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Combining Epidemiology & Economic Analysis

to Inform the Response to the HIV Epidemic in Ho Chi Minh City

2006

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Combining Epidemiology & Economic Analysis

to Inform the Response to the HIV Epidemic in Ho Chi Minh City

2006

A^2 Project Technical Working Group

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The Analysis and Advocacy (A^2) Project is a partnership among international organizations and in-country agencies. In-country partners include national AIDS programs, ministries of health, centers for diease control, and provincial AIDS committees. International partners are Family Health International (FHI), the East-West Center (EWC), and Task Order 1 of the Health Policy Initiative. In Vietnam, the A^2 project is a collaborative initiative of the Ho Chi Minh City Provincial AIDS Committee (HCMC-PAC), the National Institute of Hygiene and Epidemiology (NIHE), Family Health International, the East-West Center, and Task Order 1 of the Health Policy Initiative. Supported by the United States Agency for International Development (USAID) through the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), the A^2 project synthesizes and interprets HIV-related epidemiological, behavioral and programmatic data to provide insight into the HIV epidemic in Ho Chi Minh City (HCMC) and give decisionmakers the information they need to improve the effectiveness and efficiency of HIV responses. The project's ultimate goal is to ensure the most appropriate HIV prevention, care, and treatment in HCMC.

ANALYSIS & ADVOCACY

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Executive summary

The HIV epidemic in Ho Chi Minh City

Ho Chi Minh City (HCMC) accounts for a quarter of the reported number of HIV infections in Vietnam. The accumulated HIV infections reported through June 30, 2006, totaled 32,094, with 14,580 AIDS patients and 5,516 deaths.

Since the appearance of HIV in HCMC in early 1990, some groups have been identified as being at high risk for HIV infection, such as injection drug users (IDUs) and female sex workers (FSWs). These two groups in HCMC, as in other provinces in Vietnam, have been tested as part of the sentinel surveillance system since 1994. However, other sub-populations, such as men who have sex with men (MSM) and clients of sex workers, are not included in this system even though they also contribute to the growth of the epidemic. The HIV epidemic in HCMC comprises many sub-epidemics among sub-populations. Within each sub-population, different epidemics at different times with different factors have promoted the spread of HIV.

One of the best examples is the epidemic among IDUs; it consists of (1) an epidemic in the early 1990s among older drug users, which stabilized at about 43 percent; and (2) a later epidemic starting in 1996-97 among very young drug users that plateaued around 54 percent. Both epidemiological and behavioral evidence related to IDUs in HCMC show how rapidly the epidemic can change within the IDU sub-population.

Regarding sex workers, prevalence among non-injecting sex workers rose slowly to about 11 percent in 2006, while prevalence among injecting sex workers grew more rapidly to about 60 percent. Current evidence shows that the injecting behaviors of sex workers played an important role in spreading HIV among this population.

Data on MSM and clients of sex workers have been limited, representing the largest gap in HIV data in HCMC. However, prevalence among MSM was estimated to be high, at 8 percent in 2004, and it is clear that both sub-populations play a role in driving the epidemic[1].

The Vietnam National Strategy on HIV/AIDS Prevention and Control provides the strategic framework for a comprehensive response to the HIV epidemic. The strategy's overall objectives are to maintain the national HIV prevalence rate among the general population at or below 0.3 percent to 2010, with no further increase after 2010; and to alleviate the impact of HIV/AIDS on socioeconomic

1 *Tuan AN, Hien TN, Roger D. Prevalence and risk factors associated with HIV infection among men having sex with men in Ho Chi Minh City. AIDS Behaviors, 2007.*

development. The strategy identifies nine components for intervention, and the Ho Chi Minh City Provincial AIDS Committee, like other provincial committees, is developing action plans that will guide the implementation of each component.

The Analysis and Advocacy (A^2) Project

The A^2 Project is a joint regional project of international, national, and provincial partners. The international partners are Family Health International, the East-West Center, and the USAID Health Policy Initiative, Task Order 1 (formerly the POLICY Project). A^2 is being implemented in Bangladesh, China (Yunnan and Guangxi provinces), Thailand, and Vietnam. In each country, national and provincial government organizations responsible for monitoring and responding to the epidemic are also partners in A^2. Vietnamese A^2 partners are the HCMC Provincial AIDS Committee and the National Institute of Hygiene and Epidemiology. The project is funded by the United States President's Emergency Plan for AIDS Relief (PEPFAR).

The overall objective of the A^2 Project is to develop a clear understanding of the HIV epidemic in countries in the region and to translate that understanding into effective policies and appropriately targeted and resourced programs. Governments and donors can then make evidence-based decisions using an empirical base to ensure that resources dedicated to HIV truly make a difference. Working in resource-constrained settings, A^2 aims to build capacity to

- bring together local epidemiological, behavioral, response, and program costing data
- analyze that data with state-of-the-art modeling tools
- determine responses and resources needed for maximum impact
- target policymakers, program managers, and donors with this information so that they will make the best choices

The analyses produced by the A^2 Project provide sound evidence of the need for increased resources and should be used to guide both the mobilization and allocation of resources to interventions that address the factors driving the epidemic in HCMC.

A^2 analytical tools

A^2 uses two key modeling tools. The Asian Epidemic Model (AEM) is a semi-empirical model that replicates the dynamics of HIV epidemics in Asian settings to project future epidemiological trends. The Goals Model links program goals—such as those established by Vietnam's National Strategy on HIV/AIDS Prevention and Control - to the resources needed to achieve those goals. Both models have been successfully used in several international settings to help countries with projecting their epidemics and allocating resources more effectively.[2,3,4,5,6]

A^2 used AEM to project the course of the HIV epidemic in HCMC if existing risk behavior levels were to remain the same. The application presented here was built using key information about HIV in HCMC and the behaviors driving the epidemic:

- the size of most-at-risk populations (MARPs), such as sex workers, clients of sex workers, IDUs, and MSM
- estimates of past and current levels of risk behaviors (e.g., number of sex partners, condom use, frequency of sharing needles among IDUs)
- estimates of HIV and other sexually transmitted infection (STI) levels in most-at-risk population groups and the general population

The trends in these risk behaviors were extracted from existing studies and surveillance data and used as inputs to the model. AEM was then fitted to these observed trends in order to develop a baseline projection that accurately reflected the epidemiological and behavioral history of the epidemic in HCMC.

The Goals Model was used to estimate the resources required to implement the nine action plans in HCMC and the impact of the interventions on risk behaviors affecting the transmission of HIV. The estimated resources required to implement very early drafts of the HCMC action plans showed a large resource gap. This suggested the need for additional resource mobilization and the setting of priorities. The factors considered during the priority-setting process included the epidemic trends and size of risk groups, the effectiveness and cost of interventions, and cost effectiveness. These factors are described in more detail in Chapter 3.

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2 *Saidel, T., D. Des Jarlais, W. Peerapatanapokin, J. Dorabjee, S. Singh, and T. Brown. 2003. Potential Impact of HIV among IDUs on Heterosexual Transmission in Asian Settings: The Asian Epidemic Model. International Journal of Drug Policy (14): 63–74;*

3 *Mills, S., T. Saidel, R. Magnani, and T. Brown. 2004. Surveillance and Modeling of HIV, STI, and Risk Behaviors in Concentrated HIV Epidemics. Sexually Transmitted Infections 80(Suppl 2): ii57–62;*

4 *Brown, T., and W. Peerapatanapokin. 2004. The Asian Epidemic Model: A Process Model for Exploring HIV Policy and Program Alternatives in Asia. Sexually Transmitted Infections 80(Suppl 1): ii9–24;*

5 *Stover , J., L. Bollinger, and K. Cooper-Arnold. 2003. Goals Model for Estimating the Effects of Resource Allocation Decisions on the Achievement of Goals of the HIV/AIDS Strategic Plan. Washington, DC: Futures Group, POLICY Project;*

6 *Forsythe, S.S., and M.T. Chepkwony. 2004. Applying the Goals Model in Kenya to Allocate HIV/AIDS Resources Cost-effectively. Int Conf AIDS July 11–16; 15: abstract no. TuPeE 5477. Washington, DC: Futures Group, POLICY Project.*

The scenario modeling process was divided into two phases. AEM was used to generate a baseline projection, representing the likely future epidemic trends if the factors driving the HIV epidemic in 2005 were to remain the same. Alternate scenarios were then modeled to highlight the impact of targeting a particular risk population (e.g., IDUs) with prevention interventions. These initial scenarios were used to evaluate the impact on HIV transmission and to help shape more realistic scenarios. The period used aligned with the timeframe of the HCMC action plans (2006–2010). The Goals analyses reported in this document also focus largely on that period. Scenarios varied according to the level of coverage of prevention interventions for different populations and were assessed for the cumulative number of new infections that would be averted from 2006 to 2010 compared with the baseline epidemiological projection. The cost per infection averted was also calculated for each scenario.

Having identified recommended action plans, the Goals Model was used to assess the resources required to implement each plan for the period 2006–2010. In addition to HIV prevention interventions, resource needs were also assessed for care and support, treatment, surveillance, STI management, blood safety, capacity building, and international cooperation, as required by the nine action plans. The results of these analyses are presented in detail in Chapter 3.

Epidemic trends

The following are major highlights of the findings or trends garnered from the modeling:

HIV infections will dramatically increase. If risk behaviors remain unchanged, HIV prevalence in HCMC could steadily rise from 1.45 percent of adults in 2006 to 1.68 percent by 2010. The number of people living with HIV (PLHA) in HCMC is expected to increase from 72,400 in 2006 to 89,900 in 2010 and 105,800 in 2015. This increase is driven by a steady flow of new infections each year, which rise slowly from 9,100 in 2005 to 10,900 in 2010.

The epidemic is moving through new population groups. In HCMC through 1998, most infections occurred among IDUs. In 1998, however, the rapid rise of infections among younger IDUs started an HIV epidemic among FSWs and their clients, as many IDUs were clients of FSWs. New infections among IDUs then declined rapidly through the early 2000s because most of those sharing needles had already been infected and large numbers of IDUs were sent to the rehabilitation centers, radically reducing their injecting risk. As many street-based sex workers injected drugs, the prevalence among sex workers rose rapidly to more than 20 percent[7].

