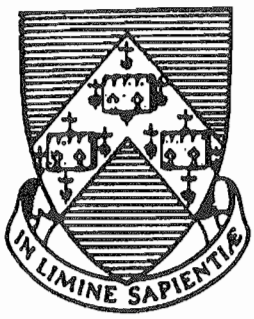

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Counting the Costs of Community Care

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AUGUST 1988

University of York

Centre for Health Economics

DHSS Health Economics Research Programme

Counting the Costs of Community Care:

A practical introduction to the economic costing of community services for people with a mental handicap.

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Acknowledgements

The authors would like to acknowledge the financial assistance and encouragement received from the Department of Health and Social Security. Credit is also due to Andy Alaszewski, Linda Davies, Cam Donaldson, Howard Glennerster, Alan Maynard, Hazel Qureshi and Norma Raynes for their comments on earlier drafts of this paper. All of the usual disclaimers apply.

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The Centre for Health Economics is a Designated Research Centre of the Economics and Social Research Council and the Department of Health and Social Security.

Abstract

The expansion of community residential facilities for people with a mental handicap requires a significant investment of society's scarce resources. If the resources are to be used efficiently it is essential that an evaluation of the relative costs and effects of alternative methods of service delivery is undertaken.

The paper describes a method of estimating the economic or resource costs of proposed developments in community provision which can be used as a basis for a broader evaluation of their efficiency. It should provide practical guidance to the professional members of planning teams and to other managers and administrators more generally concerned with quality assurance.

CONTENTS PAGE

I Introduction

The expansion of community residential facilities for mentally handicapped people, either to increase the current level of local provision or to replace hospital-based care, requires a significant investment of society's scarce resources. This investment is intended to improve the welfare of people with a mental handicap but it is apparent that other client groups also have legitimate and competing demands for the same resources. Faced with the responsibility of reconciling these demands, statutory authorities must ensure that resources are used in the best possible way. The efficient use of resources means obtaining maximum beneficial impact on client welfare for a given cost, and a full evaluation of alternative approaches to residential care has to be undertaken if this is to be achieved.

The evaluation of efficiency requires an assessment of both the costs and the outcomes associated with different methods of service delivery. As the Audit Commission have stated:-

> "There can be no single answer to the question: How much should community care cost? There are a number of different variables which must be taken into account including: quality of life, risk, choice, level of dependency and model of care chosen". (Audit Commission, 1986)

To complete the picture the Commission might also have added that in all cases where a difficult decision has to be made there will be a trade-off between cost and one or more of these variables. Indeed, decision-making would be easy if the best quality schemes were also the least expensive. In general, alternative methods of delivering a particular service will satisfy the objectives of policy in varying degrees and with differing resource consequences. The task facing service planners and

managers is to use information on the costs and effects of alternative courses of action so that decision-making may proceed in a rational manner.

Economic Appraisal

The relative merits of the alternatives open to managers may be assessed most systematically in the framework of an economic or option appraisal (DHSS 1987). An essential first step in this process is to specify the **objectives** of policy. These should be defined in terms of the personal needs of the clients rather than the provision of facilities i.e. in terms of ends not means. The full range of options available to meet these needs may then be investigated.

One option which is always available is to do nothing i.e. to continue with the current level of provision. This provides a baseline from which the changes in resource use and effectiveness implied by proposals to improve service delivery may be evaluated. As both the baseline and any changes generated by the options will differ from authority to authority the precise nature of each appraisal is impossible to predict, although the principles outlined in this paper are generally applicable.

The technique of economic appraisal has a dual role. It serves both to clarify issues by discussing objectives and options and helps to identify those solutions which make the most cost-effective use of resources. This paper concentrates on the latter of these functions but the importance of the former, an exercise in managerial creativity and inventiveness, should not be underestimated.

Costing residential services

Cost and quality of care represent opposite sides of the same coin and it is essential to consider both when evaluating the efficiency of policy options. In this paper we concentrate on one aspect of the cost-benefit equation and focus solely on the evaluation of cost. Our objective is to describe a method of costing community developments, and in particular residential services, which can be used as a basis for a broader evaluation of their efficiency. The intention is to provide practical guidance to the professional members of Planning Teams, who will usually be responsible for carrying out the evaluations, and to other managers and administrators concerned with quality assurance.

In **Section II** we outline two different approaches to the question of cost distinguishing between the economic and the financial. Estimates of both are important but our main concern is with efficiency and the evaluation of economic cost and therefore, **Section III** opens with a discussion of what these mean and goes on to describe in general terms both the principles and the method of economic appraisal. The basic principles are illustrated with a selection of representative case studies while additional technical material is confined to a series of self contained notes which can be omitted without loss of continuity or generality.

In **Section IV** we return to the issue of financial cost, relating it to economic evaluation to consider both the budgetary implications of alternative forms of residential care and the distribution of cost between provider agencies. Finally, in **Section V**, we draw some conclusions and present a checklist of questions which it is hoped may act as a guide to those engaged in their own evaluation of the costs of service provision.

II Concepts of Cost

Consideration of the cost of residential services is complicated by the number of agencies and range of funding mechanisms involved in their delivery and by the pace at which ideas about what constitutes a good service are changing. These factors are further compounded by different ideas about what constitutes a cost. Of particular concern in this context is the difference between the accountant's concept of cost and that of the economist.

In accountancy, costs are generally related to the financial expenditures of a particular agency. The implications of new service developments for different sectors of the economy are often ignored except so far as they impinge, financially, on the particular budget of interest. In contrast, the economist's concept of cost is broader and relates directly to the notion of alternatives. Resources used in one way cannot be used in any other and therefore the decision to devote resources to one activity inevitably involves giving up the benefits associated with the alternatives. The value of the most favoured alternative use to which the same resources could otherwise be allocated provides a measure of the economic cost of the chosen activity.

Both of these concepts of cost are important in planning and evaluating the provision of new community services but each in different ways.

Economic efficiency

Typically, the resources required by community facilities are provided by a range of public and private sector agencies. From the community's perspective, it matters little which agency is responsible for

supplying a particular resource as long as the service is provided in a co-ordinated and cost-effective manner. A basic assumption is that costs and benefits are valued irrespective of the organisation or people to whom they accrue. To evaluate the relative efficiency of alternative methods of delivering a service it is therefore necessary to consider the economic costs associated with all categories of resource use (including informal care), not just the financial costs which fall within the remit of one or other agency's budget. The distribution of cost; whether it is fair or unfair, can be considered subsequently as a separate exercise.

Financial appraisal

The relative economic efficiency of the proposals being appraised will not be affected directly by their total financial costs. However, the distribution of costs between the participating agencies may influence the feasibility of implementing the preferred option because of requirements to keep within approved financial limits. As well as an economic appraisal of the real resource consequences of policy options a cash-flow analysis is also required to assess their budgetary implications. The financial appraisal should aim to set out the monetary costs of each option (that is the actual undiscounted expenditure required to secure the use of resources) indicating the expected date when costs will be incurred and the budget on which they will fall. If the most cost-effective option is found to cost more than its allocated budget then explicit consideration can be given to the merits of relaxing the constraints in the interest of efficiency.

