

Editorial

Adapting and adjusting unit cost information

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Introduction

This is the thirteenth volume in a series that draws together information about unit costs for a wide variety of health and social care services. In each successive year the aim is to improve the quality and expand the range of cost information provided, building on previous data and drawing on new sources. To some extent this process is opportunistic, but it also reflects developing services and demand for information.

A key principle when estimating costs is that unit costs should accurately reflect resource implications of the unit of activity or process that is being measured in the context and for the purpose of the exercise. This means that no one estimate fits all purposes and circumstances. The information in this volume is presented in as detailed and transparent a format as possible to allow users to adapt the estimated costs to suit local or specific circumstances, or draw on particular pieces of information to provide assumptions when appropriate data are not easily available.

This editorial starts by describing new developments and new services that have been included in this volume. We then discuss adapting the information presented to reflect different circumstances or services.

New additions, changes and articles

Salaries and staffing

In last year's volume, we used information from the Employer Organisation's annual national Social Services Workforce Survey to estimate social worker salaries and to derive a social work wage specific inflator for those workers (such as team leaders and assistants)

¹ We are very grateful to Jennifer Beecham both for her ideas about the topic and for her comments on an earlier draft of this editorial.

where specific information was not available from the survey. Although mean estimates provided by the Social Services Workforce Survey last year were in line with previous estimates, wide definitions of staff type meant there were large variations around these means. This year these definitions have improved and also additional information for social work team leaders has been provided. In order to provide information on social worker assistants and home care workers, PSSRU have also carried out a survey and have added information collected on social workers, social work team leaders and occupational therapists to the notes of the relevant schema for comparison. Social worker (adult) salaries have increased this year by 7.7 per cent using the Social Services Workforce Survey but only by 2.1 per cent using the PSSRU survey. However social worker (child) salaries showed a normal increase using the Social Services Workforce Survey of 3.2 per cent. Salaries for social work team leaders and assistants show a smaller increase of less than 1 per cent owing to the fact that last year they were inflated from the previous year. Further work will be done next year to examine this pattern.

Adult mental health services

Underpinning many of the recent government initiatives in health and health care is the need for information and until recently information on what mental health services currently look like and the extent to which they are meeting central and local policy requirements has been thin on the ground. The Mental Health Service Mapping programme was developed to address this information need and Service Mapping data has been collected from NSF Local Implementation Teams (LIT) since 2002. The standardised format allows local data describing the content and scale of mental health services to be brought together to provide a national picture of provision (Beecham et al., 2002). This year three new schema have been created using these data: Crisis Resolution (page 151), Assertive Outreach (page 152) and Early Intervention (page 153). These services aim to treat adults in their own environments often avoiding the need for admission to hospital.

Children's mental health services

Similarly Child and Adolescent Mental Health Mapping (CAMHS) was developed for the Department of Health to contribute to the monitoring of the expansion and development of mental health service provision for children and adolescents. It was set up in 2002 and has become an annual exercise for the collection of data on specialist CAMH Tier 2 to 4 services (Health Advisory Service, 1995). This year we have been able to update mental health team member unit costs (pages 154 and 155) using these data. Next year, we will be including information on dedicated, generic, targeted and specialist child and adolescent mental health teams.

Children's services

The article on page 23 provides costs for a range of typical Sure Start Local Programme services. Sure Start is a government initiative designed to provide early intervention services to children aged 0 to 4 years and their parents, living in areas of high deprivation. Funding for Sure Start Local Programmes is drawn directly from central government. Providers of Local Sure Start Programmes consist of lead agencies and accountable bodies, and frequently but not necessarily the relevant Local Authority, Primary Care Trust or voluntary sector agency such as NCH. Recent moves to develop Sure Start Local Programmes into Children's Centres, and to redirect funds for these early interventions through Local Authorities have heightened the need for an indication of the costs of delivering services.

The costs are produced from data gathered from seven Sure Start Local Programmes between 2002 and 2004.

