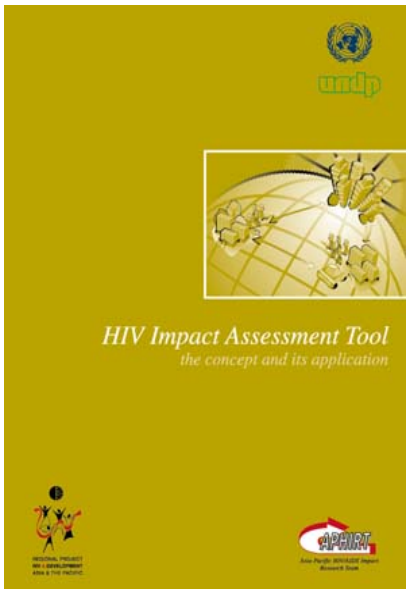
HIV IMPACT ASSESSMENT TOOL

the concept and its application

Regional Bureau for Asia and the Pacific
HIV and Development Programme
DC1-23rd FL.
1 UN Plaza
New York, NY 10017
U.S.A.

Asia-Pacific HIV Impact Research Team
c/o AIDS Action Research Group
School of Social Sciences
Universiti Sains Malaysia
11800 Penang
Malaysia



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PREFACE

The HIV epidemic is, unfortunately, likely to continue to spread for the foreseeable future. It is now acknowledged that HIV-AIDS is not simply a health problem *per se* but an epidemic that changes the development prospects of diverse countries. In order to arrest the impact of the disease on individuals, households, the productive sector and governments, more integrated and collaborative, pro-active efforts are needed.

UNDP believes that all sectors – all individuals, groups, and institutions – in society have a role to play in creating an effective response to HIV. If sectors or institutions have not yet become active in the response, this may, in large part, be due to the absence of a methodology (or tool) that appropriately address the concerns and daily work of groups in that sector. In this context, the Asia Pacific regional HIV programme of UNDP began discussions with a talented group of individuals and institutions in the region in 1999 to develop a practical tool for use by development project planners and investors as part of their decision making process *prior* to project approval. It was decided that a tool similar to Environmental Impact Assessment was lacking in the response to HIV and AIDS and that its creation would stimulate effective involvement of institutions and groups hitherto only marginally involved. The result has been the initial formulation of such an HIV Impact Assessment (HIA) methodology.

The aim of this first version of HIA is not to outline solutions but rather to stimulate the processes of reflection and discussion essential for change of perspective. With further feedback, research and pilot-testing, currently planned, the HIA tool will increasingly assist analyzing, prior to project approval and implementation, the impact of activities, projects, programmes on the spread of the virus.

The UNDP Asia-Pacific regional HIV and development programme welcomes reproduction of this publication, in whole or in part. We will be grateful for acknowledgement as well as for comments and feedback. Future refinements of the tool will be based on empirical evidence, pilot testing as well as feedback and suggestions from experts/colleagues and friends.

There is a sense of urgency associated with this epidemic, which will, if not halted, reverse years of global development efforts. There is a need to find effective, sustainable and compassionate ways of including everyone in the response. We hope this publication contributes to the quest.

Benjamin Brown
Senior Advisor
UNDP Asia-Pacific
HIV & Development Programme

Asia-Pacific HIV Impact Assessment Team

Sundramoorthy Pathmanathan, Ph.D.
(Principal Reseacher)
AIDS Action Research Group
Universiti Sains Malaysia

AIDS Action Research Group, Universiti Sains Malaysia (Penang, Malaysia)

Choo Keng Kun, Ph.D.
Lai Yew Wah, Ph.D.
Suresh Narayanan, Ph.D.
Vickasingam.Balasingam, M.A.

University of South Pacific (Suva, Fiji)

Nii-K Plange, Ph.D.
Mahendra Reddy, Ph.D.

International Institute for Population Sciences, Deemed University (Mumbai, India)

Ravi Verma, Ph.D.
Sumati Kulkarni, Ph.D.

Institute of Population and Social Research, Mahidol University (Thailand)

Bencha Yoddumern Attig, Ph.D.
Varachai Thongthai, Ph.D.
Masaki Matsumura, Ph.D.
Wassana Im-em, Ph.D

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I. Introduction

The Regional Bureau for Asia and the Pacific of the United Nations Development Programme (UNDP) initiated efforts with the AIDS Action and Research Group (AARG), Universiti Sains Malaysia (Penang, Malaysia) to develop a tool to analyze the impact of major development projects on the HIV/AIDS epidemic. The goal is to produce an effective tool that is readily adaptable to varying national contexts, which can be used by policy and decision-makers.

This initiative was based on the need to integrate HIV/AIDS issues into development policy, planning and programme implementation. The **HIV Impact Assessment (HIA)** will help project designers to take into account the potential impact that a given development project might have on the spread of HIV. It will also raise awareness of HIV/AIDS and minimize the unintended impact a development project that might have on the transmission of HIV. It is hoped that the HIA will play a role in mitigating the impact of a project on the HIV/AIDS epidemic in much the same manner as the Environmental Impact Assessment (EIA) has had in minimizing the negative effects of projects on the environment. The methodological approach of the HIA draws extensively from relevant socio-economic methodologies including social cost/benefit analysis.

To ensure that the HIA has the widest applicability, expertise in the Asia Pacific region was also sought. AARG and UNDP in Kuala Lumpur identified three partner institutions to help develop the HIA: The International Institute for Population Sciences, Deemed University, Mumbai (India), the University of the South Pacific (Fiji), and the Institute of Population and Social Research, Mahidol University (Thailand).

II. Background

The HIV virus continues to spread at an alarming rate of approximately 16,000 new infections per day worldwide. By the end of 1999, about 33.6 million people (32.4 million adults and 1.2 million children) have been infected with HIV virus since the beginning of the pandemic in the early 1980s (AIDS Epidemic Update, UNAIDS/WHO, 1999).

UNDP's involvement with the epidemic dates back to 1987 when it began receiving requests from governments to support HIV/AIDS and development programmes. UNDP’s approach focuses on the strengthening of existing mechanisms and the coordination of technical cooperation and capacity development at the national and regional level.

Recognizing the fact that the HIV/AIDS epidemic has its foundation in the structural characteristics of economies, societies and development at large, UNDP has stressed that in order to be effective, policy and programmes on HIV/AIDS must go beyond the public health sector. A multi-dimensional and multi-sectorial approach must therefore be taken. As a new challenge, the UNDP Asia Pacific regional programme aims to develop an analytical tool for the appraisal of the impact of various development projects, programmes and policies on the HIV/AIDS pandemic.

III. Rationale

HIV/AIDS is a disease that has major consequences not only for the individual, community and society, but also for the economy as a whole. According to Cohen (1992:2)[1], the relationship between the economy and HIV is a two-way relationship: "HIV affects the economy and the economic system affects the level and distribution of HIV".

Previous studies have attempted to identify the social and economic costs of HIV/AIDS on the economy as a whole, specific sectors as well as households (for example, Barnett & Whiteside, 1999; Bloom and Lyons, 1993; Bloom & Mahal, 1997; Godwin, 1997; Lim, 1993 and Panos Institute, 1992). Generally these studies have assessed the social and economic costs of HIV/AIDS projects *after* the impact has been felt. However, there is a need for policy and decision-makers to anticipate potential quantifiable and non-quantifiable social and economic costs of HIV/AIDS in development planning. Therefore, the uniqueness of this initiative to develop the HIA is that it integrates HIV/AIDS issues into development planning, design and policy *prior* to project implementation. Such an approach to evaluating the impact of HIV/AIDS has largely been ignored in the past.

More specifically, development projects frequently do not recognize the consequences of substantial population movements and their impact on the HIV/AIDS pandemic[2]. For instance, the construction of a dam will displace people from the project area (outmovers) and also attract others (inmovers) from surrounding areas into the project area, both during and after the project. At the same time, there will be people (transients), moving in and out of the project site. This confluence of different groups of people from various locations may create an environment conducive for high risk behavior and aggravate the HIV/AIDS epidemic. Thus, the project may directly and indirectly lead to the spread of the epidemic with quantifiable and non-quantifiable cost implications.

Based on existing knowledge regarding risk behavior, risk environment and interventions related to the spread of HIV/AIDS, the HIA attempts to compute the additional cost attributable to a project that aggravates the HIV/AIDS epidemic. It is an attempt to anticipate risks and identify intervention strategies of HIV/AIDS prevention in development projects.

[1] Desmond Cohen, the former Director of UNDP's HIV and Development Programme, New York.

[2] According to Cohen (1992:2-3), poverty and poor economic prospects are often key variables in the decision to migrate. There is a strong positive relationship between migrant labor flows and the spread of HIV. "This in part reflects the younger age of migrant populations and the fact that there are both female and male specific migrations. It also reflects the relaxation of social norms and the new and often risk behaviors adopted by migrants."

IV. Objectives

The major objectives of the **HIA** are as follows:

(i) General Objectives:

1. To provide a framework to assess the potential social and economic costs related to HIV/AIDS prior to implementation of development projects.

2. To provide policy and decision-makers with a basis to evaluate and select possible alternatives that would minimize the impact of development projects on the spread of HIV/AIDS.

3. To integrate HIV/AIDS issues into development policy planning.

(ii) Specific Objectives:

1. To create awareness of the social and economic cost of HIV/AIDS resulting from development projects prior to their implementation.

2. To increase awareness of the anticipated risks and help plan preventive intervention strategies.

3. To encourage project sponsors to share the responsibility of prevention and reduction of the spread HIV.

V. The HIA Conceptual Model

(i) Population Movement

It is important to note that development projects that induce population movements have the potential to spread HIV. This arises from two inter-related consequences of a project.

First, such a project brings into contact different groups of people thereby increasing the risk of contracting and/or transmitting the virus. For example, any large-scale project is likely to attract people in the construction and post-project phases, and at the same time displace others from the project area. This project induced inmovement and outmovement of people can either introduce the epidemic into the project area and beyond, or aggravate the existing epidemic within and beyond the project area. The case of the Volta River dam in Ghana provides an excellent example of how a large project contributed to the aggravation of the HIV epidemic through labor displacement and migration.[3]

[3] Initiated in the 1960s, the project flooded an area of 8,500 square kilometers and displaced 80,000 inhabitants, largely drawn from the Krobo ethnic group. Being farmers, the Krobo lost much of their land. Many women who lost their land sought work in hotels and drinking outlets that mushroomed in nearby towns to serve construction workers. Prostitution was only a short step away. When the main construction force left after five years, the women took their trade to Accra, Kumasi and then throughout West Africa.

Second, a project may generate an environment conducive to high risk behavior associated with the contraction and/or transmission of HIV. To illustrate, workers involved in the construction phase of a large project may be drawn from beyond the project area. These workers are usually males, separated from their families and with ready cash to spend. This may encourage them to indulge in unsafe commercial and casual sex, which increases the risk of contracting or transmitting the HIV virus. It also puts their spouses and unborn children at risk.

A development project's potential impact on the HIV/AIDS epidemic can be understood by conceptualizing the major population movements induced by the project. As shown in **Figure 1,** a project is likely to create interaction amongst the following five groups of people: stayers, inmovers, outmovers, transients and other communities.

1. **Stayers** are the original residents of the project area who continue to reside in the area throughout the duration of the project and in the post-project period.

2. **Inmovers** are people, including workers (outsiders) who move into the project area and those who remain during the post-project period. They also include people who have been drawn to the project area by economic or other factors during and after the project[4].

3. **Outmovers** are people who are either displaced by the project or who have moved out voluntarily.