7 *HCM PAC, FHI, WEC, HPI. The HIV epidemic in Ho Chi Minh Cty: What do we know? The synthesis report of existing studies. HCMC, 2007.*

Clients of sex workers have become the largest single group of new infections. By 2005, almost 4,000 clients a year were contracting HIV. By the early 2000s, many clients infected earlier had begun to transmit HIV to their wives, so by 2005, more than 2,000 women a year were being infected by their husbands[8].

The number of children contracting HIV is increasing. The increasing number of HIV-positive women has led to an increase in mother-to-child transmission. In 2006, approximately 1,750 children in HCMC were living with HIV, and under current conditions, that number is expected to rise to 3,850 in 2010 and 7,040 in 2015. However, this number could be lower than projected due to the impact of mother-to-child transmission prevention programs among HIV-positive pregnant women who tested early.

HIV treatment needs will dramatically increase. In 2006, there will be about 4,800 new AIDS cases in HCMC. The number of new cases since 2000 has significantly increased, and this number will likely climb to 7,700 new cases in 2010. This will result in a substantial burden for HCMC regarding medical care and treatment and a worsening of the quality of life for PLHA, their families, and society in general. Based on the projected results, it is estimated that by 2010, almost 16,000 people will need antiretroviral therapy (ART).

Resource needs and resource allocation[9]

The above projections are evidence that HIV and AIDS prevalence in HCMC will continue to increase. It is hoped that this realistic picture of the epidemic in HCMC and the proposed alternative response scenarios will help to improve decisionmaking and the effectiveness of responses in the city.

Resources are limited and setting priorities is essential. The estimation of resources required to implement the early draft of the HCMC action plans showed a large resource gap for the period 2006–2010, assuming available resources remained at 2005 levels. This suggested the need for mobilizing resources from domestic and international sources and setting priorities. Some of the factors considered during the priority-setting process were the most-at-risk groups contributing the largest number of new infections, the effectiveness and cost-effectiveness of interventions, total cost, and affordability, among others.

Alternative scenarios. Various analyses and policy alternatives were considered in developing the action plans, with a particular focus on prevention interventions. Alternatives were compared using several measures: the number of infections averted, the cost per infection averted, and total cost for example. Future treatment

8 *HCM PAC, FHI, WEC, HPI. The HIV epidemic in Ho Chi Minh Cty: What do we know? The synthesis report of existing studies. HCMC, 2007.*

9 *The full list of assumptions and data inputs for the application of the Goals Model in HCMC are described in the paper Resource Implications of the Ho Chi Minh City HIV/AIDS Action Plans: Resource Needs Assessment and Gap Analysis. USAID | Health Policy Initiative, Task Order 1. Hanoi, 2006 and HCMC Provincial AIDS Committee.*

costs averted as a result of more effective prevention interventions were also calculated. Using the AEM baseline scenario for comparison, alternative scenarios were modeled, and the results helped shape more realistic scenarios. This effort revealed that a combination of interventions will make the biggest impact on the number of new infections. The projections for Scenarios A (targeting FSWs and clients), B (MSM and MSWs), C (IDUs), and D (Prevention combination) all show potential to make a large impact on the epidemic. However, Scenario D had the greatest impact, reducing the number of new infections by a third relative to the baseline projection. Scenario D was also the most cost-effective, thus labeled as the recommended scenario.

Scenario D requires a substantial increase in program coverage as well as the mobilization of additional resources. The total resource requirement for 2006 is VND73.71 billion (US$4.64 million), increasing to VND210.09 billion (US$13.21 million) in 2010. If the available resources remained at the level of 2005, only 57 percent of the resources required for 2006 will be financed; this share decreases to only 20 percent in 2010.

Under the recommended scenario, approximately half of the total resources required are needed for care, support, and treatment. Unless a strong emphasis is placed on prevention, these costs will continue to grow in the future. If the scenario is implemented and VND220.7 billion (US$13.9 million) is invested for prevention for 2006–2010, future treatment costs of VND726.1 billion (US$45.7 million) will be avoided. The recommended scenario required a prevention investment of US$4 million in 2010. If only US$3 million (VND47.7 billion) is mobilized by 2010, the number of infections averted would decrease by almost a third (31 percent). If investment for prevention increases to US$5 million in 2010, the number of infections averted would be 20,621 as compared with the baseline projection (more than 40 percent).

Policy and program implications

- The current level of resources is inadequate to reverse the epidemic. The analyses discussed here provide sound evidence of the need for increased resources and should be used to guide both the mobilization and allocation of resources to interventions that address the primary factors driving the epidemic. Based on the level of available resources in 2005, HCMC will have an annual resource gap of VND168.3 billion (US$10.6 million) by 2010, which needs to be filled by domestic sources, multilateral and bilateral donors, and private foundations. The growth in new infections can be reversed, but the reduction in new infections demonstrated by the scenario modeling in this paper will only be achieved if prevention interventions reach sufficient numbers of most-at-risk people and change their behaviors on a large scale.

- Investing in appropriately targeted prevention interventions now will result in substantial savings in the cost of ART programs in the future. It is imperative that additional resources be mobilized from government and donor sources, so that the most effective combination of prevention programs can be implemented at the earliest possible time. The scaling up of prevention programs is urgent. The speed at which scaling up occurs will determine the number of infections that will be averted. A delay of 12 months in increasing coverage will make a significant difference in the number of new HIV infections.
- A dynamic epidemic requires a dynamic and focused response that addresses all the key groups at risk. Analysis by the A^2 Project has revealed shifting patterns of HIV vulnerability and transmission in HCMC over time. Whereas injection drug use was formerly the primary source of HIV transmission, the greatest numbers of new infections are now occurring among male sex worker clients and their wives. While injection drug use will continue to be a significant source of new infections, husband-to-wife transmission and sex between men will increasingly become important drivers of the epidemic. Prevention resources must be allocated where their impact will be greatest. The scenarios modeled here provide guidance on the effectiveness and cost-effectiveness of different patterns of resource allocation. They show that focusing resources on any one of these populations (sex workers and their clients, MSM, or IDUs and their partners) can substantially reduce the number of new infections. However, for the same investment, allocating resources across all these groups, as in Scenario D, will have an even larger effect. The most effective package addresses all most-at-risk populations simultaneously.
- Reducing new infections as illustrated by the scenario modeling will only be achieved if programs reach sufficient numbers of most-at-risk people with behavior change interventions. Although no formal assessment of the coverage of prevention programs has been undertaken in HCMC, it is clear that current programs and the rate at which they are being scaled up are insufficient to prevent HIV infection rates from increasing.
- Addressing HIV among sex worker clients and their wives will require expanded access to voluntary counseling and testing (VCT). The upward trend in HIV prevalence among clients and their wives, who are not readily identified or accessed, will increase the need for VCT in public health settings, family planning clinics, community settings, and in the antenatal care system. Strategies to encourage most-at-risk men to seek VCT will also be needed.
- Efforts should be made to encourage voluntary premarital counseling and testing for HIV among most-at-risk youth in HCMC (e.g., out-of-school youth or street children).

- Mobilizing resources and achieving coverage of target populations will not guarantee success. Investing in high-quality programs that have been shown to achieve results is essential if the reduction in new infections-and other possible outcomes that this paper highlights-are to be achieved.
- Because of the stigma associated with HIV/AIDS and the behaviors that can transmit HIV, many people living with or at risk of HIV conceal their infection or the factors that place them at risk of being infected or infecting others. To gain access to vulnerable populations with HIV prevention, treatment, care, and support interventions, the interventions must be designed to create trust in the target populations and must be accessible by those populations. Experience in Vietnam and other countries has shown that trust and access are achieved when people living with or affected by HIV are involved in the design and implementation of policies and programs targeting them.
- Resources and support will be needed for the increasing number of PLHA. With the number rising to almost 90,000 by 2010 and about 16,000 people requiring access to antiretrovirals, policymakers and program planners must mobilize adequate resources to address the growing demand on medical services, social care services, and community support for those living with and affected by HIV and AIDS.
- Sound biological and behavioral surveillance and the monitoring of program coverage and quality are critical to determining whether prevention interventions are having the desired impact. While synthesizing data for HCMC, it became clear that developing a thorough understanding of and effective response to the HIV epidemic is extremely difficult. The sentinel surveillance system needs to be moved away from the 06 centers and into the community, providing less biased and more consistent data over time. Important gaps in the surveillance system, such as HIV sentinel surveillance of MSM and male clients of sex workers, must be addressed. Studies throughout Asia indicate that MSM are at high risk of HIV infection[10]. In Vietnam, this population has been ignored until recently, when several ad hoc studies began to detect substantial HIV prevalence among MSM. Like MSM, male clients of sex workers are a population currently ignored by the policy and program response to HIV/AIDS in HCMC. This has consequences not only for the male clients but also for their wives and female partners, who may contract HIV and then transmit the virus to children. Unless the surveillance system is modified to focus on the populations most heavily affected by the epidemic, interventions will not be implemented where they will have the greatest impact.

10 *Monitoring the AIDS Pandemic (MAP) Network. 2005. Male-to-Male Sex and HIV/AIDS in Asia. Bangkok: MAP Network.*

- Translating increased resources into better outcomes requires an increase in the capacity of HIV/AIDS agencies to effectively implement and coordinate programs and activities. While this paper emphasizes financial resource needs, a lack of human and institutional capacity may prove to be a barrier even if additional financial resources are mobilized. Financial resource mobilization has to take into account the pace at which implementation capacity grows. The Capacity Module of the Goals Model can be used in the next phase of analysis to assist with this issue.

List of abbreviations

AEM	Asian Epidemic Model
ART	Antiretroviral therapy
AIDS	Acquired immune deficiency syndrome
FSW	Female sex worker
HCMC	Ho Chi Minh City
HIV	Human immunodeficiency virus
IDU	Injection drug user
ISW	Injecting sex worker
KSW	Karaoke-based sex worker
MARP	Most-at-risk population
MSM	Men who have sex with men
MSW	Male sex worker
NIHE	National Institute of Hygiene and Epidemiology
OI	Opportunistic infection
PAC	Provincial AIDS Committee
PMTCT	Prevention of mother-to-child transmission
SSW	Street-based sex worker
STI	Sexually transmitted infection
USAID	United States Agency for International Development
VAAC	Vietnam Administration of AIDS Control
VCT	Voluntary counseling and testing

chapter 1

Modeling The HIV Epidemic in Ho Chi Minh City: Dynamic Behaviors, a Dynamic Epidemic

This section summarizes a larger and more comprehensive review of size estimates, behavioral and biological data, and trends in HCMC, which presents the detailed data used for this work and the sources. The full report, The HIV Epidemic in Ho Chi Minh City: What Do We Know?, is available from Family Health International (FHI), the Ho Chi Minh City Provincial AIDS Committee (HCMC PAC), or the USAID Health Policy Initiative, Task Order 1, Vietnam.

