microbicides ^[45]									
Post-exposure prophylaxis [68,79,80]									
Prevention of mother-to-child transmission of HIV [81,82]									
Screening blood products and donated organs for HIV [44,56,83]									
Substitution treatment [84,85,86]									
Using nucleic acid test screening (NAT) of volunteer blood donations ^[87]									
IV. Mitigation of barriers to preventio	n and	negativ	ve soci	al outo	omes	of HIV	infect	ion	
Increased alcohol tax [45]									
Microfinance [88]									
Microfinance (combined with education) [89]									

Table 4.8: Summary of findings by intervention and target population

4.2 Setting the scene on principles for policy recommendations

The finite HIV/AIDS resources are mostly allocated to treatment and care under universal coverage launched in 2001; it is unaffordable to spend unnecessarily on the ineffective and non-cost effective interventions. Table 4.9 provides a generic principle on how we craft our policy recommendations for scaling up, scaling down and termination.

Table 4.9: Principle of policy recommendations

Stage of intervention	A Proven effective and cost effective	B Proven effective but no evidence on cost- effectiveness	C Proven effective but not cost effective	D Proven neither effective nor cost effective
1. No policy intervention	A1 Generate evidence through e.g. operational research to assess implementation feasibility, in order to introduce policy and program implementa- tion and rapid scale up to highest possible coverage	B1 Lower priority, it is high priority if the HIV program had introduced all proven effective and cost effective interven- tions, as country should invest more on preven- tion interventions in the light of universal ART	C1 Least priority, discourage the attempt to initiate program	D1 Discourage attempts to introduce policy or program
2. Inter- ventions exist, but no coverage data	A2 Develop effective information systems to assess coveragee	B2 Where existing program operate with no coverage data, we recommend develop coverage data. Though not cost effective, it is effective and may support the implementa- tion of proven effective and cost effective intervention	C2 Least priority	D2 Terminate
3. Inter- ventions exist, and coverage data is available	A3 Sustain and scale up to reach the highest possible coverage	B3 Where existing program operates with high coverage level, maintain these coverage, as it is effective and may support the implemen- tation of proven effective and cost effective interventions	C3 Scale down unless convincing argument to maintain program or other ethical justifications	D3 Terminate programs and reallocate resources for effective and or cost effective interven- tions

The matrix presents the interventions in four groups by level of evidence of effectiveness and cost effectiveness using colour conventions in four columns (A. dark green, B. light green, C. yellow and D. red colour). It also presents three stages of interventions in three rows: (1) no policy or program interventions; (2) interventions exist but no coverage data; and (3) interventions exist and coverage data is available. From an understanding of this matrix, we developed a generic principle for recommendations. In the matrix, there are 12 cells of possible recommendations.

Where interventions are proven to be effective and cost effective these fall in the "dark green column." If there is no policy intervention (Box A1), it is recommended to generate evidence through operational research to assess programmatic and implementation feasibility and socio-cultural acceptability, in order to introduce policy and program implementation and rapid scale up to the highest possible coverage.

From interventions in Box A2, it is advisable to rapidly install information systems in order to verify the coverage rate which facilitates program performance assessment.

Likewise, in Box A3 where interventions exist, it is recommended to sustain the current high coverage or to scale up to reach the highest possible coverage. Program barriers should be identified and overcome to reach the highest possible coverage.

Interpretation for the "red colour column" where interventions are proven neither effective nor cost effective indicates it is advisable to terminate these programs, or not to initiate. Financial resources and programmatic efforts should be given to interventions in the "dark green" and "light green" groups.

In the "light green column" where interventions are proven effective, but there is no evidence on cost effectiveness, we recommend to initiate a program if there is none, or to scale up these interventions to reach a high coverage level. This is because investment in prevention interventions is small, 14.1% of total spending on HIV/AIDS (see Table 4.6), with a decreasing trend in terms of proportion of total spending on HIV/AIDS as a result of scaling up universal ART. Another argument in favour of spending on more on prevention interventions classified as light green: HIV/AIDS is consistently the top first burden of disease in terms of Disable Adjusted Life Year-DALY loss in 1999 and 2004 ^[90], see also Table 4.3. Based on these arguments, we tend to recommend in favour of interventions which fall under the "light green category" to scale up and reach high coverage instead of scaling down; while efforts should be made to uncover the cost effectiveness of these interventions.

Compared to "light green category", we tend to not favour scaling up interventions which fall under the "yellow colour category". This is because though effective, it is not cost effective or efficient to do so. Programmatic efforts should be given to "dark green" and "light green" categories.

4.3 Results of critical assessment

With reference to Teerawattananon et al ^[1], Table 4.9 is the main result of our assessment of population coverage for all current prevention interventions which are relevant to the nine population groups.

Table 4.10 is self-explanatory; there are 25 interventions under four clusters for nine population groups. In addition to the Green, Yellow and Red traffic light convention, the white represents interventions that do not have evidence on effectiveness and cost effectiveness while the grey refers to interventions not applicable to that specific population.

Based on the matrix in Table 4.10 we produced nine tables (Table 4.11 to 4.19), one for each population group, where specific recommendations can be made.

Γ		_	1				
•	I	General population				Similar to Young Pop	Sporadic activities by government or GF ^J but no coverage data
:	I	Young people (10-24 yrs)		No policy, but some small project ^a	No policy, but some debates are discussed ^c	Some activities are provided by health centres but data of coverage is unavailable. In addition, GF RCC round 1 has a plan for many projects	
	IJ	Healthcare Workers	sk				
1	u.	Prison inmate	correlates of ri				
1	ш	Pregnant women	gical and social				
1	٥	Sero- Discordant couples	uence psycholo				
	U	IDU	beliefs and infl			No data at national level, but some small scale projects are available and its coverage was about 50% of target group	
1	8	MSM	je, attitude and			Activities are provided by TUC+MSM consortium, its coverage about 6.25% of target group	
	A	Female sex workers	affect knowledg			100% coverage for direct FSW in Bangkok only. There were small scale project in some provinces (estimated 75,046 direct FSW) All projects get govern- ment budget support	
חו באבוורוסוו ווורבו אבו		Interventions	I. Interventions that	1. Abstinence-only programs	2. Abstinence-plus programs ^b	3. Community-based education	4. Mass media campaigns

Table 4.10: Existing prevention activities and coverage by risk groups, according to gradient of effectiveness and cost-effectiveness of HIV

I	General population			No policy on PICT yet for any group	No data on VCT for this group Current policy on free access
т	Young people (10-24 yrs)	In 2006 reported for 465 students in 16 schools ^T	Coverage 40.5 % of target school ^k In addition, GF RCC round 1 2008 has a plan for many projects	No policy on PICT yet for any group	No data on VCT for this group Current policy on free access
Ð	Healthcare Workers				
Ľ	Prison inmate				National policy of Dept of Correction to provide compre-
ш	Pregnant women			No policy on PICT yet for any group	99.1% of pregnancies covered by VCT (2007)
۵	Sero- Discordant couples				At initial phase of policy implement- ation, a number of
c	IDU	Peer group- activity in every year, since 2004 ^g			Activities to educate IDUs and inmate in prisons, no regular
В	MSM	Activities are provided by TUC+MSM consortium, its coverage about 6.25% of target group ^f			No coverage data, stigma is a major barrier to VCT. Therefore
А	Female sex workers	Peer group- education for direct sex workers with community based education ^{d, [51]} ,			Coverage data is incomplete:- 100% coverage for the Direct FSW in
	Interventions	5. Peer education	 6. School-based sex education program (combined with life skills) 	7. Routine (provider-initiated) voluntary HIV screening at healthcare settings (PICT)	8. Voluntary HIV counselling and testing (VCT) Note: VCT services in 2008 was 257,457

