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EVALUATION OF OBSTETRIC EARLY DISCHARGE: AN OVERVIEW

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CONTENTS

	Page
Abstract	
1. Introduction	1
2. Methods	3
2.1 The Early Discharge Schemes	3
2.2 Survey Questionnaires	4
2.3 Client Satisfaction Study	5
2.4 Reasons for Non-participation	6
2.5 Economic Evaluation	7
2.5.1 Resource Use - Hospital	7
2.5.2 Resource Use - Domiciliary Midwifery Program	8
2.5.3 Resource Use - Community	9
3. Results	10
3.1 Client Satisfaction Study	10
3.2 Reasons for Non-participation	12
3.3 Postnatal Care: Expectations and Gains	15
3.4 Economic Evaluation	19
3.4.1 Sensitivity Analysis	20
3.4.2 Economies of Scale	22
3.4.3 Societal Viewpoint	24
3.4.4 Enhancing Cost-effectiveness	27
4. Discussion	29
4.1 Satisfaction Study	29
4.2 Non-participation Study	30
4.3 Economic Evaluation	31
5. Conclusion	33
References	34

ABSTRACT

This paper gives an overview of evaluations of obstetric early discharge schemes at three hospitals in Western Sydney Area Health Service. Satisfaction of early discharge and hospital clients with their postnatal care, the reasons given by eligible women who chose not to participate in the schemes, and cost-effectiveness analyses are presented.

It was found that women choosing early discharge were more likely to be satisfied with their postnatal care than were women choosing institutional care. This result is dependent on sufficient support for the women in the home, absence of medical complications, and autonomy over the selection of the type of postnatal care received. Participation in the schemes could be increased through better communication of information and increased provision of help in the home.

Both Blacktown and Westmead Early Discharge Schemes currently cost the health care system more than the value of the hospital resources which they release. The value of hospital resources released by the Auburn scheme exceeds its costs, but the difference is slight. All results are sensitive to assumptions made in the analyses. Improvements in cost-effectiveness are possible, but would not necessarily lead to reductions in hospital expenditure, as that would depend on the uses made of released resources. From the perspective of the wider community, all three schemes cost more than the value of resources which are released. At issue, therefore, is whether the increase in client choice which the early discharge schemes bring about is judged worth the additional cost.

1. INTRODUCTION

Obstetric early discharge schemes increase choice by providing women with an alternative form of postnatal care to that conventionally provided in hospital. This involves a shorter length of hospital stay with domiciliary support provided for up to seven days after the birth of the baby. It is assumed that, by reducing length of hospital stay for a proportion of women, pressure on obstetric beds is reduced and hospital resources are released for other uses.

The Medicare Incentive Package, introduced in 1988/89, provided enhancement funding for the establishment of schemes to improve the efficiency of the public hospital system through provision of alternatives to hospital postacute care. In the case of postnatal care, the plan was to provide midwifery supervision and advice in the client's own home, replacing four to seven days in hospital or supporting earlier discharge which previously had occurred without professional supervision due to pressure on hospital beds.

The Westmead early discharge scheme began in 1984, discharging eligible women between 24 and 48 hours after delivery, and providing domiciliary visits by midwives until the seventh postnatal day. The scheme was evaluated during its first year of operation, and no increased maternal or infant morbidity was found for women choosing the scheme (James et al, 1987). Since the evaluation, admission criteria have been relaxed. In 1989, schemes were established at Blacktown and Auburn Hospitals with funding under the Medicare Incentive Package. Evaluation was required as a condition of the funding.

Literature from Britain and North America reporting studies of obstetric early discharge deals primarily with the assessment of physical and emotional state or concerns of the mother, rather than with her satisfaction with the postnatal care. No increased morbidity was demonstrated for mothers, or their infants, taking early discharge, provided there was home follow up by a midwife.

This paper gives an overview of studies at the three hospitals in Western Sydney Area Health Service which offer obstetric early discharge schemes. These studies evaluated satisfaction of early discharge participants and non-participants with their postnatal care, determined the reasons some women chose not to participate in the schemes, and carried out economic evaluations, in the form of cost-effectiveness analyses, of the obstetric early discharge schemes at the three hospitals. Greater detail is available in CHERE Discussion Papers 10, 11 and 12, dealing with client satisfaction (Kenny et al, 1992), reasons for non-participation (Cameron et al, 1992) and economic evaluation (Scott et al, 1992).

2. METHODS

2.1 The Early Discharge Scheme

All studies were conducted in the three participating hospitals of Western Sydney Area Health Service: Westmead, a large teaching hospital, and Blacktown and Auburn, smaller district hospitals. The obstetric early discharge schemes involve discharge from hospital within three days of the baby's birth, in contrast to the full hospital stay. The average length of postnatal stay, for those eligible for early discharge but not participating in the scheme, was 4.01 days at Westmead, 3.95 days at Blacktown, and 4.46 days at Auburn Hospitals during the study period.

On booking-in, women were asked to indicate whether they would prefer a full hospital postnatal stay or early discharge, if eligible. If they chose early discharge, eligibility was assessed on medical grounds by a domiciliary midwife, and reviewed by a physician. Clients were excluded from eligibility for the scheme on the basis of factors such as caesarean delivery, hypertension, breastfeeding problems, or prematurity or jaundice of the infant. Interpreters and ethnic health workers were used to assist with communication with clients as required. The women were free to vary their preferences after the birth.

Women who chose to stay in hospital were also screened for eligibility so that a potential comparison group of non-participating women could be identified. Non-participants were screened at the hospital by the area coordinator of the domiciliary midwifery program using the same criteria applied to those choosing early discharge. Screening was conducted weekly or biweekly.

During the study period (1991), there were, on average, 350 deliveries per month at Westmead, 230 per month at Blacktown, and 150 per month at Auburn. The Westmead and Auburn domiciliary midwifery programs (DMPs) were able to cater for about 50 clients per month each, and Blacktown for about

60. Clients were drawn from a limited geographic area, and women living outside the service area were referred to other schemes where possible. Early discharge clients were visited at home by a midwife approximately daily or, occasionally, twice daily during the first week after the birth. An interpreter service was provided as needed, and some home help for housework or child care was also available, depending on the midwife's assessment of client needs.

