



**CENTRE FOR HEALTH ECONOMICS  
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# **The Decline in Patient Numbers in Mental Handicap Hospitals: How the Cost Savings should be calculated**

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THE DECLINE IN PATIENT NUMBERS

IN MENTAL HANDICAP HOSPITALS:

HOW THE COST SAVINGS SHOULD BE CALCULATED

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## ABSTRACT

The movement of patients out of long stay mental handicap hospitals releases some funds which can go towards the development of community services. This paper considers the size of the possible savings on the basis of leaving the resources available for care unchanged for those who remain in hospital. It is argued that the savings depend on the dependency of those discharged, the existing level of services and the policy of a particular hospital about the use of paramedical staff. This has the implication that each hospital has to be considered individually.

The paper goes on to discuss how costs in hospitals should be apportioned, and how potential savings can be identified. On the basis of a study of five hospitals in the Northern Region it emerges that there are few fixed costs, but the discharge of low dependency patients produces savings of approximately 50% of average cost. The results show that this rises as the programme involves the discharge of more dependent patients.

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## **1. Introduction**

1.1 This paper reports some of the results arising from a study of savings that can be achieved when patients move out of mental handicap hospitals. The study looked at all five large mental handicap hospitals in the Northern Region. The Regional Health Authority (RHA) plans to use these savings to contribute to the cost of providing services outside hospital for people with a mental handicap. Under the present programme 951 in-patients are expected to move into community based care within the next seven years.

## **1.2 The Terms of Reference**

The terms of reference for the project stated that the first task was -

"To identify the maximum level of revenue that can be released by hospitals for the mentally handicapped following the transfer of residents to the community without deterioration in the current level of service to those remaining in hospital"

The second task was to consider the timing of savings, and this was done as part of the same exercise.

The concern of the RHA is to identify those funds which can be put towards the cost of providing alternative care in community based services. However, the RHA wishes to avoid unplanned reductions in the quality of care for those who remain in long stay hospitals.

## 2. Background

2.1 For some years the number of patients in long stay mental handicap hospitals has been declining, but this process has accelerated as the policy of discharging patients into the community has been implemented. Much of the focus of debate has been on the costs and quality of the new community based services (eg Wright & Haycox, 1985) and facilities, but there is increasing interest in the cost and quality of the remaining hospital services (eg. Wright & Haycox, 1984). In particular there is some argument about how much money should be removed from the hospitals as patient numbers fall, and over what timescale savings can be achieved.

Studies of the run down in services and the costs of these services are called retraction models. Such models consider what costs can be saved, and what the effects will be on the quality of care for those who remain in hospital.

## 2.2 Existing Policies

Prior to this work being undertaken the Northern RHA had a policy of taking back from the District 70% of the average cost of in-patient services as the patients move out into the community. Most other Regions in England have attempted to take back the full average cost (after some timelag). In all cases the funds removed from hospital are kept within mental handicap services, going to develop new services or as a "dowry" to the receiving District as in Trent (1984). (More detail of the policies of English Regions is given in Normand (1986)). The Northern policy is therefore relatively generous to those districts with mental handicap hospitals. Despite this it has been argued that the policy will lead to a decline in the quality of care for those who remain in hospital. In

particular there has been concern that it would be difficult to achieve this level of savings in the early part of the closure programme. If it is true that the 70% recovery would lower the quality of care, then it would clearly be the case that there would be an even greater problem in Regions which aim to recover the full average cost.

### 3. The Approach Taken

3.1 There are two reasons for believing that taking a fixed percentage, such as the 70% used by the Northern RHA, would lead to changes in standards of hospital care.

- a) Some costs are fixed, so that they will be incurred so long as activity remains on the hospital site.
- b) Costs of care are likely to vary with patient dependency, so that achievable savings will be relatively smaller when low dependency patients are discharged.

