Costing for UHC

OPM seminar series on health financing for UHC

1. Introduction

Constructing realistic scenarios of the costs of health care is a vital part of a country's strategy to meet international goals on achieving universal healthcare coverage (UHC). In 2010, the World Health Report estimated that a low income country would need to spend around $60 per capita by 2015 to ensure a health system capable of providing for current and emerging healthcare needs.[1] Estimates increase substantially in countries with higher input costs (e.g. salaries) and where the disease burden is already concentrated on the more expensive-to-treat non-communicable diseases. This paper summarises OPM's experience of conducting costing analyses across a number of countries and the issues arise that are of relevance to future attempts to cost UHC.

2. Purposes of costing

Costing exercises have a number of purposes including:

- **Costing as part of an evaluation of cost-effectiveness:** Often focused on a comparison between new and existing treatment technology that can be linked to the (incremental) outcomes achieved.

- **Payment of providers:** Development of tariffs for individual procedures, general services (e.g. bed-day) or standardised treatment of an illness episode (e.g. case-based systems such as DRGs).

- **Budgeting:** Estimate the cost of a programme, essential package of services and costs of achieving more ambitious targets such as UHC.

- **Efficiency:** Understanding variation in costs and reasons for these variations with the purposes of making better use of existing resources and future investments.
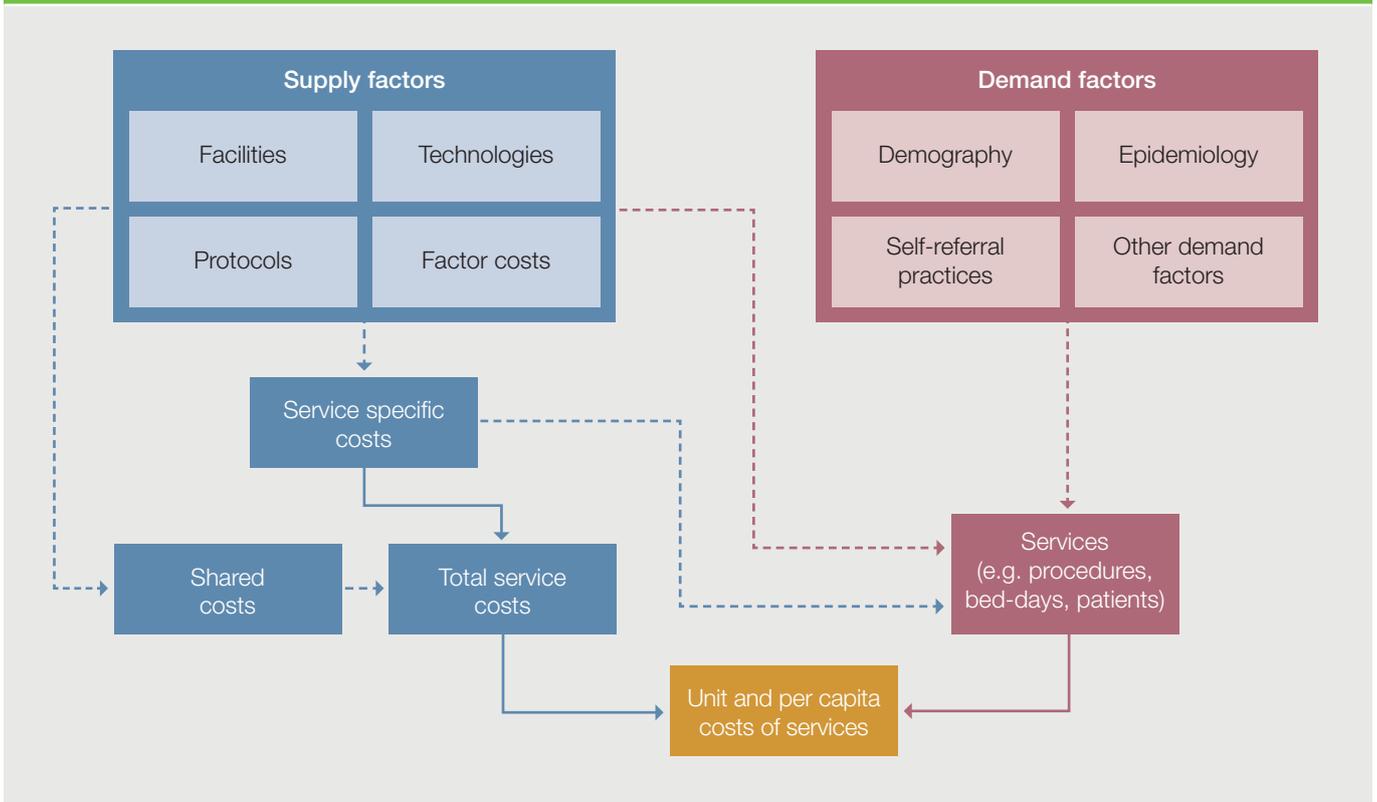
Since the way in which costing is undertaken is largely dictated by the purpose to which estimates will be put it is important to be clear about objectives from the start.

