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Cost-effective interventions that focus on most-at-risk populations

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Acronyms

ADB	Asian Development Bank
AEM	Asian AIDS Epidemic Model
AIDS	Acquired Immune Deficiency Syndrome
APCOM	Asia Pacific Coalition on Male Sexual Health
ART	Anti-Retroviral Treatment (or Therapy)
ASEAN	Association of Southeast Asian Nations
BCC	Behavioral Change Communication
CSM	Condom Social Marketing
CSW	Commercial Sex Worker
DfID	Department for International Development (United Kingdom)
DIC	Drop-In Centre
EE	Enabling Environment
FSW	Female Sex Work(er)
GFATM	Global Fund to Fight AIDS, TB and Malaria
GMS	Greater Mekong Sub-region (includes Cambodia, Lao PDR, Burma, Thailand, Vietnam and Guangxi and Yunnan Provinces of the People's Republic of China)
HAART	Highly Active Anti-Retroviral Treatment
HIV	Human Immunodeficiency Virus
HPI/GMR-C	Health Policy Initiative/Greater Mekong Region – China
HR	Harm Reduction (interventions)
ICAA	Independent Commission on AIDS in Asia
IDU	Injecting Drug User
Lao PDR	Lao People's Democratic Republic
M&E	Monitoring and Evaluation
MARP	Most-at-Risk Population
MSM	Men Who Have Sex With Men (encompassing all males who engage in male-male sexual behavior and who are homosexual or bisexual and self-identifying in diverse ways – including as heterosexuals – and transgender people)
MSW	Male Sex Work(er)
NGO	Non-Government Organization
PEPFAR	President's Emergency Plan for AIDS Relief (United States)
PHC	Primary Healthcare
PLHIV	People living with HIV
PMTCT	Prevention of Mother-to-Child Transmission
RCA	Rapid Costing Approach
STI	Sexually-Transmitted Infection
UNAIDS	Joint United Nations Program on HIV and AIDS
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Population Fund
USAID	United States Agency for International Development
US-CDC	The Centers for Disease Control and Prevention (United States of America)
VCT	Voluntary Counselling and Testing

Executive Summary

Governments in low- and middle-income countries will not alone provide adequate financial support for the fight against AIDS. They face a daunting challenge. The best use of limited resources will be to focus attention and funding on the most-at-risk populations (MARPs). These groups include sex workers, intravenous drug users, and men who have sex with men. All of these groups suffer from stigma and discrimination. Majorities in most countries do not want to see their tax payments spent on these groups. Some international donors also resist directing their funds to the needs of MARPs. Prevention programs in support of these groups receive less than a fifth of funding support in many countries, yet these at-risk groups account for a far larger share of new infections in Asia, Latin America, and much of Africa.¹ Only in the countries of eastern and southern Africa that experience generalized epidemics has HIV dispersed widely into the general population and hence now requires substantial financial resources be spent across a broad spectrum of the countries' populations.

The political obstacles to helping the MARPs that suffer stigma and discrimination are great. Governments in Brazil, Thailand, India, Mexico, and Cambodia have made real progress in focusing on interventions that reduce risk of infection in those most-at-risk groups. Yet many other governments in low- and middle-income countries are reluctant to pay for the very services that would have the greatest impact in turning back the pandemic. A solution to this impasse may lie in a more effective division of labor between governments and donors. Governments, along with their social security and public health insurance schemes, can specialize in interventions that are broadly accepted in their societies. These include universal precautions, program management, condom distribution, workplace programs, and youth education. Civil society organizations can support overall surveillance, monitoring and evaluation. These entities can focus on getting value for money from spending on AIDS interventions. If they do so, these watchdogs are sure to demand substantial attention to prevention programs for MARPs, even in countries with generalized epidemics.

External multilateral assistance can complement locally-financed efforts by focusing on MARPs. The Global Fund, World Bank, regional banks, and UNAIDS can focus future assistance on MARPs because of their independence from governments. Many bilateral agencies can also be an expanding external source of financing for prevention interventions focused on MARPs. Far more money than is currently available can be usefully allocated to voluntary counselling and testing, peer counselling, and condom distribution among these groups. The value of lives saved and future health services avoided thanks to prevention now far exceed costs incurred for prevention efforts among MARPs.

Where generalized epidemics already prevail, the share of resources directed at MARPs must necessarily be smaller and the messages for changed behavior must reach a broader audience. National strategic plans will have to be tailored to the realities of the epidemic in each country.

¹ A 2007 review compared actual spending against resource needs estimates prepared earlier by UNAIDS. In only one of four countries reviewed did spending for MSM peer counseling and support services reach or exceed amounts deemed necessary (Mexico). In three others, El Salvador, Guatemala, and Panama, amounts identified as spent for these groups was far short of requirements. NGOs that did not report their program spending may have filled some of the gap (Izazola and others 2007). There were also substantial deficits in spending for harm reduction among drug users and for sex workers.

Introduction

The AIDS 2031 Costs and Financing Project commissioned a projection of Global Resource Needs Estimates (GRNE) a quarter century into the future. This effort represents the first creation of long-term scenarios that assess funding requirements far beyond the present and readily foreseeable next few years. A main conclusion of this exercise is that a substantial gap between needs and availability of funding is likely to persist throughout this period. If resources prove to be scarce, it will be essential to set priorities and focus limited resources on interventions that yield the most benefits relative to costs incurred.

What then are the most cost-effective interventions? Given the distinctions between the different forms and implications of the epidemic in different national settings, analysts prescribe a different blend of services for the three groups of the epidemic observed so far:²

In many countries, the low prevalence of the epidemic suggests that it will remain contained among a small percentage of the population as a whole (most high-income OECD countries fit this description);

In others, many of the countries in Asia and the Pacific, Latin America and the Caribbean, Middle East and North Africa, and West Africa, the epidemic is characterized as concentrated and reaching 5 percent or more of adults in selected most-at-risk populations (MARPs) but with the prospect that it might be prevented from breaking out into the general population with effective prevention interventions among those MARPs; and,

For much of eastern and southern Africa there is a generalized epidemic, one in which significant portions of the whole adult population are already HIV positive and many more are at risk, including unborn children, health workers, and spouses of HIV positive persons.

In low-prevalence settings, there needs to be vigilant awareness about risky behavior that can spread the disease, but the resource requirements are, for the most part, well within the financing capabilities of governments and private insurance arrangements.

With concentrated epidemics, strategies and costs of implementing them can be far higher yet still modest enough to be financed by a sound combination of domestic and donor support. For example, the Independent Commission on AIDS in Asia (ICAA) estimates that spending about a dollar per person per annum should be adequate to control HIV in the region if limited funds go to high-priority, cost-effective uses.

The generalized epidemics of eastern and southern Africa pose the greatest financing challenge. Only Botswana, Namibia, and South Africa possess financing capacity to cover their prevention, care and treatment needs. Donors from high-income countries, government, philanthropies, and multinational corporations must play a major financing role in that region. PEPFAR, for example, supports 14 countries, many of them in the eastern and southern Africa region. A large share of all spending in these countries will be used to pay for ART that extends lives that would

² The map appearing in the annex shows adult prevalence rates by country. The one region with prevalence for several countries that is above 15 percent is eastern and southern Africa. The rest of Africa, Asia and Latin America exhibit lower prevalence rates. Low levels of the epidemic appear in the more developed countries of north America, Japan, Europe, and Australia/New Zealand, mostly high-income countries.

otherwise be lost. A risk is that cost-effective spending for necessary prevention will be short-changed in these settings of generalized epidemics.

This paper focuses preferentially on MARPs and necessarily on that substantial majority of low- and middle-income countries that are experiencing concentrated epidemics. Containing the epidemic to these groups is one of the clear challenges for the near and longer-term fight against AIDS.

The challenge as discussed below takes two distinct but interrelated forms: (1) Finding the fiscal space and financial basis needed to pay for prevention among the MARPs, and (2) securing the policy space needed to focus on help for groups that suffer from stigma and discrimination. This political economy issue is likely to be with supporters of the fight against AIDS right through to the year 2031; success requires clarifying that issue and bringing it higher up on the policy agenda.

Denial, disapproval, and behavioral risks among MARPs

A specialist in HIV and AIDS issues recently said, “It all comes down to sex and drugs.” What he meant was that the general public’s sensitivity to the links between the HIV epidemic and the objectionable behaviour associated with sex workers, men who have sex with men (who are virtually defined by their sexual preferences), and intravenous drug users leads to stigma and discrimination against those groups. One result is that governments that may wish to foster programs directed at behavioural change among these groups cannot depend on public and community support in favour of effective programs. To the contrary, governments may be actively blocked from taking steps to promote effective programs among these groups by hostile public opinion.