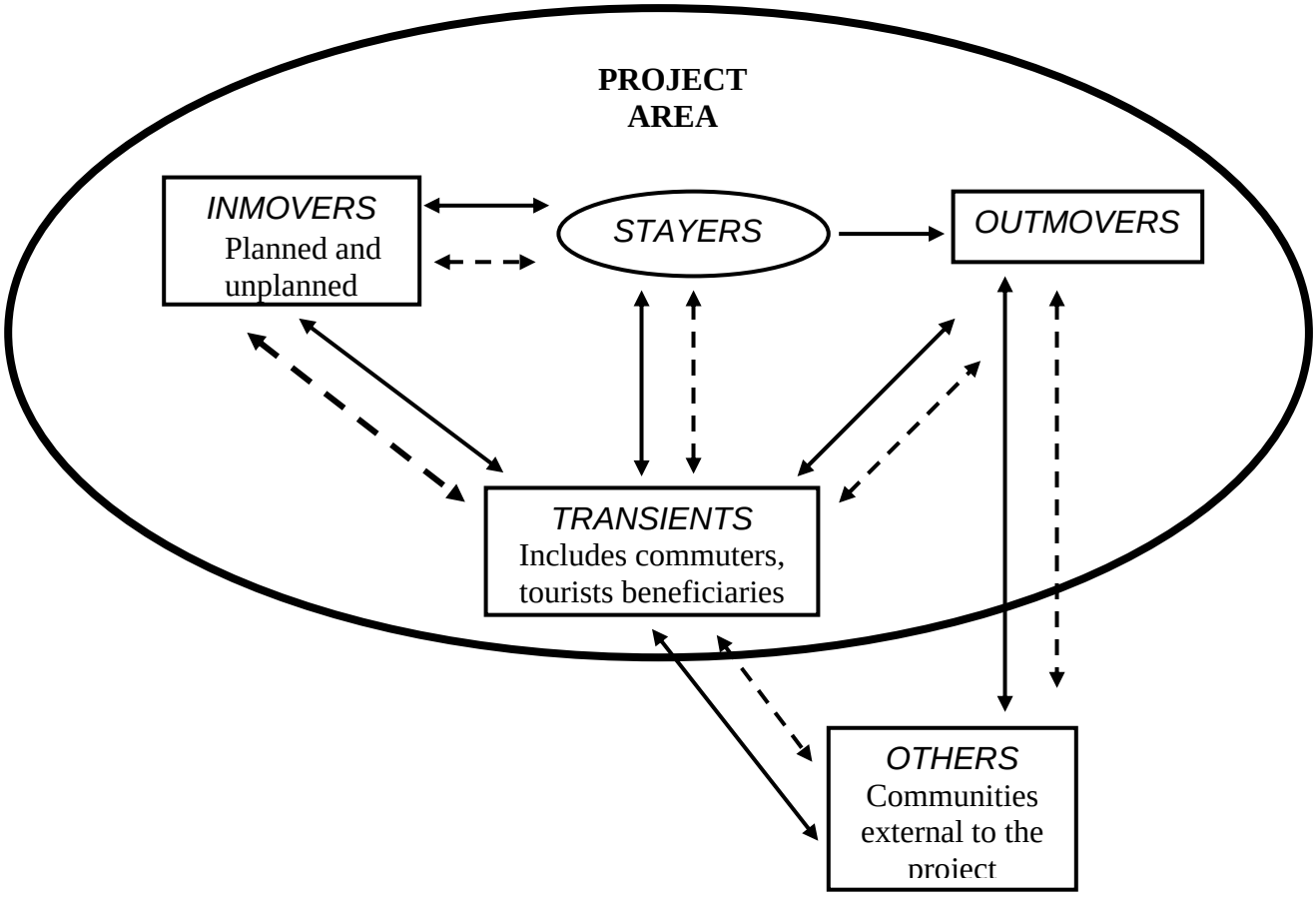
A government HIV survey in 1995 showed that Agomanya, a town just a few kilometers from the Volta river dam, had the highest rates of infection of all the eight surveillance sites studied. HIV infection among pregnant women here was five to ten times more common than in the rest of the country (Summarized from Decosas, 1996).

[4] Post project population in-movement could be planned (as in the case of the relocation of a given population to a new township), or unplanned as in the movement of people in search of new opportunities).

4. **Transients** consist of two groups of people: The first group consist of people who are directly or indirectly involved in the project, including those who move in and out of the project area as well as those who stay only during the duration of the project. This covers certain groups of workers involved directly in the project, and others supplying auxiliary services (like raw material transporters, vendors of temporary services and commercial and non-commercial sex workers). The second group is beneficiaries of the project who do not reside permanently in the project area. For example, tourists visiting a newly developed tourist area or users of a newly completed highway would fall into this second category of transients.

5. **Other Communities** would include communities external to the project that interact with outmovers or transients from the project area.

Figure 1: Population Movements and Potential HIV Transmission associated with Development Projects.



NOTE:

Points of contracting and/or transmitting HIV.

Points to prevent or minimize transmission of HIV.

Figure 1 illustrates how contact between the five groups (stayers, inmovers, outmovers, transients and other communities) increases the risk of contracting and transmitting the virus. The bold lines show potential points and directions of virus contraction and/or transmission, with the arrow heads suggesting the direction of contracting and/or transmitting. Thus outmovers, being drawn from among the original population in the project area, carry the risk of contracting and/or transmitting HIV out of the project area to other communities (indicated by the bold line with a single arrow head pointing away from the project area). Meanwhile, inmovers not only bring the risk of contracting and/or transmitting to the project area, but also face the risk of contracting and/or transmitting from the project area.

Interactions between inmovers, stayers and transients have the potential to increase the risk of contracting and/or transmitting of the virus among one another. Transients and outmovers, however, have a further potential to contract and/or transmit the virus to other communities external to the project.

(ii) Risk Environment and Risk Behavior

The socio cultural and economic as well as demographic changes associated with population mobility into and out of a project area will determine the risk environment related to HIV/AIDS in the communities associated by the project. Within this context, attitudes, values, knowledge and practices affecting safer sex, injecting drug use (IDU) and other types of substance abuse, sexual health and the management of blood and blood products will determine the extent of risk in terms of susceptibility[5] and vulnerability[6] which have long and short term impact for the HIV/AIDS epidemic associated with the development project. Assessing the HIV/AIDS impact of these changes takes into account the increase risk environment and potential high risk behavior associated with the spread of the epidemic in the project area and beyond.

(a) Risk Environment

[5] Susceptibility refers to factors that can determine the rate at which the pandemic is propagated and maybe considered in part as describing the riskiness of the environment. Such factors may be physical (in the case of development of a new road), environmental (as in a drought which results in unusual population movements), cultural (a particular sexual practice of belief), economic (increased unequal distribution of income), or social (the operation of labor and associated housing markets in urban areas) [Barnett and Whiteside, 1999: 57].

[6] Vulnerability may overlap with susceptibility and describes those features of social or economic entity which make it more or less likely that excess morbidity and mortality associated with the disease will have deleterious impacts upon that unit. An important component of this concept is that of the medium and long-term impact of death and illness on social and economic life (Barnett and Whiteside, 1999:57).

Risk environment is an environment in which the chances of disease transmission are increased as a result of social, economic and cultural factors (Barnett and Whiteside, 1999:57)[7]. Some risk environment factors may include the following:

i. Project employees interacting on a regular basis with sex workers (SWs).
ii. Wage earners with affordable and disposable income for alcohol, drug use and SWs.
iii. Opportunities for SWs to establish activities at project site.
iv. The cultural practices of drunkenness and drug usage associated with sexual activity.
v. Lack of awareness and knowledge regarding sexually transmitted diseases (STDs) and unsafe sex.
vi. The prevalence of machismo culture and peer pressure to engage in unsafe sex and drug use.
vii. Sexual relationships of people from different areas with unknown sexual histories (casual sex, multiple sex partners, etc…).
viii. Feelings of loneliness and sexual deprivation due to absence of regular partners.
ix. Poverty that reduces the ability of SWs to negotiate condom usage with their clients.
x. Regular law enforcement that drives commercial sex industry and drug subculture underground.

(b) Risk Behavior

Individual responses and adaptation to high risk environment arising from a development project may lead to high risk behavior conducive to HIV/AIDS transmission and infection. Risk behavior can be classified under unsafe sexual activities, unprotected commercial sex, IDU and other substance abuse, management and mishandling of blood and blood products. The following are some examples of risk behavior:

i. Unsafe sexual activity (homo/hetero/bisexual) through commercial and casual sex.
ii. SWs receptive to unsafe sex for more money.
iii. Increased unsafe sex activities with multiple partners.
iv. Increased incidence of unsafe IDU and other substance abuse.
v. Increased sexual abuse and violence against women.
xi. Fear and lack of knowledge about STDs and reluctance to seek treatment.
xii. Fear of deportation and termination of employment due to STDs and HIV/AIDS infection and refusal to go for HIV testing and treatment.
xiii. Practice of unsafe sex and IDU due to denial and belief that contraction of HIV/AIDS is fated.

[7] For example, sexual intercourse is intrinsically not a risky behavior, however when a deadly disease appears and the social and economic environment is such as to facilitate rapid and/or frequent partner change, then that environment may be described as risk environment.

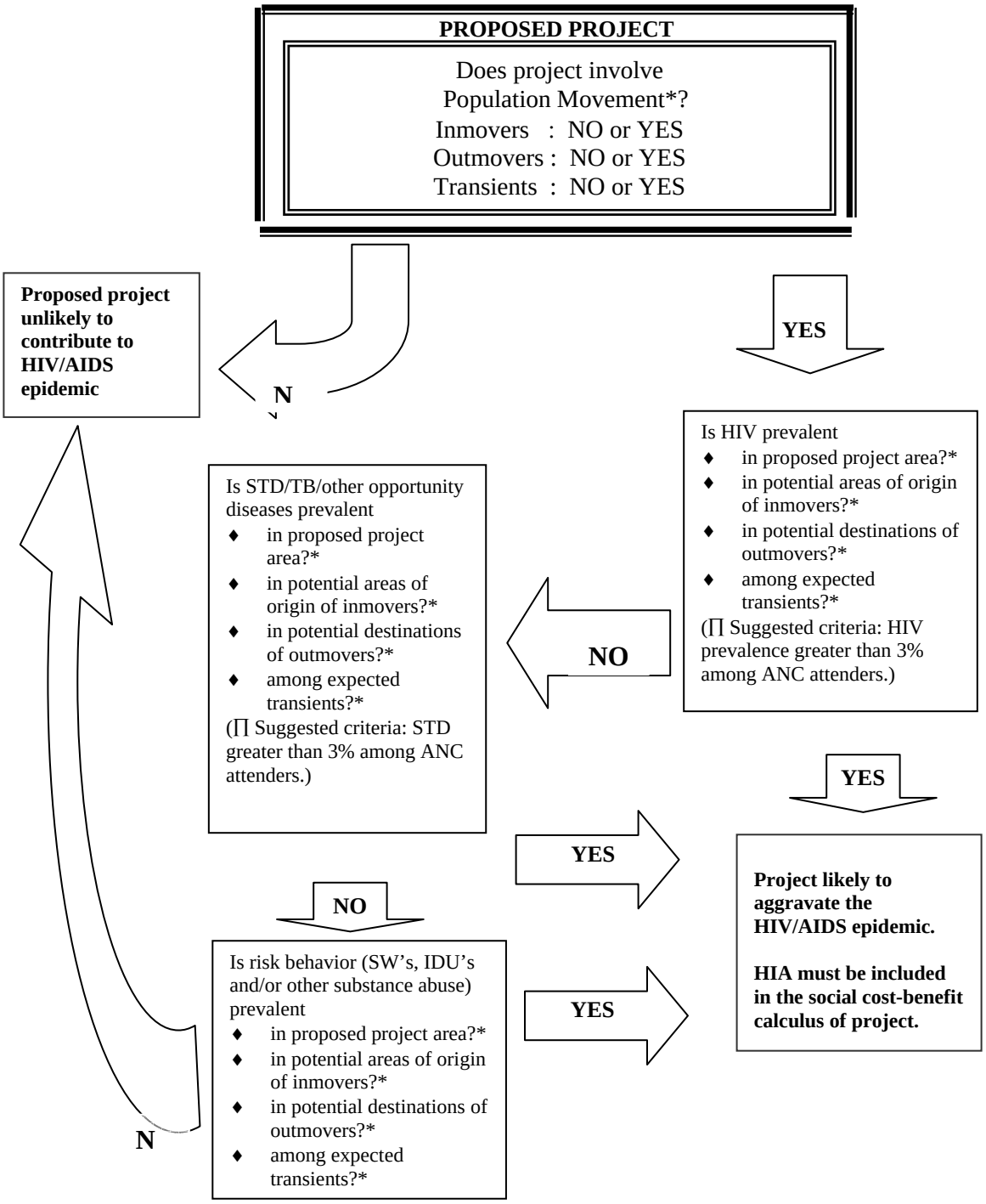
High risk behavior of the individual has a ripple impact on the family, community and society. These include:

- Exposure of sexual partners to HIV/AIDS infections.
- Transmission from infected mother to their children during pregnancy, delivery and through breastfeeding.
- The exposure of others (those outside the project area) to infected sex workers who leave project site.
- Transmission of HIV through SWs within and outside the project area.
- Transmission of HIV through IDU within and outside the project area.

VI. Assessing the Need of HIA

The conceptual model and its main variables (population movement, risk behavior and risk environment) that determine the impact of development projects on the HIV/AIDS epidemic form the basis for assessing the need of a HIA. The HIA Flow Chart seen in **Figure 2** systematically assesses the need for a HIA in development projects.

Figure 2: HIA Flow Chart



* If **YES** to any of the listed alternatives in the box, follow the **YES** path.
∏ Suggested criteria based on Whiteside (1999:213).

VII. Baseline Information for HIA

The HIV/AIDS risk environment and risk behavior associated with a development project can be gauged based on information from two main sources. First, the characteristics of the project area[8], and second, the characteristics of the project itself.

(i) Project Area Characteristics

The HIV/AIDS related characteristics of the project area may lead to a high risk environment that increases susceptibility and vulnerability of the population to HIV/AIDS.

Some key information of a project area would include:

- The number of unemployed young and single women.
- Availability and accessibility of commercial sex outlets.
- Availability and accessibility of health care facilities for sex workers (SWs).
- Availability and accessibility of injecting drugs and other mood-altering substances.
- Availability and accessibility of syringes.
- Promotion, availability and accessibility of condoms.
- HIV sero-prevalence rate (SPR) within the community.
- Geographical location of the project area (proximity to town, easy access to transportation, etc…).
- Availability and accessibility of alcohol, entertainment facilities, e.g. bars, taverns, pubs, nightclubs, discotheques, etc.
- Poverty level of population in the project area.
- Safety of handling and management of blood and blood products.
- Degree of religiosity of population in the project area.
- Degree of law enforcement.
- Availability and accessibility of any HIV/AIDS prevention programmes.
- Availability and accessibility to health services (hospital, clinics, etc…).

