

Editorial

New developments and changes in guidance on the discount rate

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Introduction

This series of volumes draws together information about unit costs of a wide, and growing, variety of health and social care services. The information is presented in as detailed and transparent a format as possible in order that users can adapt the estimated costs to suit local or specific circumstances, or draw on particular pieces of information to provide helpful assumptions when appropriate data are not easily available.

An important exercise when drawing on data or making assumptions based on other sources where direct information is not available is to test the sensitivity of results of any cost evaluation to changes in assumptions. One important assumption that has to be made with respect to capital costs is the level of the expected rate of return on that capital, usually taken as the discount rate. Guidance on this and on capital charging generally has changed recently, with implications for the estimated costs in this volume.

This editorial starts by briefly describing distinctive aspects of this volume before turning to the basis for changes in guidance about the discount rate and implications for our estimated unit costs.

New additions, changes and articles

Intermediate care

As part of the new emphasis on intermediate care a number of Rapid Response teams across the country are aiming to reduce the number of people who have to be admitted to hospital for treatment, freeing up hospital beds and so reducing waiting times for acute care. In this volume, we have been able to draw on information kindly provided by Sue Baldwin, Head of the Rapid Response Team to provide a detailed costing of the Rapid Response Service for Shepway which is operated in the Royal Victoria Hospital in Folkestone. A short article (pages 19-21) provides the service description and objectives of the service and discusses the assumptions made to arrive at the costs estimated in schema 7.6.

In another article (pages 15-18) Anita Patel and colleague evaluate the costs and influence of between-scheme variations on the estimation of unit costs for three services that have evolved within Lambeth, Southwark & Lewisham in south London. Each provides a combination of two types of support: supported discharge (rehabilitative support for patients discharged from local hospitals after disabling acute illness, injury and surgery) and rapid response (taking referrals directly from Accident and Emergency departments or occasionally from home in order to avoid an acute hospital admission). The study highlighted substantial differences between the three schemes, many of which were dependent on the historical context of their evolution.

Pharmacist

Unit costs of a community and hospital pharmacist have been introduced this year (see schemas 8.6 and 12.6 on pages 108 and 152), drawing on information from a variety of sources including a recently completed census carried out by the Royal Pharmaceutical Society of Great Britain. This is the first research-based census of pharmacists on the register of the Royal Pharmaceutical Society of Great Britain and will be significant in analysing industry trends and informing future planning.

For the purpose of producing unit costs, the PSSRU commissioned data from the census on the number of pharmacists working within each age band. This has enabled us to estimate the length and distribution of the expected working life of a pharmacist in order to annuitise the investment costs of training following the approach adopted for other health care professionals in the Ready Reckoner project (Netten and Knight, 1999; Netten et al.1998).

Training costs

Since 1999 we have incorporated information from the Ready Reckoner study about the investment costs of training for most health service professionals as one element of the unit cost estimation process. Each year we have updated the information presented in the original report reflecting current spending and specific inflators where necessary. In this volume we include a table showing the initial investment costs of training and the annuitised values that reflect expected working life distributions, using both 6 per cent and 3.5 per cent as the discount rate (see page 99).

Reference costs

In previous years we have drawn on the TFR2 returns on overall levels of expenditure and activity from Trusts as a basis for estimating hospital costs. As Andrew Street describes in his article (pages 23-24), these returns have been superseded by the Reference Cost return which is mandatory for all providers of NHS services. Andrew describes the basis for the estimates which we now draw on for our estimate of inpatient and outpatient costs in schema 7.1 (page 95) and discusses variations in these costs and where caution should be exercised in the use of Reference Costs generally.

Where Reference Costs are available for services for which we have bottom up estimates, we have included this information in the relevant schema (see for example schema 8.1, page 103).

Technology dependent children

Medical advances and government policies emphasising the importance of care at home have led to the emergence of a group of children with continuing medical and nursing needs living in the community. Some of these children remain dependent on the medical technology that enabled them to survive.

Although many of the service and family costs arising from the home care of technology dependent children are similar to those already identified in research on families with severely disabled children, there are a number of areas in which technology dependent children incur even more additional expenditure. Extra expenditure, over and above that needed by severely disabled children, is likely to arise in the purchase and installation of special medical equipment for use at home; regular 'consumable' nursing supplies associated with special equipment; domiciliary specialist nursing services and home support services; and for parents, costs arising from the provision of hospital-level care in their homes, such as mobile phones/pagers, extra electricity to run machinery and refreshments for home care workers.

Schemata 6.5.1 to 6.5.3 draw on three exemplar case studies to illustrate the wide range of medical, nursing and other needs of technology dependent children.

Discount rates

In order to estimate the equivalent annual opportunity cost of capital we need to have an estimated rate of interest that represents the return we could have had, had that capital not been tied up in the production of the service. This rate of interest is usually set at the same level as the discount rate.

