Costing Guidelines for HIV Prevention Strategies

Joint United Nations Programme on HIV/AIDS

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UNAIDS BEST PRACTICE COLLECTION

COSTING GUIDELINES FOR HIV PREVENTION STRATEGIES

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Foreword

It is essential to know the costs of different prevention strategies to be able to set public policy priorities in the fight against AIDS. Hence this important costing tool, a new edition of Costing guidelines for HIV prevention strategies, first issued by UNAIDS in 1998. The guidelines now contain cost analysis worksheets and cover injecting drug users.

In many developing countries economists are scarce, but these guidelines make it possible for other professionals such as accountants and planners to analyse costs. Such analyses must be combined with a judgement of an intervention's outcome. That an intervention has a low cost does not necessarily mean it is worth while from an economic perspective; for example, if it does not slow the spread of the disease or has unwanted side-effects that outweigh benefits.

As a companion tool to these guidelines, UNAIDS has created a number of dynamic spreadsheet and mathematical models that estimate outcomes such as number of cases of HIV transmission averted and cost per Disability Adjusted Life Year (DALY), on a strategy-by-strategy basis. The models cover:

- Mother-to-child transmission
- School education
- Sex worker intervention
- Blood transfusion services
- Prevention interventions for injecting drug users

The models are available at the UNAIDS website (www.unaids.org) and on the CD-ROM Economics in HIV/AIDS planning: getting priorities right, UNAIDS, June 2000.

The Global Programme on AIDS (GPA) at the World Health Organization first began developing costing guidelines, working with the London School of Hygiene and Tropical Medicine (LSHTM). UNAIDS has now taken the lead in both disseminating these important and up-to-date guidelines and models and promoting their use in strategic planning.

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Introduction

Background

More than a decade into the worldwide implementation of HIV prevention work, there is a noticeable lack of costing and cost analysis specific to this field. There is even less work on assessing the relative cost-effectiveness of different prevention strategies. Cost analysis is a tool that can provide useful insight into the functioning of projects, as well as being a key component of cost-effectiveness analysis.

Within HIV prevention, cost analysis has the potential to help managers at project level decide upon the most appropriate way to deliver a particular strategy. Cost analysis will assist managers in a number of ways, which include:

- providing an overview of the total amount of resources that are needed to begin or continue a project;
- assessing the use of different inputs (such as staff or equipment) within a project, and assisting in discussions about the relative efficiency and equity of projects;[1]
- guiding discussions about the most appropriate mix and volume of preventive strategies and the best way to allocate resources—for example, whether more resources should be allocated to Sexually Transmitted Diseases (STD) services relative to media education;
- providing an idea of the extent of resources required for scaling-up or replicating interventions.

Cost and cost-effectiveness analyses serve to provide basic evidence for on-going policy questions and debates. Cost analyses have always been identified with issues of efficiency, cost-recovery and sustainability of programmes. However, cost analysis can also play an important role in examining issues of equity and targeting, which have recently come to the forefront of the policy debate [14, 25]. With the on-going research and development of new HIV prevention strategies, the question of their feasibility is integrally connected with issues of cost, efficiency and priorities for resource allocation. Cost and cost-effectiveness analyses are even more germane in this context.

Cost data from on-going HIV prevention activities contribute to a more informed national and international debate. Prevention activities may be extremely varied both within and between countries. Therefore, it is important that, although costing approaches will depend on the purpose of the specific exercise and on local circumstances, there is consistency in the costing methods used. In this way, work undertaken in one context can have maximum relevance to managers in other contexts. In order to facilitate this consistency, recommended methodologies and standardized worksheets are provided here for costing HIV prevention interventions.

The principles of these Costing Guidelines are derived from *Cost Analysis in Primary Health Care—a training manual for programme managers* (hereafter referred to as the 'PHC Manual'). [1] The manual was produced for programme managers to illustrate how cost analysis might be used to address basic questions about the efficiency, equity and sustainability of the health activities for which they were responsible. It was hoped that the use of cost analyses would contribute to decisions about the optimal use of resources within the health sector and within individual programmes. Excerpts taken from the PHC Manual will be referenced as "PHC: page number". The PHC Manual is one of a number of relevant costing manuals produced over recent years [1,4,5,6,8]. Much of the guidance it provides is directly applicable to managers of AIDS programmes who want cost analysis to contribute to their own decision-making. The PHC Manual is recommended reading for users of these Costing Guidelines, but is not required in order to understand and use these Guidelines.

As in the PHC Manual, these Guidelines cost projects from the perspective of service providers and not from a social perspective. This should be borne in mind when interpreting the findings of the costing studies. The relevance and clarity of the Guidelines have been tested by costing a sample of prevention projects in several countries. This experience has been fed into the revision of the Guidelines.

Aim of the Guidelines and Audience

The specific aim of these Guidelines is to encourage and enable managers of HIV prevention projects and programmes to conduct cost analysis. These Guidelines relate the costing methodology presented in the PHC Manual and adapted to HIV prevention activities. These Guidelines can be used to assess projects/programmes at national, regional, district and community levels. We do not assume any prior experience or training in economics for users of these Guidelines. Detailed exercises to practise concepts of cost analysis are found at the back of the PHC Manual.

Structure of the Guidelines

The Guidelines begin by introducing and describing different strategies for HIV prevention. Chapter 2 provides an introduction to the basic economic concepts of cost analysis, upon which these Guidelines are based. Chapters 3 and 4 take the reader through a step-by-step guide to planning and undertaking a cost analysis, including how to collect data. Chapter 5 looks at adding up costs and how to generate different results from the analysis. Annex 1 provides the background worksheets for individuals wanting to undertake a cost analysis. Finally the Guidelines end with a section on relevant literature in the area of cost and cost-effectiveness of HIV prevention strategies. A Microsoft Excel version of the spreadsheet is available on the UNAIDS website (www.unaids.org/publications) or the CD-ROM: Economics in HIV/AIDS planning: getting priorities right, UNAIDS (June 2000).

Chapter 1

HIV PREVENTION STRATEGIES

In order to conduct a cost analysis of a project or programme, it is crucial to understand how a project functions. This section provides an introduction to different HIV prevention strategies and highlights factors that are important to the collection of the cost data. Under the heading of established strategies, examples of nine strategies are presented. While it is recognized that there are other strategies, these represent some of the most common strategies currently being implemented. The discussion of cost analysis throughout these guidelines will explicitly feature these strategies. The second section in this chapter discusses new and emerging HIV prevention strategies, to which the same costing principles would apply. While these strategies are described individually, this is not meant to suggest the adoption of a vertical approach to HIV prevention programming. Rather, the aim of this chapter is to introduce readers to the various strategies and highlight issues with respect to cost analysis. In practice, a number of strategies may be used jointly.

1.1 Established prevention strategies

This section will provide an introduction to nine established AIDS strategies. It discusses the description of potential projects, and key variables that are likely to affect the costs of each strategy are also discussed. The nine strategies are:

- Screening blood for HIV infection
- Use of the mass media
- AIDS education in schools
- Social marketing of condoms
- Treatment of sexually transmitted diseases
- Commercial sex worker peer education
- Voluntary counselling and testing
- Prevention activities among injecting drug users
- Prevention of mother-to-child/vertical transmission

SCREENING BLOOD FOR HIV INFECTION

1. Introduction

An HIV blood screening strategy aims to reduce the estimated 5-10% of HIV infections in developing countries that are transmitted through infected blood transfusions [33]. This aim can be achieved almost entirely through the testing of all blood donations for HIV antibodies before transfusion, and the discarding of donations that test HIV-positive.

HIV blood screening can only be conducted as an integral part of a more comprehensive blood transfusion service (BTS) but, for the purposes of these guidelines, consideration of the strategy is restricted to the HIV blood-screening component. Nonetheless, the methodology presented could be extended to cover the other potential components. The main activities undertaken by a BTS are: donor recruitment and selection; collection of blood; a variety of blood screening tests; blood processing, storage and distribution; final transfusion of the blood; and support activities such as management and administration and staff training. A broader HIV blood safety strategy could have additional activities, such as more rational use of blood transfusion by the health service and prevention of conditions that usually require blood transfusion as part of their treatment.

On a number of counts, screening blood for HIV stands out from the other strategies that will be discussed in this chapter. Firstly, there is general agreement on the degree of the strategy's effectiveness. Consensus that more than 95% of HIV-negative patients transfused with HIV-infected blood will seroconvert enables calculation of the number of cases of HIV infection preventable by HIV blood screening. Calculations are, however, dependent on the reliability of the blood tests, and the chances of transfusing infected blood. The number of units of blood testing false positive will depend on the specificity of the test as well as the prevalence of HIV in the donated blood.

Secondly, the responsibility for HIV infection acquired through infected blood products lies almost entirely with health services. Preventive action therefore also lies with them (in contrast to other strategies that stress prevention through individual responsibility and altered behaviour). This can lead to a medical and political imperative to implement the strategy, irrespective of its cost-effectiveness relative to alternative HIV prevention strategies. It can also make it the least politically sensitive HIV prevention strategy to adopt.

Nonetheless, at any prevalence level of HIV, only a small proportion of the population, namely blood transfusion recipients, will benefit directly from the strategy. This leads to controversy over the priority to be afforded to HIV blood screening. On the one hand, it is suggested that only at certain levels of HIV prevalence will HIV blood screening be a cost-effective strategy to pursue [34]. On the other hand, it is advocated that no unscreened blood should be transfused, except in life-saving situations. More information on the costs and effectiveness of implementing

HIV screening strategies may reduce the degree of controversy. Nonetheless, political and ethical considerations make it unlikely that any country would be able, or inclined, to have a policy of transfusing untested blood on the grounds that resources necessary for HIV screening would be better spent elsewhere.

In presenting the costs of the HIV blood screening strategy, other indirect benefits of the strategy should also be reported. These may include reduced transmission of other blood-acquired infections such as hepatitis B and syphilis (which results from the more comprehensive screening procedures established in conjunction with the HIV screening strategy), and enhanced accessibility to blood transfusions. A detailed manual on costing blood transfusion services is available from WHO [37].

2. Description of potential projects

The nature of BTS projects can be very variable and one of the early tasks of the costing exercise will be to describe the particular one to be costed. BTS may be integrated with other health services, often as part of hospital services, or may be run independently from other health services in a vertical fashion. Costing is likely to be easier in the latter case, where the services are more easily identifiable, than when they are integrated with other activities.

Countries' strategic responses to the risk of HIV transmission through blood will also be variable and context-specific. The costs of adding HIV screening procedures to an established BTS may be quite small. For some countries, however, to provide HIV-screened blood may entail major reorganization of the BTS. Some examples of the ways in which HIV blood screening strategies may be implemented:

a) Countries without organized blood transfusion services may collect and transfuse blood as and when needed. In this case, the HIV blood screening strategy is likely to be decentralized and entail one-test screening procedures at peripheral locations.

b) Countries may implement decentralized use of test kits as in (a), but supplement this with more centralized arrangements for supplementary testing of the positive tests.

c) Regional blood banks may be established with their own laboratory blood-testing facilities or with samples being sent to a more central facility for HIV testing. At this organizational level and above, techniques such as pooling blood for testing may be used to reduce costs. Decentralized use of one-test kits may still be appropriate in peripheral services.

d) The national BTS may be centralized with all blood collected and tested centrally and HIV-screened blood distributed from the centre. Decentralized use of one-test kits may still be appropriate in peripheral services.

These are only a few examples of an array of possible options for responding to the risk of HIV transmission through infected blood. Clearly, the nature of the services will strongly influence their costs, and these will differ from one model to another. In undertaking costing and cost-effectiveness analyses of BTS, it is important to appreciate that different country analyses will seldom be dealing with directly comparable systems.

3. Variables which affect costs

In addition to the cost implications of organizational and structural differences between different BTS outlined in section 2 above, there are other factors that vary between projects that affect absolute costs and relative cost-effectiveness. Some of these are highlighted below:

- **HIV prevalence in the recipient and donor population**. Firstly, the recipients: there is no HIV infection averted if a clean unit of blood is transfused to a patient who is already HIV-positive. Secondly, the donors: if the prevalence of HIV in donated blood is 20%, then the amount of blood discarded would be likely to be twice as much as when the prevalence is only 10%. This will affect the costs of replacing blood and the cost per HIV infection averted.

- **Donor recruitment policies**. HIV-infected donations will be fewer if measures are taken to exclude donors at high risk of HIV infection and to actively recruit low-risk voluntary donors. For example, in Zambia, schoolchildren are the principal population from whom blood is collected. This necessitates widespread travel by mobile blood collection teams. The cost of transport is high, but is offset by the much-reduced need to discard blood.

- **Whether blood samples or patients are the focus of HIV testing**. Where patients are the focus, the way in which HIV-positive donors are counselled will have resource implications. In some cases, positive tests will lead to counselling of infected patients and tracing of their sexual contacts; sometimes to counselling of the patient only; and sometimes simply to discarding the donation and no personal contact is made with the patient.

- **Economies of scale at different organizational levels**. For example, where blood is collected, tested and transfused on demand at the local level, costs for recruitment, collection, storage and transport will be considerably less than they are in more structured services. The volume of blood collected at the local level will determine whether or not pooled or bulk testing of blood can be conducted. At the national level, the size of the BTS will determine the scale of operations and influence unit costs.

- **The type of HIV tests being used**. Although the price of HIV tests has been decreasing in recent years, the rapid serological test is still more expensive (per unit tested) than testing a large batch using an ELISA test. However, depending on the volume and frequency of blood collected, the use of an

ELISA reader may or may not be most economic. The number of extra tests used as controls also depends on the number of units being tested at once. Rapid tests use essentially one control per test, whereas an ELISA test will use, at most, one for every six tests. This will affect the total costs of testing.

- **The reliability of the HIV tests used**. False tests will lead to the wastage of good blood and the transfusion of infected blood. However, most tests now have high levels of sensitivity and specificity.

- **Whether laboratory costs are exclusively attributable to HIV blood testing** or shared with other laboratory services.

- **The order in which different tests are conducted** (e.g. HIV, hepatitis, syphilis and blood grouping) will affect the costs when the blood is discarded and not tested further as soon as it tests positive for any one test. The most cost-effective order will be a factor of the relative costs of the tests and the prevalence of each condition in the donor population, which will in turn dictate the probability of each test leading to discarding of the blood. However, not all services operate in this fashion, and sometimes all tests are performed before any blood is discarded.

- **The skill mix of staff implementing the strategy**. The skill mix of the staff may also determine the degree to which choices are made between ELISA and rapid tests.

USE OF THE MASS MEDIA

1. Introduction

A mass media strategy entails the development of IEC (information, education and communication) materials and their dissemination to the general population through a variety of media channels. The strategy can be implemented through one or a series of individual campaigns.

Consideration of the strategy here is restricted to campaigns that achieve a high coverage of the general population or large sub-groups such as 'the young'. Campaigns targeted at high-risk groups or advertising associated with specific commercial products are excluded. Issues relating to these two areas are raised in the sections on sex worker peer education, condom social marketing and prevention strategies among injecting drug users. Also not considered here is use of the press through passing AIDS news to journalists. This can supplement the efforts of using other mass media.

The objectives of most AIDS-associated mass media campaigns are:

- to provide information, raise awareness and stimulate discussion;
- to inform people about the availability of further information and services;
- to encourage behaviour change to minimize the risk of infection, usually through increased condom use; decreased number of sexual partners; and decreased incidence of sex with high-risk partners;
- to reduce misinformation about casual transmission; and
- to prevent discrimination against those infected with HIV.

The first three of these are of relevance here in the context of HIV prevention. The challenge in using mass media directed at the general population is to develop messages that are generally understandable and acceptable yet that still manage to be personally persuasive. The strategy has the potential to reach a large number of people relatively easily. Its coverage depends on the form of media used and access to that media amongst the groups targeted.

In the majority of countries where AIDS has been reported, the government has taken some measures to inform people about the risks and prevention of the disease. The extent and way in which media have been used have been very diverse. Initial campaigns were rapidly developed in response to HIV and were typically poorly prepared. Later campaigns were more appropriate for their respective circumstances, had specific aims, and focused on particular audiences. This was achieved through more careful planning, such as using focus group discussions and market research to define the issues that needed addressing, and then testing, revising and re-testing messages with prospective audiences and key interest groups to ensure their clarity, appropriateness and acceptability and to prevent any negative side effects [20].

2. Description of potential projects

There is considerable diversity in the way that mass media campaigns are conducted – their intensity, level of coverage, quality and the type(s) of media used. Examples of the latter include radio, television, film, music, entertainment, newspapers, journals, posters, pamphlets and stickers. In developed countries, heavy use has been made of television and newspapers to obtain high levels of IEC coverage. Some countries have supplemented these strategies with household distribution of information brochures. Developing countries have tended to emphasize radio and printed materials distributed through a number of outlets such as clinics, schools and public transport. Government mass media campaigns have tended to use broadcast and print media channels whilst local groups have emphasised print media and personal contact [20].

In any one country, there are often several HIV prevention strategies running simultaneously, and the boundaries of a mass media strategy vis-à-vis other strategies, such as social marketing or AIDS education in schools, may not be clear.

To an extent, the boundaries are artificial because of the synergy between the different strategies. For example, a government mass media campaign may enhance the success of a social marketing organization and that organization may popularize and reinforce the messages that the government advertising campaign is imparting. In this way, the two strategies are reinforcing and cross-subsidizing each other. Similarly, the effectiveness of a mass media campaign with an emphasis on condom use will be dependent, amongst other things, on the availability and accessibility of condoms provided through other strategies. The effects of person-to-person education strategies may also be strengthened by mass media campaigns.

3. Variables which affect costs

Some of the variables affecting costs are highlighted below:

- **Materials development**. The amount of time and type of work invested in development of the IEC materials will influence costs. For example, external consultancy resources may be drawn upon during this phase. These costs may be reduced if the materials used had already been produced elsewhere. For example, material such as films or educational programmes can be bought from other countries, or material that has already been screened can be re-broadcast.

- **Type of media used**. There are clearly different costs associated with broadcast media and, for example, print media.

- **Intensity of media use**. For example, the length of a programme or publication, the frequency with which it is transmitted, and the duration of the campaign.

- **Quality of the media**. For example, whether peak or off-peak airtime is used for broadcasting.

- **Rate of charging for airtime or press space**. Media coverage may be paid for at commercial rates, or sponsored by the private sector, or subsidized by the government.

- **Economies of scale**. Mass media campaigns tend to have high fixed costs. Therefore, the larger the population and the greater the population density, the lower are likely to be mass media unit costs. Conversely, a small population widely scattered will be more expensive per person covered.

- **Country variation in the costs of media production and transmission**. This can be sizeable, and make international comparisons between projects problematic.

AIDS EDUCATION IN SCHOOLS

1. Introduction

AIDS education in schools is a specialized type of IEC (information, education and communication) programme, implemented by teachers and other school staff. In these guidelines it is assumed that the strategy is implemented during school time. It will normally be undertaken after development of a school curriculum for AIDS education and will often be incorporated in wider sex education activities. The objectives of AIDS school education programmes will be similar to those of mass media programmes, including:

- to provide information, raise awareness and stimulate discussion;
- to encourage the development of safe behaviour to minimize the risk of infection through, for example, delayed first intercourse or increased condom use;
- to correct misinformation about casual transmission;
- to prevent discrimination against those infected with HIV.

As with a mass media strategy, resources will initially be invested in the development and production of education materials targeted at school children. The type of media used will normally be printed materials for use in the classroom (readers, activity sheets, booklets for students, teaching guides for teachers), but videos, posters and magazines may also be produced.

School education programmes are relatively labour-intensive, engaging a variety of school staff and students to deliver AIDS education. Staff involved may include schoolteachers and school counsellors. Head teachers may be given training to sensitize them to the importance of AIDS education in their schools. In the absence of this sensitization, trained teachers may be inhibited from implementing the strategy because of resistance from their colleagues.

Schools have the potential to raise awareness and influence both short- and long-term behaviour because they provide an environment where children and young adults are encouraged to learn and to respond to authority. It is generally assumed that the target population is uninfected and that the benefits of the strategy will accrue some time after its implementation through improved knowledge, attitudes and behaviour.

AIDS education in schools is likely to be implemented as a discrete programme. Potential benefits of the programme may, however, be reinforced by other complementary strategies, such as mass media campaigns aimed at the general population or young adolescents, condom social marketing projects and other projects that enhance condom availability.

2. Description of potential programmes

AIDS school education programmes are most commonly implemented in the government sector, through additions to the school curriculum. A programme may be implemented nationally or coverage may be more restricted, for example, to a regional or municipal initiative. A programme may involve partnership with other agencies such as NGOs running smaller-scale school education projects.

The acceptability of an AIDS school education programme and its content will be highly dependent on the cultural context and therefore will vary a great deal between countries. Programmes will also vary in terms of their quality and intensity. For example, a programme may entail only a brief training session for teachers followed by one-off sessions with children during which messages are relayed and materials handed out. Alternatively, AIDS education may be incorporated into the national curriculum, teachers may receive several weeks' training, and children may have regular classes over several years. These classes may combine AIDS education with more general health and sex education and use a variety of participatory approaches to discuss HIV and promote healthy sexual behaviour.

3. Variables which affect costs

Some of the variables affecting unit costs are highlighted below:

- **Development of educational materials:** the amount of time and type of work invested in development of AIDS school curricula and supporting materials. For example, external consultancy resources may or may not be drawn upon during this phase.

- **Production of educational materials:** the quantity and quality of educational materials produced for each student and teacher covered by the strategy.

- **Training school teachers:** the amount of time invested in sensitization and training of school staff.

- **The amount of school teaching time dedicated to AIDS education**.

- **Personnel costs:** the strategy is labour-intensive and the relative costs of trainers and teachers should be borne in mind in making any international comparisons or extrapolating cost data to other countries.

- **Economies of scale:** the larger the target population, the more the strategy's fixed overhead costs, such as costs of curricula and material development, will be spread over more schools and schoolchildren, thus reducing unit costs.

SOCIAL MARKETING OF CONDOMS

1. Introduction

'Social marketing' is the marketing of public health goods or ideas through conventional marketing channels. Condom social marketing (CSM) was initially undertaken as part of contraceptive social marketing. CSM has been developed as a strategy for the prevention of AIDS because of its potential to distribute large numbers of condoms. Condoms are one of the main ways in which individuals can protect themselves from HIV infection, as well as from other STDs that may facilitate HIV transmission during subsequent exposure to the infection. Enhancing access to condoms or its complements are an integral part of the majority of the other strategies discussed in this chapter.

In many countries, people cannot get condoms easily, regularly or cheaply. Condoms may not be readily available at a time convenient to consumers. Condoms tend to sell for a relatively high price in the commercial sector or be distributed freely or at a nominal fee through the public sector. In the former situation, price can bar access for many potential users; in the latter situation, condom quality is often low, or perceived to be so, and availability may be irregular.

The main objective of CSM projects is to increase the availability and use of good-quality, low-cost condoms and hence contribute to preventing the transmission of HIV infection. The strategy usually promotes condom use in general and use of the social marketing organization's own condom brand in particular. The strategy also aims to disseminate messages concerning HIV prevention, safe sexual behaviour and correct condom use. These objectives are achieved through fairly standard marketing techniques with the main activities being to conduct market research; to acquire and package condoms; to advertise and promote the product; to train retailers; to distribute the product; and to manage the project. The non-clinical nature of condoms allows a wide range of potential retailers, including health professionals, pharmacists, midwives, traditional birth attendants, traditional healers, shopkeepers and itinerant salesmen, to be involved in the project. Condoms can be sold in both traditional outlets (e.g. pharmacies) and non-traditional outlets (e.g. petrol stations, hotels). In practice, a variety of means of distribution have been developed to ensure high coverage.

Project activities are adapted according to the context and environment in which the strategy is being launched. Social marketing projects can stimulate demand for condoms by conducting market research and then launching appropriate promotion and advertising campaigns. These may be similar to the mass media campaigns discussed above, but more focused on target groups and relying on local promotions as well as on the wider coverage achieved through mass media. Once demand is stimulated, commercial companies may themselves be prepared to invest directly in the condom market. Where demand already exists and has clear potential to rise, social marketing has a role to play in increasing the supply of condoms and increasing access through strengthened distribution networks.