(ii) Project Specific Characteristics

[8] Defined as a geographical area that is delineated and identified on the plan of a proposed development project. This area is also referred to as the project community area.

Project specific characteristics will assist in determining the risk environment and risk behavior. The following are some examples of the type of information that might be required.

- Place of origin of anticipated labor for the project (data acquired for HIV related characteristics and SPR).
- HIV/AIDS related characteristics and sero-prevalence rates (SPRs) of anticipated labor for the project.
- Preference in hiring youth workers (18-30 years).
- Pattern of wage/salary payment (weekly, daily).
- Availability and accessibility of alcohol in project site.
- Type of housing provided for project workers.
- Availability and accessibility of SWs on the project site.
- Availability and accessibility of leisure/recreational facilities on project site.
- Availability of health care facilities on project site.

VIII. Procedures in Conducting the HIA

There are 6 steps involved in conducting the HIA. They are based on information regarding the potential population movement, HIV/AIDS prevalence rate, high risk environment, high risk behavior and preventive intervention strategies. In addition the HIA will also identify the non-quantifiable and quantifiable social and economic cost of a proposed development project on the HIV epidemic.

Procedures/steps in conducting the HIA includes:

Step 1.

Collecting, analyzing and disseminating data on background information of the proposed development project (see **Table 1**).

[Note: If resources are available, a more detailed baseline information survey based on project area and project specific characteristics can be administered.]

Step 2.

Identifying population movement (see **Figure 1**) due to the proposed development project. If there is no population movement involving inmovers, outmovers, and transients then there is no need for a HIA to be conducted.

[Note: Proceed to Step 3 if there are any forms of population movement.]

Step 3.

Assessing the need and desirability of a HIA based on the HIA Flow Chart (see **Figure 2**). This step is based on analyzing data regarding the prevalence of HIV, STDs, TB, Hepatitis, other opportunistic diseases and risk behavior in proposed project area, potential areas of origin of inmovers, potential destination of outmovers and among transients.

Step 4.

Determining the risk environment and risk behavior based on data at individual, community and national level associated with the project. This is to identify the comprehensive scenario of the potential impact (quantifiable and non-quantifiable) of the proposed project on the HIV epidemic.

Step 5.

Costing the impact of HIV/AIDS based on based on quantifiable and non-quantifiable variables (economic, medical, social and psychological).

Step 6.

Evaluating possible preventive intervention strategies to mitigate the potential impact on HIV/AIDS epidemic.

Table 1.

Background Information of Project

Indicators				
1.	**Project Information**	**Name of Project**:		
1.1	Geographic location.			
1.2	Type of development project: e.g. dam construction, agriculture, new township, highway projects, tourism, transport etc.			
1.3	Total investment.			
1.4	Total labor force.			
1.5	Duration of project.	Total number of months: _____		
1.6	Gender Composition.	Male: _____%	Female: _____%	
1.7	Age Groups.	18-25 yrs old _____% 26-35 yrs old _____% 36- 45 yrs old _____% > 45 yrs old _____%	18-25 yrs old _____% 26-35 yrs old _____% 36- 45 yrs old _____% > 45 yrs old _____%	
1.8	Population groups.	Stayers _____% Outmovers _____%	Inmovers _____% Transients_____%	
1.9	Equity ownership.	Government_____% Mixed_____%	Private_____% Others _____%	
1.10	Residential status of project area.	Rural	Urban	Suburban

IX. Costing the Impact of HIV/AIDS

In assessing the impact of development projects on HIV/AIDS, both quantifiable and non-quantifiable cost must be taken into consideration. Previous studies tend to emphasize mostly on the quantifiable and economic cost of the impact of development projects on the HIV/AIDS epidemic. This has greatly underestimated and understated the impact of non-quantifiable cost of development projects on HIV/AIDS.

(i) Non-Quantifiable Costs

It is well recognized that many of the social and psychological cost of development projects on HIV/AIDS are not easily or readily quantifiable. This is evident from the complexity of the impact and cost of HIV/AIDS to the individual, society and economic system.

Some of the non-quantifiable (social and psychological) cost at the individual, household and community levels include (see **Figure 3**):

(1) Individual (Psychological) Level

1. Poor self-esteem.
2. Suicidal tendencies
3. Anger and violent reaction
4. Depression/loneliness
5. Feelings of rejection
6. Feelings of guilt/shame/self-blame
7. Denial and withdrawal
8. Stigmatization
9. Stress and anxiety

(2) Household Level

1. Loss of main breadwinners (death, fostering, adoption)
2. Family dissolution
3. Budgeting problems emanating from care for People with AIDS (PWAs)
4. Loss of access to property
5. Single parenthood
6. Head of household responsibilities forced on elderly
7. Violence against women and children
8. Emergence/increase of household poverty
9. Crisis of fertility and childbirth
10. Discrimination/Prejudice of female head of household
11. Increase of Orphans
12. Increase in school drop-out rates

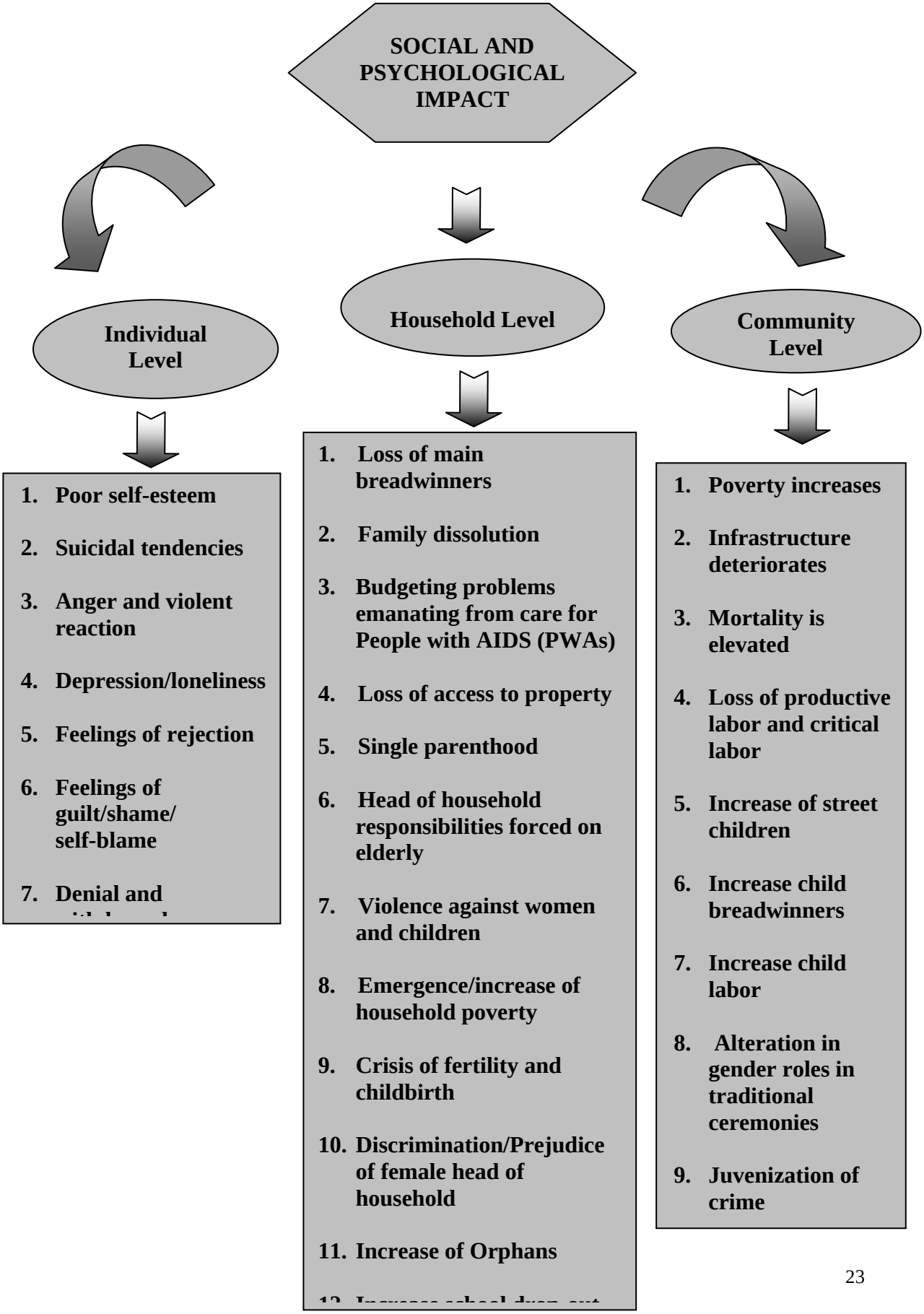
13. Increase of child labor and child sex workers
14. Loss of food security and nutritional status
15. Increase widowhood and divorce rates

(3) Community Level

1. Increase in poverty (vicious cycle of poverty)
2. Deteriorating infrastructure
3. Elevating of mortality
4. Loss of productive labor and critical labor
5. Increase of street children
6. Increase child breadwinners
7. Increase child labor
8. Alteration in gender roles in traditional ceremonies
9. Juvenization of crime
10. Discrimination
11. Unrealistic fear of infection
12. Breakdown of social support system

This non-quantifiable information will be utilized to complement the quantifiable analyzes of the impact of development projects on the HIV/AIDS epidemic.

Figure 3: Social and Psychological Impact



(ii) Quantifiable Costs

In this section, a framework is provided to estimate the additional costs attributable to a project that aggravates the HIV epidemic by inducing population movements and creating an environment conducive to high risk behavior. The aggravation of the epidemic takes the form of the additional infections induced by HIV positive individuals who are residing in, or are attracted to, the project area. All costs with respect to these additional infections represent the additional costs attributable to the project.

While these additional costs are attributable to the project, they are not necessarily all reflected in the estimated costs of the project. Consequently, the costs associated with the project are likely to be understated.

These costs have to be anticipated and estimated before the project is implemented and its consequences on the HIV epidemic are fully known. Thus, a crucial ingredient is the pre-construction of the most likely scenario, in order to estimate the associated costs. Although the scenario will vary from country to country and by type of project, some key or central elements of the cost will probably be similar in most situations.

Two main components are involved in estimating additional infestions/cases attributable to the project that aggravates HIV/AIDS:

(a) Estimating the additional HIV infections and AIDS cases attributed by the project.
(b) Estimating the associated cost of AIDS (due to this infection).

(a) Estimating the Additional HIV Infections and AIDS Cases Attributable to the Project

In order to estimate the additional HIV infections and AIDS cases induced by the project, the following three steps are involved:

(1) Estimating the number of HIV positive individuals within the project area.
(2) Estimating the number of additional infections these individuals are likely to induce.
(3) Estimating the number of AIDS cases attributed to the project (equals to the number of HIV cases, by assumption).

Step 1: Estimating the Number of HIV Positive Individuals within the Project Area

This involves estimating the number of HIV positive individuals who are likely to move into the project area and/or are already there. This, in turn, involves several steps:

First, the potential areas from which each of the four population groups (inmovers, stayers, outmovers, and transients) are drawn have to be identified.

Second, in the current wave of HIV/AIDS, transmission of infection occurs both through those demonstrating high risk behavior and those traditionally not associated with the epidemic (housewives and unmarried women, for example). Hence, we need to identify the category of people with high SPRs and those with low SPRs in each of these areas. The high SPR category should be further desegregated into various subcategories. The low SPR category, on the other hand, could be proxied by blood-donors. The SPRs for those in the high SPR subcategories and the blood-donor group should be obtained.

Third, for each of the four population groups (inmovers, stayers, outmovers, and transients), the number of persons likely to fall within each of the high SPR subcategories should be estimated. The remaining persons are assumed to belong to the low SPR category.

Finally, for each of the population groups, the number of people in the respective subcategories are multiplied by the SPRs obtained from step two to get the associated number of HIV infections. Summing these estimates gives the total number of HIV-positive individuals in the respective population groups

It is assumed that the composition of **stayers** and **outmovers** are reflected in the data pertaining to the area from which they are drawn (in this instance, the project area).

In the case of **inmovers,** it is difficult to predict their composition *in advance*. It is reasonable to expect that this group will draw disproportionately more individuals with high SPRs. The highest SPR found in the area of origin (see second step) could be used to estimate the number of HIV positive persons in the high SPR group. On the other hand, to estimate HIV positive individuals among the low risk SPR group, the SPR of blood donors (found in the area of origin) may be used.

Transients also pose a problem since it is often difficult to identify their areas of origin. It is therefore necessary to make an assumption regarding the composition of the transient group by sectors of employment instead. For example, it may be that the majority of transients are likely to be drawn from the transport sector, construction sector and sex workers. If that is the case, the SPRs for each of these sectors obtained from other sources (like national or cross-country data) may be used to derive the number of HIV positive cases.

The SPRs for **external communities** are not necessary as it is assumed that they will not be drawn to the project area.

Conceptually, the number of HIV infected individuals estimated through the above procedure are HIV positive even before the project begins. Thus, their infections are *not a consequence of the project*. In other words, regardless of whether the project has been implemented or not, these individuals have already contracted the HIV virus. Thus all costs associated with their infection *cannot be attributed to the project*.[9]

[9] However, project managers with workers already infected with the HIV virus will have to bear some of the associated treatment and related costs.

