

A methodological framework to derive the cost of the GP consultation

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Abstract. With an emphasis on a primary care-led NHS, the cost of a GP consultation will be a major element in any economic analysis. No standardized methodology is available for deriving this cost, and there are a wide range of estimates. Wherever possible, local unit costs should be derived from individual practice information, particularly when local circumstances are relevant to a study, but unless standardized methodology is used, studies undertaken in different settings or at different times will not be compatible. This paper proposes a framework which will enable each practice to determine their unit consultation costs and offers data that can be used where local information is not available.

Keywords. Consultation cost, GP.

Introduction

Against a background of increasing demands on limited resources, there is a need to relate costs of a medical intervention to its benefits to facilitate decision making. With the increasing focus on doctor–nurse skill mix and a shift in services from secondary to primary, the cost of a GP consultation will be a key element of any analysis.

How costs are derived and combined will depend on the assumptions that have been made in their derivation. It is important to be clear what assumptions have been made and why in order to maintain consistency across comparative studies and prevent inappropriate conclusions being drawn. In a review of the existing literature, Graham and McGregor¹ found a lack of standardized methodology and a wide range of GP consultation costs ranging from £3.00 to £11.00 for a 10 min consultation updated to 1995/1996 prices. Although national cost estimates are available,² wherever possible local unit costs should be derived from individual practice information, particularly when local circumstances are relevant to a study. However, it should always be borne in mind that costing studies themselves have resource implications and there will be an inevitable trade-off between accuracy of cost data and the resources needed to obtain such information.³

The aim of this paper is to offer a framework to allow individual practices to determine their own costs using local data where available and provides national data where it is not.

Some basic costing principles

Although there is no such thing as a gold standard cost estimate, there are a number of basic costing concepts that underlie any costing study.^{4,5} These principles help to maintain consistency and comparability across studies where uncertainty can arise from variability in sample data, generalizability and analytical methods employed. Here we highlight four important costing concepts that are relevant when costing a GP consultation.

- (i) **Perspective.** The viewpoint or *perspective* of a study will dictate which costs to count. The perspective of the individual patient, the GP practice, the purchasing authority, the NHS or society in general can all be considered, and different answers may be obtained for each approach. For example, in local cost studies, undergraduate and postgraduate training will not be an issue but when the policy or intervention under consideration has implications for the composition of the NHS workforce, an estimate of these investment costs will be relevant. Annuitying the cost of pre- and post-medical education across an expected career lifespan adds additional costs of £29 951 p.a.⁶ to the cost of a GP. Health economists generally advocate a comprehensive societal perspective measuring all costs regardless of who incurs them. Presenting data in a disaggregated form allows an analysis to be undertaken from

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different viewpoints, enabling the needs of key decision holders to be met.

- (ii) Opportunity cost. When resources are limited, someone's gain is somebody else's loss. When measuring costs in economic terms, the objective is to identify the *opportunity cost*, i.e. the value of the best alternative forgone in order to provide that service. Consider the cost of a GP increasing consultation time by an extra hour. The GP may work the same number of hours but reduce services provided in other areas, so the opportunity cost is the value of the services displaced. Alternatively, the working week may be extended, so the opportunity cost is that of the GP's leisure time. In practice, the most appropriate estimate of the cost will depend on the context of the evaluation and the perspective of the exercise.
- (iii) Marginal cost. Most decisions in health are not concerned with whether a service should be provided or not but whether to expand or contract an existing service. For this reason, health economists advocate the use of *marginal* costs rather than *average* costs. For example, the *average* cost of n consultations will be the total cost of GP services divided by n , and the *marginal* cost will be the cost of the $(N + 1)^{\text{th}}$ consultation. As most costs will have fixed and variable elements, in the short run, *marginal* costs will differ from *average* costs. In the long run, however, all resources are variable and, in practice, long-run marginal costs often approximate to average costs.
- (iv) Allowing for uncertainty—the role of sensitivity analysis. Given the problems associated with cost estimation, it is important to identify assumptions when reporting cost studies and wherever possible test the sensitivity of any conclusions drawn from the use of such data to any assumptions made across their range. Sensitivity analysis allows the outcome of an economic analysis to be tested over a range of situations likely to be found in practice to determine the robustness of analysis to potential changes in key variables.⁷ Ideally, any estimates that are used in the generation of the unit cost of a GP should include a likely range to enable a sensitivity analysis to be undertaken.

