

**An Evaluation of Program Budgeting
and Marginal Analysis Applied in
South Australian Hospitals**

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TABLE OF CONTENTS

1	Introduction	1
2	PBMA Studies in South Australian Acute Hospitals	2
	2.1 The Principles of PBMA	2
	2.2 South Australian Acute Hospital Studies	3
3	Evaluation of Acute Hospital Studies	7
	3.1 Objectives and Organisational Context	7
	3.2 Methodology	10
	3.3 Process Issues	14
	3.4 Outcomes	16
4	Future Directions in Planning and Priority Setting	18
5	Conclusions and Recommendations	23
	References	32
	Appendix 1 Participants in Consultations	33
	Appendix 2 Issues for Consideration in PBMA	34

An Evaluation of Program Budgeting and Marginal Analysis Applied in South Australian Hospitals

1 Introduction

Program Budgeting and Marginal Analysis (PBMA) is a tool to aid decision makers in setting priorities in the provision of health services. In recent years its use by health departments and service providers has become more widespread, both in Australia and overseas. In South Australia this has resulted in a series of pilot PBMA studies in the acute hospital and community health sectors. The aim of PBMA is to help decision makers plan services in the face of limited budgets, by combining information on the costs and health related benefits of services. It represents a practical application of economic principles in setting priorities by using cost-effectiveness principles applied through the use of marginal analysis.

The Health Economics Unit, at the Centre for Health Program Evaluation, was commissioned by the South Australian Health Commission to evaluate five PBMA studies which have been conducted in the acute hospital sector. The terms of reference for the project included two main elements: an evaluation of the objectives, methods used, process and outcomes of the hospital PBMA studies; and recommendations as to the potential application of PBMA in the newly announced Department of Human Services structure. This report provides a brief description of the five studies, critiques the approaches used, explores future directions in priority setting, and provides conclusions and recommendations on the use of PBMA in South Australian Health Services.

2 PBMA Studies in South Australian Acute Hospitals

2.1 The Principles of PBMA

PBMA is based on the notion of what health economists term allocative efficiency. Allocative efficiency is achieved when health related benefits from a service, or set of services, are maximised for a group of individuals. The underlying principle is one of maximising health related benefits from scarce health service resources. To attempt to achieve allocative efficiency both the costs and outcomes from health services must be considered in health service planning. PBMA addresses allocative efficiency by providing a systematic framework for maximising health related benefits for a given budget considering both the outcomes from, and costs of providing, a range of services.

PBMA can be described briefly in terms of four main steps. A fuller description of the approach has been given by several authors (Peacock & Edwards, 1997; Donaldson et al, 1995; Shiell et al, 1993; Mooney et al, 1992).

The first step usually consists of defining program areas to be examined, and constructing the program budget. The program budget establishes a link between the costs and activity levels of different services within the programs being studied.

Step two is to identify services which may be potential options for expansion or contraction (increments and decrements) in the future, sometimes referred to as wish lists. The aim of the wish lists is to identify potential changes to services which may improve the overall levels of health related benefits for the population. The potential changes in services should be achievable in practice in the short term. PBMA may be used to examine changes within or between programs (such as considering service changes within or between disease areas). By identifying only a relatively small number of services to be considered as options for change the focus of PBMA is on incremental changes in services, and not the wholesale reform of health service delivery.

The third step is to evaluate services on the wish lists in terms of their effectiveness and the costs of service delivery. Published evidence on the effectiveness of services may be used where available to evaluate services on the wish lists. Where published evidence is not available, expert opinion may be used to estimate effectiveness using techniques such as options appraisal. Estimates of effectiveness and costs can then be combined to determine the cost-effectiveness of services, and the relative cost-effectiveness of those services can be used as a guide to incrementally move towards allocative efficiency. The equity implications of changes in service configuration can then be assessed, and decisions modified accordingly.

The final step is to re-allocate resources according to cost-effectiveness and equity criteria. The process can then be repeated over time so that progressively more and more difficult services to evaluate are addressed. By sequentially repeating the process the emphasis of PBMA is to gradually move towards the allocative efficiency goal of maximising health gains for a given level of resources.

2.2 South Australian Acute Hospital Studies

As part of the development of priority setting approaches in South Australian Health Services, the South Australian Health Commission (SAHC) has sought to pilot PBMA in both the acute hospital and community health sectors. In the hospital sector this led to five pilot studies conducted at Flinders Medical Centre, Noarlunga Health Services, the Women's and Children's Hospital, North Western Adelaide Health Service, and the Royal Adelaide Hospital. The aim of these studies was to pilot the use of PBMA as an aid to service planning in the acute hospital setting. The studies were intended to be a learning exercise, primarily to develop skills and discuss issues in priority setting using a PBMA framework and to explore the usefulness of PBMA itself. Each pilot study was run largely as an independent project by the hospital or health service concerned, with some financial support from the SAHC. Provided below are brief summaries of each project, fuller details for four of the studies are provided elsewhere (Flinders Medical Centre 1997, 1998; Noarlunga Health Services 1998; Women's and Children's Hospital 1998a, 1998b, 1998c, 1998d; Alexander and Bruggermann 1998; North Western Adelaide Health Service 1998).

Flinders Medical Centre

The Flinders Medical Centre (FMC) study chose a single program based in the Respiratory Unit for the prevention and care of Chronic Airflow Limitation. The program area was chosen as it "made good clinical sense", and as it represented the major area of the Respiratory Unit's workload. The project was seen as an organisational change process to be integrated into current management practices. A patient flow model was used to identify sub-programs of services for Chronic Airflow Limitation, which consisted of five inpatient and six non-inpatient sub-programs. A minimum data set was constructed which included: detailed descriptions of each sub-program including linkages with other programs where services were provided jointly; identification of outcomes based on a review of evidence on survival and quality of life measures; data on use of hospital based resources during the study period; and cost information for episodes of care. A provisional wish list was constructed which had 7 increments and 6 decrements. Wish lists were examined using an evidence based approach to estimate the effectiveness of services through a review of the published literature, and the use of local data on activity and costs.

Two increments (a rehabilitation/education program and a more intensive vaccination program) and two decrements (a reduction in avoidable admissions and a reduction in unnecessary days of inpatient stay) were chosen for implementation. Other services on the wish lists were not chosen for implementation as they were funded separately by the SAHC during the study or because the study team decided they were not viable options for change. Outcomes from the study also included recommendations for research into the reasons for readmissions for patients with chronic airflow limitation and the use of high flow/high concentration oxygen therapy by ambulance officers, and recommendations for study results to be used in the SAHC COPD project.

Two major issues were generated by the FMC study. Firstly, the study team encountered significant problems in using the Trendstar package to estimate the cost of services for the PBMA

study. Issues included coding errors in the data and the recording of costs incurred outside of the accident and emergency department and medical wards. The project has already led to changes in some of the problem areas identified with Trendstar. Secondly, the study noted that it may be difficult to move funds between service areas within a specialty. In practice, reductions in services which receive budgets from the hospital on a casemix funding basis may not lead to a freeing up of resources for services with line item budgets, as resources may be redirected to other services and specialties.

Noarlunga Health Services

Noarlunga Health Services (NHS) chose a program area covering surgical services at Noarlunga Hospital. Areas for specific attention were identified through consultation with health professionals at NHS and review of waiting lists. A wish list was created with six increments and six decrements. Barriers and opportunities for achieving changes in services were then identified and the marginal costs of those services. The majority of services on this list were excluded from further consideration for a number of reasons, including: limited opportunity to change the service due to structural constraints; need for the service was not perceived to be as pressing as was thought at first; and proposed reallocation of resources were achieved during the study due to other initiatives. Expert judgement was then used in determining which services on the wish list should be expanded or contracted.