Although social marketing aims to keep condom prices low, some projects launch a variety of condoms to appeal to different parts of the market. In this way, revenue from more expensive condoms can be used to cross-subsidize condoms at the lower end of the market.

Revenue collected through sales offsets programme costs and reduces the subsidy needed for project activities. The balance struck between cost recovery and demand will to some extent be a political decision, reflecting the relative importance given to sustainability and coverage [57]. The costs of many social marketing projects are subsidized by governments or donors, contributing to lower prices and increased access to condoms. In contrast, some projects have achieved complete self-sufficiency, continuing marketing activities without donor financing or technical assistance. An example is the Indonesian DuaLima Red condom project where commercial partners cover all costs [55].

Large-scale CSM projects are usually overseen or implemented by private not-for-profit organizations. To date, the expertise for these projects has tended to come from a small number of American organizations, either directly or through their subsidiary in-country organizations. How project responsibilities are allocated between participating private and public sector organizations will vary between countries and according to the politics of the overseeing organization.

2. Description of potential projects

There are several potential project designs, depending upon the environment in which a project is launched and the varying emphases on sustainability and coverage of the implementing organizations. Cisek and Maher (1992) have grouped the approaches into four types, with increasing degrees of private sector participation [55].

Type 1 projects increase availability of condoms through distribution of donated supplies. The projects often set up and manage their own administrative structures, implementing agencies and distribution networks. Condoms are heavily subsidized and hence accessible to all if distribution networks are adequate. These projects tend to be expensive for the donors financing them and tend to remain donor-dependent.

Type 2 projects use existing private and public infrastructure to a greater extent. For example, a project may arrange for local private distributors to conduct distribution and training activities. There is increased cost recovery to cover project costs.

Type 3 projects diversify commodity sourcing and are no longer dependent on donated products. One approach for acquisition of condoms is for a project to negotiate reduced prices with condom manufacturers. In return for the manufacturers putting condoms on the market at a reduced price, donor funds are used for promotion and marketing of their products, in effect running specialized

IEC campaigns on the manufacturer's behalf. This may be the most appropriate approach in countries where demand is low and potential manufacturers are wary of investing in market development themselves. This type of project would use the existing distribution network and contribute to its development.

Type 4 projects maximize the use of private sector infrastructures, including commercial sector management of the project. Donors' involvement is in market-building but the commercial partners may also contribute to this. The projects have no management costs and no commodity costs. Condoms are retailed at a price that covers all costs plus profit margins for the private sector distributors, wholesalers and retailers.

3. Variables which affect costs

Some of the variables affecting costs are highlighted below:

- **How long the project has been running**. Start-up costs are very often high, given the need for market research and product development. This stage often includes a high level of technical support that contributes to the high cost. In addition, the longer the project runs, the more sales will increase, which will imply a fall in unit costs over time.

- **Economies of scale**. These depend on the size of the market.

- **The nature of the targeted population**. For example, the distribution of the population between rural and urban areas will influence costs.

- **The source of project condoms**. These may be donated to the project, bought on the international market, or put on to the market at negotiated prices by commercial manufacturers.

- **The social marketing model used**. In particular, costs will be influenced by the role of the commercial sector in such activities as administration, management, training, promotion and distribution. A Type 1 model will have more costly distribution systems than a Type 4 model. The extent to which the involvement of the commercial sector affects cost will depend on the perspective of the costing exercise. If the perspective is of public sector costs only, involvement of the private sector will greatly reduce costs. If the perspective is of all providers, costs may be reduced slightly as it may be more efficient for the private sector to take on these roles than for a social marketing organization to set up duplicate systems.

- **Levels of cost-recovery**. These will affect net project costs.

- **Whether or not the main implementing organiation only markets condoms**. If other commodities (such as other types of contraceptives) are marketed

as well, overheads can be shared over the social marketing of a number of commodities.

- **Variables that affect the promotion and advertising component of the strategy**. These include what forms of media are actually available to market condoms (similar to discussion in the mass media strategy about which variables affect the costs).

TREATMENT OF SEXUALLY TRANSMITTED DISEASES

1. Introduction

Sexually Transmitted Diseases (in the context of this strategy paper, curable STD—in other words, not including HIV) are a major health problem in developing countries. Over and Piot (1993) estimate that they are one of the ten main health problems responsible for loss of healthy life years [19]. As a significant cause of morbidity, there would appear to be a strong case for the provision of STD treatment, and this case is strengthened further when the interaction between STD and HIV is considered [66]. Unprotected sexual intercourse is a risk factor for both and there are a number of facets to the interaction between the two. HIV infection, through its effect on the immune system, can increase susceptibility to STD and also inhibit the effectiveness of any STD treatment. In turn, STD can facilitate transmission of HIV, particularly in infections where there is genital ulceration. This latter relationship indicates the value of treating STD as a means of reducing the risk of HIV transmission, as well as of curing the STD themselves and preventing their further transmission.

This discussion focuses primarily on management of STD. This includes the treatment of the disease as well as health education and promotion activities such as counselling, education and condom distribution. Preventive strategies for both STD and HIV will be similar since risk factors and target populations are alike. Some of the issues concerning prevention of STD and AIDS in a target group are addressed in the discussion about commercial sex worker peer education.

One of the first steps in implementing the strategy should be to develop and disseminate standard STD diagnostic and treatment protocols. Dissemination through seminars, workshops and training sessions should be followed by regular supervision of clinicians treating STD. Additionally, training in areas such as drug supply logistics, counselling and partner notification might enhance non-clinical skills.

Treatment of patients is likely to entail diagnosis by clinical examination and, where available, by laboratory microscopy, blood tests and culture techniques. Diagnosis is difficult for most STD syndromes and particularly so in women.

As microscopic examination is often not adequate for diagnosis, and laboratory tests are expensive and technically demanding, there is increasing use of medical examination and clinical algorithms for diagnosis (syndromic case management). The syndromic approach uses algorithms based on commonly presenting signs and symptoms to diagnose and treat [62]. Diagnosis is followed by provision or prescription of drugs. Patients should also be counselled and supplied with condoms as an integral part of their management to prevent themselves and their partners from further infections.

Promotion of condoms overlaps with some of the other strategies addressed in this document—in particular, social marketing of condoms, mass media education and sex worker peer education. Some projects may also include partner notification. This is a form of targeting that aims to identify and treat the infector and any infectees of the patient. In this way, the uninfected can protect themselves, the infected can be cured and the patient may be able to avoid becoming re-infected. The service provider or the patient may take responsibility for notifying and referring partners. This outreach service can consume high levels of resources and its feasibility and effectiveness is highly dependent upon the cultural environment of the strategy.

Wider benefits of the strategy, other than the reduced spread of HIV, should also be identified. These include reduced morbidity and mortality from STD in general, through STD treatment and increased condom use, and the potential avoidance of unwanted pregnancies through increased use of condoms. There may also be organizational benefits such as enhanced drug supply systems and reduced costs through adoption of more rational prescribing procedures.

2. Description of potential projects

Projects will vary in terms of which of the above activities are actually being implemented. The simplest projects may only diagnose and provide drug prescriptions. Other activities such as development of treatment protocols, training, counselling, condom provision and partner notification may be seen as optional extras and implemented according to the motivation and the resources within individual projects.

Some STD treatment projects may have a long history independent of AIDS concerns; others may be newly established or strengthened to make STD treatment more accessible and to affect AIDS transmission. STD treatment projects that are explicitly part of a policy-driven strategy are likely to be in the government sector. Private sector STD treatment facilities are more likely to have been set up opportunistically, with profit rather than policy the main motive. Costing these enterprises may provide useful information to contribute to public sector policy decisions.

Some projects may have been set up by universities or research groups as operational research projects. This may mean that they incur additional costs compared

with regular service delivery. The nature and level of these costs should be reported in the results of the costing exercise. If some of the costs would not be incurred in project replication, or are irrelevant to project efficiency (e.g. research costs), it may be desirable to exclude them from any cost analysis.

Variations will also be found in the way that STD treatment services relate to other parts of the health service. They may be established 'horizontally', indicating that they are integrated with primary health care services for the general population. STD patients may, for example, be seen in general outpatient clinics. Alternatively, they may be established 'vertically', indicating that they are complementary to general primary health care services but established separately from them. In this situation, patients may be seen in specially designated STD clinics. A third scenario is that STD treatment services may be provided as part of projects that specifically target high-risk groups such as sex workers or their clients. Such groups can be costly to reach with STD treatment services, but the projects may be more cost-effective than alternatives because of the number of HIV transmissions that they can prevent.

Finally, referral mechanisms may vary between projects. Government STD clinics are likely to refer upwards to their own facilities. Where they exist, private and NGO clinics will refer to secondary and tertiary facilities within their own sector. Alternatively, they may have arrangements to refer to government facilities.

3. Variables which affect costs

Some of the variables affecting costs are highlighted below:

- **The incidence and prevalence of STD in the general population**. This will affect utilization of services and hence unit costs.

- **Diagnostic approach**. Whether diagnosis is determined by clinical examination, microscopy or laboratory test, culture or syndromic case management.

- **The sensitivity and specificity of diagnostic procedures**. These procedures may lead to inappropriate or unnecessary treatment.

- **Whether drugs are provided by the project**. Alternatively, they may be prescribed only, the costs falling on patients.

- **The costs of drugs and diagnostic tests**. These will, in turn, be influenced by whether they can be purchased locally or are imported using foreign exchange.

- **The source of project condoms**. These may be bought on the international market or donated to the project at inflated or subsidized prices.

- **The appropriateness of prescribing practices**.

- **The activities provided**. Which activities (e.g. development and distribution of standard protocols, partner notification) are actually undertaken in a particular project and to what extent.

- **The costs of salaries**. These may comprise a relatively high proportion of total costs since the strategy is labour-intensive, involving one-to-one consultation. The relative costs of personnel should be borne in mind in making any international comparisons.

COMMERCIAL SEX WORKER PEER EDUCATION

1. Introduction

Peer education projects are generally labour-intensive strategies. If the target population is relatively accessible and/or a high-risk one, then potential benefits can be higher and the intervention is likely to be more cost-effective. Commercial sex workers (CSWs) are a high-risk group for HIV infection because of their number of sexual partners and because they often have other STD that enhance HIV transmission. They therefore tend to be a high-frequency HIV transmitter core group for the rest of the population.

Identifying and reaching CSWs in a given population may initially be quite time-consuming. Experience has shown that CSWs peer educators can be used effectively to locate other CSWs and to conduct peer education. It is assumed that working CSWs are more receptive to learning and adopting behaviour change when approached by peers. The main objectives of a peer education project are to encourage CSWs to use condoms with all partners and to seek STD treatment promptly. The CSW peer educator projects may also target CSW clients for educational activities.

The projects are almost always managed and implemented by nongovernmental organizations (NGOs). Initial strategy activities include development and production of targeted IEC materials and recruitment and training of CSW peer educators. The majority of CSWs are women and projects often engage women who are current or former CSWs to reach them. Once the project is under way, typical outreach activities include education, skills training (for negotiating with sexual partners and using condoms) and condom sales/distribution. Peer educators can be an effective link between CSWs and STD services, encouraging CSWs and clients to seek screening and treatment. STD treatment is not included in this discussion, as it was dealt with earlier.

The activities of a CSW peer education project overlap, or are complementary to, a number of the other strategies addressed in this document, including condom

social marketing, mass media education and treatment of STD. The success of the peer education strategy may be partially dependent upon these other strategies and, in turn, CSW peer educators can play a valuable role in increasing STD/HIV awareness and increasing condom use. Some of the non-AIDS benefits of this strategy, such as decreased STD prevalence and incidence, and possibly a decreased number of unwanted pregnancies through condom use, should be described when the costing results are presented.

2. Description of potential projects

Some variation is found in the nature of projects. Facilities within which projects are implemented can include bars, social centres, residences, STD clinics, brothels and truck stops. Educational sessions may be conducted on a one-to-one basis or organized as group sessions. Peer educators may engage in formal activities (e.g. educational sessions arranged beforehand) as well as informal activities (such as mentioning HIV/STD transmission when negotiating the price with the client). IEC materials may or may not be used. Where used, they may range from simple pamphlets, comics and posters, to promotional materials such as T-shirts and bags, and specially produced videos and films. Condoms may be distributed freely or sold as part of cost recovery or a commercial enterprise. Peer CSWs implementing the project may be volunteers or salaried staff. The success of these projects relies on the ability of peer educators to mix freely in the community. Using volunteers can significantly decrease the financial cost of implementing the project. This cost saving does, however, need to be weighed against high drop-out rates seen amongst volunteers who may not always be able to give priority to project work.

3. Variables which affect costs

Some of the variables affecting costs are highlighted below:

- **The amount of time and type of work invested in development of appropriate IEC materials**. For example, external consultancy resources may or may not be drawn upon during this phase. IEC materials may also be periodically revised.

- **The amount of time invested in staff and peer educator training**.

- **The geographical and social accessibility of target groups**.

- **The total number of CSWs targeted**. Large numbers may mean greater expenditure on some of the IEC materials and on condoms but may contribute to lower average costs.

- **The intensity of contact between peer educators and CSWs**. For example, whether educational sessions are conducted with individuals or groups.

- **Whether peer educators are salaried or voluntary staff**.

- **Types of educational materials used in the sessions** (e.g. flashcards, leaflets).

- **The source of project condoms**. These may be bought on the international market or donated to the project at inflated or subsidized prices.

- **Whether a charge is made for condoms** or whether they are provided free.

- **The existence of complementary activities** such as income support or crèche/childcare facilities.

VOLUNTARY COUNSELLING AND TESTING

1. Introduction

HIV voluntary counselling testing (VCT) is now playing a larger role in HIV prevention activities. VCT has received greater prominence due to the increasing profile of interventions to prevent mother-to-child transmission and options for care and management of opportunistic infections (e.g. preventive therapy for tuberculosis) [91]. As part of the counselling process, VCT can help inform uninfected clients of the risks of HIV and educate HIV-positive people about coping and preventing transmission to their partners. However, the implementation of VCT is problematic. A key issue has been the acceptability of VCT and people's willingness to be tested and then return for their results. In Côte d'Ivoire, only 17.5% of the HIV-positive women who were initially identified took part in a trial—some did not agree to test, others did not return for results, and more than 40% refused to enrol in the trial despite being HIV-positive and pregnant [138]. Implementation is better if efforts are made to focus on the programmes' process [92]. The uptake of VCT services is low even in well-resourced countries and highlights the importance of fear and stigmatization as a barrier to use of these services.

A service providing VCT involves pre-test counselling, post-test counselling, and the test itself. Necessary support activities include training of staff and development and distribution of IEC materials. Counselling should be part of any service that involves testing for HIV. The objectives of VCT are numerous [90]:

- to strengthen motivation to change sexual and drug behaviours, in order that seronegative people can protect themselves from infection, and to prevent transmission from seropositive people;
- to encourage those likely to be at high risk to come forward for testing;
- to allow early identification of medical and social needs of HIV-infected people, and ensure that common infections are properly treated;

- to allow women to make informed decisions about reproductive health issues;
- to enable people to cope with stress about HIV-related problems and relieve anxiety associated with uncertainty about HIV serostatus;
- to provide a service, including counselling, to those who seek knowledge of their serostatus so that they can protect themselves and others from infection and plan for the future.

The main activities of VCT include:

i. A pre-test counselling session, between a trained counsellor and a client, couple or group;
ii. Laboratory tests, for those clients who decide to go ahead with the test;
iii. A post-test counselling session for those who have been tested.

There is controversy over the effectiveness of VCT at both the individual and population levels: evidence has been reviewed by De Zoysa et al. (1995) [84]. A review of 50 studies showed mixed results for the impact of counselling and testing on risky behaviour [85]. A study in Rwanda showed increases in reported condom use [82]. Large increases in condom use and abstinence followed repeated and intensive counselling among couples found to be discordant (i.e. only one partner infected) in a research project in Zaire [86]. The AIDS Information Centre in Uganda, which offered anonymous HIV testing and counselling, also showed substantial increases in condom use [88]. A study in the United Republic of Tanzania found that a significantly higher proportion of woman than men did not want their spouse to know their HIV status [97]. Although several studies suggest that VCT may be effective, at least in the short term, in modifying sexual behaviour amongst heterosexuals and especially when couples are counselled together, the relationship between VCT and a reduction in HIV transmission is complex. One strategy that may increase the effectiveness of VCT is the use of rapid testing techniques rather than the widely-used ELISA [94-96]. This means that people can obtain results on the same day or relatively quickly.

There has been some concern that VCT, because of its emphasis on personal counselling, is a very expensive strategy. It has been suggested that those who come forward for VCT may be a special group, who could perhaps be reached by other, less costly means [84].

Other non-HIV benefits of VCT that should be reported in the analysis include diagnosis of STD and prevention of STD infection that may occur because of changed sexual behaviour. There are concerns about adverse effects including psychological distress, stigmatization, disruption in couple and family relationships, violence and divorce, which mean that people are reluctant to both undergo tests and return for the results. Failures to maintain confidentiality may lead to social or work discrimination.

At present, there is very little information available on the relative costs and effectiveness of the different models of VCT. Information on total costs will help organizations choose between different models [98,99].

2. Description of potential projects

VCT is often provided by NGOs as well as by government health services, and hence the nature of the services provided may be quite diverse. The service may be provided as a free-standing project, or may be integrated into other services (e.g. antenatal clinics, STD clinics, drug treatment centres, HIV support groups, blood transfusion services). The clinic may deliberately offer an anonymous service to reduce the risks of discrimination, or its activities may be tied in closely to the provision of other health services. The targeted population may be the general population, or specific high-risk groups. VCT is now also being undertaken in the private sector.

3. Variables which affect costs

These include:

- **The geographical and social accessibility of the population**. This will influence the workload of the service.

- **HIV prevalence**. As prevalence rises, the costs of testing will increase, although economies of scale may be observed as well.

- **Whether or not particular groups are deliberately encouraged to come for testing**. For example, educational messages could be specifically aimed at encouraging certain groups to attend, and this would increase the costs of the service (though it may also increase its effectiveness).

- **The level of training of counsellors**. Fully-trained counsellors may be used, or most of the counselling may be done by health workers with some additional training and fully-trained staff used only for supervision and training. Lay counsellors (non-health professionals) from the community may also be employed in VCT services.

- **The degree of emphasis placed on careful and intensive counselling**. VCT services are labour-intensive. For example, in a study in the United Kingdom of HIV testing in antenatal clinics, over 80% of the costs were associated with the time required to ensure that informed consent was given [83].

- **The number attending relative to the capacity of the service**.

- **The type of test and number of tests**. Various alternatives exist for the test itself, and the cost of HIV antibody testing can be reduced in a number of ways [88], which is also discussed in the blood safety section.

- **The relative importance of the use of volunteers** to support some of the activities of the centre. NGO-run centres, in particular, may make use of volunteers to help run the service.

- **The relative sophistication of the educational materials used**, and their costs of development and production.

- **Whether or not free supplies (e.g. condoms) are distributed**, and the source of condoms.

PREVENTION MEASURES AMONG INJECTING DRUG USERS

1. Introduction

Injecting drug users (IDUs) are often at high risk of HIV infection due to the risk of HIV transmission associated with sharing injecting equipment with others. The rapid spread of HIV among IDUs has now been documented in an increasing number of countries including countries in Eastern Europe, Latin America and Asia. The incidence of HIV has increased among IDUs and their sexual partners. Vulnerable groups to IDU use include the urban poor, street children, prisoners, sex workers, itinerant and guest workers and communities in drug-producing areas [105]. The major risk factor for transmission of HIV among IDUs is multiperson reuse or sharing of syringes. In addition, indirect sharing of equipment such as water, cotton, cookers and other drug preparation equipment has also been attributed to assisting the transmission of HIV [106]. Thus one key aim of IDU interventions is to prevent multiperson reuse of syringes and allow IDUs access to sterile syringes [107]. IDUs are also at high risk from transmission of other bloodborne infections such as hepatitis B and C.

The most effective way to prevent HIV transmission among IDUs is the elimination of drug use. However, in reality, programmes work towards minimizing or reducing harm. Thus there is a hierarchy of activities and educational messages used: (1) stop using and injecting drugs; (2) if continuing to use drugs, do not share equipment, but use own supplies; (3) if sharing, then disinfect to reduce transmission [108]. The general objectives of HIV prevention activities are to increase protective behaviour and reduce risk of HIV infection. This includes changing drug use, needle practices and sexual behaviours simultaneously. The HIV prevention strategies for IDUs are highly targeted.

A comprehensive strategy for HIV prevention among IDUs may include:

- primary prevention of drug abuse;
- provision of information, education, counselling to reduce needle/syringe sharing;
- use of bleach to clean/disinfect syringes/needles and drug preparation equipment;
- changing laws to permit legal purchase of needle/syringe, outreach programmes for IDUs, syringe/needle exchange activities;

- referral for treatment of medical problems such as STD, peer education programmes;
- access to substance abuse treatment [106,109].

Educational messages are used to promote the one-time use of sterile syringes/needles and their safe disposal. IDU programmes are relatively labour-intensive, engaging a variety of staff and volunteers.

There are multiple interventions and multiple outcomes. In presenting the costs of the IDU prevention strategy, the direct and indirect benefits of the strategy should also be reported.

At present, there is very little information available on the costs of the different models of HIV prevention for IDUs in a developing or transitional country context. Based on the limited evidence, projects promoting access to sterile syringes are relatively cost-effective, especially when compared to the lifetime cost of HIV treatment in the context of the United States [110].

2. Description of potential projects

The nature of IDU projects is variable and one of the first tasks of a costing exercise will be to describe the particular one to be costed. HIV prevention activities can occur in conjunction with other health services or may be run independently. They often operate on a relatively small-scale basis at the community or city level. In general, IDU activities are likely to be implemented as a discrete or stand-alone programme, separate from other HIV prevention strategies aimed at the general population, although there may be complementary strategies such as condom social marketing or distribution and STD treatment. Needle et al (1998) provides a summary of the major intervention strategies, which have been put in place [108].

Type 1 projects are community-based outreach projects and are designed to reach the IDUs' sexual partners and drug-using networks. Using community and IDU peer workers, these programmes include activities such as educational messages for risk reduction, bleach distribution, HIV counselling and testing, treatment referrals, condom distribution, as well as trying to change norms related to unsafe drug use and risky sexual behaviours.

Type 2 projects, needle-exchange programmes (NEPs), provide sterile needles and syringes to IDUs in exchange for used needles and syringes. Activities include exchange of potentially contaminated syringes, bleach distribution, treatment referrals, condom distribution, educational messages for risk education, HIV testing and counselling as well as screening for other infectious diseases.

Type 3 projects focus on drug abuse treatment. They aim to eliminate and reduce drug use through replacement use of illegal drugs with substances such

as methadone. These programmes can include individual and group counselling, HIV testing and counselling and referrals to other health care services, as well as educational messages to reduce risky drug use and sexual behaviour.

Type 4 projects try to influence risky behaviour by changing the norms of drug use and sexual networks through network-style interventions. This is done through the use of IDU peers who may be seen as opinion leaders in their networks.

These activities may be complemented by media interventions such as television, radio and newspaper advertisements promoting the main educational messages as well as the intervention.

Community-based outreach programmes are often used in settings where NEPs are not viable legally. There have also been efforts to involve pharmacists in the sale, distribution, or exchange of syringes in Europe, North America and Asia. Pharmacy-based programmes often provide IDUs with a choice of prepared packs. Pharmacy-based activities have lower start-up costs because there is already an established distribution network. Other advantages to pharmacy-based interventions are that they may be more accessible geographically, with longer opening hours.

Using volunteers can significantly decrease the financial cost of implementing the project. This cost saving does, however, need to be weighed against high drop-out rates seen amongst volunteers who may not always be able to give priority to project work.