A key problem is denial and ignorance about the MARPs. A recent overview by a Johns Hopkins University medical specialist noted several specifics to Asia that may apply to other low- and middle-income regions as well:

- All three most-at-risk populations, but especially MSM, are understudied in many emerging HIV epidemic contexts; there are rarely data about MSM in national HIV surveillance efforts in the majority of low- and middle-income countries;
- There is an urgent need to include risks in national HIV and AIDS surveillance, in measures and data concerning sexually transmitted infections (STI), particularly where denial and stigma make such inclusion culturally difficult; and,
- Evidence-based and rights-based approaches to HIV both mandate that there be non-discrimination in services, access, and funding.³

These findings serve to emphasize the critical importance of taking steps now to include MSM as well as the other most-at-risk populations in planning for prevention, care, and treatment throughout those low- and middle-income countries experiencing a concentrated epidemic.

³ Beyrer, Chris. 2008. HIV and AIDS epidemics among men who have sex with men () in Africa, Asia, Latin America and the Caribbean, and the CIS. *.ppt, 29 Jun 08; italics in the original presentation.

MARPs prevention is underfunded for several reasons:

- 1) Stigma and discrimination -- many members of civil society oppose use of public funds to finance services for at-risk groups deemed unacceptable by reason of their presumptive behavior;
- 2) Weak demand for prevention is characteristic of health or insurance services that those potentially in need simply ignore because of myopia or procrastination; and,
- 3) Poor awareness of the seriousness of the MARPs epidemic due to lack of relevant data; e.g., a recent review of costs of interventions by group presents detailed data on sex workers, IDUs, miners, truck drivers, and prisoners but none on MSM.⁴

Reallocation of resources away from general prevention to services attuned to the needs of most-at-risk populations is simultaneously essential and politically difficult for governments throughout Asia, Africa, and Latin America.

Although these three groups, perhaps no more than fifty million persons and just two percent of adults in all low- and middle-income countries are a small minority within the larger populations of the countries and cities in which they reside (see Table 1),⁵ they play a central role in the epidemic.

Table 1. Global estimate, population of MARPs.

Population	Population Size (Thousands)
Sex Workers	9,083
Men who have sex with men	28,796
Injecting Drug Users	10,300
TOTAL	48,179

Source: UNAIDS unpublished estimates. These so-called ‘default’ estimates may be too low. Another of the papers for the aids2031 Costs and Financing Project is examining the likely numbers of sex workers in small, medium and larger cities of sub-Saharan Africa and that analysis may yield higher estimates of the numbers of women in this group.

⁴ Alban, Anita. 2007. Review of Unit Costs and Cost Analyses of AIDS Programmes in Asia. Mimeo. Manila: ADB. Presumably this highly competent professional would have presented data on services costs if she had found it. This experience confirms other professionals’ observation that men who have sex with men remain a hidden population from a scientific point of view.

⁵ In round numbers, these are the totals UN agencies use as best guesses about how many persons may be the object of group-specific interventions that aim to reduce harm and assure use of protection by condoms in sexual encounters. These groups normally live in cities because the individual members of the most-at-risk populations are likely to survive most securely in anonymous urban settings.

There are several reasons to believe that the numbers in Table 1 understate the number of persons in these groups:⁶

- 1) Suffering stigma and discrimination these groups will not readily present themselves for enumeration by authorities in the manner that households accept to be counted by census takers;
- 2) More than five percent of adult males in the USA asked about sexual practices acknowledge they are MSM; applying this percentage to the same age and sex group in the five billion people living in low- and middle-income countries yields a number of about 60 million MSM, more than double the number in Table 1;
- 3) Estimates from Asia alone for sex workers count 10 million, whereas the numbers used in Table 1 assume 9 million for all low- and middle-income countries; and,
- 4) Drug users are likely a shifting population also difficult to enumerate.

These factors taken together suggest that under-enumeration of MARPs is likely the norm. Estimates of resource requirements needed to address behavioural change and other interventions among these groups may thus also be on the low side.

In Asia three out of four HIV infections can be linked directly to the three MARPs. The AIDS Epidemic Model (AEM) developed for the ICAA projects the likely future of the epidemic. It shows that on current trends half of all new infections will be among MARPs by 2020 (see Annex Figure 2).⁷ In much of the Latin America and Caribbean region, the MARPs are also predominant groups affected by HIV and AIDS.

In Asia, an estimated ten million women sell sex to about 75 million men, and these two sides of the 'market for sex' may be "the single most powerful driving force in Asia's HIV epidemic."⁸ The wives of males who purchase sex are at risk by extension, but in Asia, broadly speaking, wives do not have additional partners and so the chain of epidemic causation may stop without turning into a generalized epidemic.

MSM contribute a tenth to a quarter of all HIV cases in several countries of the Asia region, and some studies indicate that the contribution of MSM in Latin America and the Caribbean is higher still. For comparison consider that the five to seven percent of USA males who identify themselves as MSM accounted in 2005 for 71 percent of all adult male HIV infections in that country.⁹ Three out of four adults living with HIV in Asia are men. The percentage of women living with HIV and AIDS rose to 24 percent in 2007; most of them probably contracted the virus from husbands or boyfriends who were infected during paid sex or through intravenous drug use.¹⁰

⁶ Studies by Baral and others (2007), Burnet Institute (2008), Caceres and others (2008), Mathers and others (2008), Vandepitte and others (2006) offer examples of efforts to make improved estimates of numbers in these groups.

⁷ ICAA 2008, Redefining AIDS in Asia, p. 57.

⁸ ICAA 2008 Redefining AIDS in Asia, p. 32.

⁹ US Centers for Disease Control, June 2007, HIV and AIDS among men who have sex with men Fact Sheet.

¹⁰ ICAA 2008, Redefining AIDS in Asia, p. 30.

In selected countries, especially those bordering the golden triangle of heroin and other injectable drug production, IDUs are a major part of the epidemic because of needle sharing.

Resource needs among MARPs, evolving estimates and approaches

Turning back the AIDS pandemic will require greater attention to prevention for the most-at-risk populations. One careful analysis of a hypothetical country program in Asia with a concentrated epidemic suggests that 42 percent of all AIDS intervention spending should be allocated to programs for MSM, sex workers and their clients, and injecting drug users (see Table 2). The analyst considered what interventions yield the most positive results in terms of infections averted; the result was to recommend spending a large share of resources on MARPs prevention. The analysis applied specifically to Asia; it was commissioned by the Asian Development Bank. It probably applies as well to other regions experiencing concentrated epidemics, e.g., Latin America and the Caribbean and Eastern Europe.

In other scientific work, data based on the Asia Epidemic Model (AEM) yield similar results. That model emphasizes the cost-effectiveness of spending on these three most at-risk population groups. A summary of principal findings from several independent research studies also underlines the importance of focused prevention among these key groups (see Text Box 1).¹¹

Text Box 1. How much is needed? How spent? How big an increase in funding?

- *Overall, an estimated \$550 million is needed to reach 60 percent of MSM in the region with peer education/outreach, VCT, and condoms*
- *About half of this spending would be needed for VCT, with another 40 percent allocated to peer education and outreach, and 10 percent devoted to condom distribution*
- *Countries need to increase their expenditures by anywhere from 4 to 25 times in order to reach at least 6 out of 10 with peer education and outreach programs*

Source: Health Policy Initiative 2006; USAID, p. 16

¹¹ See Health Policy Initiative 2006, HIV expenditure on MSM programming in the Asia-Pacific region, and Health Policy Initiative 2008, The value of investing in MSM programs in the Asia-Pacific region policy brief.

Table 2. Asia region country example of resource needs for HIV and AIDS activities, USD millions.

HIV programs for specific population/ intervention	2006–10
Men who have sex with men	21
Sex workers	15
Injecting drug users program (drop-in center-based)	14
Injecting drug user programs (motorcycle-based outreach)	10
Highly active antiretroviral treatment	17
Surveillance	17
Capacity-building	9
Other mobile populations	8
Behavioural change communications, general population including condoms	7
Migrant workers	6
Youth on the streets	4
Operational research	3
Prison populations	2
Treatment of opportunistic infections	2
Voluntary counselling and testing	1
Monitoring, evaluation and research	1
TOTAL	142
Sub-total MARPs, first four rows	60

Source: Alban (2007), based on the INPUT model; see Costing Guidelines for HIV and AIDS Interventions Strategies, ADB and UNAIDS 2004.

Under spending on MSM

Data from seven Asian sites illustrate a mismatch between disease burden and funding for programs targeting MSM (see Table 3). This small group accounted in 2004 for six percent of adult prevalence and 8.5 percent of new infections.¹² In most areas of Vietnam, Cambodia, Lao PDR and two southern China provinces prevention spending for this group was less than three percent and actually zero in one area.¹³ These data illustrate the failure of governments and donors to allocate resources to programs that seem to benefits groups that experience widespread stigma and discrimination. Thailand and a few other countries are notable for their ability to fund programs for groups that in other countries get short shrift.

¹² A² Project Vietnam.

¹³ HPI 2006, Table 1, p. 3.