Step 2: Estimating HIV Infections Attributable to the Project

In estimating the cost attributable to the project, we must compute the additional infections individuals are likely to transmit over some future time period. Therefore, we need to compute the additional infections arising from the interaction of HIV infected individuals with non-infected individuals, consequent to the project. This requires an estimate of the average number of people an HIV positive individual is likely to infect over his/her sexually active lifetime.

In reality, many factors affect the course of subsequent (or downstream) infections such as sexual behavior, sources of transmission and modes of transmission (see discussion on risk environment and risk behavior). These are likely to vary from situation to situation making the rate of downstream infections difficult to predict in advance. The usefulness of the Epimodel (Chin and Lwanga, 1991) for this purpose was considered. However, it appears that the Epimodel cannot be used to establish the additional infections that arise from a given number of HIV-infected persons.[10]

If data on how many additional infections, on average, an HIV-positive individual is likely to trigger over a 10 year span are available,[11] these should be used. Alternatively, data from other similarly placed countries or region can be relied upon.

For example, if we use an average figure of 10 sexually active years following a person becoming HIV positive, and further assume that a single person infected with HIV infects another person every four years (Bloom, Mahal et al. 1997: 215), a single HIV infection today can be shown to result in at least 5 additional infections over a ten year period.[12] This average figure multiplied by the number of HIV infected individuals attracted to the project area (computed earlier) will yield some estimate of all additional infections attributable to the project over a ten year time frame, subsequent to the initiation of the project.[13]

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[10] The Epimodel appears unsuitable to estimate the number of additional HIV infections arising from the interactions with a given number of HIV positive individuals. The model requires the year in which HIV was first detected, a recent reference year, and an estimate of the number of HIV infections in the reference year. The model then extrapolates forwards and backwards to estimate the number of HIV infections for a period of up to 20 years. But it is not clear whether the estimates of infection after the reference year arise from the number of infections entered for the reference year.

[11] This approximates the average time between HIV-infection and full-blown AIDS (Nelson, 1996). If further downstream infections are to be considered, a longer time span may be used.

[12] Computations of Bloom and Mahal (cited in Bloom, Mahal et al. 1997: 216) yield a figure of 6.5 extra infections over the next decade. Whiteside (29 March 2000) in a personal communication suggested a figure of 7 based on South African data.

[13] Again, a limitation of such an estimate is that it ignores the fact that behavioral changes influence the rate and number of additional infections in the future.

Step 3: Estimating the Number of AIDS Cases Attributable to the Project

Once the number of additional HIV-positive cases is established, the next step is to estimate the number of AIDS cases that will result. A simple rule is to assume that all HIV positive individuals will become full blown AIDS cases.

(b) Estimating the Associated Cost of AIDS

Four categories of costs have been identified in the literature with respect to HIV/AIDS. (Bloom and Mahal, 1997)

First, medical costs associated with the disease, including the costs of detecting, treating and caring.

Second, the income (or output) foregone because of morbidity (illness) and mortality related to HIV/AIDS.

Third, psychic costs such as mental anguish, pain and suffering endured by the patient and family. While these costs are important, they are rarely discussed or quantified due to inherent problems in quantification.

Fourth, costs of prevention, information and education associated with the disease.

1.1 Medical Costs

An individual who is unaware that he/she is HIV-infected is likely to suffer from many symptoms that mimic other common ailments and seek treatment for these. Conceptually, such treatment costs should also be included. However, unless it is positively established that the individual is infected, it would be impossible to estimate and attribute these expenses to HIV. Since a large number of HIV infected individuals do not know this until the infection manifests as AIDS, most studies estimating direct treatment costs focus solely on the costs of treating a full-blown AIDS case.

Three approaches have been used in the literature to estimate these costs.

First, is to rely on hospital data on costs and charges, including drug costs, required to treat an AIDS patient from diagnosis to death (Bloom and Carliner, 1988). More recently, a major Thai study (Myers, Obremskey and Viravaidya, 1993) utilized this approach. The drawback of this approach is that it may underestimate the cost since patients may also receive treatment from other sources as well or provide symptomatic treatment

themselves (Bloom and Glied, 1993). In the case of public hospitals, charges are often subsidized heavily.

An alternative approach suggested by Bloom and Glied, 1993) is to simulate the care cost per patient based by drawing on medical care costs from three sources: The distribution of AIDS symptoms, the number of medical examinations and hospital days and drug protocols typically prescribed for various opportunistic infections associated with AIDS, and the unit costs of medical examinations, hospital days, drugs and HIV tests typically prescribed in a country.

The third approach relies on cross-country data for countries in which medical care costs were estimated. A regression line showing the relationship between per capita income and per case medical care expenditures on AIDS in these countries is then used to predict the medical care costs for the country in question. One such equation, estimated by Bloom and Mahal (1993) and used in a Sri Lankan study (Bloom, Mahal et al, 1997) is given below:

Ln MCE = 1.03+0.955*ln PCY
(0.698) (0.086)

R^2= 0.88; N= 20

Where MCE is the estimated average lifetime AIDS medical care expenditures (circa 1992), PCY is the 1992 per capita income, and countries are the unit of observation. Figures in parentheses are the standard errors of the coefficient estimates.

Which method is used will depend primarily on the availability of data and their reliability. However, the third approach is only recommended when the first two approaches cannot be implemented. The approach discussed below is a combination of the first and second approaches.

Direct treatment costs may be divided into inpatient and outpatient treatment for AIDS.

1.1.1 Cost of Inpatient Treatment[14]

Ideally, detailed treatment costs for AIDS patients should be sought. If these are not available, aggregate hospital care costs for opportunistic infections might be used. If even these are not available, then hospital care costs with respect to all diseases should be estimated. Some part of it can be apportioned to AIDS cases based on some acceptable assumption.

[14] Unless otherwise indicated, all data given in brackets in the following sections are for illustrative purposes only. They are drawn from a South Korean study (Yang, 1993).

Total cost of treatment will include non-drug charges and drug costs per patient day.

(i) Non-drug Charges

These are proxied by hospital charges per patient day (HCPD).

HCPD =Total hospital charges per year divided by total number of days all patients stayed in the hospital per year.

Alternatively,

HCPD = Total Hospital Charges per year divided by (Total Number of Patients per year x Average Stay per Patient per year)

HCPD captures the costs of laboratory procedures, other (non -drug) materials, surgery costs, consulting fees, follow-up, salaries of doctors, nurses and support staff, etc.

Taking an average length of stay in hospital for AIDS patients (41 days in South Korea- see Cho, 1991), the non-drug care charges per patient in hospitals can be found by multiplying HCPD with the average length of stay in hospital for such patients (or 41 days).

Total non-drug charges for all AIDS patients = Cost of non-drugs per patient x Total AIDS patients

(ii) Drug Costs

Three alternative sources of data may be sought for drug costs per patient day (DCPD) in connection with AIDS patients.

Ideally, the drug costs per AIDS patient, per day is required. This may differ from country to country depending on the drug protocols being implemented. If these data are unavailable, drug costs per patient day for related or opportunistic diseases may be used. The last alternative is to use general drug costs per patient day and adjust it upwards on the basis of informed guesses to reflect the higher cost of treating AIDS.

Total drug costs per AIDS patient = DCPD x average length of hospital stay per AIDS patient will yield

Total drug costs for all AIDS patients = Total drug costs per AIDS patient x Total AIDS patients.

In seeking hospital data, it would be preferable to obtain, where possible, drug costs and non-drug charges from private hospitals since public hospitals are usually subsidized heavily, and therefore, may well understate the opportunity cost of resources.

Inpatient Treatment Costs = Total non-drug charges + Total drug costs.

1.1.2 Cost of Outpatient Treatment

Several types of outpatient costs are incurred:

(i) Immune Tests

An immune test is probably required once every (6) months, after HIV is detected. If time between infection and detection of symptoms of HIV-related illnesses is assumed to be (5) years, a person will average (10) immune tests.

(ii) Cost of AZT Treatment

AZT is prescribed (where affordable) once the number of CD4 cells fall below a certain level.

AZT is typically received (1.37) months per year. Given that it takes about (5) years between detection and development of AIDS, the average patient will receive (1.37 x 5 = 6.85) months of AZT

(iii) Other Drug Therapies

These may include therapies such as HAART (Highly Active Antiretroviral Therapy), where applicable.

Thus, cost per outpatient visit = cost of immune test + cost of AZT + other drug therapies as discussed above.

Total outpatient cost per patient year = No. of visits per year per patient x cost per visit.

Total cost of outpatient treatment = Total outpatient cost per patient year x number of outpatients per year

Direct Treatment Costs = Total costs of inpatient treatment + Total costs of outpatient treatment.

1.1.3 Costs of Alternative Treatment

These refer to costs of seeking medical attention outside the formal medical delivery system, for e.g**.** traditional cures. Several problems arise in trying to obtain data on this. First, AIDS carries a stigma, and people who seek traditional cures are often persons who may not want to reveal their HIV positive status. Second, there are no known traditional cures for AIDS; thus, it is difficult to establish whether a person seeking traditional cures does so on account of AIDS or is seeking relief for other opportunistic diseases associated with AIDS. Third, little or nothing is known about charges and cost structures among traditional doctors. Bearing in mind these data limitations, estimates of alternative treatment cost may be included.

1.1.4 Home Care

This would consist of (where relevant), the following:

(i) Professional Nurses/care Providers

It is unlikely that AIDS patients at home rely upon professional nurses or care providers, unless they are very wealthy. In most cases, members of the household or family provide the required care. Nevertheless if it is known that the use of professional care providers is

significant, some estimate of the charges multiplied by the average number of days such care is required will yield **cost of professional care providers per patient.**

(ii) Non-paid Care Providers (family/ relatives)

The cost of nursing care provided by family or relatives may be measured by the income foregone by the care provider, if he/she was working previously. Otherwise, the loss of household output has to be imputed.

One approach (Lim, 1993) to imputing this is to use per capita income data. Since household helpers are likely to be housewives or others with low opportunity costs, their income foregone is assumed to be one half of the national per capita income.[15] It is further assumed that one AIDS patient requires the care of one non-HIV-infected person. This figure is converted to a per day basis by dividing it by 365 days. The per day income foregone multiplied by the average number of days such care is required will give an estimate of the **cost of non-paid care providers per patient.**

(iii) Home Care Drugs (Excludes Out-patient Drugs*)*

Data on total cost of drug protocols, if any, followed in routine homecare for AIDS patients divided by the average number of days such drugs are administered will give an estimate of **drug costs in home care per patient day**.

1.2 Income (Output) Foregone

1.2.1 Output Foregone due to Disability

Output lost due to disability can arise from two situations:

First, an individual may quit the job prematurely after being diagnosed as having HIV. The average number of working days lost must be estimated. Since this is likely to vary, one suggestion is to use (12) months since this is the mean survival time after AIDS diagnosis (Yang, 1993:48).

Second, patients have been reported to be unable to work when they are on AZT, which is normally towards the end of the survival period. The average time period a patient is on AZT (6 months) may be assumed to reflect this second period of disability.

Based on these assumptions, the average disability period is obtained by adding the two above (18 months)

Loss of output due to disability is measured by average earnings (such as wage or sectoral or national per capita GDP estimates) multiplied by the average disability period

[15] A more appropriate proportion could be assigned, depending on individual regions or countries.

1.2.2 Output Loss to Economy Arising from Premature Death

The loss to the economy arising from the premature death of a productive worker is given by the discounted value of the output foregone over the remaining working lifespan. The remaining working lifespan is estimated by subtracting the age of the deceased from the average retirement age.

The annual income foregone multiplied by the number of work years lost will yield the total income foregone which must be discounted using a suitable discount rate. This, of course, assumes that the individual's annual income remains the same throughout the remaining period.[16]

A simple formula to compute the present value (PV) of the income foregone is as follows:

$$S\left(\frac{1}{r}\right)\left[1-\frac{1}{(1+r)^t}\right]$$

Where S is the annual income foregone; r is the chosen rate of discount and t is the working lifespan lost as the result of premature death.

However, there is a problem in estimating the income foregone arising from the death of a person who has never worked outside of the home. Some method of imputing an income must then be utilized.

While the loss of financial support suffered by dependents is subsumed in this estimate, it does not capture the emotional and other psychic benefits that family and friends forfeit on account of the death of the patient. In that sense, it must be emphasized that the calculation above is not intended to approximate the value of the life lost, because this approach will suggest that the value of an unemployed person or a pensioner is zero or negative (see subsequent discussion on psychic costs).

To operationalize the formula, it can be assumed that the average annual income of the deceased is proxied by the per capita income, if other more accurate wage or income measures are not available.

Since the estimated additional infections occur over a ten year period (and deaths occur beyond that period), costing the impact of these infections and deaths become more complex. In general, the cost estimated in any one year may not reflect correctly the future costs because of several factors. First, behavioral changes may well reduce the estimated number of infections and deaths. Second, medical advances may reduce the cost of treatment, the rate of contraction and the rate of transmission in the future. Third,

[16] Several additional refinements are required conceptually. However, the *ex-ante* nature of our estimates makes it difficult to incorporate these. See Over, Bertozzi and Chin (1989) for a discussion on these refinements.

the discounted present value of costs falls when the number of periods over which the costs are discounted increase. Hence discounted costs may well be insignificant the further away the downstream effects are.