1. Evolving risk behavior levels over time

Risk behaviors are not static but change over time-in part in response to expanded prevention efforts but also in response to expanding opportunities for risk associated with economic growth. The following summarizes trends in risk behaviors that have been deduced from existing data[11].

Injection drug users. The situation with injection drug users (IDUs) in HCMC has been extremely dynamic. With a large percentage of IDUs now in 06 rehabilitation centers, the injecting high-risk behavior among IDUs has decreased in the last several years. HIV prevention interventions have also had an impact. However, significant levels of risk behavior persist in the community. Existing evidence indicates that the percentage of IDUs sharing needles has dropped from 60 percent to 30 percent between the early 1990s and 2004; yet, on average, IDUs continue to inject 2.5 times per day.

Female sex workers and their clients. For sex workers and clients, condom use is by far the most effective prevention measure. Data from condom sales, qualitative research, and surveys of sex workers and clients strongly suggest that condom use has significantly increased in recent years. However, it is likely that reported levels

11 *These trends for HCMC have been documented thoroughly in a report Ho Chi Minh City – Integrated Analysis and Advocacy Inputs Document, which can be obtained from Family Health International/Vietnam.*

of 80 percent to 90 percent condom use in surveys are overestimates, especially given the limited coverage of sex worker and client interventions in HCMC. The most likely explanation for the over-reporting of condom use is a social desirability bias on responses received to questions about condom use. More limited exposure to interventions among karaoke-based sex workers (KSWs) has produced smaller increases in condom use than among street-based sex workers (SSWs). After an exhaustive review of all existing data, the percentage of consistent condom use was estimated at 70 percent among SSWs and 60 percent among KSWs for 2006. Sex workers in HCMC continue to be at high risk of contracting HIV, given the 1.6 clients per night for SSWs and 1.0 client per night for KSWs.

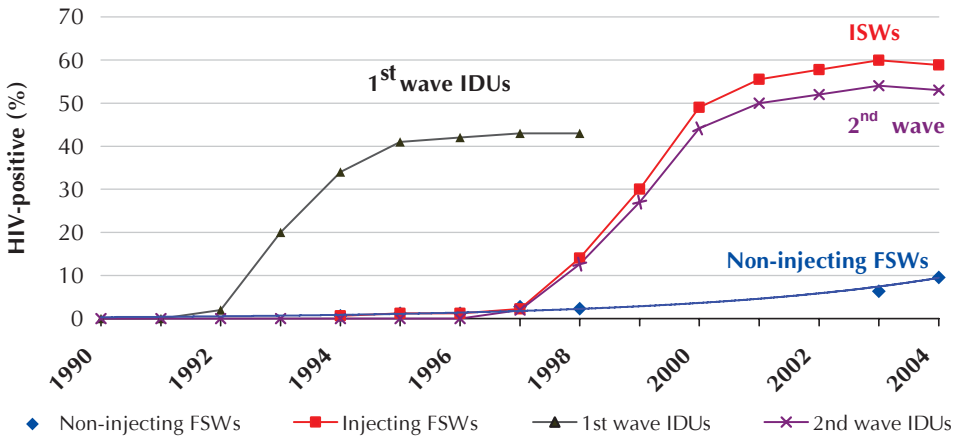
Injecting female sex workers. Unlike many other places in Asia, in HCMC, many FSWs use injection drugs, exposing them to HIV through both sexual and injecting routes. Existing evidence indicates that 25 percent of SSWs and 1 percent of KSWs injected drugs in 2004, with a frequency of 2.5 times per day, comparable with that among male IDUs. However, needle-sharing among injecting sex workers (ISWs), at 80 percent for street-based and karaoke-based ISWs, is higher than among male IDUs.

Men who have sex with men. Having anal sex places people at high risk of transmitting HIV. In Vietnam, data for men who have sex with men (MSM) are limited, as this group is not currently monitored through the surveillance system. However, several studies have indicated that anal sex is common among MSM, with about half of the population practicing the behavior. Condom use during anal sex has increased in response to information dissemination in the community and was at almost 70 percent in 2006.

2. HIV prevalence among sub-populations

HIV prevalence trends in HCMC must be interpreted with caution. The number of IDUs in the 06 centers has risen rapidly, resulting in a higher proportion of IDUs in the community being confined to rehabilitation centers. Similarly, data for female sex workers (FSWs) was obtained in rehabilitation camps, with changes occurring in the camps over time. In recent years, ISWs have been moved to camps outside the surveillance system—once again producing an apparent decline in prevalence. However, Figure 1 reveals the prevalence trends for these populations when careful adjustments are made for these changes in the populations sampled.

Figure 1. Adjusted HIV prevalence among IDU and FSW sub-populations to year 2004



Among IDUs there is evidence of two separate "waves": (1) an epidemic in the early 1990s among older drug users that stabilized at about 43 percent and (2) a later epidemic starting in 1996-97 among very young drug users that plateaued at about 54 percent. Among sex workers, prevalence among non-injecting sex workers rose slowly to about 11 percent in 2006, while prevalence among ISWs grew more rapidly to about 60 percent. HIV prevalence among MSM was high, at 8 percent in 2004. Existing evidence indicates that once appropriate adjustments are made, prevalence continues to climb among non-injecting sex workers and MSM, while remaining stable at high levels among IDUs and ISWs. Closer analysis of this data will continue, supplemented by additional studies, to paint a picture of the HCMC HIV epidemic in coming years.

3. Size of key populations affected by the epidemic

Estimating the sizes of the population groups most-at-risk for HIV is critical for understanding the pathways through which HIV spreads and the potential extent of the epidemic. Size estimates are also essential for determining the capacity and resources needed to implement comprehensive interventions for these populations. Population projections from the General Statistics Office (GSO, 1999) using the constant fertility value have been used to estimate the population at large (e.g., total number of males and females in the city).

Most-at-risk populations. Certain populations (e.g., FSWs and their clients, MSM, and IDUs) have an elevated risk of contracting HIV. Estimating the size of these sub-populations is challenging because they often hide their behaviors and avoid contact with law enforcement and other government officials. However, following an analysis of available data, consensus has been reached on the probable sizes of these groups. As better information becomes available, these numbers may be adjusted in the future.

Injection drug users. The number of IDUs in HCMC is estimated at about 30,000. At present, almost three-quarters of these IDUs are in 06 rehabilitation centers.

Female sex workers. The two key groups of female sex workers in HCMC are SSWs and KSWs. In HCMC, there are an estimated 12,000 and 8,000 SSWs and KSWs, respectively. These groups were included in this model because SSWs have a somewhat higher risk for HIV than KSWs—both through injecting drugs and selling sexual services more often.

Clients of sex workers. The size of this population group is very important, as these men serve as a "bridge" between their wives and girlfriends and the sex workers. Large-scale surveys in male populations typically under-estimate the percentage of men visiting a sex worker in the last year, as many men do not want to admit this behavior. Based on existing evidence, the number of men in HCMC who are currently clients (who have purchased sex within the last 12 months) of sex workers is estimated to be 220,000, approximately 12 percent of the adult male population in HCMC. The percentage of men who have ever visited a sex worker in their lives would be much higher.

Men who have sex with men. Social attitudes have kept MSM largely invisible in Vietnam, and it is only recently that an HIV prevalence of 6–8 percent has been detected in this group. Conservative bias in the population leads to substantial under-reporting of this behavior in surveys. Based on international and regional evidence and sexual behavior surveys in Vietnam, the number of MSM in HCMC is estimated at 36,000, representing approximately 2 percent of the adult male population in HCMC. This number represents MSM who regularly have sex with other men, not those who have ever had sex with other men, which would be a far larger number.

chapter 2

Likely Course of the HIV Epidemic in HCMC in Coming Years

Using the above description of populations and risk behaviors in HCMC over the last 15 years, a model was constructed using the AEM software to reproduce the adjusted HIV trends. All the parameters used in AEM are described in the report, "The HIV Epidemic in Ho Chi Minh City-AEM Inputs Document," which is available from Family Health International and the Ho Chi Minh City Provincial AIDS Committee.

Because AEM allows the analysis of only one IDU epidemic, the first epidemic among IDUs was modeled using the Epi-model software to produce the number of new infections, current infections, and deaths associated with this earlier epidemic. These were then added to the values from the AEM to produce the overall estimates. For projecting into the future, all behaviors were fixed at their 2006 levels, which would be expected if programs are not strengthened. This section describes the future course of the epidemic if risk behaviors were to remain the same.

HIV prevalence in HCMC can be expected to steadily rise from 1.45 percent of adults in 2006 to 1.68 percent by 2010 (see Appendix 2). Figure 2 illustrates the expected trends for the entire general population, adult males, and adult females. With several major sources of HIV risk including sex work, injection drug use, and male-to-male sex, HIV prevalence in adult males will be significantly higher than that among females by 2010 (2.53 percent compared to 0.92 percent). The primary source of risk for most women is sex with their husbands. The incident rate in 2006 is 194 new HIV infections per 100,000 population. Although these rates may appear low, given the large population in HCMC, they translate into a large number of individuals living with HIV and ultimately requiring care and treatment.