Two major changes from the study results were implemented. The first change was to develop a primary care initiative with a multi-disciplinary team to treat people with dysfunction of the gastrointestinal tract (increment), and a linked ceiling to be placed on gastroenterostomy surgical procedures (decrement). These changes were secured through surgical staff at NHS agreeing to participate in the development of an ambulatory care program for obesity, funded through resources released from the corresponding reduction in surgical activity. The second change was to increase the number of hip and knee replacements (increment), which will be funded from a reduction in transfers into the hospital from post replacement surgery (decrement), and a reduction in the associated costs of ambulance transfers to the FMC (decrement). PBMA is being explored as a potential longer term management framework at NHS, and it has been recommended for application to four further areas of service provision.

Women's and Children's Hospital

The Women's and Children's Hospital (WCH) trialled PBMA in the Women's and Babies' Division, running three separate studies based on obstetrics, gynaecology, and neonatology programs. The WCH began the study process by conducting a consumer workshop where 80 previous patients from the three specialties were invited to attend a session covering the principles of priority setting in health services. 18 consumers attended, and 9 went on to further participate in the studies. Program structures were determined through consultation with staff, and a program budget was constructed for each containing cost and activity information. A planning session was then held to determine objectives for the programs and identify wish lists. 43 participants attended (24 staff from the division, 10 health service providers external to the division, and 9 consumers), and the meeting generated three increments and three decrements

for the wish list for each program. A second planning session was held after available marginal cost and marginal benefit information had been collected for the services on the wish lists. This session estimated benefits from services using an options appraisal framework to reach decisions on resource allocation. Participants raised two issues from these workshops: the evaluation stage of the studies was too rushed; and the selection of services on the wish lists was ill considered due to time constraints at the first session. Consequently, there were no firm recommendations directly made from the studies, but study results were used to assess the funding of new initiatives.

Since completion of the study, however, the WCH has administered a follow up questionnaire to reconsider results for the three programs. The questionnaire revisited issues which arose from the options appraisal exercise, and resulted in the identification of three incremental changes and one decremental change to services which are now being implemented. The questionnaire also identified a number of other options for changes to services to be considered in the future.

PBMA is being used as a long term planning tool at the WCH, where it has been incorporated into the Women's and Babies' division annual planning process. The first pilot has led to a further PBMA study in paediatrics, as well as generating a research agenda in evidence based practice for women's and children's services. The study raised a number of further issues. These included: the need to move slowly through the PBMA process and not to attempt to tackle too many services and programs at once; the need to fully explore and discuss the criteria over which services are to be evaluated; and the need to seek the active involvement of key players including community representatives.

North Western Adelaide Health Service

The North Western Adelaide Health Service (NWAHS) also ran three separate studies, based on programs for obstetrics, surgery, and cardiology. The main aims of the studies were to evaluate the value of PBMA as a priority setting tool in each specialty and to involve clinicians, health professionals, executives, and administrative staff in establishing priority setting mechanisms. The Obstetrics and Cardiology specialties also included the aim of using PBMA costing models to validate Trendstar cost information. Each program was divided into sub-programs. Obstetrics used four sub-programs determined from clinical pathways models - elective caesarean, emergency caesarean, labour ward vaginal delivery, and family birthing unit vaginal delivery. Surgery targeted three departments - Upper Gastrointestinal, Colorectal, and Breast Endocrine - which looked at potential changes to services only within those departments. Sub-programs in surgery were determined by examining surgical procedure groups in order to utilise Trendstar costing data. Cardiology sub-programs were defined as myocardial infarction, unstable angina, and heart failure. The three studies were allowed to progress largely independently, and evolved in different ways. The most significant element of the NWAHS was the development of service cost estimates, following the objective of validating Trendstar cost information. All three studies failed to move beyond developing costing models and did not address setting priorities within programs.

The experiences at NWAHS raised a number of issues, including: the level of detail necessary and time constraints on determining costs, the scientific credibility of the process, the treatment of

ethical and political considerations in the priority setting process, issues around the impact of dominant personalities in the process, and the impact of organisational change on priority setting processes.

Royal Adelaide Hospital

The Royal Adelaide Hospital (RAH) study did not get beyond identifying a potential program area for study. The study was initially proposed following a workshop on PBMA and priority setting principles. A number of potential program areas for the pilot were suggested, including diabetes and mental health. These were rejected as the program areas were too broad and/or potentially covered too many aspects of hospital and other health services provision. Other potential areas for consideration were rejected because of the ongoing HealthPlus trials in Cardiology and homeless services, as the implications for services from these trials would affect any recommendations from PBMA. The RAH chose drug overdose as the program for examination, looking at services within RAH and in the community following discharge. The choice of program reflected a desire to examine resource allocation and priority setting across care sectors. The study encountered significant problems, however, due to a lack of data. The project team found that there was insufficient information about the treatment patterns of clients who had taken an overdose. This meant it became impossible to determine whether the current configuration of services was appropriate, how effective services were, and what the needs of clients were. The RAH decided to stop the project at this stage because it needed to gather information on follow up care and outcome following discharge before it could address the possibility of shifting resources from inpatient care into community based services.

The experiences at the RAH have resulted in two major outcomes. Firstly, a study of the treatment and follow up of drug overdose patients has been established. Secondly, the experiences have increased existing knowledge of what currently happens to overdose patients when they are discharged, and what follow up services are used. The process of PBMA itself generated some interest, particularly in the principles of marginal analysis, and there is still the potential for PBMA studies to be developed in the future at the RAH.

The five studies described above, and issues arising from them, are evaluated in Section 3 of this report. Future directions in planning and priority setting, drawing on experiences from these studies, are examined in Section 4.

3 Evaluation of Acute Hospital Studies

The evaluation of the hospital PBMA studies was carried out through consultation with key staff involved in the projects, and through appraisal of relevant project documentation. Key staff included staff representatives from each of the respective hospitals/health services, the Department of Human Services, and the project consultants. Consultations occurred through a series of meetings following completion of the studies. A list of participants in this process is given in Appendix 1.

The hospital PBMA studies were evaluated under four major criteria: objectives and organisational context, methodology, process issues, and study outcomes. Under each criteria a wide range of issues may be considered. A more complete description of issues which may require consideration when evaluating PBMA studies is given in Appendix 2. The purpose of this evaluation is to provide a critical appraisal of the five hospital studies to identify key issues which are fundamental to the practical application of PBMA. As a result, the focus rests on areas of difficulties experienced which raise issues for the future application of PBMA in South Australia, rather than areas of studies which raise few issues for the use of PBMA.

3.1 Objectives and Organisational Context

Study objectives

The main aim of the SAHC was to trial the use of PBMA in hospitals as an aid to priority setting and the planning of services, with the major emphasis on the studies representing a learning exercise. The background was one which saw a desire to involve clinicians in decision making processes using PBMA as a tool for explicitly addressing the issue of maximising health related benefits from health service resources. The studies also had the aim of separating notions of cost cutting from priority setting through explicitness and openness in decision making.

The objectives of the hospitals, where stated explicitly, were broadly similar. Key aims included: the trialling and evaluation of PBMA as a potential management tool for planning services; identification of sub-programs and the costs and benefits of services within sub-programs; and to provide recommendations for future research and the development of priority setting processes. Although not explicitly stated in all cases, a major aim of the FMC, NHS and WCH studies was to identify potential service changes which could be implemented in the short term. Both the FMC and the WCH also included explicit aims of developing and agreeing upon values and principles for priority setting in health services. The NWAHS project differed from other studies in that their main aim was to focus on the development of cost models and cost estimates to verify existing cost data.

Organisational Context and Study Timing

A key issue in priority setting studies is the organisational context within which the study takes place, and the timing of the study in relation to other policy changes and management initiatives. Organisational context and policy changes during a PBMA study may ultimately determine whether the priority setting process is successful in changing the culture of planning, and in the

implementation of study results. Study reports and consultations with study participants indicated internal political factors may have hampered the progress of some studies, and that stronger specialties (or those with more staff involved with the study) dominated some aspects of the studies.