Methods

In order to estimate the cost of a consultation, it is necessary first to identify the value of resources consumed and then to allocate these resources to activities undertaken. In theory, all inputs should be valued in terms of their opportunity cost, i.e. their value in their next best use. The steps are as follows:

- (i) The principal components of primary care costs are identified and valued. These are GP's income,

practice expenses, capital costs and health authority overheads. Where relevant to a study, the undergraduate and postgraduate training costs of a GP must be considered.

- (ii) The annual cost of a GP then has to be allocated to different types of activity such as surgery consultations, telephone consultations and home visits, allowing for the fact that each type of activity will require non-patient contact time for case work and administration. This generates a cost per unit of patient contact time.

It could be argued that the cost of each consultation should reflect any additional payment elements that it may contain (e.g. a consultation that contains an item of service payment) in order to assess changes in resource allocation accurately. However, the degree to which intended average net income is achieved is monitored and, if activities change in such a way that the intended average gross income exceeds or fails to meet expenses adequately, then adjustments are made in following years. Separately identifying additional costs associated with any one type of activity would require an analysis that allowed for all other causes of variation in expenses.

- (iii) Finally, unit consultation costs can be obtained knowing the length of each activity.

To illustrate our approach, we work through a hypothetical exercise to derive the unit cost of a practice of five full-time doctors with an average list size of 1950 patients working 44 weeks a year, 40 h GMS work a week. In addition, 2 weeks study leave of 30 h each are taken. We have not considered the undergraduate and postgraduate training costs of a GP.

Derive the total cost of a GP

GP remuneration. As argued previously, variations in GP income reflect funding and not true local variations in the value of the GP input. As a general rule, therefore, the average net intended income can be used for GP remuneration. In this example, we use the 1997/1998 figure of £50 398. Using GMS income will result in double counting as this already contains an element which reflects anticipated practice expenses.

Practice expenses. Practice expenses can be taken directly from the practice accounts. The following points should be noted in order to ensure that expenditure and activity can be linked appropriately to reflect unit costs:

- (i) Ignore all reimbursements except those that reflect input by non-practice staff.
- (ii) Exclude expenditure on equipment (see below for allowing for such capital costs)
- (iii) Estimate the cost of practice staff including salaries, superannuation and national insurance. If consultation costs are to exclude practice

nurses, their costs should be removed in addition to an amount that reflects the administrative backup that they require.

- (iv) Whether locum activity is included will depend on the context of the study but, if locum activity is included, then all locum costs must be included in the expenses regardless of whether reimbursements were received.
- (v) To maintain consistency, do not include practice medical expenses such as dressings, drugs or dispensing. These should be added to the cost of the consultation if relevant to the study.

For the purpose of this example, these expenses are taken as £22 000 excluding practice nurse costs.

Central support overheads. If information about Health Authority overheads is not available locally, use national data. Excluding support of purchasing, these overheads are estimated as £3432. We also include the central support costs of ongoing training of £636 per year to give total indirect support costs of £4068⁸ per whole time equivalent GP.

Travel costs. Estimate car expenses actually incurred, including depreciation on each vehicle. These costs are excluded from surgery consultation costs and added to the cost of a home visit. In this example, £2500 is taken as travel expenses.

Capital costs. For *building costs*, the true marginal cost is the opportunity cost of having the capital value tied up in the building. Where we are concerned with an expanding service, this is the cost of a new building. In order to convert this to an equivalent annual cost that can be combined with revenue costs, we annuitize the capital value to reflect the return that could have been expected over the lifetime of the building (usually taken to be 60 years). In the UK, Treasury guidelines are that the expected rate of return on capital investments in the public sector should be 6%.⁹ Alternatively, cost rent or notional rent reimbursement can be used as a proxy for capital costs.

The percentage floor area occupied by attached community staff such as health visitors and physiotherapists should be estimated and this proportion removed from the premises capital cost element as this accommodation is included in cost rent calculations. For a consultation cost excluding the cost of the practice nurse, the percentage floor area occupied by the practice nurse should also be calculated and this amount removed. In this example, cost rent is £6075 and health authority staff and practice nurses each occupy 10% of surgery area. Building capital cost is therefore £4860

For *equipment costs*, the practice account estimate of depreciation will be adequate. This is calculated for tax purposes on the basis of a depreciation of 25% p.a.

