Booklet A2: Determining the Costs of Sexual and Reproductive Health Programmes

Because there are always fewer financial resources available than required given the needs of SRH programmes, SRH programme managers have to use the available resources as good as possible. Therefore it is important to know and monitor the costs of programmes. SRH programme managers can team up with economists to undertake cost studies of particular interventions or programmes. Such studies are the subject of this booklet, which addresses questions such as:

- What are the costs of a family planning programme?
- What kind of cost data should be collected, and from what sources?
- What is the best way to organize the collection of cost data?
- How are costs calculated?
- What is the difference between financial and economic costs?

The main steps in the process of costing SRH programmes are covered in this booklet. They are illustrated by an example of a costing study of a specific package of maternal health services in Uganda.

A2.1 A Step-By-Step Approach to Costing

Booklet A1 described already how information on costs can be used to monitor and improve SRH programmes. Cost analysis can give an indication of the amount of resources required to continue a programme. In combination with other information, e.g. on health effects, it can be used to assess the effectiveness and efficiency of programmes (see more in Booklet A3). In this way, cost analysis can help increase the available resources for SRH or help programme managers make the best use of existing resources. This chapter covers the main steps that need to be taken into account when undertaking a costing, which helps programme managers work together with economists, manage costing studies or even participate in such studies.

Step 1 – Defining the scope of the study

The starting point of a costing study is to determine the scope of the research so that its purpose and boundaries are clearly defined. This should happen as early as possible in the process. The scope of the programme should specify the intervention or programme under study, clarify what activities and what kinds of costs are included, and also indicate what might not be covered.

The description of the intervention or programme to be costed should cover all information that is essential to interpret the cost results. For example, the programme description should include information about the objectives of the programme, its main activities, the level of operations, the type of provider and sources of funds. The background and purpose of the study are also crucial information for end users of the results (see Box A2.1).

Ideally, defining the scope of a study should be a participatory process, going beyond the programme manager and the researcher and engaging all interested parties – such as providers or international funding agencies. The input from interested parties and end-users is important for data collection and analysis of the results.

Box A2.1: Example Step 1 – Scope

A central problem of the safe motherhood programme in Uganda is access to quality care. The number of trained service providers is insufficient and concentrated at the tertiary level of care. To improve the management and sustainability of maternal and SRH programmes, the Ministry of Health is asking whether it can achieve cost savings in these services without negatively affecting quality. In addition, the Ministry wants to know how much patients pay for maternal health services, to assess the feasibility of user fees.

To carry out this assessment, cost and efficiency differences between public and private hospitals need to be analysed. Therefore, the research objectives are to:

- estimate the costs of providing safe motherhood services in different health service facilities (public and private),
- estimate the cost to the patient of accessing safe motherhood services,
- compare and analyse the costs of different facilities.

Step 2 – Financial and economic costs

For many people, costs are items or things that are paid for. For economists, there are two types of costs: financial (or accounting) costs and economic costs. Financial cost is the money paid for the resources used, based on their price. However, economists are also aware that the price might not always reflect the full value of the resources. For example, many SRH programmes use volunteers or receive donated or subsidized drugs. Though no price was paid for these resources, they certainly do have value. Economic costs include this, non-monetary, value.

The use of free, donated or subsidized goods for a SRH programme means that these are not being used by society for alternative purposes. For example, the volunteer's time could alternatively have been used for paid employment. The drugs could have been sold by the donating company for a profit. The subsidy that enables the programme to run relatively cheaply is always paid for by someone (e.g. taxpayers, donors), who could have used the money elsewhere. This lost opportunity is the cost that society bears in return for the cheaper SRH programme, or the so-called '**opportunity costs**'. Economic costs take these opportunity costs into account by including the non-financial value of resources.