To avoid these problems the study reported here looked at each of the hospitals individually to identify costs which could be saved. This has meant that a programme of ward closures has been assumed, and costs related to patients and wards identified. The savings which should be achieved as patient numbers decline are the costs of wards which are closed, and of services which are no longer needed.

This approach involved costing the wards and patient services, and identifying those which vary with patient numbers. Since it was an aim to use a uniform approach to the analysis of all the hospitals a standard method of cost apportionment had to be adopted. There was some variation

in the type and quality of the data available in the different hospitals, and the approach had to make use of readily available figures, such as those in the cost accounts, with the minimum of specific data collection.

### **3.2 Some General Principles**

The dependency of patients is an important factor in the cost of providing services. It is never easy to measure dependency, since measurement is a process of combining different indicators in a single index. In general dependency is measured in two dimensions: the ability to perform tasks and the degree of behavioural problems. There is only partial correlation between measured dependency and the observed cost of providing services. In this study there was the further problem that no standard system of measurement such as the Wessex scale was in use in the different hospitals, and there was even variation in the number of categories used.

In the absence of consistent dependency measurement various proxies, such as the level of nursing care provided have had to be used. This had the drawback that dependency was measured in terms of the services provided, which made it difficult to make comparisons of the dependency and the level of care provided. Although as a general rule it is not legitimate to compare patient dependency in different hospitals using this proxy approach, it is more acceptable to produce an ordinal ranking of ward dependencies within a given hospital. Nurse managers in the hospitals believe that they allocate their available nursing staff in relation to dependency. Patients were assigned to five dependency categories for the purpose of this study.

3.3 It was assumed that, unless other information was available, the patients to be discharged first were those of lowest dependency. In some cases specific community schemes for high dependency patients are being planned, which will lead to the discharge of high cost patients, yielding large savings. But in most cases, where low dependency patients move out first, the initial savings will be quite small, with larger savings available when those moving out are more dependent. It may be possible in hospitals with few low dependency patients to save the 70% of average cost per patient discharged by the end of the current programme, after perhaps half of the patients have been transferred, but in the early stages of the programme the possible savings will be less.

3.4 An advantage of retraction models, such as the one adopted here, based on the analysis of the costs of operating wards, is that they allow the calculation of savings on various patterns of discharge. If some high dependency patients have been moved out a high dependency ward can be assumed to have closed, and the relevant savings identified.

In designing the assumed ward closure programme, the lowest dependency wards as defined by the hospital, or in two cases as measured by nurse staffing, were identified. Where wards were described as low dependency, but nurse staffing was unusually high, the ward was not included early in the programme. It is not necessarily implied that these particular buildings would close, but that the patients are typical of those who will move out. If anything this will underestimate the potential for savings, since hospitals will typically close buildings which are peripheral to the hospital site or which are in poorest condition. Such buildings are typically more expensive than average to keep in use.

3.5 Many of the schemes for community care are taking longer than expected to set up. Consequently the programmes of discharges from hospitals are also running behind the original plans. It was therefore decided to determine the relationship of patients moved, wards closed and costs saved. No dates for closures have been assumed although they can easily be added as progress on alternative care is made and the rate of discharges from hospitals becomes clearer.

3.6 Savings from the discharge of patients were only calculated in this exercise on the basis of whole wards closing. There were two reasons for this. Firstly, many of the costs of patient care can only be saved once a ward has been closed, since a level of supervision, heating and maintenance will be required up to this point. Secondly, most hospitals will be able to close at least one ward each year, and so will be able to make the savings within a short time of the patients leaving. In cases where a small hospital is faced with slowly declining patient numbers it may be important to look more carefully at the behaviour of costs in partially used wards. This is particularly important where there are additional constraints to the rationalisation of wards, and the hospital may have several that are partially used.

3.7 It was assumed in this exercise that a ward would close as soon as the number of patients discharged was equal to the number of available beds in the next ward in the programme. Given the slight spare capacity in most hospitals this should be achievable with good management. Where the decline in numbers came from deaths rather than discharges it is possible to save more, since those who die are on average of higher dependency than those who are discharged. However, allowance also needed to be made for

any new admissions, who will also typically be of higher dependency than those discharged.