The period over which the pilot studies were conducted was characterised by a significant degree of change and uncertainty in the organisation of South Australian health services. This may have resulted in difficulties in understanding strategic directions which made addressing complex priority setting issues more difficult.

Two statewide policies in operation during the study period also impacted on the progress of the pilot studies. Firstly, the HealthPlus coordinated care trial had commenced which had significant overlap with some of the studies, and a considerably higher profile both at the state and national levels. This may have contributed to any reluctance in undertaking a PBMA study, and narrowed the potential scope of studies. Secondly, the SAHC had relatively recently introduced casemix funding for the acute hospital sector but casemix was not used in the PBMA process. This may have led to a reluctance to trial new priority setting methods while hospitals were still adapting to casemix funding, and when the interaction between PBMA and casemix was unclear.

The five hospital studies were based in contrasting organisational contexts and experienced different policy changes during the study period. Whilst the FMC, NHS, and WCH studies appeared to have had relatively few difficulties relating to organisational context and policy changes, the NWAHS and RAH studies encountered significant barriers.

Both the FMC and NHS studies focussed on priority setting in a largely self contained program of services, where staff had a long history of collaboration in service planning and delivery. In the FMC study the project was undertaken by a small and cohesive team within the Respiratory Unit, focussing on a single area of service delivery (Chronic Airflow Limitation). The NHS study also had a small and cohesive team, concentrating on a single area of service delivery (surgical services). Divisional heads were not involved in the NHS study, which may have reduced the potential for institutionalised barriers to the process and increased the cohesiveness of the project team. The study attempted to engage some clinicians, who are largely paid on a fee for service basis, but was unsuccessful in doing so. Whilst this may have reduced the scope of the study slightly, it may also have reduced the potential for some difficulties in undertaking a priority setting study. The WCH study was large, spanning three specialties, but did not suffer from significant problems due to organisational context and policy changes. This was in part attributable to the decision to run three separate micro (within program) studies which used smaller, more cohesive teams, within each specialty.

In contrast, organisational and political issues within NWAHS at the time of the PBMA studies largely overtook their pilot. The health service was in a period of significant instability, with a large organisational upheaval in the Queen Elizabeth Hospital, major changes in senior management personnel, and the recent amalgamation of the Queen Elizabeth Hospital and the Lyell McEwin Health Service to form the NWAHS. Moreover, the project scope was essentially too large in that it covered three major specialties, each with strong management leadership and varied agendas, which were attempting to adapt to the ongoing organisational changes.

Within the RAH, PBMA was not seen as a high priority at different levels of the organisation. The use of PBMA as an alternative decision making tool was not seen as a high priority perhaps because traditionally there has been strong leadership in decision making at the hospital.

Hospital Management Leadership

Strong management leadership for the projects was evident in three of the five studies (FMC, NHS and WCH). This was perceived by the parties involved as a major contributing factor to the relative strengths of these studies. In NWAHS strong leadership for the project was largely absent. There was little or no evidence of a driving force from management for the PBMA process, at least in part due to the significant organisational change the health service was experiencing. At the time of the project it appears that senior management devoted their energies to matters relating to the organisational changes, and that PBMA was not a priority. In the RAH strong leadership was also not evident from the senior management, though there was some interest within the hospital at some levels of the organisation.

A potential downside to strong leadership also emerged through some of the studies. There was the perception that the choice of projects to be studied, and even the trialling of PBMA as a whole, was driven by the SAHC and the CEOs of the respective hospitals/health services. This may lead to a bypassing of members of staff with particular interest in PBMA in certain areas of service delivery who have the enthusiasm to drive the process. This indicates that a balance needs to be reached between driving the process from the management side and from the service providers side in order to successfully carry out a PBMA study.

Role of the SAHC

The main aim of the SAHC in promoting the trialling of PBMA in hospitals was to develop the approach as a learning exercise in priority setting and the planning of services. However, the objectives of the SAHC, either internally, or how they were presented externally may not have been clear, with the result that there was (at least at times) the perception that the studies would result in actual resource shifts. This may have contributed to some difficulties in the PBMA studies, with a lack of clarity in objectives adding a degree of confusion and additional pressures to the priority setting process. This may have led to some key players within hospitals seeing PBMA solely as a rationing tool, leading to scepticism over the approach and that study results would be used to reduce their budget. Unfortunately staff changes in key positions may have caused some of this confusion, which in future could be addressed in an attempt to ensure continuity of objectives and strategies.

The approach of the SAHC may also have been “too hands off” in letting each hospital develop its approach largely independently. A lack of clear direction opens up the possibility of PBMA being applied to problems where it may not be applicable, and in ways which may not be potentially fruitful. One result of this hands off approach has been that PBMA appears to have assumed a life of its own in different settings, which may have led to it being applied in contexts where it was not appropriate.

PBMA was written into the Health Service Agreements for the hospitals concerned. The spirit of the inclusion of PBMA in Health Service Agreements was that it was not a technique which the SAHC wished to impose on the hospitals, rather it was included to communicate information to the acute hospital sector. In retrospect, it is relatively easy to conclude that hospitals may have perceived the spirit of PBMA's inclusion as a contractual obligation rather than a recommended course of action which may have resulted in some reluctance to pursue the approach.

3.2 Methodology

Understanding and Accepting Concepts and their Application

Some studies raised questions as to whether the concepts and application of economic principles and priority setting methods were fully understood by some key stakeholders in the study process. It is, however, difficult at times to establish whether these "misunderstandings" were genuine misconceptions due to a lack of adequate training and support in health economics, or whether they represented a fundamental objection to the concepts and approaches used. It may be argued that rejection of appropriate concepts may be the result of inadequate training and discussion, however it is also likely that not all health service professionals will be keen to adopt "alternative" philosophies to planning health services drawn from a "non-medical model".

The NWAHS provided some good illustrations of when concepts and their application are either misunderstood or not accepted. For example, the report cited an expression that the "Division already successfully establishes priorities". To what extent priorities are successfully established depends crucially on how one defines success. This may be defined in any number of ways, including the alleviation of symptoms for individual patients, the maximisation of (health related) welfare for the population served, or the financial viability of the hospital. To undertake a priority setting exercise the criteria for setting priorities need to be established clearly at the outset. Having defined these criteria, the extent to which priorities are successfully established is an empirical question, which PBMA seeks to address. Indeed, international studies of small area variations in clinical procedures show the presence of significant unexplained differences in clinical practices. Recent research at the Health Economics Unit indicates Australian health services also exhibit large unexplained variations in clinical practices.

A further example from NWAHS stated "the need for PBMA to focus beyond economics and include ethics". The discipline of health economics arose through a rejection of the economic rationalism arguments promoted by a relatively small number of economists. Much of health economics research, including PBMA, focusses on consideration of health related benefits and their multi-faceted nature. PBMA explicitly recognises the need to incorporate decision making criteria other than those based around cost and expenditure. Many of these other criteria may be related to ethical criteria, the most notable of which are equity considerations. The need for ethical considerations is recognised, the appropriate issue is how to best include them in health service planning.

Program Choice and Complexity

The range and scope of programs chosen for examination varied between the studies. A single program was chosen by the FMC (Chronic Airflow Limitation), NHS (Surgical Services), and the RAH (Drug Overdose). The aim of these three studies was a micro, or within program, examination of services in terms of cost-effectiveness. The WCH and NWAHS chose multiple programs, but both studies only considered options for change within programs. As a result both these study sites ran multiple micro PBMA studies within their pilot. In both the WCH and the NWAHS three micro studies were conducted in Obstetrics, Gynaecology, and Neonatology (WCH) and Obstetrics, Surgery, and Cardiology (NWAHS). The NWAHS and RAH did not, however, reach the point of determining priorities within their programs.