Initial strategy activities include development and production of targeted IEC materials and recruitment and training of IDU volunteers/peers. Once the project is under way, typical outreach activities include distribution of educational materials, peer education, and the distribution and exchange of supplies.

3. Factors which affect costs

Key intervention-related factors, which will influence the level of costs, are:

- **Nature of activities and integration with other services**.
- **Materials development**. The amount of time and type of work invested in development of the IEC materials will influence costs. For example, external consultancy resources may be drawn upon during this phase. These costs may be reduced if the materials used have already been produced elsewhere.
- **The amount of time invested in staff and peer educator training**.
- **The geographical and social accessibility of target groups**.

- **The total number of IDUs targeted**. Large numbers may mean greater expenditure on some of the IEC materials and on supplies but may contribute to lower average costs. Scale effects have not been observed in IDU programmes, given that most interventions operate on a relatively small scale.

- **The intensity of contact between peer educators and IDUs**. For example, whether educational sessions are conducted with individuals or groups.

- **Whether peer educators are salaried or voluntary staff**.

- **Type**, **intensity and quality of media used**. There are clearly different costs associated with broadcast media and, for example, print media relative to radio and television. The length of a programme or publication, the frequency with which it is transmitted, and the duration of the campaign will also influence costs, as will the use of peak or off-peak airtime for broadcasting.

- **Rate of charging for airtime or press space**. Media coverage may be paid for at commercial rates, or sponsored by the private sector, or subsidized by the government.

- **Personnel costs**. The strategy is labour-intensive and the relative costs of staff should be borne in mind in making any international comparisons or extrapolating cost data to other countries.

- **Provision of project condoms**. These may be bought on the international market or donated to the project at inflated or subsidized prices.

- **Whether drugs are provided by the project**. Alternatively, they may be prescribed only, the costs falling on patients.

- **The existence of complementary activities:** such as legal and welfare counselling.

PREVENTION OF MOTHER-TO-CHILD/VERTICAL TRANSMISSION

1. Introduction

The risk of vertical transmission from an infected mother to her baby ranges from 21% to 43% in developing countries, depending on breastfeeding patterns [122]. The virus may be transmitted during pregnancy (in utero), childbirth (intra-partum), or through breastfeeding (post-partum). The primary strategy for preventing vertical transmission is avoiding HIV infection in girls and women. However, there are several interventions known to be effective during pregnancy, childbirth

and post-natally to lower the probability of transmission from an HIV-positive mother to her baby. The key interventions for prevention of mother-to-child transmission (MTCT), which are currently relevant for low- and middle-income countries, include:

1) Antiretroviral (ARV) therapies

Transmission to the baby can be reduced by two-thirds with the administration of long-course antiretroviral therapy with zidovudine (ZDV) (123). However, the administration of this regimen is complex and expensive. Several clinical trials have examined shorter and cheaper ARV regimens. The success of the Thai short-course trial in reducing MTCT by 50% among a non-breastfeeding population led to a greater emphasis on non-breastfeeding strategies in developing countries (124,125). Studies among breastfeeding populations find a 38%-44% reduction in MTCT using a short-course ZDV regimen (126,138). In 1999, a Ugandan clinical trial found that a single dose of nevirapine (NVP) taken during labour and by the infant after birth was almost 50% more effective than the short-course ZDV regimen (127).

2) Provision and advice on infant feeding

Given the success of ARV therapy in these clinical trials, there is increasing focus on infant feeding and MTCT in developing countries. It is estimated that breastfeeding doubles the transmission of HIV (128). Factors that increase the risk of transmission include longer duration of breastfeeding and the stage of infectivity. Evidence from one trial suggests that exclusively breastfed infants were less likely to become infected than non-breastfed or mixed-fed infants (129). It is unclear how the duration of breastfeeding and early weaning affect these results (130). MTCT through breastfeeding has become a very significant source of debate, given the intensive efforts on the part of both national and international communities to promote breastfeeding over the past 20 years. There are significant concerns about the use of formula feeding leading to increased morbidity/mortality of infants, and other feeding options such as early weaning, surrogate breast-feeding and pasteurization of breast milk are being discussed. There is concern about the difficult logistics of pasteurization, and there have been cases where surrogate mothers have acquired the HIV infection from infected infants (131).

VCT has also received increased prominence due to the high profile of MTCT prevention.

Given the efficacy of the ARV interventions, there have been several studies looking at the cost-effectiveness of MTCT prevention interventions (133-136). However, there is limited information on the cost of implementing such activities, particularly outside a trial context. In general, the cost of the intervention has been inferred by mixing data from a number of sources and countries (133,134,136). While this approach can guide priority-setting in a global context, it is harder to infer costs and resource requirements. The focus of analysis has been mainly on the cost of ARV drugs, and there have been only a few attempts to model the infrastructure requirements for such an intervention (137). It is important to consider

what additional infrastructure and staff are needed and also where they might come from. There is very limited cost information on the provision and distribution of formula feeding for the infants of HIV-positive women, and the costs of using replacement methods for HIV-positive women and their families.

2. Description of potential projects

The implementation of MTCT prevention interventions is still in early phases in many countries. Testing and offering of antiretrovirals generally occur within the existing health and antenatal care infrastructure. The actual timing of the HIV testing and counselling will depend on the type of regimen that is being undertaken and the stage of pregnancy at which a woman first attends antenatal services. There are significant problems associated with women consenting to and then returning for HIV test results, before undertaking antiretroviral therapy (as discussed in the VCT strategy). Different models of VCT and feeding advice are currently being piloted.

3. Variables which affect costs

Key issues affecting costs that have been highlighted are:

- **Antiretroviral regimen**. The choice and price of drugs for a particular regimen will significantly affect the costs of the intervention.
- **HIV prevalence**. As prevalence rises, the costs of testing and delivery of the regimen will increase. However, economies of scale may also be observed.
- **Extent of additional capacity which is required to administer the regimen**. Existing facilities and services may need to be strengthened (e.g. laboratory capacity, additional staff to attend deliveries).
- **Feeding strategies**. Provision of replacement feeding methods, such as formula-milk, will significantly increase costs.
- **The geographical and social accessibility of the population**. This will influence the workload of the service.
- **The number attending relative to the capacity of the service**.
- **The type of test and number of tests**. Various alternatives exist for the test itself, and the cost of HIV antibody testing can be reduced in a number of ways.

1.2 New and emerging HIV prevention strategies

In addition to those established strategies currently being implemented, there are also new and emerging HIV prevention strategies. These strategies are in different stages of development and clinical trials, and the feasibility of their use in a low- and middle-income country context is still unclear.

This section provides a brief description of:

- microbicides and female-controlled methods;
- use of vaccines.

Microbicides and female-controlled methods

There has been wide interest in female-controlled methods for prevention of HIV. There are several producers of female condoms, and these are actively being marketed through social marketing programmes in several countries. There is also controversy about the role of existing spermicides in preventing STD/HIV [141].

The development of chemical barrier methods such as vaginal microbicides to prevent HIV infections is on-going. Both product development, including clinical evaluation, and product acceptability studies are under way. It is not anticipated that microbicides will be available for some years.

To date, there has been little discussion of programmatic issues such as introduction, distribution and post-marketing surveillance, as well as analysis of the costs and cost-effectiveness of microbicides. However, it is envisaged that microbicides would be sold through current contraceptive marketing programmes [139,140].

Vaccines

Currently, vaccines for HIV are in the clinical trial stage in the United States and Thailand. There is still the issue of whether these clades of the vaccine will be appropriate in other settings, e.g. sub-Saharan Africa. Some preliminary modelling on the cost-effectiveness of vaccines has highlighted a range of factors that will affect costs:

- production costs including fixed costs
- implementation costs including
  - training and health education
  - establishing stores/cold chains
- programme costs (vaccine, staff, transportation, fixed costs)
  - costs of adverse reactions

Further, the cost-effectiveness of these vaccines will be affected by population access (high-risk groups versus general population), the timing of expected effect on HIV incidence, requirements for booster doses and infectious rate among the target groups [88].

Chapter 2
CONCEPTS OF COST ANALYSIS

This chapter reviews the fundamental concepts underlying cost analyses. It highlights that there are several choices about the type of cost analysis that will be undertaken.

2.1 What are costs?

Economists define a cost as the value of resources used to produce a good or service. However, the way these resources are measured can differ. There are two main alternatives with respect to measurement of these resources: financial and economic costing.

Financial costs represent actual expenditure on goods and services purchased. Costs are thus described in terms of how much money has been paid for the resources used in the project or service. In order to ascertain the financial costs of a project, we need to know the price and quantity of all the resources used or, alternatively, the level of expenditure on these goods and services.

Economists conceptualize costs in a broader way. They define costs in terms of the alternative uses that have been forgone by using a resource in a particular way. These **economic** or **opportunity costs** recognize the cost of using resources, as these resources are then unavailable for productive use elsewhere.

"The basic idea is that things have a *value* that might not be fully captured in their *price.* It is not difficult in many health programmes to identify resource inputs for which little or no money is paid: volunteers working without payment; health messages broadcast without charge; vaccines or other supplies donated or provided at a large discount by organizations or individuals" (PHC: 57). Thus the *value* of these resources to society, regardless of who pays for them, is measured by opportunity cost.

Economic costs then include the estimated value of goods or services for which there were no financial transactions or when the price of a specific good did not reflect the cost of using it productively elsewhere. The main ways that financial and economic costs differ is in the way they treat:

- donated goods and services;
- other inputs whose prices are incorrect or distorted;
- valuation of capital items.

The calculation of economic costs will be discussed in chapter 4.

The choice of whether to use financial, economic or both approaches depends on the objectives of the analysis. If the purpose of the costing exercise is to compare expenditure against budget allocations or to explore affordability of the project, then only actual project expenditure should be recorded. In this instance, the financial cost of a consumed resource for which nothing was paid, for example a donated good, is zero.

If, however, the purpose of the exercise is to address project sustainability or to consider replicating the project elsewhere, the concern will be to record the costs of all resources consumed, whether or not they were paid for from the project budget. In this instance, the economic costs of donated goods and services, valued by their equivalent market prices, are used in the analysis. "Analyses using economic costs do not replace those using financial costs, but supplement them with additional information useful for decision-making" (PHC: 57).

2.2 Whose costs? Society, provider, household and private costs

A societal perspective would encompass strategy-related costs incurred by all members of society, including the private sector, the public sector and private consumers (e.g. households and individuals). A provider perspective would exclude costs incurred by private consumers or households. A public sector perspective would exclude costs incurred by the private sector and by private consumers, and collate only those costs incurred by the public sector in implementing the strategy. These costs can be considered as the costs of providing particular programmes, and are borne by the organization delivering the services (although this does not mean that the organization finances the entire cost of the services). In addition, individuals and households may also incur costs when using these services.

As well as providing funds directly through the payment of user fees, private individuals may also contribute to financing service delivery through the provision of goods. For example, some blood transfusion patients may have to purchase their bags and needles privately before coming to the service, and many STD treatment patients will have to purchase their drugs privately from pharmacies after their consultation.

As in the PHC Manual, these guidelines calculate the cost of projects from the perspective of service providers and not from the perspective of the society and its individuals. The only part of the household cost that will be considered is the amount of fees or payments made which contribute towards financing services and will be known as **private costs**. The information on fees collected from clients of HIV prevention services can contribute to the debate on cost recovery. For example, analysis from specific projects can suggest the percentage of project running costs that can potentially be covered from fees—an issue that is very pertinent to sustainability of projects and one that is often focused on by donors.

Including full household costs would mean including a wider range of private costs, such as travel and time costs. Module 8 of the PHC Manual should be referred to for further information on measuring the costs that private individuals incur in accessing services.

2.3 Full and incremental costs

A full cost analysis estimates the costs of all resources that are being employed in running a project or programme, including basic infrastructure. An incremental analysis looks at the cost of adding or implementing the additional project or programme to existing services. It does not attempt to provide cost estimates for existing services.

An incremental analysis accounts for the major 'new' inputs that are required by the new intervention. However, since it assumes that the organizational infrastructure already exists, an incremental costing will underestimate costs that are of a general administrative nature borne by the organization (particularly communications and office supplies). Similarly, it does not account for items such as the overhead costs of running the organization as is done in a full costing analysis. It is also more difficult to generalize from incremental cost analyses, unless the prior level of existing services and infrastructure is clearly specified. The incremental approach is particularly appropriate to use when the intervention or project is not the major component of the organization's overall cost structure [50].

The availability and ease of data collection as well as organizational structures may heavily influence whether a full or incremental costing is undertaken. This is further discussed in chapter 3.

2.4 Total, average and marginal costs

The **total** cost represents the cost of producing a quantity of services or output for a particular project or programme. This can be the result of a full or incremental cost analysis.

The **average** cost is then the total cost per unit of output, and is calculated by dividing total cost by the units of output or services produced.

The **marginal** cost is the additional cost of producing one more unit of output. This should not be confused with incremental costs that look at the additional cost of adding on an entire service or project, whereas marginal costs are concerned with cost differences within a service or project [2].

Again the purpose of the cost analysis will determine whether to focus on average or marginal costs. If you want to look at differences in costs between different providers or clinics, you should compare average costs. If you want to look at the impact of expanding services (e.g. expanding hours or number of staff), then you need to consider marginal costs [5].

2.5 Joint costs

The resources that you are costing may not be fully used in the specific project or programme that is being examined (e.g. a person may be working on a number of projects, some not dealing with HIV prevention). They may be used jointly with other ongoing projects. In this case, a decision needs to be made about what proportion of the resources should be allocated to the specific project or programme that is being costed, and the way it should be allocated. The way you allocate the resources may vary according to the type of resource, and this will be discussed in chapter 4.

2.6 Classification of costs

"To estimate a health programme's costs, it is necessary to classify its components. Cost elements can be broken down in several ways, as illustrated below. A good classification scheme depends on the needs of the particular situation, but there are three essential elements:

- it must be relevant to the particular situation
- the classes (categories) must not overlap
- the classes chosen must cover all possibilities

"Resources used for programmes can be described in many different ways. For example, an HIV prevention programme might be described as using the following resources: personnel, money from external sources and mass media. These categories are well defined and their meaning is clear. However, they do not constitute a very useful way of thinking about the resources used in this programme. The main problem is that the categories overlap; money from external sources can be used to pay for personnel, and personnel are likely to be involved in mass media operations. If we add up the value of these three categories, they may well come to more than the total cost of the programme.

"One reason why the categories above are difficult to use is that they confuse different dimensions of resources, mixing activities (in this case 'mass media') with sources ('money from external sources') and physical inputs ('personnel'). Obviously, several different classification schemes are involved here" (PHC: 5).

The main type of cost-classification is by **inputs**. "Inputs are considered as either **recurrent** items (those that are used up in the course of a year and are usually purchased regularly) and **capital** items (those that last longer than a year). A scheme for classifying costs by inputs (with examples of each category) is shown in Box 1.

Box 1. Classification of costs by inputs

Capital costs

- Vehicles: bicycles, motorcycles, four-wheel-drive vehicles, trucks
- Equipment: refrigerators, sterilizers, manufacturing machinery, scales, other equipment with a unit cost (price) of $100 or more
- Buildings, space: health centres, hospitals, training schools, administrative offices, storage facilities
- Training, non-recurrent: training activities for personnel that occur once or rarely
- Social mobilization, non-recurrent: social mobilization activities, e.g. promotion, publicity campaigns, that occur only once or rarely
- Start-up activities: activities which are likely to last the lifetime of the project, such as production of materials, recruitment of staff

Recurrent costs

- Personnel (all types): supervisors, administrators, consultants, casual labour and volunteers
- Supplies: drugs, vaccines, syringes, educational materials, condoms, small equipment (unit cost less than $100)
- Vehicles, operation and maintenance: petrol, diesel, lubricants, tyres, spare parts, registration, insurance
- Buildings, operation and maintenance: electricity, water, heating, fuel, telephone, telex, insurance, cleaning, painting, repairs to electrical supply/appliances, plumbing, roofing and heating
- Training, recurrent (e.g. short in-service courses)
- Social mobilization: operating costs
- Other operating costs not included above

"Other possible ways of classifying components are by:

- function/activity
- organizational level (e.g. national, district, community)
- source of funds (e.g. national and local governments, donors, nongovernmental organizations)
- type of currency" (PHC: 5-8)

2.7 Unit costs and measurement of outcomes

"Unit costs are another term for average costs. They can be calculated for both financial and economic cost analysis. For a specific project or programme, several types of unit costs can be calculated, depending on the type of outcome that is specified" (PHC: 53). In general, we can classify three types of outcomes:

- Primary outcome, which measures the final effect or impact on health status due to the intervention of the project;
- Intermediate outcome, which reflects intermediate changes due to the intervention of the project, required before there is a health impact;
- Immediate or process measure, which measures the activities or outputs of the intervention.

In terms of HIV prevention strategies, the primary outcome measure is the number of HIV infections averted. There are several practical problems in determining the number of HIV infections averted. First, the most direct way to measure infections averted is through randomized clinical trials, which are both expensive and rarely implemented for behavioural change interventions. Second, in order to calculate the full impact of the intervention, we need to consider both infections averted for those people involved in the intervention, as well as secondary infections averted because the chain of transmission has been broken. This requires information about the epidemiology, behavioural patterns and transmission efficacy in the specific population. Third, if several prevention strategies are being used together, it is difficult to attribute infections averted to any specific strategy [15].

Three approaches have been used to overcome these problems. First, other primary outcome measures, such as Disability-Adjusted Life Years (DALYs), have been suggested. Second, intermediate or process-outcome measures have been used. Table 1 (source: adapted from [15, 1]) discusses the strengths and weaknesses of the different measures that have been used in measuring outcomes of HIV prevention strategies. Third, model-based evaluation has developed as a means of estimating HIV infections averted. These models attempt to capture the dynamic nature of this transmission, as well as epidemiological and behavioural patterns. The models are used to provide simulations about the possible impact of HIV prevention strategies on the total number of HIV infections averted (including secondary infections) [23]. The development of the models can be quite complex.

Table 1:
The strengths and weaknesses of different outcome measures

Outcome measure	Strengths	Weaknesses
Disability-adjusted life years (DALYs) gained—primary outcome.	• Cross-sector, cross-programme and cross-intervention comparisons are possible. • Ability to assess impact of combined clinical management and prevention strategies. • Morbidity and mortality effects combined in one measure. • Ability to measure consequences of clinical management when death is certain outcome. • Can include indirect consequences such as TB or STD cases treated and/ or prevented.	• Based on subjective measures of disability. • Possible over-simplification. • Derived from and dependent on the primary outcome of the intervention. • Debate over their validity. • Not widely recognized outside the health sector.
Infections averted – primary outcome of an HIV prevention strategy—primary outcome.	• Comparisons across different prevention strategies are possible. • DALYs can be derived easily with adequate information on mortality and life expectancy.	• Unable to evaluate strategies that include clinical management component. • Unable to compare across health interventions. • Unless measured through randomized controlled trials, may need sophisticated modelling to assess impact on general population. • May not include indirect consequences of intervention.
Numbers educated or counselled; cases detected through screening for blood transfusions and counselling—intermediate outcome measure.	• Relative ease of measurement and interpretation. • May give some indication of impact, even though final health status unknown. • Reflects operational efficiency of programme. • Can identify most efficient method of delivery.	• No measure of impact on HIV transmission. • Does not account for variations in populations' HIV seroprevalence. • Gain achieved may not reflect real change in impact.
Condoms distributed or sold/numbers receiving educational material; numbers tested/screened — process-outcome measure.	• Ease of collection, these measures are often part of routine monitoring of programmes. • Reflects operational efficiency of programme. • Can identify most efficient method of delivery.	• No measure of impact on HIV transmission. • Does not account for variations in populations' HIV seroprevalence. • Gain achieved may not reflect real change in impact.

Given the variation in outcome measures, there can be a number of unit costs derived for a particular project or programme. For example, let us assume that the total costs of a peer education project were $30,000 for one year, where there were 1040 education sessions in that year reaching 2496 people. In addition, using a model-based analysis, there is an estimate that there were 250 HIV infections averted (based on information about behavioural changes and increased use of condoms). Then, for this peer education programme among sex workers, the following type of unit costs could be derived:

- an immediate service or process (output): cost per education session
  = $30,000/1040
  = $ 28.85 per education session

- an intermediate effect: cost per person educated
  = $ 30,000/2496
  = $ 12.01 per person educated

- a final effect or impact on health status: cost per HIV infection averted
  = $ 30,000/250
  = $ 120 per HIV infection averted

It may be possible to calculate unit costs by activity within a project or programme if activity-specific outputs are available (for example, if we know that training activities cost $5000 and there were 60 people trained, then the cost per person trained is $83.33). In practice, the calculation of the final impact can be quite difficult and depends on the nature of the prevention strategies being considered. For a strategy such as HIV blood screening, it is possible to calculate the cases of HIV infection directly prevented. However, to estimate the number of secondary infections requires model-based evaluation or randomized clinical trials. Thus, for most studies, process or intermediate unit costs are often presented (e.g. cost per condom distributed, number of people buying condoms). However, it is recommended that the calculation of unit cost should try and use outcome measures that are closer to the health impact end of the spectrum. Thus, for the condom social marketing project, reporting 'costs per condom distributed and reported used' will be more useful in terms of extrapolating impact.

2.8 Cost-effectiveness

"Cost-effectiveness analysis is a tool which enables programme managers to make informed decisions about resource allocation. By measuring and comparing the costs and consequences of various interventions, their relative efficiency can be assessed and future resource requirements estimated" [15].

The key feature of cost-effectiveness analysis is that it is used to examine alternatives that all work to meet the same objective. The results of the analysis are described in terms of the cost per unit of effectiveness for each alternative.

The cost-effectiveness ratio is calculated for each alternative by dividing cost by the unit of effect (e.g. HIV infection averted). Then a comparison is made between these ratios. "The alternative with the lowest cost per unit of effectiveness is the most cost-effective, and is generally to be preferred on grounds of economic efficiency" (PHC: 67).

"Cost analysis is one of the key building blocks for cost-effectiveness studies. Unit costs based on intermediate outputs can be thought of as preliminary cost-effectiveness results; more ambitious cost-effectiveness analyses are directed at health status impacts" (PHC: 54).

For this type of analysis, economic costing is used: cost-effectiveness looks at the economic efficiency of different alternatives. More detailed discussion on undertaking and interpreting cost-effectiveness analysis are available from a number of sources [1,2,7,8].

There is a dearth of data on the relative cost-effectiveness of the very varied prevention strategies that are being implemented around the world. Costing and subsequent cost-effectiveness analysis can contribute to greater awareness in this area and facilitate decision-making about the best use of present and new resources. For example, if a country receives a loan or grant for AIDS-related prevention activities, cost-effectiveness data would help planners to assess which strategies, and what combination and volume of each, might provide the best value for money in the context of the objectives desired.

Chapter 3

PLANNING THE COSTING EXERCISE

The following three chapters will discuss the planning and collection of data, and analysis of costs. To encourage a consistent approach to costing a wide variety of HIV prevention projects, standard worksheets for field use are provided in Annex 1. An Excel spreadsheet version of these tables is available on the accompanying disk. These worksheets can be used directly on paper, or form the basis for creating spreadsheets on data-management computer software. In the next three chapters, we will discuss in detail how to fill out these forms, with reference to the technical guidance in the PHC manual, and with additional guidance on how best to complete them.

The forms are devised to allow cost data to be built up in the field, but where accurate expenditure data are already collated and available, these can be entered into the forms directly. There are 5 types of worksheets included in Annex 1:

1. Background data sheet.

2. Form A—Project Summary sheet—presents costs by input and level.
   This is a collation of all Form B summary sheets.

3. Form B—Summary of costs at each level.
   This is a collation of all Forms C1-C10.

4. Forms C1-C10 provide the basis for data collection by input category:
   C11—cost recovery.

5. Form D—collection of output/outcome information.

These worksheets will be referred to throughout the next three chapters. In addition, there will be 'tips-of-the-trade' described in boxes. These tips are designed to illustrate different issues in the collection of costs and possible ways to deal with problems.