Table 3. Expenditure on MSM programming, 2004, selected countries and regions (nominal USD)¹⁴

Country, City, or Province	MSM Prevention Expenditure	Total Prevention Expenditure	Share of Prevention Expenditure
Thailand	\$482,500	\$12,516,400	3.85%
Vietnam	\$220,000	\$20,670,673	2.59%
Ho Chi Minh City	\$4,232	\$430,376	0.05%
Cambodia	\$190,000	\$8,506,560	2.23%
	\$184,676		2.17%
Southern China Province 1	\$27,728	\$20,900,000	0.13%
Southern China Province 2	\$0	\$3,012,500	0.00%
Lao PDR	\$40,000	\$2,694,600	1.48%

Source: HPI 2006, Table 1, p.

Benefits and costs of spending to address AIDS prevention among MARPS

Countries with concentrated epidemics in Asia need to spend over USD6 billion in 2009, an amount far larger than current outlays.¹⁵ Other regions of the globe with concentrated epidemics also exhibit some gaps in spending, although several countries in Latin America have succeeded in financing ART from their own tax revenues. Resistance to financing interventions for MARPs has diminished in that region, but in both Asia and West Africa problems remain. Senegal, a leader in confronting AIDS over the past decade has taken a backward step.¹⁶

Programs likely to avert most of the new infections in concentrated epidemic must reduce transmission among MARPs. In Asia, the cost per disability-adjusted life-year gained may be as low as three dollars for interventions focused on sex workers and their clients, USD40 for harm reduction among IDUs, and USD75 to reduce transmission among MSM (see Annex Figure 3).¹⁷

¹⁴ USAID/CDC (2005), Strategy Report, p. 10. Personal Communication, Family Health International (FHI) Vietnam, August 2006. Personal Communication, FHI Cambodia, August 2006. Personal Communication, POLICY Project/Cambodia, November 2005. Personal Communication, POLICY Project/Thailand, 2005. Personal Communication, USAID | Health Policy Initiative, Task Order 1, Vietnam, August 2006.

¹⁵ ICAA 2008, p. 71-72.

¹⁶ See reports on arrests and detention of MSM advocating for condom use in Senegal in *The New York Times*, 20 Jan 09, Science Times. Vigorous protests are already underway among AIDS advocates groups.

¹⁷ ICAA 2008, p. 15.

From any point of view such spending offers value for money; it is a ‘good buy.’ Similar value for money is likely for other world regions as well. Even in eastern and southern Africa with their generalized epidemics, interventions among the MARPs would yield a positive benefit-to-cost ratio.

Analysts who have studied the issues of priority setting and resource allocation uniformly call for far more spending on prevention for MARPs. These include inter alia the Danish health economist, Anita Alban,¹⁸ the team of specialists commissioned in 2007 by UNAIDS (Stover and others 2006), The World Bank in its recent report, HIV and AIDS in South Asia, an economic development risk (Haacker and Claeson 2009), and the independent Commission report sponsored by the Asian Development Bank, UNDP, and UNAIDS. Agreement among these groups of scientists should help solidify and bring forward decisions by funding authorities to make the necessary changes and allocate resources in a manner consistent with sound and nearly uniform advice.

Benefits of prevention for MARPs

Prevention, like a good insurance policy, can pay for itself. In a global overview of potential benefits of scaling up prevention, Stover and co-authors write as follows:

A strong, global commitment to expanded prevention programs targeted at sexual transmission and transmission among injecting drug users, started now, could avert 28 million new infections between 2005 and 2015. The figure is more than half of the new infections might otherwise occur during that period in 125 low- and middle-income countries. . . . [G]reater spending on prevention now would not only prevent more than half the new infections that would occur from 2005 to 2015 but would actually produce a net financial saving as future costs for treatment and care are averted (Stover and others 2006, p. 1474).

Globally, the cost of preventing an infection was estimated to be USD3,923, and the net present value of lifetime treatment costs saved is estimated to be USD4,707, for a net saving in money of \$784 for each infection averted (Stover and others, Table 2, p. 1475). Investing in prevention can save money on medical costs avoided.

There are additional benefits. Stopping infections saves lives of adults that can be productive over many added life-years. Preventing 25,000 infections each year for a decade would save a quarter million lives, equal to 7.5 million DALYs saved through the year 2050. A life saved could be ‘worth’ USD5,000 or more per life-year saved.¹⁹ This estimate yields a gain in value of USD37.5 billion over the years 2009 through 2050, a small but welcome increment to well-being in low- and middle-income countries.²⁰

Prevention spending among MARPs, the main source of potential reduced infections, could be about USD100 per most-at-risk person per annum. The annual total cost of such prevention

¹⁸ See references to Alban and Hahn, 2002, Alban, 2006, and Alban, 2007.

¹⁹ At purchasing power parity exchange rates, per capita incomes in low- and middle-income countries, excluding sub-Saharan Africa, are about USD5000 (World Bank, *World development indicators 2008*, Table 1.1). Future-year income levels will be considerably higher, especially in the fast-growing Asia region.

²⁰ The 25,000 infections averted each year for ten years yields 250,000 infections averted. The saved persons live on average an additional 30 years yielding a gain of 7.5 million life years.

would be about USD5 billion or USD50 billion in a decade. This result suggests that benefits expressed in life-years saved would fall somewhat short of costs incurred.²¹ This conclusion ignores an important line of analysis that shows a value of statistical life substantially greater than the net present value of incomes earned. For the USA, Viscusi found that wrongful death legal cases, wage differentials for risky occupations, and court awards indicated in the 1990s a value for a statistical life, as he called it, was USD3 million to USD7 million, averaging USD5 million. In more recent analysis of international data, he concluded the USA-based values are about USD8 million and that many other countries' data, when adjusted for level of per capita income show similar high valuations of life (Viscusi and Aldy 2003).

From another approach ICAA estimates that interventions for all MARPs cost USD100 per person per annum (see Annex Table 3.6). Applied to the total number of persons in the groups shown in Table 1 above, the annual cost of interventions would be USD5 billion. If these amounts avert 2.8 million infections annually, then the cost per infection averted would be USD1,800. Stover and others estimate cost per infection averted at USD3,900, about double the amount suggested by the Independent Commission. Only direct experience of scaled-up and focused programs for MARPs will reveal which of these estimates proves to be correct.

Whatever costing approach is used, it seems certain that each averted infection repays with saved medical costs and highly-valued additional years of life as a result of an averted infection. If resources are scarce, focusing on the high-benefit interventions for MARPs shows the most promise.

High impact interventions need to be at the core of the HIV and AIDS intervention (see Annex Table 3.3). In Asia and probably for all areas with concentrated epidemics, the cost of these core interventions would not exceed a dollar per capita per annum (see Annex Table 3.6). Total resource requirements each year reach USD6.4 billion in Asia, but about half that amount would properly be seen as part of the overall health system budget in most Asian countries (see annex table 4 and ICAA 2008, p. 111). Yet even these limited sums substantially exceed amounts now allocated to effective HIV and AIDS interventions.

Current estimates for the Asia region identify only USD1.2 billion as available from all sources (ICAA 2008, p. 111). If priority interventions among MARPs can be financed, the results will be substantial:

- Cumulative infections will fall by 5 million;
- A reduction in the number of people living with HIV in 2020 by 3.1 million;
- A decline in the number of AIDS related deaths by 40 percent; and,
- An observable decline in HIV prevalence in the region.²²

The investment of a dollar in cost-effective, appropriate prevention can save up to eight dollars in treatment costs for expanding epidemic countries.²³ Financing prevention programs that

²¹ Analysis along these lines by Viscusi (1993, 2003), Nordhaus (2003), and Cutler (2004) demonstrate the remarkable gains derived from a wide range of cost-effective health interventions. The work is summarized in Funding First (2006) and Murphy and Stopel, ed., 2003, *Measuring the gains from medical research: an economic approach*.

²² ICAA 2008, p. 77.

²³ ICAA 2008, pp. 71-72; see also Stover and others 2006, The global impact, *Science* 311.

benefit the MARPs can be beneficial because they offer a global public good. As a result these public goods require global actions and financial support. Despite some progress made, AIDS currently accounts for more deaths among people aged 15-44 than do tuberculosis and other diseases (ICAA 2008, p. 48).

Similar benefits could derive from focused prevention efforts among MARPs in other world regions as well.

Who will pay?

Governments everywhere are reluctant to finance programs that address the needs of groups that may be stigmatized and lack overall community support. In Asian countries there is growing awareness of the existence of male-male sex but little popular or political acceptance of it. As a result, many governments in the region have not allocated sufficient human or financial resources to addressing the needs of MSM or other MARPs. Their behavior in this regard is not unlike much of the rest of the world.

