19.4: Health intervention costs

When planning to obtain cost information in the context of an intervention trial, it is important to plan and budget for the collection of cost data as an integral part of the trial design. While it is usually possible to carry out an economic analysis with retrospective estimation of costs at the end of the trial, this is likely to be less satisfactory than if the cost data are obtained concurrently.

4.1 Types of costs

Two types of costs should be considered in analysing the costs of a health intervention: the costs of providing the intervention (provider costs) and the costs of obtaining it (user costs).

4.1.1 Provider costs

Many kinds of inputs are needed to carry out health interventions. A helpful way to describe and catalogue the inputs required is to plot each step in the intervention process on a flow chart, reviewing all inputs needed (costs) at each step. The Panel of Experts on Environmental Management (PEEM) for Vector Control guidelines (Phillips et al., 1993) provide an excellent framework for estimating both financial and economic costs of an intervention. Financial costs are expenditures on the inputs for the intervention (the usual lay use of the term ‘cost’); economic costs are the value of the benefits foregone by employing the resources for the intervention, rather than for something else.

A common approach to categorizing costs is to separate them into recurrent and capital (Box 19.1).

The main categories of cost involved in providing a health intervention are likely to include staff time, provision of drugs or vaccines, laboratory tests, other diagnostics, information and education costs, transport costs, utilities, space or rent costs, equipment, any incentives or reimbursements provided to patients, and other administrative costs, including any
indirect costs or ‘overheads’. Most of these data can be obtained from the project accountant or the health facility or the health programme itself. It may be worth focusing time and effort to get more precise estimates of costs of the items that account for a large share of the budget. Staff costs are likely to be a major component, and getting as much precision as possible, in terms of the time allocation of different categories of staff and their different salary levels, will be essential. For example, if, in one arm of the trial, the patients are seen by a doctor and, in the other arm, by a nurse, it is important to establish the number of hours and the hourly rate of the two categories of staff. It is also useful to focus on those elements that are likely to differ between arms of the trial; if the trial is comparing a laboratory-intensive intervention with an intervention that depends simply on clinical signs, it will be important to obtain as much precision as possible on the costs of laboratory tests involved.

### 4.1.2 User costs

The second type of cost data to be collected includes the costs patients and families incur in seeking care or availing themselves of the intervention. Usually, these data can be collected fairly simply through a brief interview with patients. A short questionnaire, using only a few questions, can provide sufficient data to estimate patient costs. PIs are often reluctant to add questions to existing instruments, and even more reluctant to add entire new questionnaires, however brief. But the downside of not collecting patient cost data may be large.

Patient cost elements may include:

- cost of travel to and from a clinic to obtain the intervention
- time of patients and, where relevant, their family for travel to the clinic or intervention site
- other costs incurred—lunch, overnight stay, childcare, etc.
- wages/salary foregone or costs of work not done (for example, on the family farm).

As an example of the importance of estimating patient costs, in a trial in Uganda, HIV-infected patients were randomized to receive home-based or facility-based delivery of antiretroviral therapy. The outcomes (disease progression) for patients in the two arms were similar, but the home-based strategy, which relied on monthly home visits by trained lay workers, used less of the time of doctors and nurses. However, the main difference in cost-effectiveness was due to the costs to patients in obtaining care; the cost of a clinic visit was assessed as, on average, $2.30, which represented about 13% of reported monthly cash incomes for men and 20% for women (Jaffar et al., 2009). Given the disparities in average wealth, this level of expenditure would be approximately equivalent to an average European taking an intercontinental flight every month for a clinic visit!

Saunderson (1995), in an economic evaluation of options for the treatment of TB in Uganda, found that 70% of the cost of tuberculosis treatment was borne by patients themselves. Similarly, Ettling et al. (1991) found that 90% of the costs of seeking treatment for malaria fell on patients, while Needham et al. (1998) found that patient costs of seeking care for tuberculosis in Zambia were prohibitive.

Box 19.1 Categorization of costs into recurrent and capital

**Recurrent costs**—those used up in the course of a year and needing regular replenishment such as:

- personnel and other labour (wages, salaries)
• supplies
• building operating and maintenance costs (electricity, water, etc.)
• in-service training (in-service courses for specific skills and knowledge)
• information, education, and communication (IEC) costs.

*Capital (fixed) costs*—investments in items that last for more than a year such as:
• buildings
• vehicles
• equipment
• basic training
• land.

Generally, capital costs are discounted over the expected lifespan of the entity.

### 4.2 Approaches to costing

Although categorizing and listing costs of inputs needed for interventions are an important first step, there are three further important aspects of costing that should be considered to ensure comparability and completeness. The first is to examine costs by unit of service (such as days in hospital, outpatient visits, education campaign, or delivery of bed-nets or vaccines to a community). The second is to use a functional approach to costing, such as activity-based costing (ABC), where each specific activity, such as a hospital-based delivery, is costed. This is more useful for understanding the nature of costs than that of a line item that simply lists costs by type of input such as personnel or travel. The third is to annualize all costs for a given population for a given period of time, using depreciation methods for capital expenditures and appropriate discount rates, to bring all costs to the current year value (see Section 3.3).

Functional costing is usually based on a unit of service such as an outpatient visit or a hospital stay. All activities (processes) needed to carry out a unit of service are mapped out by a flow chart; each step in the process is analysed for the inputs used, including personnel time and overhead; a cost schedule is constructed to determine the full costs of each activity; and finally these are summed to determine the costs of that unit of service.

The idea of putting all costs involved in providing a service (intervention) onto a comparable basis of time and population is straightforward, but the details of depreciation and appropriate rates of depreciation for different inputs are beyond the scope of this chapter, and input from a health economist should be sought.

#### 4.2.1 Valuing resource use

Sometimes, unit costs will be estimated from trial centres, but more commonly they are derived from national data. Another option is to use the estimates provided by the WHO-CHOICE programme (<http://www.who.int/choice/en>). WHO-CHOICE has the objective of ‘providing policy makers with the evidence for deciding on the interventions and programmes which maximize health for the available resources’. Among the data provided are unit cost estimates for a variety of health services, by country or region; examples include the cost of a hospital bed-day by type of hospital, outpatient visit, and other patient-level costs.
As indicated in Section 1, collection and management of costing data should be planned during the study design phase and linked to the intervention outcome data. As with any prospective study, there should be a plan for ongoing data quality monitoring to address missing and poor-quality data issues immediately. Queries should be managed on an ongoing basis, rather than at the end of the trial, to maximize data completeness and quality and the timeliness of the final analysis.