3.8 In general no guidance is given on how the local management should organise the services, but only on the level of cost that can be saved with good management. There may be scope for some managements to save more than is estimated here, but we are confident that the savings we estimate are possible with no deterioration of the standard of care for those who remain.

#### **4. Estimation of Costs**

##### **4.1 Nursing Cost Savings**

The salaries of nurses represent the largest single component of cost. It was therefore important to identify with some accuracy the nursing costs that could be saved. In hospitals where patients are cared for in single dependency wards, it is straightforward to calculate the savings from the closure of a ward. In the early stages of the run down of a hospital it is the lower dependency patients who are typically moved into community care, so that the nursing savings will be those for the closure of a low dependency ward.

4.2 More problems arise when allocation of patients to wards is on some other basis such as home town, and care is provided in mixed dependency wards. The movement of low dependency patients into the community will raise the average level of dependency in the hospital and therefore in each of the (mixed dependency) wards. The remaining wards require more nurses if the standard of care is to be maintained. There is therefore a need for

a method to calculate the extra nursing establishment required to prevent a deterioration of the service.

4.3 A simple model of dependency and nursing has been developed, based on the relationship observed in hospitals which use single dependency wards. When the number of patients discharged reaches the number in the next ward to close, some nursing costs are saved, and some are transferred to other wards in recognition of the higher dependency in remaining wards.

4.4 The estimated relationship between changes in dependency and changes in the level of nursing is based on too small a sample for statistical testing to be used. In some dependency categories there were only two wards from which to look for a pattern. There is a need for more work to explore the relationship of nursing levels, dependency and the resulting quality of care. However, it is possible to conclude tentatively that, if the standard of care is to remain the same, the nursing staff on a mixed dependency ward with 40 beds must rise by approximately two whole time equivalents for every change in the average dependency category (as measured by the hospital on the five point scale).

The discharge of 40 patients from a hospital with mixed dependency wards is likely to have an effect equivalent to raising the average dependency in one other ward by one full category. It is therefore possible to calculate the necessary extra staffing on remaining wards following the discharge of 40 patients. Similar calculations can be carried out when smaller wards are closed.

In assessing the nursing cost savings in this study it was assumed that the nurses are all paid at the mid point of the relevant scale. There is some evidence that mental handicap nurses are typically nearer the top

of the scale, so our estimates may slightly understate the potential for nursing cost savings.

#### 4.5 Non-Nursing Cost Savings

It is argued above that it is in principle easy to calculate the nursing costs of wards in mental handicap hospitals, and the savings that should be available when wards are closed. In the case of non-nursing costs there are more problems in allocating and apportioning costs, and in identifying those that will vary with patient numbers, patient numbers weighted for dependency, wards or the hospital as a whole. There are apportionments of costs which are useful for producing costs accounts, but which do not represent costs which can be saved in the short run.

4.6 There was some unease in the districts at the use of data from the costs accounts as a source for calculating potential savings. There were two reasons for this. Firstly there was some doubt about the accuracy of the accounts. Secondly it does not always follow that costs can be saved, even when there is no objection to the apportionment. Although the financial data used in this study are largely taken from the cost accounts, an attempt was made to identify the components that could be saved as numbers of patients change, and wards are closed.

Costs were divided into various categories in this study.

- those that required specific detailed consideration as to how and when savings are achievable

- those that were effectively variable costs, allowing average savings to be made with each patient transfer. This category represented only a small part of total costs of patient care.

