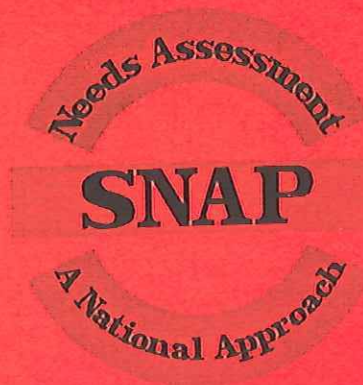


Scottish Needs Assessment Programme



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**PROGRAMME BUDGETING  
AND MARGINAL ANALYSIS:**

**A HANDBOOK FOR APPLYING ECONOMICS IN  
HEALTH CARE PURCHASING**

COMMISSIONED BY SNAP

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# Scottish Needs Assessment Programme

## PROGRAMME BUDGETING AND MARGINAL ANALYSIS

### A HANDBOOK FOR APPLYING ECONOMICS IN HEALTH CARE PURCHASING

COMMISSIONED BY SNAP

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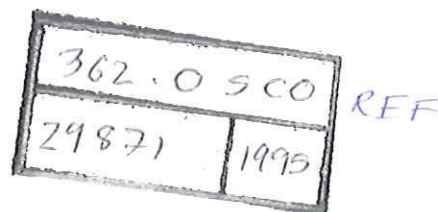
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## EXECUTIVE SUMMARY

Economics is a means of assisting decision-makers to choose between alternatives when resource availability makes it impossible to carry out all beneficial activities. Programme budgeting and marginal analysis (PBMA) is a way of operationalising the economics input to purchasing.

“PB” and “MA” are in fact two separate, but related, activities. The basic premise of PB is that it is important to know how resources are currently used before thinking about ways of changing this pattern. The basic premise underlying MA is that to have more of some services it is necessary to have less of others or, if growth monies are available, that some projects will be funded whilst others will not. This is the distinctive feature of the economics approach to priority setting. PBMA is a framework, which emphasises (a) use of local cost data, (b) whatever evidence is available on effectiveness and, most importantly, (c) that many decisions are still based on value judgements, and that the important thing is to be as explicit as possible about such judgements.

PBMA can take place at the “micro” level of purchasing (i.e. setting priorities within programmes, such as “child health” or “diabetes”) or at the “macro” level (where a more global “between-programme” approach to priority setting can be taken).

The five basic stages of the “micro” PBMA framework are as follows:

<b>Stage 1</b>	Identify the programme
<b>Stage 2</b>	Produce a statement of expenditure and activity by sub-programmes (i.e. the "programme budget")
<b>Stage 3</b>	Decide on services which are candidates for expansion/introduction and services which are candidates for reduction
<b>Stage 4</b>	Measure costs and benefits of proposed changes (i.e. “marginal analysis”)
<b>Stage 5</b>	Make recommendations

“Macro” PBMA is similar, except that stage 1 requires all programmes to be defined in line with purchasers’ objectives.

Despite the apparent simplicity of this framework, experience to date has suggested that any purchaser attempting to use it will face the following problems:

- how should programmes be defined?
- which programme should be chosen for analysis?
- who should be involved?
- how is a programme budget constructed and when does it contribute to the exercise?
- how are options for change identified, in particular options for resource reduction?
- how are options evaluated?

The document reviews the experience of various case studies to date, before making recommendations for health boards interested in using PBMA as a priority setting aid in purchasing.

### HOW SHOULD PROGRAMMES BE DEFINED?

Programmes should be based around specialties for reasons of pragmatism, building up in the future to either a disease-basis or a client group basis to fit with the concept of a “health strategy”.

### WHICH PROGRAMME SHOULD BE CHOSEN?

Choice of area should take account of the following:

- whether the programme is high on the local agenda, which could lend impetus to the exercise, but, if too important, result in an exercise being rushed.
- if background data have already been assembled this may prove helpful in identifying options for change. Authoritative evidence of inefficiency in the current service helps with the difficult issue of identifying savings.
- studying a service without much prior knowledge may take longer initially but can result in more careful and productive thought about ways of saving money to spend on expansions.

## WHO SHOULD BE INVOLVED?

Any exercise must be purchaser-led and may include the following structures and mechanisms:

- a steering group to oversee the project and to evaluate options for change. Membership would include public health, contracts & planning, finance and information. Providers may be involved in this group, depending on local relationships
- an advisory group to recommend options to be evaluated. Membership would include providers from hospital and community, general practitioners, local consumer body, and (possibly) patient groups and members of the public. In addition, there would be public health involvement from the purchasing organisation to act as a link to the steering group. The advisory group may also have a role in commenting on the evaluation of options for change.

Although there are “grey areas”, this mainly involves local providers in setting the objectives of the service and identifying options for change. Purchasers should lead the exercise, but the advice and involvement of local experts cannot be ignored. Thus providers’ knowledge is combined with an “independent” evaluation of the options in terms of the costs and benefits involved.

## HOW IS A PROGRAMME BUDGET CONSTRUCTED AND WHEN IS IT BEST USED?

A programme budget rearranges data from current activity and cost statistics. A programme budget is best used when:

- purchasers have little direct experience of the service, so the PB stage can be used as a learning exercise;
- there is no organised professional provider group with overall responsibility for treating the condition to generate analyses of current problems and proposals for change;
- the service is so diverse that the current issues cannot be easily summarised but still form a homogeneous programme.
- it is important to involve providers at an early stage to convince them of the accuracy of the data and the fixed nature of the budget for the programme.
- a “macro” PBMA framework is used.

## HOW ARE OPTIONS FOR CHANGE IDENTIFIED?

There is no single satisfactory way to identify options for reduction. The process is still full of value judgements but could be made more systematic by use of the following mechanisms:

- Determine the objectives of the current programme: what outcomes is the service intended to deliver, and by what means? Then use the programme budget to combine data on current activity and spending patterns in asking how the current service compares with its objectives.
- Use a “thought experiment” (i.e. a hypothetical example) to assist in thinking about options. To help with service expansions, what alternative uses could be found for an extra £100,000? Similarly, suppose a saving of £100,000 had to be made with the minimum loss of benefit to service users: how could this be achieved?
- To overcome the problem of one or two vociferous individuals dominating proceedings, it may be possible to follow discussions on options for change with a secret ballot, inviting each individual present to submit their ideas for expansions and corresponding reductions.
- Conduct a literature review, which, in the context of PBMA, is clearly directed towards the identification of feasible options for change. Several sources are suggested in the document. In general, care should be taken in transferring the results of national report or literature review findings to the local situation. However, at this stage, the aim is to identify potential ways to change.
- Perhaps the most obvious way to identify options for change is through the local knowledge of those involved in purchasing and providing services. For example, it may be realised that, in some specialties, rates of day case could be higher, suggesting a possible service reduction with no loss of health benefit.
- It is not clear whether all interested parties will be represented on the multi-disciplinary team. Those who are not can be consulted regarding options for change.
- Suggestions in local and national policy documents such as the Scottish Office review of maternity services.

The methods are complementary to a considerable degree; experience suggests a number of different approaches will be necessary to generate an adequate number of service reductions to evaluate. This also recognises that PB is only one possible means to an end.



## HOW ARE OPTIONS EVALUATED?

One possibility is using an option appraisal approach against a series of criteria. These criteria do not have to be weighted. The important thing is to be able to demonstrate the costs of proposed expansions in services, the cost savings from proposed service reductions to pay for such expansions and, at the very least, to make some judgement about the relative benefits of each.

As far as possible, this process should be informed by outcome data, but:

- for many local issues (e.g. on where services should be located) no studies will exist;
- even if studies do exist, it is important to evaluate their “transferability” to the local situation (e.g. was a study carried out on patients of a similar degree of severity to those who may benefit from an expansion of services locally?).

## CONCLUSIONS

The technique of PBMA is not perfect. However, it can be used to achieve change by introducing a systematic analytical framework into contracting. The advantages of PBMA are summarised in the table below.

PBMA: SUMMARY OF ADVANTAGES
(1) Systematic analytical framework
(2) Recognises that sacrifices are necessary to achieve desired expansions
(3) Can lead to joint ownership of recommendations
(4) Recognises subjectivity
(5) Helps to focus on defining services
(6) Helps to focus on the objectives of services
(7) Uses locally-relevant information
(8) Breaks down priority setting into manageable tasks

The PB stage of PBMA may not always be necessary. However, it can be useful in refining thinking: “what is meant by mental health services in our health board?”. Furthermore, it focuses the mind on the objectives of the service and, through the programme budget, emphasises limited resources. The process of production of a programme budget may also imply that some services are provided at present for unexpected reasons. Provision of services for no reason at all may be highlighted or the existence of an objective (and, therefore, potential benefit) which is currently unmet.

Perfect data are not required for priority setting in purchasing. Even when better data (the production of which is to be encouraged) are available, it will still be necessary to have in place the correct framework for its use. PBMA can provide this framework. PBMA is not a panacea. Economics techniques never can be so. As Cohen (1995) points out “It is improvement that is sought, not perfection...”. In our view, the PBMA framework can offer a clear improvement in the way priorities are set. We hope that this “handbook” will aid in the achievement of this improvement.

## Acknowledgements

Although this paper was assembled by three authors it has been possible to produce it only because of the work of many other people. In particular, the authors are grateful to the authors of papers presented at a workshop on programme budgeting and marginal analysis (PBMA) which took place at the University of Strathclyde Graduate Business School, Glasgow in September 1994, as well as to contributors from the floor at that workshop. Since then, further helpful discussions have taken place with Sara Twaddle and Kirsten Major of Greater Glasgow Health Board, Susan McPhee of Grampian Health Board, Julie Ratcliffe of the Health Economics Research Unit, Sheila Scott of Argyll and Clyde Health Board and Rosalie Viney of the Centre for Health Economics Research and Evaluation at Westmead Hospital in Sydney, as well as students attending a number of different lectures and seminars. Particular thanks are also due to Gavin Mooney, David Parkin and Elizabeth Russell who introduced the authors to the topic.

Finally, thanks to the Chief Scientist Office (CSO) of the Scottish Office Home and Health Department who financed the Strathclyde workshop and to both the CSO and the Scottish Forum for Public Health Medicine who commissioned this handbook for purchasers of health care. The views expressed should be attributed only to the authors.



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## 1. INTRODUCTION

This handbook is about using economics as an aid to setting priorities in health care purchasing. In particular, it is aimed at those in the purchasing function in the National Health Service (NHS) who perceive the principles of economics to be sound but who struggle to translate such principles into practice.

The technique which offers great potential in bridging the gap between economic principles being "a good idea" and such principles being used in practice is programme budgeting and marginal analysis (PBMA). It should be pointed out at this early stage that "PB" and "MA" are in fact two separate, but related, activities. The basic premise of PB is that it is important to know how resources are currently used before thinking about ways of changing this pattern. The basic premise underlying MA is that to have more of some services it is necessary to have less of others or, if growth monies are available, that some projects will be funded whilst others will not. If this principle were not accepted, there would be no need to set priorities and we could purchase or provide as much of any type of health care as was wanted or needed.

Applying such simple concepts, however, is not so straightforward. The issues surrounding the application of PBMA form the main part of this handbook.

The handbook is divided into 11 sections. It will be seen in the box below and in the layout over the page that those who feel they are sufficiently familiar with the principles behind the application of economics to health care priority setting can miss out many of the earlier sections of the handbook whilst those who feel they are "beginners" or in need of refreshment should read the whole document.

### READING THIS DOCUMENT

This document is for two groups of people:

- (1) Those who see themselves as new to the field of using economics in health care priority setting should read the whole document.
- (2) Those who already have some experience of using PBMA or exposure to economics ideas and methods should read only sections 6 to 11.



## 2. LAYOUT AND READERS' GUIDE

Programme budgeting is not new to the public sector nor to health care. The earliest recorded uses of the technique are in the private sector in the United States of America in the 1920s. It was then used in the US Defence Department in the 1940s and reached its "heyday" in all areas of the US public sector during the 1960s (Merewitz and Sosnick, 1971). In the UK, PBMA was advocated as being of use in health care priority setting in the 1970s (Mooney, 1977; Fordyce *et al.*, 1981). Only recently, have examples of its use in health care purchasing been forthcoming (Cohen, 1994).