III The Evaluation of Economic Cost

Definition

Economic costs are equivalent to sacrifices and represent what the community has to give up in order to obtain the service in question. For this reason they are also known as **opportunity costs.**

Technical Note: Opportunity Costs

The notion of opportunity cost arises because resources are scarce relative to the demands that we could place upon them. This inevitably means that priorities have to be set and choices made between alternative courses of action. The real cost of the chosen activity is the value of the benefits which would have been obtained had the most favoured of the alternatives been chosen instead.

Opportunity costs and financial costs are only equivalent when prices reflect the value of the alternative uses of resources. The two notions of cost diverge from one another either when a resource is used for which no price is paid or where price is distorted because of market imperfections or elements of taxation or subsidy.

In these circumstances, it may be necessary to adjust the market price of the resource or to impute a shadow price based on its value in an alternative use. Whether or not the market price should be adjusted depends on the reasons why the price does not reflect the resource cost. It is often beyond the scope of most cost appraisals to consider these factors and so, as a general rule, HM Treasury recommend that market prices be used including direct taxes and rates but excluding other indirect taxes such as VAT and fuel duties.

Practical implications

This definition has two important practical implications for the way costs are evaluated. First, it is necessary to identify all the changes in resource use which would result from adopting the policy being evaluated. Second, it is necessary to ascertain whether or not any actual or projected cash outlays associated with the use of the resources accurately represent their economic cost.

The basic steps

These implications translate into three basic steps which, it is recommended, are followed when evaluating the economic costs of policy options. The three steps are as follows:

Step 1: Identify **changes** in resource use.

Step 2: Quantify **changes** in resource use.

Step 3: Evaluate **changes** in resource use.

Emphasis is placed on the change in resource use because the economic costs of service developments relate to the net-additional resources required to bring them into operation.

Decision-context

The context in which costs are evaluated is important for a number of reasons, not least because it sets the boundaries of the costing exercise. The extent of any change in resource use will depend upon individual circumstances such as the baseline from which one starts, the scale of any programme relative to that baseline and whether or not the programme will replace care which would otherwise be given elsewhere. From an economic perspective it is meaningless to ask what will a service cost unless the decision-context is pre-specified in some detail.

The context-specific nature of economic cost makes it difficult to prescribe a method of evaluation which will be uniquely correct in all circumstances. In economics there can be no equivalent to the Accountant's "Statement of Standard Practice" and a technical handbook of economic costing techniques which set out to be comprehensive in its coverage would be both cumbersome and unsatisfactory. To overcome this difficulty each of

the basic steps identified above is described subsequently in a little more detail using a selection of case studies and examples to illustrate some of the more technical points.

Technical Note: The Scope of the Appraisal

In an evaluation of the cost-effectiveness of residential care it would also be important to specify the scope of the appraisal. This would include a statement of the objectives of policy against which the effectiveness of alternative means of service provision could be measured as well as a clearly defined question for the study to answer. The latter determines what form the appraisal should take and in particular how measures of the effectiveness of provision should be incorporated into the appraisal. In cost-effectiveness analysis (CEA) outcomes are quantified but left unvalued while in cost-benefit analysis (CBA) outcomes must be valued in terms commensurable with resource use (i.e. usually money). The costing methodology is a constant feature of all forms of economic evaluation. (Drummond, 1980)

For completeness the perspective of the study i.e. whose costs and benefits are important, should also be specified. Reference has already been made to the desirability of adopting a societal perspective, considering all costs and benefits, but an assessment solely of the public sector effects may be justified either where private sector effects are expected to be small or where they are likely to reinforce the conclusions of the narrower study.

STEP 1 : Identification of Changes in Resource Use

Prior identification of the changes in resource use ensures that all resources are considered not just those which are easy to value in financial terms or those which fall upon a particular agency's budget.

In this context it is often useful to have a general checklist of organisations or individuals who are likely to be affected by resource changes. This list would include:

1. Statutory Agencies

NHS Authorities

Family Practitioner Committee Services	- General Practice - Dentistry - Ophthalmology - Pharmaceutical Services
Local Authority Services	- Social Services - Education - Housing - Leisure
Other Public Bodies	- Water Boards - Passenger Transport Executives

2. Private/Voluntary Agencies

e.g. Housing Associations
Voluntary Societies
Providers of private residential care services

3. Families of Patients/Residents/Clients

4. Patient/Resident/Client

By way of illustration the changes in resource use associated with two policy actions:- the provision of alternative accommodation for mentally handicapped people currently living in hospital and for those currently living in the parental home, are shown in figures 1 and 2.

Figure 1 Changes in Resource Use: Transfer from hospital

Resources of new facility	less	**Savings in hospital care**
Capital		Capital (?)
Running costs		Running costs (marginal)
Use of other agency services		
Use of community facilities		
Personal consumption		Personal consumption
Informal sector		Informal sector

Figure 2 Changes in Resource Use: Transfer from home

Resources of new facility	less	**Changes in resource use in parental home**
As per figure 1		Housing costs
		Service costs
		Informal care costs
		Personal consumption

Categories of resource use

Capital costs - costs of buildings and major fixtures and fittings

Running costs - costs of staffing, heating, lighting, cleaning, repairing and maintaining the unit together with providing for the personal comfort, clothing and feeding of the residents.

Costs of using other agency services - costs of services provided to the residents by the staff of other agencies (for example General Practitioners, Therapists, Tutors, Voluntary Visitors, Nurses, Social Workers etc.) and not usually included in the unit's cost-accounts.

Costs of using community facilities - costs of using day centres, schools, colleges, swimming pools, leisure centres, public transport etc.

Personal consumption - costs incurred by the resident arising from their purchases of household and personal requisites. The amount involved is dependent on personal incomes.

Informal sector - costs imposed on family and friends by the location or organisation of the residential institution.

Informal care - costs imposed on family and friends by the care of the handicapped person. Technically this includes the value of lost leisure time and forgone employment opportunities (Wright 1987).

The major categories of resource use which are required to support the new community facilities are the same in both of the examples although the actual mix of inputs and therefore the costs will differ according to the type of new provision made available. The problems of quantifying and evaluating these cost categories are discussed in the next sections.

STEP 2 : Measurement of Changes in Resource Use

This step will usually be carried out simultaneously with the previous one but listing it separately serves to emphasise the importance of measuring and subsequently valuing the change in resource use brought about by the project in question.

The main problem involved is the need to identify how changes in the scale of provision affect costs. For example, it is possible that some services are operating below full capacity and therefore increased usage imposes no or very low extra costs. If residents use a nearby swimming pool during off-peak hours, they will be using up spare capacity in that pool and therefore such increased usage could be treated as a zero cost. On the other hand an increase in the demand for residential care based on small housing units will increase the demand for housing accommodation and all the costs of such housing have to be evaluated. In quantifying and in evaluating costs it is important to identify the extra costs or cost savings which occur over the scale of the proposed policy options. These extra costs, those costs which change with the scale of provision, are termed **marginal costs**. Only in exceptional cases are these marginal costs equal to the average cost of existing provision. Thus, although it may cost £12,000 per year to care for someone in a hospital for mentally handicapped people, costs will not increase by £12,000 if an additional person is admitted, nor will £12,000 be saved if one person is discharged and the bed left empty.

