

How to do (or not to do). . .

Cost and unit cost calculations using step-down accounting

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There is paucity of unit cost data from low- and middle-income countries, although recent initiatives have emerged to help rectify this. The limited budgets assigned to health care facilities mean that health planners and managers must be able to account for the resources used in health facilities as well as use them efficiently. Step-down cost accounting (SDCA) offers a relatively simple method for generating cost and unit cost data at the facility level. However, to the best of our knowledge, there is a lack of clear and concise guidance on how to undertake SDCA. Therefore, this paper, using a worked example, illustrates the different steps involved to generate cost and unit costs for a small hospital.

Key words: costs, unit costs, step-down cost accounting, hospital costs

Introduction

Previous papers in this series have described how to present costs when making adjustments for differential timing (Walker and Kumaranayake 2002) and inflation (Kumaranayake 2000). Another paper in this series compared the contents of the various cost and cost-effectiveness guidelines (Walker 2001). However, none of these papers have addressed the issue of how to estimate costs, and in particular unit costs. Indeed, it is noteworthy that of the many guidelines reviewed previously, the onus has been on calculating costs for health care programmes (Creese and Parker 1994; Drummond et al. 1998), and as such there is a distinct lack of practical guidance on the estimation of unit costs within the context of health care facilities. There are differences between costing at the facility level and the programme level as often disease-specific interventions do not have joint costs to allocate (because they are often implemented in a vertical manner), and/or as many are delivered in health centres, which do not have such complex flows of overhead costs to consider.

Unit costs refer to the cost of providing a single good or service, and are another term for average costs (Creese and Parker 1994). A unit cost can be attached to various levels of health care provision, for example *intermediate* services such as the cost of a meal or a laboratory test, or to *final cost centres* such as the cost of providing a health care service, for example an out-patient visit or a bed-day in a specific ward, such as the intensive care unit.

Unit costs, and indeed cost data more generally, provide information that can be helpful for a number of issues, including:

- providing an indication of how many resources are needed to run a service (Kadama 1990);
- providing managers with better cost visibility by helping to identify costs and cost drivers as they relate to output;¹

- assisting health planners in deciding budget allocations to the various health facilities/services (Green et al. 2000, 2001);
- deciding which curative care is best delivered in hospitals, as well as examining the trade-offs between preventative, primary and secondary curative services, once the costs of various activities are known (Shepard et al. 1998);
- assessing the comparative efficiency of health care services across settings (Barnum and Kutzin 1993; Flessa 1998; Adam et al. 2003; WHO-CHOICE 2003);
- as guidance for introducing, or setting, user fees; and
- to ensure adequate funding for services is available (Phillips 1987).

At present, there is a relative dearth of unit cost data for health care services in low- and middle-income countries (LMICs). There are a number of reasons for this. Often records of the resources used to provide services are incomplete or absent. Similarly, activity data, which forms the denominator in the unit cost calculation, i.e. data that quantifies the throughput of people visiting a health facility and their diagnosis type, is often sparse or unreliable. And finally, another obstacle in LMICs is the lack of trained staff needed to carry out such costing exercises.

Although the estimation of unit costs is context specific and reliant on available data, this paper describes a common technique of calculating unit costs, namely step-down cost accounting (SDCA), which offers a relatively simple and practical approach to costing health care facilities. The paper is organized into two sections to reflect the stages presented in Figure 1.

The first section covers Stages 1–5 and concentrates on the estimation of costs. Here the aim of the exercise and the range of cost centres are defined, resources are identified and the step-down allocation of all their associated costs, including overheads, is assigned to final cost centres. The second

section covers Stage 6–7, concentrating on activity data and outlining the combination of this with total costs to arrive at unit costs. A worked example is used throughout these sections to illustrate the different steps involved in SDCA – the example reflects the organization of a typical small hospital, although the structure has been simplified for illustrative purposes. The costing example is presented from the perspective of the health care provider, such that client and household costs are ignored. The discussion considers some alternative unit costing methodologies.

Estimation of costs

Broadly speaking, the SDCA approach identifies the range of resources needed to run a facility, and then assigns these resources to chosen ‘cost centres’ on an allocation basis (e.g. floor space, occupied bed days etc). These costs in turn filter down until the final cost centres of interest are left.