Given what may be seen as the "chequered history" of PBMA, it is important, to commence this document by addressing three related questions:

- what is wrong with the way health care priorities are set now?
- what is the alternative or, rather, what is PBMA?
- and, why should PBMA work now when it has not done so in the past?

These questions are addressed in the following three sections (3-5). Then, in the main part of the monograph, the gap between economics in theory and using economics in practice is bridged by addressing several issues which have been raised in attempting to apply PBMA in practical health care priority setting exercises. These issues are addressed in five sections. In the sixth section, issues which have arisen in carrying out PBMA but which are common to all priority setting methods are acknowledged. The main role of the monograph, however, is to address practical issues which are specific to PBMA (see box below). Therefore, in the seventh section, the issues addressed are those which have arisen around defining the remits of groups of purchasers working on specific priority setting topics. In the eighth section, the issues of the role of the programme budget and problems in its construction are discussed. In Section 9, the issue of identifying options for expansion (or introduction) and corresponding options for contraction is dealt with before raising some points, in Section 10, on the actual evaluation of options identified. Section 11 summarises the main advantages and limitations of PBMA.

### **PRACTICAL ISSUES IN APPLYING PBMA**

- (1) Remit**
- (2) The role of the programme budget and problems in its construction**
- (3) Identifying options to receive more and those to receive less resources**
- (4) Evaluating the options**



### 3. "WHAT'S WRONG WITH WHAT I DO NOW?"

The first question entering the heads of many readers of this document may be "what's wrong with what I do now?" with regard to priority setting. The answer to this question is threefold and is summarised in the box below. The following two sub-sections deal with this question by criticising alternatives to the use of economics whilst the third sub-section focuses on recent inappropriate and ineffective uses of economics in health care priority setting.

#### WHAT'S WRONG WITH WHAT I DO NOW?

- (1) Generating "wish lists" with no conception of where resources will come from to pay for these.
- (2) Prioritising according to "burden of illness" rather than "benefits obtained for resources spent".
- (3) Inappropriate use of cost effectiveness league tables (CELTs).

#### *Generating wish lists (or "ostrich economics")*

Despite providing interesting information, several policy documents produced by national expert groups on particular aspects of health care are unhelpful for priority setting (Department of Health, 1993). This is because such documents usually recommend changes in practice or extensions in services which have resource consequences. Little indication is given of where resources are to be obtained to pay for the implementation of such "wish lists" or, indeed, whether their implementation is worthwhile relative to the current allocation of resources.

It may not be the role of such documents to suggest what changes should take place on a local basis in order to meet national policy recommendations. However, many documents produced by local purchasers reflect the same problem.

Thus, it seems that many purchasers are comfortable with no explicit rationing at all (Klein and Redmayne, 1993). This perpetuates the pretence that no rationing at all is necessary and does not permit any definition of objectives or any analysis of whether such objectives are being met (Mooney, 1992). It fails to recognise the first premise of economics, scarcity of resources, because it denies the inevitability of choice. Such an approach is impotent to deal with the basic problems that face every purchaser (and provider) of health care. More seriously, such an approach involves rationing by stealth, the "costs" of this being inefficiency and loss of accountability. A framework based on economics tools can help overcome such costs.

A realistic argument against explicit rationing is that the techniques are not available to allow this to happen - or, at least, for people to feel comfortable with such rationing. It is the lack of objective comparisons which much of this handbook addresses.



### ***Burden of illness***

Purchasing activity has tended to focus on the production of reports taking a “needs assessment” or “burden-of-illness” approach to priority setting. One such approach is to measure the total amount of ill health, categorised by disease, and to claim that this gives a picture of relative “need”. Priorities are then set according to the size of the need. Caricaturing this epidemiologically based approach, a group working on a priority setting exercise would assess population needs for the services being considered and the extent to which these needs are currently being met, then make recommendations to reduce unmet need. Cost is included around the fringes of the exercise, but essentially another “wish list” of new ways to spend money is the result. In England, Project 26 epidemiologically-based needs assessment reports show elements of this approach (Stevens and Raftery, 1994), although cost effectiveness analyses are also used. The early experiences of the Welsh Health Planning Forum also encountered these types of problem (Cohen, 1995).

Using this approach, priority, in terms of use of health care resources, would then go to alleviating or analysing the diseases which are the big killers, big resource users or big sources of morbidity in society. Other similar “burden-of-illness” approaches to priority setting are “cost of illness” studies (Shiell *et al.*, 1987). In addition to Project 26, prominent examples in UK health care policy making are the uses of this approach in the documents “The Health of the Nation” and “Scotland's Health” (Secretary of State for Health, 1991; Scottish Office Home and Health Department, 1992).

#### **QUESTION MARKS OVER A “BURDEN OF ILLNESS” APPROACH TO PRIORITY SETTING**

- ? Burden of disease ignores effectiveness**
- ? Changes in costs are not accounted for**

Such approaches simply tell us whether one problem is bigger than another. For priority setting, they do not actually come up with a resource allocation rule except to imply “the bigger the problem the more money it should get”. Except by chance, this rule is unlikely to lead to the objective of maximising benefits to the community given resource constraints.

The reason for this is that there are two major flaws with such an approach. First, “total need” *per se*, and “total cost” to an extent, are red herrings. It is changes in need (or marginal met need) that should constitute the outcome measure. It is not the size of a disease or illness that counts but what can be done about it in terms of the effectiveness of interventions. The second flaw is that changes in costs resulting from interventions are ignored.

It is only by matching the costs of health care interventions to the benefits produced (or needs met) that we can choose the mix of health care resources which maximises benefit (or met need) to the community. This does not mean, however,



that economists would propose to measure the costs and benefits of all existing and new health care. Given that every health board or authority already has a given starting point in terms of its current uses of resources, the important thing is to make changes in such allocations which result in greater benefit than before. Thus, we need only analyse the costs and benefits of the proposed changes. This may mean that it is important to know the starting point (i.e. how resources are currently used), a point explored in more detail in Section 8 below. However, the important point to recognise is that redeployments of resources will mean that some areas of health care will lose resources in order to pay for expansions elsewhere. It is necessary to get this across to participants in priority setting early on in any exercise (Cohen, 1994). Economists call such analysis of change or redeployment "marginal analysis". (It should be borne in mind at this stage that, despite the everyday-language association of the word "marginal" with "insignificance", in health economics it is a crucial concept. It focuses on change, and, within the context of health care purchasing, such change can be large or small.)

A common example which is used to demonstrate the different results from the use of the economic approach as opposed to a burden of illness approach is chiropody for people over the age of 75 years. This has been shown to represent good value for money in terms of health gains relative to resources spent (Bryan *et al.*, 1991). Yet, it would not rank highly under a burden of illness approach as, relative to other conditions, foot problems do not cause major morbidity or mortality or lead to large health care costs in total.

An economics approach would avoid these logical flaws. However, the application of such an approach is not so straightforward. For example, how does one decide on the changes to focus on in MA? It is issues such as this which are addressed Sections 6-10 of this handbook.

### ***Recent uses of economics in purchasing***

Economics focuses on the need to make choices between alternative courses of action when all are beneficial but not all can be achieved within current budget. Its potential relevance to the NHS in general and to purchasing in particular is, therefore, obvious. Health economics is still a young discipline, however, and the transfer of sound principles into practice can be difficult. Prior to the internal market reforms, economics tended to be used too late in the decision-making process and to be focused on cost (although there are notable exceptions such as the option appraisal technique used for capital schemes). This is reflected in the following quote:

**"Because few decision makers actually have the objective implied in cost-effectiveness analysis and even those who do rarely have a societal perspective..., it is not surprising that societal cost-effectiveness analysis has been infrequently used to set policy." (Detsky and Naglie, 1990)**

In the early days of purchasing, economists were called on to support public health physicians in preparing needs assessment exercises. The structure of these projects was often such that the economics contribution amounted to little more than a review of the available literature. This source material often proved patchy in



terms of its coverage, methodological quality and relevance to the situation facing the local purchaser. Economic literature reviews produced few helpful implications and were tucked away in appendices alongside data sources, resulting in dissatisfaction all round. A review of the plans of English purchasers in 1992/3 noted, "**The most immediately striking aspect is the lack of any attempt to mobilise 'science' in setting priorities.**" (Klein and Redmayne, 1992).

Cost-effectiveness league tables (CELTs) were the main tool available for economists at this time. These were also known as cost-per-QALY league tables (showing ratios of the net cost and quality adjusted life years gained for a health care intervention relative to an alternative way of treating the same patients). The technique tackles the issue of cost and health gain head-on: a simple interpretation of the table is that switching spending from services with high costs per QALY gained to services with low costs per QALY will ultimately yield more QALYs for the local population from a given budget.

Attempts to apply this thinking to policy issues began to raise a number of questions about the technique, many of which are still unresolved. Particular attention focused on the relevance to local situations of a single CELT, built up over time in the economics literature from a number of evaluations carried out in different care settings at different points in time and with subtle, but potentially important, differences in method. In addition, each item in a QALY league table has a different comparator. An intervention can be made to "look good" by comparing it with another intervention which is not "value for money" anyway.

It should also be remembered that league tables contain programmes of various sizes. Thus, a package of two projects (A and B) together may produce more QALYs than a larger project (C) which uses the same amount of resources. This may be the case even if one of A or B is lower down the league table than C. League tables account only for individual projects rather than combinations of projects.

#### **QUESTION MARKS OVER QALY "LEAGUE TABLES"**

- ? Different studies done in different places at different times**
- ? Local relevance**
- ? Each item in the "league table" has a different comparator**
- ? Coping with combinations of projects**
- ? Purchasers are not involved in their construction**

It has also become clear that purchasers are not QALY maximisers: while economists usually claim their techniques are an aid to decision-making rather than a self-contained answer, this weakened the perceived relevance of the technique. Economics is often "sold" as being useful in rendering explicit any assumptions



which have been made about values. Yet, if the purchaser is not involved in the construction of league tables, s/he has not been involved in making such value judgements (i.e. deciding how much weight to attach to an improvement in quality of life or eliciting such weights from local people) and, unsurprisingly, will not see their relevance to the local situation.

More recently, a refined version of the CELT has been marketed as the PRIORITY consultancy package. This aroused interest amongst Scottish purchasers, with the majority of mainland health boards deciding to explore the technique further. PRIORITY refines the QALY technique in two ways:

- stressing the need for locally relevant data to be used, including costs, epidemiological data and, where available, outcomes. In addition, local values should be used to trade-off length and quality of life when calculating QALYs.
- taking account of purchasing objectives other than health gain by using an option appraisal framework, with objectives being weighted to reflect their relative importance before options are scored. As the weighting was based on the trade-off purchasers would accept in terms of health gain foregone to meet the other objectives, the final benefit measure could be interpreted as weighted or augmented QALYs.

Both of these developments strengthen the CELT approach, although the concept was not particularly original (see Breen, 1991). Some of the practical issues raised include the question of whether local purchasers have the resources or skills to evaluate every service in which they are interested. Another "chestnut" is who should be involved and at which stages of the process - should purchasers decide objectives alone? are the techniques available to ask the public to value health states in a valid and reliable way? are there sufficient data to complete the exercise?

There are more fundamental concerns, however:

- the PRIORITY technique is still based around the Rosser health status classification, designed over twenty years ago to classify the output of an acute hospital. It uses disability and distress as its dimensions of "health-related quality of life" which have been demonstrated to be insensitive to meaningful changes in health in sectors such as care of the elderly. Unless a new technique can be incorporated, the technique can be applied only to acute services and only to those whose main outputs are reductions in disability and distress.
- CELTs assume that services are being provided at the least possible cost consistent with achieving health gain (production at least possible cost being known to economists as "technical efficiency"). This is evidently not the case. Contract negotiations between purchasers and providers often focus on day-case surgery rates, generic prescribing, skill-mix and so on. The aim of these is to maintain the same level of health gain at less cost, so releasing resources to be used elsewhere without anyone suffering as a result. Sticking strictly to economic theory, it would be dangerous to pursue allocative efficiency (i.e. reallocate



spending between services in the way a CELT suggests) without ensuring technical efficiency.

- even without this issue, it is not clear that any purchaser is willing to risk the publicity that would result from a decision not to purchase an effective service (i.e. one that produced health gain) on the grounds that the benefits were insufficient relative to benefits which could be obtained by using the resources in a different way. A system that is specifically aimed at producing this sort of policy input is not especially relevant, although it is possible that one day its time will come. Generally, purchasers seek technical efficiency savings to make investments in service developments.