Home care

Home care services play a key role in maintaining older people in their own homes. Work conducted during the past year as part of our Costs, Quality and Outcomes research programme has focused on collecting and drawing together information on the costs, prices and quality of home care services together with provider and home care workforce characteristics. As part of this work 29 mostly independent home care services have completed the cost calculator developed for the UK Home Care Association (UKHCA) and we report on the results of this on pages 9-12. We hope to draw on ongoing analyses of the data collected on home care in future volumes.

Intermediate care

The continued emphasis on intermediate care services has led to an increasing number being established throughout the country. In this volume we have been able to draw on an innovative recuperative care service for older people that provides intermediate care in an extra care housing setting. The service provides a stepping stone between hospital and home, or between residential care and living independently in the community.

Pay and price deflators

We discuss below the use of deflators to reflect the changing costs of inputs. This year there have been important changes to both the Personal Social Services (PSS) and Hospital and Community Health Services (HCHS) pay deflators. The article on pages 17-21 provides information on the PSS indices and the revised methodology for its calculation using the Annual Survey of Hours and Earnings (ASHE). Although the Department of Health has been producing a Personal Social Services (PSS) Pay and Prices Index for many years, in the past only one index has been produced to uprate all services. This year, for different purposes, different parts of the PSS sector have been included and four indices have been produced. These cover both full sector and independent provision for all clients (adults and children) and also for adults only and also more specifically the Local Authority sector for all clients (adults and children) and for adults only. This has enabled us to be more specific when choosing a deflator and therefore improve further on the accuracy of our estimates.

In the past PSSRU has estimated the HCHS pay index based on NHS pay awards. This year the Department of Health have calculated an average weighted index based on a wider group of staff working for the NHS (including administrative and ancillary staff). As these data provide a more accurate reflection of rises in NHS salaries over the years, they have been applied to previous years' data often resulting in significant increases.

Adapting and adjusting unit cost information

Unit cost information is used for a wide variety of purposes including:

- policy evaluation
- planning
- service or practice evaluation
- economic evaluation

The timing, purpose and the context will influence the cost estimate and thus the degree to which information in this series of volumes needs to be adapted. Wherever possible, of course, it is best to start with data directly related to the activity being costed, but this is not always possible, which is why the information presented in these volumes provides a valuable resource.

In some situations adapting the data presented here will be a simple substitution. For example, for professionals we present the assumed salary costs and these can be replaced by the actual salary costs where these are known. In other situations, the information will not be known directly – it is just clear that some adaptation needs to be made, as the assumptions presented here are not appropriate.

There are a wide variety of circumstances in which it would be necessary and/or desirable to adjust estimates of unit costs presented here. Here we discuss three:

- changing prices of inputs over time
- different assumptions about the opportunity costs of capital
- changed patterns of activity of professionals.

Changing prices of inputs

In any costing exercise it is important to reflect the price base of the year(s) in question. The aim in each of these successive volumes is to improve the quality of the cost estimates. This means that information is not directly comparable over time. While in some instances it may be appropriate to use unit costs from previous volumes it is always advisable to check the assumptions used then and in more recent volumes in case important changes have been made. The assumptions and data that underpin any of our unit cost estimates can be found on the right hand column of each schema with further information about sources presented in introductory paragraphs. Where the information is based on a piece of research and no assumptions have been changed over time it is best to use the costs identified at the time of the research and uprate or deflate them to the appropriate year. Clearly where there have been changes it is best to use costs based on the assumptions that most closely reflect the circumstances of the particular exercise before uprating or deflating these.

We provide a variety of deflators (see pages 189-190) to reflect the different resources used:

- Capital (Building Cost Information Service) The House Rebuilding Cost Index is intended to update the house rebuilding cost figures prepared by BCIS between annual revisions;
- Tender Price Index for Public Sector Building (non housing) (PUBSEC) is used to update capital costs in social care;
- General prices (RPI);
- Hospital and Community Health Services (HCHS) pay and prices, separately and combined;
- Personal Social Services (PSS) pay and prices, separately and combined.