3.1 Defining the question and objectives

Analysis of the costs of HIV prevention may be undertaken for a number of reasons. Before making preparations for a costing study, a manager should be clear about the questions s/he is seeking to answer, the purpose of the planned work and the use to which the work will be put. These will help to establish the boundaries for the costing exercise. For example, it should be clear whether the exercise is being conducted to examine the costs and efficiency of only on-going activities, or whether it is being conducted with a view to project replicability. If these types of issues are clarified at the outset, it will be easier to ascertain exactly what data are to be collected and there will be less risk of wasting time in unnecessary activities.

Objectives for a cost analysis can include:

Examining the efficiency of a project

The objectives of the costing exercise may be to analyse on-going costs of an established project to identify potential cost savings and to improve the efficiency of the service. In this case, project start-up costs may be excluded. Within a project, a manager may want to analyse expenditure by input to understand which areas of the programme involve high or low spending. In order to exclude project start-up costs, all activities that are undertaken to initiate the project are excluded from the analysis.

Modification/sustainability

If the initiative to conduct the costing exercise is coming from the project itself, managers may want information for one, or a combination, of the following objectives: improving budgeting; monitoring costs; planning improvement of the current system, and improving the future of the strategy. A manager may, for example, be particularly concerned about the sustainability of the HIV prevention programme and be seeking an accurate estimate of the budget necessary to maintain it. If charging for services is an option, information on costs can help to establish appropriate prices. Cost analysis may also be used in discussions about the feasibility of scaling-up/expanding the project. If sustainability is the main concern, start-up costs are excluded, but if one is considering the expansion of a project, then it is necessary to consider whether certain aspects of start-up activities need to take place.

Replication

If the impetus for the costing exercise is coming from outside the project, objectives are more likely to concern replicability of the project and extrapolation of results to other situations. Local managers will probably give considerable time to the fieldwork phase and it is important that the resulting data also be of use and value to them.

This is particularly the case with **CSM**. Most formal CSM projects are overseen or managed by foreign private groups or their subsidiaries. These organizations' financial management tends to be strong and they will be monitoring costs for their own purposes. The objective of a costing exercise is, therefore, not likely to be that of collating information on the on-going costs of the project for management purposes, but rather that of assessing the costs of this strategy relative to the other main strategies or providing information on costs of replication of the project elsewhere.

If the objective is to provide information on the total costs of the strategy with a view to replication, both on-going and start-up costs should be collected. Start-up costs include any development and production of information, education and communication (IEC) materials as well as dissemination of diagnostic and treatment protocols, IEC, and recruitment of workers.

Cost-effectiveness

Cost-effectiveness studies can assist in priority setting, resource allocation decisions and design of services. A manager may want more information on the relative cost-effectiveness of alternative ways of delivering the prevention strategy for which s/he is responsible. As an example, decisions may need to be made within a sex worker/peer education project on whether to engage part-time volunteer workers or full-time salaried staff. Cost analysis may contribute to an understanding of the differences between such options, weighing the tension between increased costs and also increased effectiveness, and thereby contributing to the planning of new or expanded projects. Another objective of the costing exercise may be to compare the cost-effectiveness of different HIV prevention strategies relative to each other (e.g. compare school education relative to strategies of CSW peer education).

Since alternative delivery channels may be considered, it is important to include start-up costs if the objective is to determine relative cost-effectiveness.

There is great difficulty in ascertaining the effectiveness of **mass media** campaigns and, particularly, in attributing effects to the campaigns rather than to any other kind of media or information source. It is thus unlikely that costs will be studied to compare the relative cost-effectiveness of a mass media campaign with other strategies.

Private/provider perspectives

We assume here that private costs other than fees paid (e.g. for the purchase of condoms) are excluded from the costing analysis; but they should be referred to in the presentation of the costing data. However, some **CSM** projects are exclusively in the private sector and will, by definition, have a private provider perspective. Other projects span the private and public sectors and the perspective taken will depend upon who is commissioning the costing exercise and its objectives. If, for example, a Ministry of Health wants to know the financial implications for its own budget of undertaking a CSM project, the cost analysis may be based solely on public sector expenditure—i.e the expenditure of the government and donor-funded portion of the project.

3.2 Identify the alternatives to be compared

Chapter 1 describes different HIV prevention strategies individually. In practice, however, HIV prevention projects are unlikely to take place in such neatly defined packages. Indeed, it is recognized that a combination of approaches can be mutually and positively reinforcing. For example, the success of a school education programme or a condom distribution programme may depend on the success of a concurrently running mass media campaign. Similarly, a CSW peer education project may combine STD treatment, counselling and condom promotion. As the boundaries between strategies may be unclear, it is important to be specific about what exactly is being costed, what combination of strategies is being examined, what alternatives are being compared and, if proceeding to undertake cost-effectiveness analysis, what the appropriate measures of effect/outcome are for the costs being measured.

For example, it should be explicit at the outset whether the aim is to cost one particular **mass media** campaign or to cost a broader mass media strategy that may include a number of campaigns conducted by one or several organizations. **HIV blood screening** is clearly not a stand-alone strategy but, rather, an additional component to whatever form BTS take in a particular country. In practice, there may be significant overlaps between CSW peer education projects and other HIV prevention strategies. If **VCT** is integrated with other services, the costing will need to consider which activities should be excluded. These activities may include partner notification, assistance to support groups, preventive therapy for TB and treatment of STD.

3.3 Describe each alternative

Once the question to be answered is clear, the purpose of the costing and the scope of the work have been defined, and it is apparent what alternatives are being costed, the exercise can proceed to describe each alternative in detail. To do this, it is useful to be clear about how costs will be classified. To undertake cost analysis of HIV prevention, a primary classification by input and organizational level is recommended. It is also useful to make a secondary classification of the strategies by the activities that are taking place within them. This helps ensure that costs are not duplicated or omitted between inputs and activities. It also provides a framework by which a strategy can be costed by activity if this is deemed useful for decision-making.

Inputs

The most common inputs to be found across all strategies are listed in Table 2 below and on the worksheets. When costing a particular project, it is necessary to specify in detail the inputs within each category and this can be done on worksheet forms 'C'.

Table 2:
Classification of costs by main input categories

Capital costs	Recurrent costs
Buildings	Personnel
Equipment	Supplies
Vehicles	Vehicle operating and maintenance
Consultancies (non-recurrent)	Building operating and maintenance
	Consultancies (recurrent)
	Other (including media fees)

It is important to remember that all items that have a life of more than a year are treated as capital items. This means that capital items need to be annualized over the number of years that the items are expected to last (annualization will be discussed in chapter 4). Thus all IEC material, training and consultancies, whose impact is expected to last more than a year, need to be treated as capital items. In order to gauge whether an item lasts for more than one year, it is important to look at the frequency of the item in the project—e.g. how often refresher training is provided.

✔ ***Tip-of-the-Trade 1: Activities as inputs***

Another cost which may appear as an input category is start-up activities. Although this is really an activity, adding activities to the input list can be justified in certain cases. "If one activity is clearly separate from the others, both financially and administratively, it may be easier not to attempt to break it down into its component physical inputs, but merely to record the total cost. For example, start-up, training and social mobilization activities are treated as categories of inputs and included along with personnel, vehicles and the like. When this is done, it is assumed that **all** the resources required for the activity (e.g. personnel and vehicles) are included in that category (e.g. training) and not under the separate categories of personnel, vehicles, and so forth. Thus, the full cost of all inputs used for training is estimated and used as the value for that category" (PHC: 9). Start-up, training and social mobilization activities whose impact is expected to last more than one year are treated as capital items.

In these guidelines, consultancies are also regarded as an input, for reasons explained later. It is, therefore, important to ensure that none of the consultancy costs are double-counted. For example, fees and allowances paid to individuals working on a consultancy input should not also be costed in the personnel inputs.

Activities

Resource inputs combine to accomplish activities. It is useful to present cost data by activity. Bringing together measures of cost and output by 'activity' rather than by the more aggregated 'strategy' can provide an extra tool in project evaluation. Each HIV prevention strategy is likely to encompass a range of activities, some of which will be common across all strategies and some of which will be unique to particular strategies. Table 3 displays a categorization by activity for each of our nine sample strategies.

Table 3:
Classification of strategies by activity

Strategy	Activities
1. HIV blood screening	**Donor recruitment**—including everything related to motivating, educating, recruiting, selecting, screening, counselling and retaining blood donors. **Blood collection**—including all costs of collecting blood from accepted donors. **HIV testing**—including the first and any subsequent confirmatory tests. **Blood processing**—including all costs (except HIV testing) related to the processing of blood, including other testing, blood grouping, preparation of blood products, and all measures taken to ensure safety of blood prior to storage. **Blood storage/distribution**—including all steps taken in storing and transporting blood through to its final transfusion in hospital. **Training**—training of all personnel, including laboratory, medical, managerial and support staff. **Management and administration**—including planning and supervision of the strategy.
2. Mass media	**Development and production of IEC materials**—often includes focus group discussions and market research; testing, revision and re-testing of messages with sample audiences; and translation of the materials into a range of local languages. The costs of the production of the IEC materials, once they are designed, should also be included here. **Transmission/distribution of IEC materials and messages**—modes and costs of transmission will vary according to the type of media being used. Sometimes these activities will include pre-publicity by advertising firms, for example prior to launching television or radio dramas. **Management and administration**—including costs of the overheads of the campaign, planning costs and the cost of evaluating the strategy (including baseline surveys and post-campaign evaluations).
3. HIV school education	**Development and production of curriculum and educational materials**—includes preliminary work such as focus group discussions and testing, revision and re-testing of messages with sample audiences, as well as the production of the final materials. There may also be continuous production of materials for the project, for example when an AIDS magazine or newsletter is established. **Training**—a variety of school staff may be taken away from their routine activities and given training to implement the new curriculum. Ideally, training should address teaching methods as well as provide information on AIDS. If the new curriculum becomes an on-going activity, staff should be given refresher training as well as initial training. **Implementation of curriculum**—comprises in-school teaching activities of the staff responsible for teaching the AIDS curriculum. **Management/administration**—day-to-day management and administration of the strategy by the overseeing department (for example the Ministry of Education or Ministry of Health); also includes the costs of planning and evaluating the strategy.

Planning the costing exercise

Strategy	Activities
4. Condom social marketing	**Development and production of IEC materials**—may include market research, testing, re-testing and any necessary translation. Although promotional materials may be produced for mass media transmission, some may also be produced for more local distribution, particularly in countries where explicit advertising of condoms is restricted. Local promotional materials may include such items as calendars, diaries, key rings, stickers and T-shirts. Technical assistance from specialist marketing consultants is commonly brought in from time to time during the project. **Training**—includes retailers receiving some guidance on the correct use of condoms so that they can relay this information, and possibly other HIV prevention information, to their customers. Necessary training may be undertaken by the social marketing organization or contracted to the commercial manufacturer. **Transmission of IEC materials/messages**—includes all advertising and promotion activities. Activities may include sponsored conferences and professional seminars, award ceremonies for achievement, use of mass media, face-to-face distribution of promotional materials through health professionals, pharmacists, midwives, traditional birth attendants, traditional healers, shopkeepers and itinerant salesmen, and mass distribution in hotels, bars and companies. **Condom distribution**—includes costs of storing and packaging the condoms as well as distributing them to wholesalers or retailers. Distribution channels may be private or public sector or both. Packaging and distributing may be contracted out. **Management and administration**—includes day-to-day activities, planning and evaluation activities and technical support from management consultants.
5. STD treatment	**Development/distribution of diagnostic and treatment protocols**—this may include strengthening of existing laboratory facilities. **Training**—including clinical and support staff. **Diagnosis**—includes both laboratory and syndromic diagnosis. **Counselling**—including drug and condom provision. **Partner notification**—partner tracing, notification and counselling. **Management and administration**—including planning, supervision and evaluation.
6. Sex worker peer education	**Development and production of IEC materials**—for the target population. **Recruitment of peer educators**—can be thought of as a social mobilization component in the project. This activity will occur throughout the lifetime of the project, although the main recruitment will occur at the beginning. Both staff and other peer educators could do this. **Training**—of all staff and particularly of the CSW peer educators who will have responsibility for conducting the educational sessions; includes refresher training. **Transmission of IEC materials/messages**—to the target population, through individual and/or group sessions. **Condom distribution/sales.** **Management and administration**—including planning, supervision and evaluation of the strategy.

Strategy	Activities
7. Voluntary counselling and testing	**Development and production of IEC materials**—clients may be shown a video, or handed educational materials at the pre-test counselling session; materials require development, testing, and production. **Training**—counsellors need to be trained in appropriate techniques, with fully-trained counsellors available to conduct the training and supervise staff with lesser levels of training. **Counselling—pre-test**—done with individuals, couples, or groups. Individual counselling may be followed or preceded by a group session, sometimes involving showing a video. Condoms may be distributed free of charge or sold. Blood may be drawn immediately for those who decide to proceed with the test, or at a separate visit. **Testing**—laboratory testing of blood may be done on site or at a central facility. **Counselling—post-test**—all individuals may be given their results at a post-test counselling session, or only those found positive. **Management and administration**—especially for the free-standing centres, there will be a number of management activities to be carried out.
8. Harm reduction	**Development and production of IEC materials**—often includes focus group discussions and market research; testing, revision and re-testing of messages with sample audiences; and translation of the materials into a range of local languages. The costs of the production of the IEC materials once they are designed should also be included here. **Transmission/distribution of IEC materials and messages**—modes and costs of transmission will vary according to the type of media being used. **Recruitment of peer educators**—can be thought of as a social mobilization component in the project. This activity will occur throughout the lifetime of the project, although the main recruitment will occur at the beginning. Both staff and other peer educators could do this. **Counselling**—designed to decrease risky behaviour, such as sharing equipment. **Syringe/Needle Exchange**—exchange of used needles/syringes for clean ones. **Disposal of contaminated needles**—this could include provision of sharps containers, transport, biohazard disposal and possible incineration. **Bleaching/Distribution of substances to clean equipment**—distribution of, and advice on, cleaning solutions. **Condom distribution**—includes costs of storing and packaging the condoms as well as distributing them to wholesalers or retailers. **HIV testing**—including the first and any subsequent confirmatory tests and counselling pre- and post-test. **Referral to other services**—includes referral to other medical services (e.g. STD treatment), social welfare and legal support. **Training**—training of all personnel, including laboratory, medical, managerial and support staff. **Management and administration**—including planning and supervision of the project.

Strategy	Activities
9. Mother-to-child transmission	**Strengthening Antenatal facilities**—including provision for HIV testing. **Training**—of staff. **Purchasing and storage of ARV drugs and replacement feeding.** **Counselling**—before notification of results, during ARV regimen and for follow-up. **Management and administration**—including planning and supervision of project and follow-up of mothers and infants.

In practice, not all cited activities may be happening within the implementation of a particular strategy. It is, nonetheless, likely that implementation of each strategy entails some combination of these activities. In some cases, a resource input, as specified in the primary classification, will be used solely for one activity and, in other cases, it will be shared between activities. For example, in a government STD clinic, drug inputs may be entirely consumed by the 'STD treatment' activity, whilst a clinician's time may be split between 'STD treatment', 'counselling', 'condom distribution' and 'management and administration'.

Some specific comments about activities in different HIV prevention strategies:

HIV Blood Screening. In a developed BTS, the majority of these activities will have been taking place prior to implementation of HIV blood screening. It might, therefore, be tempting to assume that an HIV screening strategy can be costed by measuring only the incremental costs of adding the HIV blood testing. The situation is, however, more complicated than this. In areas where HIV prevalence is high, replacement of discarded blood can constitute the main cost of HIV safety [(21)]. The cost of HIV blood screening can, therefore, be dependent more upon the costs incurred on pre-testing activities than on the costs of the HIV testing itself. For this reason, it is not sufficient to measure only the incremental costs of the HIV blood testing activity. Rather, the costs of implementing an HIV blood screening strategy will be the costs of all resources used in undertaking the HIV testing, plus the full replacement cost of the blood that tests HIV-positive and is discarded. The unit costs of this blood will be made up of the costs of donor recruitment, selection and counselling, blood collection, tests conducted before the HIV test, and a proportionate share of overheads such as administration and staff training, supervision and management.

To obtain such unit costs, the costs of some activities will have to be obtained for the wider BTS and apportioned to the strategy activities in question. For example, management and administration costs are likely to be shared between pre-testing and post-testing activities and laboratory costs may be shared between HIV tests and other tests. Having embarked this far into a costing exercise, it might be pragmatic to obtain costs for the BTS as a whole, rather than go half way and measure only those costs relevant to the HIV screening strategy.

How complete a costing exercise to conduct will depend upon the objectives of that exercise and the audience interested in the results. The manager of a BTS may be interested not only in the cost of making blood HIV-safe but also in more comprehensive and more generally applicable cost data. By costing the whole BTS, total costs can be presented by activity and the proportion of costs attributable to the HIV blood screening strategy can also be disaggregated. If a full costing is deemed appropriate, detailed guidance can be sought from WHO's *Costing of Blood Transfusion Services* [37].

CSW. There may be other complementary activities taking place, such as initiatives to reach clients for educational sessions. Other activities for CSW projects may not be directly related to HIV prevention, e.g. crèche and income-support activities.

VCT. Some centres provide support to HIV-positive groups, but this is not considered here as a core activity of a VCT service.

IDU. In practice, not all cited activities may be happening within the implementation of a particular strategy. It is, nonetheless, likely that implementation of each strategy entails some combination of these activities. In some cases, a resource input, as specified in the primary classification, will be used solely for one activity and, in other cases, it will be shared between activities. For example, a clinician's time may be split between 'STD treatment', 'counselling', 'condom distribution' and 'management and administration'.

✔ ***Tip-of-the-Trade 2:***
What to include if calculating costs in a clinical trial

Frequently, cost and cost-effectiveness analyses of HIV prevention strategies are done in the context of on-going clinical trials. In order to consider the feasibility of delivering these services, it is very important to include all costs that were necessary to ensure the functioning of the project. For example, if the project had to provide additional basic infrastructure before looking at the efficacy of a particular intervention, the costs of this basic infrastructure should be included. Similarly, it is important to exclude costs associated with the research dimension of the intervention (e.g. some components of monitoring and evaluation).

Organizational level

Some of the HIV prevention strategies may have activities at a number of organizational levels. National programmes may operate from the field through districts and regions up to central-level administration. As one moves up organizational levels in the hierarchy, away from the point of service delivery, it can

become increasingly difficult to obtain data and to tease out relevant costs. Which costs at each organizational level are to be included in the costing study will depend upon the scope of responsibility of the decision-maker who is expected to use the results, and the way in which the results will be applied.

It is recommended that a full costing be conducted at the main service delivery level. For higher organizational levels, it is recommended that personnel inputs be costed, and that any other additional or incremental costs incurred by adding the HIV prevention strategy to existing work be included. Where HIV prevention is integrated with other work, the incremental cost of its addition may be very small at regional and national levels. Taking this approach means that the main inputs to be costed at the higher organizational levels are personnel, vehicle use and supplies. Overheads at those organizational levels, such as buildings, office equipment, utilities and general administration, can generally be excluded. Where, however, new HIV prevention strategies require substantial new administrative, logistic or technical support from more central levels, these incremental costs will involve a wider range of inputs and be more substantial. These inputs should be costed and appropriately allocated to the AIDS strategy. For example, the cost of strengthening the National AIDS Control Programme to support a new preventive strategy should be costed in that strategy.

In order to determine the organizational level, it is important to consider the range of ***service providers*** available for a project or programme. Again, these will differ by strategy:

HIV blood screening. The more localized the costing study, the more likely that it will be concerned with just one provider. In contrast, a national strategy may include a number of providers. For example, in Zaire the mining industry is responsible for a significant proportion of transfusions but transfusions are also available in the public and private sectors. Which providers to include should be clear from the objectives of the study and, in particular, from consideration of the decision-making audience.

Decisions about the organizational levels from which costs should be recorded are likely to be dictated by the objectives of each particular costing exercise. If the BTS to be costed is localized—for example, HIV blood screening at one mission hospital—it may be necessary to cost only one service delivery level.

If the study is looking at national costs, it will probably need to consider costs at all organizational levels from the centre to the periphery. Starting from the centre and moving down through the system, cost information for each organizational level should be sought from expenditure records. If such expenditure records are not available, costs may need to be built up from quantity and unit cost information collected during field visits. Fieldwork may need to be restricted to costing a representative sample of facilities at each of the organizational levels.

Mass media. At any one time, there may be a number of AIDS media campaigns being conducted in a country by both government and nongovernmental organizations. More so than in some of the other strategies, there can be an array of providers involved in the strategy, or even in one campaign. For example, a radio drama in Zambia (47) entailed the involvement of the Health Education Unit of the Ministry of Health, the Government National AIDS Prevention and Control Programme, the National Radio Corporation, a number of colleges and NGOs, drama groups, and the USAID public health communication support programme, AIDSCOM. An array of implementers and organizations will need to be assessed for cost information. Some activities may be contracted out to commercial enterprises, for example IEC production to professional advertising agencies. This may simplify cost collection as the fees charged are likely to include the agency's own overheads and support costs for the work conducted. In this case, the expenditure for the activity in question can be treated as an aggregate input rather than broken down into its constituent inputs.

By definition, a mass media campaign is often implemented at the national level and activities centralized. Costs may, therefore, need to be obtained from only one organizational level, although there may be a number of providers involved at that level. Costs collected will be those directly incurred by a particular campaign plus an appropriate share of the overhead costs of the organization with primary responsibility for supervising, managing and administering the campaign or strategy. This might, for example, be a share of the running costs of the Health Education Unit of a Ministry of Health or its equivalent.

It is recommended that, apart from the lead agency in the campaign, no efforts be made to cost the overheads of other organizations with partial involvement in the strategy. A share of the personnel costs of those organizations should, however, be included, and allocated according to the share of staff time spent on the mass media campaign.

HIV school education. The main provider of the strategy is likely to be a government ministry, such as the Ministry of Education or Ministry of Health. Curriculum development and material production may be undertaken by them or contracted out to a specialized agency. Similarly, training of staff may be undertaken by the Ministry or by a contracted agency. The actual teaching of AIDS education is undertaken by staff in the schools included in the strategy. Donors may also provide inputs to the strategy, for example consultancies during the start-up phase. If the project is a more localized NGO initiative, the only providers involved may be the NGO and the schools in which they are implementing the strategy.

Most of the costing data should be available centrally from the organization with overall responsibility for the strategy—for example, the relevant Ministry. Costs of the time that school staff spend on the strategy during training and teaching may need to be obtained from a sample of schools involved in the strategy.

If any donors provide assistance to the project, for example start-up technical assistance, it may be necessary to approach them directly for details of the costs of their inputs. If the project is a more localized NGO initiative, cost data should be collected directly from the NGO, and other costs, including personnel, from the schools in which the strategy is being implemented

Condom social marketing. There are usually several institutions involved in a social marketing project. A foreign donor may provide consultancies in the start-up phase and on-going financial assistance. Either the donor or a commercial manufacturer may be the source of condoms. In-country, most activities tend to be coordinated by a social marketing organization. They may contract other organizations for marketing, promotion, and distribution. The Ministry of Health or Family Welfare may be involved in project policy, monitoring and distribution of the condoms through its own outlets. At the periphery, individual retailers will be purchasing and selling the condoms. In most instances, the social marketing organization will have central expenditure records that collate the financial costs of these decentralized activities. To obtain the economic costs of the strategy, it may be necessary to deal with some of the other agencies directly. For example, the social marketing organization may not have information on the costs of donor inputs.

Due to the social marketing organization's role in centralizing expenditure data from decentralized project activities, the majority of costing information should be available from that organization's office. Field visits may, however, be necessary to obtain extra data, for example, costs of any inputs that do not entail project expenditure. It may be necessary to approach the organization's headquarters overseas as well as foreign donors for details of the costs of external inputs—for example, condoms and consultancies. Only direct contributions to the project should be included; overheads that are not specific to the country project can be excluded.