For example, using the assumption that one HIV individual will infect another person every four years, it was shown earlier that a total of five new infections will result over a ten-year period. It can be shown that 20 per cent of the additional infection will occur in the fourth year while the eighth and tenth years will account for 40 per cent each. The HIV infections which occur in the 4^{th} year will develop into full-blown AIDS only after another ten years, which is approximately the average time period between HIV infection and full-blown AIDS. The HIV-infections that occur in the 8^{th} and 10^{th} year will become full-blown AIDS cases in the 18^{th} and 20^{th} years, respectively. This implies that different periods of discounting (and possibly different discount rates) have to be utilized to estimate the income foregone. These complications may well prove to be intractable.

In order to circumvent these difficulties, it may be prudent to assume that all the additional deaths occur at the same time period. The computation of annual income foregone (given by *S* in the formula) must use data on the income likely to prevail during the period death occurred.

Based on the assumption that the additional infections occur four years after exposure and death after another ten years, it is reasonable to use the annual income likely to be earned by the deceased in the 14th year after the launch of the project

1.2.3 Loss of output due to sick leave of worker with HIV but still working

An employed HIV-infected individual taking sick leave will also contribute to output loss. If data on the average number of days an HIV-infected patient reports sick are available, an estimate can be made.[17]

1.3 Psychic Costs

As indicated earlier, the psychic costs such as the pain and suffering borne by the patient and family cannot be accurately measured nor can a value be put on these costs.

Even the value of the life that was prematurely lost due to AIDS is only partially reflected in the earnings (or output) foregone. Such computations fail to take into consideration the value of intangibles such as the time the deceased would have spent with spouse, family or children. Several approaches have been used to adjust for the underestimation of the value of a life lost when these intangibles are ignored.

[17] Cost of retraining new employee to replace worker lost (where applicable) may represent an additional element of cost. However, difficulties in estimating it may preclude its inclusion. In labor surplus economies and in situations where the majority of HIV cases are likely to be among unskilled workers, these costs may negligible.

One approach, used in Germany (*The Economist*, December, 1993), simply estimates the value of lost earnings *without* discounting it. This then raises the estimate of the value of life lost. However, because the basic human capital framework is relied upon, this approach will imply that the value of the life of a high earning individual is greater than that of a low earner. It also faces the problem of suggesting that there is no value placed on the life of individuals with no paid work.

Another approach to valuing life is by estimating the willingness to pay to avoid a particular risk—say, death through AIDS in our context. Individuals are asked how much they are willing to pay to avoid a certain kind of risk While there are many problems to this procedure, studies show that the willingness to pay to avoid different risks vary among the same individuals. This implies that a person attaches a different value to his life being saved from the avoidance of AIDS, for example, as compared to it being saved from avoiding an auto accident. Conceptually, however, the value of the life saved should be the same in both situations.

If data are available, either one of the two approaches could be used to account for psychic costs. On the other hand, it may be decided that, given the reservations, estimates of psychic costs be left out altogether (see Bertozzi, Chin and Over, 1989, for further discussion).

1.4 Prevention Costs

Prevention costs attributable to the project are confined to the costs involved in implementing prevention and education strategies associated with the additional HIV infections.[18]

There are two approaches to estimate prevention costs. First, is to attempt an estimate of the costs of individual prevention and education strategies. Second, is to rely on government and other expenditures on these. While the second approach has obvious weaknesses it is expedient.

The second approach will involve estimating the total annual expenditures (for the most current year) devoted by

- **Ministry of Health (MOH) Expenditures on AIDS education and prevention schemes/programmes**
- Donors Aid programmes to MOH (if not included in the above), NGOs and private organizations.
- Private organizations and private individuals (excluding Donor aid)

[18] However, prevention and other costs incurred by those responsible for the project with respect to their HIV-positive workers are not included here, although such expenditures are important because they help reduce additional infections and related costs.

These can be reduced to a per capita basis, which is then multiplied by the number of new infections to obtain prevention expenditures attributable to the project.

At least two limitations with respect to the second approach must be noted. The data so obtained pertains to expenditures already incurred and may not reflect the actual level of expenditure that may be required in the future. Second, such expenditure levels reflect a macro average and may be quite different from what may be required in individual (micro) cases.

X. Preventive Intervention Strategies

A major goal of the HIA is to create awareness among sponsors of development projects that there are multisectorial and multidimensional impacts and costs to be borne as a result of a project's aggravation of the HIV/AIDS epidemic. It also aims to encourage them to bear the social responsibility of planning for preventive intervention strategies to minimize the impact of high risk environment and high risk behavior related to HIV/AIDS.

Kumaranayake et al (1993:3) has identified seven established HIV/AIDS preventive strategies and key variables that are likely to affect the cost of each strategy. The seven strategies are:

1. Screening blood for HIV infection.
2. Use of mass media.
3. HIV/AIDS education.
4. Social marketing of condoms.
5. Treatment of sexually transmitted diseases.
6. Commercial sex workers peer education.
7. Voluntary counseling and testing.

In addition, Kumaranayake et al (1993:24) have also identified new and emerging HIV/AIDS prevention strategies that may be used in minimizing the impact of HIV/AIDS epidemic:

1. Prevention of mother to child/vertical transmission.
2. Microbicides and female control methods.
3. Use of vaccines.

Preventive intervention strategies must be taken to minimize the impact of high risk environment and high risk behavior. These intervention strategies should be strategically planned, culturally sensitized and cost directed (Barnett & Whiteside, 1999 and Kumaranayake, L. et al, 1998). Specific intervention strategies that can be taken and assessed in costing the impact of HIV/AIDS on development projects include:

(i) Intervention Strategies for Project Area

- AIDS awareness campaign at the project site and at the community level.
- STD/AIDS education targeted at workers, youth and women.
- Sex education with involvement of sex workers as stakeholders.
- Involvement of Tavern/Night-Club/Adult entertainment proprietors in AIDS awareness campaign.
- Improved mechanisms for handling and management of blood products.
- Outreach and peer education programmes for injecting drug users.
- Provision of health education, basic health services.
- Retraining of SW's for alternative employment.
- Community involvement and social action in AIDS prevention.
- Provision for HIV/AIDS prevention information at canteens which serves Alcohol.
- Checks and control of pornographic outlets in the project area and surrounding communities.
- Drop in counseling centers.
- Regulation of brothels and massage parlors.
- Peer education for youth.
- Involvement of religious leaders in HIV/AIDS prevention.

(ii) Intervention Strategies for Project Employees and their Families

- AIDS education for project employees and their families.
- Availability and accessibility to good quality condoms and their proper usage.
- Sex education.
- Education and awareness about condom usage.
- Availability and accessibility to films/videos or television programmes on HIV/AIDS.
- Provision of alternative recreational and leisure activities.
- Counseling services
- Peer education programmes.
- Availability and accessibility to HIV/AIDS testing facilities.
- Anti drug abuse campaign and harm reduction programmes.

Costing the Impact of Preventive Intervention Strategies

The types of prevention intervention strategies to be identified and planned is based on the additional new HIV/AIDS cases attributable to the development project and characteristics of groups vulnerable to HIV/AIDS infection especially those groups with high SPRs. It is expected that the cost involved in implementing these prevention programmes will outweight the cost and impact of additional new HIV/AIDS infections. However, the lack of data on costing these strategies makes it difficult to compute the actual cost of prevention programmes to be borne by the project sponsors.

Nevertheless, Kumaranayake et al (1993:21-23) has described as a guide some of the major variables that can be taken into consideration in implementing and costing major established prevention strategies. For example, in voluntary counseling and testing programmes, variables that affect costs include:

- The geographical and social accessibility of the population.
- Whether or not particular groups are deliberately encouraged to come for testing.
- The level of training of counselors.
- The degree of emphasis placed on careful and intensive counseling.
- The number attending relative to the capacity of the service.
- The type of test and number of test.
- The relative importance of the use of volunteers.
- The relative sophistication of the educational material used.
- Whether or not free supplies (e.g. condoms) are distributed.

In costing prevention strategies it must be recognized that a combination of approaches or strategies can be mutually and positively reinforcing. For example an AIDS education programme may include condom distribution strategies running concurrently with a mass media awareness campaign. This compounds the problems of costing each intervention strategy and attributing costs to be borne by project sponsors and other relevant parties.

XI. Conclusion

It must be emphasized that a HIA will not deter but contribute to development. It serves the long-term interests of social and economic development by ensuring that current development projects do not aggravate the HIV/AIDS epidemic with additional burden for individuals, communities and nations.

It is equally important to emphasize that whatever inconveniences a HIA may entail at the beginning of the project, it will ensure substantial savings at the implementation and subsequent stages. This is because it will highlight the potential aggravation (and associated costs) and, at the same time, facilitate the formulation of preventive intervention strategies that can reduce these costs.

For the HIA tool to play its proper role of alerting policy and decision-makers to the additional social and economic impact that a proposed project will entail, several pre-conditions must exist:

First, the HIA must gain the trust and confidence of national policy and decision-makers. This will be reflected in their commitment to the HIA by mandating HIA through appropriate legislation.

Second, there must be a commitment by policy-makers (and all other institutions involved in the fight against HIV/AIDS) to build and maintain a comprehensive database

on various dimensions of the AIDS epidemic. This will facilitate the widest applicability of the HIA.

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Third, when a HIA is required, it must begin at the earliest possible stage of the project—perhaps at the feasibility or pre-feasibility stage, for two important reasons. First, this allows project planners the time to make changes in the scope, design or location of the project (if necessary), in order to mitigate the project's impact on the HIV/AIDS epidemic. Second, an early HIA gives ample opportunity for the findings, in particular the proposed prevention strategies, to be incorporated into the project. If, on the other hand, an HIA is delayed and attempted at a stage when substantial time and resources have already been committed to the project, it is likely that the implications of the HIA will either be ignored or not be given the attention it deserves.

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HIA UTILITY KIT

This utility kit has been prepared for use in conjunction with the report. It consists of a series of tables and figures indicating the kinds of data required for analyzing the impact of a development project on the HIV/AIDS epidemic.

The outcome after applying the HIA utility kit will be in the form of a written assessment. This assessment will consist of information on the (quantifiable and non-quantifiable) social and economic impact of a development project on the HIV/AIDS epidemic.

Procedures in Conducting the HIA

There are 6 steps involved in conducting the HIA. They are based on information regarding the potential population movement, HIV/AIDS prevalence rates, high risk environment, high risk behavior and preventive intervention strategies. In addition the HIA also identifies the non-quantifiable and quantifiable social and economic costs of a proposed development project on the HIV epidemic.

Procedures/steps in conducting the HIA:

Step 1.

Collect, analyze and disseminate data on background information of the proposed development project (utilize **Table U1**).

[Note: If resources are available, a more detailed baseline information survey based on project area and project specific characteristics can be administered.]

Step 2.

Identify population movement (utilize **Figure U1**) due to the proposed development project. If there is no population movement involving inmovers, outmovers, and transients then there is no need for a HIA to be conducted.

[Only proceed to Step 3 if there are any forms of population movement.]

Step 3.

Apply the HIA Flow Chart (utilize **Figure U2**) to further assess the need and desirability of a HIA. This step is based on analyzing data regarding the prevalence of HIV, STDs, TB, Hepatitis, other opportunistic diseases and risk behavior (utilize **Table U2**) in proposed project area, potential areas of origin of inmovers, potential destination of outmovers and among transients.

Step 4.

Determine the risk environment and risk behavior based on data at individual, community and national levels (utilize **Table U3, U4 and U5**) associated with the project. This set of data is used to identify the comprehensive scenario of the potential impact (quantifiable and non-quantifiable) of the proposed project on the HIV epidemic.

Step 5.

To cost the impact of HIV/AIDS based on quantifiable and non-quantifiable variables (economic, medical, social and psychological), apply **Tables C1 to C11.**

Step 6.

Evaluate the possible preventive intervention strategies to mitigate the potential impact on HIV/AIDS epidemic (utilize **Table U6**).

Step 1.

This preliminary step requires background information on the proposed development project (see **Table U1**).

Table U1.