I	neral Jation	cT by any idual in and est for	Thailand national amented 2 2000, 10% cage for oyees. om ing ing ines in 'places ^p	rnment y on free om bution has not the first y as FSW possible ss by
	Ge popı	to VG indiv walk requi	ASO was imple since with cove empl Cond vend wan	Clear gove polic but h but h and l and l self-r self-r
т	Young people (10-24 yrs)	to VCT by any individual walk in and request for VCT		Clear government policy on free condom distribution, but has not been the first priority as FSW and possible access by self-purchase
G	Healthcare Workers			
ш	Prison inmate	hensive VCT, provision of condom, education, treatment and care for prison inmate but no coveragedata ⁿ		viour
ш	Pregnant women			ninate the beha
D	Sero- Discordant couples	problems encountered, no data on coverage		 but do not elir Clear government policy on free condom distribution, but has not been the first priority as FSW
c	IDU	coverage data Coverage was 0.9 % of the project in Bangkok ^m		of a behaviour Clear government policy on free condom distribution, but has not been the first priority as FSW. IDU, but may access by self-purchase
8	MSM	coverage should be low		t lower the risk Clear government policy on free condom distribution, but has not be the first priority as FSW, MSM most accesses by self-purchase
A	Female sex workers	Bangkok and some brothels in Chiang Mai ^d These activities got financial support from government	Doubtful systematic policy interventions, no coverage data Safe sex education in some provinces ^o but no coverage data	Lerventions tha Clear government policy on free condom distribution, now 100 % coverage for Direct FSW ^{d, p}
	Interventions	cases I but did have breakdown data who got the services	9. Workplace-based education (±condom distribution/ free STD clinic visits)	II. Harm reduction in 10. Condom use 10.1 Condom provided by government

nant Priso nen inmat

PrisonHealthcare workersToung peopleGeneral modulationNorkersVorkers(10-24 yrs)populationNorkersNo data, See Annex 2No data, See Annex 2No data, See Annex 2NoNoNo policy to Policy to health personnelNo policy Policy to health bersonelNo policy policy health bersonelNoNoNo policy Annex 2No policy Annex 2NoNoNo policy policy bersonelNo policy policy bersonelNoNoNo policy policy to bersonelNo policy policy bersonelNoNoNo policy policy bersonelNo policy policy bersonelNoNoNoNo policy policy bersonelNo </th
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% Policy to provide one month ART to personnel exposed to HIV for occupational safety '
Policy to provide one month ART to health personnel exposed to HIV for occupational safety ¹
% age ^k

I	General population	Policy to screen HIV antibody and antigen and Hep B-C were well in place and funded, In 2008, coverage 99.79 % k		No policy but available for affordable patient (1,500 units/day) ^s		Current advocated for the national policy. The trend of having sex after alcohol consumption is increasing, with 39.80 % condom used rate ^m
Н	Young people (10-24 yrs)					
g	Healthcare Workers					
L	Prison inmate					
E	Pregnant women				tion	
D	Sero- Discordant couples				es of HIV infect	
U	IDU		Application of Methadone maintenance 100% coverage in public services ⁹		e social outcom	
B	MSM				on and negativ	
А	Female sex workers				iers to preventi	
	Interventions	22. Screening blood products and donated organ for HIV	23. Substitution treatment	24. Using nucleic acid test screening (NAT) of volunteer blood donations	IV. Mitigation of barr	25. Increased alcohol tax

н	General population	No policy and not applicable.	No policy and not applicable.
T	Young people (10-24 yrs)		
U	Healthcare Workers		
L	Prison inmate		
ш	Pregnant women		
٥	Sero- Discordant couples		
U	IDU		
в	MSM		
A	Female sex workers		
	Interventions	26. Microfinance	27. Microfinance combined with education



- Thailand is not a recipient of the PEPFAR grant. However, there are some small scale projects initiated by individual interest e.g. abstinence advocacy project of "Rak Neuan Sagnuan Tau" led by a former senator; Rabiabrat Pomgpanich.
- Abstinence and encourage condom use and other safer sex practice for sexually active participants. ٩
- some debates are being discussed among different groups (e.g. MOPH vs MOE) about the right to encourage Nevertheless, condom use υ
- of .⊆ Information is from the interview of Ms. Vipada Maharattanaviroj, STIs cluster, Bureau of AIDS, TB, and STIs, Department Disease Control, Ministry of Public Health. There are small scale projects of community-based education and peer groups some provinces, especially the upper North and East of Thailand; i.e. Chiang Mai, Phrae, Lam pang, Chon Buri. σ
- This is survey data in 2001 using geographical mapping. Source of data is the website of STIs Cluster, Department of Disease Control, Ministry of Public Health http://www3.easywebtime.com/aids_stis/statvd2.html access on 12 January 2009. b
- TUC and MSM Consortium estimated 0.01-0.03% of male adults, around 0.53 million, were MSM, of which 60% had risk Therefore, behaviour, 0.32 million. The consortium provided activities on community-base education to 20,000 individuals. the coverage was 6.25% (20,000/320,000=0.0625).
- Department of Disease Control, Ministry of Public Health, activities for IDU groups are (1) community-based education for and Peer group activities since 2004 to 2005, (2) incorporate HIV/AIDS Education in Exchange needing program for 9 villages in Amphur Maechan, Chiang Rai Province and ARKA hill tribe in the North, (3) small scale project on street outreach for IDU groups organized by Thanyarak Institute and all 8 regional Addiction Treatment Coverage TB and STIs, Centres and (4) Methadone replacement Program throughout the country under the Universal Health Care to the report of the study of AIDS prevention and alleviation during 2002 - 2006 the Bureau of AIDS, Program, 100% coverage. However, this is available only 147 public hospitals. harm reduction and HIV/AIDS Refer σ
- Health Security Office (NHSO). NHSO provided financial support, 37.50 baht per capita, to the local government unit in order Information is from Key Informant interview. KI is Mr.Sorakij Bhakeechip, Director of AIDS Management Fund, the National

- Refer to the working group of AIDS project RCC Round 1 2008, the summary report of the first meeting for the Coordinating and Development of AIDS Project of Sub Recipients (SRs) in 2009, Principle Recipient office (PR), Department of Disease the main Control, Ministry of Public Health, there is a plan for an implementation of training project aiming to develop good practice of students and school model or so called "Learning Resource". It has been implemented in 2008 only 1 school each province, 43 provinces out of 76 provinces. In addition, youth network in school will be established. PATH and BATS are responsible unit for these projects and get support from GF. The same projects will be applied for general population as well.
- Information is from Key Informant interview. KIs are Dr.Cheewanan Lertpiriyasuwat and Dr. Petchsri Siriniran, Department of Disease Control, Ministry of Public Health. There are 4 campaigns in each year supported from different sources i.e. government budget and GF. For example mass media campaign on the World AIDS day, Valentine 's Day and the New Year. Fhere are other sporadic projects as the National media via TV and posters in several circumstances e.g. (1)"Yeud OK Pok cong", encouraging condom use, supported from GF 20 Million baht per year, (2) "Kui Rak Puerd Jai, مِستَسْنَهْ شَالَاً". sincere talk among lovers", for the family life education and counselling and (3) "Vending machine for condom, maximyers."
- Coverage data is from the UNGASS country progress report 2008: Thailand, reporting period: January 2006 December 2007. There are three patterns of school based education which are (1) at least 5 hours per year inserted in the subject, (2) at least 10 hour on life skills and sex education and at least 16 hours intensive class on sex education.
- Total annual VCT services in 2008 was 257,457 cases (73% was NHSO service, 15 % was SSO service, and 12% was CSMBS, already reported in the PMTCT system. This data was retrieved from the NHSO routine report (AIDS Management Fund, National AIDS Program Report 2008, NHSO) which was likely to be under-report. These figures were the public services, not included as it was % was other services) There is no breakdown who are these VCT subpopulation, except pregnancy private secto Q and
- Bang-on Thepthien and Parinda Tasee. 2008 Behavioral related to HIV infection among drug user in 4 years round Bangkok Metropolitan. Journal of Public Health and Development. Vol.6 No. 1. E

- Some safe sex education programmes for FSW at the work places in Bangkok. For example 14 night clubs (about 2,000 workers), 13 KARAOKE places, public parks in BKK (e.g. Silom, Klonglord, Wang Saranrom).
- Information from the interview of Dr.Cheewanan Lertpiriyasuwat, AIDS cluster, Bureau of AIDS, TB, and STIs, Department of Disease Control, Ministry of Public Health. ASO is "AIDS-response Standard Organization". ۵
- ^q Surveyed by Dr. Wongsa Laohasiriwong, CDP-Health HIV/AIDS
- was US.CDC is concerned that appropriate post-exposure management is an important element of workplace safety. Reference is made to Adelisa LP, Denise M C, Lisa AG, Walid H, Clara SR. Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis. MMWR Recomm Rep 2001;50 (RR-11):1-52. Refer to Policy and guidance: Technical Policies of the UNAIDS Programme by UNAIDS it recommends PEP in comprehensive prevention package which emphasizes primary prevention, even HIV-PEP proved that is not 100% effective. 2008, L
- Laboratory Centre of Thai Red Cross, Thailand. No government policy to provide NAT but voluntary NAT testing in blood use paid by patient is available (1,500 units/day). Therefore, in fact, only patients in private hospitals could access to NAT.
- TB and STIs, Department of Disease Control, Ministry of Public Health, activities for young group are 19 training course including peer Refer to the report of the study of AIDS prevention and alleviation during 2002 - 2006. Bureau of AIDS, group educational in every year since 2004, campaign, counselling services. ⊢

4.4 Status of prevention interventions and policy recommendations for nine population groups

4.4.1 Female Sex Workers

Table 4.11: Summary of current interventions, coverage and recommendations for FemaleSex Workers