✔ ***Tip-of-the-Trade 3:***
Gathering data from CSM organizations

Key information to obtain from the social marketing organization includes the total cost of the project (and an idea of the methods used to calculate this figure); the number of condoms sold; project expenditure on condoms; and revenue returning to the project from condom sales. Although social marketing organizations are usually prepared to share information, it may be in their own format, which is not ideal for cost analysis. It may, therefore, be necessary to adapt such information as is available. For example, in a costing of a Futures Group project where condoms were part of a broader contraceptive social marketing project, it was found that costs were not tracked by contraceptive method [61]. Costing, therefore, entailed taking a share of direct project expenditures allocated in proportion to Couple Years of Protection provided by condoms, plus the cost of the condoms themselves.

STD treatment. Any primary-level STD treatment service is likely to be provided by a single organization, be that a government, private for profit or NGO provider. Occasionally, however, private or NGO facilities may receive government support for supervision, training or drug supplies. Some private and NGO facilities without their own laboratory or referral services may rely on government facilities for these.

- **Government**. If the study is looking at national costs, it should consider costs at all levels from the centre to the periphery. Starting at the centre, cost information for levels below should be sought from expenditure records. If such expenditure records are not available, costs will need to be built up from information collected through field visits to the lower levels. A sample of representative primary-level facilities should be included in the costing study. The costs of laboratory and referral services should be included in the costing study and these may be incurred at higher organizational levels.

  Overhead and support costs for managing and administering the service may need to be collected at a number of levels. In vertical systems, relevant costs at the different levels are likely to be well defined and should be included in their entirety. There may, for example, be specific STD project offices at the national and provincial levels. Where STD services are integrated horizontally with other services, it will be harder to determine the costs that relate to support of the STD services. In this situation, only the incremental costs incurred in supporting the strategy should be included, together with the costs of the time that personnel spend working on the strategy.

- **Private-for-profit and NGOs**. Some projects may consist of only one specialized STD clinic or one general clinic that provides STD treatment, and the costs for these may be available from a visit to one organizational level only. Elsewhere, the primary STD service may be linked to a private/NGO referral hospital and two organizational levels may have to be visited to obtain the necessary costing data.

Sex worker peer education. This type of strategy is normally implemented by NGOs. A lead NGO may coordinate support from other NGOs and from national or international donors. Occasionally, government institutions may provide some inputs to the project, such as condom supplies, building space or salary support. Donors may also provide condoms, as well as technical assistance. Condoms may also be sold by peer educators rather than just distributed free.

It may be necessary to deal with only one or two organizational levels to cost this type of project. The main source of data will be the NGO's management office. The second organizational level, for information that the NGO office is unable to provide, is the community level where peer educators conduct educational activities, although at this level, the organization may be much more informal. Government contributions may need to be investigated separately, for example at the district or municipal level. It may also be necessary to approach donors for the costs of their inputs.

VCT. Where VCT is provided by a variety of agencies, the objectives of the study will determine whether a representative sample is required, or a study of the service thought to be most replicable or most effective.

Where VCT centres are provided routinely by governments, and if the study looks at costs nationwide, costs will have to be considered at all levels from the centre to the periphery. Starting from the centre, cost information for levels below should be sought from expenditure records. If these are not available, costs will need to be built up through visits to lower levels. A sample of VCT facilities should be selected for detailed costing. The incremental costs of support given to the VCT clinics by higher levels should be included.

If a VCT service provided by an NGO is being costed, there may be only one level of interest or, at most, the level of the service plus the incremental costs of support provided from a head office. Since VCT services may be funded from a number of different sources, including NGOs, government subsidies, and external donors, a variety of contacts may need to be made with funders at different levels to obtain comprehensive cost data.

IDU. An IDU project is typically implemented by NGOs. A lead NGO may coordinate support from other NGOs and from national or international donors. Occasionally government institutions may provide some inputs to the project, such as condom supplies, building space or salary support. Donors may also provide condoms, as well as technical assistance. Condoms may also be sold by peer educators rather than just distributed free.

3.4 Decide on the data timeframe

"Usually, you should attempt to measure the costs incurred over one full year. This is likely to be consistent with the records of most types of relevant data, such as expenditure on personnel and services provided. A one-year period avoids any distortions that might be caused by seasonal effects. Occasionally, limitations of information, e.g. for a new programme, or for study time, might make it necessary to choose a shorter period. If you study costs for less than one year, you will probably need to discuss with other knowledgeable persons ways of avoiding serious distortions.

"In general, it is recommended that, to enhance accuracy and relevance of cost data, you should choose the most recent year for which cost data are likely to be available. If the year chosen is too far in the past, important information may be lost. If the year is too recent, some routinely collected statistics may not yet be available. Sometimes the financial year (the period for which routinely collected expenditure data are summarized) is not the same as the calendar year (the period for which effectiveness statistics are likely to be aggregated). If this is the case, see whether it is possible to obtain disaggregated data for each

month covering costs or effectiveness, so that you can construct either annual effectiveness data for the financial year or expenditure figures for the calendar year" (PHC: 26). If you are collecting more than one year's worth of information, then you need to keep careful track of which year the expenditure took place.

When undertaking a costing exercise, cost data can be collected retrospectively from such sources as accounting records, questionnaires and interviews. Alternatively, information systems can be specially established to collect costing data prospectively over a suitable time period. Once collected, these data will also be analysed retrospectively.

Costs are likely to vary during the course of a project's implementation, especially if there are high initial start-up costs. These costs are associated with start-up activities that are conducted at the beginning of a project and rarely repeated, such as the purchase of vehicles or project infrastructure. For example, development of standard diagnostic protocols may be one of the start-up costs of an STD treatment strategy. If start-up costs are being included in the costing, they should be treated in the same way as capital costs and annualized over the expected lifetime of the project.

Different timeframes for data collection may be chosen according to the objectives of costing studies, in particular:

- Concern with operational efficiency and modification of on-going projects may mean that start-up costs can be ignored and only on-going recurrent and annualized capital costs collected. If only on-going costs of regular services are being considered, it is recommended that annual costs be collected for a recent appropriate year. They should include recurrent costs and annualized capital costs.

- If the study is seeking information on total project costs, costs should be recorded for all years in which they were incurred. These costs will include start-up costs such as planning, staff recruitment and project site identification.

- Identification. This is particularly important for **CSM**, as unit costs tend to decrease over the life of a CSM project due to the increasing volume of sales. In making comparisons between projects, it is important to consider how long each project has been running. CSM projects tend to have high start-up costs incurred in market research, project design and project launch.

- If the costing exercise is addressing future modification or sustainability of the project, the costs of on-going activities (including depreciation of capital inputs) should be collected from a routine phase of the project. These should ideally be costs for the most recent year for which data are

available. If costs are taken from a period early in the project, it is important to exclude one-off start-up costs that would inflate estimates of the resources needed to sustain the project in the future.

- If information is required on the costs of replicating the project, all costs incurred over the history of the project since its inception should be collected. This includes both start-up and on-going activities. Costs incurred in all years of the project should be recorded, including the costs of organizational changes made as part of the HIV prevention strategy. For example, for HIV blood screening, changes may include establishing a national BTS for the first time, reorganizing an already established BTS, adding facilities such as laboratories, or adding a new set of tests in laboratories. Start-up costs may also include operations such as the establishment of new national policies for BTS blood-screening practice.

- The selected timeframe may also depend on the maturation of the project. If the strategy is of limited duration, a costing exercise may need to encompass all costs, including those incurred by start-up activities. If the strategy has become institutionalized and is now an established operation, it may be appropriate for the costing exercise to investigate on-going costs only.

- **Mass media** campaigns will normally be a time-bound discrete exercise rather than a continuous on-going set of activities. Because of this, each mass media campaign is most appropriately costed from its conception to completion. The costing exercise will, therefore, capture all costs rather than differentiate between start-up and on-going costs in the way appropriate for some of the other strategies. If the objective is to cost a broader strategy that is, in fact, on-going, the strategy as a whole may include a series of campaigns. It may then be necessary to cost overheads for developing and overseeing the series, in addition to costing each campaign.

To undertake cost-effectiveness analysis it is important that data on both costs and effectiveness be linked in such a way that only the costs of those resources that produce the effects are measured. It is usually recommended practice to estimate both costs and effects over the period of a year. Nonetheless, consideration needs to be given to what is most appropriate for a particular strategy. One year of cost data may be appropriate for prevention activities that are on-going, for example blood screening programmes. However, in some strategies, such as mass media campaigns, costs may be incurred over a shorter time period and effects may happen over a longer time period in the future. In all cases, it is essential that a record be made of the timeframe to which data refer.

If cost data have been collected from more than one year, it will be necessary to convert them to a constant Base Year value before adding them together (see chapter 4). The chosen Base Year should normally be the most recent year for which data are available.

3.5 Select a sample

Sometimes it may be necessary to cost a national programme that consists of geographically widespread and multiple units, for example a national blood transfusion service or STD programme. In this case, it may be practicable to cost only a sample of facilities from each organizational level or levels. Even when costing a more localized project such as a peer education project, it may be necessary to sample time allocations of representative members of staff during representative weeks of the year.

✔ *Tip-of-the-Trade 4: Selection of samples*

"There are several ways in which you can make your selection. Usually, in taking a sample, you are not just interested in the particular units you select. You wish to be able to draw conclusions about the population as a whole. If this is the case, there are certain rules you must follow. Statisticians have devised many different approaches to satisfy the conditions necessary to allow valid conclusions to be drawn about the population from samples. Four of these approaches are described below. For each of them, the size of the sample drawn will influence the degree to which inevitable statistical variation will affect the confidence to be placed in the estimate for the whole population. Disregarding expense and other problems, the larger the sample, the greater the confidence (i.e. the smaller the range of probable error). Another factor is the extent of variation among units of the population; smaller variations permit a smaller sample size. You might wish to consult a statistician about these matters.

"One of the customary approaches to selection is *random sampling.* This is a good technique to use if you can feasibly list (and number) all the elements of the entire population and if there are no subgroups you are particularly interested in. You could, for instance, use it in selecting health centres within a district. Having decided on the sample size, you would select the required number of units at random from a numbered list, using a table of random numbers.

"Systematic sampling is a second approach. It is easier to use than simple random sampling, and is most useful when there are large numbers in the population (say, patients attending a hospital). The procedure is as follows:

- Obtain a list of all the units (n) (in no systematic order) from which the sample is to be selected.
- Decide on the size of the sample *(s).*
- Calculate the ratio *n/s (*= k). Select every kth item on the list, starting at any point. For example, say you want a sample of 50 patients (i.e. *s = 50)* out of 2000 attending the clinic in a year (i.e. n = 2000). Then k = 2000/50 = 40, and you would then select every 40th patient. If *s* does not divide exactly into n, e.g. k = 40.54, then round k up or down to the nearest whole number.

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"If you were interested in the health centre costs of a PHC programme in the country as a whole, studying a random (or stratified) sample would probably require a lot of travelling and effort, since these units are likely to be widely dispersed. An alternative approach is to first select a sample of districts and then to look at the health centre costs only in those districts. This is called *cluster sampling.* It gives less valid results than pure random sampling, but can have major logistical advantages. First, select a random sample to determine the clusters (in this case, districts) to be studied; then, in the selected clusters, either select all the units (health centres) or a random sample of them.

"A fourth approach with a formal statistical basis is *stratified sampling.* You may wish to ensure that you include units with particular characteristics in your sample (e.g. health centres in both rural and urban areas), so that you can compare them. To do this, first divide the total population (in this case, all the health centres) into subgroups (urban and rural); then take a random or systematic sample or even a clustered sample in each subgroup.

"While the mathematical 'merits of the above approaches are well known to specialists, there are situations when a less formal, but more practical, sampling technique might be used, which may be referred to as *judgement sampling.* In a substantial number of practical cases, barriers to statistical sampling might exist, for example excessive costs or limited co-operation from staff in specific delivery units. When one of these problems occurs, random sampling may not be possible, and you may need to use your own judgement to select a reasonably typical group of units for study. The practical advantages of this method are evident, but the inability to draw general conclusions about the entire population on a formal statistical basis is a clear drawback to the use of a judgement sample. It is offered as a less than ideal, but occasionally practical, approach to the task of choosing your sample" (PHC: 27-28).

The basis upon which any sample is selected should be explicitly reported in the presentation of results. When the costs of the sample facilities or activities are analysed, it will be necessary to multiply these data up to acquire costs for the population that the sample represented.

3.6 Work itinerary

"Three important ground rules in the process of data collection are:

- Collect the information at the highest organizational level at which it is available for main service delivery (if it is of reasonable quality) to minimize study time and expense.

- Be careful to avoid counting the same cost element (input) twice ('double counting') when you have obtained data at more than one level (for example, when staffing or salary figures have been provided at both the delivery-unit and higher levels).

- Put your greatest efforts into finding (and using) information on the largest input categories rather than the smaller, less important categories (such as supplies and building operation in most programmes). The latter can often be handled by rough calculations, perhaps based on rules of thumb, such as assuming operating costs of buildings to be equal to a certain percentage of their annual capital costs" (PHC: 29).

Chapter 4

COLLECTION OF COST DATA

In this chapter, we present a step-by-step guide to collecting the cost data and consider how to make any necessary adjustments to the data. This chapter should be read in conjunction with the worksheets presented in Annex 1 and available in Microsoft Excel format on the UNAIDS website (www.unaids.org/publications) or the CD-ROM: *Economics in HIV/AIDS planning—getting priorities right*, UNAIDS (June 2000).

4.1 Financial and economic costs

Before proceeding to specify how to collect cost data, the difference between financial and economic costs should be appreciated as in some situations it will be important to carry out analysis with one rather than the other. By having separate columns for financial and economic costs, the worksheets record explicitly which inputs have entailed actual project expenditure (financial costs) and which have been attributed economic costs.

If the costing exercise is going to be used to undertake a cost-effectiveness analysis, then all resources consumed should be valued in terms of their opportunity cost, i.e. their full economic cost.

There are three main areas in which economic costs differ from financial costs:

Donated items. The economic cost or value of donated goods and services can most easily be estimated by taking their equivalent market prices. "For example, in the case of radio time you could find out what the radio station normally charges for advertising (if this is what it would otherwise do with the time slot allocated to your programme), taking into account the duration and time of day. For volunteer labour, you could find out whether those people receive a salary or

wages elsewhere and use that to cost their donated time" (PHC: 58). Varying degrees of effort can be put into estimating economic costs. Donated goods and services should always be valued.

If the input price is wrong or distorted. If some of the consumed resources have market prices that do not reflect their true value—for example they are too low due to subsidies, too high because of inclusion of transfer taxes or are distorted through government-set foreign exchange rates—it may be necessary to replace the stated prices with 'shadow prices' for purposes of analysis. "Economists use the term 'shadow price' to refer to a price that has been adjusted for various reasons, including donations, to yield economic cost" (PHC: 58). The actual shadow price you use will depend on the nature of the good. For instance, if official exchange rates are distorted, you may want to use prevailing black market rates.

It is recommended that effort be expended on shadow pricing in proportion to the contribution that the resource in question makes to the overall cost of the project.

Capital inputs. "Capital goods are defined as inputs that last for more than one year. If you studied expenditure only in one particular year, you could easily get a distorted view of long-term average annual costs. For example, a great deal of equipment might have been purchased in the year *before* your study, with no expenditure on capital at all during the study period. One way to get an idea of long-term financial commitments is annualize or spread out costs by:

- identifying all the capital goods (vehicles, equipment, buildings, etc.) being used in that year;
- finding out the current (replacement) cost of purchasing them (C);
- estimating the total number of years each is likely to last from when it was purchased (N) (the 'working life' or 'useful life');
- estimating the average annual cost of each capital item in terms of a simple 'straight line' depreciation" (PHC: 32-33).

This average annual cost is what you would put down for the cost of each capital item for one year under financial costs.

"With economic costs, you will usually be concerned with the cost of resources used over a specific period (say, one year), rather than at the time they are purchased. Simply obtaining the straight-line of capital items is a way of spreading capital costs over a period of time, but it is not adequate if one is interested in economic costs, which must take into account the value of alternative opportunities for using the resources tied up in the capital inputs.

"To calculate the economic cost of capital on an 'annualized' (cost per year) basis, use the following approach.

- *Current value.* Estimate the current value of the capital item, as the amount you would have to pay to purchase a similar item now (i.e. the replacement value rather than the original price).

- *Useful life.* Estimate the total number of years of useful life the item can realistically be expected to have (from the time of purchase).

- *Discount rate.* Find out the discount rate used by the economic planning office or Ministry of Finance. *Annualization factor.* Consult a standard table (found at the end of this chapter) to find the correct annualization factor.

- *Calculation of annual cost.* Calculate the annual cost by dividing the current value of the item by the annualization factor. This factor is determined by the discount rate and useful life of the item.

"For a single $10,000 piece of equipment with a useful life of 5 years, the approach above would be applied as follows:
  - Discount rate: 10%
  - Annualizing factor (from standard table): 3.791
  - Calculation of annual economic cost: $10,000/3.791 = $2,638 per year (rounded figure).

"To compare this *economic* cost with the corresponding *financial* cost, note that the latter would be $10,000/5 = $2,000 per year. The investment of funds 'up front', to pay for the equipment in full at the start of its use, raises the annual economic cost—which is to be expected" (PHC: 59-61).

The practical steps to be taken in collecting cost data are very similar whether the desired result is financial or economic cost data. Each worksheet in the Annex is designed so that financial and economic costs can be clearly distinguished and it is important that the two categories of cost are not confused. Whether economic or financial costs are used, whether a manager analysing financial costs chooses to take a project budget perspective and exclude costs of donated goods, or to take a wider perspective and include them, and whether or not shadow pricing is introduced into economic costs, will depend upon the objectives of the costing study being undertaken. The worksheets are designed to accommodate these different purposes. It is always important to accurately record the way in which economic costs have been derived from financial costs.

4.2 Gathering background data

The information recorded on the background data sheet is needed for analysis of the cost data, including calculation of economic costs, where necessary, and for making the results of the study more generalizable.

The information required can usually be obtained from the Central Economic Planning Office, the Finance Ministry or the Central Bank. Which of these is more accessible may, in practice, depend upon contacts between the officials with whom one is dealing in the health or other ministries, and in these other institutions. The numbers recorded should be the average figures for the Base Year.

The choice of discount rate—a rate that reflects the opportunity cost of tying up funds in the project—is particularly critical since it can significantly influence the relative cost-effectiveness of strategies being compared. If there is no particular recommended rate for the country, then a rate can be taken from economic project appraisals done by other organizations such as the World Bank. A more difficult approach would be to calculate the real rate of interest, i.e. the rate of interest that would be obtained by depositing the money in the bank minus the rate of interest. Alternatively, a simpler approach is to take a 'high side' World Bank discount rate of 10%. The effects of using different rates can be explored by conducting sensitivity analyses. In order to see how sensitive your results are to the choice of rate, you can consider three scenarios: (i) your choice of rate; (ii) twice that rate; (iii) half that rate. Then the costs should be calculated based on these three different scenarios, in order to determine if your analysis is highly sensitive to your assumptions (PHC: 72).

4.3 Collecting input data (Form C)

General

This set of forms is the main tool for data collection in the field. A set of 'C' forms can be collated for each organizational level (see discussion in chapter 3). If data are being recorded manually, each set should be stapled together and attached to a Form 'B' summary sheet, by organizational level. There is a separate Form 'C' to collect data for each category of input:

- C1 – capital costs: buildings
- C2 – capital costs: equipment
- C3 – capital costs: vehicles
- C4 – capital costs: consultancies
- C5a – recurrent costs: personnel
- C5b – example of personnel time allocation form
- C6 – recurrent costs: supplies
- C7 – recurrent costs: vehicles operation and maintenance
- C8 – recurrent costs: building operation and maintenance
- C9 – recurrent costs: consultancies
- C10 – recurrent costs: other

Best estimates often have to be made for some costs for which there is considerable uncertainty. If these costs represent a significant proportion of the overall total, the effects of altering the estimates can be explored by conducting sensitivity analyses similar to the discussion on discount rates above.

Data collection at the different organizational levels

The 'B' forms have been developed to accommodate collation of costs in as many organizational levels as are relevant to the costing exercise in hand. The number of levels included is likely to vary according to the strategy, the type of service provider and the questions being addressed. The 'B' forms can themselves then be collated and totalled into a single Form 'A', which is a cost summary sheet for the strategy.

Currency

Forms should generally be completed and worked in the local currency and this currency should be stated on all forms.

Where inputs have been purchased in foreign currency, you will need to differentiate between those bought from inside the country, and those bought from abroad. Where an input, such as office rent, has been purchased in foreign currency *inside the country*, note the amount and convert it to the equivalent price in local currency. In order to do this, use the market exchange rate at the time the cost was incurred. The foreign exchange price should also be noted in a footnote on the form.

However, where an input has been bought in foreign currency *from abroad*, convert its cost to Base Year costs first, and then convert this figure into local currency using the market exchange rate for the Base Year (see 'Converting to constant prices' below).

When an organization keeps all its records in US dollars, it is suggested that conversion to local currency take place at the end of the costing exercise.

Source of funds

All 'C' forms have a column in which to record the source of funds for each input. Information on source of funds may be particularly important for planning the sustainability of programmes and for assessing the cost to private individuals for the prevention services that they receive. Funding sources are likely to include:

1. Ministry of Health (all organizational levels)
2. Other ministry (specify)
3. Municipality/local authority
4. NGO/community groups
5. Private for-profit organization
6. Private individual
7. External donor (specify)

It is recommended that a list of funders be drawn up for each project and that each main source of funds be given a code to simplify data entry on the forms.

Source of data

Each form also has a line to record the source of cost data by input. The source of data cited should state both the organizational source, for example Accounts Department in the Ministry of Health, and the type of source, for example balance sheets, interviews, accounting records or questionnaires.

Converting to constant prices

If cost data have been collected from more than one year it will be necessary to convert them to a constant Base Year value before adding years together. This allows for the fact that inflation causes the value of money to alter from one year to another. When it comes to data analysis, the most recent year for which data were available should be chosen as the Base Year and costs in all other years should be converted to their equivalent values in the Base Year. For example, if costing data were collected from 1990 to 1999, then 1999 should be treated as the Base Year.

This conversion is done using measures of domestic inflation such as Consumer Price Indices that should be available from the Finance Ministry, National Bank or Department of Statistics. To convert expenditure in year Y to the prices of the chosen Base Year, multiply the expenditure in year Y by the consumer price index for the Base Year and divide by the consumer price index for year Y. If foreign currency has been used to buy inputs from inside the country, it is appropriate still to use the domestic price index. However, if foreign currency has been used to buy inputs from abroad, then an appropriate foreign price index should be used to convert the sum to constant prices. For example, if a vehicle is purchased with US$ from the United States in 1990, then in order to convert prices to the Base Year 1999, a US Price Index must be used for that vehicle cost. Convert 1990 $ to 1999 (Base Year) $ first, and then convert into local currency for 1994, using 1994 market exchange rates.

The bottom row of the final two columns of each Form 'C' should be used to convert the total financial or economic costs into total costs for the Base Year.

✔ ***Tip-of-the-Trade 5: Time is important***

Often data are available for a number of years. It is important to be consistent in terms of the time frame that you adopt for the cost analysis. If you are collecting from different years, it is important to note this down, variable by variable. It is helpful to have a separate set of sheets C1-C10, with each set corresponding to one year. The importance of noting down the year becomes apparent as you try to convert exchange rates (you need to use the exchange rate that is appropriate for the time-period). If you are collecting from different time-periods and want total costs for the entire period, you need to convert the data to the same year, using the domestic inflation rate.

4.4 Data collection

CAPITAL COSTS

Capital resources are those resources that have a life expectancy of more than one year.

a) Buildings (Form C1)

Buildings may include health centres, hospitals, offices, staff houses and warehouses.

Financial cost

We recommend costing the buildings being used for implementation of the strategy by recording the annual rent (if rented) or by estimating the equivalent annual rent (if owned). "This means obtaining an estimate of the annual price charged for renting similar space. The estimate should distinguish between furnished and unfurnished buildings and between air-conditioned and non-air-conditioned space. In effect, this approach treats buildings as recurrent, instead of capital, inputs. You will probably need the assistance of a real-estate agent or someone else who is familiar with the rental market in the area" (PHC: 52).