Background Information of Project

Indicators			
Project Information	**Name of Project**:		
1. Geographic location.			
2. Type of development project: e.g. dam construction, agriculture, new township, highway projects, tourism, transport etc.			
3. Total investment.			
4. Total labor force.			
5. Duration of project.	Total number of months: _____		
6. Gender Composition.	Male: _____%	Female: _____%	
7. Age Groups.	18-25 yrs old _____% 26-35 yrs old _____% 36- 45 yrs old _____% > 45 yrs old _____%	18-25 yrs old _____% 26-35 yrs old _____% 36- 45 yrs old _____% > 45 yrs old _____%	
8. Population groups.	Stayers _____% Inmovers _____% Outmovers _____% Transients_____%		
9. Equity ownership.	Government_____% Private_____% Mixed_____% Others _____%		
10. Residential status of project area.	Rural	Urban	Suburban

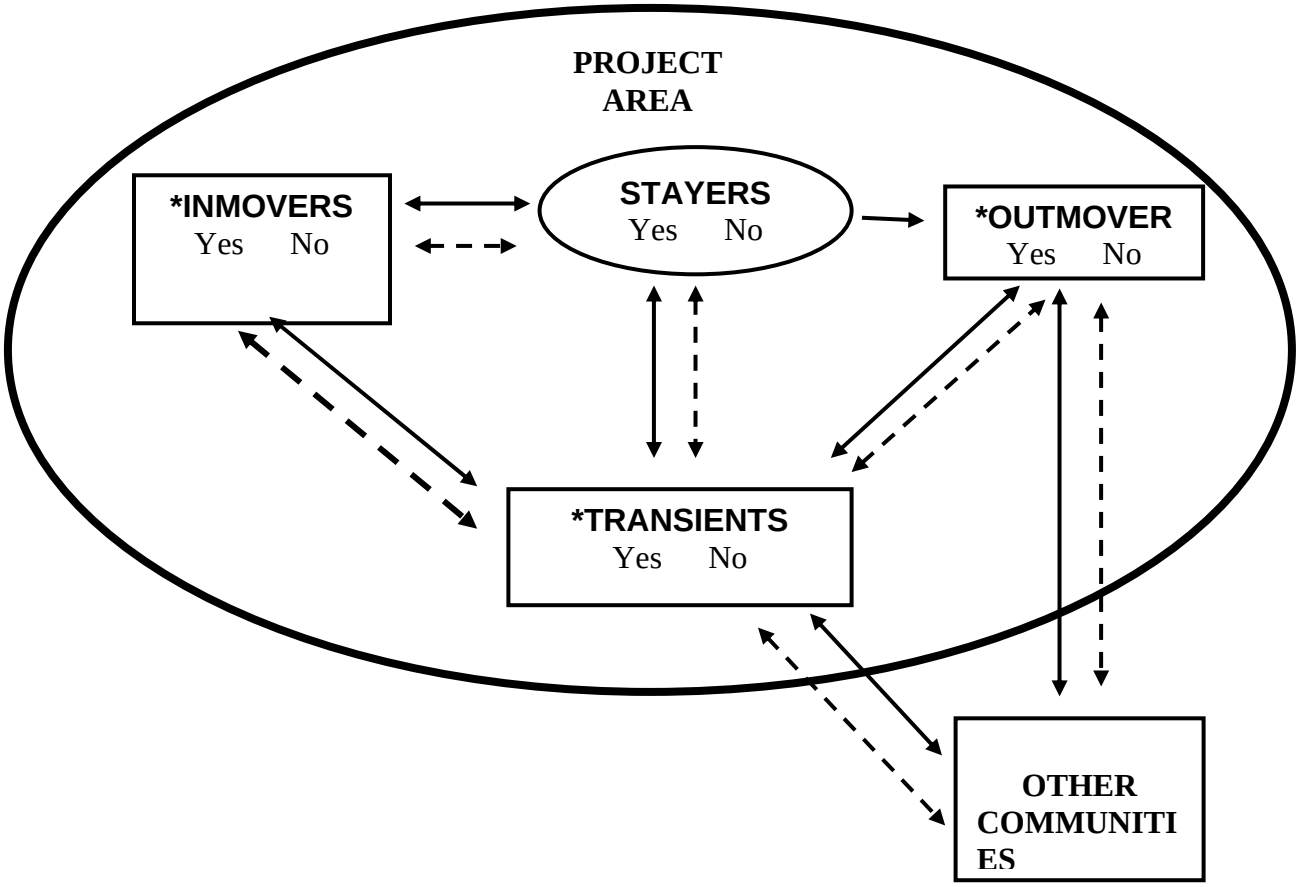
Step 2

This step will identify potential population movement associated with the development project. Thus, the following question must be answered:

Does this project induce population movement involving inmovers, outmovers, and transients (utilize **Figure U1**)?

If there is no population movement involving inmovers, outmovers, and transients then there is no need for a HIA to be conducted. Proceed to Step 3 if yes to any forms of population movement.

Figure U1: Population Movement and Potential HIV Transmission associated with Development Projects.



NOTE:

Points of contracting and/or transmitting HIV.

Points to prevent or minimize transmission of HIV.

*** Please check Yes or No**

Step 3

This step will determine the need and desirability of a HIA (utilize **Figure U2** – HIA Flow Chart). To utilize the HIA Flow Chart, data regarding the prevalence of HIV, STDs, TB, Hepatitis, other opportunistic diseases and risk behavior (utilize **Table U2**) in proposed project area, potential areas of origin of inmovers, potential destination of outmovers and among transients is required.

Table U2

Data for HIA Flow Chart

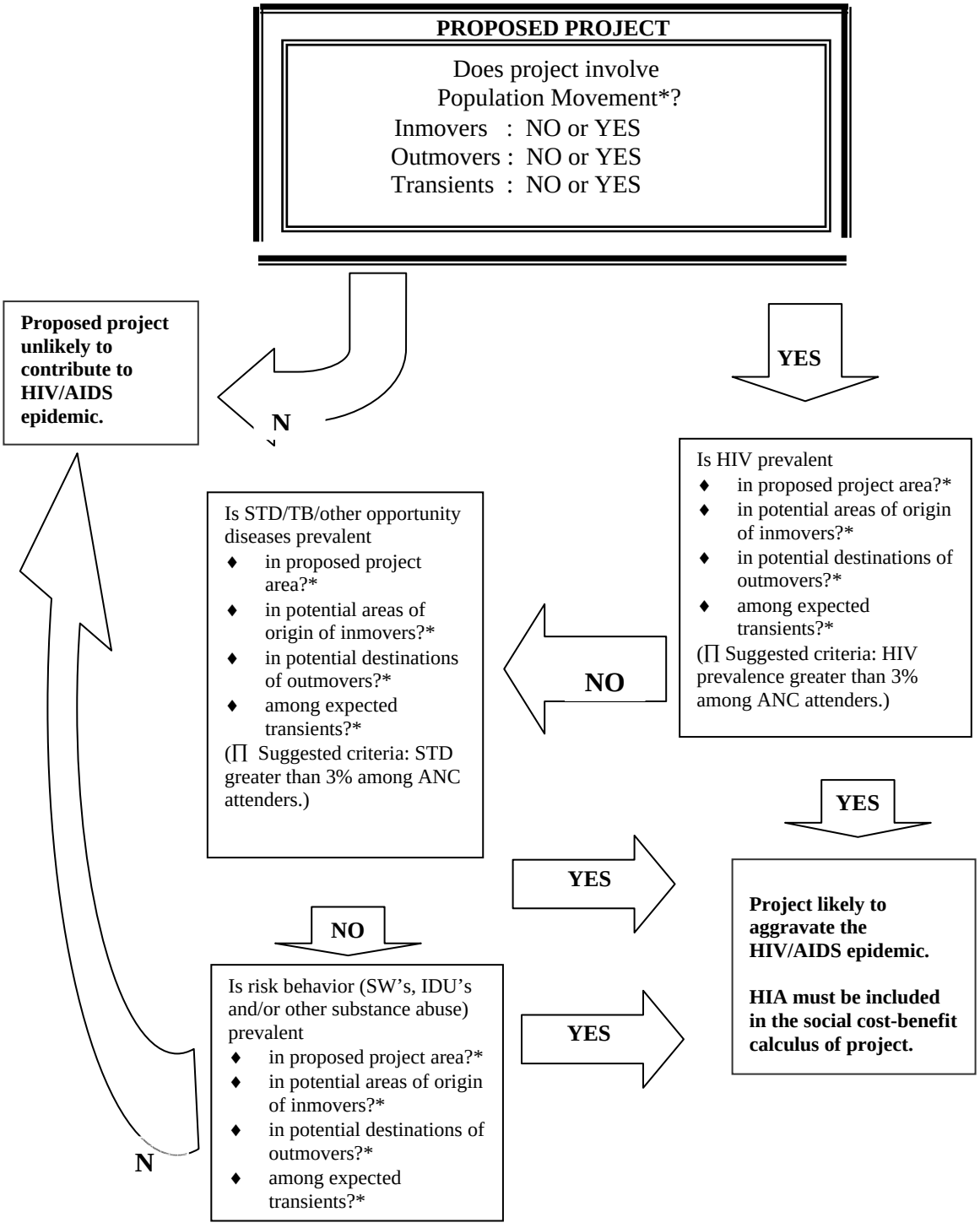
Information obtained for following table will be utilized in the HIA Flow Chart (see **Figure U2**).

	Stayers	Inmovers	Outmovers	Transients
a. HIV/AIDS incidence rates.				
b. HIV/AIDS prevalence rates.				
c. Prevalence of STD.				
d. Prevalence HIV/AIDS opportunistic diseases –TB.				
e. Prevalence HIV/AIDS opportunistic diseases – Hepatitis.				
f. Prevalence HIV/AIDS opportunistic diseases – Others, specify_____				
g. IVDU prevalence rate.				
h. High risk behavior - SW's.				
i. High risk behavior - Other substance abuse.				
j. High risk behavior - Alcohol abuse.				
k. High risk behavior - Others, specify_____				
l. Others, specify_____				

[Data for the above should come from the proposed project area, potential areas of origin of inmovers, potential destination of outmovers and among expected transients. As a guideline, if the prevalence rate is 3% or greater among Ante-natal Clinics (ANC) attenders then a full HIA exercise is strongly recommended.[19]]

[19] This criteria is suggested in Whiteside, A. (1999). However, after pilot testing and from new research on this issue, the figure used for this criteria may change accordingly.

Figure U2: HIA Flow Chart



* If **YES** to any of the listed alternatives in the box, follow the **YES** path.

∏ Suggested criteria follows Whiteside (1999:213).

Step 4

If a HIA is a required, then this step is needed to determine the risk environment and risk behavior based on data at individual, community and national level (utilize **Table U3, U4 and U5**). This set of data will be utilized to explain the potential social and economic impact of the proposed project on the HIV epidemic. This information will complement the quantitative cost of the proposed project on the HIV epidemic.

Table U3

Individual Level Information

[This is a guideline to gather individual level information to assess risk environment and risk behavior. The variables listed below are not exhaustive. Additional information at the individual level may be required depending on the social-cultural environment and geographical location of the proposed development project.]

Indicators	Inmovers	Out Movers	Stayers	Transients
Background characteristic				
1. Average Age.				
2. Gender (Male%/Female %).				
3. Ethnic group (%).				
4. Religion (%).				
5. Marital status (%).				
6. Average duration of marriage.				
7. Average number of children.				
8. Average age of children.				
9. Average education level (number of formal years).				
10. Percentage of unskilled workers.				
11. Average income.				
12. Type of income (daily, weekly, monthly – regular/irregular).				
13. Injecting drug use (%).				
14. Alcohol consumers (%).				
Migration				
15. Previous migration history.				
16. Total number of nights spent in places other than current residence in the last month.				
17. Away from home longer than one month during the last twelve months.				
Sexual behavior				
18. Average number of sex partners.				

19. Average age at first intercourse.				
20. Frequency of sex with regular partners.				
21. Frequency of sex with casual partners.				
22. Frequency of sex with sex workers				
23. Sexual preference: heterosexuality, homosexuality and bisexuality.				
24. Type of sexual activities preferred (anal, vaginal, oral, etc…)				
25. Peer group pressure to involve in unsafe sex.				
26. Frequency of condom usage.				
27. Negotiating skills. (condom use, safer injecting practices, etc…)				
28. History of STD infection.				
29. STD prevention and treatment.				
30. Culture of wife sharing.				
31. Knowledge, attitude, belief and practice (KABP) related to sexuality.				
32. Knowledge, attitude, belief and practice (KABP) related to HIV/AIDS.				

Table U4

Community Level Information

[This is a guideline to gather community level information to assess risk environment and risk behavior. The variables listed below are not exhaustive. Additional information regarding the community may be required depending on the social-cultural environment and geographical location of the proposed development project.]

Project Community Information	
General Information	
1. Ethnic composition (%).	
2. Religion composition (%).	
3. Gender composition (%).	
4. Age Structure.	
5. Dependency ratio of young and old age people.	
6. Proportion of family below poverty line.	
7. Occupation distribution.	
8. Education distribution.	
9. Population mobility.	
10. Cultural, religious practice and beliefs.	
11. Beliefs and practices regarding death and dying.	
12. Political characteristics of area.	
13. Availability of transport to town.	
14. Proximity to border towns.	
15. Barriers to in and out movement.	
16. Segregated housing for migrant population.	
17. Level and pattern of substance abuse e.g. alcohol, amphetamine, opiates, etc…	
18. Crime rate and patterns of deviance.	
19. Availability of recreation/leisure activities in the area (e.g. parks, sports facilities etc).	
20. Availability and accessibility of entertainment centers (theatres, movies, video arcades, massage parlors, health spa's, brothels, etc).	
21. Accessibility to various types of sex industry (e.g. child prostitution).	
22. Existence of community support groups/NGO's activities related to HIV/AIDS.	
23. Women's role and status in community.	
24. Education facilities.	
25. Social welfare services.	