In effect, the distinction between average and marginal costs demonstrates the importance of the decision context and the prior specification of the alternative courses of action open to decision-makers and the changes in resource use which these alternatives would produce.

Technical Note: Average and Marginal Costing

Figure 3 Average and Marginal Cost Curves

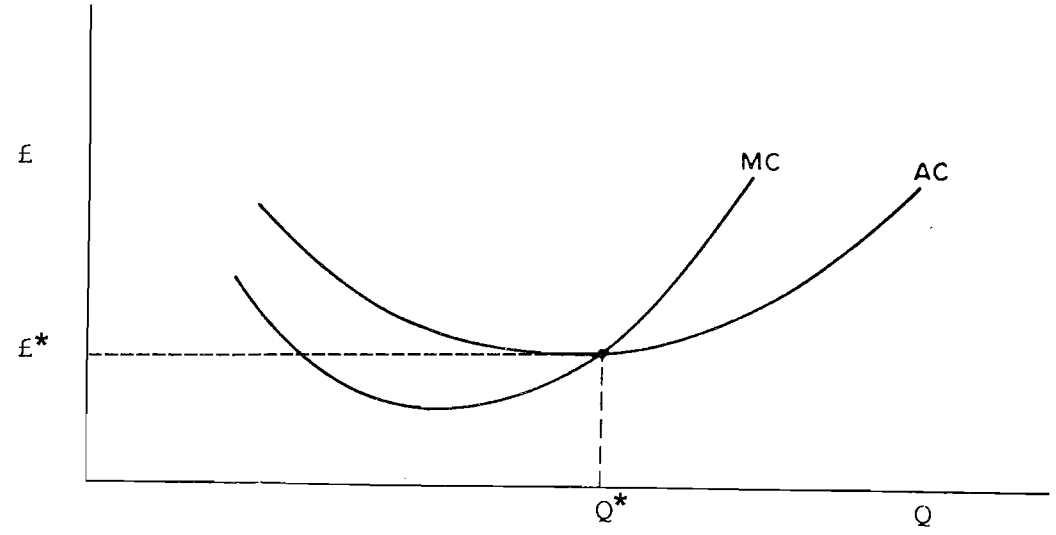

Figure 3 depicts the stylised relationship assumed to exist between costs and the quantity of output. Initially, average costs (AC) fall as production (Q) increases because fixed costs are shared over more units of output. However, at some point, diseconomies of scale begin to set in and average costs then rise as production continues to increase.

The marginal cost (MC) curve shows the change in total costs brought about by an additional unit of output. That is, the actual cost of increasing output by one unit or, alternatively, the actual savings which could be made if output were to be reduced by one unit. By definition, if average costs are falling then marginal costs must always be lower than average costs and vice versa.

Applying this to residential services, in particular to hospital care where Q would represent either occupancy or the actual number of patients, it can be seen that at only one point (Q*) is the average cost of the hospital equal to the marginal savings that could be realised if a small number of patients were to be discharged.

As the number of patients falls below this point the average costs of hospital care increase and rise above the savings that could be achieved by further discharges into the community. In a recent study in the Northern Regional Health Authority, Normand and Taylor (1987) estimate the potential savings of a retraction of hospital services to be between 50-70 per cent of average cost.

Case Study: The Additional Costs of Day Services

The use of Adult Training Centres to provide daytime support to the residents of new living facilities illustrates the importance of marginal costing. Figure 4 shows the average revenue costs of a typical ATC broken down by major cost component. However, the actual costs of extending the service to new users will depend on the scale of the new demands and the degree of spare capacity in the centre.

Figure 4 Illustrative Cost of Day Services

		£
(a) Capital -	notional rent	0.90
(b) Staff -	administration	2.50
-	instructors	4.00
(c) Non Staff -	provisions	1.10
-	transport	1.70
-	fuel	1.70
Average cost per client per day		11.90

Assuming that the centre is not fully occupied then a small increase in the number of users will not increase costs by very much. The staffing complement and most domestic expenses will not be affected and additional costs will relate only to the need for increased catering, transport and materials. As the scale of new demands increases so will its influence on other cost-components. A moderate increase in the number of clients may require additional instructors to be recruited while a larger increase may warrant restructuring of the administration and management causing additional costs in this area as well. Finally if the additional numbers are sufficient to justify a new centre or extensions to the existing one then capital costs must also be included.

The difficulty in assessing the costs of extending the provision of day services, or indeed any shared service, lies in identifying the additional resources required to support any extra demands. The average costs of existing facilities are a readily available proxy but are only of any real use when the change in demand is substantial and the extended service is not markedly different from that currently available.

STEP 3 : Evaluation of Changes in Resource Use

For practical purposes this step involves ensuring that any actual or potential cash outlay associated with the use of a resource accurately reflects its economic cost. In general, the workings of labour and commodity markets ensures that this is the case but where it is not so then it may be necessary to impute a notional value (or shadow price) based on an estimate of the value of the resource in its most favoured alternative use.

Many authorities are making use of surplus property to accommodate new residential units by adapting ex-staff accommodation or council housing stock or by constructing purpose-built units on what is usually health authority owned land. This represents a common example of resource use without an associated cash-flow. The practice reduces the financial costs of capital investment (in some cases to zero), but not the economic costs which depend on the value of any alternative use to which the property could otherwise be put. In most circumstances the potential market value of property provides a useful indicator of its alternative use value.

Technical Note: Capital: An Example of Opportunity Costing

Property already owned by an authority can only be treated as a free resource if it has no other uses. This is unlikely to apply except for a few badly located tracts of land.

Most property has other uses, either within the service or outside it, and its value in the most favoured of these alternatives must be taken into account in the economic appraisal. The replacement cost of property which has alternative in-service uses or the potential market value of other property, with planning permission if appropriate, provide ready indicators of the alternative use values. Estimates of the likely market value of land or buildings may be obtained from the offices of the District Valuer.

Social security benefits, are an example of the opposite case, namely a cash-flow without associated resource use. Such benefits are called **transfer payments** because they redistribute purchasing power from one group of society to another. They are not payments for resource use and are therefore not an economic cost although they may finance the costs incurred by individuals. For example, the resource costs incurred by a person living in a group home comprise their expenditure on housing, food, fuel and clothing etc. Such final expenditure is limited by the individual's income which in the case of most people with a mental handicap, consists entirely of their social security entitlements. The value of some state benefits can therefore be used as a convenient proxy for the final expenditures of individuals whose major or only source of income is their social security entitlements although care needs to be taken to avoid double counting.