Innovations in domestic financing

In all countries, rich and poor, health care services are financed by some combination of government outlays and out-of-pocket spending. Many low- and middle-income countries also receive donor support, multilateral and bilateral. Successful middle-income countries increasingly rely on public or private health insurance arrangements that depend either on wage taxes or general hypothecated taxes. The ICAA, in recognizing the multiplicity of funding sources and reluctance by government to assign resources to prevention programs for MARPs, devised an imaginative financing scheme. About half of all AIDS spending could come from budgets of the ministries of health and, importantly, from national health and social security insurance arrangements.²⁴

Taking these several funding sources into account, paying for MARPs prevention might not need to be an excessive burden; part of the funding for AIDS programs will properly come from social security and other health insurance arrangements. These alternative funding sources will make it easier for HIV and AIDS prevention to focus on the MARPs that today are still under-funded. In the Latin America region, social security institutes in Mexico, and the Unified Health Services in Brazil have accepted to finance services for all AIDS-affected persons regardless of their contributory status.²⁵

Spending by national governments and their health and social insurance institutions would not, however, be spread evenly over all interventions (see Table 4). Data in this table arrange spending requirements in a novel way. It ranks spending components in descending order. At the

²⁴ ICAA 2008, Table 3.1. Data in Table 3.1 are rearranged to appear in Table 4 in the annex to this document.

²⁵ For Mexico and three Central American countries, a 2007 UNAIDS review compared actual spending against resource needs estimates. Only in Mexico did spending for MSM peer counseling and support services reach or exceed amounts deemed necessary. In El Salvador, Guatemala, and Panama, amounts spent for these groups was far short of requirements. NGOs that did not report their program spending may have filled some of the gap (Izazola and others 2007). There were also substantial deficits in spending for harm reduction among drug users and for sex workers.

top are those interventions or recipient groups that require the largest amounts of the priority AIDS budget. Drawn from the ICAA 2008 estimates, the table data show the notional AIDS budget in the second numerical column drawn from the UNAIDS Global Resource Needs Estimates.

Table 4. Asia region AIDS spending requirements can be financed within the priority AIDS budget and by drawing on Ministry of Finance and Health, domestic health insurance and social security funds in Asian countries; annual amounts, USD.

Intervention ('000 USD)	Total AIDS Budget (RNM 2007)	Priority AIDS Budget	Additional Budget, other sources
	(1)	(2)	(3)
Adult ART	\$827,118	\$753,327	\$0
Program Management	\$214,576	\$410,282	\$421,649
Harm reduction	\$192,167	\$375,017	\$0
MSM prevention	\$329,491	\$340,019	\$0
VCT	\$260,815	\$318,682	\$0
CSWs and clients	\$376,000	\$292,357	\$0
Surveillance and M&E	0	\$242,075	\$0
Income for widows	0	\$221,145	\$0
Other Management	0	\$121,357	\$0
Orphans, vulnerable children	\$73,168	\$100,000	\$0
Universal precautions	\$908,255	\$90,826	\$817,430
Safe Injection	\$700,066	\$70,007	\$630,059
Public, comm. condoms	\$524,573	\$52,457	\$472,116
Low-risk prevention	0	\$46,850	\$421,649
Youth out of school	\$280,246	\$28,025	\$252,221
STI management	\$262,548	\$26,255	\$236,293
Workplace	\$224,240	\$22,424	\$201,816
PMTCT	\$92,119	\$12,836	\$0
Condom social marketing	\$103,658	\$10,366	\$93,292
Pediatric ART	0	\$7,367	\$0
Blood safety	\$69,034	\$6,903	\$62,131
Youth in school	\$25,450	\$2,545	\$22,905
Special populations	\$11,948	\$1,195	\$10,753
Mass media	\$8,686	\$869	\$7,817
Prevention for PLHA	\$4,119	\$412	\$3,707
PEP	\$2,130	\$213	\$1,917
Community mobilization	\$500	\$50	\$450
TOTALS	\$5,490,907.00	\$3,553,861.00	\$3,656,205.00

Source: Column 1: UNAIDS Global Resources Needs Estimates for 2007; Column 2 illustrates amounts properly assignable to an AIDS account separate from health sector's broader needs. Column 3 illustrates amounts that ICAA suggests should be seen as part of overall health spending financed from other health accounts.

The sum of Columns 2 and 3 exceeds that of Column 1 because of differences in estimates about needs for low-risk prevention, program management, and other cost areas that were reappraised during the work of the Independent: Commission on AIDS in Asia.

From the top down, the principal users of this notional AIDS budget are adult ART, program management, harm reduction among IDUs, and prevention among other MARPs. This ranking differs from GRNE, but the differences are fairly small. Columns 2 and 3 both support AIDS spending, but Column 2 shows amounts that 'should' be financed as part of the fight against AIDS whereas Column 3 presents amounts that 'should' be financed as part of a country's broad obligations to strengthen health systems and provide good health care.

What matters for this table is the source of financing that covers each spending category in either Column 2 or Column 3. Among the largest spending items for the 'priority AIDS budget,' it is only 'Program Management' that proposes a substantial call on the final column in the table, 'Additional budget, other sources.' The contentious areas of support for the most at-risk populations derive their funding from 'Priority AIDS Budget.' If this column could be financed entirely from donor or out-of-pocket spending (the latter appropriate for better-off purchasers of ART), governments would not face the political challenge of helping the most at-risk groups directly.

This budgeting approach obviates a serious political problem. Governments of low- and middle-income countries may be reluctant to dedicate their resources to the interventions that focus on most at-risk populations. Thus, much of the AIDS budget that focuses on prevention must be generated from donor support.

The question is, 'Who will pay?' To answer the question, consider a division of responsibilities between sources of finance as outlined in Text Box 2.

Text Box 2. Division of labor in financing AIDS interventions.

There are health sector spending areas that contribute to health system strengthening as well as the fight against AIDS. Some of these areas are widely acceptable in Asia; others are not. Specialization and division of labor between governments and donors can assure that all essential services are financed. With that specialization in mind,

- Governments should finance –
 - Universal precautions
 - HIV and AIDS program management
 - PMTCT
 - Anti-retroviral therapy
 - Care for orphans and vulnerable children
 - Other non-controversial prevention, care, and treatment
- Donors should finance –
 - Prevention for the most at-risk groups, including MSM, sex workers and their clients, and drug users
 - Other essential cost-effective programs that governments may find politically difficult

With this division of labor and full inclusion of civil society organizations that represent the most at-risk populations, better program performance can be assured.

Can multilateral donors focus on MARPs?

The analysis behind Table 4 lays out with care the obligations for government financing that can supplement and complement funds needed in the ‘AIDS priority budget.’ What then will be the source of support for that AIDS priority budget?

The response must lie largely with the donor community. Bilateral, multilateral and private foundation donors all have critical roles to play. Of particular interest may be development banks, especially the Asian Development Bank and the World Bank. Also important can be The Global Fund. All these multilaterals need to enhance their capacity to focus on MARPs prevention programs since these international institutions have distinct comparative advantages:

- They are independent of national governments;
- They can finance programs on the basis of scientific merit and the prospective benefits and costs of proposed investments in health;
- They are less likely than governments in low- and middle-income countries or bilateral donors to shy away from sound programs because of political correctness or stigma and discrimination;
- The Global Fund depends on national entities to make proposals through a Country Coordinating Mechanism (CCM). The CCM in the best of instances will incorporate civil society and its views into proposal and program implementation; and,
- The World Bank, Asia Development Bank, and Inter-American Development Bank can engage government borrowers and grant recipients in a dialogue of development that can clarify priorities for AIDS interventions assisting MARPs.

Multilateral donors may escape many of the problems that national governments, both donors and recipients, face in providing prevention programs for MARPs. Division of labor between donors and governments offers the best solution to the challenge of funding essential programs that are currently underfunded because of stigma and discrimination. To make specialization work effectively, interested parties, especially civil society organizations that represent the most-at-risk populations, need to monitor how and whether government spending complements the work of donors, out-of-pocket spending and public and private health insurance financing for HIV and AIDS interventions in each country.

Country-specific spending needs for MARPs prevention

The ICAA identified spending requirements in 14 countries of the region (see Annex Figure 5). China, India, and Indonesia with the largest populations are also the largest draws on aggregate regional spending for prevention. The balance between VCT, condom distribution, outreach and peer education are presumed to be roughly the same in all countries (see Annex Figure 6). Other regions need similarly detailed identification of spending requirements for these groups; the Global Resource Needs Estimates, the National AIDS Spending Assessments, and the formulation of National Strategic Plans all contribute to a fuller understanding of priority needs.