Two major issues arose from the choice of program structure at each site. Firstly, the choice of a single program within a distinct speciality or department simplified the issues which needed to be addressed, and reduced the workload required to undertake the PBMA study. The workload which resulted from the choice of multiple program areas in the WCH and NWAHS placed a significant burden on staff, and may have hindered the study's progress. Secondly, the choice of broad programs, spanning a range of areas of service delivery, increased the potential for different objectives and agendas to hinder the study process. This was a particularly significant issue in NWAHS. In contrast, the WCH appears to have overcome such issues through strong management leadership, and the FMC and NHS reported few difficulties due to the concise nature of the programs studied.

Program Budgets and Costing

Program Budgets in PBMA are intended to provide background information for priority setting by summarising current cost and activity patterns. The intention of PBMA is to use a broad brush approach in constructing the program budget to avoid the significant demands of collating detailed information.

Of the five hospital studies, four reported program budgets had been constructed (FMC, WCH, NHS, and NWAHS). The RAH study did not progress to the stage of constructing the program budget.

In general the FMC, WCH, and NWAHS approaches were to gather detailed cost and activity information for all services. All three studies reported this process was very time consuming. Both the FMC and NWAHS studies highlighted problems with Trendstar data as a major issue in arriving at cost estimates. In two of the three NWAHS programs, the main aim of the projects was in fact to validate Trendstar costing data. This led to the adoption of detailed costing methodologies, including the use of patient tracking forms to identify salaries and wages, goods and services, and equipment costs.

The level of detail used in these studies, and the time spent in achieving it, highlight the potential for PBMA to become sidetracked into a costing exercise. Detailed costing models are better developed as a separate exercise. The use of more broad brush approaches allows more attention to be paid to the marginal analysis phase of PBMA. More detailed costs can then be

estimated for the services identified in the wish lists. The purpose of the program budget costs is to provide information for planning across a wide range of services, and to aid in the selection of wish list services. The program budget costs are not intended to be precise measures of actual costs, nor as substitutes for casemix cost weights.

The studies raised three main issues concerning the program budget. Firstly, it was argued that cost model estimates may lack credibility with clinical staff if their basis was not perceived to be “scientific enough”. This issue should be seen in the light of PBMA representing a decision making tool in managing health services, and not a large scale scientific trial, as discussed above. Secondly, the issue of a lack of guidance on the appropriate costing model to use was raised. This is an outstanding issue which has not been fully addressed in PBMA, and requires further exploration. Finally, the need for a program budget was questioned. This issue rests on the level of information providers currently have about services and programs. If costs and activity data are routinely available under existing management arrangements, then the program budget may be largely unnecessary. Its value lies in developing knowledge of service delivery patterns where information has historically been limited.

Wish List Generation

Generating wish lists represents one of the key methodological issues in PBMA. Criticisms of this aspect of PBMA in the past have included the potentially arbitrary nature of the process used to generate increments and decrements, the inherent difficulty in deciding on decrements, and the potential for a large number of increments to be proposed in relation to the decrements.

The FMC, NHS, and WCH studies all identified wish list services for consideration in marginal analysis. The NWAHS and RAH studies did not reach this phase of PBMA.

The approaches used by the FMC, NHS, and WCH in generating wish lists appear to have been broadly similar. Each study used a program structure developed from a combination of expert knowledge and clinical pathways. Wish lists were generated by the project teams from these program structures, largely based on a consensus approach amongst participants. Information from the program budget and other sources (for example waiting list review and hospital management groups in the NHS study) was used to inform the process. Initial wish lists were revised in light of potential impracticalities in implementing some options for change in services, and external funding initiatives. A number of particular concerns about this process arose from the studies.

The background to the studies of real reductions in health service resources over recent years made the generation of decrements for the wish lists even more difficult. Also, the approach was sometimes perceived solely as a method of cutting services rather than allocating resources to raise overall health related benefits from services.

It appeared difficult for some studies to retain a wholly objective and impartial perspective in generating wish lists, which may have been influenced by vested interests within the project team.

Increments generated in some of the studies were perceived to be unrealistic at times, that is they were not practically achievable in the short term. Many of the difficulties in realising potential service changes arose where services were provided jointly with other service providers and health service agencies. This meant that some options on wish lists were not entirely within the budgetary control of the hospital in question, and any potential service changes would have financial and organisational implications for other agencies. Moreover, some decrements were considered to be impractical in hindsight, as they led to system wide changes in service delivery, which would also have implications for a very wide range of other agencies.

Some options for service change were not considered to be patient focussed after completion of the studies. This may have been the result of not enough access to appropriate expertise in identifying services to be examined in the wish lists.

The generation of wish lists remains an area of PBMA which requires further development. The process has a “chicken and egg” dimension, where it becomes difficult to identify wish lists without first gathering information on their costs and benefits. This may make the inclusion and exclusion of services for consideration rather arbitrary. The use of clinical pathway models may help alleviate this problem, as may the use of comparative information on service delivery patterns from other hospitals.

Estimating Health Related Benefits

The approach to estimating health related benefits from services varied between the hospitals. The FMC study took an approach based mainly on published evidence, whereas the WCH and NHS made greater use of an options appraisal approach.

The FMC employed an evidence based approach to estimating the effectiveness of services. They used pairwise comparisons of published evidence on health related quality of life and effectiveness of interventions. This process was aided by the Respiratory Unit’s track record in undertaking research into the costs and outcomes of services. The FMC considered their study had therefore gone further than the options appraisal approach in terms of the reliability of the evidence they had been able to gather and utilise.

The WCH project used an options appraisal framework in which they attempted to score services in terms of their performance under three sets of criteria (efficiency, effectiveness, and equity). The project team reported some difficulties in completing this exercise which centred around the understanding of the criteria to be used. The understanding of these types of concepts is pivotal in an options appraisal framework, but given more time and debate there is no reason why this aspect of the process cannot be undertaken successfully. Indeed, the WCH felt there was a lack of time to carry out the appropriate research into the effectiveness of services, and the appropriate criteria over which effectiveness should be judged for Women’s and Children’s services. Following the options appraisal exercise, the WCH felt there were still some unresolved issues surrounding the correct perspective to use in evaluating services, for example, a societal versus health sector perspective. This has led to the development of a follow up questionnaire for study participants, and the establishment of a research agenda in community values and WCH services.

An outstanding issue following the completion of the pilot studies was to what extent expert opinion should be used in comparison to published evidence. Expert opinion was seen as a potential barrier to the credibility of study results, and led to scepticism over the PBMA process for some participants. However, there was some recognition that whilst outcomes should ideally be based on published evidence, there are different areas of service delivery and different care settings which have different levels of evidence available.

3.3 Process issues

Project Management Committees

The functioning of the project management committee (or study evaluation group) may aid or hinder any priority setting process. Previous PBMA studies have identified this as a critical area in determining whether a PBMA study will be successful, however success may be defined. Perhaps the most important barrier to the priority setting process has been the effects of dominant personalities with alternative agendas and vested interests in the study. The experiences in South Australia were varied.

The FMC project management committee had worked collaboratively for some time, and represented a small cohesive group based in a single hospital unit. Their previous work had enabled them to put together a planning framework for the unit.

The NHS project management committee was also a small, cohesive team, which was helped by the relatively small size of Noarlunga hospital and area of services studied. The small area of services aided the process as there were fewer agendas to be addressed, which may have hindered priority setting processes.

The WCH project management committee was backed by commitment from senior management, who showed significant enthusiasm for developing priority setting processes. This commitment included extending involvement in the management committee beyond hospital managers and service providers to other health service providers and the community. Given the large scope of services considered in the WCH study (obstetrics, gynaecology, and neonatology) the task of ensuring project teams did not become sidetracked was significant, but largely achieved.

The NWAHS project, in contrast, was beset with problems from the timing of the study, leading to a range of decision making culture and political issues dominating the study process. A wide range of background agendas became evident throughout the study, which ultimately hindered its progress significantly.