Technical Note: Transfer Payments

One feature of transfer payments is that, save for the costs of administration, the cost incurred by one group (ultimately tax payers) is exactly offset by the financial gains received by another. In an economic evaluation transfer payments can be treated in one of two ways. They can either be counted as both a cost and a benefit to the respective groups or they can be excluded altogether. The former method has the advantage of highlighting the difference between the total economic cost of a policy option and its distribution between relevant agencies and individuals.

Although not a cost to society as a whole, the incidence of welfare benefits is obviously a cost to the public sector. An appraisal of the public exchequer consequences of different policy options should therefore include reference to the expected impact on entitlement to social security.

Two further refinements

The evaluation of resource cost does not mark the end of the costing exercise. Allowance must also be made for differences in the timing of costs and for any uncertainty in the appraisal.

(i) Allowance for differential timing

Given a choice between settling a debt today or in a number of years time most people would prefer to delay payment. At the very least this allows funds to be invested and earn interest to reduce the real burden of the cost. The existence of positive real interest rates reflects this "time-preference" providing evidence that costs of the same nominal magnitude occurring at different points in time cannot be treated as equal in value. It is therefore necessary to take account of differences in the time at which costs are incurred.

The process by which this can be done is called discounting. This involves applying a weighting factor, determined by the discount rate, to costs occurring in the future so that they may be compared as if they had all been incurred at the same time. An alternative approach, applicable where operating costs are expected to be constant over time, is to convert the capital costs into a notional, annual equivalent. This practice is intuitively more appealing given its resemblance to mortgage repayments or rents. In either case, the transformation is simply an exercise in arithmetic made easier by the use of tables outlining discount and annuity factors. Numerical examples of the discounting procedure and a table of discount factors are presented in appendix 2.

Whilst it is fair to say that there is no agreement amongst economists as to what the appropriate discount rate should be, for practical purposes, the Treasury currently recommend a real rate of 5 per cent (HM Treasury 1982).

Case Study: The Importance of Discounting

The local authority have adapted a pair of neighbouring houses to provide accommodation for six mentally handicapped adults. Before the unit is due to open the JCPT must decide whether or not to invest in energy saving improvements. The modifications are expected to cost £16,000 and should yield recurrent revenue savings of £1,000 per annum for the next twenty-five years. Should the authority invest in the project?

At first glance the investment looks appealing, paying itself off after sixteen years and accruing a profit of £9,000 over the lifetime of the project. However, this ignores the differential timing of the two cost flows and gives too much weight to the cost savings occurring in the future. The recurrent revenue savings must be discounted and expressed in terms of their present value before a more meaningful comparison can be made. The table in appendix 2 shows the present value factors of £1 per year. For 25 years the factor equals 14.094 indicating that twenty five annual payments of £1 are equivalent to a single payment made today of some £14.00. The present value of the cost savings arising from the energy saving project is therefore some £14,000 (£1000 x 14.094) and not £25,000 as indicated by simple arithmetic. The savings are less than the original cost of the improvements and therefore the project should not be undertaken.

(ii) Allowance for uncertainty

As a costing exercise is concerned with the resource consequences of different courses of action it will inevitably be affected by uncertainty about the outcomes of future events. The results of the costing may be sensitive to the assumptions made to overcome this uncertainty and therefore a thorough appraisal should also assess the robustness of its conclusions. This can be done through a sensitivity analysis which involves altering the values of key assumptions across a feasible range and examining the differences this makes to the final results. The conclusions of the appraisal are held to be robust if they are not influenced to any great extent by this process.

Technical Note: An Example of Sensitivity Analysis

Key variables which should be subject to a sensitivity analysis are the rate of discount and the estimated lifespan of capital assets. Figure 5 presents the results of such a sensitivity analysis showing how the equivalent annual cost (EAC) of a capital asset valued at £100,000 varies as the rate of discount and the expected lifespan of the asset are altered. Using the formula reported in appendix 2 new annuity factors can be calculated by substituting the different values for the rate of discount and the expected lifespan of the asset. The equivalent annual cost is the product of the capital value (in this case £100,000) and the appropriate annuity factor. At either extreme the notional annual cost of the asset varies between £5,100 and £14,240 increasing with higher discount rates and lower expected lifetimes.

Figure 5 Equivalent Annual Costs (EAC) Under Different Assumptions

Expected life-span of asset	Rate of Discount		
	3%	5%	7%
10 years	11720	12950	14240
20 years	6720	8020	9440
30 years	5100	6510	8060

Note: EAC = Annuity factor X Capital value

(to calculate annuity factors see appendix 2)

In the case study on the importance of discounting, the energy saving project (which had been rejected at a discount rate of 5 per cent over 25 years) becomes acceptable if a discount rate of 3 per cent is used or the revenue savings are expected to last for longer than thirty-three years. This demonstrates the value of sensitivity analysis in indicating the degree of risk associated with some decisions.

Evaluating the Costs of Community Provisions: Some worked examples

The following examples provide a more specific demonstration of the practical applications of some of the costing principles outlined above. The scenarios have been chosen to provide a range of typical costing problems. They are not intended nor should they be interpreted as models of good practice. [see bibliography for residential alternatives].

Example 1: Staffed Group Homes

In this example, residential services are to be provided for 24 mentally handicapped people of mixed abilities in small scale units based in ordinary domestic houses. Care staff will be attached to each house and will be responsible for providing a full range of caring and domestic functions including sleeping-in duties. During the day, the residents will either attend an Adult Training Centre or remain at home to participate in the domestic activities. The residents will also be encouraged to make use of a wide range of adult education and leisure facilities generally available in the locality.

Each resident will be registered with a nearby General Medical Practitioner who will refer for specialist medical attention, if necessary, in the normal way. The Community Mental Handicap Team (CMHT) will also maintain links with the unit and provide paramedical, nursing and social work support when required.

An estimate of the costs of a place in each group home is shown in Figure 6. Subsequent notes explain how some of the cost estimates were calculated.

Figure 6 Illustrative Costs of a Staffed Group Home

Resource	Measure	Valuation Method	Annual Economic Cost per Place (£)
(a) Capital			
- Land)		Market value	
)	4 bed house	Cost of	940
- Building)		adaptations	
(b) Running Costs			
- Unit staff	7.0 wte	Gross salaries	10250
- Central admin.	Travel	Salary & transport	300
- Non staff	Miscellaneous	Expenditure	1300
(c) Agency Services			
- Domiciliary	Visits	Gross salary	700
- Day services	Attendances	Marginal costs	2000
(d) Community Services			
- FPC	Capitation	Basic allowance	10
	Consultations	Marginal costs	--
- Education	Courses	Marginal costs	100
- Leisure	Miscellaneous	Marginal costs	100
(e) **Personal**	Miscellaneous	Net DHSS allowances	400
Annual Economic Cost per Place			16100

(a) Capital

The acquisition costs of property purchased on the open market will usually reflect its economic costs. The estimated market value of property already owned by the health authority should also be included in the appraisal to reflect the opportunity cost of the asset (its value in the most favoured alternative use). Rents paid by the residents of units located in council houses may also be used provided that the rental is based on an accurate assessment of the economic cost of the house. If there is any doubt about the basis for calculation then it is advisable to use the full market value of the property in the costing exercise and treat the rent as a transfer to the local authority either directly from the tenants or via them from the social security budget.