The discount rate is intended to reflect the fact that expenditure or benefits in the future are worth less to us than if they were incurred now. It is used to estimate the present value of a stream of expenditure and benefits for a number of purposes including appraisals of proposals for public expenditure and cost-effectiveness evaluations.

Until recently HM Treasury set the public sector discount rate at 6 per cent for public services in the UK. Treasury guidance was that a higher rate of interest (8 per cent) should be applied if the service being evaluated was “near market” in that it was also provided through the private sector. Many social care services fall into this category so in these volumes discount rates of both 6 and 8 per cent have been used depending on the nature of the service.

In the international literature discount rates have always been lower than the rate set by the Treasury. The convention has been to use 5 per cent (Drummond et al, 1997), although in 1996 Gold and colleagues estimated that 3 per cent would be most appropriate discount rate for economic evaluations as it reflects the real rate of return on US long-term government bonds (Gold et al, 1996). Guidance now tends to suggest using 3 per cent but to perform sensitivity analysis using 5 per cent because of the large number of cost effectiveness studies using this rate (Jamison, 2002).

In the UK the different factors comprising the discount rate have been “unbundled” in the current edition of the “Green Book” (HM Treasury 2003). The Social Time Preference Rate (STPR) is defined as the value society attaches to present as opposed to future consumption. This has two components:

- the rate at which individuals discount future consumption compared with present consumption on the assumption of no change in levels of income; and
- the effect of increased income over time. As income increases we value incremental rises less (at the extreme a millionaire does not value an additional £10 as much as someone on income support). We need to allow for the fact that GDP and overall wealth are expected to increase in the future.

The rate at which individuals discount future consumption includes the risk of a catastrophic occurrence (so the expected returns do not occur) and pure time preference. This is estimated as 1.5 per cent. The effect of increased income over time is estimated as 2 per cent so HM Treasury guidance is that the discount rate is now set at 3.5 per cent (HM Treasury, 2003).

Table 1 shows the equivalent annual cost of £1 using the various discount rates identified above for the most frequently used periods for discounting equipment, vehicles and buildings 5, 10 and 60 years. From this we can see that in order to estimate the equivalent annual cost of a building we now multiply the capital value by .0401 rather than .0619 (6 per cent discount rate) or .0808 (8 per cent discount rate). As most sources of information only provide tables of EAC by whole percentage points, appendix A on page 13 shows the EAC for £1 for 3.5 per cent up to 100 years.

It could be argued that when annuitising over 60 years we also ought to use the lower discount rate recommended for the longer term: between 31 and 75 years the Treasury recommends the rate

drops to 3 per cent. Under the assumption of declining rates of return the multiplier for capital over 60 years becomes 0.378.

Table 1 Equivalent annual cost of £1

Discount rate	Number of years		
	5	10	60
1.5	.2091	.1084	.0254
3	.2184	.1172	.0361
3.5	.2215	.1202	.0401
5	.2310	.1295	.0528
6	.2374	.1359	.0619
8	.2505	.1490	.0808

The discussion about the impact of this change in the discount rate has focused on the increase in the estimated present value of future costs and benefits in public sector option appraisals. This should encourage a longer-term approach to appraisal and evaluation. The main impact will be that private finance initiative construction schemes will be less likely to be value for money compared with publicly funded alternatives (Department of Health, 2003).

For the purposes of this volume we are now using 3.5 per cent as the minimum rate of return that the Treasury recommend should be used for valuing the cost of capital. Rather than recommending a specific rate for near market services, the Treasury will be producing further guidance on different factors that should be taken into consideration and ways of doing this for capital fees and charges. We will draw on this guidance for future volumes, but as the rate should depend on the purpose of the costing exercise it is most appropriate that we provide estimates based on this minimum rate together with information so users of this volume can adapt estimates for specific circumstances and test the sensitivity of their conclusions to changes in assumptions.

The reduced discount rate represents a substantial change in our previous assumptions about the cost of capital. In each schema we include information about the capital cost under our previous assumptions. Below we discuss the impact that on our estimates of both capital and the unit costs of services.

Impact of changes

Capital investments include physical capital in the form of care facilities, offices, treatment areas, equipment and adaptations to premises, and human capital in the form of investment in training and qualifying professional staff. Tables 2 and 3 show the impact of the changed discount rate on capital and unit costs for a few examples.

In terms of physical capital the impact, as we would expect, depends on how capital intensive the service is, whether the previous discount rate was 6 or 8 per cent, and the length of the period over which the capital is annuitised. Buildings are annuitised over 60 years. One of the most capital intensive services in terms of the building is sheltered housing for older people. Table 2 shows that the unit cost of the accommodation element (building and management support) of local authority sheltered housing drops by 43 per cent; once the costs of associated care are taken into account the difference is 37 per cent. By comparison, the establishment costs of care homes managed by local authorities are 8 per cent less than they would have been using the 8 per cent discount rate. At the other end of the spectrum, a rehabilitation service previously used a 6 per cent discount rate and was much less capital intensive so the overall effect on the unit cost was less

than 2 per cent. The reduction in the office costs of social workers results in a 5 per cent reduction in the overall unit cost.