2.2 Survey Questionnaires

Two questionnaires were designed, one for participants and one for eligible non-participants. Each covered general demographic characteristics, length of postnatal hospital stay, time and travel costs for visitors, time costs for family and friends who helped with child care and housework, satisfaction with postnatal care, and reasons for the choice of postnatal care. Subjects were asked about their expectations of and gains from postnatal care, and were asked to rate various aspects of the process and outcome of this care. The questionnaires for participants and for eligible non-participants contained many items in common, as well as items tailored to the specific circumstances of hospital and program groups, such as use of medical and community services at home during the first seven days after delivery, and number of domiciliary visits. Special attention was given to the wording of questions to clarify meaning, particularly for women of non-English speaking backgrounds.

After a pilot survey and refinement of the questionnaire, 350 were distributed between 21 May and 26 July 1991. Of these, 150 questionnaires were distributed to participants (program group) and 200 were distributed to non-participants (hospital group). The higher number was distributed to the latter group in anticipation of a poorer response rate. Questionnaires were distributed at each hospital in proportion to the size of the obstetric unit, and of the domiciliary midwifery program. The women in the program group received the questionnaire from the visiting domiciliary midwife on the second last visit, whilst the women in the hospital group were asked, on or near the

day before discharge, to complete the questionnaire before leaving the hospital. Thus, the questionnaire was completed, on average, 5.7 days after the birth by the program group, and 3.1 days after by the hospital group. The latter group generally completed the questionnaires one day before leaving the hospital.

2.3 Client Satisfaction Study

Major dimensions of patient satisfaction have been identified as (1) quality of care, including art of care or caring, technical quality, and outcome, (2) accessibility/convenience, (3) finances, (4) physical environment, and (5) availability (Ware, 1981). Of these, quality of care and access to care were considered the most applicable to this study, as the domiciliary service is provided in the client's own home and is free of charge, making other dimensions irrelevant. The client satisfaction questionnaire was designed around these dimensions to reflect the functions of postnatal care in monitoring and in providing education and advice for problem solving, rather than medical treatment. Questionnaire items, with related dimensions of care, are outlined in table 1.

TABLE 1 - PATIENT SATISFACTION QUESTIONNAIRE ITEMS

DIMENSION OF CARE	ITEM
Interpersonal	Treated with respect & consideration Interest in your questions & problems Midwives had enough time
Technical	Confidence in midwives' ability Information: sufficient clarity usefulness written information Midwife suggestions worked Conflicting advice
Outcome	Own physical health Own emotional state Feeding- as intended - progress Ability to care for baby
Access to scheme	Scheme explained Costs & decision
Questions for DMP clients only	Knew who to contact for help Coping with home & family Number of visits to doctor Sufficient support Home visits sufficient Home visits convenient Happy to have midwife in home

2.4 Reasons for Non-participation in the Early Discharge Program

Women who were eligible for early discharge but who chose to stay in hospital were surveyed to assess the reasons for their choice. Potential reasons were identified from a literature search and from discussion with 13 new mothers from the three hospitals. The study focused on the perceived disadvantages of early discharge and on what they hoped to gain from their choice of hospital postnatal care. Comparisons of demographic characteristics and perceptions of the quality of postnatal care were made between those who chose early discharge (participants) and those who chose to stay in hospital (non-

participants).

2.5 Economic Evaluation

Economic evaluations involve both costing of resource use and measurement of benefits obtained. In this study, a cost analysis (Drummond et al, 1987) was carried out for hospital, DMP and community resource use. As client satisfaction and the availability to clients of choice of location of postnatal care were assessed as benefits, the study can be considered to be a cost-effectiveness analysis.

The aim was to assess whether the economic value of resources released by the early discharge scheme (ie the bed-days freed up as a result of early discharge) were sufficient to off-set the costs of the DMP. The average cost of the resources released has been used to quantify their value on the assumption that bed days freed up by early discharge would be used by other patients. Thus the costs calculated in this study reflect the value of the bed days to other patients, rather than the savings that would be achieved were the beds closed down.

The costs of the DMP were calculated, and compared to the value of hospital resources released by early discharge. The costs incurred by families, friends and other community agencies were also considered.

2.5.1 Resource Use - Hospital

An average nursing cost per bed day was determined using the number of nurses on each postnatal ward. Staffing establishments were categorised by grade of nurse and costed on the basis of 1989/90 industrial award rates, adjusted for on costs. Adjustments were made for transfer of staff from postnatal wards to the program, and average costs weighted to reflect declining dependencies of clients on each successive postnatal day.

Costs directly attributable to the ward such as goods and services, ward clerks, ward space and equipment were assessed. Costs attributable to other hospital departments, such as client meals, domestic services, linen, administration, medical records and power were allocated to the postnatal wards on the basis of ward use of the relevant department, where possible. In the remainder of cases, costs were allocated in proportion to occupied bed days. Total average non-nursing cost per bed day was determined by dividing the total calculated annual non-nursing ward cost by the annual number of postnatal ward occupied bed days.

Average nursing and non-nursing costs per bed day were added and multiplied by the average length of postnatal stay to obtain a cost per episode of hospital care in both program and hospital groups.

2.5.2 Resource Use - Domiciliary Midwifery Program

The average cost per domiciliary visit was calculated by dividing the total annual cost of the program by the estimated number of postnatal visits, based on current activity at each hospital. Resource costs included administrative support, office space, staffing, transport, equipment, and goods and services. The number of postnatal visits and distances travelled by each midwife in the course of her duties were obtained from program activity statistics. Nursing unit managers for each program provided annual goods and services expenditure figures. The area coordinator of the three DMPs provided details of the staffing establishments of each program and these were adjusted to reflect the additional input provided by postnatal ward staff. The average cost per visit was multiplied by the average number of visits per DMP client to obtain a cost per client.

Cost per client per episode of postnatal care for the program group therefore consists of hospital and DMP costs for the 'average' client. Cost per client for the hospital group consists of hospital costs only.

2.5.3 Resource Use - Community

Costs to the client's network of family and friends, and to community agencies other than the hospitals, were also considered to examine whether early discharge shifted costs from the hospital to the client, her family or on to other community services.

The questionnaires elicited information on time and travel costs incurred by family and friends when visiting the client in hospital or helping with household chores and child care. Clients were also asked to estimate the hours of paid work forgone by family and friends in order to carry out these tasks. Working time was valued using average full-time adult earnings in 1990 (Australian Bureau of Statistics, 1991). The amount of leisure time forgone was calculated as the difference between the amount of time spent helping or visiting and the time taken off work. This was valued at 40% of the value of working time (Sharp, 1988). Travelling expenses were calculated from distance between postcode of residence and hospital. Visits made by Home Care Services of NSW were costed at \$25/hour. Visits to medical practitioners were costed at schedule fee rates (Department of Community Services and Health, 1990).

