In recent years considerable effort has been made to estimate the resource requirements for funding a comprehensive AIDS response, especially at the global level. Several estimates of the cost of a comprehensive response were produced over the last few years and they have been instrumental in driving the mobilization of substantial resources for HIV/AIDS. In contrast, the effort spent in estimating the cost of AIDS response at country level has remained more limited. But this is changing as there is now increased recognition that National AIDS strategies need to be more evidence-informed (so at to respond to specific local transmission patterns and results), prioritized, results-based and costed. The purpose of this note is to provide assistance and guidance on costing an AIDS response while ensuring that the costing process informs the formulation of National AIDS Strategies and their integration in Poverty Reduction Strategy Papers (PRSPs).

Overview: Ideal and Existing Approaches

In an ideal world costing would be an integral part of the formulation of national AIDS strategies. First, it would indicate how much it would cost to achieve the specific targets of each program. Second, it would inform the selection of priority programs and interventions and assist planners in designing cost-effective programs. And third, it would help mobilize funding by providing donors and governments with an estimate of the funding gap that should be closed to implement the strategy.

In practice, there are few examples of national AIDS strategies that meet this ideal situation. Typically, AIDS strategies include a comprehensive set of interventions covering prevention, care and treatment, but few include indicators of results, costs and budget for implementation. Taking the example of the interventions targeting youth and vulnerable children in Sub-Saharan African countries, one finds that most PRSPs include priority actions for this group, but a much smaller percentage lists indicators that would help monitor the implementation progress and an even smaller percentage indicates the available budget for implementing the interventions. Obviously, this raises a strong risk that the AIDS strategy will not be implemented as intended (Figure 1).

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Challenges

Estimating the cost of strategies does not contribute automatically to informing the design and selection of interventions. Costing is usually done using models which require the detailed information provided by implementation plans. As a result, costing takes place once the implementation plan is prepared, which means that it occurs at the end of the planning process. In other cases, the AIDS strategy is not costed. As indicated by the 2007 report of the Secretary General\(^3\), about 70 countries are in the process of updating or developing their national AIDS framework but only 25 have costed their updated plans.

For costing to become much more widespread than is currently the case, it has to prove its value-added. It has to show its relevance by assisting stakeholders in focusing their activities on interventions that are cost-effective as well by helping development partners implement programs that are key to the success of the strategy and mobilize the required funding. Costing is therefore useful to the extent it:

- **Informs the formulation of PRSPs.** One objective of costing is to provide an estimate of the implementation cost of programs at an early stage, which would help inform the selection of priorities. This is an argument for having an easy to use costing model that generates quickly estimates of the cost of AIDS strategies.

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\(^3\) Declaration of Commitment on HIV/AIDS: 2007 report of the Secretary General: focus on progress over the last 12 months. UN, 2007.
• **Becomes part of the national budgeting processes** such as the preparation of annual government budgets and/or Medium-term Expenditure Frameworks (MTEF). For that, a detailed costing framework, relying on a chart of accounts, is needed to provide a link between the costed programs and the budget categories used by governments for formulating their budgets. Typically, this work would be done by using a more detailed costing model that would be prepared once the implementation plan has been finalized. Its objective would be to ensure that the resource needs for the AIDS response are incorporated into the annual government budget and the MTEF.

• **Informs other costing.** This is especially important in view of the current initiative to reach universal access by 2010. In many cases, reaching these targets requires the implementation of programs for health systems strengthening and expanding the capacity of health infrastructure. As these programs benefit both HIV/AIDS interventions and other health programs, they extend beyond the scope of the AIDS response and for this reason they are best addressed as part of the health sector reforms and financing.
DESCRIPTION OF THE MODEL

How to proceed with costing an AIDS strategy is an important question facing government officials. Costing should be viewed as an integral part of the design of AIDS strategies rather than having its role confined to making a case for high levels of funding. In line with the evolving notion of what is a “strategy”, costing has to similarly change. Until recently, a strategy consisted mainly of a list of generic interventions that were meant to guide the actions of governments. Following increased awareness that the HIV epidemic is much more heterogeneous than commonly thought, AIDS strategies have become more country-specific and results-based. These new orientations have recently received added urgency in view of the sharp increase in the projected cost of funding the AIDS response at the global level. Faced with competing demands for more resources, donors and governments want to be assured that allocating more resources for funding the AIDS response will indeed provide “value for money”. The first step towards achieving this goal is to ensure that costing is part of strategic planning.