Figure 1 is adapted from Shepard (1998) and originates from the work of Hanson and Gilson (1993) – it summarizes the seven stages needed to compute unit costs.

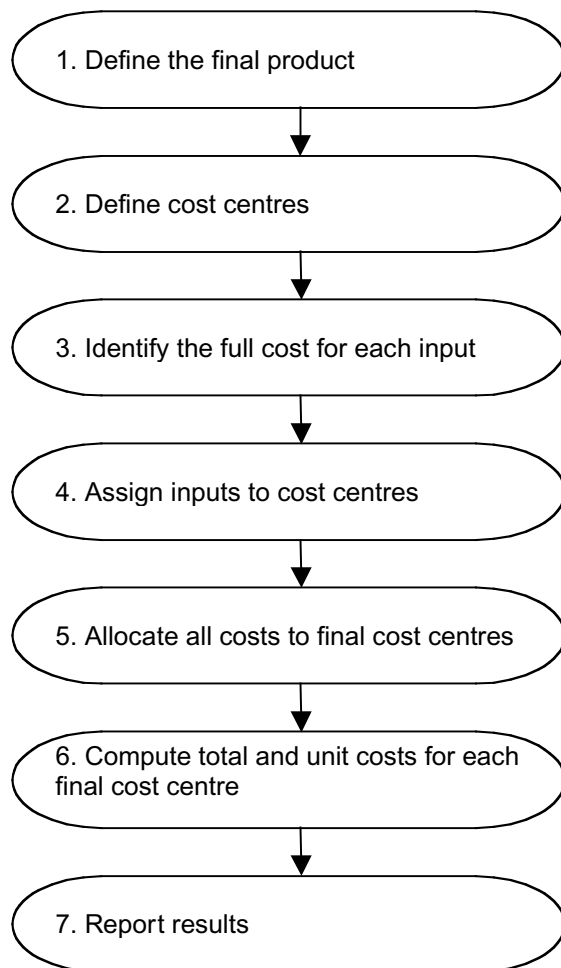


Figure 1. Summary of the stages of step-down cost accounting

Step 1: Define the purpose of the cost analysis

Before beginning the costing exercise there must be a clear notion of which services or departments are going to be assigned unit costs, e.g. for all departments and/or for each ward and/or each service? The final unit costs are shaped by (a) the purpose of the analysis and (b) the types of data available (Shepard et al 1998). It is important to decide if the aim of the analysis is to compare costs across certain departments within a hospital, in which case the unit costs for individual departments or wards should be costed, or whether the purpose is to compare the cost of two or more hospitals (adjusted for case-mix), in which case the unit costs of inpatient care may provide enough data. Alternatively, if the aim of the costing exercise is to understand the implications of changing the workload at the margin (i.e. what are the cost implications of adding one more bed to an adult male ward?), it is necessary to present the breakdown of the unit cost into its fixed and variable components. Without such information on the ‘behaviour’ of the unit costs, the analysis will be of more limited ‘historical use’ and less useful for costing future activities. However, a discussion of this latter topic is not within the remit of this paper.

Similarly, whether to undertake an economic or financial cost analysis depends on the objective(s) of the study (Creese and Parker 1994).² For instance, if the objective is to price services currently provided directly by the government free of charge, or at a subsidized rate, in order to recover costs, it may not be necessary to report economic costs. However, if the analysis aims to inform priority-setting exercises, e.g. for the purpose of a cost-effectiveness analysis, then the full range of resources used to provide services, from all sources, must be included and costed.

In terms of data availability, the final unit costs are largely dictated by how aggregated or disaggregated the cost and utilization data are. In order to generate unit costs for specific wards, a minimum level of detailed information is needed such as inpatient days, staff rosters, drug usage etc. If this level of data is unavailable then costing the next level up, i.e. inpatient care, might prove more practical and/or accurate.

Step 2: Define cost centres

For costs to be correctly allocated, a range of cost centres has to be identified. There is merit in having cost centres that correspond to the existing organizational structure of the health facility’s accounting methods, as it will facilitate data collection, analysis and presentation. For example, often salaries, pharmaceuticals or medical supplies are recorded separately in log books or commitment ledgers, and therefore costs are easier to identify and allocate into corresponding cost centres.