3. RESULTS

3.1 Client Satisfaction Study

Response rates to the survey questionnaires are presented in table 2. Response rates were very high in the program clients, so the results presented for this group should be representative of DMP clients. Response rates were slightly lower for the hospital clients, but nevertheless not low enough to introduce serious bias. A significantly greater proportion of non-respondents (hospital and program clients) were born in non-English speaking countries. No other differences between respondents and non-respondents were apparent.

TABLE 2 - RESPONSE TO CLIENT SATISFACTION QUESTIONNAIRE

Program Clients			
	Clients	Responses	% Response
Auburn	40	36	90
Blacktown	60	55	91
Westmead	50	45	90
TOTAL	150	136	90
Hospital Clients			
Auburn	51	38	74
Blacktown	72	53	74
Westmead	77	62	80
TOTAL	200	153	76

There were no statistically significant differences between program and

There were no statistically significant differences between program and hospital survey respondents with respect to the socioeconomic indices used, language spoken, country of birth, mean age, feeding method used, persons with whom they usually lived, antenatal care and antenatal class attendance. However, a higher proportion of women in the hospital group reported that they usually had no help at home from partner, children, or others. Parity also differed significantly; 40% of hospital clients were having their first baby (primiparous), while 75% of program clients were multiparous. In some instances, the difference in parity between the two groups confounded the satisfaction results. In those cases, results for the primiparous and multiparous groups are presented separately.

Satisfaction with the outcomes of care was high in both groups but women in the program group were more likely than those in the hospital group to give extremely positive responses. However, some of these differences were dependent on parity. Multiparous women in the program group were more likely than multiparous women in the hospital group to be satisfied with the progress being made by the baby and its general condition. Differences between primiparous women were less pronounced, though significantly more first time mothers in the program group were happier with the baby's overall condition than were first time mothers who chose to stay in hospital.

Self rated physical and emotional health was also high among women in both groups. Levels of emotional health were similar across the two groups of women but those in the program group tended to rate their physical health higher than those in the hospital group. This result remained significant after controlling for parity.

Satisfaction with the quality of the interpersonal aspects of care was also high in both groups of women though, once again, those in the program group were more likely to give extremely positive responses than those in the hospital group. This result was not determined by parity.

Program women were also more likely to give the extremely positive response to questions relating to technical aspects of care, such as adequacy of client education, confidence in the ability of the midwives and whether the midwives' suggestions had worked when tried. These differences were statistically significant for all cases with the exception of confidence in the ability of the midwives and the provision of information and advice. First time mothers in the hospital group tended to have less confidence in the midwives and were more likely to feel that they had not been provided with sufficient information. This may be a result of the number of midwives to which each woman had to relate. Women in the hospital group had to deal with a larger number of midwives and some (14% of the hospital group) found this confusing.

Most women in the early discharge program knew where to get help if needed, and the majority thought they had sufficient support after discharge, though 17% reported insufficient support. The most commonly requested type of support was with housekeeping and child minding. Most program women thought that they had received the right number of midwifery home visits, and most described coping with their home and family as fairly easy or easy.

In summary, it was found that women in the program group, as compared to those in the hospital group, were more likely to be extremely satisfied with the interpersonal and technical aspects of care, and at least as likely to be satisfied with the outcome of care. However, it would be wrong to conclude that early discharge with domiciliary midwife support produces a better outcome for all cases. This is because the women in this study each chose the form of postnatal treatment they felt most comfortable with. Since they were not randomised to treatment, differences cannot validly be attributed to treatment alone.

3.2 Reasons for Declining Early Discharge

A significant proportion of obstetric clients who were eligible for early discharge

declined participation in the scheme. The disadvantages of the scheme, as perceived by the women who declined to participate, are listed in table 3. Multiple responses were allowed if women identified more than one disadvantage of early discharge.

TABLE 3 - DISADVANTAGES OF EARLY DISCHARGE

Perceived Disadvantages	% Hospital Clients
Lack of medical supervision	46.5
No rest	45.7
Feed not established	41.7
Other children	37.8
Inexperienced mother	37.8
No help	19.7
No exercise class	11.0
Demanding partner	7.1
No massage class	4.7

Table 4 lists the reasons specifically identified by these women for choosing a longer hospital stay over early discharge. Other aspects also became apparent during analysis. One such factor was the lack of a clear explanation of the scheme. One quarter of the non-participating women felt that the scheme was not clearly explained to them, and another 14% said they had not heard of the scheme. Of the non-English speaking non-participants, 45% felt they had not received a clear explanation. In contrast, 95% of women choosing early discharge stated that they had received a clear explanation.

TABLE 4 - REASONS FOR NON-PARTICIPATION IN EARLY DISCHARGE SCHEME

STATED REASONS FOR NON-PARTICIPATION
1. Need for medical supervision for self and baby
2. Need for rest and recuperation
3. Need to establish baby's feeding
4. Lack of experience or confidence as mothers
5. Need of a break from chores and other children
6. Lack of help at home
REASONS WHICH EMERGED THROUGH ANALYSING DATA
1. Scheme was not clearly explained
2. Parity (first baby)

Program women were more likely than were women who chose to remain in hospital to identify financial factors as important in their choice. Nevertheless, financial factors may have influenced the decision to remain in hospital as well, as almost one third of women who chose to remain stated that they would have chosen early discharge if free home help had been available. One fifth stated that they usually had no help at home, in contrast to only 8% of program women who reported that they did not receive help at home. Some chose to remain in hospital as a break from child minding at home, which also may relate to the lack of help in this area.

Expectations of postnatal health may also be a factor influencing choice of postnatal care. Expectations were low in both groups so this alone does not explain their choice. However, women in the hospital group may be more

concerned about their postnatal health relative to other considerations such as home responsibilities. This interpretation is credible, given that hospital clients were less likely to get any help at home, and were more likely to be first-time mothers.