Costing and Strategic Planning

Costing is an essential element of the preparation of a National AIDS Strategy that is result-based, evidence-based and prioritized with clear targets and monitoring indicators. The first step in formulating an AIDS strategy is to carry out an analysis of the trends and behaviors driving the HIV epidemic in a specific country. This is an essential step for identifying the main issues, the programs to address them and the key results to be attained (Figure 3).

Once the key programs have been identified, the next task is to select the key interventions that form these programs and cost them as follows:
• The key programs of the strategy would be first costed using a simplified costing model at an early stage of preparation of the strategy. A key objective of this exercise would be to generate different scenarios that would indicate the cost of scaling up of the AIDS response and reaching universal access. Following the endorsement of the universal access initiative in June 2006, more countries are incorporating its goal of reaching universal access by 2010 in their AIDS strategies. But few countries have assessed what should be done if the needed financial resources are not available. To do that in a manner that influences the AIDS strategy, costing has to be done early and in a manner that allows many different scenarios for scaling up the AIDS response to be run quickly.

• A more detailed and complete costing of the AIDS strategy would take place once the implementation is finalized. At that time, enough information would be available to carry out a full costing of all activities and in a manner that would integrate costing within existing budgetary processes. The unit costs of interventions would be calculated from the bottom up using input spreadsheets that would be based on the chart of accounts used by government for preparing its budget. This would allow to “translate” the cost of the programs into the functional categories of the budget.

• Human and physical constraints that may affect the speed at which interventions can be scaled up would be addressed separately. For example, the lack of health professionals could also be addressed by resorting to other software specifically designed for that purpose, such as the ---- of Abt Associates.

Costing the National AIDS Strategies

Costing the global AIDS response. Since the mid-1990s various models have been formulated for estimating the resource needs of an AIDS strategy. The first estimate of the global cost of AIDS programs appeared in 1996, but it covered prevention activities only. A more complete model covering prevention, treatment and care was subsequently developed for estimating the cost of scaling up the AIDS response to sub-Saharan African countries (ActAfrica, 2000). This approach was revised and extended to all low and middle-income countries in 2001 and served to present the cost of a global response at the United Nations General Assembly Special Session on HIV/AIDS in

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5 Broomberg J., Soderlund N., Mills A. Economic Analysis at the global level: a resource requirement model for HIV prevention in developing countries. Health Policy 1996; 38:45-65
Subsequently, revision of the estimates took into account key changes such as new cost data (following decreases in the price of antiretroviral drugs) or new interventions that came to be part of the standard package of HIV/AIDS interventions. Revised estimates were published by UNAIDS in 2004 and the most recent ones in 2005. The latest estimates forecast that US$22.1 billion would be needed for meeting the cost of a comprehensive AIDS response by 2008.

**Costing AIDS strategies at country level.** The Resource Needs Model (RNM) has been used extensively for estimating the resource requirements of countries. It was most recently updated by the Futures Institute and the University of Cape Town in 2007. The model estimates the cost of three programs, namely prevention, care and treatment, and mitigation support. The interventions listed under each component are those that are recommended by UNAIDS to be included in a comprehensive AIDS response.