Coverage of intervention	Proven effective and cost effective	Proven effective but no evidence on cost- effectiveness	Effective but not cost effective	Neither effective nor cost effective
No policy intervention	Female condom use is not a policy. We recommend evaluation of programs in UNFPA sites and conduct operational research to test if female condoms are acceptable, assess program feasibility in the Thai context			No policy to introduce microbicide, but it is in the study process for policy recommend- ation Recommend- ation: Do not initiate
Interventions exist, but no coverage data	 1.No systematic intervention on workplace education and peer group education, and no coverage data Recommend to introduce clear policy interventions, rapid scale up and develop coverage data 2.No coverage data on the existing STI treatment services Recommend to improve information on coverage and improve user friendly STI treatment services 			
Interventions exist, and coverage data is available	 100% free condom distribution in direct FSW, 96.2% condom use with clients Recommend to adequately fund and sustain program coverage 100% coverage of VCT for FSW in Bangkok, few sites in other provinces. Recommend to urgently scaling up to national coverage 	High coverage of community based education for FSW in BKK, small scale pilots in other provinces Recommendation: rapid scaling up community based education program for FSW		

Female sex workers (FSW) are most vulnerable to infection, and require special attention and continued efforts of effective interventions. Of the interventions under the "dark green" banner; female condom use was not a policy, for which operational research to assess its applicability for Thai context is urgently required as an alternative to male condoms when clients refuse to use condoms. Workplace education, peer education and the existing STI treatment services are not systematically fostered without coverage data. This requires a major review and effective and wide coverage of workplace education programmes and friendly services. Free condom distribution and high level of use by clients must be sustained at the highest level possible. Wide coverage of quality VCT for FSW is recommended.

Interventions under "light green" banners: as a result of public sector reform a few years ago, STI treatment services were transferred from the STD Clinic under the Provincial Health Office to the Provincial Hospital Obstetric Gynaecology Department. The transfer was based simply on the grounds that the Provincial Health Office is an administrative arm and should not provide clinical services. This is a major negative impact, as STD clinics not only provide health checkups but were actively involved in the past few decades on prevention, education of sex workers, peer education, trust partnership building with brothel owners in ensuring a high level of condom use. Staffs in the Obstetric Gynaecology Department did not have such skills, partnership and management with owners, managers of brothels and other indirect sex establishments. STI treatments for FSW in provincial hospitals do not provide adequate barriers to prevent exposure of FSW to general patients. STI service is therefore not carried out in a user friendly manner. STI service requires major revisiting and program leadership to solve the protracted problems.

Microbicide, is an intervention in the study for policy recommendation. During the time of the investigation in this study, it was found to be neither effective nor cost-effective should not be initiated which distracts program focuses, until the study will prove effectiveness and/or cost-effectiveness.
4.4.2 MSM

Table 4.12: Summary	v of current interventions.	coverage and recomme	endations for MSM
	, or carrent meet criticity	coverage and recomme	

Coverage of inter- vention	Proven effective and cost effective	Proven effective but no evidence on cost- effectiveness	Effective but not cost effective	Neither effective nor cost effective
No policy inter- vention				Very low coverage of peer education 6.25%
				Recom- mendation: this is not high prior- ity for MSM program interven- tions
Interven- tions exist,	1. Priority group. MSM most	No coverage data of VCT due to stigmatization		
but no coverage data	accesses condoms by out of pocket payment.	Recommend: minimize stigmatization and		
	Recommend to provide more free condom distribu- tion, create awareness for sustaining high coverage	systems		
	2.No coverage data on the existing STI treatment services			
	Recommend to improve informa- tion on coverage and improve user friendly STI treat ment services			
Interven- tions exist, and			Very low coverage of community-based education 6.25%	
coverage data is available			Recommendation: this is not a high priority for MSM program interventions	

MSM are not covered by sero-sentinel surveys despite their high HIV prevalence. Surveys among MSMs by Rainbow Sky Association of Thailand (RSAT or Fah Si Roong) show consistent increase in HIV prevalence from 17% in 2004 to 28.8% in 2005, and 30.2% in 2007. The 2008 survey is expected to show even higher prevalence.

In Table 4.11, interventions under the "dark green" banner such as free distribution of condoms to MSM are under a policy vacuum. Though MSM access condoms through self-purchasing, evidence from surveys ^[14] shows very low rate of condom use. An evidence informed policy for effective condom distribution and use advocates through MSM peer groups and NGOs should be tested, reviewed, and advocated. However, the major barriers are stigmatization and difficulty of reach, with skilful health workers in the localities where they live and work; they may have comparative advantages to overcome these barriers.

For interventions under the "light green" banner, there is no coverage data on VCT services for MSM, but it is low due to stigma as confirmed by surveys in this group ^[14]. It is recommended that the social stigma barriers must be minimized to accommodate better access to VCT services. Access to and use of STI treatment services is a cross cutting problem across the whole spectrum of clients who may use it, as discussed in the female sex workers above on negative outcomes of public sector reform and termination of STD clinics in the Provincial Health Offices. Similar recommendations are made.

For interventions under the "yellow" banner, the low coverage of community based education does not matter as it was proven not to be cost effective; this intervention should be given low priority.

For interventions under the "red" banner, the review reported no effectiveness and cost-effectiveness. These interventions should not be provided if there is no proof for effective and/or cost-effectiveness.

4.4.3 IDUs

Coverage of intervention	Proven effective and cost effective	Proven effective but no evidence on cost- effectiveness	Effective but not cost effective	Neither effective nor cost effective
No policy intervention	 priority group. MSM most accesses condoms by OOP payment. IDU most accesses condoms by OOP Recommend to provide more free condom create aware- ness in order to reach high coverage No policy on needle and syringe exchange Recommend to stay as is, this is least priority to do 	No policy on needle social marketing Recommendation: though no evidence if it is cost effective, it is effective and should have a clear policy but requires extraordinary strong leadership in the light of "cracking down drug".		 No HIV vaccine , but in the clinical trial phase 3 No policy on post-exposure prophylaxis Recommend to discourage these policy interventions
Interventions exist, but no coverage data	 Small scale pilot project on street outreach supported by GF, no coverage data Strongly recommend to rapidly scale up No coverage data on the existing STI treatment services Recommend to improve information on coverage and improve user friendly STI treatment services 			
Interventions exist, and coverage data is available	VCT project supported by GF, low coverage at 0.9% Strongly recommend to rapidly scale up	Methadone substitution treatment, high coverage at public clinics Recommend to sustain the program		Small scale project of community- based education, with 50% coverage of target group Recommend to terminate this interven- tion

Table 4.13: Summary of current interventions, coverage and recommendations for IDUs

For interventions under the "dark green" banner in Table 4.13, it is unacceptable that effective and cost effective interventions such as free distribution of condoms and needle syringe exchange to IDUs with very high HIV prevalence are not endorsed by policy. However, reaching this group is a major programmatic barrier, as the current government policy against "drugs" drives all IDU movement under-ground. Distribution of condoms through peer groups and NGOs is one of the possible solutions. Street outreach has yet to be scaled up and develop information on coverage rates. VCT services are poorly performed with an extreme low coverage rate and should be rapidly scaled up.

As for interventions under the "light green" banner, it is not unexpected as there is no government policy on needle social marketing to prevent sharing of syringes and needles, as it contradicts with the policy on "drugs." We argue that it is effective, though there is no evidence if it is cost effective; it is one of a few interventions available among IDUs to prevent sharing of injecting implements. A pilot of integrated different interventions in one setting of social marketing of needles and syringes, such as condom distribution, VCT and STI treatment, delivered by IDU peer groups or NGOs would be an innovation and overcome various barriers.

Interventions that fall under the "red" banner, there is no policy on postexposure prophylaxis and must wait for the study results if it can be proven for effectiveness or cost-effectiveness in the future. One should not initiate these ineffective and non-cost effective interventions. Community based education for IDU groups should be replaced by integrated social marketing of needles, syringes and provide VCT and STI treatment services.

4.4.4 Sero-Discordance Couple

Table 4.14: Summary of current interventions, coverage and recommendations for Sero-Discordance Couple

Coverage of intervention	Proven effective and cost effective	Proven effective but no evidence on cost- effectiveness	Effective but not cost effective	Neither effective nor cost effective
No policy intervention	Priority group. They mostly access condoms by OOP payment.			
Interven- tions exist, but no coverage data	No coverage data on the existing STI treatment services Recommend to improve information on coverage and	Initial phase of VCT implementation, no coverage data Recommend to scale up the program and		
	improve user friendly STI treatment services	improve information on coverage		
Interventions exist, and coverage data is available				

Under the "dark green" banner in Table 4.14, MSM who are the priority group mainly accesses condoms by out of pocket payments. We recommend that a policy should be established regarding not only stand-alone effective condom distribution, but providing a more comprehensive approach integrating condom distribution with VCT services and STI treatment where sero-discordant couples are identified. Psycho-social dimensions and issues on HIV disclosure between discordant couples should be well understood through qualitative research to inform policy and guide effective program design.