Three levels, or tiers, of cost centres are normally identified, direct, intermediate and indirect.³

The final level of cost centres – *direct* – represent the ‘end-points of the production line’ (Kadama 1990) – the actual services delivered to different client groups and beneficiaries.

In most cases, the beneficiaries are easily identifiable as the service involves a face-to-face meeting between the service provider and service beneficiary. However, this is not always the case. For example, environmental health programmes are generally aimed at whole communities rather than individuals.

The second level – *intermediate* – comprises cost centres that provide diagnostic and departmental support to the final level, such as the pharmacy, the radiology department and laboratory. However, it should be noted that although laboratory and pharmaceutical services are usually labelled intermediate cost centres (as in our example), depending on the purpose of the analysis, they can also be defined as direct cost centres – see for example Ojo et al. (1995).

The least specific level – *indirect* – is concerned with general services, mostly in the form of overheads such as administration and transport. These services, albeit crucial, are not directly related to patient care. For example, the costs of services such as general management and maintenance are not performed for a single patient or group of patients, but as part of the overall running of a health facility. Although it is possible in some instances to associate indirect costs with specific patients or procedures (e.g. an administrator who works purely on the paediatrics ward), in general it is not. Therefore, rules of thumb or estimation procedures are required in order to allocate indirect costs to the lower cost centres. These will be discussed further below.

Step 3: Identify the full cost for each input

Having decided on cost centres, the next step is to make a list of all the individual line items (i.e. resources) used. Table 1 identifies and groups a range of line items. This list is by no means exhaustive. For example, costs associated with buildings, maintenance and catering are omitted in order to keep the working example presented in this paper simple. Identifying all line items of interest may not be easy, but it is important to reflect the total spectrum of costs used to run a facility. Commitment ledgers, budget sheets, receipts, interviews with staff and log books might all offer information on the range of resources used and expenditure, such that the full costs incurred can be established and used as a control total, to ensure that all costs have been distributed, no more, no less. In circumstances where charge data are available, i.e. the money charged for providing a good or service to the patient, caution should be taken, as these charges incorporate an element of profit and do not reflect the true cost of the resources used (Finkler 1994).

Staffing costs are expected to be by far the largest component of recurrent costs and their allocation cuts across all cost centres. A study in Namibia showed personnel costs accounted for an average of 69% of all recurrent costs across health facilities (Conteh 1999). Similarly in Balochistan, Pakistan, personnel costs ranged from 54–74% of total recurrent costs across four different hospitals (Green et al. 2001). Therefore the assignment of personnel costs warrants special attention. Interest lies not only in staff directly involved in a medical capacity with the activities of concern, but also all

Table 1. Identifying and grouping line items

Line items	Grouped line items	Total (\$)
Salaries	Personnel costs	7 000
Overtime and pensions		
Travel and subsistence		
Accommodation		
Volunteer workers		
Uniforms		
Insurance	Administrative costs	1 000
Telephone/fax charges		
Electricity/water charges		
Stationary requirements		
Office materials and supplies		
Vehicles	Transport costs	500
Tyres		
Tools		
Spares/accessories		
Servicing fees and repairs		
Fuels, lubricants and paraffin		
Linen	Laundry costs	200
Private laundry services		
Drugs	Pharmacy costs	2 500
Laboratory equipment	Laboratory costs	800
Laboratory supplies		
Office equipment	Other supplies	8 000
Furniture		
Medical equipment		
Medical supplies		
	Total costs	20 000

support staff such as cleaners, drivers and caterers. It should also be noted that local and overseas volunteers contracted to work in a facility should have their total staffing costs included if economic rather than financial costs are of concern. Volunteers and donated items can be costed by using their market rate. Ultimately, total staffing costs should reflect an individual's basic salary, plus overtime and all additional benefits such as housing allowances and government contributions to pensions. The staff establishment list can be confirmed on site to help confirm this data.

Once the line items have been identified and grouped (see Table 1), the next task is to assign the costs from both Tables 1 and 2 where possible to the designated cost centres in order to start the step-down process.

Step 4: Assign inputs to cost centres

Some costs can be assigned immediately to certain cost centres (Shepard et al. 1998). Table 2 shows how personnel costs are assigned to the different cost centres depending on the activities of the different staff. For example, the cost of a driver is assigned exclusively to transport, whereas the cost of a nurse may be spread across different wards to reflect their varied workload.