The **prevention component** includes the following interventions:

- **General population**
  - Mass media
  - Community mobilization
- **Priority populations**
  - Youth focused interventions
  - Interventions focused on sex workers and their clients
  - Workplace programs
  - Harm reduction for injecting drug users
  - Interventions focused on men who have sex with men
- **Service delivery**
  - Condom provision
  - Improving STI management
  - Voluntary Counseling and Testing
  - Prevention of mother-to-child transmission
- **Health care**
  - Blood safety
  - Post exposure prophylaxis
    - Safe injection
    - Universal precautions

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8 Similar work was done by the Commission on Macroeconomic and Health (2001) and the UN Millennium project (2002) for estimating the cost of attaining the Millennium Development Goals
The **care and treatment component** estimates the cost of care and treatment programs, including:

- Anti-retroviral therapy (ART), including laboratory tests for monitoring ART and treatment of OIs while on ART
- Care and prophylaxis in the absence of ART
- Diagnostic HIV testing
- Home-based care
- Palliative care
- Tuberculosis treatment

The **mitigation component** calculates the cost of interventions to support orphans and vulnerable children (OVC):

- Educational support
- Health care support
- Family/home support
- Community support
- Administrative expenses

Each component includes a population target group, coverage targets (for interventions) and unit costs.

- **Population target groups**
- **Unit costs**
- **Coverage targets**

**Figure 2**: Outline of Resource Needs Model

The basic approach is to first estimate the **population in need of services**. This is defined as the group who could potentially have access to services given the existing social infrastructure --for example, the youth group in need of HIV education would be those children which are attending school. The next step is to identify a **coverage target**, which is essential for estimating the proportion of the target group that will actually have access to interventions. Taking the same example, the coverage of HIV education would indicate the percentage of children in school who are reached by HIV education.
programs. Finally, the total cost of the AIDS plan is calculated as the product of the unit cost of the intervention by the number of people accessing the intervention. Since the model estimates costs that are associated with different levels of coverage of the population in need of services, these cost estimates should always be judged in relation to the target coverage. The central concepts of population target groups, coverage targets and unit costs are summarized in Table 1

Table 1: Resource Needs Model – Key Concepts

<table>
<thead>
<tr>
<th>Programs</th>
<th>Population in need of services</th>
<th>Coverage of interventions</th>
<th>Unit cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention</td>
<td>For some programs the target group is a segment of the general population such as school children. Others include the whole population such as mass media.</td>
<td>Targets are set at levels deemed necessary for turning around the epidemic. However, they differ for each of the three types of HIV epidemic (low, concentrated and generalized).</td>
<td>Unit costs are derived from regional consultation with experts and published project descriptions.</td>
</tr>
<tr>
<td>Care and treatment</td>
<td>There are different definitions. Most common is the number of people who in the absence of therapy would likely die within two years.</td>
<td>Coverage goal applies to the people in need of treatment. Current target goal of universal access is to reach 80% of people in need of treatment</td>
<td>Costs are derived from dataset.</td>
</tr>
<tr>
<td>Mitigation support</td>
<td>Target includes all orphans (maternal, paternal and dual orphans) from AIDS and non-AIDS causes. Only OVCs below the poverty line are included for Africa and only AIDS orphans for other regions.</td>
<td>Target coverage is 100% by 2010. Selection of interventions follows that of UNICEF.</td>
<td>Unit costs are derived from UNICEF.</td>
</tr>
<tr>
<td>Program costs</td>
<td>Costs are estimated for each program category</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

KEY STEPS IN COSTING

Unlike more detailed costing models that may take place once the implementation plan is finalized, the objective of a simplified costing model is to estimate the resource requirements of the main programs of the strategy. How to proceed is summarized below and further explained in the following paragraphs.
Population in Need of Services

An effective national response provides adequate HIV services to those population groups that are most vulnerable, at risk of infection and critical to the dynamic of the epidemic. Efforts will therefore have to be spent in “knowing your epidemic”. Identifying the key drivers of the epidemic is therefore the first step that will inform the identification of population groups and the selection of interventions that are important.
for reversing the course of the epidemic. For example, if a country has a concentrated epidemic in which injecting drug use and sex work are responsible for most new infections, the strategy ought to give priority to these two areas. This would imply aiming for a high coverage of high risk groups and ensuring that they get access to proven interventions.