4.7 A further category of non-nursing costs that needs consideration in any study comprises those small amounts of hospital costs that are genuinely fixed ie. overheads. Each individual hospital will face a different level of overhead cost within total hospital costs. The factors which influence the size of this overhead element centre on the ratio of ward space to hospital facilities. Non-ward space includes office accommodation, the boiler house, laundry facilities and para-medical departments. On the average ratio in the hospitals in the study (55% of the total hospital estate is devoted to wards), the overheads will be approximately 4.5% of total hospital cost. Rates, energy and maintenance costs of the non-ward accommodation will comprise the majority of this fixed cost. Whilst it is recognised that some costs may be difficult to remove, they are not considered to be fixed. However it is recognised that non-nursing costs may, in some instances, only be saved through good management.

Some savings can only be achieved in discrete amounts at specific stages in the transfer programme, and may be a consequence of buildings closing and staff reductions. For example, where only one physiotherapist is employed, the replacement may be a part-time or shared appointment. Although many of these items represent only small amounts, the collective effect can be significant. It was assumed also that hospital management would make these savings as soon as is practicably possible.

Throughout the study it became clear that different policies on providing services were used in different hospitals. The existing

relationship between dependency and cost therefore differed between hospitals. Thus the achievable savings, assuming no change in the quality of care for those patients remaining, varied between hospitals. Such policy variations were both a consequence of historical events and conscious management decisions. Not all of the costs in the cost accounts could be saved. More detail is given below of the approach taken to identifying those costs which can reasonably be saved as patients numbers fall.

#### 4.8 Building and Engineering:

Ten year rolling programmes are a common feature of hospital maintenance, causing cyclical differences in levels of expenditure on any given ward in any financial year. These costs were apportioned evenly over wards unless some specific improvement scheme were planned.

#### 4.9 Medical Staffing:

Costs attributable to medical staff arise from two different and unrelated kinds of service.

- a) **Psychiatric Services:** Services were concentrated within hospitals on the high dependency patients, and were also widely used by people outside the hospital. Very little use was made of this service by patients in the lower dependency categories.
- b) **Physical Care Services:** This was split into two elements relating to:
  - (i) routine examinations

(ii) sick list, GP type services.

This exercise assumed either element could be saved as patients transfer and that the demands of patients upon these services do not vary significantly with dependency. Within the Northern Region such physical care services are performed by both GPs on contract and junior medical staff.

#### 4.10 Physiotherapy, Occupational & Industrial Therapy:

There is a wide range of service provision within the "therapy" departments of the hospitals in this study. Workload patterns for a department showed that different groups of patients were being targeted across the hospitals. For example, one Industrial Therapy Unit deals only with patients of the lowest dependency, whilst another such unit has medium to high dependency patients as the main users. Potential savings varied depending on the current policy. (The cost of these services contained a large element of untrained helpers and nurses. It is important to identify these, even when they do not appear in the cost accounts).

#### 4.11 Portering, Transport, Catering:

As patient numbers fall there will be a drop in demand for the services of these ancillary departments. To reflect this, the provision must be rationalised as soon as possible, allowing savings to be made at specific stages in the transfer programme. It is likely that some problems will disappear with the introduction of central systems of provision. For example, a cook-chill catering service, serving several sites removes the need to maintain underused kitchens in hospitals. In effect the proportion of variable costs is increased. It may also be necessary to

introduce other joint site services as part of the rationalisation process.

**4.12 Laundry and Linen:**

The cost of patient's laundry and linen varies with both dependency and the proportion of patients who are incontinent. Where no other information was available patients with high levels of incontinence were identified by the higher levels of expenditure on medical and surgical equipment.

**4.13 Administration:**

It is recognised that as long as a site retains patients some administration costs will be incurred. To avoid very small numbers of administration staff a reorganisation of units of management may be necessary. An alternative adopted by some districts is for present hospital administrations to retain responsibility for the same group of patients, taking on the wider responsibility of community services.

**4.14 Capital Expenditure**

It was apparent in the study that in order to make possible the rationalisation of the services remaining on a hospital site it might be necessary to spend some money on minor capital works. This spending is justified by the lower running costs of the hospital services. In particular, there are three types of minor capital works which may be necessary:

- (i) Minor structural alterations, for example partitioning or the installation of lifts, that allows the mixing of patients and/or departments in retained accommodation.
- (ii) Refurbishment of remaining facilities to standards suitable for the care of the increasingly dependent in-patient population.
- (iii) Costs of demolition of empty buildings, allowing the contraction of the total hospital site. This will bring savings in both rates and site maintenance costs.