When capital is annuitised over shorter periods of time the impact of the changed discount rate is reduced. The capital cost of equipment and adaptations are annuitised over different periods of time depending on the expected life of the equipment or use of the adaptation. Wheelchairs, which we annuitise over five years, have a 7 per cent lower capital value when discounted at 3.5 compared with 6 per cent; when other costs are included the unit cost difference is 5 per cent. Equipment and adaptations annuitised over 10 years are valued at 11-12 per cent less when the 3.5 per cent rate is used compared with 6 per cent.

Table 2 Effect of changed discount rates on capital and unit costs of selected services

	Capital at previous discount rate	Capital at 3.5%	Unit Cost at previous discount rate	Unit Cost using 3.5% discount rate
Local authority sheltered housing for older people	£148 (8%)	£74	£173 per week accommodation £199 per week accommodation and care	£98 per week accommodation £125 per week accommodation and care
Local authority residential care for older people	£85 (8%)	£42	£612 establishment costs	£560 establishment costs
Voluntary sector residential rehabilitation for people who misuse drugs/alcohol.	£26 (6%)	£17	£673 per resident week	£663 per resident week
Social worker	£2,465 (6%)	£1,598	£20 per hour	£19 per hour
NHS powered wheelchairs	£271 (6%)	£253	£363	£345
Adaptations				
Additional heating	£41	£36	N/a	N/a
Electrical modifications	£53 (6%)	£47		

The change in the rate of interest assumed means that the costs of human capital investment have reduced by about 30 per cent for all health service professionals for whom we have information. The size of the investment means that the impact on the unit cost tends to be more marked than the impact of the change in the value of the physical capital costs associated with most health service professionals. The net effect of the cost of a unit of activity by a GP is a drop of 8 per cent when both physical and human capital costs are taken into account. For a hospital based physiotherapist the difference is about 11 per cent. The estimated unit costs of a hospital based nurse, assumed not to have any post registration qualifications, is about 4 per cent less, whereas the difference for a district nurse, with a community nursing degree, is over 7 per cent.

Table 3 Effect of changed discount rates on human and physical capital and unit costs of selected services

	Capital/ qualifications At 6%	Capital/ qualifications At 3.5%	Unit cost At 6%	Unit Cost At 3.5%
General Practitioner	Premises £9,666 Qualifications £34,447	Premises £6,249 Qualifications £23,258	Per hour of GMS activities £87 (£70 excluding qualifications)	Per hour of GMS activities £80 (£68 excluding qualifications)
Nurse Manager, Day Ward	Capital £2,781 Qualifications £5,403	Capital £1,802 Qualifications £3,851	£24 per hour (£21 excluding qualifications)	£23 per hour (£20 excluding qualifications)
Hospital physiotherapist	Capital £5,468 Qualifications £5,280	Capital £3,422 Qualifications £3,796	£28 per hour (£24 excluding qualifications)	£25 per hour (£23 excluding qualifications)
District Nurse	Capital £2,643 Qualifications £7,000	Capital £1,713 Qualifications £5,027	£27 per hour (£23 excluding qualifications)	£25 per hour (£22 excluding qualifications)

Conclusion

As in previous volumes we have extended the range of and aimed to improve the basis for the cost estimates presented. The most far-reaching change has been the change in the discount rate used to estimate the equivalent annual cost of capital investments.

In some instances conclusions drawn in terms of cost-effectiveness of services or the policy implications of different investments can be very sensitive to the value of unit costs. It is always sensible to conduct sensitivity analyses to allow the implications of these changes to be explored. The change in guidance from the Treasury and the change in the base case assumption in this volume about the valuation of capital have important implications for the values presented here. The estimates based on previous assumptions about the discount rate are included in each schema to allow users of this volume to adjust the costs to reflect the circumstances of the particular investigation.

Appendix A

Equivalent annual cost (EAC) at 3.5 per cent discount rate

Year	EAC	Year	EAC
1	1.0350	21	0.0680
2	0.5264	22	0.0659
3	0.3569	23	0.0640
4	0.2723	24	0.0623
5	0.2215	25	0.0607
6	0.1877	26	0.0592
7	0.1635	27	0.0579
8	0.1455	28	0.0566
9	0.1314	29	0.0554
10	0.1202	30	0.0544
11	0.1111		
12	0.1035	40	0.0468
13	0.0971	50	0.0426
14	0.0916	60	0.0401
15	0.0868	70	0.0385
16	0.0827	80	0.0374
17	0.0790	90	0.0367
18	0.0758	100	0.0362
19	0.0729		

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