In generalized epidemics, the number of interventions that should be included in a strategy and costed has to be much greater for the simple reason that the HIV epidemic affects the whole population. This by itself creates a challenge for prioritizing interventions, which often leads to a lack of prioritization as all interventions that are part of a comprehensive AIDS response should be included. Yet, there is a need to prioritize interventions in the sense that the scale and the intensity of interventions should match the nature of the epidemic. This is perhaps best illustrated by Kenya. Recent analysis showed that infections were spreading through various channels, including some that were previously ignored (Box 2). Having such information is an important element for “prioritizing” the AIDS response in Kenya in the sense that it should lead to a greater focus on stopping the newly identified channels of transmission.

**Box 2: Kenya – Sources of HIV Infection**

New infections were found to occur in populations defined as being “low-risk heterosexual” such as cohabitating couples, which are usually not targeted in prevention programs. Equally important, this study showed that although Kenya’s epidemic is “generalized”, sex workers and their clients remain an important group on which prevention efforts should be focused. It also pointed out that men having sex with men and injecting drug users—a population group not previously explicitly the subject of prevention interventions—should also benefit from prevention services.

![Graph showing sources of HIV infection in Kenya](image)

*Source: Gouws E. et al. 2006. Short-term estimates of adult HIV incidence by mode of transmission: Kenya and Thailand as examples. Sexually Transmitted Infections, 82 (Suppl.3).*

The objective of such analysis is not to stigmatize specific groups as being “vectors of the disease”, but rather to take into account that the HIV epidemic is much more heterogeneous than was commonly thought a few years ago and, in addition, that it evolves over time. As shown by the example of Thailand, the HIV epidemic tends to

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13 For more details on prioritizing the AIDS response according to the type of epidemic, see: Practical guidelines for intensifying HIV prevention. UNAIDS, 2007.
move among various population groups over time (Box 3). Quite clearly, the AIDS response has to match the nature of the HIV epidemic.

**Box 3: Thailand: Evolving HIV Epidemic**

Following the implementation of a strong prevention program targeting commercial sex workers and their clients, the contribution of new infections from this group to the total number of infections fell rapidly. In contrast, men having sex with men received much less attention and new infections in that group rose rapidly. At the same time, new infections incurred through extramarital relations and from male to wife also rose. All of these changes suggest a need for the AIDS response to evolve over time.

![Shifting transmission routes show a dynamic, evolving epidemic](image)

*Figure 6. Source: Analysis and Advocacy (A²) Thailand Team, Pattaya presentation to ASAP meeting, January 2006.*

How to identify the population target groups? In most situations a combination of social and behavioral factors places the following groups at higher risks of acquiring and transmitting HIV:

- Sex workers and their clients
- Injecting drug users
- Men who have sex with men; and
- Prisoners

Other population groups such as people with sexually transmitted infections, mobile populations, uniformed services personnel and ethnic minorities may also face high risk of HIV infection. Broad social norms, gender inequality and unequal decision-making power should be taken into consideration, particularly in the context of high prevalence epidemic that make young girls and women particularly vulnerable. In such settings with long-standing epidemics, married women are at high risk.

Obtaining adequate data information on these various population groups is a key step for costing. In general, available demographic, behavioral and epidemiological data will be
used to identify the key population groups. The Resource Needs Model uses demographic data on the size and the composition of the population and epidemiological data on the number of people infected with HIV. It also uses data on the size of the high risk groups and estimates of orphans. These estimates are available from models such as SPECTRUM, which was developed by the Futures Group in cooperation with USAID and UN agencies. One advantage of running SPECTRUM (www.futuresinstitute.org) is that it simulates the past and future course of the epidemic. However, running such model is time and data intensive. In the absence of such data, the alternative is to use a smaller data set as is the case in the simplified resource needs model.