The RAH project failed to stimulate interest at different levels of the organisation. The major reason for this lack of interest appears to have been a number of more pressing management issues at the time which overrode any potential interest in priority setting processes.

Information Systems

A major issue emerging from the FMC and NWAHS studies was the inadequacies of information systems in providing timely and accurate information for the studies. The NWAHS study reported that obtaining procedure, cost and throughput data from Trendstar was very time consuming. The FMC study reported a range of problems, including the timeliness and completeness of data and coding errors.

The experiences of the FMC and the NWAHS raise two issues. PBMA will highlight existing deficiencies in data sources, and can generate agendas to address them. At FMC several changes in Trendstar have resulted from the study. However, until deficiencies in data sources have been fully worked through PBMA studies will still experience problems in gathering appropriate information. In light of this, there is a need to consider the development of information systems which are responsive to the demands of planning and priority setting in general. The hospital PBMA studies should be used to inform this process.

Resource Constraints

All studies had resources made available by the SAHC for a project officer. The funding of project officers had two main advantages for the hospital studies. Firstly, it is unlikely that all of the PBMA projects would have been attempted without a project officer. There was a general reluctance of most of the hospitals to undertake new management initiatives without a resource commitment from the SAHC. Secondly, there is a substantial workload involved in conducting priority setting exercises. This workload includes gathering and collating cost and activity information, gathering information to aid the generation of wish lists, and searching for and reviewing effectiveness evidence. Two main resource based issues arose from the five studies.

Resource constraints were seen as a particularly important issue in the process of estimating the effectiveness of services on the wish lists. Some study participants felt more time was necessary than was available to determine the appropriate criteria over which effectiveness should be measured, and to seek out evidence on services examined. Furthermore, where this task was undertaken by a "lay person" because of time constraints on other staff, there was a perception that the results of the effectiveness component of the study were not as credible. Some study participants indicated that effectiveness evidence would hold more credibility if it had been collated by an expert in the field, or if it had included more consultation with clinicians.

The whole PBMA process was inherently time consuming and staff had difficulty in fitting the project on top of their existing patient load. This led to a lack of enthusiasm amongst some staff for the study. This was in part due to project management issues, and in part due to time constraints from staff's existing workloads.

Health Economics Advice

All five studies had external advice in health economics and priority setting processes from project consultants. In general, external advice was seen as sufficient, and played an important role in guiding the study and the priority setting process. Academic leadership was seen as

important and was provided throughout the studies. Participants in the studies reported the need for ongoing external advice, particularly in the education of staff. It was seen to be important that the study teams were advised by a senior external expert in health economics. This led, in part, to the employment of Prof. Gavin Mooney as a consultant for the studies. Prof. Mooney brought both significant experience and status in health economics and priority setting processes to the studies.

Only the FMC study reported a background in health economics within the study team. The Respiratory Unit at the FMC has had a ten year history of research into costs and outcomes of services using economic principles, with significant collaboration with John Moss, a health economist at Adelaide University. One member of the team had also gained a qualification in health economics prior to the PBMA study. Other study teams did not report a background in health economics and relied upon external advice where required. Whilst a number of key staff have gained skills from the studies which will have longer term benefits, there was a general perception that more health economics input was needed in the studies, and will be continued to be required in the future.

3.4 Outcomes

The five studies may be best seen as a trial of PBMA applied to different organisational contexts, rather than a trial of PBMA in its own right. Each study reported varying degrees of success over different types of specific outcomes. Study outcomes can be broadly split into those relating to resource allocation and health related benefits, decision making culture, and research agendas.

In general, the process of PBMA was seen as important in its own right. The studies allowed staff to discuss issues relating to service delivery, costs, and outcomes which may not have been seen (at the outset) as part of the PBMA process per se. Furthermore, the skills developed by staff involved should be beneficial in the long term as concepts are employed and developed on other contexts.

Resource Allocation and Health Related Benefits

Within the time frame considered, the hospital studies as a whole may be considered as a qualified success in implementing service changes. Three studies resulted in implemented changes to services. The FMC study implemented two increments and two decrements, NHS two increments and three decrements, and the WCH three increments and one decrement. Whilst the FMC and NHS arrived at these decisions within the initial study period, the WCH undertook follow up work before recommending implementation.

Three factors limited the number of recommendations which were implemented. Some services initially identified in the wish lists were later considered to be impractical options for change in the short term. Many of these included services which required cooperation of other health service agencies and were not in the direct control of the hospitals. These options may be potential candidates for examination in the future. Some services on the original wish lists received funding from external sources during the study period. Implementation of study results is a long term issue. Since completion of the studies there has only been limited time to change the

configuration of services at the hospitals concerned. In the longer term, it is possible that study results will inform further changes. Implementation of study results requires significant planning to manage the change process and to avoid short dislocation of services. As a result, the benefits from PBMA may not be immediate, but may span many years into the future, especially as priority setting processes are better understood and developed more fully.

Decision Making Culture

A change in the decision making culture of the hospitals concerned is perhaps the most important outcome from the five pilot studies. Whilst a change in this culture is the least tangible of the study outcomes it is of vital significance, and its importance should not be overlooked because it is more difficult to observe than other outcomes. Changes in the decision making culture of the hospitals were evident – to a greater or lesser extent – in all five studies. Primarily, these changes relate to the introduction and/or development of notions of both outcomes and costs in priority setting, and the development of explicit and open frameworks for addressing difficult planning decisions. These outcomes have also been translated into other areas of health services, where significant interest in the projects has been reported.

One of the most useful aspects of changes in the decision making culture has been to encourage staff to critically appraise the configuration of services which are currently provided, and to examine whether this configuration is appropriate. This has raised the profile of priority setting in general in service planning, and the need for consideration of a wider range of issues in service delivery patterns, including notions of costs, outcomes, and opportunity costs. The change in culture to move towards explicit consideration of outcomes is of particular importance. The use of PBMA has highlighted the need to evaluate outcomes in a more rigorous manner than reliance on clinical anecdote. Whilst several studies reported scepticism over the use of expert judgement in PBMA, the studies have highlighted the need to use published evidence where it is available, and have drawn attention to the strengths and weaknesses of expert judgement where published evidence is not available.

The WCH project, in particular, highlighted a change in its decision making culture as a key aspect of the outcomes from the pilot study. This change has resulted in “a culture of planning” being introduced, with structured frameworks for decision making being introduced. Moreover, the study has been useful in raising clinicians awareness of the resource implications of clinical practice for other patients and the hospital.

Research Agendas

Several projects developed research agendas in public health and clinical research from the PBMA process. The FMC project generated a research agenda which included investigation of the reasons for readmission of patients with Chronic Airflow Limitation, the use of intensive oxygen therapy by Ambulance drivers, and the relationship between variations in length of stay between consultant physicians and the changeover of junior medical staff. The study also recommended that its results be used to inform the COPD study being undertaken by the SAHC. The WCH study has, in particular, led to a study of community values relating to Women’s and Children’s services. The RAH project resulted in increased awareness of drug overdose issues,

and has led to a research project examining inpatient and community services for overdose patients. The potential for PBMA to generate research agendas should not be ignored. The process of determining priorities in service provision will always generate a wide range of research questions, and examination of these research areas will hopefully feed back into the priority setting process in the future.

4 Future Directions in Planning and Priority Setting

The critical appraisal of the five acute hospital studies has highlighted several key issues in the application of PBMA in South Australian health services. These issues can be used to identify fundamental principles which need to be addressed if PBMA is to be developed and applied as a practical aid to decision making. The fundamental principles are:

- Organisational stability
- Integration of funding and priority setting mechanisms
- Consideration of costs and outcomes in decision making
- Change management
- Provider ownership
- Training in priority setting methods
- Commitment to further research and development of methods

These principles apply equally to the potential development and application of PBMA across the Department of Human Services (DHS) and in the acute hospital sector. Any future practical application of PBMA is unlikely to provide useful results for priority setting if these principles are not adequately addressed. Discussion is therefore presented in terms of key areas which the DHS needs to address to establish the foundations for PBMA and priority setting in South Australia. It would be inappropriate to focus on the smaller details of PBMA if the foundations on which it rests are not first in place.