The choice between financial and economic costs depends on the purpose of the costing study. For example, when monitoring budget expenditure, the use of financial costs is sufficient to know on what money has been spent. However, when using a costing study to evaluate the sustainability of a programme, economic costs should be collected as well in order to capture all resources used, whether or not money was paid for them. Financial costs alone would overestimate the sustainability, or underestimate the true costs of health care programmes. For example, a programme may have to switch from volunteer labour to paid labour when the volunteer organization pulls its support or moves on to other activities. Or a drug donation programme may stop after a donor programme ends. The non-financial costs should, therefore, be included when the analysis aims to assist policy- makers in making decisions on behalf of society as a whole.

The basic principle for estimating economic costs is to approximate the value the "free" goods would have had in their next-best, alternative use. The easiest way to do

this is to look at the prices such goods would have if they were sold normally. For example, in the case of donated television advertising time, the economic cost is what television broadcast companies normally charge for a similar time slot. For volunteer labour, the salary that these people would have received elsewhere, or in a similar paid job on the programme, can be used to value their donated time. If goods have been obtained at subsidized prices, these prices need to be adjusted to get the economic costs. Economists call this shadow pricing.

Box A2.8: Example – Economic costs

To estimate the economic costs to patients of accessing antenatal care (ANC) services, the study team will not only look at the user fees paid, but also include the opportunity costs. The economic costs are incurred for example because family members voluntarily accompany the patient to the facility. These carers do not get paid (financial costs), but their work does have a value that should be included in the patient economic costs.

The value of the carers is estimated by using the salary that this family member would earn if he or she did not come along to the hospital but worked instead. If the family member is not currently employed, a proxy can be used. For example, in order to value the time of a housewife, one could take the wage earned by someone who does similar work as a maid in someone else's house or use the country's minimum wage.

Step 3 – Cost perspective

Depending on the scope of your study, a cost analysis can include different categories of costs, the main ones being:

- Provider costs (sometimes including programme and health system costs)
- Household costs

Provider costs are the costs that are borne by the producers of SRH services: the health facility in the private or public sector. This will always include the costs that are directly related to health service delivery, e.g. testing or treatment. This includes the costs of different kinds of tests (e.g. X-rays, HIV testing), drugs (e.g. morphine, quinine), supplies (e.g. swabs, soap), and specialized health care personnel (e.g. gynecologist, surgeon). For example, the provider costs of HIV testing include the costs associated with testing itself, such as the cost of doing and interpreting the test by the physician; the cost of the test kits and other supplies used during testing; as well as the costs of pre- and post-test councelling (e.g. private room, educational material, counselors …). However, provider costs also include programme costs, the costs of delivering a health service as part of a wider SRH programme, such as training of health care workers or supervision visits by the regional SRH managers.

Moreover, because a health service never happens on its own in isolation, a costing study should ideally also cover the **health system costs** of delivering this service. These are costs of an intervention that are not directly related to service delivery, but do fall onto the wider health system. This includes, for example, the costs of the infrastructure (building and equipment) or the health facility administration, of which a part should be allocated to the intervention under study. Investments in health units other than those used for the intervention are excluded (e.g. when costing antenatal care one does not need to include any costs from the tuberculosis ward).

However, even provider costs that include programme and health system costs, do not cover all the costs borne by society of a certain SRH service. There are also costs

that accrue to the people receiving the health service, patients and their families. These are therefore called **household costs**. This information is especially valuable when considering the fees charged for SRH services. It could help clarify how costs to patients might affect health care seeking behaviour. Alternatively, when performing a cost analysis from a societal perspective, one may wish to include all costs of a programme, including those borne by patients.

What are the main elements of household costs?