Box 4: Resources for estimating the size of target groups

Until recently, there were few easily accessible sources of information that would provide information on the size of the potential target groups that are to be reached by interventions. Useful sources include:

- DHS (Demographic and Health Surveys)
- Behavioral surveys
- Coverage surveys. An extremely useful source of information is the surveys carried out by the Policy Project. The most recent one (2006) provides information on the coverage of key prevention, treatment, care and mitigation services in some 69 low and middle income countries and in particular it includes hard-to-get information on high risk groups such as men having sex with men, commercial sex workers and injecting drug users. (Stover, J., and M. Fahnestock. 2006. Coverage of Selected Services for HIV/AIDS Prevention, Care, and Treatment in Low- and Middle-Income Countries in 2005. Washington, DC: Constella Futures, POLICY Project. The report can be downloaded from www.ConstellaFutures.com

How to select the key interventions that should be costed? Following the identification of the groups that would be the focus of the key programs of the strategies, the next step is to select the key interventions that should be costed. This is again an important step for the purpose of applying a simple costing model. What is needed is not a long list of interventions, but rather the key interventions that should be costed. Why such a selection is necessary? Mainly because the list of interventions can become extremely long. For example, in the recent case of a small country over 900 interventions were included in the strategy. In countries with a large population, the task of costing thousands of interventions could quickly become daunting.

One option is to rank the interventions. In Swaziland, for example, the National AIDS Coordinating Authority used the following three explicit criteria to identify high priority activities that could be implemented:\(^\text{14}\):

- Is the activity evidence-based and is it likely to have an immediate impact on the epidemic?
- Does the country have the capacity to implement the activity?

• Can the activity be funded (i.e. does the country have or could it get the resources?)

Setting coverage targets for interventions

Coverage is a critical element when attempting to make an impact on the epidemic. Like other communicable diseases, HIV does not show a decline in the number of new infections unless a critical number of people is reached and changed their behavior. Setting coverage targets therefore will involve considering both the coverage of the interventions (i.e. which groups will have access to interventions) and the scale (how many people in each group will be the beneficiaries) that can be achieved with available resources. In practice, countries have followed several approaches for setting coverage targets.

Establish target levels for services. This is a key step in the estimation process as resource estimates are based on moving from the current level of coverage to the projected targets. For most of the interventions, existing levels of capacity and infrastructure of the health systems will limit the proportion of the target groups that can be reached. For example, the pregnant women who can be reached by interventions to reduce the transmission to children of HIV will be limited by the number of women who have access to health clinics. These limits are reflected in the number of people that can be currently reached by the programs. This group is referred to as the potential target group (PTG). Over time, however, the percentage of the potential target group who will have access to the HIV/AIDS interventions will increase.

The general principle is to set targets in a manner that ensures equitable access to services, as well a substantial impact on the epidemic. For some interventions the obvious target coverage should be 100% such as for safe blood or school-based HIV education in the case of generalized epidemics. For other interventions, it may be unrealistic to reach 100% of the population as there are no examples of countries reaching such coverage. This is the case for example of antiretroviral treatment which uses a target of 80%.

In other cases, it may be feasible to set coverage based on a normative approach. Various studies have shown that interventions won’t have a significant impact on the transmission of infections among high risk groups (commercial sex workers, injecting drug users and men having sex with men) unless the coverage of interventions reach 60-80%. For example, the HIV prevalence rate among sex workers in Cambodia started to decline when those adopting safe sexual practice (consistent condom use among sex workers) exceeded 50%. For costing purpose, a coverage rate of 60% was used to account for the fact that not all the members of the targeted group will change behavior. The UNAIDS recommended level for coverage by type of epidemic are shown in Table 2.
Table 2: Target Coverage by Interventions and Type of Epidemic