Organisational Stability

The trialling and application of new priority setting methods should only be undertaken during periods of relative organisational stability. For new decision making tools to be developed, a stable planning environment is needed which allows key stakeholders to explore new methods and discuss their application. Organisational changes will reduce the willingness of key stakeholders to develop alternative approaches to health service planning. Stability in the planning environment is needed both within the DHS and the provider(s) involved. This allows the strategic directions of the DHS and providers to be developed and clearly understood. During periods of organisational instability and uncertainty it is most prudent not to attempt the trialling of new priority setting techniques.

Within this context, the major organisational changes which have occurred in the South Australian health system in recent years have had a major impact on health service planning. If priority setting processes are to be developed in earnest in South Australia a degree of continuity is crucial. A major theme which has emerged from the hospital PBMA studies (and also those in the community health sector) is that if time and resources are to be dedicated to developing a particular model of priority setting, there needs to be confidence that the chosen model will remain in place for some time and will be actively implemented. Despite enthusiasm from the SAHC for the process during the pilot studies, the future is now unclear due to the recent restructuring of the Health Commission within the new Department of Human Services. Several key issues need resolving if PBMA is to be pursued as a tool for health service planning in South Australia: the DHS needs to establish its direction in terms of health service planning and priority

setting; key departments and personnel within the DHS need to be identified to drive the process; and a commitment to a degree of continuity in approaches to long term planning needs to be demonstrated by the DHS. It is vital that the DHS works towards creating an environment which promotes the use of priority setting methods if it wishes service providers to use those methods.

Moreover, the DHS needs to develop more expertise in priority setting methods if it is to successfully drive appropriate frameworks for health service planning. PBMA is a long term, rather than a short term planning tool, but all too often the imperative for short term results prevents the necessary long term investments from being made. Without careful consideration of the investments needed, and commitment to the appropriate methods chosen, any priority setting approach almost inevitably never realises its potential. Such lessons are evident both in the experiences in South Australia, and in the evidence on priority setting methods from elsewhere in Australia and overseas.

Integration of Funding and Priority Setting Mechanisms

Successful application of priority setting methods requires a degree of integration in funding and priority setting mechanisms. If priority setting mechanisms conflict with funding mechanisms at the state or regional levels, or with budget setting mechanisms within provider organisations, it is unlikely that priority setting methods will lead to changes in the allocation of resources. Before priority setting methods are trialled careful consideration should be given to the broader health service resource allocation framework.

Careful consideration, in particular, needs to be given to the role of PBMA within DHS health service funding mechanisms. Broadly defined, there are two main types of funding mechanisms – population based and throughput based – which offer different opportunities for the use of priority setting methods. South Australia has adopted a particular type of throughput funding model, casemix funding, in recent years.

Population based funding models are perhaps most consistent with PBMA and other priority setting methods. PBMA is based in cost-effectiveness: the maximisation of health related benefits from health service resources. Population based funding allocates resources on the basis of population need. To the extent that population needs reflects the capacity to benefit (achieve health gains) from health services, it has an outcomes focus consistent with PBMA. Priority setting methods may then be used to set priorities within budgets allocated to populations. The main drawback of population funding models is that they do not directly address the issue of operational efficiency. PBMA may have a role, however, in promoting this type of efficiency.

Casemix funding has two main strengths in the context of priority setting. Firstly, its classification system for health services is well developed, widely accepted, and is based on clinical parameters. Secondly, the construction of cost weights produces detailed cost information on a range of health services. PBMA can draw on casemix information by using the DRG classification system and the cost information used to construct cost weights. The major drawback with casemix funding is that it places a significant emphasis on throughput rather than capacity to benefit and outcomes in health service planning. This may lead to planning strategies

at the state, regional, and provider levels which are based mainly on throughput considerations, which may potentially conflict with cost-effectiveness considerations in priority setting models.

Consideration of Costs and Outcomes in Decision Making

Application of priority setting methods which are based in the principles of cost-effectiveness require that key stakeholders accept the need to consider both outcomes and costs in health service decision making. A decision making culture which does not promote the consideration of both outcomes and costs will almost inevitably result in the failure of priority setting studies.

In light of this, the implementation of study results to achieve actual changes in service configuration can be seen as a secondary result from the five hospital studies. The major outcome from the studies was a change in the decision making culture within some of the hospitals. The studies were largely successful in raising health services managers' and providers' awareness of costs and outcomes in the planning process.

The education of key stakeholders in the need to consider costs and outcomes is of fundamental importance. If the main aim of PBMA is to allocate resources in a more cost-effective manner, then the acceptance of the role of costs and outcomes in planning is essential. It is a testament to those directly involved in running the three studies which implemented results that actual changes to services were achieved, given the significant groundwork in these principles which had to be established. Indeed, a lack of acceptance of these principles was a major reason why the NWAHS and RAH studies did not progress to identify options for changes in services.

The DHS needs to pursue this education process vigorously, with significant potential for work in collaboration with health economists, epidemiologists, public health practitioners, and medical sociologists. Much of this process will involve negotiating difficult issues, including debates concerning clinical freedom, ethics, and the practical application of evidence based guidelines. Much of this groundwork has not yet been established in the Australian, or South Australian, health sector. PBMA and other priority setting methods will only achieve real gains in population health if these issues are first addressed.

Change Management

The application of new priority setting methods results in significant changes in decision making culture, and potentially in the configuration of health services. Change management strategies should be developed to identify and address potential problems in the application of priority setting methods and their results.

One of the key themes of the hospital studies was that strong management leadership, combined with enthusiasm from service providers, is necessary to complete a priority setting exercise. If strong management leadership is absent it is unlikely that a priority setting process will be successful (even if success is defined in many ways). One of the vital roles of managers is to negotiate the study through a series of changes in decision making and planning cultures.

Furthermore, the management then has the responsibility for implementing changes in service provision and managing the associated potential for dislocation of services and staff.

Any priority setting process is inherently difficult because health service staff may be averse to change and uncertainty, just as most people are. The DHS and hospital managers need to develop skills in the change management process, both in terms of changes to management processes and in terms of physical changes to services. PBMA has been criticised by some commentators as it has frequently failed to result in actual resource shifts. This is not a criticism of the method, per se, as few evaluative techniques address how change is to be brought about. It instead reflects the difficulties associated in bringing about organisational change.

Provider Ownership

Strong leadership from management within provider organisations, and involvement of service providers in all stages of the priority setting process is necessary. Providers will only own the process if they are involved from the outset, and the process is driven internally. This includes involving providers in initial discussions about appropriate priority setting models for development, as much of the development of priority setting models depends on information and expertise held by service providers. More importantly, the implementation of changes to service delivery becomes extremely difficult without provider acceptance and ownership of those changes.

In the context of the acute hospital studies, all of the five hospitals have expressed an ongoing interest – albeit to different degrees – in developing PBMA as an internal management tool. In the cases of the FMC, NHS and WCH this interest is being actively pursued. Two main related issues emerged during the studies. Some hospitals expressed the desire to extend the process by coordinating PBMA development across different health sectors. This may take the form of a South Australian working or focus group. This will have two main outcomes. Firstly, it offers the opportunity for different sectors to learn from the experiences of other sectors. Secondly, a theme of some of the hospital studies was a desire to examine potential resource shifts from the hospital into community based services. Such a group would offer a potential forum to develop these ideas. This also has the advantage of complementing national initiatives to move towards integrated care. The studies in South Australia represented the development of priority setting tools by providers, for providers, even though initial impetus may have come from the SAHC. The studies are therefore fundamentally different to PBMA applications overseas, where they have been developed as a purchasing tool. This may have gone some way to aiding the relative success of some studies. It raises the issue, however, of where resources necessary to drive the process should come from. Whilst there is interest in developing PBMA further, at least one hospital has indicated it will not be able to proceed further without an ongoing resource commitment from the DHS.