3. Components of costing

Most health service costing studies are made up of two main elements: service costs and levels of activity.

Service costs: Typically decomposed into costs that are specific to individual services (e.g. drugs, staff directly treating patients, diagnostics) and shared or overhead costs (e.g. administration, much equipment, buildings). Service specific costs can be estimated based on the actual practice of treating patients (actuals) or the expectation of treatment provided based on expert assessment (normative). Shared costs are almost always based on the actual costs of running facilities or programmes using a combination of expenditure data (e.g. for wages, utilities) and imputation of depreciated value (e.g. equipment, buildings, vehicles). Shared costs can be apportioned through a simple allocation of shared costs to cost-centres (e.g. based on numbers of patients or size of department) or more sophisticated step-down processes.

Figure 1: Components of costing exercises

Supply factors
- Facilities
- Technologies
- Protocols
- Factor costs

Demand factors
- Demography
- Epidemiology
- Self-referral practices
- Other demand factors

Service specific costs

Shared costs → Total service costs

Services (e.g. procedures, bed-days, patients)

Unit and per capita costs of services

Levels of activity: Base levels of service use actual numbers of procedures or patients treated in order to produce a cost per patient or cost per population (per capita) of providing a service or range of services (package). For most purposes, current use of services needs to be adjusted for future levels of need (normatively specified) or demand. This requires taking into account projections of future demography and epidemiology, the impact of demand on the supply of services (such as numbers of facilities and their location) and other demand factors (e.g. changing perceptions of need).

Prediction of costs based on these two elements can be undertaken through accounting or statistical means. Where the numbers of service units (e.g. facilities) is small, rules are required that enable estimations of changes in costs as activity increases. For example, while costs of medicines might be expected to increase in proportion to patients, staffing and equipment, costs of a laboratory might be regarded as fixed until a specified level of service is exceeded. When there are a larger number of service units, statistical approaches can be employed to estimate costs based on a mathematical relationship (cost function) between services provided and total costs. The advantage with this approach is that estimation is based on what is actually observed in high and low performing facilities. Statistical methods can easily be abused particularly where they estimate costs of activity that is above (or below) what current exists.

4. Costing studies

OPM has undertaken a range of costing exercises over the last ten years (Table 1). These have tended to focus on the costs requirements of an essential service package, variations in efficiency and predictions of future costs given changes in need, demand and improved productivity. These studies have not explicitly focused on universal health coverage but provide the building blocks for an estimation based on different assumptions around what is included in the package, where it is provided and population need.

Table 1: Examples of costing exercises conducted by OPM					
Country	Year	Number of services	Costs of essential package per capita	Costing basis	Spending on healthcare (2011 US$ total/ public per capita)
Package costing					
Timor Leste	2010	29 MNCH, FP and CD	US$29	Normative	US$40/36
Indonesia 1	2009	34 MNCH, FP and CD	US$22	Normative	US$99/37
Kenya	2008	50+ MNCH, FP and CD (including HIV)	US$55	Blend	US$53/32
Kazakhstan	2010	Guaranteed package of 60 conditions, 90% cost NCD	US$132	Actual	US$461/251
Costing building blocks					
Tanzania	2012	Total facility and unit costs Costs of intermediate outputs by level and provider ownership Costs of 56 conditions		Normative and actual	US$41/19
Indonesia 2	2011	Total facility and unit costs Costs of intermediate outputs by level and provider ownership		Actual	US$99/37

Studies in Timor-Leste, Indonesia, Kenya and Kazakhstan have focused on the cost of government specified essential package of services.[2-5] With the exception of Kazakhstan, these largely focused on communicable diseases, maternal, new-born and child health and family planning services. Content of packages necessarily reflect what was considered affordable at the time. The package of services in Kenya and Indonesia has since expanded to include a variety of non-communicable diseases driven by the need to attract members into developing health insurance schemes.

The Tanzania and second Indonesian study were broader approaches to costing focusing mainly on actual costs of service delivery and providing estimates of components of cost.[6-7] Cost components included cost per outpatient visit, cost per bed-day, cost per minute in an operating theatre and cost per x-ray. These can be used as the basis for developing payment tariffs as well as forecasting future resource requirements.