Given these concerns, what alternative tools are available? One consideration to bear in mind when thinking about this question is that, economics cannot deliver a substitute for the judgements involved in priority setting in the way that a “league table” appears to do. What is required is a framework which recognises scarcity of resources, the need to make choices and, therefore, that value judgements about alternative uses of resources are the basis of setting priorities. It may, of course, be possible that cost per QALY information in some form (but not in the form of a league table) can be used within such a framework.

It is our view that PBMA provides such a framework. But what is PBMA?

#### **4. WHAT IS PBMA?**

**Stated simply, PBMA involves two related activities, these being (1) to examine current spending on a particular service or programme and its component parts and (2) to analyse whether there is a better package of care that would use the same resources but meet the objectives of the service to a greater extent.**

A potential strength of the technique is that it can fit into the existing work of a purchasing organisation. Purchasers already use multi-disciplinary groups to review specific services, which provide a ready made forum to experiment with the approach.

The basic logic of the PBMA approach is outlined in the box below. Experience has taught us that purchasers are reluctant to begin to suggest changes in the delivery of services unless they have some idea of how resources are currently distributed either within or between programmes. Once this is done, questions can be asked about possible changes in the distribution of resources. However, in a budget-neutral situation this will mean that some services have to lose resources in order to pay for expansions elsewhere. The logical conclusion, therefore, is that we need to examine the costs and benefits of the proposed courses of action.

#### **WHY SHOULD PURCHASERS BE INTERESTED IN PBMA?**

**Because PBMA addresses the following issues:**

- (1) How can we know where we are going if we do not know where we are? (i.e. how are resources currently used?).**
- (2) Once we know where we are, we can begin to examine how our limited resources can be redeployed in order to produce greater benefit for the community.**
- (3) Redeploying resources will mean that some areas of health care will lose resources in order to pay for expansions elsewhere.**
- (4) Therefore, we need to know the costs and benefits of proposed courses of action.**

There are two main ways of applying the framework of PBMA. The first is to work at the level of health care programmes and to examine priorities within such programmes. This is known as "micro PBMA". The second is to work at the level of the purchaser's overall budget and to examine priorities between programmes. This is known as "macro PBMA". It is important to emphasise that these are not substitutes but complements. A macro view may point to a programme which needs to be examined in more detail in a micro PBMA. Conversely, a micro PBMA may



show that not many proposed developments can be implemented within current programme spending and, therefore, that if such developments are thought to be worthwhile, resources must come from elsewhere within the “macro” budget.

Each of these approaches to PBMA is outlined in turn.

**Micro PBMA**

The five basic stages of PBMA are outlined in Table 1. In deciding on a programme to analyse, thought needs to be given as to what constitutes a "programme". The main source of debate around this issue is whether programmes should be disease- or client/service-specific. An example of the former is diabetes whilst an example of the latter is child health services. There are no hard and fast rules. The driving force will be the classification which best suits the purchaser. It will be seen that a mixture of disease and service approaches have been taken. Some classifications, such as child health services, cut across several specialities and other services, making resource use difficult to measure accurately. If the classification is deemed to be sufficiently important, however, it may be worth estimating such resource use. This issue is addressed in more detail below.

**Table 1 Five stages of PBMA**

<b>Stage 1</b>	Identify the programme
<b>Stage 2</b>	Statement of expenditure and activity by sub-programmes (i.e. the "programme budget")
<b>Stage 3</b>	Decide on services which are candidates for expansion/introduction and services which are candidates for reduction
<b>Stage 4</b>	Measure costs and benefits of proposed changes (i.e. marginal analysis)
<b>Stage 5</b>	Recommend changes based on cost and benefit information

The second stage involves compiling a statement of the activity and expenditure incurred in each part of the programme. An example of a programme budget for intrapartum care used in a PBMA of maternity services in Grampian Health Board is displayed in Figure 1. It can be seen that the Figure contains activity as well as financial data: cells with cases working out as planned being headed “activity”; cells based on transfers (e.g. because of complications) being headed “transfers”; and cells with cases resulting from births in unplanned locations (usually at home when the birth was planned to take place elsewhere) being headed “accidental”. Along with this, a list of definitions of each cell in the matrix was produced. This matrix format for a programme budget seems to be conventional. However, it is possible to have more than two dimensions. The shaded areas (e.g. B1) represent cells which simply do not make sense (i.e. we would not expect to observe any activity or expenditure in such boxes). These data contain many imperfections. However, this stage of the work helps to define a programme and its component parts (or sub-programmes) and permits an assessment of "where the programme is at" before any changes in uses of resources are considered. It could even be argued that the fact that PB exposes imperfections is an advantage of the technique in itself.

**FIGURE 1 PROGRAMME BUDGET OF ACTIVITY AND EXPENDITURE IN INTRAPARTUM CARE**

LOCATION OF DELIVERY	BOOKED FOR:				
	HOME	DOMINO	GP/MIDWIFE CARE (non-DOMINOS)	OBSTETRICIAN CARE	
ABERDEEN MATERNITY HOSPITAL SPECIALIST	A1 Transfers - 8 £6,584	A2 Transfers - 26 £21,398	A3 Transfers Turner - 11, Maryhill - 128, Peterhead - 56, Seafield - 29, Chalmers - 29, Torphins - 4, Leanchoil - 19, Fraserburgh - 60, Jubilee - 12, Insch - 2. £288,050	A4 Activity/Transfers - 4000 £3,292,000	
ABERDEEN MATERNITY HOSPITAL MIDWIVES UNIT	B1	B2 Activity - 82 £47,756	B3 Activity - 1595 £825,244	B4	
COMMUNITY HOSPITAL	C1	C2 Activity - 6 £2,000	C3 Activity Turner - 26, Maryhill - 234, Peterhead - 122, Seafield - 64, Chalmers - 78, Torphins - 45, Leanchoil - 52, Fraserburgh - 151, Jubilee - 42, Insch - 6. £349,300	C4	
OUTWITH GRAMPIAN	D1 Ninewells/Raigmore Hospital - 0	D2 Raigmore/Angus - 0	D3 Activity - 13 £17,142	D4 Extra-contractual referrals - 38 (including Ninewells - 10) Raigmore-239 £452,150	
HOME	E1 Activity Data - 28 £12,880	E2 Accidental - 3 £1,380	E3 Accidental Turner - 0, Maryhill - 4, Peterhead - 4, Seafield - 0, Chalmers - 0, Torphins - 1, Leanchoil - 0, Fraserburgh - 0, Jubilee - 0, Insch - 0. £4,140	E4 Accidental - 9 £4,140	



More importantly, however, PB helps to stimulate thought about where possible future changes in uses of resources within the programme might be. This should be done in combination with an assessment of whether sub-programmes are meeting their objectives. Objectives, rather than outcomes, are emphasised because outcome data will not be readily available in most contexts. By looking at expenditure and activity on a particular sub-programme, it may be thought that it receives too many resources for what it achieves. Therefore, it would become a candidate for service reduction to be looked at more closely. Likewise, candidates for service expansion may also arise out of this process and, in some activities, it might be decided to take no further action at this stage.

It is important not to put too much emphasis on PB. Thought about where changes could be made may not be stimulated by PB alone. Although needs assessment has already been criticised, it could be argued that PB is just as arbitrary a way of beginning the process of priority setting. PB gives a picture of total resource use whilst needs assessment gives a picture of total need. There is no theoretical reason why these activities cannot be combined to stimulate thought about candidates for service reduction and expansion. In addition, other factors will play their part, such as local knowledge of purchasers and providers or surveys of members of the community or client groups. (The role of PB in PBMA is questioned in more detail on pages 28-33 below.)

The whole package of information, whether it be PB or needs assessment or whatever, simply provides a background for judgement about possible service developments (which can include new services as well as expansion of existing ones) and possible service reductions which would have to take place to allow such developments. Thus, the output of PB is stage 3 of the process, a list of candidates for service expansion/introduction and candidates for service reduction. The candidates for service reduction should be those about which there is most doubt about how well objectives (or outcomes) are achieved given the resources spent. Of course, on occasion, it may be that a sub-programme is not adequately achieving its objectives because it requires more resources, not less. Such sub-programmes may then become candidates for service expansion. Generally, candidates for expansion should be those with the most potential to increase benefit as resources spent increase.

One further point to discuss by way of introduction is whether lists of candidates for service expansion and reduction address issues of technical efficiency or allocative efficiency (which were introduced above on page 7). This is an important distinction. With technical efficiency, the objective of a service is taken as given. Technical efficiency is about how best to achieve that objective. As in Table 2, one may decide to compare day surgery versus an inpatient stay for some childhood conditions, such as tonsillitis. With such a comparison, the group of tonsillectomy patients are not losing out on treatment: the question is simply one of how they will be treated. A broader question, one of allocative efficiency, is whether more childhood surgery should be done at the expense of less resources going into outpatient clinics for asthmatics. This will involve one group of patients/clients being denied services in order that another group can benefit. This should happen only if more benefit is gained than is given up and, thus, overall benefit is increased.



**Table 2 Technical and allocative efficiency questions within child health services**

Technical questions	Allocative question
Day surgery versus inpatient stay for tonsillectomy	Surgery for tonsillectomy versus outpatient clinics for asthmatics
Local clinics versus hospital-based clinics for treatment of chronic conditions (like asthma)	

In principle, both types of question can be faced by PBMA. However, it will be seen from the examples to follow that decisions involving allocative efficiency are more difficult ones to make, even if such allocative decisions are taken implicitly in health services every day.

Stage 4 is for candidates to be compared through marginal analysis, the "MA" part of PBMA. MA involves comparison of the candidates in terms of costs and benefits. More precisely, this stage is about assessment of the costs and benefits of changes in uses of health care resources. As noted above, if, by making a change, more benefit can be produced in total, then the change should be made. It is, of course, possible that a result of this more detailed phase of analysis is that some candidates for service reduction are not in fact reduced and some candidates for expansion are not introduced. This would arise in situations in which the candidates for expansion do not add enough benefits for the extra resources spent (or, more accurately, resources required) relative to the benefits being produced already by the candidates for reduction.

Continuing with the example of maternity services in Grampian, a MA of costs arising from various proposed changes is shown in Table 3. The assumptions underlying these initial cost estimates are outlined in the left hand column of the table. The data reflect only those costs which would change as a result of the proposed expansions and reductions. The modest increases in activity amount to £102,496 (i.e. £56,496+£46,000) in total whilst the substantial increases result in total costs of £569,760. These increases are matched by potential cost savings of £598,320. Overall, the expansions proposed could be financed out of the proposed reductions. This is, of course, based on the assumption that the savings estimated from such reductions would be realised in cash terms. In this respect, the reader is reminded, particularly in the areas of reduced antenatal visits and less activity at Aberdeen Maternity Hospital, that it is a question of releasing resources not cash. Such resources (e.g. midwifery staff time) could be diverted from hospital to community care. Less confidence was placed on obtaining any savings from the closure of units such as Turner (see Figure 1), but more on the savings from Raigmore. All of these costs are estimates and simply provide "ball park" figures to help set the framework for more detailed discussions regarding the implementation of any shifts in resources and practical issues such as the release of resources for reallocation to alternative uses. It does seem, however, that the modest expansions are achievable within the current budget but that the more substantial expansions are less likely to be affordable.