3.3 Postnatal care: expectations and gains

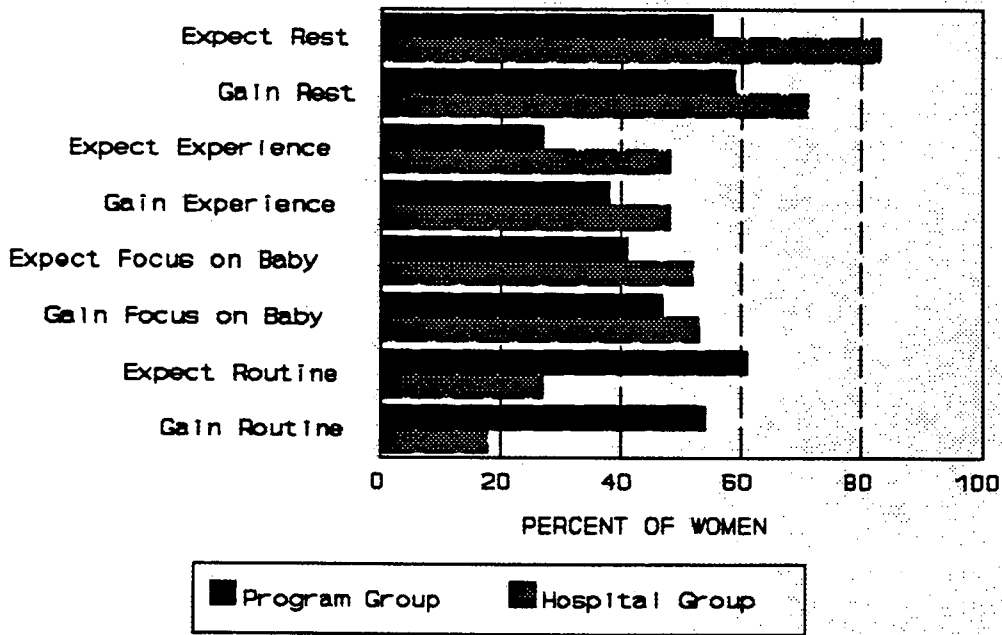
Women in both groups were asked what they had expected to gain from their choice of postnatal care, and what they felt they had actually gained.

Responses to the four questions which were asked of both groups are presented in figure 1.

Women in the hospital group were more likely to have expected rest and recuperation than women in the program group. They were also more likely to achieve rest and recuperation, though not every woman in the hospital group felt that their expectations had been met. In comparison, women who took early discharge were more likely than women in the hospital group to expect to be able to establish a routine and to succeed in doing so.

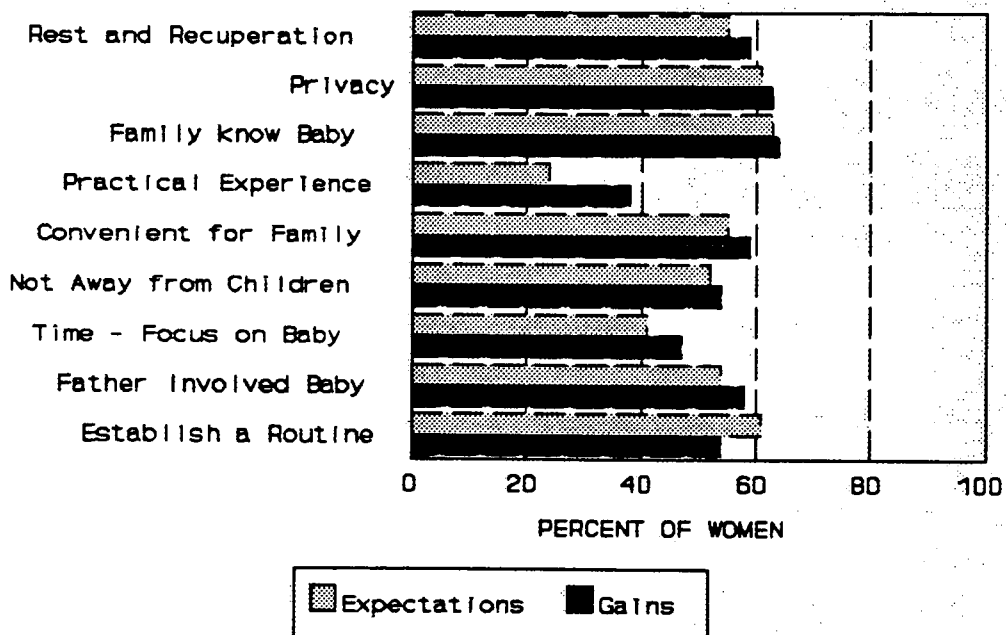
The program group were probed further on the details of their expectations and gains (figure 2). The most frequently reported expectation and gain from early discharge was the opportunity it provides for the family to get to know the baby. The need for privacy was also important and was the second most frequently reported gain from early discharge.

EXPECTATIONS AND GAINS DMP and Hospital Clients



See both questionnaires, Q18 & Q19
Figure 1

EXPECTATIONS AND GAINS Domiciliary Midwifery Program



See both questionnaires, Q18 & Q19
Figure 2

The hospital group were asked a slightly different set of questions about their expectations and gains (figure 3). After rest and recuperation, medical supervision of the baby was the most frequently reported expectations of women in the hospital group. This was also one of the most frequently reported gains.