26. Law enforcement (priority areas of enforcement).	

HIV/AIDS Related Information	
27. HIV/AIDS estimates.	
28. Incidence/prevalence of HIV/AIDS, STD.	
29. Availability and accessibility to HIV/AIDS prevention programmes.	
30. Availability and accessibility to clinics, hospitals, hospitals care and home base care.	
31. Availability and accessibility to STD clinics.	
32. Common illness in the area (morbidity), e.g. TB, Hepatitis B, Hepatitis C, etc…	
33. Availability and accessibility to sex education.	
34. Sexual beliefs and practices in community.	
35. Availability of condoms or condom outlets in the area.	
36. Knowledge, attitude and beliefs and practices about HIV/AIDS risk.	
37. Involvement of community leaders about the spread of HIV/AIDS.	
38. Community's reaction and responses to commercial sex.	
39. Community's acceptance, reaction and responses to people with HIV/AIDS.	
40. Handling of blood supplies and used syringes by health staff.	
41. Needle exchange programmes.	
42. Media's role in HIV prevention and education programme.	
43. Proportion of single headed household family in community.	
44. Discrimination and prejudice of marginalized groups.	
45. Unregulated exposure to pornography.	

Table U5

National Level Information

[This will give us information on HIV/AIDS related issues at the national level which may be determine the risk environment and risk behavior This will fill the gaps in information on the HIV/AIDS situation at the community or individual levels. The variables listed below are not exhaustive. Additional information may be required based on the need of individual countries.]

HIV/AIDS National Policy and Programme	
1. Condom distribution policy and programme.	
2. Needle exchange programme.	
3. Health and social welfare support for people living with HIV/AIDS.	
4. Welfare support to family members of people infected with HIV/AIDS (orphans, parental support).	
5. Treatment cost for people with HIV/AIDS: hospital care, home based care, hospital care.	
6. Prevention and information cost and publicity campaign cost.	
7. Loss of workdays due to HIV/AIDS.	
8. Cost of replacement workers (loss of production, training cost).	
9. Loss of income of care providers.	
10. Forgone income of the deceased.	

Step 5

This step involves costing the impact of HIV/AIDS based on quantifiable and non-quantifiable variables. (economic, medical, social and psychological). Apply **Tables C1 to C11.**

QUANTIFIABLE COST

In this step, a framework is provided to estimate the additional costs attributable to a project that aggravates the HIV epidemic by inducing population movements and creating an environment conducive to high risk behavior. The aggravation of the epidemic takes the form of the additional infections induced by HIV positive individuals who are residing in, or are attracted to, the project area. All costs with respect to these additional infections represent the additional costs attributable to the project.

(1) The number of HIV-Infections attributable to the project (over a 10 year period)

(2) The number of AIDS cases attributable to the project

(3) Medical costs of AIDS patients (attributable to the project)

(4) Income foregone due to disability and premature death associated with AIDS (attributable to the project.)

(5) Prevention costs (attributable to the project).

[No estimates of psychic costs are attempted here. Please refer to the report regarding the assumptions made and the limitations of the proposed methodology.]

1. Estimating the number of HIV-positive individuals within the project area. (Tables C 1-5)

All data in Table 1 must be obtained from potential areas of origin of the respective population groups are drawn.

Table C1: Data on SPRs in potential areas of origin of the respective population groups.

	Sero-prevalence Rate (SPR)		
	Inmovers (x)	Stayers/Outmovers (y)	Transients (z)
<u>High SPR Group</u>* a) Injecting Drug Users (IDUs)			
b) Sex workers			
c) Males attending STD Clinics			
d) Hemophiliacs			
e) Women attending ante-natal Clinics			
f) Others _____ _____ _____ _____			
<u>Low SPR Group</u> g) Blood Donors			

* These sub-groups are being used for illustrative purposes only.

Table C2: Estimating the composition of population groups likely to be drawn to the project area.

	Number of Persons		
	Inmovers* (x)	Stayers/Outmovers (y)	Transients** (z)
High SPR Group* **			
a) Injecting Drug Users (IDUs)			
b) Sex worker			
c) Males attending STD clinics			
d) Hemophiliacs			
e) Women attending ante-natal clinics			
f) Others _____ _____ _____			
Low SPR Group			
g) Blood Donors			

Notes: * If not available, proceed to Table U4 for inmovers.
** If not available, proceed to Table C5 for transients.
*** These sub-groups are being used for illustrative purposes only.

Table C3: Estimating the number of HIV-infected persons drawn to/within project area.

Column (x) of Table C1 × Column (x) of Table C2 = Column (x) of Table C3 below: Follow a similar procedure for column (y) and (z)

	Number of HIV-Infected Persons		
	Inmovers (x)	Stayers/Outmovers (y)	Transients (z)
<u>High SPR Group</u>* a) Injecting Drug Users (IDUs)			
b) Sex workers			
c) Males attending STD Clinics			
d) Hemophiliacs			
e) Women attending ante-natal Clinics			
f) Others _____ _____ _____			
<u>Low SPR Group</u> g) Blood Donors			
Total	X_1 =	X_2 =	X_3 =

* These sub-groups are being used for illustrative purposes only.

Alternative approach for estimating the number of HIV-infected persons among Inmovers

The data on composition of inmover population required in Table C2 might not be available because this is difficult to predict in advance. If this is the case, Table C4 below outlines an alternative procedure for estimating the number of HIV infections among inmovers.

Table C4: Estimating the number of HIV-Infected persons among Inmovers (Alternative Approach)

Risk Category	**SPR** (x)	**No. of Inmovers** (y)	**Estimated HIV-Infections** (h) $h = (x) \times (y)$
High SPR Group	*	**	H_1
Low SPR Group	***	****	H_2
Total number of HIV-Infected persons			$\sum_{i=1}^{2} H_i$

Notes: * Use the highest SPR from column (x) of Table C1
** Estimate independently the number of inmovers with high SPRs.
*** Use the SPR for blood-donors from column (x) of Table C1
**** Estimate independently the number of inmovers with low SPRs.

Alternative approach for estimating the number of HIV-infected persons among Transients

The data on the composition of transient population may be difficult to obtain because of the problems of identifying their areas of origin. In that case, their composition by sectors of employment is estimated and sectoral SPRs are used.

Table C5: Estimating the number of HIV-infected persons among Transients (Alternative Approach)

Composition**	**Estimated Numbers** (x)	**SPR*** (y)	**Estimated HIV-infections** (H) H = (x) × (y)
Transport Sector Workers			H_1
Construction Sector Workers			H_2
Sex Industry Workers			H_3
Other Workers _____ _____ _____			H_4
Total number of HIV-Infected persons			$\sum_{i-1}^{4} H_i$

Note: * Estimates obtained from regional or national data or comparable data from other countries.

** These sub-groups are being used for illustrative purposes only.

Table C6: Estimating the number of HIV-infections and AIDS cases attributable to the project.

Groups	**Number of HIV-Infected Persons**
Inmovers Stayers/outmovers Transients	X1 (From Table C3 or C4) X2 (From Table C3) X3 (From Table C3 or C5)
Total HIV-infections attracted to/within the project area	$\sum_{i=1}^{3} X_i$
Total HIV-Infections attributable to the project = Total AIDS patients attributable to the project (by assumption)	$(5)^{*}\sum_{i=1}^{3} X_i$

Note: * This figure represents the estimated number of additional infections a single HIV positive person is assumed to cause over a 10-year period. A different figure can be used if better information is available or a longer period of downstream infections is being considered.

Cost Of AIDS

1. Medical Costs (Tables C7-9)

Table C7: Inpatient treatment costs

Non-Drug Charges	Data	Notes on Computation
(a) Total hospital care charges per year.		
(b) Total number of days all patients stayed in the hospital per year		
(c) HCPD (Hospital charges per day)		(a) ÷ (b)
(d) Average length of stay in hospital per AIDS patient		
(e) Cost of non-drug care per patient		(c) × (d)
(f) Total number of AIDS patients		From Table U6
(g) Total non-drug charges for all AIDS patients		(e) × (f)
Drug Costs		
(h) DCPD (Drug Cost per patient day)		
(i) Total drug cost per AIDS patient		(d) × (h)
(j) Total drug cost		(i) × (f)
Total inpatient treatment costs		(g) + (j)

Table C8: Outpatient treatment costs

Test/Treatment	**Cost per test/dose** (x)	**No. of test/dose** (y)	**Total Cost** C= (x) × (y)
(a) Immune Test		(10)*	C1
(b) AZT Treatment			C2
(c) Other Drug Therapies			C3
(d) Total cost of outpatient visits per patient			$\sum_{i+1}^{3} C_i$
(e) Number of AIDS patients. (from Table C6)			
(f) Total costs of outpatient treatment.			(d) × (e)

Note: * Average as reported for South Korea (Yang, 1993). Use local figures if available.

Table C9: Total Medical Cost

	Data	Notes on Computation
(a) Direct Treatment (i) Total inpatient treatment costs		(From Table C7)
(ii) Total outpatient treatment costs		(From Table C8)
(iii). **Total direct treatment costs**		(i) + (ii)
(b) Cost of Alternative Treatment (If any) (i) Cost of alternative treatment per patient		
(ii) Number of patients		
(iii) **Total cost of alternative treatment**		(i) + (ii)
(c) Home Care Costs (C1) Professional nurses/care providers. (i) Average charges per patient day		
(ii) Average number of days care needed		
(iii) Number of AIDS patients		
(iv) Total home care care cost.		(i) × (ii) × (iii)

Table C9: Total medical costs *(Continued)*

	Data	Notes on Computation
(C2) Non-paid care providers. (i) Estimate of income foregone per day		
(ii) Average number of days care required		
(iii) Cost of non-paid care providers per patient		(i) × (ii)
(iv) Number of AIDS patients.		
(v) Total income foregone by non-paid care providers.		(iii) × (iv)
(C3) Home-care Drugs (If any) (excluding outpatient drugs) (i) Average cost of drugs per day		
(ii) Average number of days drugs administered.		
(iii) Cost of home-care drugs per patient.		(i) × (ii)
(iv) Number of AIDS patients		
(v) Total cost of home-care drugs		(iii) × (iv)
(d) Total home-care costs		C1 (iv) + C2 (v) + C3 (v)
Total Medical Costs		a (iii) + b (iii) + (d)

Table C10: Income foregone

	Data	Notes on Computation
(a) Loss of income due to disability. (i) Average disability period per patient	(18 months) *	
(ii) Average earnings per month per patient		
(iii) Loss of income due to disability per patient.		(i) × (ii)
(iv) Number of AIDS patients.		From Table C6
(v) Total Income cost due to disability.		(iii) × (iv)
(b) Income foregone due to premature death. (i) Annual income foregone per patient (S)		
(ii) Rate of discount (r)		
(iii) Working life lost (t)		(Age of retirement - age at death)
(iv) Present value of income foregone.		$S\left(\frac{1}{r}\right)\left[1-\frac{1}{(1+r)^t}\right]$
(v) Number of AIDS patients.		From Table C6
(vi) Total income foregone.		(iv) × (v)

Note: * Illustrative data from South Korea (Yang, 1993). Use local figures if available.

Table C11: Prevention costs

	Data	Notes on Computation
(a) AIDS related expenditure by MOH, per year.		
(b) Donors (AIDS Programmes) to MOH (If not included above), NGO's and private organizations, per year.		
(c) Private organization expenditures (excluding aid from donors), per year.		
(d) Total prevention costs, per year.		(a) + (b) + (c)
(e) Total population (of country)		
(f) Prevention costs per capita, per year.		(d) ÷ (e)
(g) No. of HIV cases attributable to project		From Table C6
(h) Prevention costs per year		(f) × (g)
(i) Total prevention costs attributed to project.		(h) × (10)*

Note: *If a longer period of downstream infections is considered, this time period will increase accordingly.

Step 6

The final step evaluates possible preventive intervention strategies to mitigate the potential impact on HIV/AIDS epidemic (utilize **Table U6**).

Table U6

Preventive Intervention Strategies

Listed below are some identified risk factors and responses associated with development projects. This list is neither exhaustive nor complete.

It must be noted that not all risk factors will be relevant in all cases. Furthermore, each response would have its pros and cons. The evaluation of risks and responses must therefore be tailored to the specific project that is being evaluated.

RISK FACTORS	**RESPONSES**
Sex Outlets	♦ Effective Enforcement ♦ Legalize & Regulate ♦ Education & Counseling ♦ Health Services ♦ Optional Employment
Multiple Partners	♦ Educational Campaign
IDU (Injecting Drug Use)	♦ Effective Enforcement ♦ Legalize & Regulate ♦ Education & Counseling ♦ Health Services ♦ Needle Exchange
Other Substance Abuse	♦ Effective Enforcement ♦ Legalize & Regulate ♦ Education & Counseling ♦ Health Services ♦ Needle Exchange
High Risk Behavior of Youth	♦ BCC – Behavior Change ***Communication*** ♦ IEC – Information, Education Communication ♦ Access to Condom ♦ Youth Drop-In Centers ♦ Sports Facilities ♦ Peer Education ♦ Negotiating Skills ♦ Parenting Skills ♦ Sex Education ♦ Substance Abuse Education ♦ Value Based Education

Unsafe Sex	♦ BCC ♦ IEC ♦ Condom Outlet ♦ Outreach Outlet
Increase Sero-Prevalence Rate of Labour Origin Place	♦ IEC/BCC ♦ Counseling ♦ Test Them
Migration without Families	♦ Housing ♦ Counseling
Crime	♦ Effective Enforcement
Dislocation (Loneliness)	♦ Cultural Assimilation and Association ♦ Community Centers
Indirect/Casual Commercial Sex	♦ IEC/BCC

Appendices

A Hypothetical example of a Computation using a HIA Spreadsheet.