4.4.5 Pregnant Women

Table 4.15: Summary of current interventions, coverage and recommendations forPregnant women

Coverage of intervention	Proven effective and cost effective	Proven effective but no evidence on cost- effectiveness	Effective but not cost effective	Neither effective nor cost effective
No policy intervention	No policy on PICT for pregnant women			
	Recommend to formulate national policy and clearly spell out and rapidly scale up in order to reach high coverage			
Interventions exist, but no coverage data				
Interventions exist, and coverage data is available	 Effective VCT with high coverage Effective PMTCT with high coverage Strongly recommend to sustain high coverage and program achievement 			

HIV vertical transmission prevention among pregnant women through the PMTCT program is a success story with high coverage. There are several enabling factors:

- High ANC coverage, 98% in 2000-2006, high level of skilled attendant at delivery, 97% in 2000-2006, and high level of institutional care, 97% in 2000-2006 ^[91].
- Strong MOPH policy commitment, including full support of free breast milk substitutions for 18 months to babies born by PMTCT and good information systems.
- Simple programmatic design: ART delivery to pregnant women and new born babies,

In Table 4.15, interventions under the "dark green" banners such as VCT with high coverage, PMTCT with very high coverage were fully implemented. As a result, in the 14 provinces with good monitoring systems of the outcomes of PMTCT, infection rates were constant at 6.4% between 2001 and 2004, and a declined sharply to 1.3% in 2006^[10].

Under the "dark green" banner, Provider Initiated Counselling and Testing (PICT) was effective and cost effective for pregnancies, but there was no PICT policy for clients in ANC. In light of high coverage of VCT and PMTCT, offering PICT to pregnant women has no role, but the program has to sustain high coverage of VCT and PMTCT. Policy options to consider include diversifying PMTCT to offer VCT to husbands in ANC through advocates of couple counselling. Offering quality VCT to husbands in ANC is another key potential strategy to boost awareness of safe sex in and enrolment into universal ART program for negative counselling.

4.4.6 Prison Inmates

Table 4.16: Summary of current interventions, coverage and recommendations for PrisonInmates

Coverage of intervention	Proven effective and cost effective	Proven effective but no evidence on cost- effectiveness	Effective but not cost effective	Neither effective nor cost effective
No policy intervention				
Interventions exist, but no coverage data				
Interventions exist, and coverage data is available			VCT implementation with low coverage As there is no cost effective intervention for this captive population, it is strongly recommended to scale up due to its effectiveness and continuity of ART or VCT after being discharged from prison. For prison inmates, a package of integrated services should be considered such as distribution of condoms, VCT, treatment of TB-HIV, provision of ART.	

Intervention under the "yellow" banner in Table 4.16, include VCT services among prison inmates which, though effective, was proved not to be cost effective. VCT coverage in prisons is lower than 30%.

Prevention interventions had inadequately addressed problems among prison inmates, the most vulnerable population group. In 2007 there were 168,656 male and 24,660 female prisoners in 162 prisons throughout the country. About 52% of them had sentence terms of less than 5 years, 36% were 5-20 years, 10% were 20-50 years, 1.5% were life-imprisonment, and 0.09% had death penalty ^[92] sentences. Between January and

December 2008, there were 46,981 juvenile delinquents (boys 91% and girls 9%) in 5,451 mid-way homes ^[93]. There is a great opportunity to introduce effective and continued interventions in the prisons and beyond when they are released back to the society.

To ensure health equity, more resources and program efforts should be given to this group e.g. free condom distribution. It is unfortunate that there is no evidence on effectiveness and cost-effectiveness of condom distribution in prison inmates under the 'white banner' (Table 4.9). Evidence indicates VCT is effective but not cost-effective for this group. We recommend scaling up VCT services in general. Policy makers should consider offering an integrated package such as distribution of condoms, quality VCT services, treatment of TB-HIV, provision of ART, and ensuring continued service beyond their release from prison. Strong collaboration between the Ministries of Justice and Health is an important foundation for effective policy formulation and implementation.

4.4.7 Healthcare Workers

Table 4.17: Summary of current interventions, coverage and recommendations forHealthcare Workers

Coverage of intervention	Proven effective and cost effective	Proven effective but no evidence on cost- effectiveness	Effective but not cost effective	Neither effective nor cost effective
No policy intervention				
Interventions exist, but no coverage data				
Interventions exist, and coverage data is available				Post exposure prophylaxis: government policy to provide one month ART to health personnel exposed to or suspect to expose to HIV in their clinical services.
				Despite evidence on ineffective and non CE, UNAIDS and US-DDC recommend this intervention as an occupational safety. It is not easy to terminate the ongoing program.

Interventions under the "red" banner, Table 4.17; Post-Exposure Prophylaxis was found ineffective and non cost effective for healthcare workers. The government provides full support for a free one-month course of ART to health care workers who are exposed to or are suspected to have been exposed to HIV infection in their clinical services. In theory, PEP should be terminated but politically, it is not that easy to terminate on the grounds of occupational safety in addition to full investment in Universal Precautions. Otherwise they would be discouraged to provide health services to HIV/AIDS patients. However, incidence of occupational injuries is very low; therefore there is little financial implication to the government. It is further recommended to modify conventional PEP towards a comprehensive prevention package.

4.4.8 Young People

Table 4.18: Summary of current interventions, coverage and recommendations for YoungPeople

Coverage of intervention	Proven effective and cost effective	Proven effective but no evidence on cost- effectiveness	Effective but not cost effective	Neither effective nor cost effective
No policy intervention	Young mostly accesses condoms by OOP payment.	No policy on abstinence-plus programs	No policy on PICT for young people	
	Recommend to sustain provide free condom distribution and create awareness	Recommendation: Although this is less priority, it should be considered to advocate in conjunction with other CE interventions	Recommenda- tion: This is the least priority	
Interven- tions exist, but no coverage data	No coverage data on the existing STI treatment services Recommend to improve informa- tion on coverage and improve user friendly STI treat ment services	VCT, no coverage data Recommend to scale up the program and improve information on coverage	Community- based education with govern- ment financial support, no coverage data Recommenda- tion: This is least priority	Despite no government policy, there were small projects of abstinence-only Recommend to terminate
Interventions exist, and coverage data is	School-based sex education program, 40.5% coverage			
avallable	Recommend to strengthen and scale up to achieve 100% coverage			

For interventions under the "dark green" banner, in Table 4.18, the priority group is the young population (10-24 years old) most of whom access condoms by out of pocket payment. A recent policy on installing condom vending machines in wash rooms in high schools and universities resulted in hot debates both for and against and in the end it was not successful. However, young people access condoms in convenient shops and out of pocket payment. The most important point is to create awareness of safe sex behaviour in this group. The low coverage, at less than half of school based sex education program should be accelerated. Friendly STI services also need to be promoted.

Interventions under the "light green" banner, abstinence plus programs should be integrated with school based sex education. By nature, VCT services for young people are not easy to scale up; therefore program efforts should be given to school based education.

Interventions under the "yellow" banner, PICT and community based education for young people should receive lower priority. Abstinence only under the "red" banner should be terminated.

4.4.9 General Population

Table 4.19: Summary	of	current	interventions,	coverage	and	recommendation	าร	for	the
General Population									

Coverage of inter- vention	Proven effective and cost effective	Proven effective but no evidence on cost-effectiveness	Effective but not cost effective	Neither effective nor cost effective
No policy inter- vention	 They can access condom by OOP Recommend to maintain public awareness on safe sex and condom use purchase by their own No policy on male circumcision Recommend to generate evidence on public acceptability of male circumcision in Thai context 	 No policy on microfinance combined with education Recommend to scale up the intervention 	 No policy on community- based education No policy on PICT to general population Recommenda- tion: These inter- ventions are of low priority 	No policy on mass or community treatment of STI Recommend not to initiate such program 2. No policy on microfinance Do not recommend because it is not applicable in Thailand

Coverage of inter- vention	Proven effective and cost effective	Proven effective but no evidence on cost-effectiveness	Effective but not cost effective	Neither effective nor cost effective
Interven- tions exist, but no coverage data	No coverage data on the existing STI treatment services Recommend to improve informa- tion on coverage and improve user friendly STI treatment services	Existing VCT for walk in individuals but no coverage data Recommendation to scale up this and improve information on coverage	 Despite no policy, NAT was implemented for patient in private hospitals, no coverage data but should be very low coverage Recommend to bargain the price of the test to reach the CE level and advocate as a national policy to achieve 100% coverage Sporadic activities of mass media campaigns by government or GF¹ but no coverage data Despite evidence on effective but non CE, the existing program should be 	
Interven- tions exist, and	 Existing policy to increase Alcohol Tax 	1. Existing intervention on workplace-based education but low coverage		
coverage data is available	Recommend to maintain high level of taxation	Recommend to maintain the intervention and increase coverage		
	on alconol	2. Extremely high coverage of screening blood products and donated organ for HIV		
		Recommend to maintain high coverage		

Interventions under the "dark green" banner in Table 4.19, it is reasonable that they can access condom by out of pocket payments. It is advisable to increase and maintain public awareness on safe sex and use of condoms. Male circumcision is not a customary practice for newborns; it is recommended that policy is guided by research and evidence on public acceptability in the Thai context. Policy to increase Alcohol Tax is recommended.