Next steps and future projections to 2031

What can be done to strengthen future programs to reduce AIDS infections among the MARPs in Asia as well as other regions and countries experiencing a still-concentrated epidemic? Several specific tasks merit attention:

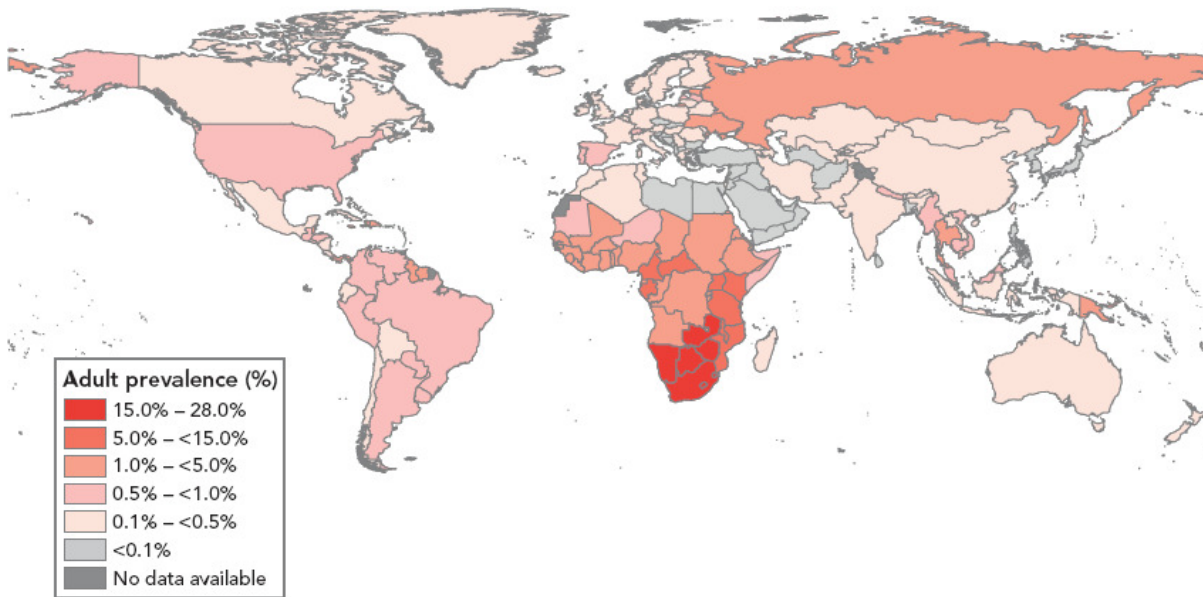
- The thorough analysis provided by ICAA needs to be matched by equivalent analyses for other major world regions;
- The ICAA report looks principally at concentrated epidemics; a different approach may be required in eastern and southern Africa with their generalized epidemics. Those countries need to devote a larger share of resources to care and treatment but they dare not underinvest in prevention among their own most-at-risk populations;
- Advocacy organizations and the UN System, among others, can approach the multilateral donors, including The Global Fund, to propose that they announce a readiness to entertain proposals that focus on prevention services in the upcoming Round 9 of proposal submissions;
- International agencies (UNAIDS, UNDP, ADB, WHO) could compile a summary of current actions, programs, and groups in several regions and present these for public dissemination to encourage the spread of ‘best practice’ to additional groups and countries;
- Donors and governments could begin discussion of divisions of labor and specialization in finance that can encourage both sides to do more; and,
- Leveraging additional finance is a goal of many donors; sharing responsibilities along lines identified in Table 4 offers one means of claiming leverage fairly.

Bilateral and multilateral donors can preferentially support prevention and other ‘sensitive’ spending areas. Governments can focus on universal precautions, overall program management, condom distribution, youth, and other spending areas compatible with publicly-accepted uses of government spending. Civil society organization and country coordinating mechanisms can assure adequate attention to surveillance, monitoring and evaluation. These entities can focus on getting value for money from spending on AIDS interventions. If they do so, these watchdogs are sure to demand substantial attention to prevention programs, which are among the most life-saving and cost-effective of possible uses for financing resources.

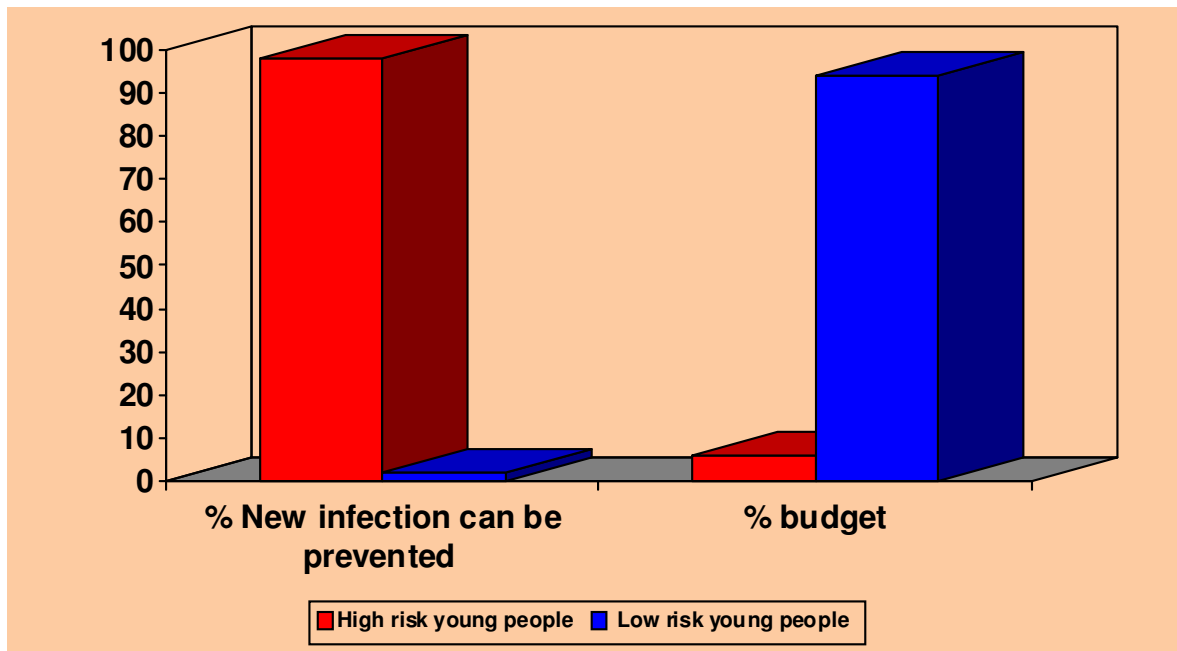
Priority actions could include strengthened efforts by UNAIDS to promote focused actions for the MARPs. Donors and governments can effectively lead efforts to discuss and resolve issues requiring a sound division of labor that takes into account both fiscal and policy space opportunities and constraints. Leveraging additional finance and sharing responsibilities between AIDS and health system strengthening goals offer the best prospects of curbing the epidemic.

Annex

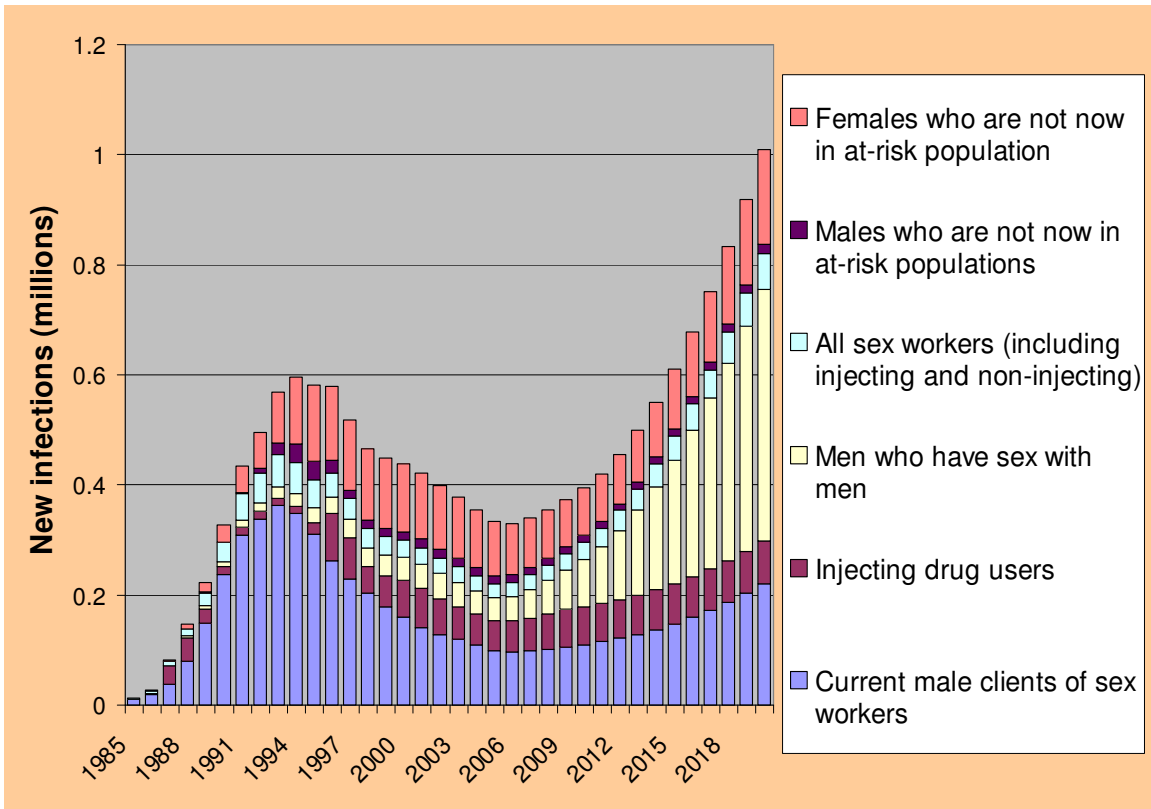
Annex 1. HIV prevalence among adults, by country