Training in Priority Setting Methods

If outcomes and costs are to be considered in health service decision making and used in priority setting frameworks, key stakeholders will require training in appropriate concepts and methods. This requires education in key principles, including allocative efficiency and cost-effectiveness, as

well as training in the different models for health service resource allocation and priority setting. An integral part of the training process should be the trialling of new priority setting methods, and opportunity for participants in different studies to share experiences and knowledge.

There is a need for the DHS, and the South Australian health system as a whole, to develop its skill base in priority setting methods if planning based in cost-effectiveness is to be pursued. This may be achieved through two main strategies. Firstly, through the training of health service staff in the fundamental principles of priority setting through workshops, short courses, and postgraduate qualifications in disciplines including health economics, epidemiology, public health and medical sociology. There are a number of informal and formal courses available from Universities in Australia, covering aspects of the principles of priority setting in varying degrees of detail. Secondly, through increasing the provision of advice from, and collaboration with academics and health professionals with expertise in priority setting methods. In particular the NH&MRC has recently identified health economics as a priority area for development in Australia, both in its research and policy development roles. In order to pursue the development of sound priority setting methods and processes, continuing collaboration with academics and health professionals is necessary at a national level where there is a depth of knowledge in alternative approaches to priority setting.

In the context of the acute hospital studies, there was an identified need for more health economics training. Whilst a number of key staff have gained skills from the studies which will have longer term benefits, there was a general perception that more health economics input was needed in the studies, and will be continued to be required in the future. Moreover, there is a need for more training to develop the skills to apply priority setting principles in practice. To meet these needs, South Australian health services should be looking to further develop its stock of priority setting expertise through measures such as the development of programs for graduate trainees, cadetships for postgraduate study, and collaborative research strategies leading to postgraduate training and qualifications.

Commitment to Further Research and Development of Methods

Priority setting methods should be seen as an ongoing tool to aid decision making in health services. These methods require development and refinement over time. Demonstrable changes in the delivery of services will generally only occur in the long term following careful consideration of the methods used and the issues generated in priority setting processes. The development of both priority setting methods and research into issues generated should be seen as an integral part of the planning cycle. This will lead to enhanced understanding of methods, and refinement of techniques and information to aid health service planning based in the principles of cost-effectiveness.

Two main areas of research questions have been generated by the acute hospital studies. Firstly, some studies raised issues around the development of priority setting methods. Four main areas of interest were raised: the generation of services to be included in the wish lists; the appropriate methodology to estimate the effectiveness of services; the appropriate costing methodology to use; and the nature of values and criteria relevant in priority setting. All these areas are the subject of current and proposed research projects in Australia and overseas. The

DHS also has a responsibility to foster the development of these areas of research, particularly when they apply directly to health service planning in the South Australian context. To this end, the DHS is supporting a study of community values in South Australia. At the same time, studies generated a range of research questions addressing epidemiological, outcomes, service delivery, and evaluation issues. Again there is a need for a local commitment to research local issues. This commitment is already in place, at least in part, and has resulted in an RAH study of drug overdose treatment and follow-up patterns.

5 Conclusions and Recommendations

The most appropriate way to interpret the outcomes of the five hospital PBMA studies, and also the five concurrent community health studies, is as a trial of PBMA applied under a range of different circumstances. The hospital studies occurred under very different sets of conditions and organisational contexts, and resulted in a range of study outcomes. Where PBMA did not result in actual shifts in resources, this was not due to methodological flaws in aspects of PBMA per se, but the inappropriate application of the whole technique. In this way South Australian health services have been involved in a form of natural (or some might say supernatural) priority setting experiment.

If success of the projects is judged on realised changes in services based in the principles of cost-effectiveness, then the FMC, NHS, and WCH studies were relatively successful. If success is defined in terms of achieving a change in decision making culture and acceptance of a range of issues in planning services, then the projects as a whole may be seen as much more successful. Even in the NWAHS and RAH studies there was evidence of identification and recognition of important issues in priority setting. Moreover, whilst PBMA was inappropriate in its proposed context at the RAH, the study team was able to identify this at an early stage and postpone trialling the technique. In all contexts, however, the most important issue to bear in mind should always be whether PBMA is a better decision making tool than the mechanisms already in place. The discussion presented in this report leads to several main conclusions, many of which have already been discussed in some detail.

There are several key principles which lay the foundation for the application of priority setting tools. Without these foundations priority setting studies are unlikely to meet their goals. Priority setting should be undertaken in a context of relative organisational stability with coherence in long term strategies for planning across health services. Instability in health service organisations almost inevitably results in the failure of priority setting processes. Strong management leadership is required to drive the process. Without this the process is unlikely to be successful. At the same time, ownership of the project by key stakeholders is necessary, including ownership by service providers and community representatives. The whole process must be accompanied by a change management strategy, as implementation of change is difficult if service providers become disenfranchised. The key principles of considering costs and outcomes need to be firmly established, and the incentives generated by health service funding and priority setting mechanisms need careful consideration. Implementation of PBMA results will only occur if a decision making culture which considers costs and outcomes has been established. In many cases in both hospital and community health PBMA studies much of the study has been devoted to establishing this decision making culture. This process requires a long term strategy of training and education of staff from the DHS and service providers. This would be best achieved through a program of training for health professionals, development of the local pool of expertise in priority setting methods, and active collaboration with other sources of expertise in priority setting and resource allocation methods. PBMA also generates a significant number of research questions, and research agendas should be pursued as part of the planning cycle.

If these foundations have been established, the successful application of a sound PBMA study will rest on four factors.

(i) Program choice

PBMA studies are most successful when they address operational efficiencies within a coherent and relatively small program area. A first trial of PBMA should be limited to a within program study of a single program. Multiple within program studies should be avoided. This allows the development of methods for priority setting in a less pressurised, and potentially rushed environment.

Between program studies should not be attempted at the outset, but should be considered for future development. They have significantly greater demands in terms of data and a greater probability of failure due to political factors. However, if PBMA becomes established they also offer the greatest potential for population health gains.

(ii) Information systems and cost data

PBMA studies rely on timely and accurate information, particularly cost data. Current information systems are focussed on financial and accounting data requirements and have limited use for health service decision making and planning. Information technology systems require development to progress planning processes.

PBMA requires two sets of information for successful application: activity and cost data.

Activity data should provide a summary of services within a given period for the program(s) considered. A minimum data set should contain summary information on attendances for outpatients and separations and length of stay for inpatients. The most convenient classification appears to be by DRG where available. This information should be easily generated from information systems. In time, systems may be developed to include reports by ICD codes and for procedures.

Cost data should also be easily generated from existing information systems. Of primary importance is cost data at the service level. This data should distinguish between the fixed and variable costs of providing a given type of service. This allows the estimation of incremental costs associated with service contractions or expansions.

Of secondary importance is cost data at the patient level. Cost data at this level may be considered in terms of its level of robustness, in much the same way effectiveness evidence is classified. At the lowest level DRG cost weight information and provider estimates may yield average cost per patient data. At the next level, cost per patient data may be separated into fixed and variable costs, and allocation rules may be developed to identify inpatient hotel costs, differences in length of stay etc. At the highest level of robustness cost data may be obtained from patient tracking and clinical costing systems. As a starting point in developing PBMA, DRG cost weight information and provider estimates are acceptable. In time reporting systems should be developed to provide timely and accurate information relating to fixed and variable costs, explicitly including length of stay considerations. Patient tracking and clinical costing systems should not be

pursued as part of PBMA, as the priority setting process will degenerate from a decision making into a costing exercise.