Each building being used should be listed in column 1 of Form C1 and the source of funds for the building noted in column 2. The actual annual rent or equivalent rent for a similar unfurnished building should be recorded in column 3. Ten per cent (10%) of the annual rent price should be recorded in column 5 to cover the costs of furnishings. The total of these two costs can then be recorded in column 6. There may also be field offices located in other cities, whose costs should also be counted.

If there are buildings that are only hired occasionally for implementation of the strategy, the actual hire fees over the course of a year should be recorded in column 6. It is assumed that any space hired for such short-term use is furnished and that it is, therefore, not necessary to add extra costs for furnishings.

Economic cost

Use of some premises may be provided free of charge. For example, the Ministry of Health may dedicate a room in the Ministry to oversee the strategy. Although this entails no financial cost to the project itself, the provision of such premises does represent an economic opportunity cost. An economic analysis should value that space in case free provision is not sustainable in the future; for example, if the space is allocated to another project. The cost at market rates to hire or rent such space, as and when it is needed, over the course of a year should be recorded in column 4. However, it is possible that, if an organization had to pay rent, it would choose to relocate to a different, cheaper, area. It may be necessary to make a couple of estimates of opportunity cost, e.g. rent in city centre as well as rent out-of-town. Efforts need not be made to cost the capital overheads of other organizations with partial involvement in the strategy. Any agency to which work is contracted out is, in any case, likely to include a proportionate share of its overheads—including buildings—in its fees.

✔ ***Tip-of-the-Trade 6: Floor space***

If you are trying to obtain an annual rent for a space, it is useful to know the floor space (e.g. in square metres or square feet). Commercial rents are often quoted in terms of this floor space. If the area is unknown, you may want to do a rough approximation by pacing out the length and width of the space.

Allocation

If buildings are shared, a proportion of their costs should be allocated to HIV/AIDS prevention on the basis of floor space used, or as a percentage of total floor space for which rent is being quoted and/or by the share of time that that space is used for the AIDS work. The allocated percentage and the resulting cost should be entered in columns 8 and/or 9.

Strategy-specific comments:

- **HIV blood screening** is likely to have incremental resource implications only if laboratories are newly established or if reorganization of the system to accommodate the HIV prevention strategy necessitates new buildings.

- Implementing **HIV school education** is unlikely to require any additional space in schools. Capital costs of the schools can, therefore, be excluded. Only capital costs of lead agencies such as the Ministry of Education should be considered.

- Capital costs tend to be a low proportion of overall project costs in **social marketing projects**, **sex worker peer education projects** and **HIV prevention projects among IDU users**.

- In vertical systems, where premises are used only for **STD** or **VCT** services, the capital and recurrent costs of buildings should be attributed to the strategy. For STD or VCT services integrated with other services at the primary level, and for joint laboratory facilities, only a proportion of the capital and recurrent costs of the buildings should be attributed to the strategy. These should be allocated by space and/or time and/or activity indicators. At organizational levels above the primary level, only incremental costs of buildings need be costed against these strategies.

b) Equipment (Form C2)

Capital equipment refers to supplies that last for more than one year. Use the current cost for a similar piece of equipment, not the original purchase price. The cost should include freight. Sources of cost data could include recent government contracts, supply records from donors or local dealer estimates. The working life of a piece of equipment can be ascertained by asking individuals who operate it how long this type of equipment generally lasts before it is beyond repair (PHC: 33-34).

A handy cut-off is to classify all capital equipment according to a unit price of $100 or more (unless national accounting procedures specify a different cut-off point) and these items should be listed in column 1 of Form C2, and the funding source for the equipment noted in column 2. Equipment with a unit price of less than $100 should be treated as a recurrent input and the cost recorded on Form C6.

Financial cost

The replacement price of the equipment should be recorded in column 3. If the equipment is imported, the foreign exchange price, including freight and insurance, should be noted in column 3 and converted (see sections on 'Currency' and 'Converting to constant prices' in 4.3). The life expectancy or working life of the equipment when new should be recorded in column 5. When such an estimate cannot be provided, a five-year life can be assumed for most equipment. The average annual financial cost should be calculated by straight-line depreciation and entered in column 6 (see chapter 3).

Equipment, such as audiovisual equipment, may need to be purchased for the development of the IEC materials. If the equipment will continue to be used over the length of its life, then a proportion of its annualized costs should be allocated to the strategy or campaign being costed. If the equipment will have no further use at the end of the project, its capital cost should be annualized over either its own life expectancy, or the length of the project, whichever is the shorter. For example, if the campaign is implemented from beginning to end in eight months, then two-thirds of the annualized cost of any equipment used exclusively for the strategy should be allocated to the campaign. If, however, equipment purchased to produce the campaign has no foreseeable future use, the total capital costs of that equipment should be written off against the eight-month period.

It is assumed that the depreciation and running costs of equipment used by contracted organizations will be included in their fees.

Economic cost

If the market replacement price is significantly divergent from the economic value of the equipment, a shadow price can be estimated and entered in column 4. This might be the case where equipment is imported and there is a distorted foreign exchange rate. The average annual economic cost of equipment can be calculated following the above methodology and entered in column 7.

Allocation

If equipment is shared between the HIV prevention strategy and other work as, for example, National Blood Service laboratory equipment, costs should be allocated by the proportionate share of a relevant activity measure or by the proportion of time that the equipment is used for each. The allocated percentage and the resulting costs should be entered in columns 8 and/or 9.

Strategy-specific comments

- An **HIV blood-screening** strategy is likely to entail the purchase of new equipment if laboratory services are to be part of the strategy. These costs may be a significant component of the total costs of the strategy.

- For **HIV education in schools**, there will be only a limited need for equipment to implement the strategy.

- A share of the equipment in the **social marketing** organization's office should be allocated to the strategy. Such equipment as is needed by the strategy will tend to be for the production of the promotion and marketing materials.

- The majority of the equipment necessary for **STD treatment** is laboratory equipment but some diagnostic equipment will also be present in clinics.

In specialized STD clinics, the full cost of this equipment should be included and, in integrated clinics, a share of the costs. The costs of the STD-related equipment should be allocated to the strategy in the same ratio as staff time allocations or by activity levels such as the percentage of total tests conducted that are for STD.

- For **CSW peer education** projects, the main need for equipment will be for training and education activities. Items such as video cameras, televisions, video players, slide projectors, overhead projectors and computers may be purchased specifically for the project.

- For **VCT**, if the tests are done on the premises, then the separate elements of the costs of the tests need to be investigated, including the equipment. If the tests are done outside and charged for, then the fee can be taken as the financial cost of the test. If there is reason to believe that this cost is highly subsidized, then the test will need to be costed. If the test is free (for example, done at a government hospital), then the actual cost of the test will need to be studied. The simplest approach to cost the test will be to estimate the annual cost of the testing equipment and relevant laboratory staff (ignoring other laboratory costs and overhead costs since these will relate to many other activities), and express the cost per HIV test done in a year.

c) Vehicles (Form C3)

The kinds of vehicles you may need to value include bicycles, motorcycles, four-wheel-drive vehicles, cars and trucks. Use the current cost for a similar vehicle, not the original purchase price. The cost should include freight. Recent government contracts, supply records from donors, or local dealer estimates are useful sources of information. The working life of a vehicle will vary considerably, depending on vehicle type, terrain, use and maintenance. Consequently, you should try to obtain a local consensus on the expected working life of each type of vehicle. Ask several people who use, drive or service cars for an estimate of how long this type of vehicle has lasted in the past (i.e. how long before the vehicle reached a stage where it was not worth repairing). For consistency, it is best to use the same time period (e.g. three or five years) for a given type of vehicle for the entire analysis, unless there are major differences in terrain, etc. that would justify the use of different figures.

In the event that some of the data described above are not available, a rough approximation of annual vehicle capital costs can be obtained from local rates for hiring vehicles. In such a case, the cost of vehicles looks like a recurrent, rather than a capital, item, but it should still be considered a capital cost.

Financial costs and ***economic costs*** should then be calculated as described in chapter 3 (e.g. straight-line depreciation and economic calculation of capital) and form C3 should be completed, as described above for equipment.

The capital and recurrent costs of any vehicles purchased for the strategy should be included in the costing exercise. If the strategy opportunistically uses other vehicles that are available (e.g. borrowed from elsewhere), the actual expenditure incurred by using them for strategy activities should be included as financial costs. Any economic analysis should include an appropriate share of the capital and recurrent economic value of the use of these vehicles.

Allocation

If a vehicle is shared between implementation of the AIDS strategy and other work, the capital costs of that vehicle should be apportioned accordingly. See section (g) below on allocation of running costs of vehicles for recommended methodologies that can also be applied to the apportionment of their capital costs. The preferred method would be apportionment by mileage, followed by duration of vehicle use.

It is important not to double-count vehicles that travel between different organizational levels. For example, if the cost of a vehicle is included at district level then none of its cost should be recorded at the field level to which it makes supervisory visits.

✔ *Tip-of-the-Trade 7: Travel costs*

Travel (other than by vehicles owned by the organization) may also be a separate category of costs. Some travel may not be done using vehicles belonging to the organization, but rather by public transport (e.g. taxis and by air). For example, in community-based CSW peer education projects, field staff may often attend all educational sessions and travel by taxi to the sites.

Travel should not be confused with vehicle cost, but rather included as an item under other recurrent costs (see section h). The total expenditure on travel should be included as part of financial costs. Economic costing is required if the price of this travel seems to be distorted.

If travel is included, it is important not to double-count its components under other categories (e.g. consultant's travel could be included here or under 'consultancy'; it is suggested that their travel be included under 'consultancy activities').

Strategy-specific comments

- For **HIV blood screening**, vehicles used to implement the strategy are likely to vary. Recruitment of donors at low risk of being HIV-infected may require mobile blood collection services. Reorganization of services may necessitate additional transport for the central testing and subsequent distribution of blood

- For **mass media and HIV education in schools**, vehicles may be needed during training activities and for the distribution of educational materials. Transportation costs may be relatively high if printed IEC materials have to be distributed. This is not contracted out and hence costed as an aggregate input elsewhere.

- In **CSM**, most transport requirements, for example for promotion or distribution activities, will usually be contracted out to other agencies. If the social marketing organization owns and runs its own vehicles, an appropriate share of the capital and recurrent costs of these should be allocated to the CSM project.

- For **CSW peer education**, vehicles may be used by NGO staff to identify new project sites, hold education meetings and make supervisory and monitoring visits.

- Purchase of vehicles specifically for **STD treatment** is most likely in vertical systems.

- For **VCT**, vehicles may be used to transport samples for testing, and to provide follow-up support to those tested.

- For **IDU** interventions, elements of transportation or travel may be used in training staff and volunteers, distribution of IEC and other supplies and safe disposal of contaminated supplies and equipment.

d) Consultancies (Form C4)

Short-term consultancies can be treated as a separate input. Since many HIV prevention projects have been initially set up vertically, they have been externally supported and are characterized by consultancy inputs provided by either expatriate or local experts. It is important to record these costs separately as they can be relatively high, often financed in foreign currencies and may skew analyses if recorded as integral parts of other input categories.

Consultancies may involve technical assistance from a variety of organizations, both national and international, for example from donor or specialized agencies or from advertising firms. Inputs may be provided by consultants external to the

implementing organization or by experts from the organization's own headquarters. The costs of consultancy packages usually comprise salaries or fees, international and/or local travel and subsistence and miscellaneous reimbursements. Some consultancies, such as those contributing to pilot projects or market research, will be provided once only during project start-up and, if relevant to the analysis being undertaken, these costs should be recorded as capital costs on form C4. Start-up costs will be relevant when analysis is of total costs of a project since inception but not relevant when analysis is focused on efficiency and sustainability of on-going activities. Some consultancies may not just be restricted to the start-up phase but may instead be a capital component of the on-going project. Examples are training consultancies whose effects are anticipated to remain over several years.

It is important to decide which consultancies to include, since different missions will have very different purposes. Where a project is partially donor-financed there may be regular donor consultancies, especially for monitoring and evaluation purposes. The project itself may not incur financial costs for these inputs but, if they are deemed essential to its local implementation, their economic costs should be included in any economic analysis. It is suggested that costs be included where the consultancy forms an important part of project support, but excluded where it is for the purpose only of satisfying donor requirements, for example those monitoring or evaluation missions for the donor headquarters overseas. Long-term consultants, present for 12 months or more, should be recorded and costed on personnel form C5a.

Consultancy inputs are likely to vary considerably in terms of the number of individuals involved, the lengths of inputs and their purpose. Column 1 of Form C4 can be used to record these details briefly, but sufficiently to distinguish the particular consultancy for future reference. The funder of the consultancy can be recorded in column 2.

Financial cost

Often only part of the costs of the consultancy package will be met from the project's in-country budget. Expatriate inputs, in particular, may be funded by multi- or bilateral donors, sometimes even from non-project expenditure subheads. Only actual expenditure by the project needs be recorded as a financial cost in Form C4. If a total expenditure figure is available for the consultancy, this can be recorded directly in column 6 without being broken down into its component parts in columns 3, 4 and 5.

The same approach should be taken to annual costing of capital consultancies as for other capital items. The number of years for which the effects of the consultancy are expected to last should be recorded in column 8. The total cost of the consultancy should be divided by the duration of effect, and the average annual cost should be recorded in column 9.

Economic cost

The full value of the consultancy inputs (even if 'donated' from external funding) should be recorded on Form C4 if the analysis is to use economic costs. Donors can be approached for information on consultants' daily fees and subsistence rates and prices paid for air fares. Precise information on these costs, often paid by headquarters offices overseas, may not be available, but rough figures should at least be estimated and entered in columns 3, 4 and 5. The total economic cost of the input should be entered in column 7. Where costs are met in foreign currency, this should be recorded in a footnote and the local currency equivalent entered (see sections on 'Currency' and 'Converting to constant prices' in 4.3).

Annualization of the costs of the consultancy should be undertaken, as for the other economic capital costs. The average annual economic cost should be entered in column 10.

Allocation

If the consultancy input is being shared between HIV prevention and other work, the costs of the input should be allocated on the basis of the proportion of the consultants' time spent on each type of work. The allocated percentage and the resulting costs should be entered in columns 11 and/or 12.

Strategy-specific comments

Start-up consultancies, often used for training of trainers and the production of IEC materials, are important for many strategies. Although some governments or National AIDS Control Programmes may launch IEC campaigns alone, **mass media and CSW peer education** projects are increasingly incurring consultancy costs, particularly in the design and development of IEC materials. For **HIV education in schools**, some consultancy costs may be incurred in the design and development of the strategy and its curricula and materials. **CSM** projects tend to have high start-up costs incurred by market research, project design and project launch. For **STD treatment**, some consultancies might provide technical assistance for development of diagnosis and treatment protocols. Start-up consultancies may also establish baseline studies to monitor different HIV prevention strategies, and be used for training of trainers and the production of IEC materials.

RECURRENT COSTS

Recurrent costs are costs for those resources that are expected to be consumed (or replaced) within one year.

e) Personnel (Form C5a)

"Salaries, wages, and other expenses associated with personnel are frequently the single largest cost item in health programmes. You should therefore take great care in estimating their value. In most cases, you will be interested in both the staff directly involved in the activity you are concerned with (e.g. nurses, health aides, trainers, supervisors) and other support staff (e.g. managers, administrators, cleaners, guards, drivers).

"The full cost of employing someone is represented by the individual's gross earnings—that is, the take-home pay plus any additional benefits, such as contributions to health insurance, social security, and pension plans, plus tax. These gross earnings should include any incentive payments, overtime, hardship bonuses, holiday and sick pay, and allowances for uniform, housing and travel. If the worker receives any additional commodities, housing or other non-monetary benefits, the value of these should also be estimated, using the prevailing prices of similar items (e.g. the current market rent for similar housing).

"Sources of cost data: Expenditure records and payrolls in the Ministry of Health will have cost data on salaries and allowances. You may need to look elsewhere for some data. For example, pensions may be paid by the Civil Service Board or another agency, and per diem allowances are often paid by external agencies. Data from the private market can help in the valuation of non-monetary benefits, such as housing. If you need to identify the earnings of particular individuals, ask for their salary grade rather than their actual salary. People are usually more reluctant to reveal their earnings than to state their position on a standard salary scale. Furthermore, it may be difficult to decide what the figure you are given means (gross or net salary, for example). Salary schedules can usually be obtained from the agency administering the civil service. Each type of information will need to be collected from the most appropriate level. If you ask only about salary grades, you will not get information about other allowances and bonuses. A rough estimate could be made by assuming that the average ratio between salaries and allowances for the whole institution (or a relevant subgroup) can be applied to each individual. For example, you may find from district-level expenditure data that allowances are, on average, about 12% of salaries. You would then add an extra 12% to each individuals salary" (PHC: 35-36).

Financial cost

List, in column 1 of Form C5a, all staff who contribute to the activities of the strategy being costed, and list, in column 2, by whom they are being funded.

Column 1 should include both voluntary and paid staff, and staff who are in support roles, as well as those directly implementing the strategy. In small-scale operations, this list might be by staff name and grade; in larger-scale operations, by staff category and grade. Information on gross earnings should be entered in column 3. The mid-point of the salary range can be used where actual data are not available. An estimated financial value for all allowances and fringe benefits, whether received in cash or kind, should be entered in column 5. These may include, for example, money payments for overtime or travel time, imputed rent for free accommodation, estimated cash values for uniforms or health care provided to staff.

Salaries and allowances for long-term expatriate inputs should be distinguished from local salaries. Where these salaries and allowances are paid in foreign currency, this should be recorded in columns 5 and 6, and converted as described in the sections on 'Currency' and 'Converting to constant prices' in 4.3. Short-term expatriate inputs should be recorded as consultancies on Form C4 (capital) or C9 (recurrent). NGO service providers may make substantial use of volunteers. Financial costs should include any incentives paid to them or benefits in kind.

The costs of staff in other organizations to which strategy work is contracted out may be included in fees charged to the lead organization and should not be double-counted. Note that the forms are designed to collect annual personnel costs. If costs for an alternative time period are presented, this should be clearly indicated.

Economic cost

Since the long-term sustainability of relying on volunteers may be uncertain, a value for the time of volunteers should be included in the economic cost analysis. Volunteers could be asked what they would be earning in the next most likely use of their time. In the case of volunteer workers or staff receiving token payments, a sample of such staff should be asked what they would be earning in salaries and allowances in their next most likely use of time. This might range from very little in areas of high unemployment, up to full salaries. This shadow wage should then be entered as an economic cost in column 4.

If expatriate inputs are being subsidized by part or full payment of salaries and allowances by external funders, the value of these subsidies should be included in the costs in columns 4 and 6. In considering the economic costs of expatriate inputs, thought should be given to whether an equally qualified national could be engaged for the same work at a different cost. If this were feasible, underneath the line stating the expatriate salary cost, record the cost of hiring a similarly qualified national. A sensitivity analysis could be conducted to assess the effect this change would have on the overall costs and cost-effectiveness of the project.

If it is felt that the salaries being paid by the project are highly divergent from market rates, enquiries should be made locally about the market value of the

work. For example, civil servants may be overpaid through minimum wage settlements or underpaid compared with the private sector. In these instances, consideration should be given to substituting shadow prices for these inputs and recording them in column 4 (see the beginning of this chapter). In practice, the need to do this will rarely be encountered and it should be done with care, as estimation of economic value of work can be complicated. For example, an apparently underpaid government worker may work less hard or for fewer hours than his/her equivalent in the private sector, and so the salary paid may, in fact, reasonably value the output of work.

Allocation

Some personnel may work exclusively on the HIV prevention strategy whilst others may split their time between the strategy and other work. Personnel costs should be allocated to the AIDS strategy on the basis of time allocations. The recommended means of apportioning time is to talk staff through the activities of their last working week, having ascertained that there was nothing atypical about that week. If the previous week had been atypical, for example a training week, the most recent typical week should be chosen. Rather than recording this prospectively, staff could be asked to estimate retrospectively how they allocated their time. This might be most appropriate for inputs of administrators and managers at the more central levels. At clinic and laboratory levels, personnel costs might be allocated more accurately by activity measures (discussed below). If not included elsewhere, personnel costs of training activities should also be included.

Costs should then be allocated according to time spent on HIV prevention as a proportion of total working time. Time spent on general management and administration, breaks, sick leave, etc., should be apportioned between the HIV prevention strategy and other work in the same proportion as specified working time. Worksheets to record the week under examination should be devised according to the nature of the working week in each situation (an example of such a worksheet is provided at Form C5b). The costs of personnel indirectly supporting the strategy, for example receptionists and cleaners, should be apportioned to the strategy on the basis of the average of the percentage allocations of other directly involved staff.

If it is not possible to obtain time allocations for staff, the next best approach is to allocate their costs by activity allocations. For example, the costs of National Blood Service laboratory technicians might be allocated to the strategy on the basis of HIV tests as a percentage of total tests conducted.

The proportion of personnel costs allocated to the AIDS strategy and the resulting costs should be recorded in columns 9 and/or 10.

Strategy-specific activities

- The following implications of the **STD** treatment for personnel costs should be considered: the allocation of the costs of existing laboratory staff to HIV

testing; the costs of any new laboratory staff employed to meet increased testing demand; allocation of the costs of existing health service staff for HIV activities such as pre- and post-test counselling; the costs of any additional staff for these activities; the cost of staffing any HIV-specific IEC material production/transmission; and the personnel costs of collecting increased volumes of blood necessitated by increased levels of discarding unsafe blood.

- **Mass media** campaigns may solicit inputs from celebrities to enhance the popular appeal of their messages. Often these inputs will be provided without charge and so incur zero financial cost for the strategy. An economic analysis should consider whether free celebrity time is a viable assumption in the future of the project or in its replication elsewhere (whatever is the objective of the costing). If it is not viable, a shadow economic wage could be attributed to that input.

- For **HIV education in schools**, it is important that the costs of all staff involved in the strategy be included. This includes the cost of their time spent in training (initial training outside school, and follow-up training in the school), as well as the time that school staff members spend implementing the strategy.

- As the **CSW peer education** is labour-intensive, personnel costs may be a relatively high, or even the largest, proportion of total costs. There are two groups of personnel to be financed: community-level CSW peer educators and NGO staff based at the next level up. NGO staff such as managers, field coordinators and supervisors will tend to be full-time employees with formal salaries and allowances, the costs of which may need to be allocated between the strategy and other activities. The CSW peer educators may also receive salaries and allowances or may work as volunteers, receiving only honoraria and reimbursement of expenses. In any economic analysis, a sample of volunteer workers should be asked what they would be earning in the next most likely use of that voluntary time. An appropriate shadow economic wage should then be calculated on the basis of their estimates and entered into the analysis. Peer educators may suffer losses of income (e.g. lower price of transactions due to use of condoms or due to marginalization because of their role as a peer educator). If possible, this should also be evaluated and included in the shadow costings.

✔ ***Tip-of-the-Trade 8:***
Calculation of the opportunity cost of sex worker time

In Cameroon, it was difficult to obtain a shadow wage for the volunteer time of peer educators, as they came from very varied backgrounds. However, when asked, "what did you give up?" the educators answered

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in terms of the loss of clients and lowering the price of the transaction, because they insisted on the use of a condom.

In order to get an estimate of the opportunity cost, the average loss of clients in a month was multiplied by the average price of a transaction. This average price was obtained by looking at the various sub-groups in the CSW population and the range of prices charged for a transaction [74].

f) Supplies (Form C6)

Supplies are materials that are used up in the course of a year. Equipment costing under $100 (unless national accounting procedures specify a different cut-off point) can also be treated as supplies even if they will last longer than the year. All categories of supplies consumed should be listed in column 1 of Form C6 and their funding source noted in column 2. "You might wish to distinguish between supplies acquired with local currency and supplies requiring foreign exchange. The general data-handling process will be similar. In some instances, it will be useful to identify separately, and summarize, major supply categories or categories of particular interest (i.e. calculate subtotals for drugs, stationery).