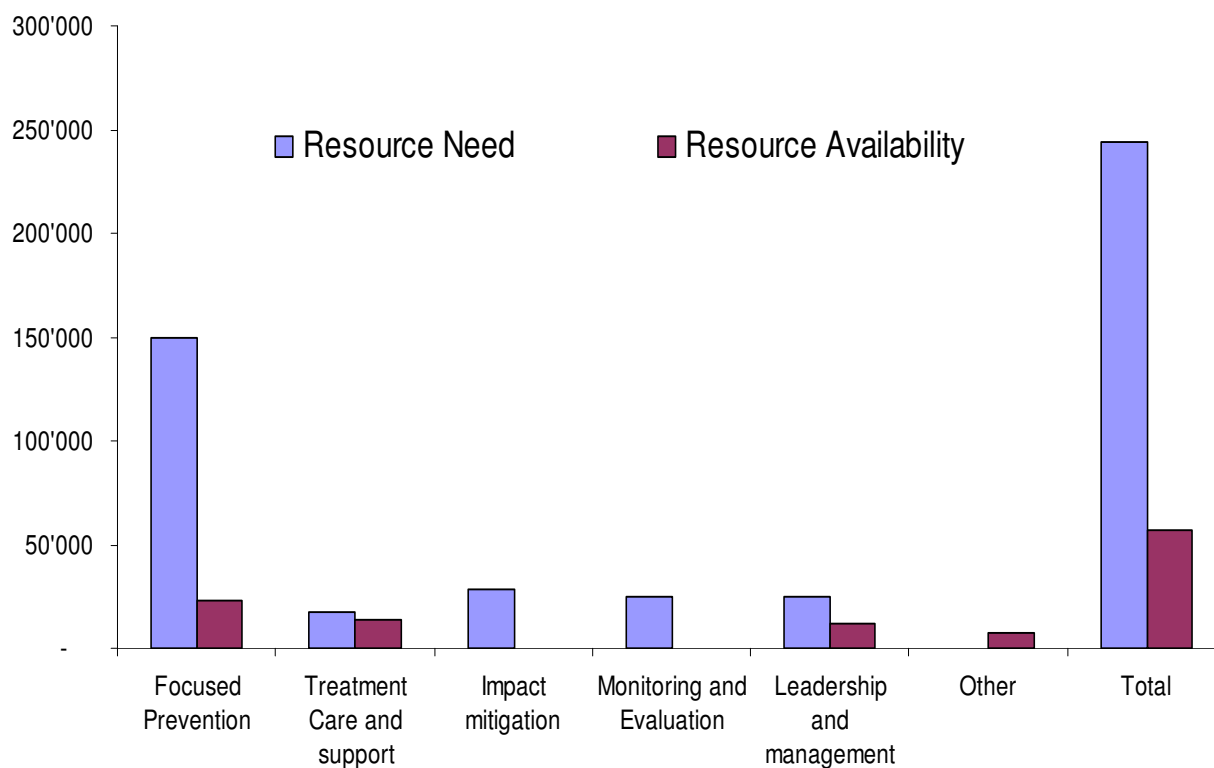
Annex 2. Resources do not follow priorities



Annex 3. MSM, the largest source of new infection?

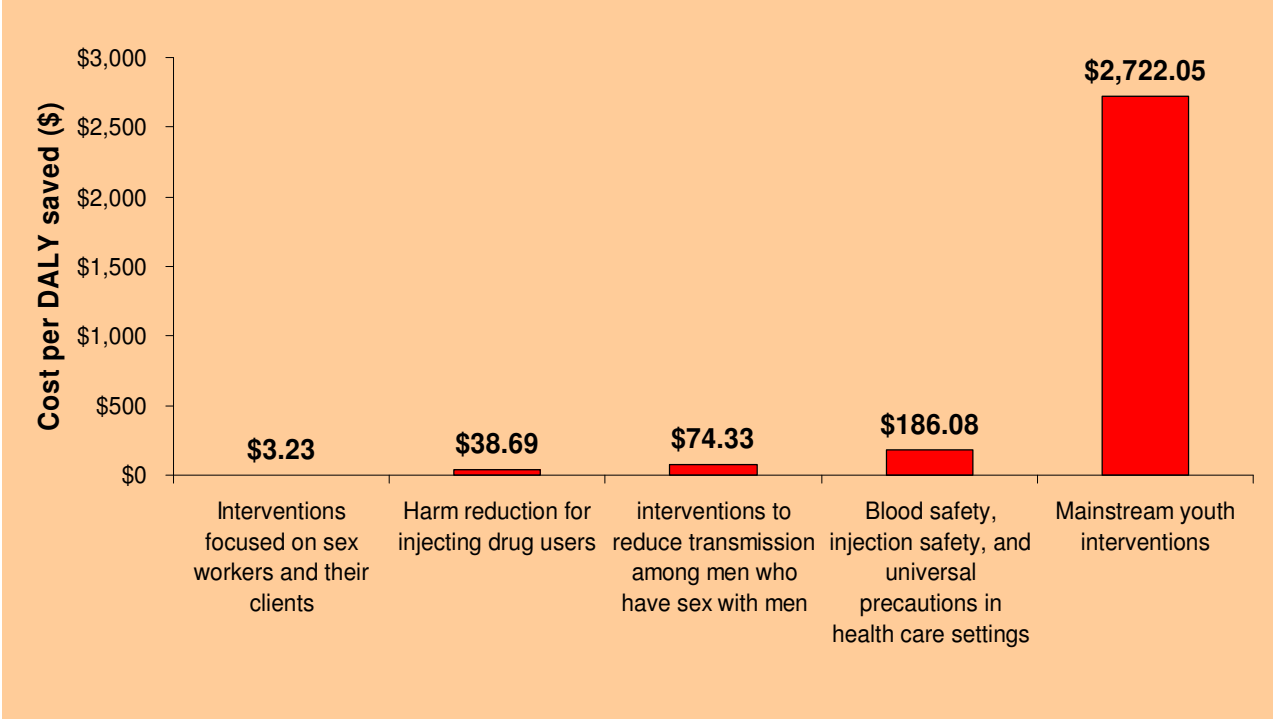


Annex 4. Prevention resource is not enough: Resource Need versus Resource Availability in Indonesia, 2008

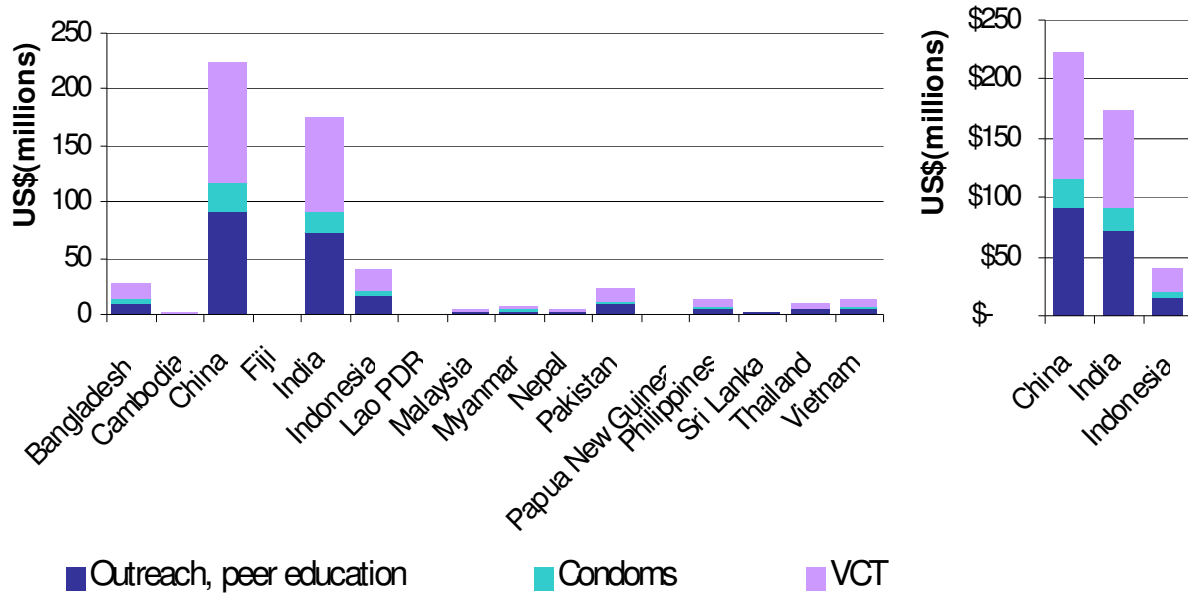


Source Note: Resource needs estimates are based on cost exercises by the Indonesia country team at the ADB-UNAIDS workshop for national strategic plans (NSPs). Resource availability estimates are based on reported figures from Indonesia included in the UNGASS Report for 2008 (consistent with data in GF proposal).