5. Issues arising

Costing studies tend to be static exercises: Actual costing studies are necessarily based on current configurations of service utilisation, facility numbers and size and treatment approaches. These can provide the building blocks for the future estimation of costs but require additional information to enable robust extrapolation (see section 3).

Service costings may perpetuate inefficiency: Studies of actual costs of services incorporate current practices – whether efficient or inefficient – into the estimates including, for example, excessive use of certain inputs (e.g. medicines), under-utilisation of equipment and ineffective treatment protocols. Projections of future costs will perpetuate these inefficiencies unless adjustments are undertaken. Several adjustment techniques are available.

a. **Efficiency modelling:** Statistical methodologies such as Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA) can be used to determine the most efficient service units (facilities, departments, areas) at different levels of activity and model the cost implications if all units converge to the most efficient (Figure 2). Adjustments are constrained by current practice in the best performing units which may not perform well compared to international benchmarks.

b) **Normative adjustments:** Unit costs can be adjusted by incorporating better practice into assumptions about the ways individual services are provided. Because the approach is based on a theoretical rather than empirical practice, there is no guarantee that methods can be implemented in practice. Weaknesses with each approach may mean that in practice a combination of methods is used.

Figure 2: Hospital DEA in Indonesia
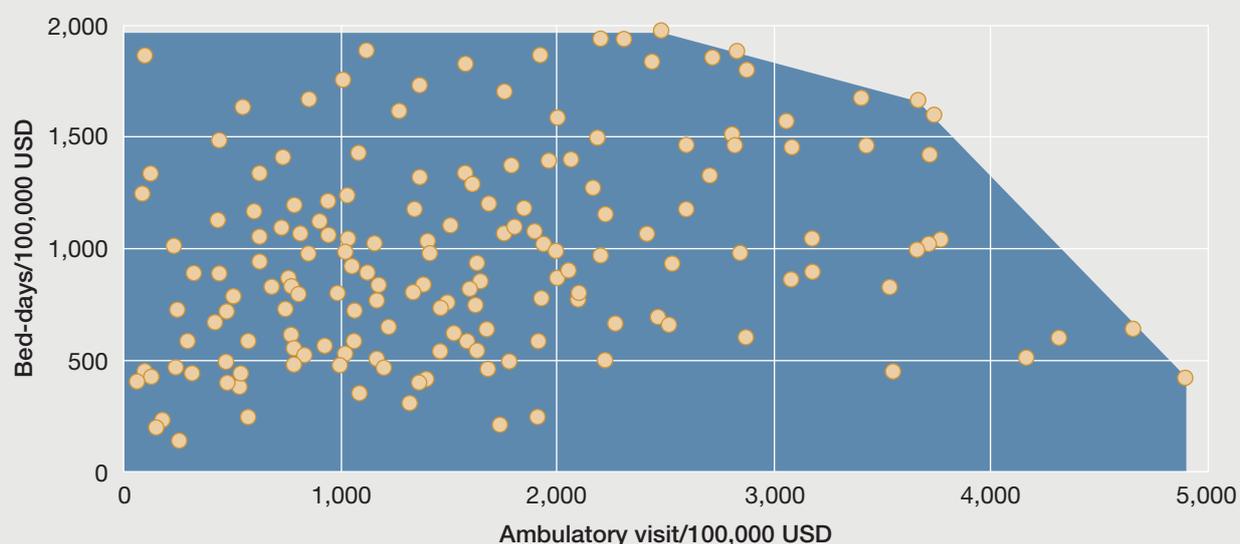
Note: Developed by Hafidz Firdaus from his PhD work and based on data collected from the Indonesia costing study. Hospitals that are technically inefficient operate at point in the interior of the frontier, while there are five hospitals are technically efficient on the frontier line.

Costs of essential services and UHC: One of the difficulties with UHC is that while the depth of coverage is easy is to specify (100% of the qualifying population of a country, based on residency, citizenship or other qualifications) the breadth of the package is not as well defined. While definitions of essential packages tend to be based on positive lists of services, universal coverage is usually defined more flexibly (access to general practitioners, specialist hospital services where necessary etc.) that permits a country to enlarge the scope of services are resources and technology becomes available. Costing of services needs to be similarly flexible. General extrapolations of costs based on aggregate expectations (e.g. numbers of primary care visits per capita, percentages accessing specialist care) benchmarked against countries that have established UHC may provide a more rapid and flexible guide to aggregate resource requirements than detailed costing of lengthy lists of services.

Costing for provider payments: Many low and middle income countries are following high income countries in establishing case-based systems of provider payment. Considerable costing detail is required to populate these and current systems are often based on relatively crude and inaccurate data. Where substantial investment is to be made in large scale costing exercises, it is often efficient to ensure that methodologies will generate information that can be used to drive these emerging systems.

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