As with the cost estimates we provide the best estimates in any given year so these are not always consistent from volume to volume. The most recent volume will show the best estimates using complete data for previous years but the values for the current year are usually temporary estimates.

It is clearly important to use the most appropriate deflator. In some instances, for example health service professionals, it will be sufficient to apply a single index to the overall unit

cost of interest. In other instances it is more appropriate to deflate the different cost elements separately. When we are updating the costs for these volumes we use this latter approach as far as possible.

An example of a schema which uses a variety of inflators on different items of cost is found on page 83, schema 5.3 Special needs flats for disabled people. The 2002 volume showed the results of work based on expenditure and activity for 2001/02, but since then we have used appropriate inflators to uprate the different element of the costs to present day values. For capital, we have used the house rebuilding index provided by the Building Cost Information Service/Association of British Insurers (BCIS/ABI) and inflated the original cost by three years to give a cost estimate for 2005. Similarly revenue expenditure including household expenses, premises, provisions and so on, have been inflated using the PSS prices index. Salary costs have been inflated using the PSS Pay Index and personal living expenses which are based on the Family Expenditure Survey for 2001/2002 have been inflated using the Retail Price Index. This index uses the price changes in a 'basket' of goods which reflects the average household use of different goods and services. Finally external services have been inflated using either the PSS or the HCHS inflator to reflect the type of professionals involved.

Opportunity costs of capital

In order to allow for the opportunity cost of buildings and equipment tied up in the production of services we have to make assumptions about both the length of time that the investment will be tied up in the service and the rate of return on that investment. For the most part these are both unknowns so it is helpful to have conventions to ensure comparability of cost estimates. It is important, however, to test the sensitivity of conclusions drawn on the assumptions made, particularly when there is a shift or difference in the assumptions made in different time periods or different circumstances.

In the 2003 volume there was a major shift in assumptions about the rate of return on changes in guidance from the Treasury (Netten, 2003). Prior to that date the convention was to assume a discount rate of 6 per cent, which was the rate set by HM Treasury for public sector services. However, in the international literature, discount rates were always lower than the rate set by the Treasury and guidance suggested using 3 per cent and 5 per cent to perform sensitivity analysis because of the large number of cost effectiveness studies using this rate. In the UK, the different factors comprising the discount rate were 'unbundled' in the 'Green Book' (HM Treasury, 2003). On the basis of this analysis Treasury advice is now to use 3.5 per cent for most purposes.

In the 2003 and 2004 volume we included information about the cost of capital using both the 3.5 and 6 per cent discount rates. In this volume we no longer do so but the information is straightforward to adapt.

Table 1 shows the equivalent annual cost of £1 using the various discount rates identified above for discounting equipment, vehicles and buildings 5, 10 and 60 years. If we needed to make estimates on the basis of the 6 per cent discount rate used in previous volumes, we divide the annuitised value by the multiplier used to reflect the 3.5 per cent discount rate (.0401 for buildings) and multiply the result by the multiplier used to reflect the 6 per cent discount rate (.0619 for buildings). Thus the estimated weekly capital cost of a council run care home for older people (page 34) using a 6 per cent discount rate would be:

$$\begin{aligned} \text{EAC}_{6\%} &= (\text{EAC}_{3.5\%}/.0401).0619 \\ &= (£47/.0401).0619 \\ &= £73 \end{aligned}$$

Table 1 Equivalent annual cost of £1

Number of years	3.5 per cent	5 per cent	6 per cent	8 per cent
5	.2215	.2310	.2374	.2505
10	.1202	.1295	.1359	.1490
15	.0868	.0963	.1030	.1168
60	.0401	.0528	.0619	.0808

Patterns of activity

Many health and social care services are delivered through face to face contact with health and social care staff. In order to incorporate the implications of time spent on other activities into an estimated unit cost of face to face contact or home visit, a multiplier is applied to the basic unit cost per hour (this basic unit cost just reflects total costs divided by number of hours worked). Data needs to be collected (or assumptions made) about activities to estimate this multiplier. For most services the critical elements of activity relate to time spent on face to face contact, other direct client/patient related work and indirect activities (such as meetings and so on). When home visits are part of the service travel time is also important.