To facilitate comparisons between schemes with different mixes of capital and revenue the capital costs have been converted into an equivalent annual cost (EAC) which is in effect a notional rent (see Appendix 2).

(b) Running costs

The cost of staffing the unit consists of the gross salary payments, estimated conventionally from the mid-points of appropriate salary scales, plus the employer's contributions to National Insurance and Superannuation. In areas where recruitment of staff is difficult it may be more appropriate to use higher points on the relevant salary scale. Staffing norms may be used to predict staffing costs but should not be allowed to prevent consideration of the cost and quality implications of different staff ratios and mixes of grade and professional background.

The cost of non-staff items, such as provisions, materials and energy supplies, will be reflected in the expenditures required for their purchase. An estimate of the likely costs of these items can be gained from the experience of other units of similar kind.

Central administration costs relate to the extra time and travel required to support a service dispersed over several sites. Once quantified, the time input can be valued at the appropriate hourly salary rate plus employers contribution to National Insurance and Superannuation. Transport costs relate to the expected additional expenditure calculated from standard mileage allowances.

(c) Agency Services

The costs of domiciliary services such as community nursing, paramedical and social work services have been estimated with reference to the time-input of consultations supplemented with travel costs [see technical note in example 2]. Day services represent the marginal costs of attending a local ATC which, in this example includes, transport and the salary costs of an additional instructor at the day centre.

(d) Community Services

Calculating the cost of using generic community facilities raises the familiar problem of identifying the additional resources required to support the new demands. The use of such community leisure facilities as swimming pools currently tends to be confined to off-peak periods and so resources have already been committed and the marginal costs are negligible. This argument may hold true at current levels of utilisation (in which case the value of additional information needs to be balanced against the effort required to secure it) but may change as utilisation

increases in response to philosophies such as An Ordinary Life and Normalisation. Quantifying the use of generic facilities at least enables one to consider the possible resource consequences for the agencies responsible for their supply.

Technical Note: The Cost of General Medical Provision

One implication of the shift in emphasis from hospital to community based care is increased reliance upon the Family Practitioner Service for general medical coverage. The question for this paper is what are the likely resource costs of an increase in the number of consultations with General Practitioners following the provision of new community residences.

The average cost of a consultation with a G.P. depends upon where the consultation takes place. In the surgery, the average cost is approximately £2.20 but this rises to £6.50 for a visit to the patient's own home, because of travel costs and longer consultations. However the average financial cost of a consultation provides no indication of the resource consequences of transferring a significant number of people into the community.

In exchange for standard capitation allowances and fees for such items of service as immunisations and cervical cytology the G.P. contracts to provide comprehensive general medical coverage. A G.P.'s income is unaffected by the number of consultations he or she may have to make and, provided the increase in demand is not sufficient to warrant an additional physician, the public sector costs of any extra consultations are effectively zero.

This does not imply that the economic costs of G.P. consultations are also zero. The economic cost relates to the time which the G.P. has to devote to meeting the additional demands for his or her services and to the value of that time in whatever alternative activity the physician would otherwise be engaged in. In theory, this might be a consultation with another client, some other professional or administrative duty, or a leisure activity. It is therefore difficult to cost G.P. consultations without a specific assessment of the alternative uses of their time. This is practically impossible within the context of an appraisal of residential services but to ensure that the impact upon the family practitioner services is not totally ignored it is suggested that the expected number of consultations be recorded. This at least allows consideration of the extent of any additional workload to be placed on the general physician.

The capitation allowance depends on an individuals age and not their place of residence. As such it can be excluded from many comparisons of the cost of residential care. However it does constitute a cost (albeit very small) and should be included in the costs of schemes for people who have been discharged from long term hospital care and who register with a General Practitioner for the first time. In 1986 the allowance on list sizes in excess of 1000 people ranged from £8.49 for people aged under 65 years to £12.69 for those aged 75 or more.

(e) Personal expenditures

This entry relates to the residents' own expenditures on personal items. The estimate is based on net social security allowances excluding any charges paid to the provider agency for board and lodging. Such charges are transfer payments which redistribute the cost of residential services from the provider agency to the social security budget.

Example 2: Purpose built community residential setting

A new community residential setting providing places for 24 mentally handicapped adults of mixed abilities is to be constructed on a site currently owned by the health authority. The unit will employ its own nursing and domestic staff and provide a waking night-time service. Close links will be maintained with the neighbouring hospital which will be responsible for providing specialist medical and paramedical support as well as centralised laundry and catering facilities. An occupational therapist is to be employed full-time in the unit to provide social skills training for most residents. The remaining residents will attend a local Adult Training Centre for vocational training.

An estimate of the expected economic costs of the unit is shown in Figure 7. As before subsequent notes explain how some of the cost estimates were calculated.

(a) Capital

The expected construction costs of the unit have been taken from cost guidance issued to NHS Works Professionals by DHSS (HN(80)21). The value of the site has also been included, even though it is owned by the authority, to reflect its economic cost. In this example it has been assumed that if the site were not developed it could otherwise be sold to

raise additional revenue. The decision to build upon it therefore denies the authority the opportunity of using the sale proceeds. An estimate of the market value of the site was provided by the District Valuers Office.

Figure 7 Illustrative Costs of a Purpose-built Residential Setting

Resource	Measure	Valuation Method	Annual Economic Cost per Place (£)
(a) Capital			
- Land	0.5 hectare	Market value	110
- Buildings	24 places	Construction costs	910
(b) Running Costs			
- Unit staff	20 wtes	Gross salaries	6250
- Central admin.	Minimal additional costs		--
- Non-staff	Miscellaneous	Expenditure	1150
(c) Agency Services			
- Medical	Consultations	Gross salaries	400
- Paramedical	Visits	Gross salaries	400
- Day services	1 wte O.T. ATC attendances	Gross salary Marginal cost	500 500
(d) Community Services	Minimal additional costs		--
(e) Personal Consumption	Miscellaneous	DHSS Allowance	400
Annual Economic Cost per Place			10620

(b) Running Costs

Both staff and non-staff costs have been calculated in the same way as before. The development of one new community unit is unlikely to require significant reorganisation or addition to the central administrative function and therefore no additional costs are envisaged in this area.

(c) Agency services

The medical and paramedical input provided by the hospital staff has been costed according to the time-input of their consultations valued at the appropriate hourly salary rate plus the additional costs of travel. The example of social work services described in the technical note provides a more complete description of the method which is easily generalised to other professional services.

Technical Note: The Cost of Domiciliary Services - The case of social work support.

As with any evaluation, estimating the cost of domiciliary services to be delivered to new residential units entails identifying, quantifying and then valuing the requisite change in resource use. In the case of social work support the main resources will be the time of the social worker plus transport costs incurred in visiting the units. If the increased demand is sufficient to warrant the restructuring of, or additions to, central administrative personnel then costs incurred in this area should also be included.