Interventions under the "light green" banner, microfinance and education should be addressed for policy recommendation; scaling up STI treatment faced a common problem of incompetent providers and user unfriendly services in provincial hospitals as a result of recent public sector reforms discussed in other sections. Work-place based education has high potential for extension due to the nature of the institutionalized population. However, the Ministry of Labour has yet to buy into this policy and provide an enabling environment, incentives and other mechanisms to facilitate implementation. HIV and other essential screening in blood safety programs is performing well, all donated blood was tested with HIV antibody and antigen tests, other agents such as Hepatitis A, B and C were also screened. It is recommended to sustain the high performing blood safety program. Control of alcohol consumption has an indirect positive impact on HIV prevention and others such as violence and injuries. It is recommended to maintain a high alcohol tax and other measures to control supply and advertising. These are in the legislative framework but have yet to improve the enforcement capacity. VCT for the general population should be scaled up and improve information coverage.

Interventions under the "yellow" banner; show that it is advisable that community-based education and PICT are a low priority, in view of other cost effective interventions and have not yet fully materialized in this group and other risk groups such as FSW, IDUs and MSM. It is recommended to scale up to full coverage of Nucleic Acid Testing (NAT) of all donated blood, to address the inequity problem between public and private hospitals blood services, ensure the highest possible safety blood service to prevent law suits from medical errors and iatrogenic HIV infection. The cost of laboratory test is still unaffordable, the Thai Red Cross Society, as the designated National Blood Centre, has yet to better perform in bringing down the price of this test. It is possible that NAT will become cost effective when the cost of laboratory tests decreases. Finally regarding interventions under the "red" banner, the development of a policy on mass community treatment of STIs should be discouraged by all means. Despite the evidence, mass media campaigns are neither effective nor cost effective. The existing program should be modified to minimize stigma and create public awareness on safe sex.

5. Discussions

In the results section, it is imperative to report the results in the performance assessment of interventions used with different population groups, and to provide discussion and policy recommendations.

Discussion focuses on mismatches of interventions, priority groups, and cross cutting issues around program bottle necks.

5.1 Mismatches of intervention

We define mismatches between the stage of interventions verified against evidence on effectiveness and cost effectiveness. Mismatches are (1) the proven effective and/or cost effective interventions (combined dark green and light green banners) that were not implemented, and (2) the proven ineffective and non-cost effective interventions (red banner) that were actually implemented. Table 4.19 depicts a conceptual thinking of mismatches. Interventions falling in Box A1 and C3 are the mismatches where evidence based policy formulation, effective programme design and implementation are required for Box A1 and terminations are required in Box C3.

Likewise, in Box A2 and A3, interventions match with evidence on effectiveness or cost effectiveness and require scaling up for Box A2 while maintains high performance in Box A3.

Stage of intervention	Proven effective and cost effective, proven effective but no evi- dence on cost effective	Effective but not cost effective	Neither effective nor cost effective
No policy, no intervention	A1 Mismatches,	B1 Borderline,	C1 Match,
	Needs evidence based policy formulation, effective program design and implementation	Scale up or low priority is on case by case review	Discourage attempts to initiate
Interventions exist, poor	A2	B2	C2
performed	Matches,	Bordenine,	Mismalches,
	Need for scaling up	Scale up or low priority is on case by case review	Needs to terminate
Interventions	A3	B3	С3
exist, good performed	Matches,	Borderline,	Mismatches,
	Need to maintain high performance	Scale up or low priority is on case by case review	Needs to terminate

Table 4.21: Critical assessment of mismatches of HIV/AIDS interventions

Stage of intervention	Proven effective and cost effective, proven effective but no evi- dence on cost effective	Effective but not cost effective	Neither effective nor cost effective
No policy, no intervention	A1 - Free distribution of condom to MSM, IDU, Discordance couples, young people and general population - PICT offered to pregnant women - Abstinence plus in young people - Male circumcision in male newborns - Needle and syringe exchange for IDU - Microfinance combined with education for general population - Female condom for FSW	B1 - PICT for young people, general population - Community based education in general population - Needle social market- ing for IDU	C1 - Microbicide in FSW - HIV vaccine - PEP for IDU - Mass community treatment of STI for general population - Microfinance policies

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Stage of intervention	Proven effective and cost effective, proven effective but no evi- dence on cost effective	Effective but not cost effective	Neither effective nor cost effective
Interventions exist, poor performed	A2 - Work place education for FSW - Community based education and peer education for FSW - STI treatment for all population groups - VCT for FSW, MSM, IDU discordance couples, young people - Street outreach for IDU - School based sex education program for young people - Workplace-based education in general population - Community based education for and peer education MSM	B2 - VCT for prison inmate, general population - Community based education for young people - Mass media campaign in general population - Nucleic Acid Test for donated blood	C2 - Community based and peer education for IDU - Abstinence only in young people
Interventions exist, good performed	A3 - Free condom distribution for FSW - High coverage of methadone substitu- tion treatment in public clinics - VCT and PMTCT for pregnant women - Screening of HIV antigen, antibodies and other in all donated blood - Increase alcohol tax	B3	C3 - PEP for healthcare workers

With the application of a conceptual framework, Table 4.21 synthesizes all HIV/AIDS prevention interventions categorized as Green, Yellow and Red banners for all nine population groups by three stages of implementation.

There are seven mismatches in Box A1 for which different policy recommendations are made. From the critical assessment and understandings from discussions with key informants, we suggest the following:

Four interventions require further evidence on applicability, acceptability and programmatic designs. These are:

- o Female condoms for FSW: operational research to test if it is acceptable, assess program feasibility in the Thai context
- o Male circumcision in male newborns: generate evidence on public acceptability in Thai context
- o Female condom use and microbicides which are in the study process for policy recommendation

Two interventions require immediate policy actions.

- More availability of free distribution of condoms to MSM and IDUs.
 Condoms can be integrated in a comprehensive package by peer groups and NGOs. For example integration of VCT, condom distribution, STI treatment service and ART. Condom distribution to discordant couples can be done in VCT clinics. Condom distribution to young people and the general population are not easy in terms of programmatic design, but creating awareness of safe sex is essential.
- Needle social marketing for IDUs: there is a need for a clear policy but requires extraordinary strong leadership in the light of "cracking down on drugs."

Two interventions do not require attention.

- PICT offered to pregnant women, as the program should focus on sustaining high coverage of PMTCT. Opportunities exist to extend VCT services to husbands in ANC clinics
- o Abstinence plus in young people is not a policy culture in Thailand; safe sex and condom use are main programmatic focuses.

There is one serious mismatch in Box C3, the PEP for healthcare workers. It should be terminated but politically not easy on the grounds of occupational safety. We recommended keeping it, as incidence of occupational injuries is low and financial implications to the government would be low. Conventional PEP should be modified towards a comprehensive prevention package.

We commend the good performance contained in Box A3, and recommend sustaining its high performance, such as free condom distribution to female sex workers, methadone substitution treatment in public clinics, VCT and PMTCT for pregnant women, screening of HIV antigen, antibodies and others in all donated blood, and increased alcohol tax which has an indirect impact on vulnerability to HIV infections.

In Box A2, many activities require rapid and wide scale up. For example, community-based education, peer education and VCT for FSW in Bangkok which showed high coverage, although other provinces were lagging behind. These interventions should be scaled up throughout the country with sufficient support from the government.

5.2 Which priority group?

Based on sero-sentinel evidence of high prevalence and high risk of infections and transmission of HIV to others, three population groups require priority attention: FSW, MSM and IDUs. As clearly reflected in a survey conducted by Laohasiriwong ^[14] indicating that MSM and IDUs have multiple partners and clients of sex workers, unsafe sex practices and low condom use rate, sharing needle and syringe among IDUs, are the main drivers of HIV transmission. Specific recommendations for these three population groups were provided in section 4.4.1 FSW, 4.4.2 MSM, and 4.4.3 IDUs.