**Table 3 Incremental costs of proposed expansions and reductions in maternity services**

PROPOSED EXPANSIONS	COST
<p><b>Increased activity in Moray (mainly at Dr Gray's)</b>            Current proposed activity: 1000-1,100 births p.a.            Modest increase: 60 DOMINO/home births            Substantial increase: 600 DOMINO/home births</p> <p><b>Increased DOMINO/home deliveries in Aberdeen</b>            Current activity: 1,991 normal births p.a.            Modest increase: 120 DOMINO/home births            Substantial increase: 1200 DOMINO/home births</p> <p><b>Increased DOMINO/home deliveries outwith Aberdeen and Dr Gray's</b>            Current activity: 1,120 normal births p.a.            Modest increase: 70 DOMINO/home births + 500 others            Substantial increase: 700 DOMINO/home births</p>	<p>£56,496            £274,000</p> <p>To be absorbed            £116,000</p> <p>£46,000            £179,760</p>
PROPOSED REDUCTIONS	COST SAVINGS
<p><b>Reduced antenatal visits</b>            The average number of visits to be reduced from 13 to 7/8</p> <p><b>Downsizing activity at AMH:</b>            A. The above expansions could result in between 960 and 1090 maternities being moved out of AMH.            B. The post natal length of stay to be reduced for normal births from 3.5 days to 2.5 days.            Cost reductions are assumed to be those of a small ward including overhead costs and reduced staff. This could be equivalent to making available 9 - 10 midwives (E grade) to work in the community.</p> <p><b>Down-sizing activity at Raigmore</b>            These are currently funded on a cost per case basis. Funds will be released as a result of change in the size of the contract but it is unlikely that the full amount currently paid to Raigmore will be available.</p>	<p>£196,460</p> <p>£160,000</p> <p>£241,860</p>

Two further issues are worthy of note at this point. Firstly, most of the changes in Table 3 reflect technical efficiency (i.e. treating the same group of people differently). It could be argued, however, that some of the proposed changes deal with allocative efficiency in that there could be small reductions in benefit for some people at antenatal and post-natal stages in order for gains to be had elsewhere.

Secondly, the area of pregnancy and childbirth is probably that with the largest collection of evidence from randomised trials for any area of health care; the (updated) database on Effective Care in Pregnancy and Childbirth (ECPC) (Chalmers *et al.*, 1989). Yet, in the Grampian exercise, outcome data from ECPC applied to one area of proposed change only; that of early post-natal discharge.

There are some trials of continuity of care but none directly comparing DOMINOs or home births with conventional delivery. Obviously, there are no trials on whether to locate services in Aberdeen or Elgin! The location of services is a common priority setting issue about which there is unlikely to be any evidence from the literature now or in the future.

However, at this stage it is important to emphasise that the most important role of PBMA is the framework it provides; based on a logical way of thinking with regard to priority setting for purchasing.

Locally-relevant estimates (or descriptions) of the costs and benefits of proposed service changes are, ultimately, the outputs of PBMA. These can then be used in stage 5 to make recommendations.

### ***Macro PBMA***

A logical extension of micro-PBMA is macro PBMA - although it could be argued the other way around, i.e. that the logical extension of the macro approach is the micro approach!

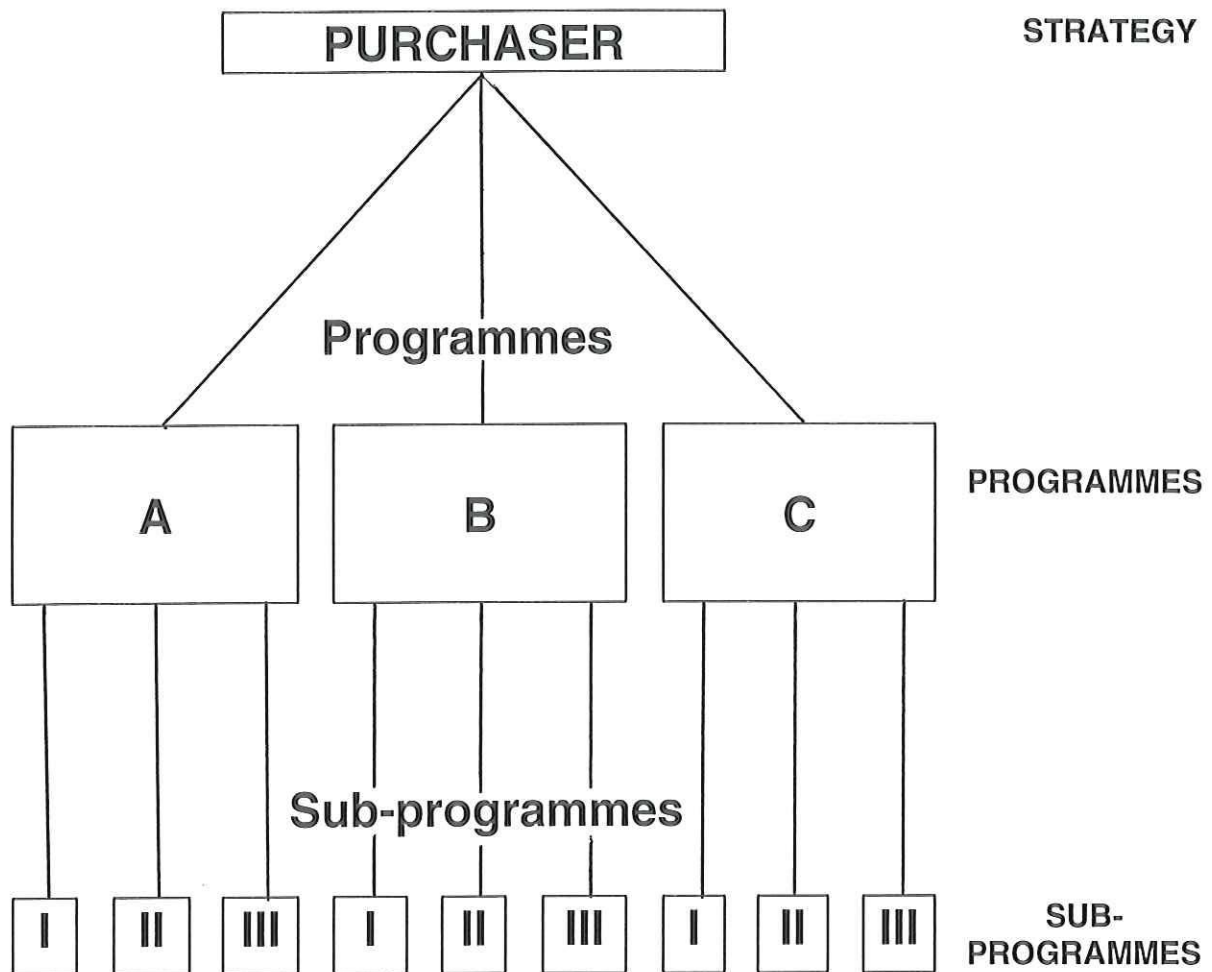
The best way of conceptualising macro PBMA is as in Figure 2. It involves disaggregating the purchaser's total expenditure into programmes. Programmes may be defined in terms of groups of specialties, disease groups, service settings or in terms of client groups. The definitions would reflect purchasing strategy. Strategy will embody broad purchasing objectives such as mortality reductions across a range of disease groups, and programmes A to C would reflect these objectives. Sub-programmes (e.g. A1 to AIII) would be defined in relation to the objectives of specific programmes. For example, different rates of heart disease are linked to socio-economic and geographic differences in deprivation, so sub-programmes of A might be expenditure on heart disease by geographic area.

Obviously, in this model of purchasing, resources can be moved across programmes (e.g. from A1 to CII), whereas the micro PBMA model restricts the analysis to examination of changes only within programmes. The programme budget has a potential role to play by offering a basis for improving on current subjective judgements regarding the appropriateness of the level of expenditure on programmes (as opposed to expenditure within programmes) and, thus, regarding the choice of programmes for further macro-level analysis where programme expenditure appears inappropriate. For example, in Mid Glamorgan, the distribution of total spending across the programmes in 1993-4 was as listed in Table 4.

At one level, such information increases understanding of the current situation. It is purely descriptive, however: the first problem is how to translate this into options for change. There is nothing in this presentation of financial information which allows a purchaser to judge whether spending more on "cancer" than on "oral health" is appropriate. However, it may generate a question: what would reallocating (say) £500,000 of purchasing power from cancer services to oral health services achieve in terms of net health gain? This is the type of issue that is amenable to evaluation.



**FIGURE 2 MACRO-LEVEL PROGRAMME BUDGETING**



**Table 4 Spending by health gain area in Mid Glamorgan (combining District Health Authority and Family Health Services Authority expenditure)**

Health gain area	DHA & FHSA spending (£m)	%age of total
Cancers	18.6	5.5
Cardiovascular disease	46.1	13.7
Maternal and early child health	27.6	8.2
Physical and sensory disability	32.8	9.7
Pain, discomfort & palliative care	46.5	13.8
Oral health	14.3	4.2
Respiratory disease	29.3	8.7
Injuries	19.0	5.6
Learning difficulty and disability	13.9	4.1
Mental distress and illness	38.4	11.4
Healthy living	8.2	2.4
Healthy environments	13.5	4.0
Other	28.8	8.5
<b>Total</b>	<b>241.9</b>	

Source: Cohen (1994)

An alternative is to use some form of comparator or baseline to raise questions about current spending. Here, the programme budget is crucial. Three types of comparison have been discussed:

- comparisons of spending distribution with that of other purchasers with similar population characteristics and service provision structures - note that care must be taken in ensuring common programme definitions and cost allocation methods.
- in East Sussex, the proportion of spending on different age groups was compared with the weights used in the national resource allocation formula to reflect relative needs (Brambleby, 1995).
- comparisons of well-defined population groups within the purchaser's catchment area - mergers of health authorities in England offer the scope for comparing two populations, for example. As purchasers define localities to devolve purchasing activities, a PB approach may be possible at this level too.

In each case the purpose of the comparison is to invite the question, "Why are there differences between the local position and the comparison group?" rather than implying that either distribution is inherently correct. As with other aspects of PBMA, the problem is to start asking questions amenable to analysis.

Clearly, "top-level" PB, like this, has great potential in assisting purchasers tackle the national policy agenda on reallocating spending away from acute secondary services and into primary and community-based care.

It could be argued that the macro approach is more difficult to apply because it is harder to make comparisons of the costs and benefits of diverse programmes and sub-programmes. However, diversity within programmes, such as child health, can make intra-programme comparisons equally difficult. Furthermore, it is important to emphasise that such comparisons take place implicitly anyway and, again, that the importance of PBMA lies in the framework it provides for aiding such comparisons.



## 5. WHY NOW FOR PBMA?

PBMA is not new, as indicated in the introduction to this handbook and in the first quotation in the box below. Some readers may even remember PBMA being talked about in the NHS in the 1970s and 1980s! But why is it the case that it was not much used then but offers great potential now?

Part of the answer to this question lies in the second quotation in the box: the programme budget tended not to be generated by those who would be using it. Therefore, the relevance of the information was somewhat diminished.

### **PBMA IS NOT NEW!**

**“A new concept has been adopted for the 1964 agency estimates: namely that of zero-based budgeting. This means that all programs will be reviewed from the ground up and not merely in terms of changes proposed for the budget year....Consideration must be given to the basic need for the work contemplated, the level at which the work should be carried out, the benefits to be received, and the costs to be incurred.”**

**(US Department of Agriculture, 1962)**

**Six weeks later “25 sets of binders representing agency estimates, most taking up three feet of shelf space, appeared in the Office of Budget and Finance.”**

**(Wildavsky and Hammann, 1968, p147)**

Furthermore, the culture in the NHS is changing, largely as a result of two factors:

- the purchaser-provider split clarified the role of each agency and explicitly made it the objective of the purchaser to address the health care needs of the local population within a fixed budget. If it is accepted that “need” can be redefined as “ability to benefit”, then maximising “met need” produces an objective comparable to economic efficiency (i.e. maximising benefits from a given budget). The situation is not this straightforward, as we will see later, but produces an environment that is potentially receptive to economics.
- a growing acceptance among all types of NHS staff that resource scarcity was not the product of a particular government or dogma but a fundamental factor that would have to be addressed in all future decisions. This is not to say, “We are all economists now”, merely that the potential relevance of means of assisting with difficult decisions is more widely recognised.

This “favourable climate” is to be welcomed. However, it should be remembered that although “programme budgeting and marginal analysis (‘PBMA’) has received a new lease of life as a result of the introduction of the purchaser-provider split in the United Kingdom,.....it does not require such a split to exist before the ideas and techniques used can have value..... All that is required for the PBMA approach to be relevant is that there are concerns about how best to decide priorities in health care” (Madden *et al.*, 1995).

The potential advantages of using an economics approach to priority setting have been established. As part of that, it is possible to say that the potential advantages of MA have also been established. The role of PB is less clear cut; this issue is discussed in Section 8 below (see page 28). However, it is important to move onto the question of what practical issues arise in attempting to implement this concept and what can be learnt from past experience? It is these issues to which we now turn.