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Low Level</th>
<th>Concentrated</th>
<th>Generalized</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vulnerable Groups</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIDS education for primary and secondary students</td>
<td>30%</td>
<td>45%</td>
<td>100%</td>
</tr>
<tr>
<td>Out of school youth (6-15)</td>
<td>10%</td>
<td>20%</td>
<td>50%</td>
</tr>
<tr>
<td>Interventions for high risk population (sex workers, IDUs and MSMs)</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Workplace interventions</td>
<td>0%</td>
<td>3%</td>
<td>50%</td>
</tr>
<tr>
<td><strong>General Population</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of mass media campaigns per year</td>
<td>2</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Percent of adult population accessing VCT each year</td>
<td>0.1%</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>% of casual sex acts covered with condoms</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td><strong>Medical services</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of need for post-exposure prophylaxis that is met</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Safe blood (% of units screened for HIV)</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>STI treatment</td>
<td>60%</td>
<td>75%</td>
<td>100%</td>
</tr>
<tr>
<td>PMTCT (coverage among women attending ANC)</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Antiretroviral treatment</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
</tbody>
</table>

Source: Resource needs for an expanded response to AIDS in low- and middle-income countries. UNAIDS. August 2005.

**Expand coverage by being both ambitious and realistic.** There is no doubt that the current coverage of interventions must be increased for the AIDS response to have a significant impact on the course of the HIV epidemic. So far, most prevention interventions reach less than 10% of the target groups, which will have to be increased to have a noticeable impact. However, in the context of limited resources, there may be a choice to be made between expanding all programs equally or concentrating resources on scaling up more rapidly a few selected programs. These are questions that costing should help answer.

**Cost the interventions**

As a first start, it is recommended to cost the strategy by applying unit costs. Constant unit costs are used by the model for estimating the resource requirements of the model. The assumption that costs are constant makes sense for short projection period (say three years) during which abrupt changes in costs are unlikely. However, it would need to be modified when the strategy projects a sharp increase in the coverage of interventions. In such cases, more health professionals would need to be trained and hired, health facilities would have to be expanded, and various other providers would have to scale their services quite rapidly. Typically, the easy to reach groups are covered first and the

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15 This is shown by most simulation exercises which typically aim for 60% or more coverage in order to have a significant impact over the medium-term. This rationale also underlies the aim of the universal access initiative.
easiest interventions are implemented first. This means that as the coverage of interventions rises, it would prove increasingly costly to reach marginal population groups that may be widely dispersed geographically. Some of these issues can be addressed by including the cost of training programs, special incentives for health professionals to reach rural areas, etc.

Given the goal of having a simple costing model, the best option is to use standard unit cost derived from the existing literature, while acknowledging that the cost of the strategy would be underestimated when the coverage increases rapidly towards the maximum target. This approach has the advantage of providing estimates early on and quickly. However, in most cases these unit costs should be checked and modified as needed on the basis of local cost data. This second part of the work could be done later on when the operational plan is being prepared. Specific input spreadsheets could be used for that purpose.

**Optimize resource allocation**

The next steps are not part of the costing model, but they are an important component of the strategic planning exercise. The estimation of the resource gap is crucial as it provides information on whether the strategy can be implemented with existing and projected resources. If the gap is found to be too large, even taking account mobilization of external assistance, then the program interventions and coverage would have to be reviewed. This review can be done by scaling down the speed at which coverage is projected to increase over time and/or phasing over time the implementation of some interventions.

In some case, a more ambitious review of the cost effectiveness of program interventions exercise can be carried out using the GOALS model (http://www.futuresgroup.com/goalsmodel). This model combines costs per intervention with their projected impact on HIV prevalence in the general population. Running such a model require various country data, which may not be available, in which case values derived from other countries will have to be used. Despite the obvious uncertainty involved, running such simulation can be worthwhile as it provides a way of ranking the effectiveness of interventions while keeping the total cost of the interventions constant. In cases where the goal of reversing the HIV epidemic is not attained, the package of interventions can be modified and re-entered in the model until a decline in HIV prevalence is observed.