EXPECTATIONS AND GAINS Hospital Stay

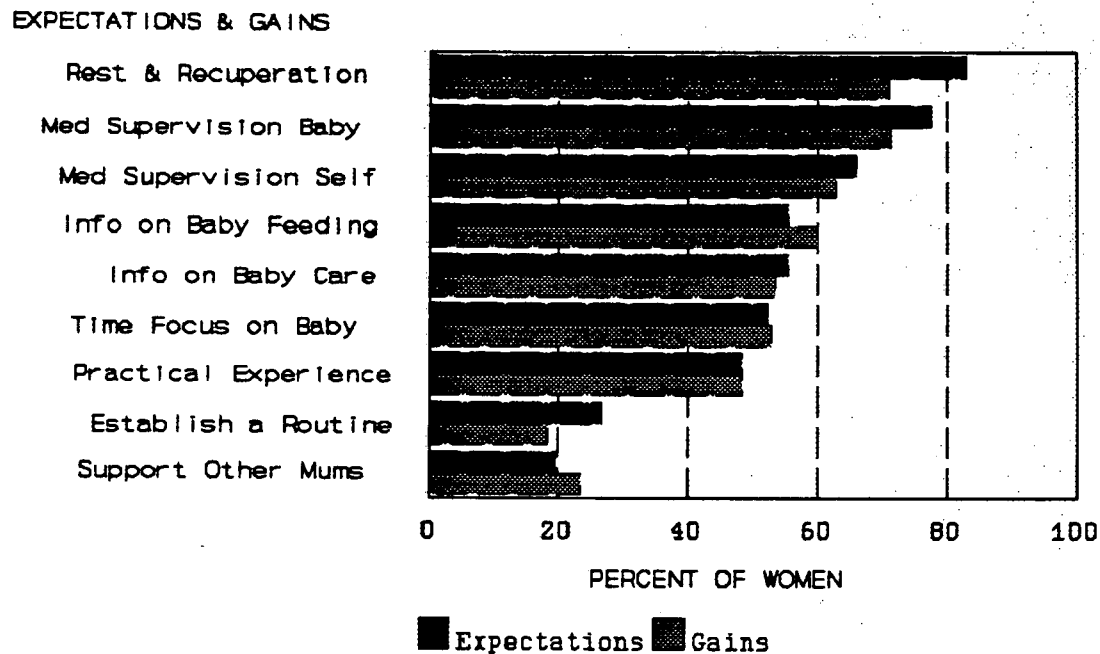


Figure 3

Overall, most women in the program group achieved their expectations, and they tended to attain benefits which they had not expected. In contrast, a significant number of women in the hospital group did not achieve the expected rest and recuperation or establishment of a routine. However, their reported gains did not differ significantly from their expectations in other areas.

3.4 Economic Evaluation

Results are presented both for changes in hospital and in community resource use. The sum of these represents an estimate of the effects of early discharge on societal resources. The physical resources released by each of the early discharge schemes are presented in table 5. Annual figures were determined from the expected annual number of DMP clients based on current activity levels.

TABLE 5 - QUANTITY OF RESOURCES RELEASED

	<i>Hospital Group</i>	<i>Program Group</i>			
	Average Length of postnatal stay per client	Average Length of postnatal stay per client	Average DMP visits per client	Bed Days Saved per episode	Annual Bed Days Saved
Auburn	4.46	2.06	4.28	2.40	1178 ^a
Westmead	4.01	1.71	5.11	2.30	1273 ^b
Blacktown	3.95	1.83	5.98	2.13	1870 ^c

a - based on average level of activity between January and June 1991 (491 DMP clients annually).

b - based on average level of activity between January and June 1991 (553 DMP clients annually).

c - based on level of activity between June and October 1991 (878 DMP clients annually).

Estimates of the economic value of these resources are presented in tables 6 and 7. The results demonstrate that Westmead and Blacktown DMPs use more resources than they release at current activity and capacity levels, but that Auburn DMP releases resources valued slightly higher than its costs. The results are sensitive to the assumptions underlying the calculations (see section 3.4.1).

TABLE 6 - THE ECONOMIC VALUE OF RESOURCES RELEASED PER EPISODE (\$)

	Cost per hospital client	Cost per program client	Net economic value of resources released per episode of postnatal care
Auburn	621.65	Hospital: 307.47 DMP: 307.93 Total: 615.40	6.26
Westmead	654.44	Hospital: 312.39 DMP: 378.54 Total: 690.93	-36.49
Blacktown	478.61	Hospital: 238.27 DMP: 423.06 Total: 661.34	-182.73

TABLE 7 - THE ECONOMIC VALUE OF RESOURCES RELEASED PER YEAR (\$)

	Economic value of resources released	Total DMP cost	Net economic value of resources released per year
Auburn	154,291	151,219	3,072
Westmead	189,294	209,490	-20,196
Blacktown	211,075	371,552	-160,477

3.4.1 Sensitivity Analysis

Sensitivity analysis tests the robustness of the results to variations in key assumptions. Sensitivity of the results was tested with respect to the level of ward staffing, ward activity rates, DMP activity rates, average visits per DMP client, and length of postnatal stay (LOS). Variations tested were mean ward staffing establishment plus and minus one standard deviation; ward activity rates (bed days per year) plus and minus 10%; DMP activity (postnatal visits per month) plus and minus the highest and lowest actual monthly activity; and mean average visits per client plus and minus standard deviation. Length of stay was varied for both the hospital group and for the program group.

Results of the sensitivity analysis for Blacktown DMP are illustrated in figure 4. As an example, if the average length of postnatal stay for a hospital client were only 2.82 days, then the net economic value of resources released would fall to -\$268,000. None of the variations tested led to net resource savings.

BLACKTOWN SENSITIVITY ANALYSIS

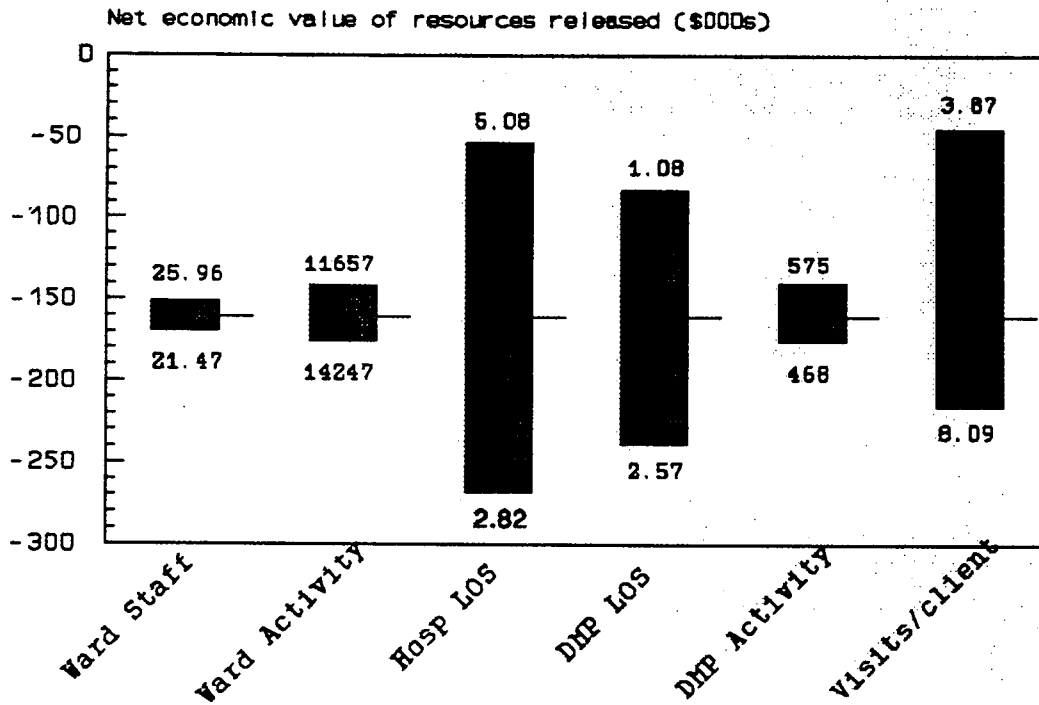


FIGURE 4

Only a reduction in the number of postnatal visits per client combined with operation of the DMP closer to capacity or reduction in staff numbers has the potential to improve cost efficiency.