"The full cost of supplies should include the cost of transport to the point of use (i.e. any freight charges for import of materials and any internal distribution costs). The cost should be that of all the material consumed, including any that is lost or wasted as well as that which is actually used for its intended purpose. Losses can result from misplaced shipments, damage (e.g. from water or rodents), pilfering and materials becoming out of date. This loss has to be paid for by the programme, and should be included in the estimates. Supplies to be costed do *not* include those that are distributed but kept in store (as inventory stocks). Only those that are consumed should be counted.

"Unless expenditure records are very detailed, they are unlikely to be useful for estimating the costs of most of the materials specific to your programme. Instead, you will need information on quantities and prices.

"Quantities: For many supplies, there will be stores at different levels (national, regional, health centres), which will usually have their own inventory records. The quantity distributed from these stores during the year will be equal to the inventory at the beginning of the year *plus* the quantity received during the year *less* the inventory at the end of the year.

"The amount distributed is not necessarily the amount consumed: commodities may be stored at a lower level. Only at the lowest level of the distribution system, such as the health centre, are supplies dispensed the same as supplies consumed. However if you measure only consumption, you will fail to take into account the wastage that has occurred.

"Prices: Supply invoices, order forms, price lists and catalogues are sources of information about purchase prices or replacement prices. Costs of international and internal transport should be included. International freight costs can usually be readily determined (supply invoices and order forms should include them) and should not be overlooked, since they often add a further 10-20% to the original price. It may be more difficult to estimate internal transport costs; in fact, if supplies are transported by vehicles belonging to the programme, the costs will be included in the vehicle running costs and should not be included here" (PHC: 36-38).

Financial cost

If detailed expenditure records are available, the financial costs of supplies consumed should be entered directly in column 6. These costs should include transportation of the supplies to the point of use. Where reliable expenditure records are not available, costs should be calculated from quantities consumed, including loss and wastage (column 3), and unit costs (column 4/5). If quantities consumed are not available, it may be necessary to estimate consumption based on output. For example, to estimate the consumables used in blood collection and testing, an inventory of all the consumables needed per unit of blood could be costed, and then multiplied by the number of units collected. Allow a margin (approx. 10%) for loss and wastage.

Imported supplies should be grouped together and, where purchased in foreign exchange, this should be recorded in a footnote on the form. The equivalent local currency costs should be calculated using the procedure outlined in 'Currency' and 'Converting to constant prices' in 4.3.

Remember that if materials have a life longer than a year (e.g. a film), then their value will need to be annualized over their length of life, and these materials should be treated as capital items.

Economic cost

Market prices should be taken as the economic unit costs of donated goods and these prices should be entered in column 5. Where market prices for certain supplies are known to be highly divergent from the true opportunity costs, a shadow price should be substituted as the economic cost in column 5 or 7. This may be particularly relevant in the case of drug and condom supplies where import prices may be subsidized, inflated due to economic/political tying to certain exporters, or distorted through unrealistic exchange rates. Shadow prices can be calculated from the international market prices or can be from the Essential Drugs Programme or from a supplier such as UN Supplies Division and converted into local currency prices using the market exchange rate.

Allocation

Data, especially when taken from expenditure records, may aggregate supplies consumed by HIV prevention and other work. It may, therefore, be necessary to allocate only a proportion of the costs of the supplies to HIV prevention. This would most usually be done on the basis of activity measures as shown in some of the examples in Part 3. The percentage allocation of costs and the resultant cost to the strategy should be entered in column 8 and/or 9.

- Additional supply costs will be incurred for **HIV blood screening**. These will include one-test kits, small pieces of equipment, and chemical reagents for use in the laboratories. There may also be an increase in the cost of medical and surgical equipment for collecting blood, such as blood bags and needles, since a greater volume of blood will need to be collected to allow for discarding. Some office supply costs might also increase, in line with increased strategy-related administration

- For **mass media and HIV education in schools;** if the lead organization is producing some of its own IEC materials then considerable supply costs may be incurred directly for such commodities as photocopying supplies, ink, videos, cassettes and batteries or, indirectly, through the use of government printing facilities. Alternatively, IEC material production may be contracted out and costed as an aggregate activity. For example, commercial printers may be used to produce campaign posters and pamphlets and specialized advertising agencies may be used to produce television and radio materials.

- The recurrent costs of **CSM** projects can be high and this is, in part, attributable to the costs of the condom supplies. Their source and price can be highly variable. The financial cost of the condoms should be obtained and, if imported, this should include the cost of transportation into the country. The financial price of condoms may be highly inflated or subsidized. Inflated prices occur when donors' commodities are purchased in home markets and are considerably more expensive than those on the international market. The financial cost to the project may be zero if the commodities are donated but the financial cost to the donor may exceed the economic opportunity cost of those commodities.

- Many CSM projects receive condoms from donors and their supply prices are higher than prices on the international market. If there is a possibility that, in the future, condoms bought at competitive prices will be provided to the project, then a shadow economic price could be used in the cost analysis. An appropriate price can be obtained from the Essential Drugs Programme or from a supplier such as UN Supplies Division. In reality, however, many social marketing projects will continue to be sourced with donors' condoms for the foreseeable future and the inflated prices may, therefore, be most relevant for any medium-term analysis of these projects.

- Where the project is able to negotiate with commercial condom suppliers to provide subsidized condoms in return for financing some of their marketing

and promotion activities, there may again be a requirement to calculate a shadow economic price for the costing analysis. This is particularly true if the present subsidized price cannot be guaranteed in the future.

- Supplies for STD treatment will mainly include diagnostics, laboratory supplies, condoms and drugs. Costs of these are likely to be relatively high and should, therefore, be calculated with some care. Costs of some supplies may need to be allocated between STD and non-STD work and this should be done according to the activity measures outlined in the personnel section above.

- To record the quantity and cost of drugs consumed by an STD clinic, expenditure information should be sought from the next organizational level up—say, the district level—where cost and quantities may have already been combined and recorded in accounting information. If that information is not available, drug use should be investigated at the clinic in question, for example from their inventories. In both these situations, drug costs may need to be allocated between treatment of STD and other illnesses. If neither of the above methods is possible, clinicians could be asked to record their prescriptions prospectively over a period of, say, one week. Total STD drug costs could then be estimated from average prescription costs and facility utilization data. The total costs derived this way should be inflated by a locally agreed factor to allow for the additional costs of drug wastage and loss.

✔ ***Tip-of-the-Trade 9:***
Calculating the total costs of drugs in an STD treatment programme in the United Republic of Tanzania

The quantity of drugs prescribed was estimated through the analysis of a sample of health units. Data on drugs prescribed for the last 20 registered STD cases were recorded from a survey of treatment registers. The drugs prescribed were costed from unit prices provided by the national Essential Drugs Programme in the United Republic of Tanzania (inclusive of cost, insurance and freight). Then the total cost of drugs supplied was estimated on the basis of the total number of STD cases seen in all the health units and an estimate of the proportion of patients actually provided with drugs. Since drugs are often in short supply, it was estimated that only 40% of patients were supplied drugs (with sensitivity analysis of 20% and 60% used). Costs of drug storage and delivery within the country were estimated crudely as a cost per health unit (multiplied by the number of health units) and then added to the total drug costs [65].

- For **CSW peer education**, the main supply costs will be for IEC materials and for condoms. The relatively high recurrent costs of the strategy can, in part, be attributed to condom supplies, the source and price of which can be highly variable.

g) Vehicle operation and maintenance (Form C7)

Many health programmes rely on vehicles to distribute supplies, permit coordination and supervision, and otherwise implement the provision of care. Often, transport is a weak link; vehicles are available but fail to operate efficiently because of a lack of fuel or spare parts. It is important to know what it costs to operate and maintain vehicles. Unfortunately, these costs are among the most difficult to measure.

The costs of operating, maintaining and repairing vehicles should all be measured. These will include materials, such as fuel, lubricants, insurance and registration fees, tyres, batteries and spare parts. The cost of drivers should be recorded under 'personnel'. If a mechanic is assigned to the programme, the cost will also be included under 'personnel'. However, where repairs and maintenance are contracted out, or where they are performed by a different office or agency, their cost should be included under 'vehicle operating costs' (i.e. you should make an estimate of total repair costs, including an allowance for the mechanic's salary, rather than including the salary under personnel costs).

"Expenditure records may give some indication of the cost of operating and maintaining vehicles, but it is likely that you will need to interview drivers and mechanics and consult logbooks to get a sufficiently detailed picture. Fuel consumption is one input for which records are probably reasonably good. If not, you should be able to estimate fuel consumption based on the mileage of the vehicle. Logbooks should indicate distance travelled (say, 5000 kilometres), and drivers should be able to tell you the average distance travelled per litre of fuel consumed for that particular type of car in the prevailing conditions (say, 10 km per litre). Total consumption is then 5000/10 = 500 litres. The price paid per litre for fuel multiplied by the number of litres used gives the total cost of the fuel (even if it is merely charged to a government account). If logbooks and other information sources are not adequate for the calculations suggested (which is all too often the case), alternative data sources can probably be employed. For example, your ministry's central motor pool personnel may be able to give you a rough estimate of the total annual cost of operating and maintaining each type of vehicle. With information on the vehicles used (and the fraction of their time devoted to your programme) you can make a 'rough and ready' calculation that will suffice.

"Oil and filter changes and other maintenance may be done irregularly or on a routine basis, either after a set number of kilometres or at regular time intervals (e.g. once a year). If you are unable to calculate these inputs in the same way as fuel, you could simply increase fuel costs by a set percentage (e.g. 15%) to allow for them. Again, the central motor pool may help you with this" (PHC: 39).

Financial cost

Form C7 summarizes the main inputs for operating, maintaining and repairing project vehicles. The easiest and preferred method is to access expenditure

records for vehicle running costs. If such expenditure records are not available, logbooks and staff interviews should be used. If logbooks are not available, staff interviews alone will have to provide the necessary information. If no reliable information can be gleaned from any of the above, the least preferred method is to apply the value of standard government mileage allowances to the mileage undertaken in implementation of the strategy. These mileage allowances are devised to reimburse officers for official use of private vehicles or to charge them for private use of official vehicles and are deemed to cover running costs plus depreciation. In this situation it is important to ensure that the capital costs of the vehicles are not double-counted between this form and Form C3.

Economic cost

Where financial costs are clearly different from opportunity costs, for example where mechanics work voluntarily on vehicles, estimated economic costs can be entered in column 4. Where vehicle running costs are a relatively small component of overall costs, limited time should be spent trying to calculate economic costs and shadow prices.

Allocation

Some vehicles may be used exclusively for implementing the AIDS strategy. Others, however, may be shared between the strategy and other work and their running costs must be apportioned accordingly. In columns 5 and 6 of Form C7, the allocation made can be recorded and used to apportion costs. It is recommended that all inputs on Form C7, apart from personnel, be allocated by mileage undertaken for the strategy as a proportion of total mileage in a sample month. If logbooks are not available from which to derive this information, staff should be interviewed to ascertain the proportion of days in a sample month that the vehicle is used to implement the strategy.

The way in which all the above allocations are made should be recorded either as a footnote on the worksheet or separately.

h) Building operation and maintenance (Form C8)

"Operation and maintenance of inputs is quite easily handled. Although observers are sometimes concerned with utility expenses, these do not form a large proportion of the total. If it is difficult to obtain information, draw on past experience (and other opinions) to obtain a rough estimate of building operation and maintenance as a proportion of the annual market rent. Multiply the annual rent by this proportion to obtain an amount for operation and maintenance.

"Operation and maintenance for buildings should include charges for lighting, water, telephones, heating, insurance, cleaning materials, painting, and repairs

to plumbing, roofing, heating and office furniture. As previously noted, the salaries of guards, cleaners, etc. should be counted under 'personnel'.

"This is one category where recorded expenditure data are sometimes quite adequate. Recurrent costs for buildings will normally be listed under such headings as 'utilities, maintenance or cleaning, and security'" (PHC: 40).

Financial cost

If expenditure information is available, then it should be used to complete Form C8. Information should ideally be recorded for a full year to allow for seasonal fluctuations in utility expenditure. If annual utility expenditure figures are available, then a total figure can be inserted for the year in row 15 rather than being built up by month. If expenditure information is not available, then a percentage of the rental value of the building should be used to cover these costs. The appropriate percentage should be estimated by local managers and will vary according to the quality of building construction, the age of the building and the nature of the services being provided there. The figure calculated should be entered in row 16 of Form C8, together with an explanatory footnote. This rough estimation is acceptable, as these costs are unlikely to be significant in the overall profile of costs.

Economic cost

If it is felt necessary to substitute any shadow prices for financial costs, clear footnotes should indicate where and why this has been done.

Allocation

If a building is shared between HIV prevention and other work, the running costs of that building will need to be allocated accordingly. This should be done by calculating the proportion of floor space used by the HIV-related work as a proportion of the total floor space of the building that the running costs relate to, and/or by the share of time that that space is used for the HIV work. The percentage allocation of costs and the resulting cost to the strategy should be entered in row 17.

i) Short-term consultancies (recurrent) (Form C9)

For a discussion of short-term consultancy inputs, see section (d) under 'Capital costs' above. Under recurrent costs, consultancy inputs that ***recur*** throughout the life of the project should be recorded, for example consultancy inputs to annual monitoring and review missions. Judgement should, however, be made as to whether such consultancies are an essential and necessary part of the progress of the project, in which case they should be included, or whether they are conducted for donors' own monitoring purposes and should be excluded from the costs of the project.

Financial cost

See section (d) above. The frequency of the consultancy inputs being costed should be recorded in column 8 of Form C9. (If a project document is available, this should indicate the planned frequency of these inputs.) The frequency of the inputs may indicate the need to translate costs recorded for one particular year into average annual costs. For example, if consultants are provided for monitoring missions every other year, the costs for each mission should be halved to provide an average annual cost. Average annual costs can then be recorded in columns 9 and/or 10.

Economic cost and Allocation

See section (d) above.

j) Other recurrent costs (Form C10)

"This is the residual category. It was recommended that all the inputs to training and social mobilization programmes should be added together to give a single figure, rather than including them under separate headings (personnel, buildings, etc.). Each of these input categories has its recurrent counterpart, when activities are repeated periodically. The sum of these activities over one year is a recurrent cost of the programme. There are probably no special problems involved, or instructions needed, for calculating the costs of these two categories of inputs. If a training or social mobilization programme serves more than one programme, the total cost should be distributed among those served. If training and social mobilization are costed as discrete inputs, care must be taken not to duplicate any of the costs elsewhere in the exercise.

"Recurrent equipment costs include fuel (e.g. kerosene for cold-chain refrigerators) or electricity operating costs (but only if these are not included under building operation and maintenance), as well as the cost of spares for maintenance and repairs. Other categories might include postage, printing, photocopying and the costs of operating and maintaining equipment, but not stationery, which is counted under 'supplies'.

"Expenditure records may contain some data, but they are unlikely to be detailed enough. For a piece of electrically operated equipment you will need to know its power requirements (the number of kilowatt-hours), the length of time it is operated over the year, and the cost per unit of electricity. You will probably need to ask the people directly responsible for the equipment about the kind of maintenance and repairs that were necessary and what spare parts were needed. There are a variety of 'rules of thumb' to estimate the likely operating and maintenance costs of equipment used in health programmes. Most of these rules relate recurrent costs to the original capital expenditure. The specific relationships will depend on the price structure in the country, the nature of the equipment, and

so forth. You should explore the precise cost relationships in your own situation rather than relying on approximations from elsewhere" (PHC: 40-41).

For most HIV prevention strategies, this cost category will be relatively insignificant. It will, however, be more significant for mass media and condom social marketing strategies as media costs will be included here. How these are dealt with is discussed further under the 'strategy-specific comments'. Potential inputs for other strategies include equipment maintenance, operating and repair costs, postage, photocopying and printing. Only minor effort should be made to cost these inputs where they are likely to be negligible in the overall profile of costs.

Financial cost

If available, cost information should be taken from expenditure records. If unavailable, rough estimates of costs should be made from quantities of inputs consumed and prices.

Economic cost

If any of the financial prices clearly do not reflect opportunity costs, a shadow price should be substituted in column 4, but effort in doing this should be proportional to the cost. Media fees are dealt with separately below.

Allocation

Shared costs should be apportioned in a manner appropriate to the way that they are incurred. The percentage allocation of costs and the resulting cost to the strategy should be entered in column 5 and/or 6.

Strategy-specific comments:

- In **HIV blood screening**, where blood donors are given financial incentives, there may be an increase in payments, proportional to the increased volume of blood collected. This applies also to any refreshments or gifts provided for blood donors, and should be counted as other recurrent items.

- For **mass media and CSM**, this category of costs will include the costs of media time and/or space. Extrapolating from other public health media campaigns, it can be expected that media costs will vary greatly between countries. This reflects absolute and relative differences in the price of media, which affects the project's purchasing power, and also differences in the type and quality of media used [18].

- In countries where there are state-run newspapers and radio and television channels, the financial costs of using these media may be subsidized or free to the project. In some countries, it may even be legislated that a certain percentage of air time or press space is to be dedicated to educational messages.

If it is felt that this situation cannot be guaranteed in the future, then any economic analysis should include the economic opportunity cost of the media used. This is best calculated by ascertaining the cost of the same amount and quality of media time or space for a commercial campaign.

- Where media slots are charged at a commercial price to the project, it can be assumed that these costs are economic ones, including all associated costs and overheads.

- For **HIV education in schools** and **CSW peer education**, where expenditure for initial or refresher training is available, it is likely that training costs will be a significant component of total costs. The training packages may include the costs of preparation, the venue used, transport, materials, trainers' personnel costs, per diems of attendees and the cost of the time of the school staff participating.

k) Private costs (Form C11)

Private individuals have been mentioned as a source of funds in this chapter. Each of the 'C' Forms seeks information on the source of funds for inputs, and the fact that some inputs are privately financed can be recorded there. Although these guidelines take the perspective of service providers, these expenditures should be recorded in order to calculate project revenues and hence the net costs of the project.

Form C11 provides a separate record of the cash fees that are raised from individual clients. The form is very general, allowing collection by month for a number of types of fees and will, therefore, need to be adapted to particular circumstances. The preferred method of obtaining the data is from fee collection registers or income records. If these are not available, estimates of fees raised should be made from volume of clients and average official fee rates, although these estimates will clearly miss over- and under- charging and any leakage of funds. Data on fees paid should be kept separate and not added to total costs (otherwise there will be double-counting).

To set the data in context, more qualitative information should also be recorded on how the fees are administered and managed; for example, whether they can be kept at the level at which they are collected and what they can legitimately be used for.

- For **HIV blood** screening, the most common private costs will be fees paid for transfusions. Data on fees collected should be obtained from the BTS. However, it will probably be possible only to record gross fees for the transfusion provided, and not to disaggregate the element of the overall fee that patients are implicitly paying for 'HIV-safe' blood.

- Private individuals may finance some of the supply inputs, for example by providing their own needles and blood bags. These costs can be added to the costs that the BTS itself incurs, since they purchase additional resources required to implement the strategy.

- Individuals may bear some costs to receive **mass media** messages and information. These costs may include batteries to operate radios, television licence fees and the price of newspapers and magazines. However, receiving the HIV/AIDS messages will be only a small proportion of the benefits of subscribing to these forms of media. It is recommended that, even when a societal perspective is being taken, these user costs be excluded. Private travel costs associated with the strategy should be minimal since, almost by definition, mass media bring the messages and information to the population wherever they are. Time may be spent listening to HIV prevention material on the radio or television, or reading IEC material in the press. It is recommended, however, that the economic opportunity cost of that time be assumed as being zero.

- **HIV education in schools** takes advantage of an available audience. It can be assumed that school students do not incur any additional financial, time or travel costs to participate in the HIV/AIDS education sessions.

- For **CSM**, the main type of private expenditure will be the purchase of condoms. Total private expenditure will be a factor of the marketing prices at retail outlets and the quantity of sales. Where the price of condoms is standard throughout the country, it will be easier to derive this figure than in situations where retailers are free to set their own profit margins. Private time and travel costs will also be incurred in obtaining the condoms and this could be assessed if costing from a societal perspective. From a provider perspective, the relevant information will be the net sales revenue passed back to the centre rather than private costs at the periphery. The social marketing organization should be able to provide information on net sales revenue. This is subtracted from project costs to obtain total net costs.

- For **STD treatment**, the most common private costs will be fees paid for consultation and/or drugs. Similarly, **in VCT**, fees may be paid for testing. Information on fees collected should be available from the service provider, sometimes collated at a more central level than the clinics themselves. The extent to which total fees collected can be equated with fees paid will partly depend on the amount of leakage of funds from the system. Fees paid to service providers should be identified separately if all inputs provided at the facility have already been costed. They can be subtracted from total strategy costs to give net costs.

- If drugs are prescribed but not provided by the clinic itself, the cost of drug purchase will also fall upon clients. If the costing study is taking only a provider perspective, then these costs can be ignored. If private costs are to

be included, the costs of these drugs should be investigated. Clients could be interviewed for information on their expenditure or, alternatively, prospectively collected clinicians' prescriptions for STD treatment could be used to estimate the average costs of obtaining these prescriptions from pharmacies.

- **CSW peer education** projects may charge CSWs for some of the services offered; for example, fees may be charged for condoms. In such a situation, the implementing NGO should be able to provide information on the quantity of sales and unit prices. The establishments within which the project is implemented may also be charged fees—for example, a flat fee for being incorporated in the project, or fees for educational talks given to their CSWs. Again, the NGO should have records of these private costs. These fees can be subtracted from total project costs, to give net total costs.

4.5 Collection of outcome data

During the process of collecting data on costs, data on the outputs and outcomes of the programme should also be collected, in order to calculate average and unit costs of the strategy. Chapter 2 discusses the entire range of outcomes that can be measured for HIV prevention strategies. Unless you are involved in model-based evaluations or clinical trials, it is only feasible to try and obtain process and intermediate measures of outcome.

These outcomes will differ according to the HIV prevention strategies used (e.g. for **CSM** projects you may be looking at the number of condoms sold, in contrast to **VCT** projects where you could use the number of people counselled and tested as the outcome measure). Even if you are trying to assess a number of strategies which are being used together, the use of process or intermediate outcomes means that the measures will be relatively specific to each strategy.

In order to decide for which outcome measures you will try and collect data, it will be useful to ask the following questions:

- What are the main objectives of the project or strategy?
- What are the main activities in the project or strategy?
- What are the outputs of the project or strategy? Are they related to particular activities?
- What are the main intermediate outcomes?

The answers to the questions will help clarify the nature of the outcome measures for the entire project as well as by activity. They will help to clarify the type of data that needs to be collected both for process and intermediate outcomes. In practice, data availability will significantly influence the actual measures that can be used in the cost analysis. However, before beginning the data collection, it is useful to understand the nature of both process and intermediate measures.

Process measures of outcomes

These measures are used to record the outputs of the project or programme. To determine the outputs it is useful to review the individual activities. For example, in an IDU needle exchange project, the activities include development of IEC materials, recruitment of volunteers, training of staff, exchange of needles, disposal of needles and counselling. Given these activities, we can think of a number of output measures:

– number of materials produced (e.g. printed matter, books)
– number of volunteers trained
– number of staff trained
– number of condoms distributed
– number of needles/syringes exchanged or distributed
– number of people reached

A measure of output that can provide more information about the possible impact of the project is:
– number of persons in contact with NEP and exchanging needles

It is generally easy to obtain process measures of outputs from programmes. The data are often routinely measured and available from existing project or programme records. Thus the important thing is to identify the range of activities and consider the individual outputs that are associated with them.

Intermediate measures of outcome

These measures reflect intermediate changes needed to achieve health impacts of the prevention strategy. However, several of these variables are continuous (e.g. frequency and sharing, proportion of sex acts in which condoms are used). This raises a number of issues about the extent to which you indicate a change has occurred (e.g. do you include someone who has reduced injection frequency or increased condom use frequency by 1%?). Is there a threshold or critical value above which we consider that people have modified their risky behaviour? If we converted these measures to percentage variables such as:

– percentage of IDUs sharing syringes
– percentage cleaning syringes with disinfectant
– frequency of use of a single syringe,

a unit cost calculation would then make no sense (e.g. cost per percentage of IDUs sharing syringes).