Figure 2. Overall HIV prevalence in Ho Chi Minh City from 1984 to 2020 (percent of adults 15 years old and older living with HIV)

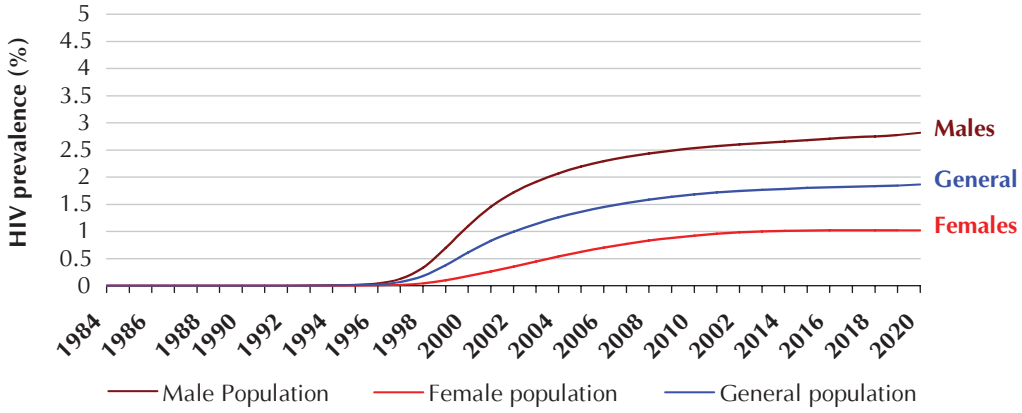
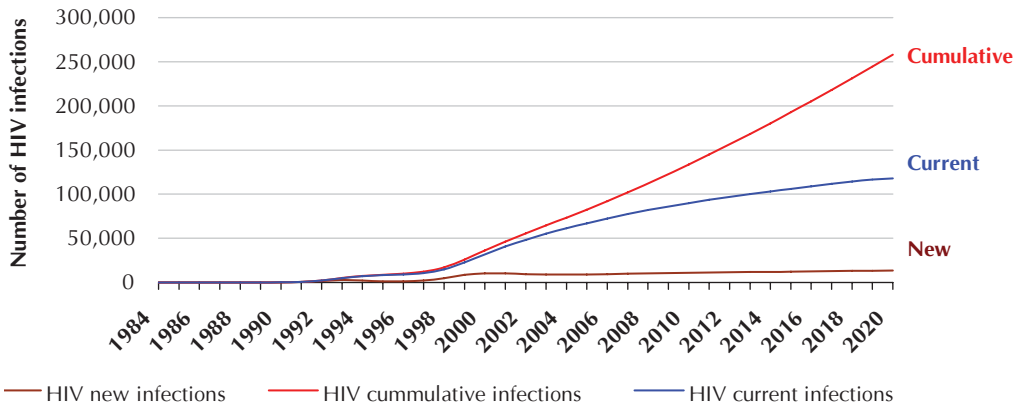


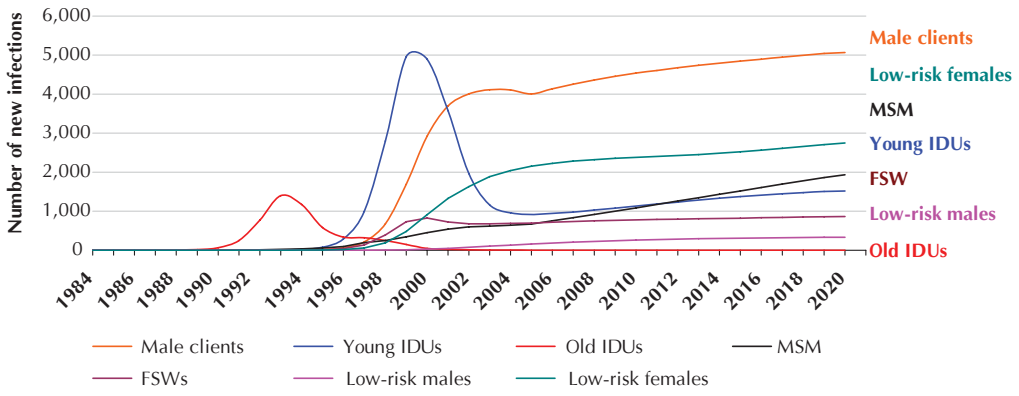
Figure 3 shows the **steady growth in the number of people living with HIV in HCMC from 72,400 in 2006 to 89,900 in 2010 and 105,800 in 2015**. This increase is driven by a steady flow of new infections each year, which rise slowly from 8,100 in 2006 to 9,300 in 2010 (see Appendix 3).

Figure 3. Absolute number of HIV infections in Ho Chi Minh City



Prevention programs would be most effective if they focused on the populations with the largest number of new infections and those that fuel those infections. Figure 4 shows how the number of new infections in different sub-populations has changed over time. In the early stages of the HCMC HIV epidemic through 1998, most infections occurred among IDUs. In 1998, however, an epidemic among FSWs and their clients was started due to the rapid rise of infections among younger IDUs, many of whom were clients of FSWs. New infections among IDUs then declined rapidly through the early 2000s because most of those sharing needles had already been infected and large numbers of IDUs were sent to the rehabilitation centers, radically reducing their risk.

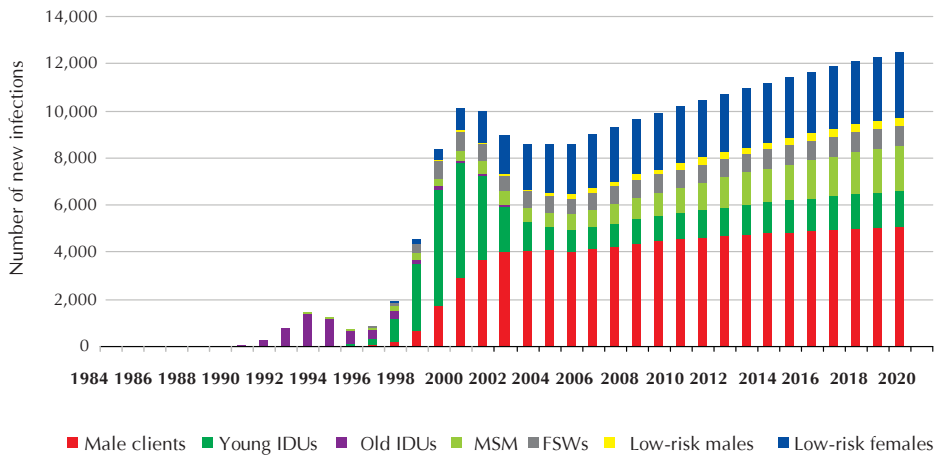
Figure 4. Trends in new infection by sub-population



Because many SSWs injected drugs, the prevalence among sex workers rose rapidly to 24 percent in 2000. With almost 220,000 clients in HCMC, the number of clients newly infected with HIV rose rapidly. By 2005, almost 4,000 clients a year were contracting HIV. Although condom use increased in the early 2000s, slowing the increase of new infections, it did not rise high enough; and the number of client infections continues to climb slowly today. By the early 2000s, many clients infected earlier had begun to transmit HIV to their wives; thus, by 2005, more than 2,000 women a year were being infected by their husbands. Again, this number will continue to rise steadily unless stronger programs addressing the high-risk behavior of clients of sex workers and husband-to-wife transmission are put into place.

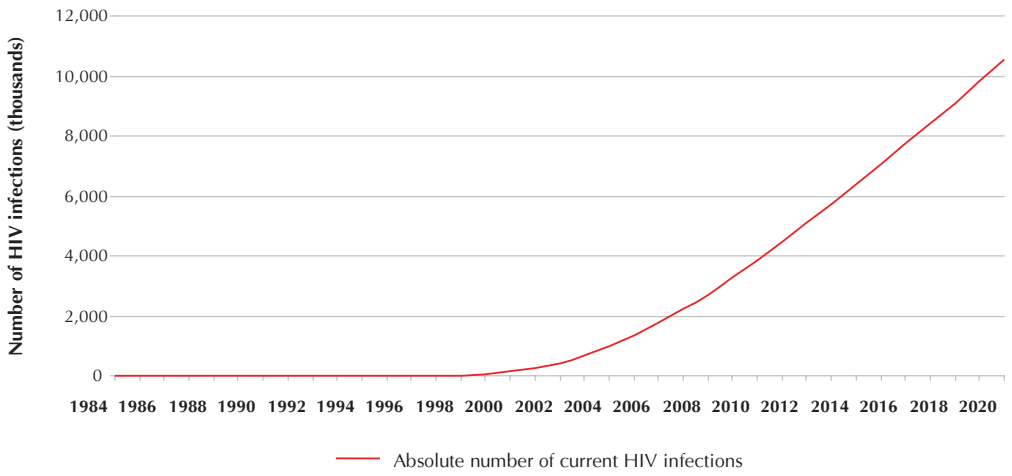
By the mid-2000s, the HCMC epidemic transitioned from one in which new infections were driven by injection drug use to one driven by clients of sex workers and husband-to-wife transmission. Some people find this surprising, as prevalence is much higher among sex workers, IDUs, and MSM. However, even though their relative HIV prevalence level is much lower than that of these other groups, sex worker clients and their wives contribute to a large portion of new HIV infections because they are much larger groups of people than FSWs, IDUs, and MSM (see Figure 5).

Figure 5. Absolute number of new HIV infections by sub-population



The number of HIV-positive children will rise steadily through the next decade unless expanded programs for prevention of mother-to-child transmission are established. The increasing number of HIV-positive women led to increasing mother-to-child transmission starting in 2000. **In 2006, approximately 1,750 children in HCMC were living with HIV, and under current conditions, that number is expected to rise to 3,850 in 2010 and 7,040 in 2015** (see Figure 6).

Figure 6. Absolute number of new HIV infections among children in Ho Chi Minh City



HIV takes time to cause symptomatic illness, that is AIDS, but the epidemic has existed long enough that the number of new AIDS cases will quickly increase in the coming years. In 2006, there were about 4,800 new AIDS cases in HCMC. Figure 7 shows a significant increase of new cases since 2000, which will rise to an estimated 7,700 new cases in 2010. This situation will create a substantial burden for HCMC regarding medical care and treatment and a worsening of the quality of life for people living with HIV, their families, and society in general.