Table 2. Assignment of different staff included in the personnel line item costs to cost centres

Line items	Cost to be assigned	Indirect cost centres			Intermediate cost centres		Direct cost centres					
		Admin ^a	Transport	Laundry	Pharmacy	Laboratory	Maternity ward	Out-patients	Paediatrics ward	Other services		
<i>Personnel</i>												
Director	1 500											
Secretary	500	1 500										
Pharmacist	700	500			700							
Physician	1 400											500
Lab technician	500					500						
Nurse	1 000											
Nursing Assistant	600											400
Cleaner	300			100								200
Driver	500		500									200
Total	7 000	2 000	500	100	700	500	700	700	700	500	500	1 300

^a Administration.

Table 3 presents the personnel costs together with all the other costs that can be immediately assigned to the various cost centres at this initial stage.

The order of each cost centre within each tier (i.e. indirect, intermediate and direct) should reflect the flow of resources within the health facility. Below is a guide to how best to collect resource data and possible ways of assigning costs to each indirect and intermediate cost centre.

Indirect cost centres

Administration

Although this cost centre includes expenditure on items such as stationary, telephone bills, courier post and travel expenditure, it is often difficult in practice to detail these expenditures or to trace their actual flows. For hospitals, administrative tasks will typically be performed by designated administrative staff. Of course, some administrative tasks will also be performed by the nursing staff.⁴ One way to address this is to interview the medical staff in order to establish what proportion of their workload is accounted for by clinical and administrative tasks, and use the data to distribute their personnel costs according to the time inputs actually involved in administration.

Transport

The transport cost centre includes line items such as fuel, lubricants, tyres, spare parts and accessories, servicing fees, and repairs and maintenance. The first step in calculating the cost of operating, maintaining and repairing vehicles is to examine commitment registers, or similar records. These list all expenditures on transport on a monthly basis and/or for the whole financial year. Another important source of data is the vehicle logbook, which details the number of kilometres travelled and the purpose of each journey. Together these sources allow the cost of fuel consumed to be calculated, and in some instances, when the purpose of the travel is indicated, assigned to particular cost centres. Another element of transport costs is the cost of drivers' time. This is estimated using the relevant data on personnel line items.

Laundry

Laundry costs include the detergents, staff, uniforms and cost of appliances. Search of hospital records detailing the supplies ordered and received is usually available and should be used to ascertain the overall laundry costs.

Catering

Catering expenditure consists of the provision of the catering service itself, and the amounts spent on kitchen utensils and supplies. A further cost is that associated with personnel and supply of uniforms. In the absence of complete information, a sample of data on the number of meals provided over a specified period should be collected, broken down by meals for patients in the different wards, as well as meals for staff and visitors. Unit costs for these meals can often be obtained

Table 3. Assignment of line item costs to cost centres

Line items	Cost to be assigned	Indirect cost centres		Intermediate cost centres		Direct cost centres				
		Admin	Transport	Laundry	Pharmacy	Laboratory	Maternity ward	Out-patients	Paediatrics ward	Other services
Personnel	7 000									
Administration	1 000	2 000	500	100	700	500	700	700	500	1 300
Transport	500	1 000	500							
Laundry	200			200						
Pharmacy	2 500				2 500					
Laboratory	800					800				
Other supplies	8 000		1 000	300	3 200	1 300	1 000	1 000	1 000	5 000
Total	20 000	3 000	1 000	300	3 200	1 300	1 700	1 700	1 500	6 300

directly from the catering contract and used to calculate the relevant expenditures.

Cleaning

Cleaning costs comprise the employment costs of cleaners and the costs of the materials and supplies they use. A sample of the materials received by health facilities can be used in the absence of better data, and priced using the figures quoted in the Government Stores order book or similar.

Maintenance

This cost centre encompasses a wide range of expenditures, including the maintenance of buildings and equipment, as well as fuel for generators. Logbooks are usually kept on resources used; these should be located and used in conjunction with price information on the individual items. Handymen, guards and gardeners are also assigned to this cost centre.