AUBURN SENSITIVITY ANALYSIS

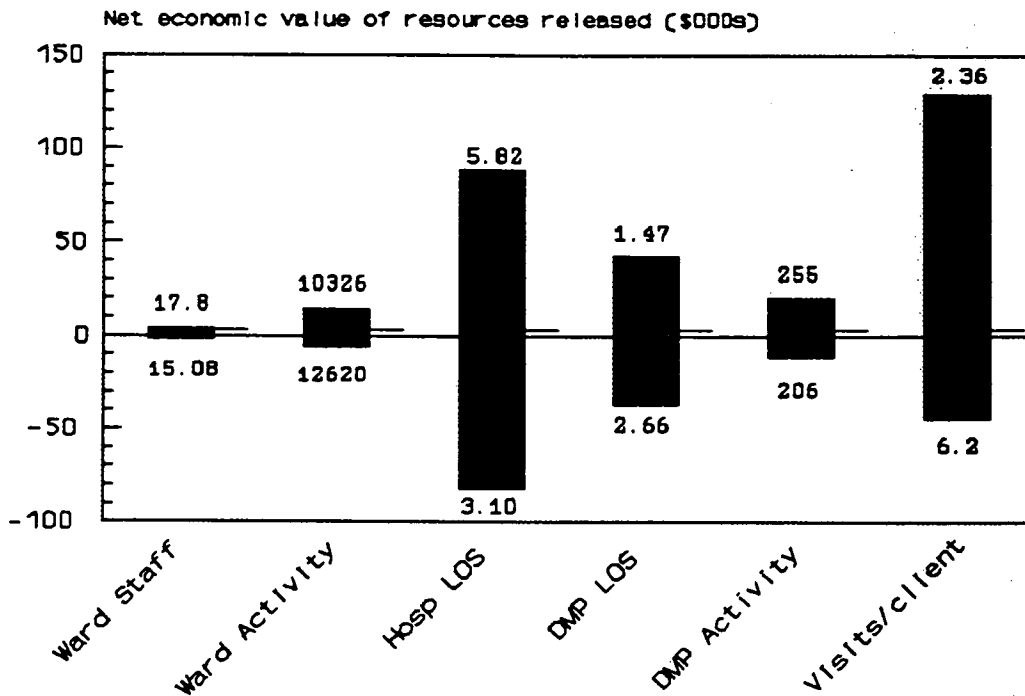


FIGURE 5

The resource saving found for Auburn Hospital is extremely sensitive to the assumptions made in the evaluation (figure 5). This limits robustness of the results. Increasing DMP activity and reducing the number of visits per client would increase cost-effectiveness. Further reductions in length of hospital stay, independent of the early discharge scheme, would diminish its cost-effectiveness.

The result for Westmead (figure 6), is sensitive to all assumptions apart from DMP activity and ward staff establishment. Reductions in the number of visits per client would enhance cost-effectiveness.

WESTMEAD SENSITIVITY ANALYSIS

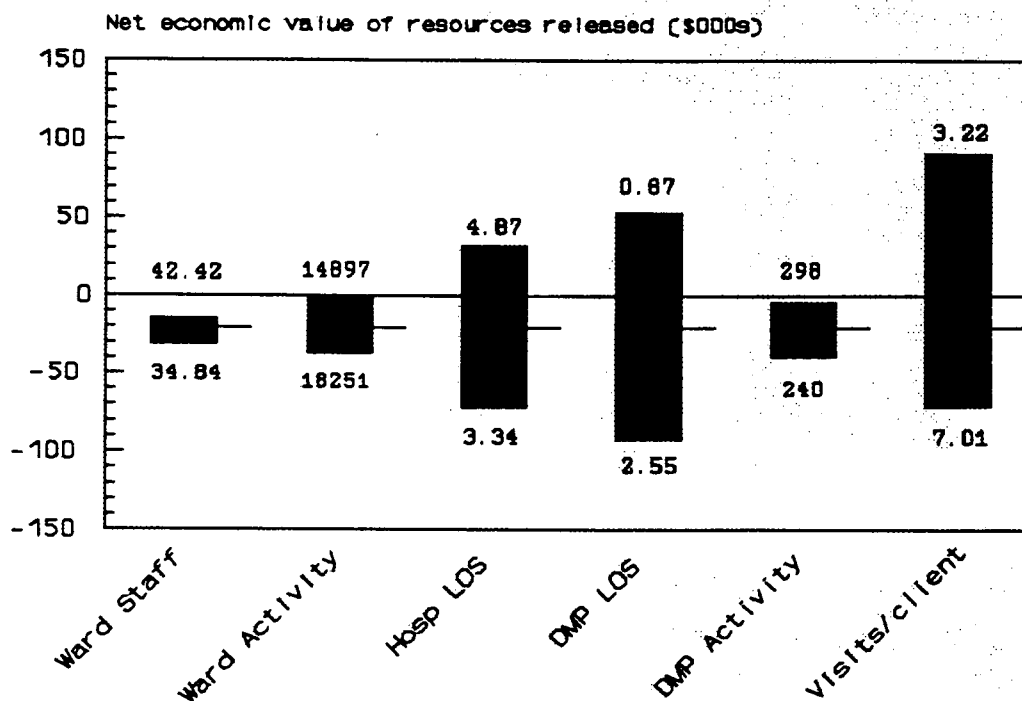


FIGURE 6

3.4.2 Economies of Scale

The average costs of the program depend on the scale of activity and the ratio of fixed to variable costs. For example, average cost per visit will fall as number of visits per month increases, since fixed costs are distributed over more visits. By considering the ratio of fixed to variable costs and the capacity of each of the programs, it is possible to assess whether efficiency might be improved by alterations in the scale of activity.

Variable costs of the programs included numbers of staff and cars, travel, goods and services, and equipment. Fixed costs were assumed to be the share of area support costs and the opportunity cost of office space. Program capacities were estimated from data on program activity, using the highest number of postnatal visits per FTE midwife as maximum capacity per midwife. Similarly, the

number of visits per car was calculated and the highest value used as the maximum capacity per car. Other variable costs were assumed to change in proportion to the number of visits.