## 5. RESULTS

5.1 The present programme of the Northern RHA involves the discharge into the community of 951 patients. In order to see how the costs will behave as the dependency of patients discharged rises, this programme can be reviewed in seven stages. Since our analysis was based on the closure of whole wards the seven sections are of slightly different sizes. The annual hospital savings from discharges are shown in table I.

TABLE I

BEDS CLOSED	NURSING SAVINGS £'000	OTHER SAVINGS £'000	TOTAL SAVINGS £'000
74	155	218	373
178	356	597	953
294	556	987	1543
424	826	1451	2277
606	1284	2101	3385
770	1735	2731	4466
951	2309	3450	5759

(all costs are in 1985/86 prices)

5.2 These figures help to clarify the argument about the percentage of average cost that can be saved. In essence it depends on the size of the closure programme. If 74 beds are closed annual savings total £373,000, or £5,041 per bed. Compared to the Regional Average cost of £10,142 this represents 49.7%. A programme of closure for 951 beds releases £6,056 per bed on average.

5.3 To get an idea of the phasing of savings, it is useful to look at the extra savings as extra beds are closed. This is done in Table II.

TABLE II

BEDS CLOSED	EXTRA ANNUAL SAVINGS £'000	EXTRA ANNUAL SAVINGS/BED £'000
74	373	5.041
178	580	5.577
294	590	5.086
424	734	5.646
606	1108	6.088
770	1081	6.591
951	1293	7.144

5.4 There is little change in the funds released per patient in the first half of the Northern Region's programme. As the programme progresses the funds released will rise. Compared to the original Regional average cost the savings per patient discharged rise from 49.7% to 70.4%.

## 6. Conclusions

The following conclusions emerged from this study:

6.1 In the early stages of the programme the patients discharged are generally of a lower than average dependency, and generate only fairly small savings. Any simple percentage recovery, or a policy of full average cost recovery will change the standards of care at least at some stages of the programme.

6.2 The correct level of recovery, assuming the standard of care is to remain constant for the patients still in hospital, depends on what kind of patients are being discharged. A further reason for not using a percentage is that the regional average cost rises as low dependency patients move out. Different hospitals have patients with very different levels of dependency.

6.3 Given the small number of mental handicap hospitals it is worth carrying out retraction model exercises in each. These models would be easier to calculate, and more reliable in use if a standard system of patient dependency measurement, such as the Wessex Scale, were in use in all hospitals. In addition to helping to identify savings they produce information about the current costs and service provision which should be of interest to managers. The approach adopted in this study used few new data, but was able to demonstrate a wide variation in savings and the phasing of these savings.

6.4 Few costs are fixed beyond a period of 1-2 years, although some may only be saved after some rationalisation.

6.5 Small wards cost more to run for any given level of dependency, although it may be that the quality of the resulting care is better.

6.6 No single policy applied to all hospitals will avoid changes in the standards of care since there is great variation in the dependency of patients in the different hospitals.

6.7 Savings in the early stages of the rundown of a hospital are typically around 56-60% of average cost, rising as the dependency of patients discharged rises.

REFERENCES

Wright, K., Haycox, A. (1985) Costs of Alternative forms of NHS care for mentally handicapped persons. CHE Discussion Paper No 7.

Wright, K., Haycox, A. (1984) Public Sector Costs of Caring for mentally handicapped persons in a large hospital. CHE Discussion Paper No 1.

Trent RHA (1984) Financial Strategy for the Development of Mental Illness and Mental Handicap Services.

Normand, C., (1986) Transfer of Mental Handicap Patients into the Community; RHA Policies on the Transfer of Resources. Health Economics Consortium