At this stage all the indirect cost centres have been assigned relevant costs. The next step is to assign costs from the list of grouped line items to the intermediate cost centres

Intermediate cost centres

Pharmacy

Pharmaceutical costs are critical inputs into effective health services and consume a significant share of the budget (excluding personnel). For example they accounted for 20–30% of total recurrent costs across four different hospitals in Balochistan, Pakistan (Green et al. 2001). They therefore demand particular accuracy in their cost estimation. The costs of pharmaceuticals comprise the drugs and medical supplies, as well as the cost of pharmacy personnel. Other less obvious costs include the costs of storage and transportation, as well as the overhead costs of procurement and Central Medical Stores, the latter costs being excluded from many costing exercises.

Laboratory

Hospitals records related to the price of the various tests, together with costs of personnel and other supplies and equipment should also be costed.

Step 5: Allocate all costs to final cost centres

As discussed above, in health facilities certain resources can be directly attributable to specific cost centres, whereas most resources are spread across a number of different departments and services, such as laundry or laboratory testing. There are different ways of allocating these shared (or overhead) costs to reach the cost of providing a specific service.⁵ Table 4 is adapted from Shepard et al. (1998) and provides a summary of different bases for allocation used in past studies.

Tables 5 and 6 present a hypothetical example of the process

Table 4. Allocation bases for cost centres used in previous studies

Allocation basis	Indirect costs to intermediate and direct costs						Intermediate costs to direct costs		
	Admin	Transport	Catering	Laundry	Cleaning	Maintenance	Pharmacy	Laboratory	X-ray
Admissions								X	X
Direct costs	X	X			X	X			
Days of care			X				X	X	X
Estimated actual use		X		X					
Estimates by employees							X	X	X
Floor area				X	X	X			
Number of beds									
Personnel costs	X	X	X			X			
Personnel numbers	X		X	X	X	X			

Adapted from Shepard et al. (1998) based on allocation criteria used in previous studies.

of SDCA. The method requires that the sum of each cost centre filters down to the remaining centres until one is left with the direct cost centres of interest (Drummond et al. 1998; Shepard et al. 1998).

Administration

Administrative costs can be apportioned on the basis of activity data. In the example of our hypothetical health facility presented in Table 5, administrative costs are allocated on the basis of staff numbers in the following way. Direct total costs from the line items for administration are \$3000 (\$2000 from personnel and \$1000 from other identified line items shown in Tables 2 and 3). Having looked at staff rosters, a percentage breakdown of all administration costs can be made: 10% to transport (i.e. 10% of full-time equivalent staff work in transport in our example), 5% to laundry, 20% to outpatients and so on. It follows that once the percentage breakdowns have been decided, then the total costs of administration can be redistributed accordingly, i.e. \$300 (10% of the total \$3000) is allocated to the transport cost centre, \$150 to laundry and \$600 to outpatients, etc. Having assigned all the administration costs to the remaining cost centres, the \$3000 has now been absorbed. The transport cost centre now has an additional \$300 on top of the \$1000 it originally started with; laundry has increased from \$300 to \$450 following the absorption of administrative costs etc.

Transport

Transport costs can be apportioned on the basis of activity data. In practice, the majority of these costs are often allocated to outreach, emergency and general outpatients. Table 5 shows the allocation of transport costs based on vehicle usage recorded in logbooks – outpatients are responsible for the majority of trips and therefore receive the largest portion of transport costs. In some instances a nominal amount may be assigned to catering, cleaning and maintenance if the vehicles are being used to pick up/deliver supplies related to these cost centres. Now it is the turn of the transport costs to be allocated, \$1300 in total. Like the administrative costs, the

transport costs are allocated to the remaining cost centres, this time on the basis of vehicle usage, and the costs associated with transport filter down to the other cost centres. And then the laundry costs are redistributed and so on and so forth.

Laundry

Activity flows in relation to laundry are not easy to track. However, overall laundry costs can be apportioned to hospital cost centres on the basis of occupied bed days, with some weighting for maternity bed days on account of higher usage rates for instance. Table 5 uses estimated actual use as the allocation basis.

Catering

The cost of patient meals can be assigned to the wards on the basis of inpatient days. The cost of staff meals is allocated on the basis of staffing rosters where available, staff interviews or in the case of support staff and visitors across all wards on the basis of patient allocation. For reasons of practicality, catering, cleaning and maintenance cost centres do not appear in our example.

Cleaning

Cleaning costs can be allocated on the basis of proxy measures of floor space, or based upon the number of beds for wards.