(iii) Generation of wish lists

The generation of wish lists may potentially be prone to arbitrary choices and peer group influences. In the hospital context, where programs tend to be specialty or condition based, clinical pathway models should be used to generate a full range of options for the wish lists. The wish lists should contain new technologies/interventions and evidence on their effectiveness where possible. An explicit criteria for inclusion on wish lists should be that the proposed change in services is practically achievable within the planning horizon. The greatest potential for implementing service changes will come from services which are under the sole budgetary control of the provider concerned.

(iv) Estimation of benefits and marginal analysis

Benefits or outcomes from services on wish lists should be evaluated, where possible and practical, from published evidence. At the outset, the volume and quality of published literature should be established, and its usefulness for the priority setting exercise assessed. Published scientific reviews of the literature should be used where possible from national and international sources of effectiveness and cost-effectiveness reviews. Lengthy literature reviews by members of the study team should be avoided, as the priority setting process will degenerate from a decision making exercise into a literature review project.

Published evidence will not be available for the majority of services evaluated in PBMA, however, which needs explicit recognition at the outset of the study. Expert judgement should be used in an explicit and open framework in this case. Such judgement has always been used in planning health services, but has generally been implicit and potentially ad hoc in its application. Explicitness and openness in judgement is vital to ensure concepts and methods are fully discussed and clearly understood. Decision analysis techniques, of which options appraisal is one, should be used to provide the appropriate framework for using expert judgement.

In light of the above discussion and issues raised the following recommendations are made for the practical application of PBMA.

The seven key foundations for priority setting studies should be addressed before undertaking a PBMA study:

- PBMA should only be undertaken in a situation of organisational stability and clear strategic directions.
- The role of priority setting mechanisms within alternative funding and budget setting systems should be examined before commencing a PBMA study.
- Acceptance of the need for consideration of costs and outcomes in health service planning by key stakeholders is a prerequisite for priority setting methods.

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- PBMA should be accompanied by a change management strategy.
 - Providers should be involved with the priority setting process from study inception to implementation.
 - Training of key stakeholders in priority setting concepts and methods should be undertaken before and during the priority setting process.
 - There should be an ongoing commitment to further research and development of priority setting tools in the South Australian context.

If these foundations are established and PBMA is to be used as a priority setting tool it is recommended that:

- The DHS and acute sector hospitals pursue the development of PBMA as a management tool for hospitals to aid the planning of services within concise program areas.
- The DHS and acute sector hospitals examine the potential for PBMA to explore changes in services across programs more fully, and identify barriers and opportunities for this application of PBMA.
- The DHS and other health sector providers pursue the development of PBMA as a management tool for providers examining services within concise programs, and explore its potential for application across programs.
- The DHS and acute hospitals develop information systems which produce timely and accurate information for planning and decision making.
- These information systems primarily provide summary data on service activity and fixed and variable costs.
- The DHS and acute hospitals develop clinical pathways models to inform the priority setting process.
- The DHS and acute hospitals identify and use sources of published scientific reviews of evidence to inform the priority setting process.
- PBMA use expert judgement in an open and explicit framework where published evidence is not available.

And, if PBMA is to be used, it is recommended that longer term strategic development of priority setting methods in South Australia should be pursued by the DHS, specifically:

- A consistent framework and set of methodologies be developed for South Australian Health Services – possibly as a handbook – to ensure appropriate applications and methods of priority setting are used.
- Key areas for priority setting exercises be established through the analysis of variations in clinical practice, best practice guidelines, and waiting list review.
- Incentives under alternative funding and priority setting mechanisms be examined and developed within a coherent framework for achieving DHS goals.

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Issues for Consideration in PBMA

1 Objectives and Organisational Context

What were the objectives of the study?

Were they clearly outlined?

Who were the key stakeholders involved in the study, and how were they chosen?

Were any key stakeholders omitted? If so, why?

Were study objectives generated by these key stakeholders?

What were the roles of health service providers, managers and the health department?

Were objectives appropriate for the organisational context?

2 Methodology

(a) Study design

Was the study micro (within a program) or macro (across programs) in its focus?

Were methods appropriate for the organisational context and study objectives?

Were methods clearly outlined (and accepted) by key stakeholders?

(b) Program Budgeting

How was the program structure determined, and was it relevant for the organisational context and objectives?

Were costs and activity adequately measured for the purposes of the study?

Was a program budget used? (Was it necessary?)

(c) Marginal Analysis

Was an options appraisal framework used?

Was published evidence sought/searched for?

If available, was published evidence included in estimates of service benefits? If so, how was it included?

How were increments/decrements (wish lists) generated?

How were outcomes/benefits from services defined, measured, and valued?

Were benefits/outcomes from services validated?

How were costs of services defined, measured, and valued?

Were marginal/incremental costs and benefits considered?

Were equity issues considered? If so, how were they included?

Were other decision making criteria considered? If so, how were they included?

Was there a sensitivity analysis of results?

Was there an opportunity to revisit the estimation of benefits?

Were there areas of strengths and weaknesses identified in the study methodology? If so, what were they?

3 Process and Practical Issues

(a) Key Stakeholders

Did the key stakeholders feel/demonstrate ownership of the project?

Did the key stakeholders demonstrate understanding and acceptance of methods?

Was leadership (from hospital management and the health department) present?

Were other stakeholders informed of the study and its progress/outcomes?

Was representation of key stakeholders adequate (eg from hospital managers, service providers, community representatives, health department representatives etc.)?

(b) Project Management Committee/Study Evaluation Group

How often did the study 'evaluation group' meet? Was this adequate?

Were there limitations/issues in the operation of the study evaluation group?

Were concepts well explained and understood?

Did the evaluation group have difficulties in identifying increments/decrements (wish lists) and in measuring/valuing service outcomes?

Was there enough time available for estimating benefits from services?

(c) Resources Issues

Was the process too time consuming?

Was a project officer employed? (Was one necessary?)

Was their time commitment adequate?

Was the funding of the project officer an issue (who funded the position)?

Were information systems adequate for the requirements of the study (cost and activity systems)?

Did the study inform the future development of information systems to aid decision making?

(d) Health Economics Advice

Was outside advice in health economics/priority setting methods sought/gained?

How often did the evaluation group have access to/meet with a health economist?

Was the training provided adequate?

Were there limitations/issues in the provision of outside advice?

Did other ongoing changes in policies and practices impact on the study?

Were there areas of strengths and weaknesses identified in the study processes? If so, what were they?

4 Study Outcomes

Did the study meet its objectives?

Were results held as credible by key stakeholders and other stakeholders not directly involved in the study?

Was the feasibility of implementing study results discussed?

Will the results be implemented? If not, why not?

What were the most/least useful parts of the study?

What were the key areas of relative success/failure of the study?

What factors influenced the success or failure of aspects of the study?

What strengths and weaknesses were evident from the PBMA project?

What lessons were learnt from the overall PBMA process?

Was there a change in knowledge/attitudes to decision making and planning?

5 Strategic Issues and Future Directions

(a) Strategic issues and PBMA

Was the study consistent with service provider strategic planning?

Was the study consistent with health department strategic planning?

Was the study (potentially) integral to the current health system structure?

How do study results fit in with other planning mechanisms (eg. needs assessment) and funding mechanisms (eg. casemix funding)?

Was the approach 'too abstract'? How does it relate to clinical decision making?

(b) Future directions

Is cost-effectiveness seen as an important decision making criteria in service planning?

Is PBMA seen as a useful tool for introducing cost-effectiveness into service planning?

Will PBMA or other priority setting methods be used in the future?

What other decision making criteria are important in service planning? Were/can they be captured in PBMA?

How will PBMA fit into the future health system structure?

What are the opportunities for/barriers to PBMA in the future?

If PBMA is to be used in the future:

- what changes to the current organisational culture/frameworks would be needed?
- would outside health economics expertise be required/desirable?
- what level of resource requirements would be adequate (eg project officer etc)?
- what changes would be needed to current information systems?