How time is used can have a profound effect on unit costs so it is important to reflect these patterns of activity as accurately as possible. This is an area where it is difficult to get up-to-date nationally representative data. In these volumes, for community-based nurses we have continued to use information based on a survey conducted by Dunnell and Dobbs (1982) as no subsequent study has provided sufficient data. Small-scale exercises in the past have suggested that although the specific activities undertaken may be different the distribution in terms of broad categories was sufficiently similar to warrant continuing to use this source (Netten, 2002).

The dated nature of the sources used here suggests that wherever possible information specific to the costing exercise should be used to reflect patterns of activity. A recent study collected detailed information on 34 district nurses working in five teams (County Durham and Tees Valley Strategic Health Authority 2005). The data covered 163 working days, of which 14 were weekend days. It also included nine days on which nurses were paid but not 'on the patch' – training days, sickness and so on. In the diary week, the nurses delivered 1400 home visits. On average on every 'ordinary' working day the nurses carried out more than nine home visits. The average duration of each visit was about 25 minutes, plus five minutes travel time. Sixty five per cent of nurses time was spent on visits and travel and a further 13 per cent on tasks that directly pertained to individual patients. The remaining 22 per cent was not directly related to individual patients. Table 2 summarises the time distribution data from this study in terms of the proportion of time spent on patient and non-patient related activities and home visits.

Netten and Beecham (1999) describe in more detail the basis for estimating unit costs including deriving the multipliers from activity information for different types of unit costs. Here we briefly summarise the approach using the data from the Durham and Tees study to demonstrate how the unit cost information presented in this volume can be adapted to reflect specific services or circumstances.

In order to get a multiplier to use on the basic hourly cost to reflect the cost of patient-related time we divide total hours (100 per cent) by the percentage of patient related hours. Using the data from table 2:

Durham and Tees $100/67 = 1.49$
National $100/48 = 2.08$

In order to calculate the cost of a home visit we need to ensure that we do not allocate time spent on other patients who do not receive home visits. For this purpose our multiplier is:

$((\text{percentage of home visits}/\text{total patient related time}) * \text{percentage non patient related time}) + \text{percentage home visits} / \text{home visits}$

National $= (((0.38/0.48) * 0.28) + 0.24 + 0.38) / 0.38 = 2.21$

Using the Durham and Tees study, as the nurses in the sample *only* treated patients that received home visits and did not undertake other activities for patients such as running clinics, in this case the multiplier is simpler :

Durham and Tees $= 100/54 = 1.85$

So the cost per hour of district nurse time spent in a patient's homes is 1.85 x basic hourly rate for the local study and 2.21 x basic hourly rate using national dated data. Using our estimated basic hourly cost of a district nurse (see schema 9.1), table 2 compares the resulting unit costs.

Table 2

	Non patient related	Total patient related ¹	Home visits	Travel	Cost per hour of patient related activities	Cost per hour home visit	Cost per visit
Durham and Tees	22%	67%	54%	11%	£40	£50	£17
National	28%	48%	38%	24%	£56	£60	£20

¹ Excluding travel

The cost per hour of patient related activities using the local information is 29 per cent lower than it is when the national data are used. The costs of a home visit and per visit are also lower (17 per cent and 15 per cent respectively).

This demonstrates that caution should be exercised as professionals' use of time can vary according to a change in patterns of activity more generally or particular circumstances in the local area. Whatever the reason, for users of this volume it is clearly important to adapt information whenever possible to reflect actual patterns of activity.

Conclusion

The aim of these volumes is to draw together data from a wide variety of sources and to update them as far as possible to reflect current unit costs. The presentation is designed to allow users to adapt the information to reflect the circumstances in which they are using the data. We have presented three such examples here but we would be very interested to hear

of information sources that have been drawn on and approaches made to adapting our cost estimates so we can pass these on to other users.

References

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