## 6. ISSUES RAISED BY PBMA

Some of the issues that have arisen from PBMA experiments to date will be familiar to many purchasers. This is because many of these issues are common to all priority setting techniques. For example, it is our own belief that the values of members of the community should be included in the priority setting process. But, overcoming the challenges set by this task is not necessarily the preserve of health economics. Prescriptions for this, if they are available, cannot be described briefly.

Therefore, it is our intention, in the following four sections to concentrate on issues which are quite specific to the PBMA approach. Again, many of these issues will be familiar to readers: how are options for change and potential savings identified? how can they be evaluated? how should the PB aspect be used?

These issues have been grouped under the following four headings:

- remit (choosing a programme, defining and allocating tasks, involvement of different groups);
- the role of the programme budget and problems in its construction;
- identification of options; and
- evaluation of options.

All four of these issues are relevant to micro PBMA. The first, however, is of less importance for macro PBMA. These are addressed in turn in Sections 7-10.

## 7. REMIT

In establishing the remit for a group whose task is priority setting, there are three main issues to address: how to choose programmes, what tasks are involved (including which groups have the most appropriate skills to carry out these tasks) and the timetable for a PBMA exercise.

REMIT
<p>There are three main issues to address in establishing a remit:</p> <p>(1) how to choose programmes</p> <p>(2) what tasks are involved, and</p> <p>(3) timetable</p>

### *Choosing programmes*

Two approaches have been used. One is to define a comprehensive set of programmes to be tackled in turn, while the other reviews particular subjects as the need arises. Examples of the former are contained in Table 5, where it can be seen that two independent exercises resulted in considerable overlap. Examples of the latter, "one-off" type include gynaecology in Greater Glasgow Health Board, maternity services in Grampian Health Board and child health services in Tayside Health Board<sup>1</sup>.

**Table 5 Examples of definitions of programmes to be addressed by PBMA**

<i>Mid Glamorgan</i>	<i>Southampton</i>
maternal and child health	pregnancy and the new-born
mental handicap	
injuries	injury
emotional health	
mental distress and illness	mental health
respiratory disease	infection and internal disease
cardiovascular disease	circulatory disease
cancers	cancer
physical disability and discomfort	mobility and the senses
healthy environments	
	other

Sources: Cohen (1994); Lockett *et al.* (1995)

<sup>1</sup> From this point onwards, the document will refer to examples of PBMA in various purchasing authorities throughout the UK. For those requiring more detail on these, the relevant articles are listed either in the reference list or in the further reading list in Appendix 1.



Notably, one-off exercises have tended to focus on specialty groups, while the comprehensive programmes are defined on the basis of disease group or client group. Is either approach “correct”?

The principles of PB state only that a “programme” should have some coherent sense. For example, programmes could be defined as coherent on the basis of either client groups (e.g. frail elderly people), disease groups (e.g. cancer) or even specialties (e.g. ear, nose and throat surgery).

Arguments for a specialty-based approach are summarised in the box below, along with corresponding arguments for a disease-based approach and a list of conditions which either classification should consider.

**ARGUMENTS FOR STARTING WITH  
A SPECIALTY-BASED APPROACH TO PBMA**

- (1) Routine data sets are organised on a specialty basis.**
- (2) Allocation of much spending to disease-based programmes is unclear.**
- (3) Reallocations within disease groups may be difficult.**

**ARGUMENTS FOR A CLIENT/DISEASE-  
BASED APPROACH TO PBMA**

- (1) Corresponds more closely to purchasers’ health strategies.**
- (2) Provides a clearer focus for “health gain”.**

**THE BEST CONDITIONS FOR CHOOSING ANY APPROACH**

- (i) The issue is high on the local agenda.**
- (ii) Background data have already been assembled.**
- (iii) Local expertise is available (but not essential).**
- (iv) No major service development or policy review has recently taken place.**

Our judgement would be that it is easier to start experimenting with PBMA by choosing a specialty. This is based on the following three arguments:

- routine NHS data sets are organised along the basis of care sector (acute, community, mental health) and specialties rather than client groups or diseases. Assembling PB data on the latter basis is possible, but should be the second stage of the exercise, once the purchaser is satisfied from a worked example of a specialty-based PBMA that the approach offers useful information to the



organisation. As discussed later, there is great potential to become “bogged down” in the PB phase; anything which reduces this danger in the first instance is to be welcomed.

- it is not clear how some spending is allocated to disease-based programmes, specifically acute admissions with no definitive diagnosis. This is partly evidenced by the third national review of contracting in England which showed that only 19 per cent of “main” contracts had a disease focus (Raftery *et al.*, 1994). In Greater Glasgow, ICD9 V codes account for 31 per cent of urology admissions, while the “other” category in the gynaecology exercise accounted for 26 per cent of spending. It may be precisely these areas that can produce the savings required to finance service expansions elsewhere within the programme.
- within a disease programme, it may be very difficult to reallocate spending within the next financial year without seriously dislocating the service. For example, the majority of spending on diabetes care is on the treatment of complications of the disease. Screening for retinopathy seems likely to prevent such complications (and spending) but implementation requires funding this year in order to make savings several years in the future whilst people with complications now still have to be treated. To fund expansions within the disease-based PB, a health board would have to stop purchasing services for blind diabetic people this year. A PB required to balance over (say) five years would help but ignores the absolute financial constraints purchasers face in any given financial year. It may be possible to overcome this by taking a broader (macro) view, i.e. comparing proposed expansions in diabetes care with care for non-diabetics. Funds obtained could be used to “pump-prime” screening activity now with a potential “payback” in resource savings in diabetes care in the future.

Client and disease based programmes correspond to the classifications used in many purchasers' local health strategies, allowing the principles contained in those documents to be studied in detail for implementation. Such programmes also provide a clearer focus for “health gain”. They must thus be the ultimate goal for developing PBMA.

Purchasers wishing to explore further the strengths and weaknesses of either specialty or client/disease-based approaches may prefer instead to select an area with the following characteristics:

- high on local agenda to lend impetus to the exercise but not so important that the exercise will be rushed. The technique is not inherently slow but the aim is to find out about the approach in the first instance.
- background data have already been assembled, thus proving helpful in identifying options. Authoritative evidence of inefficiency in the current service helps with the difficult issue of identifying savings.
- local expertise, although this may actually prove a disadvantage: in a PBMA exercise in Liverpool the heart disease group, with much local knowledge, made rapid progress initially but ran into problems in coming up with ways of saving



money while the group studying mental health services took longer to think about “the basics” of the programme but were able to suggest ways of saving money to spend on expansions.

- no major service development or policy review has recently occurred in the programme to be examined, at least for the first exercise. The Grampian maternity services exercise was dominated by a recent capital development which restricted consideration of options for change.

Note that the definition of sub-programmes within the chosen programme is addressed in more detail later.

### ***Involvement at each stage and responsibility***

Fundamentally, the project team have two tasks: to identify options for change and to evaluate them. Given that both areas involve considerable subjectivity, membership and allocation of responsibilities are very important. Several exercises to date have noted the danger of one or two lucid and forceful individuals (usually doctors) dominating proceedings and either questioning the need to make savings or of the validity of the exercise. Given the tasks involved, it is also important to consider the timetable for work, in particular when PBMA is best “fitted in”.

### **THE TWO MAIN TASKS OF THE PROJECT TEAM ARE:**

- (1) to identify options for change, and**
- (2) to evaluate these options quickly and accurately**

A recent review of the success of clinical practice guidelines suggests that changes in behaviour are most likely when local providers are involved in the process of drawing up the document (Effective Health Care, 1994). The issue of local ownership applies equally to PBMA. Common sense suggests that for common ownership of the plan providers and general practitioners must be involved in identifying ways of changing current decision-making. They have the advantage of knowing more about the current service than most purchasers. On the other hand, they are more likely to have vested interests to protect, so they cannot be relied upon as the only source of data and options, nor can they have the final voice in the evaluation of options. Purchasers, if they focus clearly on the health needs of the population and are determined to commission services on the basis of evidence, may be more likely to question aspects of current practice than those involved day-to-day.

## **MEMBERSHIP OF GROUPS: ARGUMENTS FOR INVOLVEMENT OF PROVIDERS AND GENERAL PRACTITIONERS**

### **THE CASE FOR:**

- (1) common ownership**
- (2) greater knowledge**

### **THE CASE AGAINST:**

- (1) vested interests**
- (2) clinicians may not question current practice**

How can the advantages of using each group be harnessed? Current PBMA exercises are experimenting with the use of two groups:

- a steering group to oversee the project and to evaluate options for change. Membership would include public health, contracts, finance and information.
- an advisory group to recommend options to be evaluated. Membership would include providers from hospital and community, general practitioners, local consumer body, and (possibly) patient groups and members of the public. In addition, there would be public health involvement from the purchasing organisation to assess the completeness with which options were identified. This group may also have a role in commenting on the evaluation of options for change.

## **STRUCTURE OF GROUPS**

### **STEERING GROUP**

**Include people from different functions within the purchasing organisation**

### **ADVISORY GROUP**

**Include providers, general practitioners, and consumer and patient representatives**

The responsibility for leading the exercise is thus clearly with the purchaser, although with the involvement of other relevant parties to the fullest extent possible.

One potential problem is that the latter group may be dominated by professionals; for example, doctors. However, the section below on options considers techniques to overcome this. Another potential problem is that the purchaser steering group is clearly the more powerful of the two; providers may feel that their role is subservient as a result. Thus, whilst purchasers have the final say in evaluation, local provider



expertise should be used wherever possible. A final issue is the range of interests to be represented. "Providers" are obviously not a homogeneous group; with sub-specialisation, it is not even clear that professional groups will have a single view. In some instances this can result in very large groups: for example, the mental health group in Mid Glamorgan had 35 members. In these circumstances it seems reasonable to question the definition of the programme: could the remit be narrowed?

With the number of interests represented, a facilitator has advantages (although in some cases, such as the Newcastle work on orthopaedics, even this is not sufficient; see paper by Craig *et al.* (1993)). It is not clear whether this should be someone who is perceived to be acceptable to purchasers and providers alike (e.g. a consultant in public health) or an independent outsider (e.g. an economist specialising in the methodology of PBMA) or a combination of the two.

The involvement of an economist is a difficult subject. Most exercises to date have used their skills but examples such as East Sussex show that it is possible to complete work without their contribution (Brambleby, 1995). Methodologically, the procedure is very straightforward: while some have chosen to start the exercise with a seminar on economics principles (Mid Glamorgan) others have found that telling the group there is no new money available for change is sufficient (Glasgow). Ultimately, this will depend on local confidence in using the technique and the availability of economists with the skills to assist.

### ***Timetable***

It is very difficult to address the issue of how long the exercise will take. This depends, amongst other things, on the size of the programme chosen, the importance of the programme, the availability of background data, the personnel involved, the degree of co-operation from providers, the size of the groups to be convened and so on. Another issue is, given that PBMA takes time, which purchasing activities should be given up to make space for it? Craig *et al.* (1995) emphasise that it is important that PBMA can easily fit into current activities of purchasers. Purchasers have very little free time to allocate. However, PBMA can fit into the usual work pattern of a multi-disciplinary group convened to review a specific issue. The only difference is that PBMA offers a structure recognising resource constraint around which the group can organise their efforts.

The timetable and allocation of responsibility are linked. PBMA is a multi-disciplinary activity, involving, *inter alia*, staff from public health, finance, planning and contracting. Each of these disciplines has its own functions to deal with, which, again, makes it difficult for PBMA exercises to be centre-stage, particularly when the exercise is lengthy. However, it could also be argued that the "multidisciplinarity" of PBMA is its strength in that it brings all perspectives to bear on an area of purchasing activity. But, if responsibility is not allocated to one or two people, the exercise is likely to be delayed or, worse, flounder.

## TIMETABLE

Timetable depends on:

- (1) size of the programme
- (2) importance of the programme
- (3) availability of background data
- (4) personnel involved
- (5) degree of local co-operation
- (6) size of groups to be convened

As part of an experiment in Newcastle, thought is also being given to how PBMA can be used to give more structure to the purchasing calendar (Craig *et al.*, 1995). A timetable which dovetails PBMA to the annual purchasing cycle is being developed, with different stages of the PBMA process scheduled throughout the year to allow sufficient time for the analyses to be undertaken. The need to inform providers of changes in purchasing intentions several months before contract negotiations, means that the final stage of this cycle would take place in the summer.