However, if the use of equipment is a key element in a study, the equipment should, like the cost of buildings, be annuitized at 6% p.a. over the expected lifetime of the equipment. Cost of equipment is taken as £2000 p.a. in our example.

Out-of-hours costs. Increasingly, GPs are contracting out their out-of-hours activities. Where this is the case, expenditure on such contracts should be deducted from any estimate of the cost of GP activity. If a co-operative is used, exclude out-of-hours activity and deduct the costs of full cover from the annual cost of the GP. The cost of these contracted out or co-operative services can be estimated simply by dividing the total cost by the number of hours of activity delivered. The most appropriate measure of activity (actual patient contact or hours covered) will depend on the purpose of the costing exercise.

The above figures are then added to give the annual cost of a GP as £83 326, excluding travel costs which are added separately to the cost of a home visit.

Derive the amount of time worked each year

In our example, each GP works 109 200 min each year. Time spent on standby out of hours is excluded. This gives a cost of £0.76 per min of GMS activity.

Identify activity data

In order to identify the cost per minute spent in patient contacts, we need data about the average length of each type of consultation (surgery, clinic, telephone contact, home visit) and number each week.

In addition, there will be non-patient contact backup, i.e. administration time arising from each activity. We assume that all GMS time is allocated directly (patient contact) or indirectly (administrative backup) towards the different types of consultation. Table 1 shows the activity analysis needed. Although some consultation data will be recorded routinely, an additional study may be required to obtain activity data that are not readily available. If locum activity is a key issue (e.g. using locums to substitute for specific types of consultation), then more specific data should be collected. The home visits that are counted will depend on the approach taken to out-of-hours work as outlined above.

To simplify the data and analyses required, we assume that the amount of non-patient contact backup time is proportional to the amount of contact time for each activity. For example, if surgery consultation takes up 75% of patient contact time, then 75% of non-contact backup time is allocated to this activity. However, we must make sure that non-contact administrative time is not allocated to travel time and study leave. To do this, we identify that:

- (i) A total of 9900 min each year is spent travelling and 3600 min on study leave. The cost of this at

our basic per minute rate is $13\,500 \times \pounds 0.76 = \pounds 10\,260$.

- (ii) Deduct this amount from the annual cost of the GP to give $\pounds 73\,066$. This is the annual cost of direct patient contact and non-contact backup.

The cost of each consultation minute is estimated as the annual cost of direct patient contact and non-contact backup divided by the number of minutes spent on these activities, i.e. $\pounds 73\,066/79\,200$.

Our approach assumes that each type of activity results in similar amounts of non-contact backup time. The resulting estimate, $\pounds 0.92$ per consultation minute, includes non-contact backup time.

Estimate consultation unit costs

Given the unit cost per minute of patient contact and with information about the length of each activity enables us to calculate unit costs per activity. Thus, in this example, from Table 1, surgery, phone and clinic contacts cost $\pounds 9.21$, $\pounds 4.61$ and $\pounds 18.44$, respectively. A home visit is made up of three elements. The cost of the consultation itself ($15 \times \pounds 0.92$), the costs of the GP travelling ($15 \times \pounds 0.76$) and the travel costs [$\pounds 2500/(15 \times 44)$] = $\pounds 29.06$ per visit.

To these costs should be added the costs of prescriptions or other medical expenses relevant to the type of consultation being studied.

Discussion

The cost of a GP contact will be an important part of any costing exercise. Costs based on local evaluations should be used wherever possible. Deriving costs from first

TABLE 1 A theoretical practice activity profile per whole time equivalent GP working 44 weeks per annum plus 2 weeks study leave

Activity	Length (min)	No. per week	Time per week (min)	Time per annum (min)
Surgery	10	140	1400	61 600
Phone	5	15	75	3300
Clinic	20	5	100	4400
Home visit consultation	15	15	225	9900
Travel time	15	15	225	9900
Study leave				3600

principles will avoid many traps such as double counting and accommodate the changing way in which primary care is delivered and remunerated. The context of a study will dictate the correct approach and which costs to count. There remain difficulties in costing out-of-hours work due to the wide variation in approach to the delivery of services in this area.

The problems inherent in any costing exercise, the relevance of a defined perspective and the importance of being clear about what elements contribute towards a unit cost are clearly demonstrated in this study. Costing methodology continues to be refined but, as the opportunity cost depends on the context and perspective of a study, there are no gold standards for cost estimates.

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