Accordingly, to more precisely measure incidence of HIV infection, the Medical Sciences Department and AFRIMS, with technical support from the US Centers for Disease Control conducted a pilot study of the BED IGG CAPTURED IMMUNOASSAY (BED-CEIA) among pregnant women and FSWs in Bangkok and 24 provinces, and army recruits from 2004 to 2007. The results suggest that HIV incidence increased among the general population, pregnant women and indirect FSWs. In sum, data from the national HIV surveillance and other ad hoc sero-surveys shows an epidemic pattern that is a combination of generalized and concentrated epidemics. There is evidence of declining prevalence in almost all groups, however prevalence is still high among IDUs, and there are indications of increasing prevalence among MSM. Recent studies of incidence provide a warning sign to Thailand that rapid spread of HIV could be returning ^[10,94]

Based on BSS, young people emerge as a new priority and vulnerable to HIV infection which requires specific monitoring for HIV infection

prevalence and interventions because of the sexual behaviour which might be risky to infection. For example, knowledge on HIV prevention was low among young adolescents, less than 20% to 30% had accurate understanding on the five UNGASS HIV preventions. Over the last 12 years, an increasingly high proportion of students, especially from vocational schools had sexual intercourse experiences. Condom use rate among students was less than 30% in most groups. However, the report of the Commission on ASIA AIDS does not show concern about this group ^[11]. From this study, it is recommended that young people, including young sex workers, young IDU, and young MSM are particularly vulnerable to HIV infection, and deserve greater attention in HIV prevention programs.

Prison inmates are the most vulnerable and socially disadvantaged group, often with repeated imprisonment, especially cases dealing with drugs. Most of them are IDUs with TB and HIV co-infections. As a captive population, there is a great opportunity to introduce effective and continued interventions in the prisons and beyond when they are released back to the society. It is recommended to scale up VCT services. Policy makers may want to consider offering an integrated package including distribution of condoms, VCT services, treatment of TB-HIV and provision of ART, and ensure services continue beyond prisons after their release back to the society. This will require a strong collaboration between the Department of Corrections, Ministry of Justice and Ministry of Public Health.

5.3 Cross cutting program bottlenecks

As a result of public sector reform - termination of STD clinics under Provincial Health Offices, and transfer of mandates to Provincial Hospitalsthe STI treatment services were weakened with a resurgence trend of STI incidence (see Annex 2). In this context, it is imperative that HIV programs build and strengthen skills to work with communities in particular owners of, and sex workers in brothel and non-brothel based sex establishment. Priority should be given to developing user friendly STI services, accessible by all, in particular FSW, MSM, and IDUs, as well as integrating STI treatment with quality VCT services.

5.4 Limitations of the study

Due to data limitation, this study cannot assess the financial resources spent in each of the 25 interventions currently employed by the national HIV/AIDS program specific to the nine population groups. As evident in Annex 1, total prevention expenditure in 2007 was 950 million Baht, which provides a good enough breakdown of expenditure on some detailed prevention interventions. In addition, this study did not aim and was not designed to conduct expenditure projection of financial resources and programmatic capacity required for scaling up recommendations provided in the "dark and light green" banners which is unmatched in Box A1, and described as low performance in A2, or to sustain high coverage in A3 in Table 4.21.

6. Annex for Chapter 4

Annex 1

Attitude of MSM and IDUs about free condoms and buying condoms [14]



Annex 2



Annual STI cases reported by routine surveillance 1996 to 2007

Source: MOPH Bureau of AIDS, TB and STI, various years

In the figure above, there was a resurgence trend of STIs reported in 2004 to 2007, reversing the decreased trend from 1996 to 2003. This is not a good sign that condom use rate might reduce, and STI incidence is a proxy indicator of HIV prevalence. Note that this is a voluntary report by mostly public providers, excluding private pharmacies and clinics. In addition, the STI report covered the whole population and did not distinguish whether they were FSW, MSM, IDU or any other subpopulation group.

7. References for Chapter 4

- ¹ UNAIDS. Practical Guidelines for Intensifying HIV Prevention: towards universal access. Geneva, Joint United Nations Programme on HIV/AIDS (UNAIDS) 2007.
- ² National AIDS Prevention and Alleviation Committee (2008). UNGASS country progress report: Thailand, reporting period: January 2006 December 2007. Thailand, Ministry of Public Health
- ³ Bureau of Epidemiology. Results of national sero-sentinel for HIV prevalence, various rounds. Nonthaburi, Ministry of Public Health
- ⁴ Wilson D, Halperin DT. Know your epidemic, know your response: a useful approach, if we get it right. Lancet 2008; 372:423-426
- ⁵ International Health Policy Program. Investment in health sector in the 10th National Socio-Economic Development Plan 2007-2011 (2550-2554 BE). A research report to the National Socio-Economic Development Board. 2008. Bangkok. Ministry of Public Health
- ⁶ Tantivess S, Walt G. The role of state and non-state actors in the policy process: the contribution of policy networks to the scale-up of antiretroviral therapy in Thailand. Health Policy and Planning 2008 23(5):328-338.
- ⁷ Revenga A, Over M, Masaki E, Peerapatanapokin W, Gold J, Tangcharoensathien V, Thanprasertsuk S. The Economics of effective AIDS treatment, evaluating policy options for Thailand. 2006, Washington DC, The World Bank
- ⁸ Tangcharoensathien V, Chokchaicharn H, Tisayaticom K, Teokul W, Patcharanarumol W. Asia Pacific Regional Report on National AIDS Spending Assessment 2000-2004. Nonthaburi, Ministry of Public Health, International Health Policy Program, 2006
- ⁹ National AIDS Prevention and Alleviation Committee. UNGASS Country Progress Report, Thailand, reporting period January 2006- December 2007. 2008, Nonthaburi, Ministry of Public Health, Department of Diseases Control.
- ¹⁰ Oxford University Press. Redefinition AIDS in ASIA Crafting and effective Response: Report of the Commission on AIDS in Asia, New Delhi.
- ¹¹ Plipat T, An assessment of the trend of sex behaviour among Thai population and sub-groups. Ministry of Public Health, Bureau of Epidemiology, Disease Control Department 2008.
- ¹² Bureau of Epidemiology. The prevention and alleviation of HIV infection for MSM. Thailand, Nonthaburi, Department of Disease Control, Ministry of Public Health, 2008.
- ¹³ Bureau of Epidemiology. The 2006 national sero-sentinel survey. Nonthaburi, Ministry of Public Health, Department of Diseases Control

- ¹⁴ Laohasiriwong W, Palipat T. Trends of sex behavior in Thailand: General and specific population subgroups. Bangkok, International Heath Policy Program.
- ¹⁵ Jamison DT, Breman JG, Measham AR, Alleyne G, Claeson M, Evan DB, Jha P, Mills A, Musgrove P. (eds). Disease control priorities in developing countries, 2nd edition. New York: Oxford University Press; 2006
- ¹⁶ Underhill K, Operario D, Montgomery P: Abstinence-only programs for HIV infection prevention in high-income countries. Cochrane Database Syst Rev 2007:CD005421.
- ¹⁷ Underhill K, Montgomery P, Operario D: Abstinence-plus programs for HIV infection prevention in high-income countries. Cochrane Database Syst Rev 2008:CD007006.
- ¹⁸ Di Noia J, Schinke SP: Gender-specific HIV prevention with urban earlyadolescent girls: outcomes of the Keepin' It Safe Program. AIDS Educ Prev 2007, 19:479-488.
- ¹⁹ Jewkes R, Nduna M, Levin J, Jama N, Dunkle K, Khuzwayo N, Koss M, Puren A, Wood K, Duvvury N: A cluster randomized-controlled trial to determine the effectiveness of Stepping Stones in preventing HIV infections and promoting safer sexual behaviour amongst youth in the rural Eastern Cape, South Africa: trial design, methods and baseline findings. Trop Med Int Health 2006, 11:3-16.
- ²⁰ Wongjak T, Wibulnuttakul K, Wichacharn M, Tejafong k, Cheewawat W, Saokaew P, Taecharoenkun S: A study of behavior post intervention on reducin HIV risk in intravenous drug users in Northern drug dependence treatment center and community clinic Chiangmai. Chiang Mai: Research Institute for Health Sciences, Chiang Mai University; 2004.
- ²¹ Peragallo N, Deforge B, O'Campo P, Lee SM, Kim YJ, Cianelli R, Ferrer L: A randomized clinical trial of an HIV-risk-reduction intervention among low-income Latina women. Nurs Res 2005, 54:108-118.
- ²² Johnson-Masotti AP, Pinkerton SD, Sikkema KJ, Kelly JA, Wagstaff DA: Cost-Effectiveness of a Community-Level HIV Risk Reduction Intervention for Women Living in Low-Income Housing Developments. The Journal of Primary Prevention 2005, 26:345-362.
- ²³ Shahmanesh M, Patel V, Mabey D, Cowan F: Effectiveness of interventions for the prevention of HIV and other sexually transmitted infections in female sex workers in resource poor setting: a systematic review. Trop Med Int Health 2008, 13:659-679.
- ²⁴ Johnson WD, Hedges LV, Ramirez G, Semaan S, Norman LR, Sogolow E, Sweat MD, Diaz RM: HIV prevention research for men who have sex with men: a systematic review and meta-analysis. J Acquir Immune Defic Syndr 2002, 30 Suppl 1:S118-129.