- *Direct health care costs.* Patients often pay charges – formally or informally – where they receive care. In addition, patients often pay for diagnostic tests and drugs. When health providers' costs and household costs are combined in a single study, it is important to avoid double-counting when assessing the total costs of an intervention. For example, if the health centre charges a patient for drugs, this should not be counted both as a cost of the health programme *and* as a cost to the household.
- *Non-medical health care costs.* For example, patients will spend money on transportation to and from the health facility, or they might have to provide their own food at the health facility.
- *Patient time costs.* Patients spent time on travel and waiting when accessing health services. They may need to take time off from paid work and loose wages, or could have used the time to work at home. This time cost is often considerable and should be included.
- *Caregiver's costs.* Though most often there is no payment, the costs incurred by the family of the patients when accompanying them to the health facility or caring for them at home should also be included (see also 'opportunity costs' in Step 2).
- *Indirect costs.* These costs cover the costs of reduced productivity due to illness or pre-mature death. There are different ways of measuring this, for example by asking patients about their income before, during and after illness, or by asking about what a household would be willing to pay to avoid the illness. Other negative impacts of illness, which have an impact on future income generation e.g. reallocation of labour in the household or decisions on schooling for children, are generally not included in costing studies though these certainly do have an impact on society.
- *Intangible costs.* These costs reflect the patient's suffering and loss of quality of life due to illness. Though important in real life, this is not often included in costing studies because it is very hard to measure objectively.

Household costs of using a health service can be measured by interviewing a sample of patients at the health centre about their spending of money and time. A household survey, requiring visits to people's homes, may also be necessary to obtain information from individuals who are not currently visiting health centres (e.g. to understand the role of household costs in health seeking behaviour).

Step 4 – Selecting a sample

It may not always be possible to do a complete costing exercise if time is limited, and if the programme under study is large and delivering services in many different health centres. In this situation, one can focus on a sample of health centres or patients. Since the aim is to make statements about the population as a whole, the sample must be as representative as possible of the whole population of a country, region or district. The selection process of the sample is, therefore, important.

There are many approaches, of which **random sampling** is the best known. In this technique a number of samples are selected at random. A statistician or economist can be consulted to ensure that the sample is representative. Care should be taken

to select a range of facilities in different locations, for example, both rural and urban. Moreover, the sample should be representative of diverse experiences in different settings, rather than one particular, optimal setting, such as a pilot project.

Box A2.3: Example – Sample

The research team collects data on the health services at two public hospitals, 20 public health centres, and on 35 midwives and 40 traditional birth attendants working independently. All the data collection happens in a single district in Uganda. The team collects data during 5 days at each of the health facilities and spends several more weeks collecting data from the independent community-based practitioners.

Step 5 – Cost classification

As part of the data collection process, all cost components need to be categorized. What classification is used depends on the information needs of the study, but the categories must definitely not overlap and should cover the whole scope of the study.

Booklet A1 already described the main cost classification: capital and recurrent costs. Capital costs are the costs of inputs with use of more than one year (investments such as buildings, equipment, and vehicles), while recurrent costs are costs for outputs that are used within a year (operating costs such as personnel, supplies, and vehicle maintenance).

However, in order to facilitate data analysis, it might be useful to classify costs in other ways. Most costing studies use an activity-based cost framework, whereby costs are classified according to the activities for which the costs were made. Activities can be directly linked to service-delivery (medical treatment or surgery), but also to programme-related activities such as supervision, training, administration or outreach. For example, a maternal health programme will include activities such as antenatal, delivery, and post-partum care, emergency obstetric care, prevention of mother to child transmission of HIV, supervision and M&E. Within these, there will be sub-activities, for example, antenatal care will include counselling and education, tetanus toxoid vaccinations, iron supplementation and different blood tests. Each of these activities will require capital and recurrent inputs.

Most costing studies focus on the total costs of recurrent and capital inputs used in different activities. However, some costing studies go a level of detail further and follow the "ingredients approach". This is especially useful if the costing study is to be used to estimate future costs of a programme (see Booklet C2). The ingredients approach lists for each activity, for the recurrent and the capital costs, the quantity and the price of each resource used (See Box A2.4.). Clearly this approach requires much more time and effort to collect data (e.g. input costs for all resources). However, assigning costs to different activities, and where possible and necessary to ingredients, makes it possible to later identify what is driving the total costs and how to improve the use of the available resources

Box A2.4: Example – Cost framework – recurrent costs

ANTENATAL CARE - recurrent costs
TREATMENT
Drugs and Supplements, for example
Ferrous Salt + Folic Acid
Tetanus toxoid
Syringe, disposable, with needle
Tests
Test, blood group, anti A + B, 10 ml
Test, hemoglobin
Test HIV 1 + 2, Doublecheck, rapid test
Other
Gloves, surgeon's
Antenatal care record
Condom, standard, male 53 mm