Figure 7. AEM projected number of new AIDS cases in Ho Chi Minh City

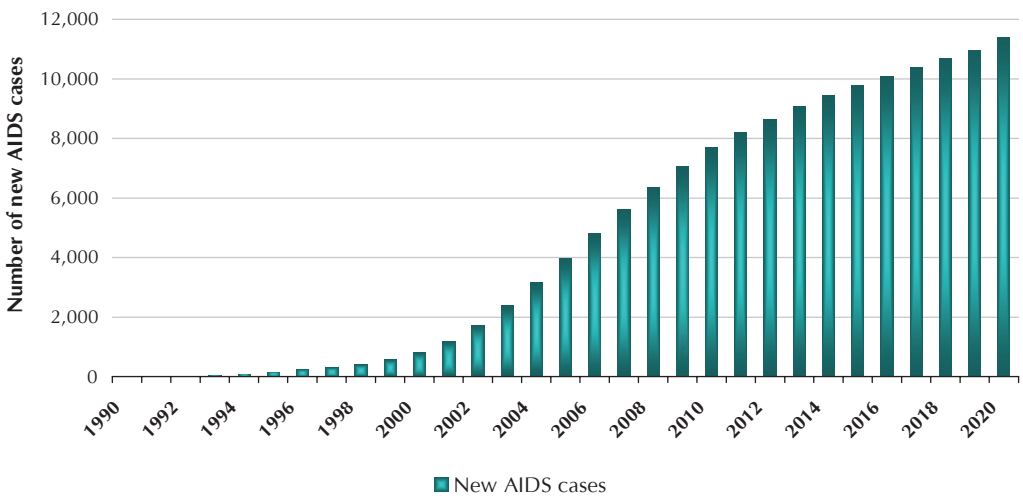
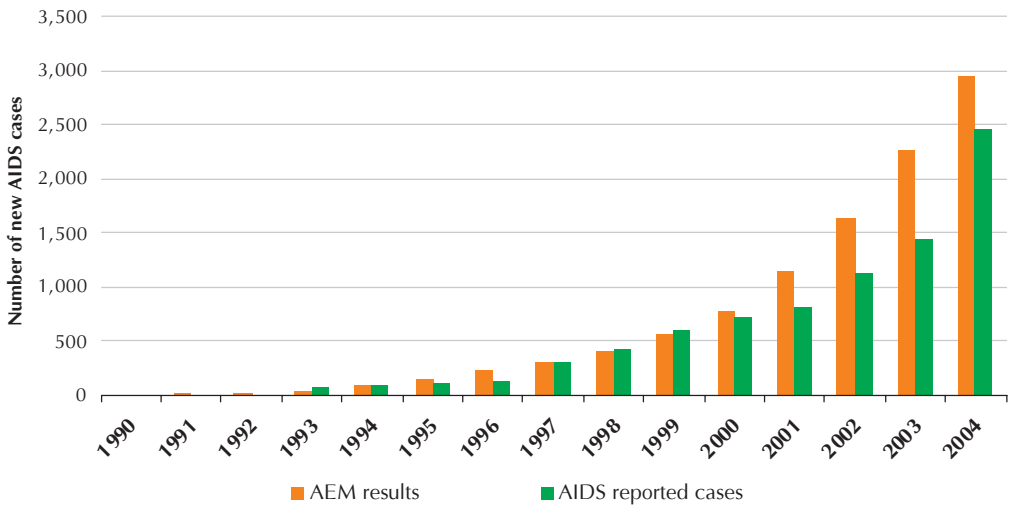


Figure 8 compares reported AIDS cases in HCMC with the results from the projections for 1994–2004. The model produces a trend that agrees with the growth in reported AIDS cases over time but is higher than the number actually reported in most years. This under-reporting of AIDS is common as a result of misdiagnosis; failure to report; and reluctance to access treatment, especially in the early stages of the epidemic.

Figure 8. Comparison of reported AIDS cases and the AEM projected number of new AIDS cases in Ho Chi Minh City from 1990 to 2004



chapter 3

Modeling Alternate Resource Allocation Scenarios

BOX 1. STEPS IN THE SCENARIO MODELING PROCESS

The steps used in the analysis were as follows:

- Develop a baseline epidemiology projection based on the available behavioral, epidemiological, and other surveillance data using AEM.
- Collect data on the cost of interventions and 2005 level of coverage of the interventions impacting HIV risk behaviors.
- Customize the Resource Needs Module of the Goals Model to reflect the components of the nine action plans.
- Use the Goals Model Impact Module to estimate the impact of risk behaviors on HIV transmission under various coverage scenarios.
- Link the Goals Model with the AEM to estimate the impact on the number of new HIV infections under each coverage scenario.
- Use the Resource Needs Module to estimate the costs of implementing the interventions under each coverage scenario.
- Link the costs of the interventions per risk group with the number of infections averted to evaluate the merit of each pattern of resource allocation or scenario.
- Compare the total resources required with the available expenditures for prevention based on the most recent available data to assess the remaining resource gap.

Various analyses and policy alternatives were considered in finalizing the HCMC action plans. The methodology and the analytical approach used in the scenario modeling are described briefly in Box 1. The Goals Model is described in much greater detail in an accompanying technical paper. This paper also includes the data inputs, sources, and assumptions used in implementing the Goals Model.

This chapter presents considerations informing the results of the scenario modeling for prevention interventions, the recommended scenario, the resource requirements for each of the recommended nine action plans, and arguments regarding cost-effectiveness and the importance of making a firm commitment to prevention.

An estimation of the resources required to implement early drafts of the HCMC action plans showed a large resource gap. This suggested the need for mobilizing resources from domestic and international sources of funding and setting priorities. The considerations taken into account during the priority-setting process were epidemic trends and size of risk groups, the cost and effectiveness of interventions, and cost effectiveness.

Epidemic trends and size of risk groups. The baseline epidemic projection gives the number of new infections by risk group if the current levels of risk behavior were to remain the same. The source of the largest number of new infections (e.g., clients of sex workers, FSWs, and IDUs) is the most important factor guiding the allocation of prevention resources.

Effectiveness of interventions. Information on the anticipated effectiveness of interventions is captured in the Goals Model Impact Matrix, which is based on a large body of epidemiology impact literature (both published and good-quality grey literature).

Cost-effectiveness, cost, and affordability. Effectiveness is not the only consideration because two interventions may have a similar impact on a risk behavior but have vastly different costs. Furthermore, an intervention may be cost-effective but still costly overall and hence unaffordable. For these reasons, cost and cost-effectiveness are further considerations taken into account during priority setting.

1. Modeling alternate prevention scenarios

The scenario modeling process can be divided into two phases. Through epidemiology modeling, a baseline projection was generated. This baseline projection represents the likely future epidemic trends if the factors affecting sexual, intravenous, and vertical transmission of HIV in 2005 were to remain the same. Alternate scenarios were then modeled to highlight the impact of targeting a particular risk group (e.g., sex worker and clients, IDUs, or MSM). These initial scenarios are unrealistic, as no HIV/AIDS program focuses only on one single risk group. Also, the targets are set at high levels (e.g., reaching between 75 percent and 90 percent of the risk group of interest) by 2010, which in many instances are unrealistic because of capacity constraints. However, these are used for illustrative and analytical purposes only in order to evaluate the impact of the extreme scenarios on HIV transmission. The findings of this part of the analysis helped shape the more realistic scenarios considered subsequently. The initial scenarios considered included the following:

Scenario A: Clients of sex workers and female sex workers

Scenario B: MSM, including male sex workers

Scenario C: IDUs

Scenario D: Prevention combination

According to the baseline projection, there will be 10,931 new HIV infections among adults and children in 2010, increasing to 13,521 in 2020. Between 2006 and 2010, the cumulative number of new HIV infections will be 51,216. Adult HIV prevalence is projected to increase from 1.45 percent in 2006 to 1.68 percent in 2010 and to 1.86 percent in 2020. The share of the cumulative number of new infections (2006–2010) among the various risk groups is as follows:

- Female sex workers: 7 percent
- Male clients of female sex workers: 42 percent
- MSM (including male sex workers): 10 percent
- IDUs: 10 percent
- Low-risk males: 2 percent
- Low-risk females: 23 percent
- Children: 5 percent

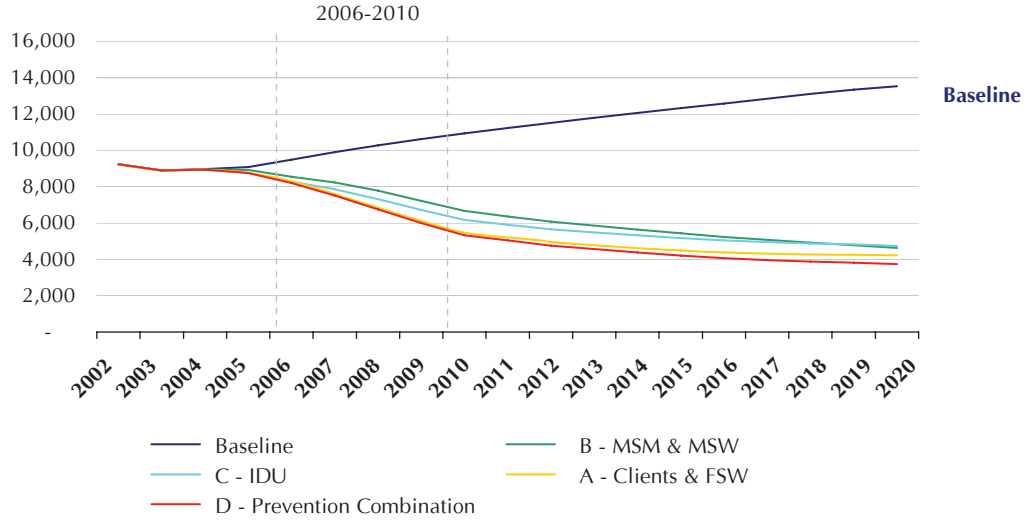
Table 1 summarizes the coverage of interventions targeting the various risk groups under each scenario. Note that this is not a complete list of all the interventions included in the action plans.