## 8. THE ROLE OF THE PROGRAMME BUDGET AND PROBLEMS IN ITS CONSTRUCTION

### *The role of the programme budget*

Some completed PBMA exercises have found that, in retrospect, they made little use of the "PB" part of the exercise. This is an important finding, since the data requirements make the PB aspect time-consuming with the potential for becoming "bogged down".

One response to this is to stress that it is important not to become bogged down in PB and to remember that the programme budget is intended to be an estimate of how resources are currently spent. It would seem odd, in a document such as this, to, first, advocate both PB and MA and then go on to say that one or other of these is of no use. However, as this has happened on some occasions, within micro PBMA's, it is important to outline alternatives which have been suggested and to stress when the PB part of PBMA is important. Our conclusion is that it is more a matter of how PB is used rather than whether it is used.

For example, another suggested way of stimulating thought about possible service expansions and contractions is to ask groups of purchasers, providers and consumers questions along the following lines:

"If spending on your programme were to be increased by £200,000 per annum, what would you spend it on and what would the effect be - if possible, in terms of both services and health, but, failing the latter, then in any terms in which an estimate can be made?"

and

"If spending were to be reduced by £200,000 per annum, what would go and what would the effect be in terms of services and health?"

This would produce options, just as a comparison of the programme budget with objectives does. The suggestion is not new as indicated in the quotation in the box below, taken from a critique of PBMA published in 1971.

**"There is an alternative way to encourage officials to reallocate funds. Each administrator in the budget-making hierarchy can be instructed to inform his superior what would be gained or lost if his agency's appropriation were expanded or contracted by certain amounts. This alternative appears to be both more promising and less costly than zero-based budgeting."**

**(Merewitz and Sosnick, 1971, p275)**

The above approach was actually used in a study of priority setting in dementia services for elderly people (Donaldson and Farrar, 1993) and since then has been used in priority setting exercises in Wales (Cohen, 1994). Neither relied on PB or needs assessment.



Therefore, it is possible to go straight to the margins in assessing the costs and benefits of proposed changes. Proponents of pure MA would say that knowing where you are does not matter - what does PB tell us about the current service that we don't already know? This is akin to the economics debate about the role of cost-of-illness studies, estimating the total resource consequences of a disease existing in society. This is very interesting information, but is it useful? What policy implications stem from the findings?

On the other hand those who propose the "PB" as well as the "MA" would claim that the knowledge generated by the PB exercise is important. In part, the scepticism about PB may stem from the alternative ways of identifying options for change listed above in Section 4: comparing the programme budget with a set of objectives is only one method of stimulating thought and to that extent its value is limited. Despite this, all those involved may wish to be reassured that they have at least an estimate of how resources are currently distributed before proceeding to identify and evaluate options. The level of uncertainty regarding how money is currently spent should not be underemphasised. As in the Greater Glasgow gynaecology exercise, PB can unearth surprising amounts of expenditure in unexpected areas. To some extent working through this stage of the exercise may represent useful "team-building", helping to create a good working environment for the more difficult stages to follow. For the purchaser, it has the crucial advantage of explicitly setting the whole project within the context of a fixed budget, stressing the need to shift spending within the programme.

Another advantage of PB is that of defining the service. The very act of going through this process, before any data on activity and expenditure are available, can result in suggestions for service expansion or contraction. Assembling a programme budget involves specifying the most useful axes for a table to show activity and finance data. This will depend on the programme and the group; examples from completed exercises include:

- gynaecology in Glasgow - care setting by diagnostic group;
- maternity in Grampian - care setting by type of care originally booked;
- ischaemic heart disease in Liverpool - care setting by type of care; and
- mental health in Liverpool - age of patient by geographical area by care setting.

The choice of axes (and hence of sub-programmes) requires a judgement as to the most meaningful format for data. In turn, this must be determined by the need to use the data assembled to identify options for change. Thus, is care-setting an appropriate dimension, given that it is very difficult to transfer resources across care boundaries (e.g. out of acute hospitals and into primary care)?

It is also important to point out that, although the end result of PB is often a programme budget with gaps and some very approximate estimates, this knowledge alone is of some value. It allows areas of information deficiency to be pinpointed, hopefully leading to improved methods of data collection in the future.

A final advantage of PB lies in its use at the macro level. In Section 4, it was pointed out that the programme budget can be crucial in comparisons with other purchasers,



comparisons of spending on different groups within a location and comparisons of localities within a catchment area.

The difficulties of constructing a programme budget are addressed in the following sub-section. However, before that, it is important to summarise when it is important to carry out PB as the first step in a priority setting exercise. This is set out in the box below.

The basic situations in which a PB exercise would prove useful are where purchasers have very little experience of the programme or little is known about the programme in advance, where organisation of care is fragmented, where the service is diverse and in macro PBMA. Further examples of PB will be required to assess the completeness of this list.

#### **WHEN IS A PROGRAMME BUDGET NECESSARY?**

**When is programme budgeting the most appropriate first step in the exercise? Based on our experience to date we would recommend use of a programme budget where:**

- **purchasers have little direct experience of the service**
- **there is no organised professional provider group with overall responsibility for treating the condition to generate analyses of current problems and proposals for change**
- **the service is so diverse that the current issues cannot be easily summarised but still form a homogeneous programme (gynaecology was one example, but cancer services may be another).**
- **a macro PBMA approach is used.**

The choice does not have to be about whether or not to have a programme budget, but rather how PB is used. For example, in a recent exercise in general surgery, the framework of a programme budget was constructed (see Figure 3)<sup>2</sup>. However, detailed information on activity and costs was collected only for the shaded cells. These are the areas which were of most concern to the health board involved and for which, as indicated in Figure 3, it was thought margins could be easily identified. However, the board still required information on the extent of current activity and costs within these cells before suggesting options for change. There seemed little point in collecting detailed information on the unshaded cells. In the case study of maternity services in Grampian outlined in Section 4, a programme budget was constructed only for the intrapartum stage, although options for change included ante-natal and post-natal care. The general surgery and intrapartum care cases could perhaps be referred to as examples of “programme budgeting at the margin”!

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<sup>2</sup> This programme budget is reproduced with the kind permission of its deviser, Sheila Scott of Argyll and Clyde Health Board.



**FIGURE 3 PROGRAMME BUDGET FOR GENERAL SURGERY**

Intervention appropriate for:	Care given in primary care setting	Care given in secondary care setting	Care given in tertiary care setting
Primary care setting		Possible negative margins: e.g. small sebaceous cysts removed by consultants	
Secondary care setting	Possible negative margins: e.g. melanoma removed by GPs		Possible negative margins: e.g. GPs referring directly or core consultants referring to non-core providers for interventions that could be carried out by core providers
Tertiary care setting		Possible negative margins: e.g. vascular surgery done by general surgery with general practitioner's anaesthetist	

***Constructing a programme budget***

What information is required to assemble a programme budget? As with the evaluation stage, the exercise can be as detailed (and time-consuming!) as is felt necessary to form a reliable basis for decision-making. An exercise in East Sussex Health Authority attempted to allocate all purchaser spending to programmes, but admitted that the figures may be incorrect by up to 20 per cent: is this accurate enough? There is no objective way to judge this, but it is essential to remember that this approach is exposing the weaknesses in existing data sets rather than creating them. Put another way, the data currently used for decision-making are far from perfect, but because they are not analysed in this way the flaws are hidden to a greater extent.

There are three potential components to a programme budget: activity data, finance data and outcomes data/objectives. Obvious sources of data for a programme budget are outlined in the box over the page.

There is little problem in obtaining hospital-based activity data for any given programme but information becomes progressively more sparse and less reliable towards the primary care end of the provider spectrum. Fortunately, the aspects of the health service about which the least information is routinely collected are also those over which the purchaser has least influence; these facts may well be connected! This is not to say that areas where there are no data should be ignored; however, in terms of the first attempt at a PBMA exercise, this should not cause too



much concern. By exposing these weaknesses in routine data, the exercise may give impetus to a review of purchasers' information strategies.

#### **ROUTINE SOURCES OF DATA FOR A PROGRAMME BUDGET**

Many of the existing examples of programme budgets have been constructed on the basis of routine data sets from Scotland. Commonly used data sources for inpatient, outpatient, general medical services and other primary care and community care services are as follows:

##### ***In-patient resource use***

Activity data from SMR1 - from a purchaser's point of view, this would be for the resident population only, using the categories chosen for the axes of the PB table, and valued using resource management costs, adjusted for important factors (such as theatre use during an episode of care).

##### ***Out-patient resource use***

Activity data from SMR0 - this is only likely to be available at an aggregated level for the whole programme and, again, can be valued using resource management costs.

##### ***General medical services resource use***

Activity data from the 1991-2 Royal College of General Practitioners (1994) consultation survey from England and Wales - this can be valued using local calculation of the cost per consultation or using the proportion of consultations for the particular cause to estimate the proportion of the total general medical services cost attributable to the programme.

##### ***Other primary care and community-based services***

Crude activity data combined with informed judgement - the lack of good quality data for these services makes this one of the most difficult parts of the exercise. Crude activity data from providers can be adapted using "informed estimates", but, in deciding about the effort to devote to this stage of the exercise, one *must* be clear about the benefits of added precision in estimating current spending on this aspect of the service.

##### ***Other sources of data***

The use of routinely available statistics does not preclude the use of alternative data sources wherever these are available such as audit studies, local research, published data from national statistics or research (so long as these are appropriate to local circumstances), and so on.

Other aspects of the service about which little can be deduced from routine data sets include primary care prescribing, community services, hospices, non-surgical treatment in acute hospitals, and out-patient activity.

To save time, programme budgets could be restricted to current services which can be directly affected through contracts. This would suggest paying more attention to getting accurate information on elective admissions to hospital (including day-cases) than on general practitioner activity, since the latter is very difficult to change (and could not be monitored in any event!). In the longer-term, such a "short-cut" policy is dangerous, since it focuses attention on areas where data are available, even if other areas are more important and offer greater potential for gain.

Finance data are required to assign a cost to the activity in each sub-programme. Typically, this uses average costs (or prices) but this in turn means that great care should be taken when envisaging the potential for shifts in spending since variable costs are only a small percentage of the average cost. The English National Steering Group on Costing estimated that 11 per cent of average costs are variable, 61 per cent semi-fixed and 28 per cent fixed, implying a considerable "grey" area between variable and fixed (Twaddle and Walker, 1995). A more recent survey of purchasers by Raftery *et al.* (1994) suggests purchasers assume 25 per cent of average costs to be variable as a "rule-of-thumb". Such considerations of what is variable and what is fixed are less important for the PB stage of the exercise but are much more important for the MA stage.

Very little is known about the patient outcomes of services and few of the exercises to date have included this aspect. This is why we have placed emphasis on consideration of objectives - whether such objectives are being met and if not whether this implies more or less resources should be allocated to particular activities.

It is also important not to get too "hung up" on this stage. The question is how accurate do the data have to be to allow the team to begin to come up with ideas for more detailed MA. It is the MA which is the crucial stage of the exercise.



## 9. IDENTIFICATION OF OPTIONS

### *Identifying margins*

**PBMA differs from other purchaser decision-making support tools in that it seeks to identify ways of saving money to pay for the expansions; this is its distinguishing characteristic**

Identifying ways of saving money is - arguably - the most challenging stage of any PBMA exercise. Yet it is the ability of PBMA to deliver savings to pay for expansions that will determine the credibility of the exercise. Anyone can invent new ways to spend more money: within programmes, the novelty of the method is in “ringfencing” savings to a programme and asking those involved in care how they would prefer the total budget to be allocated across the service.

Naturally, there has been reluctance to discuss potential savings with purchasers. The orthopaedics case in Newcastle foundered at this point, although the project team may have been too determined to achieve allocative efficiency savings: more recent experience has shown that this is rarely achievable. In Mid Glamorgan, there was also reluctance to consider any reductions other than in areas where there was virtually no health benefit. In this case, a short presentation on the principles of economics was helpful; this emphasised that reductions should not be looked at in “all-or-nothing” terms. In fact, options which looked at doing a little more or a little less of a particular thing are much more feasible and likely to be implemented. This is very close to the economic concept of the margin, the boundaries of the current service being where meaningful change can occur. The terms margins and options are used interchangeably in this handbook.