All programs were operating below capacity. This relates to the lack of control over the number of women choosing to use the program. The midwives dealt with the variations in client load by varying the number of visits per client, reducing visits as the number of clients increased. Spare capacity may be justified, given that staffing establishment cannot be readily adjusted as client load varies. However, if non-program duties were worked during periods of low activity this would help to reduce the amount of spare capacity. The cost of carrying spare capacity is a major factor affecting the ability of the program to effect a net release of resources.

3.4.3 Societal Viewpoint

Costs incurred by visitors, families and relatives of clients, and costs of other community resources used, are listed in table 8. Very few of the program clients used community resources such as professional child care, medical practitioner and home help services. Although program clients received fewer visits by family and friends per day whilst in hospital than did women in the hospital group, these visits incurred a greater cost as they were more likely to be made during work time. This may be related to the shorter hospital stay of women in the program group, which limits the total visiting time available. Costs to family and friends helping at home were less for the program groups at Auburn and Westmead, but more for Blacktown. Overall, early discharge shifted some of the costs of care to the community. However, most of this additional cost is borne by visitors.

TABLE 8 - COMMUNITY RESOURCE USE

Resource Input	Auburn Hospital Program Client Client		Westmead Hospital Program Client Client		Blacktown Hospital Program Client Client	
Costs to Visitors:						
Average number of visits per woman per day ¹	Hosp: 5.43	Hosp: 1.37 Home: 0.88	Hosp: 5.31	Hosp: 1.31 Home: 0.98	Hosp: 5.17	Hosp: 1.35 Home: 0.79
Leisure time	\$75.06	\$19.21	\$46.23	\$16.12	\$49.62	\$20.64
Work time	\$6.42	\$117.18	\$13.40	\$51.52	\$24.50	\$77.97
Travel cost	\$14.53	\$90.17	\$30.62	\$66.89	\$37.77	\$80.34
Total	\$96.01	\$226.56	\$90.25	\$134.53	\$111.89	\$178.95
Costs to family and relatives in helping at home:						
Leisure time	\$29.66	\$20.17	\$4.48	\$11.97	\$5.31	\$16.43
Work time	\$329.55	\$233.21	\$110.98	\$94.03	\$127.98	\$174.15
Total	\$359.21	\$253.38	\$115.46	\$106.00	\$133.29	\$190.58
Costs to other community services:						
Professional childcare	\$0.00	\$0.00	\$2.08	\$0.44	\$2.06	\$0.07
Use of Home Care Services of NSW	n/a	\$1.23	n/a	\$1.18	n/a	\$0.00
Use of Medical Practitioner services (after discharge)	n/a	\$0.00	n/a	\$0.29	n/a	\$0.08
Total	\$0.00	\$1.23	\$2.08	\$1.91	\$2.06	\$0.15
TOTAL COMMUNITY COST PER CLIENT:						
Overall community cost per day	\$455.22	\$481.17	\$207.79	\$242.44	\$247.24	\$369.68
Community cost per day (without costs to visitors)	\$359.21	\$253.38	\$117.54	\$107.91	\$135.35	\$190.73

Notes: 1 = Clients may have received more than one visit from the same person (eg partner).

For all three DMPs, societal costs are greater than the value of societal resources released by early discharge (tables 9 and 10).

TABLE 9 - NET ECONOMIC VALUE OF SOCIETAL RESOURCES RELEASED PER EPISODE

	Average community cost per episode ¹	Net economic value of community resources released ²	Net economic value of societal resources released ³
Auburn: Hospital	\$2030.96	-\$115.78	-\$109.52
DMP	\$2146.74		
Westmead: Hospital	\$832.91	-\$138.90	-\$175.39
DMP	\$971.81		
Blacktown: Hospital	\$977.27	-\$483.98	-\$666.71
DMP	\$1461.25		

Notes: 1 = Average cost per client per day for both program and hospital groups (from table 8) was multiplied by length of stay for hospital clients to ensure comparability between groups.
 2 = These figures are calculated by subtracting average community cost per episode for the program group from average community cost of the hospital group.
 3 = These figures are calculated by adding the net economic value of hospital resources released per episode (from table 6) to the net economic value of community resources released.

TABLE 10 - NET ECONOMIC VALUE OF SOCIETAL RESOURCES RELEASED PER YEAR

	Net economic value of community resources released ¹	Net economic value of societal resources released ²
Auburn	-\$56,857	-\$53,783
Westmead	-\$76,870	-\$97,064
Blacktown	-\$425,051	-\$585,532

Notes: 1 = these figures were obtained by multiplying the net economic value of community resources released per episode by the annual number of DMP clients.
 2 = these figures were calculated by adding the net economic value of hospital resources released per year (from table 7) to the net economic value of community resources released per year.
 All calculations are subject to rounding errors.

3.4.4 Enhancing Cost-effectiveness

By varying activity, staffing or other factors it might be possible to reduce the costs of the programs and so make them more cost-effective. The results of the sensitivity analysis and of the assessment of economies of scale make it possible to test whether changes in the activity and scale of the program can enhance its cost-effectiveness.

For Auburn DMP, an increase in monthly activity (i.e. number of postnatal visits per month) would enhance the ability of the scheme to release resources in excess of program costs. This could be done by increasing the number of participants in the program and reducing the number of visits per client, as long as outcomes are not affected. Similar measures for Westmead DMP would enable it to become cost-effective. For the Blacktown scheme, reductions in the average number of visits per client with increases in monthly activity would significantly improve cost-effectiveness, but still would not release resources of greater economic value than program costs. If activity cannot be increased sufficiently to make the program cost-effective, then reductions in staff establishment with reductions in average number of domiciliary visits per client should be considered. This would bring program activity closer to capacity. Assigning staff to other duties during periods of low activity would also help to offset costs. However, any reduction in visits per client should be monitored, to ensure that there is no detrimental effect on health status of mothers or infants.

Factors identified by women in hospital as influencing their choice not to take up early discharge included lack of free help with child care and housework, unclear explanations of the program, and family advice against early discharge. Participation could be increased by providing such help and by improving communication of information and increasing reassurance. However, such changes may also increase costs which could off-set any savings related to increased activity.