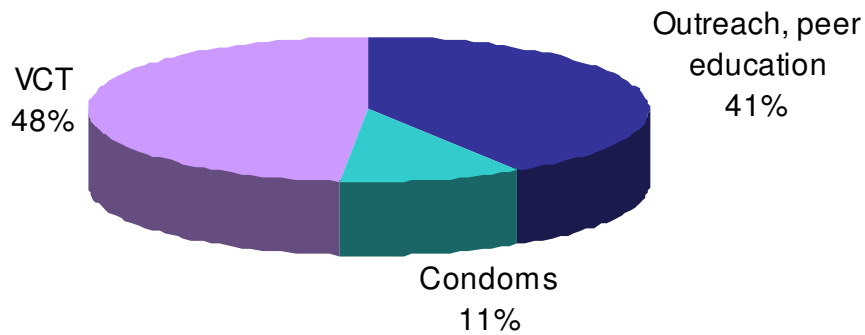
Annex 5. Prevention focused on MARPs is far more cost-effective than so-called mainstream youth interventions



Annex 6. Needed spending for MSM prevention interventions annually, 16 Asian countries, US millions



Annex 7. Share of resources required for MSM prevention, percentage distribution



US\$550 million

References

- Alban, A. 2007. Review of unit costs and cost analyses of AIDS programmes in Asia.
- . 2006. Estimation of costs of HIV interventions in Pakistan 2006-2010. 1-46.
- . 2005. Estimations of costs of HIV interventions in Estonia. 1-21.
- Alban, A., M. Fatima, D. H. Hansen, and S. Nielsen. Cost effectiveness of injecting drug user interventions to prevent HIV in Karachi, Pakistan. 1-23.
- Alban, A., and M. Hahn. 2002. Costing of Nepal HIV strategy 2002–2006: 1–26. Kathmandu: DFID.
- Alban, A., D.H. Hansen, M. Fatima, and S. Nielsen. Cost-effectiveness of drop-in-centers to prevent HIV among injecting drug users, IDUs, in Karachi, Pakistan.
- Alban, A., and C. Manuel. Background report: Cost-effectiveness of injecting drug user interventions to prevent HIV in Nepal.
- Alban, A., C. Manuel, D. H. Hansen, M. Fatima, and S. Nielsen. Review of cost-effectiveness of injecting drug user interventions to prevent HIV in Asia. 1-21.
- Alban, Anita, Adriana Gomez, and Joint Author. 2004. Costing guidelines for HIV and AIDS intervention strategies for use in estimating resource needs, scaling-up and strategic planning in the Asia/Pacific region. ADB-UNAIDS study series; tool 1. Geneva etc. Joint United nations programme on HIV and AIDS (UNAIDS).
- Anon. 2007. Resource needs for a comprehensive AIDS response- draft.
- ASEAN. 2007. Socioeconomic impacts of and resource requirements for HIV and AIDS. Indonesia: ASEAN Secretariat 2007.
- Baral, S., F. Sifakis, F. Cleghorn, and C. Beyrer. 2007. Elevated risk for HIV infection among men who have sex with men in low-and middle-income countries 2000–2006: A systematic review. *PLoS Med* 4, (12): e339.
- Beyrer, C. HIV and AIDS epidemics among men who have sex with men (MSM) in Africa, Asia, Latin America and the Caribbean, and the CIS. Full enjoyment of human rights by all.
- Beyrer, C., J. Jittiwutikarn, W. Teokul, M. H. Razak, V. Suriyanon, N. Srirak, T. Vongchuk, S. Tovanabutra, T. Sripaipan, and D. D. Celentano. 2003. Drug use, increasing incarceration rates, and prison-associated HIV risks in Thailand. *AIDS and Behavior* 7, (2): 153-61.
- Bhuyan, Anita. June 2005. Commitment for action: Assessing leadership for confronting the HIV and AIDS epidemic-lessons learned from pilot studies in Bangladesh, India, Nepal, and Vietnam. Washington, DC: USAID-Policy Project.
- Burnet Institute. 2008. Investigation into donor and organizational support/implementation of activities targeted towards men who have sex with men in the greater Mekong sub region.
- Caceres, CF, K. Konda, ER Segura, and R. Lyerla. 2008. Epidemiology of male same-sex behaviour and associated sexual health indicators in low-and middle-income countries: 2003-2007 estimates. *British Medical Journal* 84, (Supplement 1): i49.

- Chin, James, and Campaign for Fighting Diseases. 2008. The myth of a general AIDS pandemic: How billions are wasted on unnecessary AIDS prevention programmes. Discussion paper (campaign for fighting diseases); no. 2. London: Campaign for Fighting Diseases, <http://www.fightingdiseases.org/pdf/Jim%5Fchin%5FAIDS.pdf>; <http://www.fightingdiseases.org/pdf/Jim%5Fchin%5FAIDS.pdf> Note: Full Report Online.
- Commission for AIDS in Asia. 2007. Draft discussion paper on resource allocation norm for total AIDS budget, ART, prevention and impact mitigation program. Bangkok- Secretariat of the Commission. Commission on AIDS in Asia. 2008.
- Creese, A., D. Parker, F. A. Kahn, and International Nations. United. 1994. Cost analysis in primary healthcare; World Health Organization.
- Cutler, David M. 2004. Your money or your life: Strong medicine for America's health care system. Oxford; New York: Oxford University Press. <http://www.loc.gov/catdir/enhancements/fy0614/2003050673-d.html>; Materials specified: Publisher description <http://www.loc.gov/catdir/enhancements/fy0614/2003050673-d.html>; Materials specified: Contributor biographical information <http://www.loc.gov/catdir/enhancements/fy0724/2003050673-b.html>.
- Desai, Kamal, L. Sansom Stephanie, L. Ackers Marta, R. Stewart Scott, H. Hall Irene, J. Hu Dale, Rachel Sanders, et al. 2008. Modeling the impact of HIV chemoprophylaxis strategies among men who have sex with men in the United States: HIV infections prevented and cost-effectiveness. *AIDS* 2008(22): 1-11.
- Fairley, C. K., A. E. Grulich, J. C. Imrie, and M. Pitts. 2008. Introductory editorial: The analysis of a natural experiment in HIV control. *Sexual Health* 5, 89.
- Ghys, P. D., T. Brown, N. C. Grassly, G. Garnett, K. A. Stanecki, J. Stover, and N. Walker. 2004. The UNAIDS estimation and projection package: A software package to estimate and project national HIV epidemics. *Sexually Transmitted Infections* 80 Supplement 1, (Aug): i5-9 (accessed 10/1/2008).
- Global health council, HIV and AIDS, regional profiles - other regions. [Cited 11/6/2008 2008]. Available from http://www.globalhealth.org/hiv_aids/global_view/profile_others/#lamerica (accessed 11/6/2008).
- Global health council, HIV and AIDS, regional profiles - sub-Saharan Africa & Asia. [Cited 11/6/2008 2008]. Available from http://www.globalhealth.org/hiv_aids/global_view/profile_asia/ (accessed 11/6/2008).
- Guinness, L., A. Foss, and C. Watts. 2002. Modeling the impact and cost-effectiveness of CARE-SHAKTI: An HIV prevention programme for injecting drug users and sex workers in Bangladesh; London School of Hygiene and Tropical Medicine, Institute of Health Economics, University of Dhaka, ICDDR, B and CARE Bangladesh.
- Guinness, L., L. Kumaranayake, B. Rajaraman, G. Sankaranarayanan, G. Vannela, P. Raghupathi, and A. George. 2005. Does scale matter? The costs of HIV-prevention interventions for commercial sex workers in India. *Bulletin of the World Health Organization* 83: 747-55.
- Health Policy Initiative. September 2006. HIV expenditure on MSM programming in the Asia-pacific region. Washington, DC: USAID, Task Order 1.