To distinguish between lists of options the terms “service expansions” and “service reductions” have been used here; the literature also makes reference to incremental and decremental wish lists and to investments and disinvestments. It seems reasonable to assume that no multi-disciplinary group will have problems thinking of service expansions; there may be problems evaluating and prioritising such a list but that is dealt with in the next section - this stage is solely about identifying options. Much more problematic will be the offsetting service reductions. Economics is about balancing costs and benefits, not about cutting costs. However, the remainder of this section focuses exclusively on ways of making service reductions simply because this is the stage any health board experimenting with this approach will require most assistance with. We make no apologies for dealing with this aspect at length.

### *Identifying service reductions*

Reviews of English purchasers' plans have identified “top slicing” a given percentage from revenue allocation (or requiring providers to make additional efficiency savings) in order to create a fund to pay for expansions.



There are at least two reasons why we think this approach is unhelpful:

- “top slicing” funds merely shifts the problem on to providers and is likely to create pressure for drastic solutions, irrespective of the economic efficiency (i.e. impact on costs and benefits) of the measures taken.
- such an approach is indiscriminating in what services are reduced in order to pay for such expansions. An across-the-board “cut” may be applied to all services, some efficient as well as some inefficient. Furthermore, it may be that, after closer inspection of costs and benefits, proposed expansions do not provide more benefit than current services which would be reduced to pay for such expansions.

Instead, we discuss a scenario where the PBMA team working within a programme must make their proposals self-financing. (Of course, it is the case that the macro approach may highlight disparities in spending between localities, client groups or between purchasers which create opportunities to fund expansions in one programme from reductions in another, easing the self-financing restraint. In the remainder of this section, discussion is restricted to experience within programmes, although some of the principles may also apply to macro-level exercises.)

A review of the experiments with PBMA shows that there is no single satisfactory way to achieve the identification of service reductions in order to produce such budget-neutral purchasing plans. The process is still full of value judgements but attempts to be more systematic and open in its attempts to come to terms with the problem. A number of different approaches have been used to date. These are listed in the box on the following page and reviewed in more detail below:

1. Determine the objectives of the current programme: what outcomes is the service intended to deliver and by what means? Then use the programme budget to combine data on current activity and spending patterns, combined with any available outcome data (or proxies for outcome). How does the current service compare with its objectives? In the absence of reliable outcomes data for each objective, this is very subjective, of course.

At the extremes, the aim is to look for objectives without enough spending (implying that benefits could be obtained by increasing such spending) and for areas of spending with no objective. If there are areas of spending with no apparent objective, are these really part of the “core business” of the programme, and if not, are they dispensable? Note that this does not say that they should be dispensed with; it merely suggests that these aspects of the service should be evaluated against alternative uses of the funds. Ultimately, however, it may that a small amount of benefit obtained in any such activities should be sacrificed in order to obtain a greater amount of benefit by spending the resources differently.

It may be more realistic to hope that providers will be surprised by how much is being spent in specific areas and start to consider ways of reducing that sum while delivering the same outcomes (i.e. technical efficiency savings). This was the case in the Glasgow gynaecology exercise: the group was surprised that over



£1 million was being spent across the city on abortions and felt that the same activity could be provided using less resources.

2. Use a “thought experiment” (i.e. a hypothetical example), such as that outlined at the start of Section 8, to assist in thinking about options. To help with service expansions, what alternative uses could be found for an extra £100,000? Similarly, suppose a saving of £100,000 had to be made with the minimum loss of benefit to service users: how could this be achieved? This method was used successfully in Mid Glamorgan in conjunction with the short presentation on economics concepts mentioned above.

#### **METHODS FOR IDENTIFYING OPTIONS FOR SERVICE REDUCTION**

1. **Examine objectives of programmes and sub-programmes**
2. **Use a “thought experiment”**
3. **Secret ballots**
4. **Literature review**
5. **Local knowledge of providers**
6. **Representation of interested parties**
7. **Local and national policy commitments**

3. To overcome the problem of one or two vociferous individuals dominating proceedings, it may be possible to follow discussions on options for change with a secret ballot, inviting each individual present to submit ten expansions and reductions. These can then be assembled into long-lists for further consideration by the group. This method was used successfully in the Tayside child health example.
4. It is already common practice to conduct a literature review in such exercises. However, at present, they often lack direction or purpose. In the context of PBMA, however, they are clearly directed towards the identification of feasible local margins. Sources might include:
  - published reviews on evidence on effectiveness (e.g. Effective Health Care Bulletins, Cochrane Centre reports).
  - “best practice” guides (e.g. reports on a variety of subjects from SNAP, CRAG, SCOTMEG).
  - evidence on technical efficiency (while continuing to provide the current service at the same level of quality is it possible to reduce the cost by

changing who does it, when, where, how often, etc?). There may be evidence in the literature (e.g. Audit Commission reports) or this might involve the use of comparative performance (benchmarking, performance indicators).

- allocative efficiency (implications drawn from cost effectiveness league tables - an earlier section of this handbook advised caution in using such data in a "league table" format but a literature report of a service that appears to offer very poor returns may be worth further local discussion). As discussed above, the issue of not offering a service that is effective because it does not justify the costs involved is likely to be contentious: such a move may require the agreement of clinicians and providers, as well as purchasers.
- local work may be available which either assesses the extent of unmet need or assesses local care outcomes.

In general, care should be taken in transferring the results of national report or literature review findings to the local situation. However, at this stage, the aim is to identify potential ways to change. This factor takes on increased significance at the evaluation stage.

5. Perhaps the most obvious way to identify options for change is through the local knowledge of those involved in providing services. For example, in Mid Glamorgan the child health group was aware that paediatric admissions for social reasons were high, suggesting a possible service reduction with no loss of health benefit. (Of course, it should be remembered that this contention is not necessarily proven and is not "cost free" if it creates a positive margin in social care.)
6. It is not clear whether all interested parties will be represented on the multi-disciplinary team. Those who are not can be consulted regarding options for change, always with the proviso that suggesting an expansion requires the suggestion of an offsetting reduction too.
7. The exercise must work within the constraints of local and national policy commitments such as the SOHHD policy review of maternity services (Scottish Office Home and Health Department, 1993), but equally such documents can be a source for suggestions about changes in service delivery.

The methods are thus complementary to a considerable degree; experience suggests a number of different approaches will be necessary to generate an adequate number of service reductions to evaluate. In future, an additional technique will be to show groups the types of service reductions that have been suggested in previous exercises, although there is the danger that future groups will feel tempted to simply pick from this menu. It should, therefore, be used only when other approaches have been attempted.

Services which analysts have identified as options for reduction are listed in the box overleaf.



## EXAMPLES OF SERVICE REDUCTIONS IDENTIFIED

### **Greater Glasgow: gynaecology**

Increase use of day surgery for terminations and laparoscopies  
Replace D&C with endometrial sampling and ultrasound

### **Mid Glamorgan**

#### ***Changes which appear to assume no loss of health benefit***

Reduce length-of-stay (three mentions)  
Encourage generic prescribing (three mentions)  
Reduce out-patient follow-up appointments (two mentions)  
Increase proportion of cases treated as day-cases  
Reduce care in hospital units which are not general hospitals

#### ***Changes which may involve some loss of health benefit***

Reduce routine surveillance of low-risk pregnancies  
Reduce surgery for multi-site Intestinal obstruction in cancer patients  
Guidelines for varicose vein procedures  
Guidelines for ENT procedures (two mentions)  
Stop purchasing sub-fertility services

### **Liverpool: mental health**

Reduce benzodiazopine prescribing (offset by more counselling, support groups and new protocols)  
Reduce number of CPNs in one sector of the city (reallocate to the other sectors)  
Overhead cost savings from closure of long-stay hospital  
Close psychotherapy service  
Reduce number of out-patient follow-up appointments  
Reduce cost of CITC scheme  
Reduce number of CPN home visits

### **Grampian: maternity**

Change staffing levels and number of ante-natal visits  
Reduce post-natal stay by one day  
Reduce in-patient activity at main hospital site in Aberdeen, ECRs - offset by new services elsewhere

### **Tayside: child health**

Surveillance of health of school children - screened by nurse for initial assessment, nurse to concentrate on 'at-risk' cases subsequently.  
Streamline case conferences in cases of suspected child abuse  
Reduce in-patient use by shared care, community nurse specialists, referral and management protocols and guidelines for management in primary care  
Increase day-case surgery  
Reduce routine health visiting for families of children up to age three months  
Alter health visitor skill mix in line with other areas

### **Newcastle: orthopaedics**

Unification of orthopaedics service on a single site  
Earlier discharge  
Review prescribing and out-patient follow-up arrangements  
Reduce administrative and management costs



One point to note is that the suggested reductions are either intended to be ways of delivering the same service more cheaply, or involve small losses of benefit at the fringes of a given programme. This disappointed the team in Newcastle, and produced the following comment from the Liverpool team:

**"The wish lists produced by the IHD group were not practical enough and were more concerned with improving the operational efficiency of services than about allocative questions of where to redeploy monies. They included such items as strengthening links between primary care and health promotion departments, and developing and using clinical protocols." (Mooney *et al.*, 1993)**

Of course, to be useful, an option needs to be more specific than "strengthening links". However, the disappointment of those concerned with technical efficiency savings is misplaced, for two reasons:

- on a theoretical level, allocative efficiency savings involve loss of benefit - if the same saving can be made by increasing technical efficiency then this is surely to be preferred: such gains offer a "free lunch". One objection is that technical efficiency savings are not limitless. This ignores the dynamic state of the technology for supplying health services. In addition, allocative efficiency requires technical efficiency as a pre-condition.
- on a practical level, participation of all parties, especially those who have to implement the plan is an essential element of PBMA. If these are the types of savings they feel comfortable with, then - at least in the first instance - why not use these lists to encourage future participation?

Thus, although there are probably gains to be made in addressing questions of allocative efficiency, the focus is likely to be on technical efficiency improvements in the short-term. Allocative efficiency savings involve tougher choices. Despite this, reallocation away from services with a high cost per unit of benefit produced should produce more benefits in total.

The major problem with the potential service reductions is that they may not be reductions at all, or at least they may not offer the savings to pay for expansions. Several aspects of this problem are well known to NHS managers: for example, increasing day-case capacity reduces the number of bed-days required to treat the current number of cases. However, the bed-days freed are not closed, thus releasing costs, but are used for other patients; thus, the cost per case falls but the total cost may actually rise if the bed-days freed are put to more expensive uses. As one contracts manager put it:

**"Anything we do costs money, even if it looks like it should save some. If you try to stop people doing something that does not work they will go and do something more expensive ... so we don't let anybody do anything ... we're just keeping the lid on." (Freemantle *et al.*, 1993).**



A similar problem may arise with guidelines: if they free resources do these produce savings or are they used elsewhere? It is interesting to note that several groups trying to identify service reductions saw guidelines as a means of saving costs and restricting activity; in fact, if guidelines result in the treatment of previously unmet need then total costs may increase. An example might be an asthma prescribing guideline which raises pharmacy costs as more appropriate drugs are used.

It could be argued that the only item on the list which is likely to result in resource savings in the majority of cases is generic prescribing where the more expensive brand name drugs are not purchased as a result of a change in behaviour.

The main problem is that the resources freed by the service reductions are not those which are required for expansion, and are thus put to other uses. The solution may be to match not just the overall cost increase of expansion with the overall cost savings of reductions, but to deal in terms of particular resources. Suppose an expansion required more in-patient bed-days; then the group should be set the task of reviewing current use of in-patient beds and suggesting how to free up sufficient resources to allow the expansion to occur. This is more complex but no other method appears capable of controlling costs.

It is also important to bear in mind that PBMA's may set out a health board's plans for a number of years ahead. Therefore, over a period of more than a year, it may be possible to release resources tied up in inpatient beds for non-inpatient uses, if this is seen as a priority.

## 10. EVALUATION

To represent an improvement on the existing situation, a switch in spending must meet the objectives of the service to a greater extent within the same budget. Getting provider agreement to a potential change is, therefore, necessary but not sufficient. One method of assessing whether the changes represent an improvement is using standard economic evaluation tools to compare the options for expansion with the options for reduction. In this context, benefits will be defined by the objectives specified for the service at the outset of the exercise.