PERSONNEL COSTS PER CASE
Type of Staff, for example
Auxiliary/Attendant
Nurse/Midwife
General Physician
Obstetrician
Lab Technician
TOTAL

Step 6 – Collecting cost data

The primary data source of any costing study is the accounting records of SRH programmes, which show actual expenditure. Programmes track their financial expenditure in order to efficiently manage budgets, avoid cost overruns, and report to donors. All this information can be used in the costing framework.

Financial data can be found at various levels of implementation. It is good practice to start the inventory at the central level first, and only go to lower levels if the data is not comprehensive or lacks sufficient detail. Often lower levels will have been asked to report on expenditure to higher levels, so this exercise does not have to be repeated. To minimize efforts, data should only be collected on inputs that make a significant contribution to the total cost, and rougher estimates can be made for small inputs that are otherwise difficult to cost. For example, not every pen and pencil needs to be accounted for, but one might want to include a lump sum for all the office supplies together.

Sometimes expenditure records are not sufficient, for example because they are badly kept or do not contain sufficiently detailed information. In that case, additional information needs to be sought. Estimates of costs can be made on the basis of expert opinion from, for example, physicians or hospital managers. It is important in this case that the experts are well aware of what should and should not be included (e.g. does the cost of antenatal care include all health staff costs or only a proportion?). Information on quantities and prices of resources can often be gathered from places where they are purchased, e.g. pharmacies, Ministry of Health, Ministry of Public Works. It matters of course whether these prices reflect the

economic or financial costs (see step 2). One should, for example, never assume that the price patients are charged for services equals the actual cost of providing these services.

Box A2.5: Example – Cost data

Prices of medicines and supplies might not be easily available. International prices can be found through the internet from, for example, MSH International Drug Price Indicator: http://erc.msh.org/dmpguide or UNICEF Supply Catalogue: http://www.supply.unicef.dk/catalogue. However, these prices will have to be adjusted to reflect local prices. Exchange rates, price differences and transport costs should also be taken into consideration. Economists can assist with that.

Step 7 – Calculating capital costs

Capital goods are items that are bought in one year and used for several years after, such as vehicles or equipment. The most recent expenditure on capital goods is therefore unlikely to provide an accurate picture of the annual capital costs of programmes. For example, equipment may have been purchased some time before the start of the costing study so that, although it is used in the year under study, the costs are not necessarily found in the annual expenditure reports. However, the health facility may have an inventory of capital items – or what is known as a `fixed assets register' – and this can be used as a first step to determine what capital goods are used for the programme. If this is not the case, an inventory will need to be made as part of the study.

To determine the annual cost of capital goods, the current purchase price of the item is divided by the number of years it is likely to be used. This method is known as **straight-line depreciation** (see box A2.6).

Box A2.6: Example – Determining average annual capital costs with straight-line depreciation

The maternal health services use both vehicles and office/clinic space in health facilities. The following table displays how the annual cost of a car and office/clinic space were calculated using straight-line depreciation.

Capital items	Vehicle	Office/ clinic space
Replacement price	$ 15,000	$ 600,000
Useful life	15 years	30 years
Annual costs	$ 1,000	$ 20,000

However, when looking at economic costs this is not sufficient. In that case, the `opportunity cost' of capital needs to be considered as well (see step 2). In other words, the money spent on constructing a facility or on purchasing a vehicle could have been invested elsewhere and led to interest earnings. These foregone returns are the opportunity costs and should be added to the costs of purchasing the capital for the programme. This approach is called **annualization**. It is based the purchase value of the capital good, the lifespan of the capital good, and the discount rate, which measures the opportunity costs of spending money now rather than investing

it. A higher discount rate means that money in the future is less important than money now, thus favouring spending on capital goods in year 1 over investing the money. A lot of studies use discount rates of about 5-6% but for developing countries often a higher rate of about 10% is used to reflect the urgent need for interventions. Economists will make these calculations, using annualization tables, however, it is important for programme managers to beware of the assumptions behind choices about discount rates and life span as this will affect the estimated costs of a programme.