Since the results of the evaluation were fed back to DMP managers in Blacktown, a number of changes have been instituted. Staff establishment has been reduced from an average of 8 FTEs to 7.2, the average number of postnatal visits per month has increased, the percentage of women who took early discharge has increased from 25% to 42% of all deliveries, and the average number of visits per client has been reduced from 6 visits to 4.8 visits per client. Also, the position of program coordinator (who was responsible for establishing the program) was abolished. These changes led to a considerable drop in cost per episode of DMP care, from \$420 to \$295, and to an increase in economic value of resources released per annum from \$211,000 to \$268,470. However, the costs of the program still exceeded the economic value of resources released. Further changes need to be implemented if cost-effectiveness is to be achieved.

4. DISCUSSION

4.1 Satisfaction Study

This study was not a randomised controlled trial and the measurement of satisfaction related to satisfaction with the client's own choice of postnatal care. The greater levels of satisfaction measured in program clients cannot be attributed to the program alone. Allocation of women to an early discharge program could not be expected to give the same level of satisfaction as the element of choice would be lost. The differences in satisfaction between hospital and program women may in fact be due to differences between the types of women who chose early discharge and those who chose to stay in hospital, eg. parity. The results suggest that maintenance and promotion of the scheme will provide clients with greater choice of care and high probability of satisfaction with the outcomes of their choice, whether they choose to take advantage of early discharge or prefer to stay in hospital.

Timing of questionnaire administration differed between the hospital and program groups, and could have had some influence on the results. The program women completed the questionnaire on average 2.5 days later than did the hospital group, and tended to rate their physical health better than did the hospital group. Since one would expect women to feel better and more competent in baby care after each successive postnatal day, there could be a bias towards greater satisfaction in the program group. However, it is equally possible that program women would be less satisfied with postnatal care as they are attempting to cope with home and family duties as well as with a new baby. In this study, client satisfaction was evaluated at the time that the hospital relinquished responsibility for care.

The nature of domiciliary care, which is provided in the client's own home, may naturally lead to greater satisfaction with the technical aspects of postnatal care. Information and suggestions communicated personally in familiar

surroundings are more likely to be perceived as useful and clear.

Causes of differences in satisfaction for primiparous women in the hospital and program groups are not certain. First-time mothers may have received more attention from the midwives in their own homes than was possible for those remaining in hospital or, conversely, it may be that first-time mothers who were more confident tended to select early discharge. This group would likely express greater satisfaction with the service as their need of advice would be expected to be lower than that of less confident women.

4.2 Factors Influencing Choice of Postnatal Care

Women who chose not to participate in the early discharge schemes were particularly influenced by a desire for rest, perceived need for medical supervision, and the wish to establish the baby's feeding before returning home. The lack of clear explanation of the scheme, unrealistically low expectations of postnatal health, and a need for support in the home were also identified as factors which influenced the non-participants choice of postnatal care.

The economic evaluation demonstrated the importance of utilisation rates to the cost-effectiveness of the programs. Factors which could increase utilisation of these early discharge programs are:

- provision of extra support in the home,
- provision of fuller information on the early discharge program in order to increase awareness and to reduce anxiety levels,
- provision of some form of "hot line" to provide instant access to advice,
- increased flexibility to enable clients to go home one day earlier, rather than the two or three days required by the programs at present.

Overall, participation in the early discharge program could be increased if clients' fears were allayed by provision of better information and greater support in the home, both as access to advice and help with housework and child care. The costs of providing such additional services could be counter-balanced by economies of scale flowing from expansion of the program.

4.3 Economic Evaluation

The economic evaluation found that the schemes at Blacktown and Westmead presently cost more than the value of resources released, but operation of the scheme at Auburn releases more resources than it costs. However, the Auburn results are highly sensitive to the assumptions made in the analyses. All of the DMPs were operating below capacity which affects their ability to release resources. Operation closer to capacity, reductions in staff establishment and assignment of staff to other duties during low activity periods would help to increase cost-effectiveness if client welfare were not affected.

Reductions in length of stay achieved independently of the programs will reduce their efficiency, unless the effect can be offset by measures such as increasing monthly program activity and/or reducing the number of visits per client.

The most important factor influencing the cost-effectiveness of the program was the average number of postnatal visits per client. This was determined by overall workload, midwife discretion and client preference and need. The DMP with the highest proportion of primiparas among its caseload also had the highest number of visits per client, suggesting that these women required a higher level of confidence building, reassurance and information.

The median length of stay of women in the hospital group was four days, with a minimum less than two days. The task force on maternity services in NSW (Shearman, 1989) recommended five to seven days as an optimal period of

postnatal care where home support was not available. The results of this evaluation indicate that further study on the effects of number and duration of visits on maternal and infant health status, and the value of care to women in terms of reassurance and confidence building, needs to be carried out.

The relative efficiency of each early discharge scheme is determined by the difference between economic value of resources released and the value of resources consumed by the Domiciliary Midwives Program. This study demonstrates that the role of early discharge schemes in improving efficiency cannot be taken for granted.

The economic value of resources released should be viewed in terms of new opportunities for the use of these resources. This study valued freed bed days using weighted average costs on the assumption that these bed days are used by other patients. If such freed resources were used by other patients, total hospital expenditure would increase, as the scheme is being funded in addition to the bed days. If beds are closed to generate financial savings or to fund the DMP, the existence of fixed costs implies that the financial value of the resources released would be less than their economic value (ie weighted average cost per bed day).

The extra costs of the scheme must be considered in context. The costs of each of the schemes could be reduced if measures were adopted to reduce spare capacity and limit the number of visits per client to those determined by client need rather than pressure on time. However, even if the DMPs continue to cost more than the value of resources released, it is apparent that the early discharge scheme is providing women with an increased choice of postnatal care.

5. CONCLUSION

Women participating in the early discharge scheme were more likely than non-participants to be extremely satisfied with the interpersonal and technical aspects of their choice of postnatal care. The outcome of home postnatal care is likely to be at least as satisfying for them as hospital care is for the non-participants, as long as the women have sufficient support, no medical complications and are able to exercise autonomy over the selection of the type of postnatal care they receive. Participation in the programs could be increased through better communication of information and provision of support to the clients.

The economic evaluation demonstrates that Blacktown and Westmead early discharge schemes currently cost more than the value of the resources they release. The scheme at Auburn releases resources valued more highly than its costs but the difference is slight. Suggestions are made which could improve cost-effectiveness, but these would not necessarily lead to reductions in hospital expenditure. This would depend on the uses to which the released resources are directed. From the societal perspective, all three programs use more resources than are released. However, the increase in client choice may be judged to be worth the extra cost involved.

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