In practice, many of the reductions suggested have related to technical efficiency, as described above. In this case less analysis is required. In achieving the same amount of benefit, less resources are used. The main problem then becomes one of deciding which of the expansions offers the greatest returns from the resources now available.

Another scenario involves ways of reducing the existing service which may reduce benefit i.e. they represent changes in allocative efficiency. In this case, all of the options for expansion and reduction can be compared against each other in terms of costs and benefits. (The situation described in the paragraph above is, in fact, a special case where the reductions proposed have benefits equal to proposed expansions). There are two ways to carry out such an exercise:

- using a local CELT approach, evaluating each of the options against a specified alternative to produce a ranked list of cost: benefit ratios. The problem with this is that cost-effectiveness and cost-utility analyses can only cope with a small number of dimensions of benefit respectively. Most services might be expected to have several objectives. Hence, amongst other problems identified on pages 6-8 above, these techniques are inadequate.
- using an option appraisal approach, possibly incorporating aspects of the PRIORITY package discussed above.

There are also a host of practical issues which must be addressed in carrying out an evaluation in this context (see box below and discussion over the page).

### **PRACTICAL CONCERNS FOR EVALUATION**

- (1) Perspective - NHS only?**
- (2) Sufficiency of information**
- (3) Treatment of cost and benefits arising in the future**
- (4) Level of detail required**
- (5) What would happen to patients in the absence of current treatment?**



There is general agreement that these should embody all the aspects of good practice, but some problems remain:

- Which perspective should be used for identifying costs and benefits? There is general agreement that, as a minimum, the evaluation should include NHS costs and the extent to which purchasing objectives are met to define these concepts. This ignores costs to patients and any societal benefits not specified in the objectives, which might make options which shift costs from one agency to another appear more cost-effective than is actually the case. An alternative would be for regulators to ensure that all relevant societal costs are taken into account in priority setting, as is the case with option appraisal guidelines.
- Is there sufficient information to evaluate the net health effect of any given change? The Grampian maternity example was chosen in part to assess the role of the (updated) database on Effective Care in Pregnancy and Childbirth (Chalmers *et al.*, 1989), probably the most comprehensive review of outcomes data available for any area of health care. In practice, few of the margins for change corresponded with trials included in the book. More often than not there will be no data on QALYs gained or other measures of health outcome which relate to local issues to be addressed by purchasers. Though to be encouraged, we are a long way from outcome-based change on a regular basis in the NHS.
- How should costs and benefits arising in the future be treated? Should such costs and benefits be weighted (i.e. discounted) so as to reduce their magnitude when looked at from the perspective of the present? Is it permissible to use a rate different to that recommended by the Treasury for such calculations? At the other extreme, should health benefits be discounted at all?
- How thorough does the evaluation have to be? In Mid Glamorgan, the costings used were crude. Simply to say that the results must be robust enough to allow comparisons merely transforms the problem - what margin-of-error represents robustness? However, even if one takes a negative view of the accuracy of cost data, one still has to ask "what is the alternative?". It would be our view that locally-produced and relevant cost data are more useful for priority setting than that which could be obtained from national policy documents or research articles based on work from another region or (often) country.
- What is the alternative form of care for each option? If patients were not treated in the manner specified, what would happen to them instead?

Another major issue surrounds the choice of objectives. These may be distinct from the programme objectives, since these relate to the objectives of the purchaser, not of the programme. (This is not to say that the purchasing objectives cannot be used to assess options within a programme, however.) The advantage of using purchasing objectives for the evaluation is that there is consistency in the evaluation of options across programmes; it also facilitates inter-programme comparisons, a subject we return to below. This also implies that programme objectives should take account note of purchaser objectives.



Most health boards will have explicit purchasing objectives. These need constant review, however, to ensure that they are comprehensive and do not overlap. As an example, the criteria used for comparing options in Mid Glamorgan included:

- evidence of effectiveness (prefer reliable evidence that proposed change is effective/ineffective).
- number of patients treated (prefer expansions to affect as many people as possible).
- "person-centredness" (prefer options which improve accessibility, equity, responsiveness, appropriateness of services).
- severity of condition (prefer options which address life-threatening treatments).
- distance from target (prefer to address areas where purchaser not meeting national target).
- jurisdiction (prefer areas where purchaser has the most direct influence).

Most Scottish purchasers have used similar objectives to test the PRIORITY package. In both option appraisal and PRIORITY approaches, the criteria can be weighted to reflect their relative importance; scores attached to each option against each criterion can then be combined to produce a weighted score. In Mid Glamorgan this proved particularly difficult with no consensus emerging on weights; eventually the exercise used equal weights, acknowledging the weaknesses of assuming all criteria to be equally important.

The equivalence scaling method used as part of the PRIORITY may be helpful. This involves judging which is the most important criteria (usually health gain for purchasers) and asking how much health gain the organisation would be willing to give up in order to obtain a small gain on any other objective. This has the advantage of making the trade-offs between objectives explicit, and calls into question exactly what some of them mean. For example, other things being equal, purchasers commonly prefer ways of preventing disease occurring to ways of treating symptomatic disease. What is this preference based on? An assumption about the relative costs and benefits? about the absolute magnitude of the benefits alone? is there any reason for preferring prevention independently of the effect already captured on the health gain criterion? In Southampton, weights were simply allocated across criteria, with health gain receiving 40 per cent of these (Lockett *et al.*, 1995); it is not clear whether the implicit trade-offs are really appreciated by those carrying out the exercise, as equivalence scaling highlights.

The choice of criteria and the weights attached will involve the steering group of the PBMA exercise in the first instance. In future, however, these aspects might be the subject of public consultation exercises.

However, even though the practical difficulties may seem sizeable, it is important to remember that the most important thing about the economics approach is the



framework it provides for organising information and for thinking with regard to priority setting for purchasing. In many priority setting situations, the best one can hope for is simply a description of the possible outcomes of each option assessed. In fact this should be a minimum requirement. If health care providers cannot even provide descriptions of the benefits of their activities, should they really be doing them at all? If such descriptions can be supplied, intangible costs and benefits can then be considered alongside those which are more readily measurable. The trade-offs between such benefits and costs will still be explicit, even if weights have not been put on different criteria. It may be difficult even to track some of the more tangible costs. However, although getting hold of accurate costings can be difficult, in any situation the project team has to ask itself "how accurate do we need this information to be?" It may be that if the cost estimate for a particular item is out by as much as 50 per cent that the decision made would not change. It is the authors' contention that **"even crude estimates of costs and benefits, representing conditions prevailing in a local context, would serve priority setting better than attempting accurate measurement of the wrong thing"** (Donaldson and Farrar, 1993).

## **11. WHERE NOW FOR PBMA?**

It is the hope of the authors that those previously sceptical about the use of economics in practice are persuaded that the transfer of such ideas into purchasing can be achieved. For those interested in pursuing PBMA further, a list of articles additional to those referenced is provided in Appendix 1. Appendix 2 contains a list of economists and others working in the NHS who have some experience of PBMA. For those with little experience of PBMA, it would be useful to get advice from one of these people before embarking on an exercise.

In the main body of the document we have dealt with problems of remit, the role of the programme budget and problems in its construction, identifying options and evaluation. However, there are other important issues to discuss with regard to the applicability of PBMA. These are questions about the relationship of PBMA to contracting, practical issues with regard to supportive environments for PBMA, and other potential uses of PBMA which are "on the horizon". Finally, we conclude with a reiteration of perceived advantages of PBMA.

### ***Questions about contracting***

A question in the reader's mind at this stage of the document may well be "even if changes can be agreed can these be specified in contracts and monitored?"

Strictly, this is a question for the whole purchasing process, however, and not just for PBMA. But, it could be argued that PBMA is an early stage in the process of changing contracts. There are a number of steps in between PBMA and contracts which may depend on local circumstances. For example, PBMA has been used to outline a maternity services strategy showing how a board wishes to proceed over a number of years in implementing changes suggested on the basis of PBMA. Negotiations, specifications and actual contracts come after this.

The success of changes to purchasing practice on the basis of a PBMA also has to be evaluated. It is important to monitor progress against objectives and targets set as a result of a PBMA.

### ***The "supportive environment"***

The need for an environment which is supportive of the use of economics techniques cannot be underestimated. For example, when Welsh health authorities were requested to respond to "Strategic Intent and Development" (the Welsh version of "Health of the Nation" or "Scotland's Health") they were charged by the Welsh Office with producing "Protocols for Investment" with resource neutrality as an essential feature. Those authorities who failed to meet this criterion were asked to repeat the exercise. A consequence of this was a pilot of PBMA in devising such protocols in one authority. Equally, the micro environment - e.g. top-level support at purchasing organisation - is crucial to the success or otherwise of such techniques.

### ***Other potential applications***

The health care "market" is continually evolving. In this respect, it is important to be aware of the potential for the application of techniques like PBMA to priority setting at the levels of general practitioner fundholding and locality purchasing. In these



respects, the great advantage of PBMA is its flexibility. All that it provides is a framework for thinking and for organising information. There is no reason in principal, therefore, why PBMA cannot be applied in such environments. Each involves dealing with a limited amount of resources and, therefore, deciding on priorities (as in the quote by Madden *et al* at the end of Section 5).). However, to date, there are no examples of PBMA being used in fundholding or in locality purchasing.

### ***Perceived advantages***

The technique of PBMA is not perfect. However, it can be used to achieve change by introducing a systematic analytical framework into contracting, a framework which as much as possible uses locally relevant information rather than relying on literature. A further advantage of PBMA is that it breaks down what may be seen to be the daunting problem of priority setting in purchasing into a series of smaller more manageable tasks.

#### **PBMA: SUMMARY OF ADVANTAGES**

- (1) Systematic analytical framework**
- (2) Recognises that sacrifices are necessary to achieve desired expansions**
- (3) Can lead to joint ownership of recommendations**
- (4) Recognises subjectivity**
- (5) Helps to focus on defining services**
- (6) Helps to focus on the objectives of services**
- (7) Uses locally-relevant information**
- (8) Breaks down priority setting into manageable tasks**

The "framework" aspect should not be underestimated, particularly recognition that reductions in services may be necessary to achieve desired expansions (unless technical efficiency is improved or growth monies are available). This is important for discussions with providers and, if the latter are involved in the actual exercise, can lead to joint ownership of recommendations. This will increase the likelihood of their implementation. The framework thus represents a positive vehicle for getting clinicians involved in purchasing and for getting purchasers involved in clinical debates.

Subjectivity in priority setting is unavoidable. However, it is important to get the thinking right. PBMA recognises subjectivity and, arguably, gets the thinking right. In some exercises, the extent of subjectivity involved in priority setting has come as a surprise to purchasers. Recognition of this, however, is important.

However, “explicitness” about subjective judgements, which is encouraged by PBMA, is not the same as “openness”. Purchasers in the past have expressed concern that openness would discourage future participation in explicit priority setting exercises. However, explicitness helps debate and increases the understanding of others’ views.

The PB stage of PBMA may not always be necessary. However, it can be useful in refining thinking: “what is meant by mental health services in our health board?” or even what is meant by “health”. Furthermore, it focuses the mind on the objectives of the service and, through the programme budget, emphasises limited resources. The process of production of a programme budget may also imply that some services are provided at present for unexpected reasons, some good and some bad. Provision of services for no reason at all may be highlighted and, maybe more importantly, the existence of an objective (and, therefore, potential benefit) which is currently unmet.

Finally, PBMA generates clear recommendations for contract negotiations with an element of common ownership. This is important in helping to achieve change.

Imperfect data do not prevent priorities being set. Nor do they obviate the need to set priorities. This requires a priority setting framework. Equally, even when better data (the production of which is to be encouraged) are available, it will still be necessary to have in place the correct framework for their use. The real questions are whether PBMA provides that framework and, if used now, whether it offers an improvement over current priority setting mechanisms. PBMA is not a panacea. Economics techniques never can be so. As Cohen (1995) points out “**It is improvement that is sought, not perfection...**”. In our view, the PBMA framework can offer a clear improvement in the way priorities are set. We hope that this “handbook” will aid in the achievement of this improvement.



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## APPENDIX 1

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<sup>4</sup> Once again, copies of Health Economists' Study Group Papers are available from Cam Donaldson at the Health Economics Research Unit (see Appendix 2 for address).



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