The Social Worker's time can be costed using gross hourly salary rates. For example, the annual economic cost of a Social Worker on level 2 is approximately £11,700 (including 20% employer's on-costs). This translates into an hourly cost of some £6.80; assuming a normal week of 37.5 hours over 46 weeks of the year. The time costs of consultations can be calculated using this rate once the average duration of a consultation, including allowances for travel and directly associated overheads, has been estimated. For example, the cost of a consultation lasting 45 minutes with 15 minutes for travelling and 30 minutes for associated administration, would cost £10.20 [1.5 x £6.80]. Transport costs, based on standard mileage allowances, must then be estimated and added to the time-cost of consultations. This basic method is readily applicable to other professional groups, such as Community Nurses, who may also deliver a service to the client's home.

Day Services includes the gross annual salary of the occupational therapist plus the cost of the additional resources required to support the few residents attending the ATC (namely materials and provisions).

(d) Community services

Minimal use will be made of generic facilities. A nearby swimming pool will be used in off-peak periods by agreement with the local authority. Therefore, no additional costs are envisaged in this example:

(e) Personal consumption

This entry refers to the purchase of personal comforts and toiletries. It relates to the residents' income which is likely to be restricted to their pocket money allowances.

Private and Voluntary Provision

The increasing involvement of the private and voluntary sector means that no evaluation of alternative forms of residential provision can be complete without also considering their facilities. One feature of the non-statutory sector is its ability to call upon the resources of a wider range of public sector agencies, in particular social security benefits (see figure 8). This reduces the cost to health and local authorities by shifting a greater proportion of total expenditure onto the social security budget. Such financial complexities make it more difficult to evaluate cost and therefore more important to identify the resource-needs of the different types of residential provision correctly to ensure that all important inputs are included.

The costs of both private and voluntary provision can be evaluated in the manner described in this report, focusing primarily on the use and economic value of the necessary resource inputs. For private provision it will often be easier to use the charges levied by each home as a proxy. Any apparent difference between the charge for private residential care and its cost represents a return to the proprietor of the home for the use of their capital and own-time input. If the return is economically "fair" (a judgement beyond the scope of most appraisals) then it represents a legitimate resource cost.

Other Costing Issues

(a) Staffing

Where staff are to provide a peripatetic service and will not be allocated to one particular unit (an arrangement which might apply in some core and cluster developments for example) an effort should be made to apportion the costs of staffing pro-rata to the number of direct care hours likely to be provided to each unit.

(b) Temporary staff

Both statutory and non-statutory agencies are able to take advantage of the Manpower Services Commission's Community Programme and employ a number of care assistants or domestic staff on a temporary basis. The resource costs of this input (i.e. the salary costs of replacement staff) should also be included in the evaluation unless the staff concerned are totally supernumary and make no significant contribution to the care of the residents.

(c) Volunteers

Generally no financial cost is associated with the use of volunteers except minimal reimbursement of expenses and provision of meals and refreshments but an opportunity cost is incurred if the volunteer's time would be put beneficially to some other use. Valuing this time can be difficult and it is often sufficient simply to quantify it in terms of the number of hours supplied to ensure that the input is not overlooked. The costs of any professional staff required to administer or co-ordinate the volunteer programme must also be considered.

Where a residential unit relies to a significant extent on the use of volunteer labour then consideration should be given to the implications of losing that support. The salary costs of any professional replacement needed to maintain the quality of care provides an indicator of the value of the volunteers input.

Quality of Care

In the examples described earlier, the larger residential setting is obviously not as expensive as its smaller counterpart but this does not mean that it is necessarily more efficient. Efficiency describes the relationship between costs and effect. A cost-effective service is not necessarily one that minimises cost per se but one which minimises the cost of achieving a given level of benefit. Cost is therefore only one determinant of efficiency and it is equally important to consider the effect the use of services has on clients and their families. Thus, the quality of care and ultimately its impact on the users' quality of life must also be assessed.

It is beyond the scope of this document to consider in any great detail the difficulties of defining and measuring quality. The Independent Development Council (IDC, 1986) has defined what it means by quality in terms of the availability of services and the opportunities they offer the people using them to exercise choice, use community facilities and sustain adult relationships. The IDC also suggest ways in which quality assurance can be incorporated into the management of community based services. The NDG's checklist of standards provides a practical guide to local managers, facilitating self-appraisal so that improvements can be made in the light of local needs (NDG, 1980). An annotated directory is also available, which describes some 60 instruments which have been used to measure different dimensions of quality of care in residential facilities for people with a mental handicap (Raynes, 1988).

In a prospective evaluation it will be necessary for the members of planning teams to agree a set of criteria by which the quality of proposed developments can be judged. As examples, the criteria might include

attributes such as the development of self-help skills, the promotion of autonomy and integration with the local community. Once a set of attributes have been agreed, a "Delphi-type" process can be used; first, to weight the relative importance of the attributes and then to score each option according to its expected performance. This form of benefit assessment is a feature of health service option appraisals. For a more detailed exposition of the method readers are referred to appendix 3 of the DHSS guide to option appraisal (DHSS 1987).

IV Financial Implications

An appraisal of the economic costs and benefits of different policy options will help determine which method of delivering services makes the most efficient use of scarce resources. However, before implementing the preferred option consideration often needs to be given to the financial costs of schemes as well. A cash-flow analysis should aim to indicate the distribution of expenditure both over time and between participating agencies to ensure that budgetary constraints are not seriously breached. Figure 8 shows the range of agencies which might be involved in the funding or supply of resources used by different forms of residential provision and demonstrates the potential complexity of a financial appraisal.

The range of funding agencies may also complicate the delivery of cost-effective care because of the financial incentives generated by each individual source of public finance. For example, it may be more efficient to support a mentally handicapped person in their own home with a range of suitable domiciliary and day services but the costs of this form of provision tends to fall on fixed NHS and LASSD budgets. Alternatively, social security is, as yet, unlimited and entitlement to Board and Lodging allowances provides a positive incentive for people to move into private and voluntary residential provision whether or not this is appropriate to their needs (Audit Commission, 1987).

Combining an economic evaluation with an appraisal of the financial implications should at least indicate the circumstances where the delivery of more cost-effective care is being hindered by the incentives resulting from public expenditure regulations.