Maintenance

Maintenance can be allocated to all cost centres based on activity data or floor space.

Intermediate cost centres

Table 6 presents the allocation of intermediate costs. Having absorbed all the indirect costs, it is now the job of the intermediate cost centres to filter their costs down to the final tier.

Table 5. Allocation of the indirect cost centres

Cost centres	Direct totals from line items	Allocation of administration costs		Allocation of transport costs		Allocation of laundry costs	
		Redistribution based on staffing numbers %	Revised totals \$	Redistribution based on vehicle usage %	Revised totals \$	Redistribution based on estimated actual use %	Revised totals \$
Indirect							
Administration	3 000	100	3 000				
Transport	1 000	10	300	100	1 300		
Laundry	300	5	150	5	65	100	515
Intermediate							
Pharmacy	3 200	5	150	10	130	5	26
Laboratory	1 300	5	150	15	195	5	26
Direct							
Maternity ward	1 700	20	600	15	195	30	155
Outpatients	1 700	20	600	25	325	20	103
Paediatrics	1 500	10	300	10	130	15	77
ward							
Other	6 300	25	750	20	260	25	129
Total	20 000	100	3 000	100	1 300	100	515^a

^a Differences in totals are due to rounding numbers.

Pharmacy

In a hospital, pharmacists and assistants are normally on hand to dispense drugs to the patients directly or the health staff for stocking wards. Typically, small clinics and health centres have no trained or assistant pharmacists. It is normally a member of the medical staff who dispenses the drugs, as they carry out a consultation. Therefore interviews with personnel estimating the time they spend dispensing drugs could provide an allocation indication of where pharmaceutical costs should be assigned. The pharmacy normally keeps records of which drugs are given to which patients in which ward/department and it is this usage that forms the allocation basis. In the example presented in Table 6 costs are assigned on the basis of inpatient days and visits (in the case of outpatients).

Laboratory

Hospitals offering laboratory tests normally keep records of the patient and the test used – this can in turn be assigned to the associated ward/direct cost centre. In the absence of such records, activity data is used as a proxy, with a higher percentage going to general outpatients.

All the indirect and intermediate cost centres are now absorbed by the direct cost centres. Having reached this point the final two stages listed in Figure 1 can be addressed, i.e. Steps 6 and 7, the calculation of total and unit costs for each final cost centre and the reporting of results, respectively.

Activity data

Step 6: Compute total and unit costs for each final cost centre

In order to keep track of health facility caseloads, activity data are normally recorded detailing each visit to a hospital and the type of illness presented/treated. This information is very useful in unit cost analyses as it provides a denominator for the total costs collected for the direct cost centres. For example if one of the direct cost centres is the paediatrics ward, we are able to look at the throughput of patients to the paediatrics ward, and if we want to present our data in terms of the cost per paediatrics bed-day, the activity data gives us the total number of bed-days required.

Table 7 presents the calculations for turning total costs into unit costs. Two pieces of information are vital – the total costs of the direct cost centres and the units of output, for example bed-days, operations, vaccine doses administered, visits etc. In reality utilization/activity data will have been collected along the way as they may have been used as an allocation basis (see Table 4 above). The fully allocated costs for each direct cost centre are now divided by the outputs of each of these centres.

Step 7: Reporting the results

Having estimated the unit costs of interest, the onus is now to report the results. Throughout the SDCA exercise a list of

Table 6. Allocation of the intermediate cost centres

Cost centres	Revised totals cont. \$	Allocation of pharmacy costs			Allocation of laboratory costs		
		Redistribution based on days of care/visits %	\$	Revised totals \$	Redistribution based on activity data %	\$	Revised totals \$
Indirect – already allocated							
Intermediate							
Pharmacy	3 506	100	3 506				
Laboratory	1 671	0	0	1 671	100	1 671	
Direct							
Maternity ward	2 650	20	701	3 351	20	334	3 685
Outpatients	2 728	30	1 052	3 780	30	501	4 281
Paediatrics ward	2 007	15	526	2 533	10	167	2 700
Other services	7 439	35	1 227	8 666	40	668	9 334
Total	20 000^a	100	3 506	20 000	100	1 671	20 000

^a Differences in totals are due to rounding numbers.