- ²⁵ Herbst JH, Beeker C, Mathew A, McNally T, Passin WF, Kay LS, Crepaz N, Lyles CM, Briss P, Chattopadhyay S, Johnson RL: The effectiveness of Individual-, group-, and community-level HIV behavioral risk-reduction interventions for adult men who have sex with men: A systematic review. Am J Prev Med 2007, 32:S38-67.
- ²⁶ Cochen DA, Wu S-Y, Farley TA: Structural Interventions to Prevent HIV/Sexually Transmitted Disease: Are They Cost-Effective for Women in the Southern United States? Sex Transm Dis 2006, 33:S46-49.
- ²⁷ Garfein RS, Golub ET, Greenberg AE, Hagan H, Hanson DL, Hudson SM, Kapadia F, Latka MH, Ouellet LJ, Purcell DW, et al: A peer-education intervention to reduce injection risk behaviors for HIV and hepatitis C virus infection in young injection drug users. Aids 2007, 21:1923-1932.
- ²⁸ Weeks MR, Li J, Dickson-Gomez J, Convey M, Martinez M, Radda K, Clair S: Outcomes of a peer HIV prevention program with injection drug and crack users: the Risk Avoidance Partnership. Subst Use Misuse 2009, 44:253-281.
- ²⁹ Luchters S, Chersich MF, Rinyiru A, Barasa MS, King'ola N, Mandaliya K, Bosire W, Wambugu S, Mwarogo P, Temmerman M: Impact of five years of peermediated interventions on sexual behavior and sexually transmitted infections among female sex workers in Mombasa, Kenya. BMC Public Health 2008, 8:143.
- ³⁰ Elford J, Bolding G, Sherr L: Peer education has no significant impact on HIV risk behaviours among gay men in London. Aids 2001, 15:535-538.
- ³¹ Williamson LM, Hart GJ, Flowers P, Frankis JS, Der GJ: The Gay Men's Task Force: the impact of peer education on the sexual health behaviour of homosexual men in Glasgow. Sex Transm Infect 2001, 77:427-432.
- ³² Flowers P, Hart GJ, Williamson LM, Frankis JS, Der GJ: Does bar-based, peer-led sexual health promotion have a community-level effect amongst gay men in Scotland? Int J STD AIDS 2002, 13:102-108.
- ³³ Borgia P, Marinacci C, Schifano P, Perucci CA: Is peer education the best approach for HIV prevention in schools? Findings from a randomized controlled trial. J Adolesc Health 2005, 36:508-516.
- ³⁴ Mahat G, Scoloveno MA, De Leon T, Frenkel J: Preliminary evidence of an adoles cent HIV/AIDS peer education program. J Pediatr Nurs 2008, 23:358-363.
- ³⁵ Miller AN, Mutungi M, Facchini E, Barasa B, Ondieki W, Warria C: An outcome assessment of an ABC-based HIV peer education intervention among Kenyan university students. J Health Commun 2008, 13:345-356.
- ³⁶ Teerawattananon Y, Hiransuthikul N, Hanvoravongchai P, Tantivess S, Lertpiriyasuwat C, Chaikledkaew U, Thavorncharoensap M, Youngkong S, Leelukkanaveera Y, Mohara A, et al: Effectiveness of routine offer of

HIV counseling and testing at community hospitals in Thailand. Nonthaburi: Health Intervention and Technology Assessment Program; 2008.

- ³⁷ Nilabut S: Achievement of integrated teaching using the applied protection motivation theory on AIDS prevention among informal education students in Saraburi. Master of Science (Public Health). Mahidol University, Faculty of Public Health; 1999.
- ³⁸ Sunsiri M: An application of life skills to AIDS prevention among grade 9 junior high school students in Burirum province. Master of Science (Public Health). Mahidol University, Faculty of Public Health; 2002.
- ³⁹ Nobnorb S: The effectiveness of health education program on AIDS prevention among vocational male students in Krabi province. Master of Science (Public Health). Mahidol University, Faculty of Public Health; 2002.
- ⁴⁰ Simtaraj P: Effects of skills development for prevention of sexual risk behaviour on perceived self-efficacy and sexual risk behavior among male vocational students. Chiang Mai University, Department of Medical and Surgical Nursing; 2001.
- ⁴¹ Silva M: The effectiveness of school-based sex education programs in the promotion of abstinent behavior: a meta-analysis. Health Education Research 2002, 17:471-481.
- ⁴² Walker D, Gutierrez JP, Torres P, Bertozzi SM: HIV prevention in Mexican schools: prospective randomised evaluation of intervention. Bmj 2006, 332:1189-1194.
- ⁴³ Walker D: Cost and cost-effectiveness of HIV/AIDS prevention strategies in developing countries: is there an evidence base? Health Policy Plan 2003, 18:4-17.
- ⁴⁴ Cohen DA, Wu SY, Farley TA: Comparing the cost-effectiveness of HIV prevention interventions. J Acquir Immune Defic Syndr 2004, 37:1404-1414.
- ⁴⁵ Wang LY, Davis M, Robin L, Collins J, Coyle K, Baumler E: Economic Evaluation of Safer Choices. Arch Pediatr Adolesc Med 2000, 154:1017-1024.
- ⁴⁶ Corbett EL, Makamure B, Cheung YB, Dauya E, Matambo R, Bandason T, Munyati SS, Mason PR, Butterworth AE, Hayes RJ: HIV incidence during a cluster-randomized trial of two strategies providing voluntary counselling and testing at the workplace, Zimbabwe. Aids 2007, 21:483-489.
- ⁴⁷ Varghese B, Peterman TA: Cost-effectiveness of HIV counseling and testing in US prisons. J Urban Health 2001, 78:304-312.
- ⁴⁸ Allen S, Meinzen-Derr J, Kautzman M, Zulu I, Trask S, Fideli U, Musonda R, Kasolo F, Gao F, Haworth A: Sexual behavior of HIV discordant couples after HIV counseling and testing. Aids 2003, 17:733-740.

- ⁴⁹ Celentano DD, Bond KC, Lyles CM, Eiumtrakul S, Go VF, Beyrer C, na Chiangmai C, Nelson KE, Khamboonruang C, Vaddhanaphuti C: Preventive intervention to reduce sexually transmitted infections: a field trial in the Royal Thai Army. Arch Intern Med 2000, 160:535-540.
- ⁵⁰ Yotruean K: Using acitivities to promote self-prevention of HIV infection female sex workers, Chiang Mai Province. Chiang Mai University.
- ⁵¹ NaThalang D: The effectiveness of a health education program on AIDS prevention through behavior modification among traditional massage working girls in Satun province. Master of Science (Public Health). Mahidol University, Faculty of Public Health; 2001.
- ⁵² Wu Z, Rou K, Jia M, Duan S, Sullivan SG: The first community-based sexually transmitted disease/HIV intervention trial for female sex workers in China. Aids 2007, 21 Suppl 8:S89-94.
- ⁵³ Rou K, Wu Z, Sullivan SG, Li F, Guan J, Xu C, Liu W, Liu D, Yin Y: A five-city trial of a behavioural intervention to reduce sexually transmit ted disease/HIV risk among sex workers in China. Aids 2007, 21 Suppl 8:S95-101.
- ⁵⁴ Wilkinson D, Ramjee G, Tholandi M, Rutherford G: Nonoxynol-9 for preventing vaginal acquisition of HIV infection by women from men. Cochrane Database Syst Rev 2002:CD003936.
- ⁵⁵ Creese A, Floyd K, Alban A, Guinness L: Cost-effectiveness of HIV/AIDS interventions in Africa: a systematic review of the evidence. Lancet 2002, 359:1635-1642
- ⁵⁶ Fung IC-H, Guinness L, Vickerman P, Watts C, Vannela G, Vadhvana J, Foss AM, Malodia L, Gandhi M, Jani G: Modelling the impact and cost-effectiveness of the HIV intervention programme amongst commercial sex workers in Ahmedabad, Gujarat, India. BMC Public Health 2007, 7:195.
- ⁵⁷ Celentano DD, Nelson KE, Lyles CM, Beyrer C, Eiumtrakul S, Go VF, Kuntolbutra S, Khamboonruang C: Decreasing incidence of HIV and sexually transmitted diseases in young Thai men: evidence for success of the HIV/AIDS control and prevention program. Aids 1998, 12:F29-36.
- ⁵⁸ Weller S, Davis K: Condom effectiveness in reducing heterosexual HIV transmission. Cochrane Database Syst Rev 2002:CD003255
- ⁵⁹ Chesson HW, Greenberg JB, Hennessy M: The cost-effectiveness of the WINGS intervention: a program to prevent HIV and sexually transmit ted diseases among high-risk urban women. BMC Infect Dis 2002, 2:24.
- ⁶⁰ Bedimo AL, Pinkerton SD, Cohen DA, Gray B, Farley TA: Condom distribution: a cost-utility analysis. Int J STD AIDS 2002, 13:384-392.