Figure 8 Possible Distribution of Financial Costs

Funding Agency - budget	Type of Residential Provision					
	NHS Hosp.	NHS Gp Home	LA Hostel	LA Gp Home	P & V Nursing	P & V Gp Home
(a) National Health Service						
- Health and Community Services	✓	✓	-	-	-	-
- Family Practitioner Committee	-	✓	✓	✓	✓	✓
(b) Local Authority Social Services Department						
- Residential	-	-	✓	✓	-	-
- Day	-	✓	✓	✓	✓	✓
- Domiciliary	-	✓	✓	✓	✓	✓
(c) Department of Health and Social Security*						
- Income Support	-	-	✓	✓	✓	✓
- Bd. & Lodgings	-	-	-	-	✓	✓
- Housing Ben.	-	✓	-	✓	-	✓
- SDA/Mob Allow.	✓	✓	✓	/	✓	✓
- Attend. Allow.	-	-	-	-	-	✓
- Rate Relief	-	✓	✓	✓	✓	✓
(d) Department of the Environment						
- Housing Association Grants	-	-	-	-	-	/
- Hostel Deficit Grants	-	-	-	-	-	/
(e) Others						
- MSC	✓	✓	✓	✓	✓	✓
- Informal	✓	✓	✓	✓	✓	✓
- Others	✓	✓	✓	✓	✓	✓

* Entitlement to some social security benefits is dependent on the discretion of local Social Security Officers, and their judgement about the type of facility in which a mentally handicapped person resides.

Case Study: Distribution of the Costs of Alternative Residential Settings

A study by Davies (1987) in the Bristol area set out to compare the costs and quality of different residential settings for people with mental handicaps. The report of the study also contained a breakdown of the average costs of each residential setting by funding agency. Figure 9 has been adapted from that report to illustrate how the distribution of cost varies according to the type of provision.

Figure 9 Average Cost of Alternative Residential Settings

	TYPE OF RESIDENTIAL PROVISION		
FUNDING AGENCY	Group Home	Mental Handicap Hospital	Private Hostel
NHS			
- HCHS	9633	12586	27
- FPC	22	-	27
LASSD			
- day services	827	47	1997
- domiciliary	41	65	-
DHSS			
- personal allowances	1325	522	522
- Bd. and Lodging	3276	-	7280
LEA	391	-	-
Voluntary Organisations	-	78	-
TOTALS	£15515	£13298	£9863

V Conclusions

An economic appraisal is principally an aid to decision making and, as such, it is both a technical exercise and a way of thinking about questions of resource allocation and priority setting. In summary, five features should be emphasised:-

1. Alternative options

The precise form of any new residential development is a matter of choice. Options may differ according to the size of the units, their location and staffing etc. To ensure efficient use of resources the options must be made explicit.

2. Opportunity cost

Costs are equivalent to forgone benefits and arise because resources have alternative uses. An economic appraisal is concerned with comparing the benefits of doing one thing rather than doing another.

3. The margin

Economic costs are context-specific and the resource implications of changes in the scale of provision rarely correspond to the average costs of maintaining it at its current level.

4. Discounting

Costs (and benefits) of the same nominal magnitude cannot usually be considered equal in value. Consideration must therefore be given to the time horizon over which costs are incurred.

5. Sensitivity analysis

Appraisals, by their nature, are clouded with uncertainty and value judgements. Sensitivity analysis is useful in indicating the degree of risk associated with some policy options.

The technical side of an appraisal can become quite complex, particularly with large scale developments or those involving a number of different agencies. Therefore, it may occasionally be necessary to enlist the advice of a professional economist. If this guide is to be of any practical use at all then perhaps the least it should do is help the reader to decide when such help is needed (see Appendix 3).

Whether or not a formal evaluation is undertaken, resource allocation decisions still have to be made. Whatever the technicalities, the very process of identifying alternative means of meeting pre-specified objectives and weighing up their respective resource-costs and benefits is in itself a valuable managerial exercise. The approach we have outlined in this paper provides a systematic framework in which all relevant factors can be considered thus allowing the decisions to be made in a more rational manner.

The attached checklist is intended to contribute to both facets of an appraisal. It contains all of the questions pertinent to costs which a comprehensive economic evaluation should address and should therefore be of some use to planners and managers either as a guide to those who are engaged in their own evaluations or to those who have commissioned a specialist study and require assistance interpreting the validity of its results.

Checklist: Evaluating the costs of community programmes

(A) The decision context:

Is there a clear statement of the objectives of policy?
Does it specify the purpose of the evaluation?
Does it specify the perspective of the evaluation?

(B) Policy options:

Have alternative methods of meeting the objectives been identified?
Have any options been rejected prior to the appraisal?
Are the grounds for their rejection appropriate?

(C) Identification of resource use:

Have all significant categories of resource use been identified?
Does this include resources provided by other agencies and sectors?
Have any categories been excluded?
Is this appropriate given the purpose and perspective of the evaluation?

(D) Measurement of resource use:

Has an incremental (a marginal) analysis been performed?
Does the use of shared services present any problems?
If so, how have these problems been dealt with?

(E) Valuation of resource use:

Have all categories of resource use been valued?
If not, does this imply they carry no weight in the final appraisal?
What are the sources of the values?
How has the use of property owned by the authority been treated?
How has the use of facilities provided by other agencies been treated?
How have the services of the informal sector been treated?
Are these methods appropriate to the question in hand?

(F) Discounting and sensitivity analysis:

Have costs occurring at different points in time been discounted?
Has a sensitivity analysis been performed?
Are the results of the appraisal sensitive to any of the assumed values?

(G) Presentation:

Have all costs been expressed in terms of a common price base?
Does the final presentation indicate the economic costs of the project?
Is it possible to assess the financial costs and their distribution over time and between agencies?

Appendix 1: Summary of Basic Principles

i Constant prices

All costs should be expressed in terms of constant prices. The effects of inflation should be excluded and the base year to which the prices relate clearly stated.

ii Opportunity costs

The importance of considering the value of resources in an alternative use has been stressed. The actions of markets tends to ensure that prices reflect economic costs, but this is not always the case and not all resources are marketed. In these instances, it is necessary to impute a shadow-price to reflect the opportunity cost of the resource.

iii Marginal costs

Policy decisions usually result in changes in the scale of demands placed upon a service or facility. Average costs, such as those held in the accounting systems of most public sector agencies, do not always reflect accurately the marginal or incremental consequences associated with changes in scale.

iv Sunk costs

Past expenditure incurred in acquiring or renovating a capital asset should not in itself influence a decision about how the asset should be used in the future. The important consideration is what alternative courses of action are open at the time a decision has to be made. The cost of employing a capital asset in one way rather than another relates to its value in this alternative use. This value (the opportunity cost) need not bear any relationship to the historic cost of the asset.

v Transfer payments

Transfer payments should either be included as both a cost and a benefit to the respective groups or should be ignored altogether. The former method has the advantage of highlighting the differences between the economic costs of community options and their financial implications.

vi Discounting

Costs of the same nominal magnitude occurring at different points in time cannot be considered as equal in value. Either all future costs should be discounted and expressed in terms of their present value or alternatively capital costs should be converted into notional annual equivalent rents.

Appendix 2: Discounting

This appendix has been adapted from the DHSS guidance on option appraisal (see bibliography).

Table 1 provides details at a 5 per cent discount rate on the following:

a. Discount factors

b. Equivalent Annual Cost factors

c. Present Value factors (i.e. the cumulative discounted value of £1 paid annually).

Discounting

Discounting is undertaken to reflect the fact that £1 in, say, one year's time is viewed now as worth less than £1 today. The factor that expresses the precise relationship that makes values at different points in time equivalent is known as the Discount Factor. The discount factor is dependent on the discount rate and time period ahead being considered.