Table 7. Unit cost calculation

Direct cost centres	Total costs	Units of service	Units from activity data	Unit cost
Maternity ward	3 685	Day	350	\$10.53
Outpatients	4 281	Visits	1 500	\$2.85
Paediatric ward	2 700	Day	400	\$6.75

the costs included and excluded from the process should have been recorded. It is very important to identify these costs when the time comes to report the unit costs, so that the audience are informed about the *boundaries* of the analysis. For example, were district level administration costs excluded? Were security costs borne by the Department for Public Works included? Was the teaching department within a hospital excluded?

Discussion

The SDCA approach presented in this paper offers a practical approach to arrive at final cost centres from which to estimate unit costs. In addition, Drummond (1998) identifies different methods, such as direct allocation; step down with iterations; and simultaneous allocation. The first of these methods, direct allocation, is less refined than SDCA, as it ignores the interaction of overhead departments and allocates them directly to the final cost centres. Step down with iterations and simultaneous allocation use more sophisticated methods to allocate overhead costs and give a full adjustment for the interaction of overhead departments. Another way of calculating unit costs is Activity-Based Costing (ABC). This method of accounting is distinct from SDCA as the allocation of personnel time among the direct cost centres becomes the principal means of assigning indirect costs (Walters et al. 2001). The strength of ABC is that by using personnel interviews to determine the main activities within an organization, it offers a practical costing approach in LMICs. A potential constraint of this method, as with the other costing methods apart from direct allocation, is that applying ABC efficiently requires that information be

readily available by cost category and department in order to continually assess levels of efficiency and report to management (Walters et al. 2001).

The focus of this paper has been to outline in detail the process of calculating unit costs for a facility-specific level of analysis, but it is important to recognize the prominent role of unit costs beyond this level. Unit cost analyses can offer insights into the different cost profiles, and hence relative efficiency, of facilities within and between countries. Unit costs have been used in a number of recent global initiatives. The Commission on Macroeconomics and Health was set up in January 2000 under the auspices of the World Health Organization (WHO) to, among other things, forecast the costs of major efforts to scale up health services for the poor in line with the Millennium Development Goals (Jha et al. 2002).

In addition, the WHO's CHOosing Interventions that are Cost-Effective (CHOICE) is an initiative that seeks to provide a range of unit costs for different health care interventions and help develop a standardized method for cost-effectiveness analysis that can be applied to all interventions in different settings (WHO-CHOICE 2003).

Conclusions

There is paucity of unit costs data from LMICs and recent initiatives have been launched to rectify this. SDCA offers a relatively simple method for generating unit costs at the facility level. To the best of our knowledge there has been an absence of clear and concise guidance on how to undertake

SDCA. This paper aims to fill this gap by presenting in detail via a worked example the steps necessary in order to calculate unit costs. The paper aims to provide managers, researchers and policy-makers with the ability to generate unit costs that can in turn help feed into debates on issues concerning equity, priority-setting and cost recovery (Creese and Parker 1994). In particular, the authors hope this paper is of use to managers who are interested in appraising the financial requirements of operating their facility and/or who are considering introducing user fees, for example, in a climate where efficiency, sustainability and accountability are at the forefront of management. SDCA is of equal use to academics undertaking research into the cost profiles within a particular health facility or across a number of different facilities and conducting economic evaluations.

Endnotes

¹ Cost drivers are factors that cause changes in the cost of an output.

² Financial costs represent actual monetary flows on goods and services purchased. Costs are thus described in terms of how much money has been paid for the resources used by the project or service. Economic costs recognize that the cost of using resources also means that these resources are then unavailable for productive use elsewhere and are effectively being tied-up. See Walker and Kumaranayake (2002).

³ It is important to note that different words are used to refer to the cost centre groupings in step down accounting literature. For example, final costs centres are also referred to in the literature as direct costs centres, medical, or patient care, units. Intermediate costs are referred to as medical support costs or ancillary cost centres and indirect costs are also called non-medical support, or overhead costs.

⁴ Note that in the working example presented in this paper the nursing staff are assumed to devote all their time to clinical care, when in reality their time may also be spent on tasks such as administration.

⁵ Although there is '... no unambiguously right way to apportion such cost . . .', Drummond (1998) illustrates that ignoring overheads could result in significant under-estimates of the true costs of, for example, replicating or scaling-up activities.

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