A comprehensive intermediate outcome measure would be the number of people who have reduced risky behaviour. This could be a summation of all those who both stop sharing syringes and reduce their frequency of IDU.

Thus, for example, in a mass media campaign, a process outcome is the number of radio messages produced by the intervention. In order for the campaign to change health status (e.g. avert HIV infections), people need to be exposed to the campaign and messages in order to change behaviour. In this case, an intermediate outcome could be the number of people reached by the radio message. For HIV education in schools, an intermediate outcome would be the number of students taught the curriculum.

Data for intermediate outcomes are harder to acquire than simple output information. These outcomes may not be systematically monitored, and you may have to rely on project evaluations to help produce 'guesstimates' of likely ranges of values for your intermediate outcome measures [50].

This section highlights the complexity of output and outcome measures for IDU projects. While there is a range of possible variables to use, selection should depend on the availability of data, and on whether the unit cost derived from such an outcome measure can be interpreted meaningfully.

Multiple and non-discrete outcomes

There are multiple interventions and multiple outcomes associated with many prevention interventions. In addition to lowering the risk of HIV transmission, some interventions can also reduce the risk of other STD, pregnancies, blood-borne infections such as hepatitis B and C, and reduce death due to overdoses. In presenting the costs of the different HIV prevention strategies, the direct and indirect benefits of the strategy should also be reported.

Table 4: Annualization factors

Discount rate

Number of remaining years of useful life

n	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.90	0.90	0.89	0.88	0.877	0.870	0.862	0.855	0.847	0.84	0.83
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.73	1.71	1.69	1.66	1.647	1.626	1.605	1.585	1.566	1.54	1.52
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.48	2.44	2.40	2.36	2.322	2.283	2.246	2.210	2.174	2.14	2.10
4	3.902	3.808	3.717	3.630	2.546	3.465	3.387	3.312	3.240	3.17	3.10	3.03	2.97	2.914	2.855	2.798	2.743	2.690	2.63	2.58
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.79	3.69	3.60	3.51	3.433	3.352	3.274	3.199	3.127	3.05	2.99
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.35	4.23	4.11	3.99	3.889	3.784	3.685	3.589	3.498	3.41	3.32
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.86	4.71	4.56	4.42	4.288	4.160	4.039	3.922	3.812	3.70	3.60
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.33	5.14	4.96	4.79	4.639	4.487	4.344	4.207	4.078	3.95	3.83
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.75	5.53	5.32	5.13	4.946	4.772	4.607	4.451	4.303	4.16	4.03
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.14	5.88	5.65	5.42	5.216	5.019	4.833	4.659	4.494	4.33	4.19
11	10.36	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.49	6.20	5.93	5.68	5.453	5.234	5.029	4.836	4.656	4.48	4.32
12	11.25	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.81	6.49	6.19	5.91	5.660	5.421	5.197	4.988	4.793	4.61	4.43
13	12.13	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.10	6.75	6.42	6.12	5.842	5.583	5.342	5.118	4.910	4.71	4.53
14	13.00	12.106	11.296	10.56	9.899	9.295	8.745	8.244	7.786	7.36	6.98	6.62	6.30	6.002	5.724	5.468	5.229	5.008	4.80	4.61
15	13.86	12.849	11.938	11.11	10.380	9.712	9.108	8.559	8.061	7.60	7.19	6.81	6.46	6.142	5.847	5.575	5.324	5.092	4.87	4.67
16	14.71	13.578	12.561	11.65	10.838	10.106	9.447	8.851	8.313	7.82	7.37	6.97	6.60	6.265	5.954	5.668	5.405	5.162	4.93	4.73
17	15.56	14.292	13.166	12.16	11.274	10.477	9.763	9.122	8.544	8.02	7.54	7.12	6.72	6.373	6.047	5.749	5.475	5.222	4.99	4.77
18	16.39	14.992	13.754	12.65	11.690	10.828	10.05	9.372	8.756	8.20	7.70	7.25	6.84	6.467	6.128	5.818	5.534	5.273	5.03	4.81
19	17.22	15.678	14.324	13.13	12.085	11.158	10.33	9.604	8.950	8.36	7.83	7.36	6.93	6.550	6.198	5.877	5.584	5.316	5.07	4.84
20	18.04	16.351	14.877	13.59	12.462	11.470	10.59	9.818	9.129	8.51	7.96	7.46	7.02	6.623	6.259	5.929	5.628	5.353	5.10	4.87
21	18.85	17.011	15.415	14.02	12.821	11.764	10.83	10.017	9.292	8.64	8.07	7.56	7.10	6.687	6.312	5.973	5.665	5.384	5.12	4.89
22	19.66	17.658	15.937	14.45	13.163	12.042	11.06	10.201	9.442	8.77	8.17	7.64	7.17	6.743	6.359	6.011	5.696	5.410	5.14	4.90
23	20.45	18.292	16.444	14.95	13.489	12.303	11.27	10.371	9.580	8.88	8.26	7.71	7.23	6.792	6.399	6.044	5.723	5.432	5.16	4.92
24	21.24	18.914	16.936	15.24	13.799	12.550	11.46	10.529	9.707	8.98	8.34	7.78	7.28	6.835	6.434	6.073	5.746	5.451	5.18	4.93
25	22.02	19.523	17.413	15.62	14.094	12.783	11.65	10.675	9.823	9.07	8.42	7.84	7.33	6.873	6.464	6.097	5.766	5.467	5.19	4.94
26	22.79	20.121	17.877	15.98	14.375	13.003	11.82	10.810	9.929	9.16	8.48	7.89	7.37	6.906	6.491	6.118	5.783	5.480	5.20	4.95
27	23.56	20.707	18.327	16.33	14.643	13.211	11.98	10.935	10.027	9.23	8.54	7.94	7.40	6.935	6.514	6.136	5.798	5.492	5.21	4.96
28	24.31	21.281	18.764	16.66	14.898	31.406	12.13	11.051	10.116	9.30	8.60	7.98	7.44	6.961	6.534	6.152	5.810	5.502	5.22	4.97
29	25.06	21.844	19.188	16.98	15.141	13.591	12.27	11.158	10.198	9.37	8.65	8.02	7.47	6.983	6.551	6.166	5.820	5.510	5.22	4.97
30	25.80	22.396	19.600	17.29	15.372	13.765	12.40	11.258	10.274	9.42	8.69	8.05	7.49	7.003	6.566	6.177	5.829	5.517	5.23	4.97

Chapter 5
COST ANALYSIS

Once all the component costs have been collected, then the data need to be aggregated or collated. Sheets C1-C10 allowed you to collect costs at different levels. Form B is a summary of costs at each level. Once this is done, all the levels can be added up and entered onto Form A—the Project Summary sheet—to get total costs.

5.1 Adding up costs

As indicated in the introduction, those projects with access to a computer can enter data directly into a spreadsheet package using the Microsoft Excel spreadsheets available on the UNAIDS website (www.unaids.org/publications) or the CD-ROM: *Economics in HIV/AIDS planning: getting priorities right*, UNAIDS (June 2000). They would be advised to apply the same methods to facilitate collation of data from Forms C onto summary forms A and B (World Health Organization also provides such software (9)). If a computer is not available, data can be collated manually.

Form B (collating all Form C data at a particular organizational level) can be completed with either financial or economic costs, or both. The Base Year costs in the final column or row of each Form C should be transferred to their appropriate rows on Form B and then all of the input categories summed up to give a total cost of the AIDS strategy at that organizational level. It must be remembered that if only a sample of units had been costed to represent all units at a particular level, it is the total cost of the population of units from which the sample was derived that should be calculated and transferred to Form B. A record should be made of this calculation.

Form A collates the costs from each organizational level (the Form B data) to provide the overall cost of the HIV prevention strategy or programme. Form A can

be completed with either financial or economic costs (completing a form for each, if necessary).

If the set of B forms shows all costs at all organizational levels, then they can be added together to derive the overall total cost. If, however, the strategy being costed is only part of a larger programme, then it may be necessary to allocate only a proportion of higher-level costs to the overall cost calculation. For example, we may be interested in costing an AIDS strategy in one district only, within a region of 10 districts and a country of 20 regions. In this example, if costs were allocated equally between sub-units at a particular organisational level, Form A would need to collate 100% of the costs calculated for the district, 10% of the costs calculated for the region and 5% of the costs calculated for the central level. Only these relevant proportions of costs at each organizational level should be transferred to Form A for the final summation. If it is apparent that sub-units (for example districts or regions) do not make equal demands on the level above, it may be decided to make a more accurate allocation of costs, for example weighted by share of total budget or number of staff per sub-unit. A clear record should be made of how this proportion was derived, both in footnotes on the forms if they are being compiled manually and also more formally.

5.2 Cost profile

Once Form A is completed, you have essentially derived a cost profile of the project or programme that you have examined. It will look like the table below:

Cost Category	*Annual Cost (currency)*	*Total Cost (%)*
Capital		
Buildings	5 000	10
Equipment	5 000	10
Vehicles	5 000	10
Consultancies (non-recurrent)	0	
Total Capital Costs	**15 000**	**30**
Recurrent		
Personnel	20 000	40
Supplies	5 000	10
Vehicle operation and maintenance	5 000	10
Building operation and maintenance	1 000	2
Consultancies (recurrent)	4 000	8
Other	0	
Total Recurrent Costs	**35 000**	**70**
TOTAL COSTS	**50 000**	**100%**

Source: PHC: 12

Alternatively, you could obtain a cost profile in terms of activities rather than inputs. These profiles are useful in highlighting major cost components (and thus identifying potential areas where improvements in efficiency may have significant impact on costs). For example, high drug costs could indicate wastage. These cost profiles can be compared across different projects and programmes, as well as within programmes. Within programmes the profiles can be presented by different delivery units or providers, and a comparison can be made between them. "If there are significant differences in cost profiles, then this may mean that there may be ways to re-structure and improve efficiency" (PHC: 13).

However, comparison of cost profiles across countries or regions is problematic due to different price structures. Comparison of cost profiles over time might be more useful than the comparison across different projects. Thus, one must be careful only to generalize from cost profiles, and then only when appropriate.

5.3 Unit costs

Once total costs of a programme or project have been calculated, then unit costs can be derived. These can be calculated in terms of the outcome indicators for which you have collected data in sheet D, and are simply calculated as total costs divided by the outcome measure.

Unit costs can be used to compare costs between similar projects, and consider issues of project efficiency. There are several factors affecting unit costs, including:

- different prices paid for inputs by projects in different locations;
- different mix of inputs used by different projects (e.g. more staff or more supplies);
- different levels of staff productivity;
- there may be efficiencies gained due to the size or scale of the project (economies of scale). For example, condom social marketing projects seem to have lower unit costs in countries with large populations [51];
- there may be efficiencies gained due to having a number of services or projects undertaken together (economies of scope).

However, not all differences in unit costs should be attributed to differences in efficiency. A higher unit cost may not indicate a less efficient programme. There may be other factors driving these differences, for example:

- Differences in unit costs may indicate differences in ease of delivery of services. For example, a project that is based in rural areas with a more dispersed

population, or projects reaching more marginalized groups, might engender higher costs. Thus there may be equity reasons why more resources are allocated to this project.

- The duration of a project or programme may affect unit costs. Comparing an established programme with a relatively new programme should take this into account. This is particularly true for CSM projects, where some projects have gone from start-up to accruing profits in the span of 12-15 years [52].

In addition, you may want to obtain unit costs by activity. For example, if you have the costs of IEC production within a condom social marketing programme and the number of IEC materials produced, then you can calculate the unit costs of the materials produced. If training is an activity, then you can produce the unit cost per training session. This can facilitate analysis of efficiency of particular activities within a project.

5.4 Using the cost analysis in planning and budgeting

Once the basic cost analysis is done, the information can be used in a variety of ways to aid planning and budgeting for the future. In general, current cost data can serve as a baseline for extrapolating information for both the future and for other projects. What is clearly important is to consider to what extent the project from which you are obtaining cost information is similar to the activities that you are hoping to do.

The financial cost analysis can contribute to an understanding of budgeting requirements of a specified project. The financial cost analysis will give you an idea of the total volume of resources that have been spent. The financial analyses will also serve as a basis for future budgeting. There are several ways that you can use existing cost data to help in budgeting [1]:

- An ingredients approach would mean that you list all of the possible inputs and then consider to what degree you will be using them in the future project for the expected level of output (e.g. number of persons counselled) that you would like to achieve. Once you have determined the 'quantity', you can then work out the price and the cost. For example, if you think that you will need 1.25 nurses, you can consider whether to hire one full-time nurse and one part-time nurse, or whether it is feasible to hire one nurse and pay for extended hours. This approach requires a lot of detailed cost information and is appropriate if programme conditions are changing quickly.

- A less detailed approach to budgeting would be to take the current costs of a project, extrapolate to your own circumstances, and then do a rough

adjustment depending on how similar you think the projects are. An important thing to consider is whether the project you are taking the costs from is actually running efficiently. Alternatively, you could apply some mark-up to the costs (e.g. 20%) to allow some margin of error.

Regardless of the method you use, if you are budgeting for the future you need to adjust the price or cost information for inflation. You will need to consider what level of inflation to take into account, and that prices will rise every year. So, for instance, in a country with a relatively stable level of inflation of 8%, you may choose 10% as the proportion by which you expect prices to increase each year. However, if you are in an environment with rapid inflation, you may wish to convert your costs to a more stable currency such as the US dollar and then do your budget calculations [12].

Financial cost analyses will also help to consider the affordability of projects, as they provide information on the amount of money that is required to run a project. This information can be used to consider the range of sources and funds that are available to finance the project.

However, as discussed in Chapters 2 and 3, financial cost analyses only reflect the actual expenditure on a project. If a project had substantial donated components, then relying on financial cost analyses will give a distorted view of the actual resources being used. Thus when considering issues such as replication of projects to different settings or scaling-up projects in size, it is critical to consider what basic infrastructure may have been in place which was not accounted for in a financial cost analysis. For example, many NGO-based projects often receive assistance in the start-up phase (e.g. exchange of goods in kind or subsidized printing). It is here that economic analyses are useful.

For an example of the implementation of the costing guidelines, please refer to: The cost-effectiveness of HIV preventive measures among injecting drug users in Svetlogorsk, Belarus*, draft report, UNAIDS, 2000, which can be found on the UNAIDS CD-ROM,* Economics in HIV/AIDS Planning: Getting Priorities Right*, June 2000.*

Annex

Data Collection Sheets

This annex contains the data collection sheets, which are arranged as follows:

1. Background data sheet

2. Form A — Project Summary sheet—presents costs by input and level. This is a collation of all Form B summary sheets.

3. Form B — Summary of costs at each level. This is a collation of all Forms C1-C10.

4. Forms C1–C10 provide the basis for data collection by input category:

- C1 — capital costs: buildings
- C2 — capital costs: equipment
- C3 — capital costs: vehicles
- C4 — capital costs: consultancies
- C5a — recurrent costs: personnel
- C5b — example of personnel time allocation form
- C6 — recurrent costs: supplies
- C7 — recurrent costs: vehicles operation and maintenance
- C8 — recurrent costs: building operation and maintenance
- C9 — recurrent costs: consultancies
- C10 — recurrent costs: other
- C11 — cost recovery: private costs

5. Form D — collection of output/outcome data

BACKGROUND DATA SHEET

Country

_____

Project

_____

Local currency

_____

Discount rate (for base year) _____Source_____

Consumer Price Indices (CPI) for years spanned by data collection:

Year	_ _	CPI	_____
	_ _		_____
	_ _		_____
	_ _		_____

Market Exchange Rates for years spanned by data collection:

		$	Other
Year	_ _	_____	_____
	_ _	_____	_____
	_ _	_____	_____
	_ _	_____	_____

Official Exchange Rates for years spanned by data collection:

		$	Other
Year	_ _	_____	_____
	_ _	_____	_____
	_ _	_____	_____
	_ _	_____	_____

Local Market Interest Rates for years spanned by data collection:

Year	_ _	_____
	_ _	_____
	_ _	_____
	_ _	_____

Local Official Interest Rates for years spanned by data collection:

Year	_ _	_____
	_ _	_____
	_ _	_____
	_ _	_____

FORM A PROJECT SUMMARY SHEET

(Collation of all Form 'B' summary sheets)

Country _____

Project _____

Local currency _____

Costs for Base Year _ _

Financial costs / economic costs (delete as applicable)

Cost Category	Level _____	Level _____	Level _____	Total cost (%)
Capital				
Buildings				
Equipment				
Vehicles				
Consultancies (non-recurrent)				
Total Capital Costs				
Recurrent				
Personnel				
Supplies				
Vehicle operation and maintenance				
Building operation and maintenance				
Consultancies (recurrent)				
Other				
Total Recurrent Costs				
TOTAL COSTS				

FORM B SUMMARY OF COSTS AT EACH LEVEL

(Collation of Forms C1 – C10).

Country _____

Project _____

Project Level _____

Local currency_____

Costs for Base Year _ _

Cost Category	Financial costs	Economic costs
Capital		
Buildings		
Equipment		
Vehicles		
Consultancies (non-recurrent)		
Total capital costs		
Recurrent		
Personnel		
Supplies		
Vehicle operation and maintenance		
Building operation and maintenance		
Consultancies (recurrent)		
Other		
Total recurrent costs		
TOTAL COSTS		

Once all the component costs have been collected, then the data need to be aggregated or collated. Sheets C1 – C10 allowed you to collect costs at different levels. Form B is thus a summary of costs at each level. Once this is done, all the levels can be added up on Form A—the Project Summary sheet.

FORM C1 CAPITAL COSTS: BUILDINGS

Country _____ Cost data collected from months _____
Project _____ Source of data _____
Project Level _____ Chosen Base Year ____

(1) Buildings (list)	(2) Funded by	Annual rent/hire		(5) Furnishing @ 10%	Total cost		(% allocation) Cost			
		(3) Fin.	(4) Ec.		(6) Fin. (3+5)	(7) Ec. (4+5)	(8) Fin.	(9) Ec.	(10) Fin.	(11) Ec.
Total										

FORM C2 CAPITAL COSTS: EQUIPMENT

Country _____
Project _____
Project Level _____
Local currency _____

Cost data collected from months _____
Source of data _____
Chosen Base Year ____

(1) Equipment (list)	(2) Funded by	Cost		Life expectancy or working life	Annual cost		(% allocation) Cost		Base Year Cost	
		(3) Fin.	(4) Ec.		(6) Fin.	(7) Ec.	(8) Fin.	(9) Ec.	(10) Fin.	(11) Ec.
TOTAL										

FORM C3 CAPITAL COSTS: VEHICLES

Country _____
Project _____
Project Level _____
Local currency _____

Cost data collected from months _____
Source of data _____
Chosen Base Year ____

(1) Vehicles (list)	(2) Funded by	Cost		Life expectancy or working life	Annual cost		(% allocation) Cost		Base Year Cost	
		(3) Fin.	(4) Ec.		(6) Fin.	(7) Ec.	(8) Fin.	(9) Ec.	(10) Fin.	(11) Ec.
Total										

FORM C4 CAPITAL COSTS: CONSULTANCIES

Country _____
Project _____
Project Level _____
Local currency _____

Cost data collected from months _____
Source of data _____
Chosen Base Year ____

(1) Consultancy detail	(2) Funded by	(3) Fees	(4) Travel	(5) Subsistence + misc	Total cost (3) + (4) + (5)		(8) Life of effect	Annual cost		% allocation Cost		Base Year Cost	
					(6) Fin	(7) Ec		(9) Fin	(10) Ec	(11) Fin	(12) Ec	(13) Fin	(14) Ec
TOTAL													

FORM C5a RECURRENT COSTS: PERSONNEL

Country _____
Project _____
Project Level _____
Local currency _____

Cost data collected from months _____
Source of data _____
Chosen Base Year ____

(1) Category of personnel (list with grade where appropriate)	(2) Funded by	Gross annual salary		Cost of annual allowances (specify)		Total annual cost		(% allocation) Cost		Base Year Cost	
		(3) Fin	(4) Ec	(5) Fin	(6) Ec	(7) Fin (3) + (5)	(8) Ec (4) + (6)	(9) Fin	(10) Ec	(11) Fin	(12) Ec
TOTAL											

FORM C5b EXAMPLE OF PERSONNEL TIME ALLOCATION FORM

Country _____
Project _____
Project Level _____
Local currency _____

Cost data collected from months _____
Source of data _____
Chosen Base Year ____

Time/Day									12		1		2		3		4		Total strategy hours	
Mon																				
Tues																				
Wed																				
Thur																				
Fri																				
Sat																				
Sun																				
Total hours																				
Percentage of hours																				

List time allocation by arrows as indicated:

——— HIV prevention strategy work

------- Non - HIV prevention strategy work

FORM C6 RECURRENT COST: SUPPLIES

Country _____
Project _____
Project Level _____
Local currency _____

Cost data collected from months _____
Source of data _____
Chosen Base Year ____

(1) Supplies (list)	(2) Funded by	(3) Quantity consumed (including loss and wastage)	Unit cost		Cost		(% allocation) Cost		Base Year Cost	
			(4) Fin.	(5) Ec.	(6) Fin. (3) x (4)	(7) Ec.	(8) Fin.	(9) Ec.	(10) Fin.	(11) Ec.
Total										

FORM C7 RECURRENT COSTS: VEHICLE OPERATION AND MAINTENANCE

Country _____
Project _____
Project Level _____
Local currency _____

Cost data collected from months _____
Source of data _____
Chosen Base Year ____

(1) Supplies (list)	(2) Funded by	Cost		(% allocation) Cost		Base Year Cost	
		(4) Fin.	(5) Ec.	(6) Fin.	(7) Ec.	(8) Fin.	(9) Ec.
Petrol/diesel							
Oil							
Maintenance							
Insurance							
Registration							
Repairs							
Spare parts							
Total							

FORM C8 RECURRENT COSTS: BUILDING OPERATION AND MAINTENANCE

Country _____
Project _____
Project Level _____
Local currency _____

Cost data collected from months _____
Source of data _____
Chosen Base Year ____

(1) Utility	Telephone/fax	Insurance	Maint./repair	Other
(2) Source of funds				
(3) January				
(4) February				
(5) March				
(6) April				
(7) May				
(8) June				
(9) July				
(10) August				
(11) September				
(12) October				
(13) November				
(14) December				
(15) Annual cost				
(16) Total annual cost				
(17) (% allocation) Cost				
(18) Base Year cost				

FORM C9 RECURRENT COSTS: CONSULTANCIES

Country _____
Project _____
Project Level _____
Local currency _____

Cost data collected from months _____
Source of data _____
Chosen Base Year ____

(1) Consultancy detail	(2) Funded by	(3) Fees	(4) Travel	(5) Subsistence + misc	Total cost (3) + (4) + (5)		(8) Frequency	Annual cost		(% allocation) Cost		Base Year Cost	
					(6) Fin	(7) Ec		(9) Fin	(10) Ec	(11) Fin	(12) Ec	(13) Fin	(14) Ec
TOTAL													

FORM C10 RECURRENT COSTS: OTHER

Country _____
Project _____
Project Level _____
Local currency _____

Cost data collected from months _____
Source of data _____
Chosen Base Year ____

(1) Input (detail)	(2) Funded by	Annual cost		(% allocation) Cost		Base Year cost	
		(3) Fin.	(4) Ec.	(5) Fin.	(6) Ec.	(7) Fin.	(8) Ec.
TOTAL							

FORM C11 COST RECOVERY: PRIVATE COSTS

Country _____
Project _____
Project Level _____
Local currency _____

Cost data collected from months _____
Source of data _____
Chosen Base Year ____

Fee type (specify)				
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				
Annual total				
Strategy total				
Base Year Equivalent Value				

FORM D OUTPUT/OUTCOME DATA

Country _____

Project _____

Outputs for Base Year _ _

Indicators	Units	Quantity
Process Indicators		
Intermediate Indicators		

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