Algebraically: $$D_n = \frac{1}{(1 + r)^n}$$

where D_n = discount factor
r = discount rate
n = Number of years ahead

The discount factor shown in table 1 for 10 years ahead is 0.6139. this is derived by obtaining the value of

$$\frac{1}{(1.05)^{10}}$$

Equivalent Annual Costs

In some situations such as comparing the costs of options with different expected lifespans, it is necessary to know what constant annual sum of money discounted back (at a fixed discount rate) over the period it is paid, equates to a given fixed sum at the beginning of the period. This is the type of repayment principle underlying a mortgage. The constant annual sum is known as the Equivalent Annual Cost (EAC).

Algebraically: $$A_n = \frac{r}{(1 - D_n)}$$

where A_n = equivalent annual cost of £1
r = discount rate
D_n = discount factor

For example, table 1 shows that the EAC for 5 years (n=5) is 0.2310. This implies that 5 annual payments of 23p discounted at 5 per cent, sum to £1.

(i.e. $$\frac{23}{(1.05)} + \frac{23}{(1.05)^2} + \frac{23}{(1.05)^3} + \frac{23}{(1.05)^4} + \frac{23}{(1.05)^5}$$

$$= 100)$$

Present Value Factors

The process of summing a series of discounted annual payments

(e.g. $$\sum_{i=1}^{n} \frac{23}{1.05^n}$$)

is known as calculating the discounted (or capitalised) value.

If the annual payments are all equal, appropriate factors can be calculated to speed up the calculations and these are shown in column 3 of table 1.

Algebraically $$\frac{1}{A_n} = \frac{(1 - D)}{r_n}$$ = PVF (Present Value Factor)

(the sum of the values $$\frac{23}{1.05} + \frac{23}{(1.05)^2}$$ etc shown above

can be obtained by multiplying 23 by 4.329 (the appropriate PVF).

The precise time at which payments are made is important in any discounting calculation. Table 1 shows appropriate factors for payments starting during year [0] and made annually (12 months subsequently) thereafter.

Table 1 : Discount Factors, Equivalent Annual Costs and Present Values of £1 per year for a Discount Rate of 5 per cent [Base date = year 0]

Year(s)	Discount factor (= present value of £1)	Equivalent annual cost of £1	Present value of £1 per year	Year(s)	Discount factor (= present value of £1)	Equivalent annual cost of £1	Present value of £1 per year
1	0.9524	1.0500	0.952	51	0.0831	0.0545	18.339
2	0.9070	0.5378	1.859	52	0.0791	0.0543	18.418
3	0.8638	0.3672	2.723	53	0.0753	0.0541	18.493
4	0.8227	0.2820	3.546	54	0.0717	0.0539	18.565
5	0.7835	0.2310	4.329	55	0.0683	0.0537	18.633
6	0.7462	0.1970	5.076	56	0.0651	0.0535	18.699
7	0.7107	0.1728	5.786	57	0.0620	0.0533	18.761
8	0.6768	0.1547	6.463	58	0.0590	0.0531	18.820
9	0.6446	0.1407	7.108	59	0.0562	0.0530	18.876
10	0.6139	0.1295	7.722	60	0.0535	0.0528	18.929
11	0.5847	0.1204	8.306	61	0.0510	0.0527	18.980
12	0.5568	0.1128	8.863	62	0.0486	0.0526	19.029
13	0.5303	0.1065	9.394	63	0.0462	0.0524	19.075
14	0.5051	0.1010	9.899	64	0.0440	0.0523	19.119
15	0.4810	0.0963	10.380	65	0.0419	0.0522	19.161
16	0.4581	0.0923	10.838	66	0.0399	0.0521	19.201
17	0.4363	0.0887	11.274	67	0.0380	0.0520	19.239
18	0.4155	0.0855	11.690	68	0.0362	0.0519	19.275
19	0.3957	0.0827	12.085	69	0.0345	0.0518	19.310
20	0.3769	0.0802	12.462	70	0.0329	0.0517	19.343
21	0.3589	0.0780	12.821	71	0.0313	0.0516	19.374
22	0.3418	0.0760	13.163	72	0.0298	0.0515	19.404
23	0.3256	0.0741	13.489	73	0.0284	0.0515	19.432
24	0.3101	0.0725	13.799	74	0.0270	0.0514	19.459
25	0.2953	0.0710	14.094	75	0.0258	0.0513	19.485
26	0.2812	0.0696	14.375	76	0.0245	0.0513	19.509
27	0.2678	0.0683	14.643	77	0.0234	0.0512	19.533
28	0.2551	0.0671	14.898	78	0.0222	0.0511	19.555
29	0.2429	0.0660	15.141	79	0.0212	0.0511	19.576
30	0.2314	0.0651	15.372	80	0.0202	0.0510	19.596
31	0.2204	0.0641	15.593	81	0.0192	0.0510	19.616
32	0.2099	0.0633	15.803	82	0.0183	0.0509	19.634
33	0.1999	0.0625	16.003	83	0.0174	0.0509	19.651
34	0.1904	0.0618	16.193	84	0.0166	0.0508	19.668
35	0.1813	0.0611	16.374	85	0.0158	0.0508	19.684
36	0.1727	0.0604	16.547	86	0.0151	0.0508	19.699
37	0.1644	0.0598	16.711	87	0.0143	0.0507	19.713
38	0.1566	0.0593	16.868	88	0.0137	0.0507	19.727
39	0.1491	0.0588	17.017	89	0.0130	0.0507	19.740
40	0.1420	0.0583	17.159	90	0.0124	0.0506	19.752
41	0.1353	0.0578	17.294	91	0.0118	0.0506	19.764
42	0.1288	0.0574	17.423	92	0.0112	0.0506	19.775
43	0.1227	0.0570	17.546	93	0.0107	0.0505	19.786
44	0.1169	0.0566	17.663	94	0.0102	0.0505	19.796
45	0.1113	0.0563	17.774	95	0.0097	0.0505	19.806
46	0.1060	0.0559	17.880	96	0.0092	0.0505	19.815
47	0.1009	0.0556	17.981	97	0.0088	0.0504	19.824
48	0.0961	0.0553	18.077	98	0.0084	0.0504	19.832
49	0.0916	0.0550	18.169	99	0.0080	0.0504	19.840
50	0.0872	0.0548	18.256	100	0.0076	0.0504	19.848

Appendix 3: Enlisting Specialist Support

Readers who feel they would like to enlist specialist assistance are advised to contact the organising secretary of the Health Economists' Study Group (HESG) at the address below. The HESG is an association of economists with relevant research and teaching interests and the secretary will be able to put you in contact with someone in your area with appropriate experience.

The Organising Secretary
Health Economists' Study Group
Centre for Health Economics
University of York
York YO1 5DD

(0904) 430000

Alternatively, the Economic Advisors Office at the Department of Health and Social Security will also be able to put you in touch with a suitable individual or institution.

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