- . 2008. The value of investing in MSM programs in the Asia-pacific region policy brief. : 4 p.
- . 2007. HIV economic analysis: Approaches that work. : 3 p.
- Independent Commission on AIDS in Asia. 2008. Redefining AIDS in Asia: Crafting an effective response: Report of the commission on AIDS in Asia. Oxford University Press. http://data.unaids.org/pub/Report/2008/20080326_report_commission_aids_en.pdf.
- India National Institute of Health & Family Welfare (NIHFW) and National AIDS control organization (NACO). 2007. Annual HIV sentinel surveillance 200-country report.
- Izazola, Jose Antonio, Daniel Aran, Carlos Avila, and William McGreevey. 2007. Comparing NASA/MEGAS and RNM: El Salvador, Guatemala, México and Panamá, 2005. Mimeo DRAFT; Geneva: UNAIDS, May 2007
- Joint United Nations Programme on HIV and AIDS, and World Health Organization. 2007. AIDS epidemic update. Geneva: UNAIDS: World Health Organization, <http://data.unaids.org/pub/EPISlides/2007/2007%5FEpiupdate%5Fen.pdf>; <http://data.unaids.org/pub/EPISlides/2007/2007%5FEpiupdate%5Fen.pdf> Note: Full Report Online.
- Kumaranayake, L., J. Pepperall, H. Goodman, A. Mills, and D. Walker. Costing guidelines for HIV prevention strategies. UNAIDS Best Practice Collection Key Materiall UNAIDS/00.31 E.
- Laugharn, Peter, and Eric Lief. Updates 2006. European philanthropy and HIV and AIDS. Hanover, Germany: European HIV and AIDS Funders Group; Center for Strategic and International Studies.
- Levine, Ruth, Ruth Levine, Millions saved, and What Works Working Group. 2007. Case studies in global health: Millions saved. Essential public health. Sudbury, Mass: Jones and Bartlett Publishers.
- Ma, X., Q. Zhang, X. He, W. Sun, H. Yue, S. Chen, H. F. Raymond, Y. Li, M. Xu, and H. Du. 2007. Trends in prevalence of HIV, syphilis, hepatitis C, hepatitis B, and sexual risk behavior among men who have sex with men: Results of 3 consecutive respondent-driven sampling surveys in Beijing, 2004 through 2006. *JAIDS Journal of Acquired Immune Deficiency Syndromes* 45, (5): 581.
- Marseille, Elliot, Lalit Dandona, Nell Marshall, Paul Gaist, Sergio Bautista-Arredondo, Brandi Rollins, Stefano M. Bertozzi, et al. 2007. HIV prevention costs and program scale: Data from the PANCEA project in five low and middle-income countries. *BMC Health Services Research* (7): 108.
- Martin, Gayle H. 2007. AIDS expenditure in the Asia region, some preliminary findings. : 23 p.
- Mathers, B. M., L. Degenhardt, B. Phillips, L. Wiessing, M. Hickman, S. A. Strathdee, A. Wodak, S. Panda, M. Tyndall, and A. Toufik. 2008. Global epidemiology of injecting drug use and HIV among people who inject drugs: A systematic review. *The Lancet* 372, (9651): 1733-45.
- McLeod, Ross. 2007. The economic costs of inaction: Curbing the Asian HIV and AIDS epidemic. 19-Appendix.

- Meng, X., A. F. Anderson, X. Hou, Y. Wang, L. Sun, X. Zhang, Z. Li, B. Qui, Y. Lang, and L. Zhang. 2006. A pilot project for the effective delivery of HAART in rural china. *AIDS Patient Care & STDs* 20, (3): 213-9.
- Moses, Stephen A. 2006. *AIDS in south Asia: Understanding and responding to a heterogeneous epidemic*. Health, nutrition, and population series. Washington, DC: World Bank.
- Murphy, Kevin M., and Robert H. Topel. 2003. *Measuring the gains from medical research: An economic approach*. Chicago: University of Chicago Press, <http://www.loc.gov/catdir/description/uchi051/2002010963.html>; Materials specified: Publisher description <http://www.loc.gov/catdir/description/uchi051/2002010963.html>; Materials specified: Contributor biographical information <http://www.loc.gov/catdir/bios/uchi051/2002010963.html>; Materials specified: Table of contents <http://www.loc.gov/catdir/toc/fy037/2002010963.html>.
- Neal, JJ, G. Morineau, and M. et al Phalkun. 2007. HIV, STIs and related risk behavior among Cambodian men who have sex with men.
- Nordhaus, William D. 2003. Chapter 1: The health of nations: The contribution of improved health to living standards. In *Measuring the gains from medical research: An economic approach*. 263. Chicago: University of Chicago Press, <http://www.loc.gov/catdir/description/uchi051/2002010963.html>; Materials specified: Publisher description <http://www.loc.gov/catdir/description/uchi051/2002010963.html>; Materials specified: Contributor biographical information <http://www.loc.gov/catdir/bios/uchi051/2002010963.html>; Materials specified: Table of contents <http://www.loc.gov/catdir/toc/fy037/2002010963.html> .
- Open Society Institute. *Harm reduction developments 2005. countries with injection driven HIV epidemics*. : 1-72.
- Over, M., E. Marseille, K. Sudhakar, J. Gold, I. Gupta, A. Indrayan, S. Hira, N. Nagelkerke, A. S. R. S. Rao, and P. Heywood. 2006. Antiretroviral therapy and HIV prevention in India: Modeling costs and consequences of policy options. *Sexually Transmitted Diseases* 33, (10): S145.
- Over, A. Mead, World Bank, and Human Development Network. 2004. *HIV and AIDS treatment and prevention in India: Modeling the costs and consequences*. Health, nutrition, and population series. Washington, D.C: World Bank.
- Pisani, E., I. Status, and L. Availability. 2008. *The wisdom of whores: Bureaucrats, brothels, and the business of AIDS* WW Norton & Co.
- Plipat, T., K. Kladsawas, and W. van Griensven. 2008. *Results of the HIV surveillance among men who have sex with men (MSM) in Bangkok, chainmail and puce*. Department of disease control, Ministry of Public Health.
- POLICY Project (Futures Group International), United States, and Agency for International Development. 2003. *HIV and AIDS in the Mekong region, Cambodia, loaf PDR, thailand, & Vietnam: Current situation, future projections, socioeconomic impacts, and recommendations*. Washington, D.C: POLICY Project, Futures Group International.
- Reventa, Ana. 2006. *The economics of effective AIDS treatment: Evaluating policy options for thailand*. Health, nutrition, and population series. Washington, DC: World Bank,

<http://www.loc.gov/catdir/toc/fy0704/2006045541.html>; Materials specified: Table of contents only <http://www.loc.gov/catdir/toc/fy0704/2006045541.html>.

- Ruxrungtham, K., T. Brown, and P. Phanuphak. 2004. HIV and AIDS in Asia. *The Lancet* 364, (9428): 69-82.
- Sarkar, S. 2008. Commission on AIDS in Asia. implications for NGOs on MSM issues. Bangkok: UNAIDS and ADB.
- Serra, J. 2008. The political economy of the Brazilian struggle against AIDS. Washington, DC: Inter American Development Bank.
- Stover, J., S. Bertozzi, J. P. Gutierrez, N. Walker, K. A. Stanecki, R. Greener, E. Gouws, C. Hankins, G. P. Garnett, and J. A. Salomon. 2006. The global impact of scaling up HIV and AIDS prevention programs in low-and middle-income countries. *Science* 311, (5766): 1474-6.
- Sullivan, L. E., D. S. Metzger, P. J. Fudala, and D. A. Fiellin. 2005. Decreasing international HIV transmission: The role of expanding access to opioid agonist therapies for injection drug users. *Addiction* 100, (2): 150-8.
- Thailand Ministry of Public Health, and World Bank. 2005. Expanding access to ART in thailand: Achieving benefits while promoting effective prevention. Washington, DC: World Bank Publications.
- Thaisri, H., J. Lerwitworapong, S. Vongsheree, P. Sawanpanyalert, C. Chadbanchachai, A. Rojanawiwat, W. Kongpromsook, W. Paungtubtim, P. Sri-ngam, and R. Jaisue. 2003. HIV infection and risk factors among Bangkok prisoners, thailand: A prospective cohort study. *BMC Infectious Diseases* 3, (25): (28October2003).
- Thanprasertsuk, S., A. Revenga, V. Tangcharoensathien, M. Over, C. Lertpiriyasuwat, and T. Brown. 2004. Expanding access to ART for HIV and AIDS in thailand: Achieving treatment benefits while promoting effective prevention. Paper presented at The XV International AIDS Conference.
- UNAIDS. 2007. Men who have sex with men: The missing piece in the national responses to AIDS in Asia and the pacific.
- . Methods and assumptions for estimates. [cited 10/1/2008 2008]. Available from <http://www.unaids.org/en/KnowledgeCentre/HIVData/Methodology/> (accessed 10/1/2008).
- UNAIDS et. al. 2008. Financial resources required to achieve universal access to HIV prevention, treatment, care and support.
- USAID Health Policy Initiative. January 2008. Conceptual framework for financing HIV and AIDS care and treatment in ASEAN countries.
- . 2006. Personal communication, policy project. Cambodia: Task Order 1.
- UNGASS India report. 2005.
- Vandepitte, J., R. Lyerla, G. Dallabetta, F. Crabbe, M. Alary, and A. Buve. 2006. Estimates of the number of female sex workers in different regions of the world. *British Medical Journal* 333, (Supplement 3).

- Vaz LME, P. Jha, F. Plummer, N. Nagelkerke, B. Willbond, E. Ngugi, S. Moses, G. John, R. Nduati, K. S. MacDonald, and S. Berkley. 2001. The evidence base for interventions to prevent HIV infection in low and middle- income countries. Commission on Macroeconomics and Health.
- Vietnam FY 2007 country operational plan (COP). [cited 11/6/2008 2008]. Available from <http://www.pepfar.gov/about/82441.htm> (accessed 11/6/2008).
- Viscusi, W. 1912. Kip. 1993. "The value of risks to life and health." *Journal of Economic Literature* 31, (4).
- Viscusi, W. K., and J. E. Aldy. 2003. The value of a statistical life: A critical review of market estimates throughout the world. *Journal of Risk and Uncertainty* 27, (1): 5-76.
- Walker, D. 2003. Cost and cost-effectiveness of HIV and AIDS prevention strategies in developing countries: Is there an evidence base? *Health Policy and Planning* 18, (1): 4-17.