Table 1. Summary of the coverage of interventions targeting the risk groups for Scenarios A–D

Scenarios	Scenario A	Scenario B	Scenario C	Scenario D
	Clients and SWs (%)	MSMs & SWs (%)	IDUs (%)	Recommended Scenario (%)
Migrant workers	60	30	30	50
Workplace	60	30	30	50
High school students	30	30	30	30
Out-of-school youth	50	30	30	40
Women in community	30	30	30	30
Direct FSWs	70	60	60	65
Indirect FSWs	70	60	60	65
IDU counseling & testing	30	30	80	60
Needle and syringe program	10	10	30	20
Methadone program	12.8	15.8	16.8	13.4
Naltrexone program	5	5	5	5
Peer outreach for MSM	30	80	30	50
Peer outreach for MSW	30	80	30	50
Prevention costs in 2010	$4,008,976	$4,003,596	$4,005,579	$4,006,138
	VND63.74 billion	VND63.66 billion	VND63.69 billion	VND63.70 billion

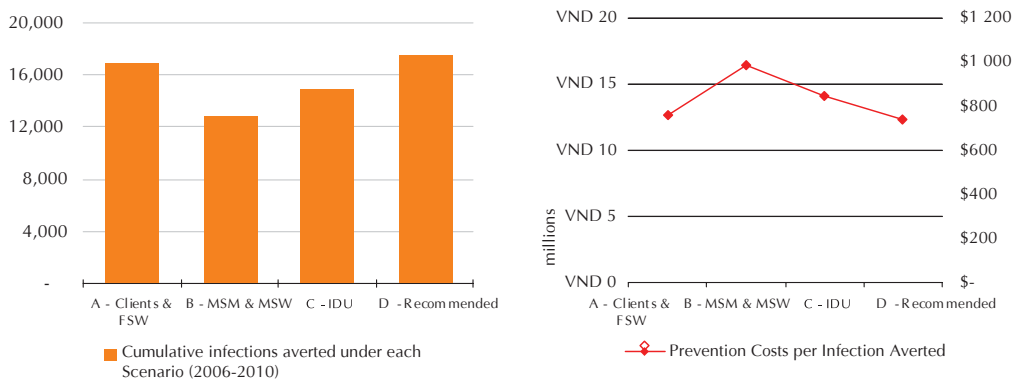
The projections for Scenarios A, B, C, and D show the potential to make a large impact on the epidemic (see Figure 9). Scenario A (emphasizing interventions targeting FSWs and their clients) results in a large decrease in the number of new infections. For the period 2006-2010, the number of new infections is estimated at 34,299, which is far below the number of new infections under the baseline projection (51,216). The number of infections that will be averted is 16,917 or 33 percent relative to the baseline projection. Note that scenarios B and C (emphasizing interventions targeting MSM and IDUs, respectively) have similar impacts; Scenario B averting 29 percent and Scenario C averting 30 percent of the number new infections relative to the baseline projection. Figure 9 shows the results from Scenario D, a combination of prevention interventions informed by the results from the initial scenarios. Under this scenario, the cumulative number of new HIV infections for 2006-2010 would be 33,780 bigger-far below all the other projections (see Appendix 4.). If Scenario D were to be implemented, 17,436 (34 percent) new infections would likely be averted relative to the baseline projection.

Figure 9. New infections for various scenarios relative to the baseline projection (2002–2010)



Cost-effectiveness analysis allows for the comparison of various prevention scenarios using the same metric, namely prevention cost per infection averted. The cumulative infections averted and cost per infection averted for scenarios A through D are shown in Figure 10. Scenarios A and D had the highest number of infections averted—a reduction of 33–34 percent in the number of new infections compared with the baseline projection. These two scenarios are also the most cost-effective. In Scenario D, the cost per infection averted is VND12.7 million (US$796).

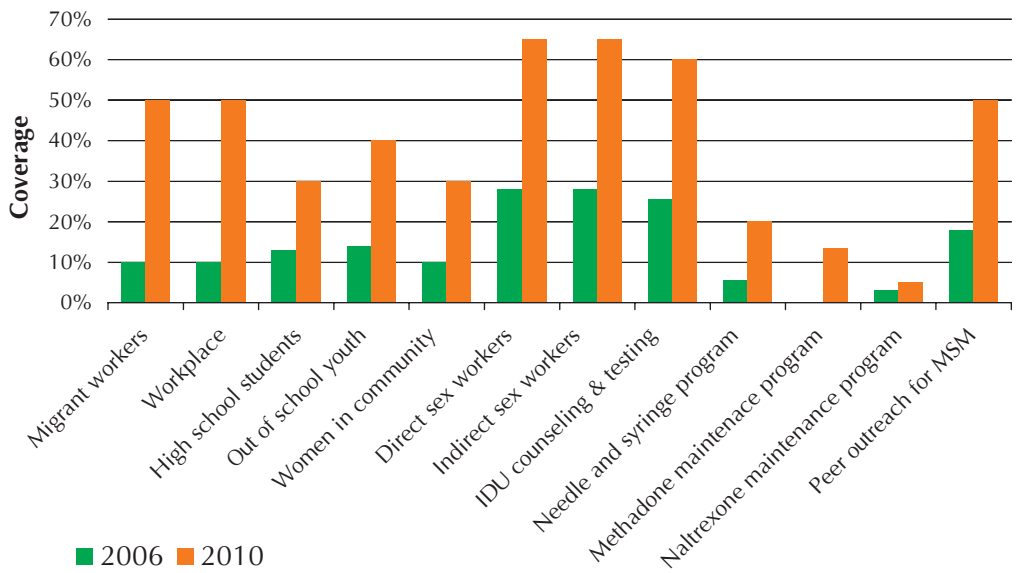
Figure 10. Cumulative infections averted and cost per infection averted (2006–2010)



2. Resources required for the recommended action plans

The proposed increase in program coverage needed to implement the recommended action plans is shown in Figure 11. Implementation of these plans could increase coverage fourfold between 2006 and 2010 (see migrant workers and workplace interventions). The extent to which HCMC can successfully scale up these interventions will depend on what extent the capacity for implementation increases.

Figure 11. Increases in program coverage for the recommended scenario (2006–2010)



Prevention

Appendix 1 presents the elements that constitute the various actions plans, as well as the financial resource requirements for each action plan. The prevention interventions fall under the following:

- Action Plan 1: Behavior Change Communication
- Action Plan 2: Peer Education, Outreach, and Voluntary Counseling and Testing
- Action Plan 6: Prevention of Mother-to-Child Transmission
- Action Plan 7: Sexually Transmitted Infections
- Action Plan 8: Blood Safety

The estimated resource requirement for prevention interventions was projected to increase from VND27.9 billion (US$1.8 million) in 2006 to VND63.8 billion (US$4.0 million) in 2010 (see Appendix 5). Action plans 1 and 2 account for 25 and 59 percent, respectively, of the cumulative requirement for 2006–2010. Some arguments in support of maintaining a high commitment to prevention are outlined in Section 3, "Importance of a firm commitment to prevention."

Care, support, and treatment

With more than 70,000 people living with HIV, significant resources are also required for care, support, and treatment interventions (included in action plans 3 and 5). It is estimated that by 2010, 80 percent of people needing palliative care will have access and 80 percent of people needing treatment for opportunistic infections (OIs), prophylaxis for OIs, and ART will have access. The resources required for care, support, and treatment are projected to increase from VND38.9 billion (US$2.45 million) in 2006 to VND133.9 billion (US$8.42 million) in 2010. Antiretrovirals account for the largest share of these costs. These estimates assume no cost sharing with the patient. If the costs of ART (antiretrovirals and laboratory tests for ART) were to be shared, then the resource gap could be reduced. Note that there is already a considerable amount of cost sharing by patients, but it is not sufficient. It is important to ensure that the patients who receive government or donor subsidies for ART are those who are in greatest financial need.

Other interventions

In addition to prevention, care, and treatment, other critical interventions are included in the analysis (e.g., surveillance, evaluation, capacity building, policy coordination, and international cooperation), which are covered in action plans 4 and 9. The full report on the Goals Model application provides more detail on these interventions. The total resource requirement to implement action plans 4 and 9 is VND6.9 billion ($0.43 million) in 2006, increasing to VND12.4 billion ($0.78 million) in 2010.

Figure 12 indicates the share of resources needed for each of the nine action plans for 2006–2010. Action Plan 5: Treatment (57.4 percent) and Action Plan 2: Targeted Interventions (17.6 percent) account for the largest shares of the total

resources required. Figure 13 and Appendix 6 show the total resources needed to support the nine action plans.

Figure 12. Share of resources needed for action plans 1–9 for 2006–2010

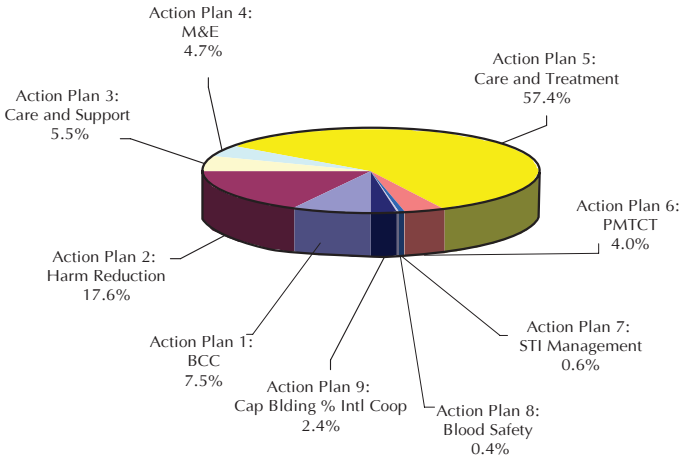
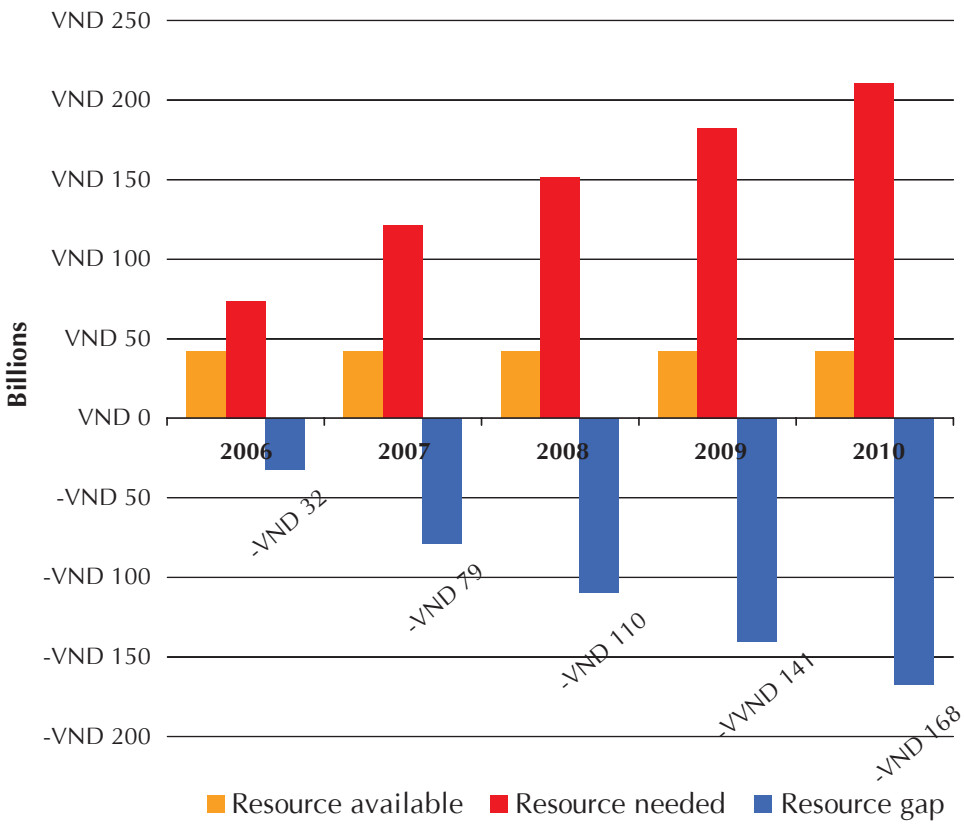