- ⁶¹ McGrath JW, Celentano DD, Chard SE, Fullem A, Kamya M, Gangakhedar RR, Khamboonruang C, Joglekar N, Malhotra-Kohli R, Kiwanuka A, Sirirojn B: A group-based intervention to increase condom use among HIV serodiscordant couples in India, Thailand, and Uganda. AIDS Care 2007, 19:418-424.
- ⁶² Thomsen SC, Ombidi W, Toroitich-Ruto C, Wong EL, Tucker HO, Homan R, Kingola N, Luchters S: A prospective study assessing the effects of introducing the female condom in a sex worker population in Mombasa, Kenya. Sex Transm Infect 2006, 82:397-402.
- ⁶³ Stoltz JA, Wood E, Small W, Li K, Tyndall M, Montaner J, Kerr T: Changes in injecting practices associated with the use of a medically supervised safer injection facility. J Public Health (Oxf) 2007, 29:35-39.
- ⁶⁴ Laufer FN: Cost-effectiveness of syringe exchange as an HIV prevention strategy. J Acquir Immune Defic Syndr 2001, 28:273-278.
- ⁶⁵ Wu Z, Luo W, Sullivan SG, Rou K, Lin P, Liu W, Ming Z: Evaluation of a needle social marketing strategy to control HIV among injecting drug users in China. Aids 2007, 21 Suppl 8:S115-122.
- ⁶⁶ Coyle SL, Needle RH, Normand J: Outreach-based HIV prevention for injecting drug users: a review of published outcome data. Public Health Rep 1998, 113 Suppl 1:19-30.
- ⁶⁷ Young TN, Arens FJ, Kennedy GE, Laurie JW, Rutherford G: Antiretroviral post-exposure prophylaxis (PEP) for occupational HIV exposure. Cochrane Database Syst Rev 2007:CD002835.
- ⁶⁸ Des Jarlais DC, Kling R, Hammett TM, Ngu D, Liu W, Chen Y, Binh KT, Friedmann P: Reducing HIV infection among new injecting drug users in the China-Vietnam Cross Border Project. Aids 2007, 21 Suppl 8:S109-114.
- ⁶⁹ Vickerman P, Kumaranayake L, Balakireva O, Guinness L, Artyukh O, Semikop T, Yaremenko O, Watts C: The Cost-Effectiveness of Expanding Harm Reduction Activities for Injecting Drug Users in Odessa, Ukraine. Sex Transm Dis 2006, 33:S89-102.
- ⁷⁰ Pitisuttithum P, Gilbert P, Gurwith M, Heyward W, Martin M, van Griensven F, Hu D, Tappero JW, Choopanya K: Randomized, double-blind, placebo-controlled efficacy trial of a bivalent recombinant glycoprotein 120 HIV-1 vaccine among injection drug users in Bangkok, Thailand. J Infect Dis 2006, 194:1661-1671.
- ⁷¹ Ono S, Kurotaki T, Nakasone T, Honda M, Boon-Long J, Sawanpanyalert P, Kimura K: Cost-Effectiveness Analysis of Antiretroviral Drug Treatment and HIV-1 Vaccination in Thailand Jpn J Infect Dis 2006, 59:168-173.

- ⁷² Sangani P, Rutherford G, Wilkinson D: Population-based interventions for reducing sexually transmitted infections, including HIV infection. Cochrane Database Syst Rev 2004:CD001220.
- ⁷³ Wawer MJ, Sewankambo NK, Serwadda D, Quinn TC, Paxton LA, Kiwanuka N, Wabwire-Mangen F, Li C, Lutalo T, Nalugoda F, et al: Control of sexually transmitted diseases for AIDS prevention in Uganda: a randomised community trial. Rakai Project Study Group. Lancet 1999, 353:525-535.
- ⁷⁴ Siegfried N, Muller M, Volmink J, Deeks J, Egger M, Low N, Weiss H, Walker S, Williamson P: Male circumcision for prevention of heterosexual acquisition of HIV in men. *Cochrane Database Syst Rev* 2003:CD003362.
- ⁷⁵ Weiss HA, Quigley MA, Hayes RJ: Male circumcision and risk of HIV infection in sub-Saharan Africa: a systematic review and meta-analysis. *Aids* 2000, 14:2361-2370.
- ⁷⁶ Weiss HA: Male circumcision as a preventive measure against HIV and other sexually transmitted diseases. *Curr Opin Infect Dis* 2007, 20:66-72.
- ⁷⁷ Gray RH, Li X, Kigozi G, Serwadda D, Nalugoda F, Watya S, Reynolds SJ, Wawer M: The impact of male circumcision on HIV incidence and cost per infection prevented: a stochastic simulation model from Rakai, Uganda. *Aids* 2007, 21:845-850.
- ⁷⁸ Kahn JG, Marseille E, Auvert B: Cost-Effectiveness of Male Circumcision for HIV Prevention in a South African Setting. *Plos Medicine* 2006, 3:2349-2358.
- ⁷⁹ Crepaz N, Horn AK, Rama SM, Griffin T, Deluca JB, Mullins MM, Aral SO: The efficacy of behavioral interventions in reducing HIV risk sex behaviors and incident sexually transmitted disease in black and Hispanic sexually transmitted disease clinic patients in the United States: a meta-analytic review. Sex Transm Dis 2007, 34:319-332.
- ⁸⁰ Roland ME, Neilands TB, Krone MR, Katz MH, Franses K, Grant RM, Busch MP, Hecht FM, Shacklett BL, Kahn JO, et al: Seroconversion following nonoccupa tional postexposure prophylaxis against HIV. Clin Infect Dis 2005, 41:1507-1513.
- ⁸¹ Teerawattananon Y, Vos T, Tangcharoensathien V, Mugford M: Costeffectiveness of models for prevention of vertical HIV transmissionvoluntary counseling and testing and choices of drug regimen. Cost Eff Resour Alloc 2005, 3:7.
- ⁸² Lallemant M, Jourdain G, Le Coeur S, Mary JY, Ngo-Giang-Huong N, Koetsawang S, Kanshana S, McIntosh K, Thaineua V: Single-dose perinatal nevirapine plus standard zidovudine to prevent mother-to-child transmission of HIV-1 in Thailand. N Engl J Med 2004, 351:217-228.

- ⁸³ AuBuchon JP, Birkmeyer JD, Busch MP: Cost-effectiveness of expanded human immunodeficiency virus-testing protocols for donated blood. Transfusion 1997, 37:45-51.
- ⁸⁴ Gowing L, Farrell M, Bornemann R, Ali R: Substitution treatment of injecting opioid users for prevention of HIV infection. Cochrane Database Syst Rev 2004:CD004145.
- ⁸⁵ Wong KH, Lee SS, Lim WL, Low HK: Adherence to methadone is associated with a lower level of HIV-related risk behaviors in drug users. J Subst Abuse Treat 2003, 24:233-239.
- ⁸⁶ Pang L, Hao Y, Mi G, Wang C, Luo W, Rou K, Li J, Wu Z: Effectiveness of first eight methadone maintenance treatment clinics in China. Aids 2007, 21 Suppl 8:S103-107.
- ⁸⁷ Lertiendumrong J, Techakehakij W, Pongpirul K, Tangcharoensathien V, Srirattana
 S: Using nucleic acid testing in screening donated blood in Thailand :a policy analysis. 2007.
- 88 Pronyk PM, Hargreaves JR, Kim JC, Morison LA, Phetla G, Watts C, Busza J, Porter JD: Effect of a structural intervention for the prevention of intimatepartner violence and HIV in rural South Africa: a cluster randomised trial. Lancet 2006, 368:1973-1983.
- Pronyk PM, Kim JC, Abramsky T, Phetla G, Hargreaves JR, Morison LA, Watts C, Busza J, Porter JD: A combined microfinance and training intervention can reduce HIV risk behaviour in young female participants. Aids 2008, 22:1659-1665.
- 90 Thai Working Group on Burden of Diseases. The report on Burden of Disease in Thailand (1999, and 2004). Nonthaburi, Ministry of Public Health, International Health Policy Programme.
- ⁹¹ UNICEF. The state of the world's children 2008, child survival. 2007, New York, United Nations Childrenis Fund.
- ⁹² Department of Correction, Ministry of Justice. Statistic Report available from <u>http://www.correct.go.th/eng/Stat/statistic.htm#_Number_of_Prisoners_</u> <u>during%2010%20years</u>. Access on 2 February 2009.
- ⁹³ Department of Juvenile Observation and Protection, Ministry of Justice. Statistic Report 2008. available on <u>http://www2.djop.moj.go.th/stat/upload_stat/4-1-2.pdf and http://www2.djop.moj.go.th/stat/upload_stat/5-1-11.pdf</u> access on 2 February 2009.
- 94 Bureau of epidemiology, Deaprtment of Disease Control. The studies of Ig-G capture BED-EIA. Ministry of Public Health, Nonthaburi, 2008.

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