Step 8 – Allocating costs to SRH interventions

If a particular item is used only for the SRH programme in question (e.g. examination table or tailor-made health education material), then its entire cost can be assigned to that programme. However, health staff, buildings, vehicles, health education and medical supplies are often used for many tasks, only some of which serve the SRH intervention being studied. To get an accurate reflection of costs, you will, therefore, need to estimate the share of the inputs that is used by each particular SRH programme.

This process is called **cost allocation**. For different inputs, different characteristics determine how costs are allocated across different programmes. For example, for vehicles used by different programmes, the number of miles/kilometers driven for each programme would be the main determinant to allocate costs. Other equipment would be allocated according to the time it was used for each programme; cost of personnel by time spent on the different activities/programmes; cost of buildings by the percentage of space used.

For example, if a nurse, earning an annual salary of US$ 10,000, spends 70% of his or her time on voluntary counselling and testing for HIV, then 70% of the salary – US$ 7,000 – should be allocated to that programme (see box A2.7).

It is especially important to get an accurate measure of the proportion of time that staff members spend on the programme being studied, as this proportion is often used as a reference to allocate other shared costs. Sometimes, personnel time is easy to measure, as staff may have specific periods of the day or week that they devote to the programme. More often, it is more difficult, especially when programmes are integrated, for example, when iron supplementation is given during antenatal care visits.

The time used can be measured in several ways. One good option is to ask staff to record their time on time sheets. This can be cross-checked with other records and through interviews with managers. Otherwise, it is recommended to observe a sample of activities and use the average time used.

Box A2.7: Example – Allocation

The antenatal clinic uses only two rooms in the health facility for out-patient services. A price estimate for just these two rooms is not available. Therefore, in order to assess the capital costs, these rooms need to be measured and compared to the overall building.

Imagine the total building is about 1000 m², costing US$ 20,000 per year, and the space occupied by the antenatal clinic is 60 m² (6% of the total). In this case, the costs to be allocated to the antenatal care programme should be 6% of US$ 20,000, or US$ 1200.

Step 9 – Analysing and reporting results

Cost data can be presented in many different ways and may serve different goals. In some instances, it is instructive to report costs in disaggregated form, by activity and by type of resource input (capital and recurrent). This allows policy-makers to identify what is driving costs or which activities might require more or fewer resources.

In addition, when possible, it is good practice to report according to the ingredients approach and list the different cost items per activity together with the unit price and quantities. This not only allows policy-makers to look into even more detail at the cost estimates, but also enables the using the results for other similar settings. Knowing prices and quantities, analysts can simply replace these by values appropriate in their own setting.

However, more often than not, studies only report aggregate costs and health effects so that it is not possible to make such detailed adjustments. Where only aggregate costs are available, **purchasing power parities (PPPs**) can be used to adjust the costs to a different location. PPP reflects the fact that US$ 1 will buy more goods in India than in the USA, so that therefore the costs of a study in one country need to be adjusted for the price differences in another country before a study can be used elsewhere. Again, an economist will know how to use PPP for your study.

However, cost analysis isn't necessarily an end in itself. For example, it can be used to estimate the future resource needs of SRH programmes (see Booklet C2). A costing study may also feed into cost-effectiveness analysis where the costs of a SRH programme are linked to evidence of the effectiveness of the same SRH programmes (see Booklet A3).

Summary

This booklet has taken the reader through the process of costing SRH interventions. The ten main steps are:

1. Defining the scope of the study
2. Selecting a sample
3. Developing an activity-based cost framework
4. Collecting financial cost data
5. Estimating capital costs – calculating the annual value of capital goods
6. Allocating costs to SRH interventions
7. Economic costs - including free or donated goods
8. Including household costs
9. Analysing and reporting results

More information about the use of cost information is provided in Booklet B1.