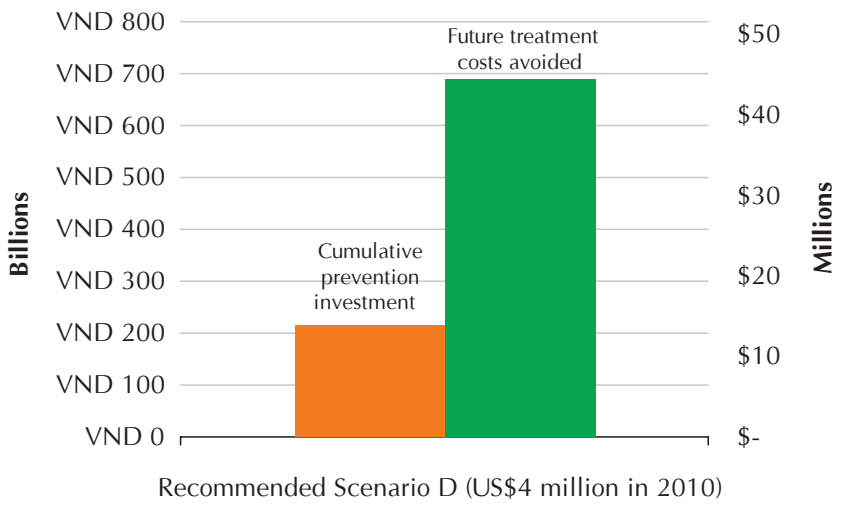
Figure 13. Resource gap analysis (2006–2010)



3. Importance of a firm commitment to prevention

Under the recommended scenario, approximately half of the total resources required are needed for care, support, and treatment. Unless a strong emphasis is placed on prevention, these costs will continue to grow in the future. If the recommended scenario is implemented and the prevention investment of VND220.7 billion (US$13.9 million) is made for the period 2006–2010, future treatment costs of VND726.1 billion (US$45.7 million) could be avoided (see Figure 14). The results of the analysis suggest that a firm commitment to prevention is needed now in order to reduce future ART requirements.

Figure 14. Future treatment costs that could be avoided if the recommended scenario is implemented for the period 2006–2010



Under the recommended scenario, prevention expenditures are expected to increase to VND63.6 billion (US$4 million) in 2010. However, what if only VND47.7 billion (US$3 million) is mobilized? Figure 15 shows that almost 31 percent fewer infections would be averted, resulting in a higher cost per infection averted (VND15.4 million; US$968). This is despite the lower total prevention cost (VND47.7 billion; US$3 million) relative to Scenario D, with the lower cost per infection averted (center circle below). Because fewer infections would be averted as a result of lower prevention expenditures, the future treatment costs avoided would be substantially less at VND498.5 billion (US$31.3 million), compared with VND726.1 billion (US$45.7 million) (see Figure 16). Table 2 summarizes the costs and impacts of different levels of prevention investment.

Figure 15. Cumulative infections averted at different levels of prevention investment (US$3, US$4, and US$5 million in 2010)

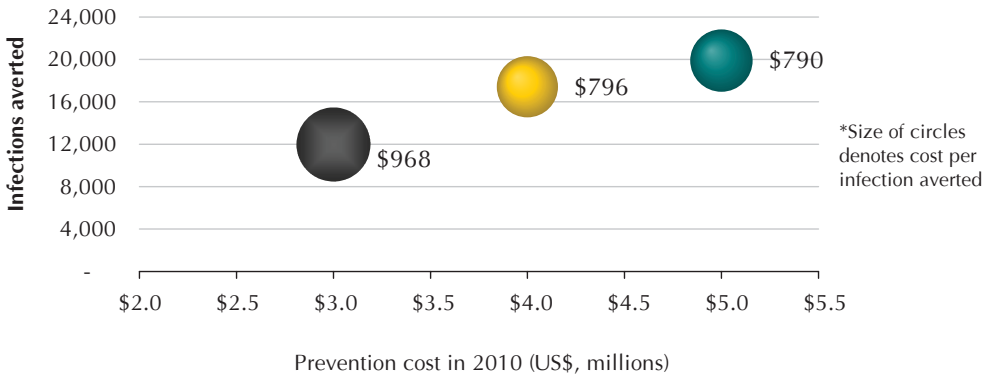


Figure 16. Future treatment costs avoided for different levels of prevention investment (US$3, US$4, and US$5 million in 2010)

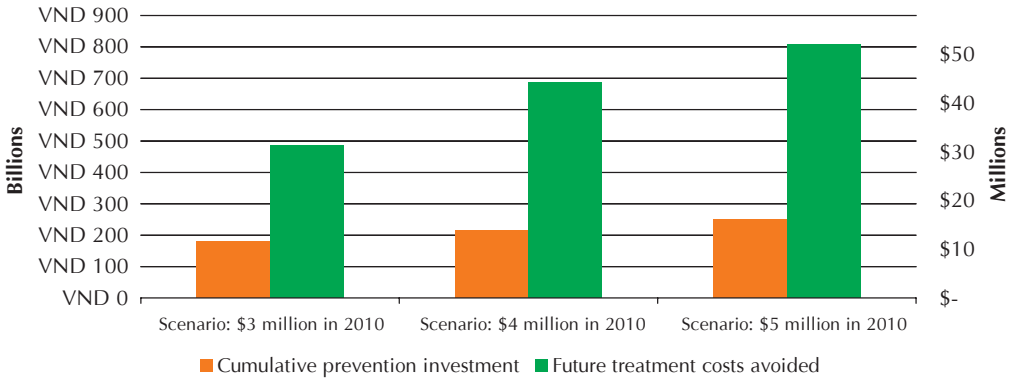


Table 2. Summary of costs and impacts of different levels of prevention investment

	Scenario: US$3 million	Scenario: US$4 million	Scenario: US$5 million
Cumulative prevention cost (2006–2010)	$11.6 million	$13.9 million	$16.3 million
	VND184.2 billion	VND220.7 billion	VND258.9 billion
Cumulative new infections (2006–2010)	39,246	33,780	30,595
Infections averted compared to Baseline projection	11,970	17,436	20,621
Cost per infection averted	$968	$796	$790
	VND15.4 million	VND12.7 million	VND12.6 million
Future treatment cost avoided 2011–2020	$31.3 million	$45.7 million	$ 54.0 million
	VND498.5 billion	VND726.1 billion	VND858.7 billion

chapter 4

Conclusions

- The current level of resources is inadequate to reverse the epidemic. The analyses discussed here provide sound evidence of the need for increased resources, and the findings should be used to guide both the mobilization and allocation of resources to interventions that address the primary factors driving the epidemic. Based on the level of available resources in 2005, HCMC will have an annual resource gap of VND168.3 billion (US$10.6 million) by 2010, which needs to be filled by domestic sources, multilateral and bilateral donors, and private foundations. The growth in new infections can be reversed, but the reduction in new infections demonstrated by the scenario modeling in this paper will only be achieved if prevention interventions reach sufficient numbers of most-at-risk people and change their behaviors on a large scale.
- Investing in appropriately targeted prevention interventions now will result in substantial savings in the cost of ART programs in the future. It is imperative that additional resources be mobilized from government and donor sources, so that the most effective combination of prevention programs can be implemented at the earliest possible time. The scaling up of prevention programs is urgent. The speed at which scaling up occurs will determine the number of infections that will be averted. A delay of 12 months in increasing coverage will make a significant difference in the number of new HIV infections.
- A dynamic epidemic requires a dynamic and focused response that addresses all the key groups at risk. Analysis by the A^2 Project has revealed shifting patterns of HIV vulnerability and transmission in HCMC over time. Whereas injection drug use was formerly the primary source of HIV transmission, the greatest numbers of new infections are now occurring among male sex worker clients and their wives. While injecting drug use will continue to be a significant source of new infections, husband-to-wife transmission and sex between men will increasingly become important drivers of the epidemic. Prevention resources must be allocated where their impact will be greatest. The scenarios modeled here provide guidance on the effectiveness and cost-effectiveness of different patterns of resource allocation. They show that focusing resources on any one of these populations (sex workers and

their clients, MSM, or IDUs and their partners) can substantially reduce the number of new infections. However, for the same investment, allocating resources across all these groups, as in Scenario D, will have an even larger effect. The most effective package addresses all most-at-risk populations simultaneously.