Table 1: Data on SPRs in potential areas from which the respective population groups are drawn.

	Sero-prevalence Rate (SPR)		
	Inmovers (x)	Stayers/Outmovers (y)	Transients (z)
High SPR Group*			
a) Injecting Drug Users (IDUs)	0.5114	0.4114	
b) Sex workers (SWs)	0.1667	0.1567	
c) Males attending STD clinics	0.0832	0.0732	
d) Homosexual males	0	0	
e) Bisexual males	0	0	
f) Hemophiliacs	0	0	
g) Others	0.0176	0.0176	
_____			
_____			
_____			
Low SPR Group			
h) Blood donors	0.0044	0.0044	

* These sub-groups are being used for illustrative purpose only.

Table 2: Estimating the composition of population groups likely to be drawn to the project area.

	Sero-prevalence Rate (SPR)		
	Inmovers* (x)	Stayers/Outmovers (y)	Transients** (z)
High SPR Group***			
a) Injecting Drug Users		100	
b) Sex workers		100	
c) Males attending STD clinics		100	
d) Homosexual males		0	
e) Bisexual males		0	
f) Hemophiliacs		0	
g) Others		400	
_____			
_____			

_____			
Low SPR Group			
h) Blood donors		5000	

Notes: * If not available, proceed to Table 4 for inmovers
** If not available, proceed to Table 5 for transients
*** These sub-groups are being used for illustrative purpose only.

Table 3: Estimating the number of HIV-infected persons drawn to/or within project area.

	Sero-prevalence Rate (SPR)		
	Inmovers (x)	Stayers/Outmovers (y): (T.1(y) x T.2(y))	Transients (z)
High SPR Group*			
a) Injecting Drug Users		41.14	
b) Sex workers		15.67	
c) Males attending STD clinics		7.32	
d) Homosexual males		0	
e) Bisexual males		0	
f) Hemophiliacs		0	
g) Others		7.04	
_____			
_____			
_____			
Low SPR Group			
h) Blood donors		22	
Total		**93.17**	

* These sub-groups are being used for illustrative purpose only.

Table 4: Estimating number of HIV-infected persons among Inmovers (Alternative Approach).

SPR Category	**SPR (x)**	**No. of Inmovers (y)**	**Estimated HIV-Infections (H) H= (x) x (y)**
High SPR	0.5114*	250**	H1=127.85
Low SPR	0.0044***	250****	H2=1.1
Total number of HIV-infected persons.			**128.95**

Notes: * Use the highest SPR from column (x) of Table C1
** Estimate independently the number of inmovers with high SPRs.
*** Use the SPR for blood-donors from column (x) of Table C1
**** Estimate independently the number of inmovers with low SPRs.

Table 5: Estimating the number of HIV-infected persons among Transients (Alternative Approach).

Composition**	**Estimated Numbers** (x)	**SPR*** (y)	**Estimated HIV-Infections (H)** H=(x) x (y)
Transport Sector Workers	300	0.045	H1=13.5
Construction Sector Workers	500	0.06	H2=30
Sex Industry Workers	100	0.1667	H3=16.67
Other Workers	300	0.0044	H4=1.32
Total number of HIV-Infected persons			**61.49**

* Notes: Estimates obtained from regional or national data or comparable data from other country.
** These sub-groups are being used for illustrative purpose only.

Table 6: Estimating the number of HIV-infections and AIDS cases attributable to the Project.

Groups	**No. of HIV-Infected Persons**
Inmovers	128.95
Stayers/outmovers	93.17
Transients	61.49
Total HIV-infections attracted to/within the project area.	$\sum_{i=1}^{3} X_i =$ 283.61
Total HIV-infections attributable to the project = Total AIDS patients attributable to the project (by assumption)	$(5)\sum_{i=1}^{3} X_i^{*} =$ 1,418.05

Note: * This figure represents the estimated number of additional infections a single HIV-positive person is assumed to cause over a 10-year period. A different figure can be used if better information is available or a longer period of downstream infections is being considered

Table 7: Inpatient treatment costs (in US $).

Non-drug Charges	Data	Notes
(a) Total hospital care charges per year	350.00	
(b) Total no. of days all patients stayed in hospital per year	20.00	
(c) HCPD (hospital charges per day)	17.50	(a) ÷ (b)
(d) Average length of stay in hospital per AIDS patient(days)	41.00	
(e) Cost of non-drug care per patient	717.50	(c) x (d)
(f) Total number of AIDS patients	1,418.05	Sh.1,E107
(g) Total non-drug charges for all AIDS patient	**1,017,450.88**	(e) x (f)
Drug Charges		
(h) DCPD (drug cost per patient day)	3.00	
(i) Total drug charges per AIDS patient	123.00	(d) x (h)
(j) Total drug cost	**174,420.15**	(i) x (f)
Total Inpatient Treatment Costs	**1,191,871.03**	(g) + (j)

Table 8: Outpatient treatment costs.

Test/Treatment	Cost per test/dose/mth (x)	No. of tests/doses/mths (y)	Total cost C=(x) x (y)
(a) Immune Test	90.00	10.00	900.00
(b) AZT Treatment (months)	192.00	6.85	1,315.20
(c) Other Drug therapies	10.00	20.00	200.00
(d) Total cost of outpatient visits per patient			2,415.20
(e) Number of AIDS patients (Sh.1, E135)			1,418.05
(f) Total costs of outpatient treatment			**3,424,874.36**

Note: Number of immune tests and AZT treatment as reported for South Korea (Yang, 1993). Use local figures if available

Table 9: Total Medical Costs (in US $).

	Data	Notes
(a) Direct Treatment		
(i) Total inpatient treatment costs	1,191,871.03	
(ii) Total outpatient treatment costs	3,424,874.36	
(iii) Total direct treatment costs	**4,616,745.39**	a(i)+ a(ii)
(b) Cost of Alternative Treatment (if any)		
(i) Cost of alternative treatment per patient	100.00	(India)per year
(ii) No.of patients (assume 10% of total AIDS patients attributable to project)	141.81	
(iii) Total cost of alternative treatment	**14,180.50**	b(i) x b(ii)
(c) Home Care Costs		
(C1) Professional nurses/care providers		
(i) Average charges per patient day		
(ii) Average number of days care needed		
(iii) Number of AIDS patients		
(iv) Total professional care cost	0	
(C2) Non-paid care providers		
(i) Estimate of income foregone per day		
(ii) Average number of days care required		
(iii) Cost of non-paid care providers per patient	1,765.00	Malaysia
(iv) Number of AIDS patients	1,418.05	
(v) Total income forgone by non-paid care providers	**2,502,858.25**	(C2)(iii) x (iv)
(C3) Home-Care Drugs (if any) (excluding outpatient drugs)		
(i) Average cost of drugs per day		
(ii) Average number of days drugs administered		
(iii) Cost of home-care drugs per patient	6,667.00	Malaysia
(iv) No. of patients (assume 10% of total AIDS patients attributable to project)	141.81	assume 10% of total
(v) Total cost of home-care drugs	**945,413.94**	(C3)(iii) x (iv)
(d) Total home-care costs	**3,448,272.19**	C1(iv)+C2(v)+C3(v)
Total Medical Costs	**8,079,198.07**	a(iii) + b(iii) + (d)

Table 10: Income Foregone (US $).

	Data	Notes
(a) Loss of income due to disability		
(i) Average disability period per patient (months)	18.00	Korea Data
(ii) Average earnings per month per patient	294.00	Malaysia
(iii) Loss of income due to disability per patient	5,292.00	(i) x (ii)
(iv) Number of AIDS patients	1,418.05	Sheet 1, E107
(v) Income lost due to disability	**7,504,320.60**	(iii) x (iv)
(b) Income foregone due to premature death		
(i) Annual income foregone per patient (S)	3,530.00	Malaysia
(ii) Rate of discount (r)	0.05	
(iii) Working life lost (t) (years)	30	Retirement age - age at death
(iv) Present value of income foregone	($54,264.75)	$S\left(\frac{1}{r}\right)\left[1-\frac{1}{(1+r)^t}\right]$
(v) Number of AIDS patients	1,418.05	Sheet 1, E107
(vi) Income foregone due to premature death	($76,950,131.75)	(iv) x (v)

Table 11: Prevention costs (US $).

	Data	Notes
(a) AIDS related expenditure by MOH, per year	73,229,503	Thailand 1997
(b) Donors (AIDS Programmes) to MOH,(if not included in above) NGO's and private organizations per year	3,000,000	Thailand 1997
(c) Private organization expenditures (excluding aid from donors), per year	1,500,000	estimate 50% of (b)
(d) Total prevention costs, per year	**77,729,503**	(a) + (b) + (c)
(e) Total population (of country)	60,000,000	Thailand 1997
(f) Prevention costs per capita, per year	1.2955	(d) ÷ (e)
(g) No. of HIV cases attributable to project	1,418.05	from sheet1, E107
(h) Prevention costs per year	1,837.07	(f) x (g)
(i) Total prevention costs attributable to project	**18,370.72**	10 x (h) See Note: *

Note: * If a longer period of downstreams infections is considered, this time period will increase accordingly.

Notes to Accompany the Spreadsheet

[The following notes accompany the hypothetical example of a computation using a spreadsheet. The spreadsheet programme (Excel file) in the attached diskette will be utilized to calculate costs.]

Table 1

1. **SPR's Inmovers** – Thailand data, June 1999; Source: Division of Epidemiology, Ministry of Public Health, Thailand.

2. **SPR's – Stayers/Outmovers**
   - rows (a) to (c) estimated by reducing the SPRs for Inmovers by 0.01.
   - rows (g) to (h) same as SPR Inmover – Thailand.

Table 2

All Estimates

Table 4

Assume 500 Inmovers – 50% high SPR, 50% low SPR.

Table 5

- **Transient Workers Composition** – estimated.
- **SPR Transport Sector Workers**, Thai data; Source: Giraud, P: in Bloom/Lyons, 1993. p. 83.
- **SPR Sex Industry Workers** – as in Table 1, SPR (sex workers)
- **SPR Other Workers** – as in Table 1, SPR (low SPR – Blood Donors)
- **SPR Construction Sector Worker** – estimate

Table 7

(a) **Total hospital care charges** – Indian Data; Source: MDACS (Mumbai District AIDS Control Society) and LTMM Hospital, India

(b) **Total number of days** …… - estimate
(d) **Average length of stay** (41days) Korean Data; Source:Yang in Bloom/Lyons, 1993, p. 47.
(h) **DCPD** – US$3 – Indian Data; Source: MDACS (Mumbai District AIDS Control Society) and LTMM Hospital, India

Table 8

(a) **Immune Test Cost** – US$90, Korean data; Source:Yang in Bloom/Lyons, 1993, p. 46
(b) **AZT Treatment** - Korean Data; Source:Yang in Bloom/Lyons, 1993, p. 46
(c) **Other Drug Therapies** – estimate.

Table 9

(c) Cost of Alternative Treatment
(i) Indian data, estimated by IIPS, Deemed University, Mumbai
(ii) Number of patients – assume 10% of total number of AIDS patients attributable to project (1419)
(iii) For (i) US$100 per year since mean survival rate of AIDS patients is 1 year Korean data; Source:Yang in Bloom/Lyons, 1993, p. 47

(C2) (iii) **Cost of non-paid care providers per patient** US$1765, Malaysian data; David Lim, 1997
(C3) (iii) **Cost of home-care drugs per patient**.
- Assume 1 year survival period, Malaysian data; provided by Dr. Goh of Penang General Hospital
- Average RM2000 per month – assume RM20,000 a year (÷3=US$6667 per year)

(iv) **Number of AIDS patients** – assume 10% of total AIDS patient attributable to project (1418.05).

Table 10

(a) (i) **Average disability period**…… 18 months. Korean data; Yang in Bloom/Lyons, 1993, p. 48.
(ii) **Average earnings**……US$294. Malaysian Data; David Lim 1997 – per capita income US$3532÷12= US$294 per month)
(b) (i) **Annual Income foregone**…… US$3520. Malaysian Data; David Lim 1997 per capita income)
(iii) **Working life lost**:30 (Age of retirement 60 – age at death 30)

Table 11

(a) ___ US$1. Source: AIDS Division, Thailand.

(b) **Donors** (AIDS) …… 1997 Thailand data; exchange rate at 30 baht to US$1. Source: AIDS Division, Thailand.

(c) **Private Organization** …… [estimate: ½ of (b)]

Please contact us:

UNDP

Regional Bureau for Asia and the Pacific
HIV and Development Programme
DC1-23rd FL.
1 UN Plaza
New York, NY 10017
U.S.A.
Tel: 1-212-906-5838/6910
Fax: 1-212-906-6336/5898
Attention: Benjamin Brown
benjamin.brown@undp.org
http://www.undp.org/hiv
http://www.hivundp.apdip.net

APHIRT

Asia-Pacific HIV Impact Research Team
c/o AIDS Action Research Group
School of Social Sciences
Universiti Sains Malaysia
11800 Penang
Malaysia
Tel: 604-6565984
Fax: 604-6565984
Attention: Dr. P. Sundramoorthy
moorthy@usm.my