- Reducing new infections as illustrated by the scenario modeling will only be achieved if programs reach sufficient numbers of most-at-risk people with behavior change interventions. Although no formal assessment of the coverage of prevention programs has been undertaken in HCMC, it is clear that current programs and the rate at which they are being scaled up are insufficient to prevent HIV infection rates from increasing.
- Addressing HIV among sex worker clients and their wives will require expanded access to VCT. The upward trend in HIV prevalence among clients and their wives, who are not readily identified or accessed, will increase the need for VCT in public health settings, family planning clinics, community settings, and in the antenatal care system. Strategies to encourage most-at-risk men to seek VCT will also be needed.
- Efforts should be made to encourage voluntary premarital counseling and testing for HIV among most-at-risk youth in HCMC (e.g., out-of-school youth or street children).
- Mobilizing resources and achieving coverage of target populations will not guarantee success. Investing in high-quality programs that have been shown to achieve results is essential if the reduction in new infections—and other possible outcomes that this paper highlights—are to be achieved.
- Because of the stigma associated with HIV/AIDS and the behaviors that can transmit HIV, many people living with or at risk of HIV conceal their infection or the factors that place them at risk of being infected or infecting others. To gain access to vulnerable populations with HIV prevention, treatment, care, and support interventions, the interventions must be designed to create trust in the target populations and must be accessible by those populations. Experience in Vietnam and other countries has shown that trust and access are achieved when people living with or affected by HIV are involved in the design and implementation of policies and programs targeting them.
- Resources and support will be needed for the increasing number of PLHA. With the number rising to almost 90,000 by 2010 and about 16,000 people requiring access to antiretrovirals, policymakers and program planners must mobilize adequate resources to address the growing demand on medical services, social care services, and community support for those living with and affected by HIV and AIDS.
- Sound biological and behavioral surveillance and the monitoring of program coverage and quality are critical to determining whether prevention interventions are having the desired impact. While synthesizing data for HCMC, it became clear that developing a thorough understanding of and effective response to the HIV epidemic is extremely difficult. The sentinel

surveillance system needs to be moved away from the 06 centers and into the community, providing less biased and more consistent data over time. Important gaps in the surveillance system, such as HIV sentinel surveillance of MSM and male clients of sex workers, must be addressed. Studies throughout Asia indicate that MSM are at high risk of HIV infection[12]. In Vietnam, this population has been ignored until recently, when several ad hoc studies began to detect substantial HIV prevalence among MSM. Like MSM, male clients of sex workers are a population currently ignored by the policy and program response to HIV/AIDS in HCMC. This has consequences not only for the male clients but also for their wives and female partners, who could contract HIV and then transmit the virus to their children. Unless the surveillance system is modified to focus on the populations most heavily affected by the epidemic, interventions will not be implemented where they will have the greatest impact.

- Translating increased resources into better outcomes requires an increase in the capacity of HIV/AIDS agencies to effectively implement and coordinate programs and activities. While this paper emphasizes financial resource needs, a lack of human and institutional capacity may prove to be a barrier even if additional financial resources are mobilized. Financial resource mobilization has to take into account the pace at which implementation capacity grows. The Capacity Module of the Goals Model can be used in the next phase of analysis to assist with this issue.

12 *Monitoring the AIDS Pandemic (MAP) Network. 2005. Male-to-Male Sex and HIV/AIDS in Asia. Bangkok: MAP Network.*

Appendix 1. Interventions under each of the nine action plans

Action Plan 1: Behavior Change Communication

Advocacy and policy environment

Women in the community

Youth

Migrant workers

Prisoners

Workplace programs

IEC materials

Mass media

Action Plan 2: Targeted Interventions

Female sex workers

Injection drug users

Transitional program

Men who have sex with men

Male sex workers

VCT outside rehab centers

VCT inside rehab centers

Action Plan 3: Care and Support

Trainings, workshops, meetings

Social support for PLHA

Palliative care

Action Plan 4: Surveillance, Monitoring, and Evaluation

Action Plan 5: Care and Treatment

Antiretroviral therapy

Laboratory tests for antiretroviral therapy

OI treatment

OI prophylaxis

Training

Action Plan 6: Prevention of Mother-to-Child Transmission

Prevention of mother-to-child transmission

Action Plan 7: STI Management and Surveillance

STI management

STI surveillance

Action Plan 8: Blood Safety

Blood safety

Action Plan 9: Capacity Building, Management, and International Cooperation

Staff for AIDS structures

Capacity building

Management and coordination

International cooperation

APPENDIX 2. PREVALENCE AMONG ADULTS OF DIFFERENT POPULATIONS IN HCMC, 2000–2010 (%)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Higher risk populations - male										
Current male clients of sex workers	3.04	4.58	5.69	6.56	7.19	7.60	7.93	8.17	8.35	8.49
Injecting drug users	40.91	48.07	51.36	51.65	50.94	49.77	48.33	46.71	45.02	43.36
Male sex workers	5.35	6.56	7.44	7.84	7.91	8.47	9.19	9.96	10.73	11.49
Men who have sex with men	4.50	5.91	7.36	8.68	9.88	11.00	12.15	13.31	14.48	15.68
Higher risk populations - female										
Hi frequency sex workers who do not inject	5.01	7.37	9.53	11.39	12.96	14.15	15.29	16.35	17.33	18.25
Lo frequency sex workers who do not inject	1.49	2.54	3.75	5.03	6.29	7.43	8.42	9.25	9.93	10.48
All sex workers who do not inject	3.02	4.65	6.28	7.82	9.21	10.37	11.41	12.33	13.14	13.84
Injecting sex workers - hi frequency	50.72	56.86	57.68	56.07	53.42	50.28	47.07	43.91	40.92	38.18
Injecting sex workers - lo frequency	47.42	52.95	53.41	51.63	48.94	45.88	42.67	39.41	36.21	33.20
All sex workers who inject	50.64	56.76	57.57	55.96	53.31	50.18	46.97	43.81	40.81	38.06
All sex workers (including injecting and non-injecting)	11.48	13.75	15.15	16.12	16.85	17.32	17.68	17.94	18.11	18.23
Currently lower risk populations										
Males who are not now in at-risk populations	0.09	0.17	0.26	0.36	0.47	0.57	0.67	0.76	0.84	0.90
Females who are not now in at-risk population	0.10	0.17	0.25	0.34	0.43	0.51	0.59	0.65	0.71	0.76
Total population now at low-risk	0.10	0.17	0.26	0.35	0.44	0.54	0.62	0.70	0.77	0.82
Population total prevalence										
Male overall prevalence	1.10	1.46	1.72	1.91	2.07	2.19	2.29	2.37	2.43	2.49
Female overall prevalence	0.18	0.26	0.35	0.45	0.54	0.62	0.70	0.77	0.83	0.88
Total population prevalence	0.61	0.83	1.00	1.14	1.26	1.36	1.45	1.52	1.59	1.64

APPENDIX 3. NEW INFECTIONS AMONG ADULTS OF DIFFERENT POPULATIONS IN HCMC, 2000–2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Higher risk populations – male											
Current male clients of sex workers	2,440	3,107	3,389	3,503	3,512	3,437	3,555	3,662	3,762	3,849	3,927
Injection drug users –"Young"	4,895	3,580	1,967	1,158	954	918	937	977	1,027	1,079	1,130
Injecting drug users – "Old"	50	25	13	5	3	0	0	0	0	0	0
Male sex workers	68	81	90	93	90	103	115	128	141	155	169
Men who have sex with men	441	528	585	604	621	654	730	809	890	970	1052
Higher risk populations – female											
High-frequency sex workers who do not inject	102	155	195	218	229	229	241	252	261	269	276
Low-frequency sex workers who do not inject	58	86	112	137	156	170	180	190	198	204	210
All sex workers who do not inject	160	241	307	355	385	399	422	442	459	473	486
High-frequency ISWs	520	368	269	224	204	194	191	190	189	188	186
Low-frequency ISWs	11	8	5	4	4	4	4	4	4	3	3
All sex workers who inject	532	376	274	228	208	197	195	194	193	191	190
All sex workers (including injecting and non-injecting)	691	616	581	583	593	596	617	635	652	665	676
Currently lower risk populations											
Males who are not in an at-risk population	23	42	63	89	113	136	158	178	196	212	225
Females who are not in an at-risk population	860	1,242	1,514	1,731	1,862	1,950	2,008	2,050	2,079	2,102	2,123
Total population now at low risk	883	1,284	1,577	1,820	1,975	2,086	2,166	2,228	2,275	2,314	2,348
Population incidence											
Male overall incidence	7,917	7,364	6,107	5,451	5,293	5,248	5,494	5,754	6,016	6,265	6,504
Female overall incidence	1,552	1,858	2,095	2,314	2,455	2,546	2,625	2,685	2,731	2,767	2,799
Total population incidence	9,468	9,222	8,202	7,765	7,748	7,794	8,119	8,439	8,747	9,032	9,303

APPENDIX 4. NEW INFECTIONS UNDER DIFFERENT SCENARIOS IN HCMC, 2006–2010

	2006	2007	2008	2009	2010	2006–2010
Scenario A—Clients and FSWs	8,298	7,597	6,843	6,099	5,462	**34,299**
Scenario B—MSM and MSWs	8,292	7,857	7,303	6,686	6,097	**36,235**
Scenario C—IDUs	8,254	7,808	7,249	6,633	6,066	**36,010**
Scenario D—Prevention combination	8,207	7,513	6,752	5,986	5,322	**33,780**

APPENDIX 5. RESOURCE NEEDS FOR PREVENTION IN HCMC, 2006–2010 (VND)

	2006	2007	2008	2009	2010
Action Plan 1: BCC	6,368,131,399	8,787,802,835	10,874,998,257	13,333,975,416	15,711,932,356
Action Plan 2: Harm Reduction	15,563,458,914	18,098,299,564	24,899,476,309	31,880,809,868	39,233,203,739
Action Plan 6: PMTCT	4,690,835,530	5,250,880,154	5,881,941,952	6,531,457,694	7,261,653,363
Action Plan 7: STI Management	786,961,895	809,394,842	831,827,790	854,260,737	876,693,685
Action Plan 8: Blood Safety	477,477,000	525,224,700	577,747,170	635,521,887	699,074,076
Total (VND)	27,886,864,738	33,471,602,095	43,065,991,478	53,236,025,602	63,782,557,219

APPENDIX 6. RESOURCE GAP IN HCMC, 2006–2010 (VND, IN THOUSANDS)

	2006	2007	2008	2009	2010
Resources available	41,817,000	41,817,000	41,817,000	41,817,000	41,817,000
Resources needed	73,705,119	120,751,950	151,329,227	182,426,387	210,093,791
Resource gap	-31,888,119	-78,934,950	-109,512,227	-140,609,387	-168,276,791
Percent of resources met	57%	35%	28%	23%	20%

Previous reports include:

1. The HIV epidemic in Ho Chi Minh City: Where is it going?
   Dịch HIV tại thành phố Hồ Chí Minh: Xu hướng trong tương lai?
2. The HIV Epidemic in Ho Chi Minh City: What Do We Know?
   Dịch HIV tại thành phố Hồ Chí Minh: Chúng ta biết những gì?
3. The HIV Epidemic in Ho Chi Minh City: Inputs parameters for baseline scenarios
   Dịch HIV tại thành phố Hồ Chí Minh: Số liệu đầu vào cho mô hình AEM
4. A^2 Advocacy Training Manual (2007)