Research Article

Identifying Factors Affecting the Placement of Mentally Ill Patients

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Abstract

Background: There is now general agreement that a comprehensive psychiatric service can operate with the minimum use of in-patient facilities. Consequently, the emphasis in most European countries is on reducing the number of inpatient beds and expanding the range of community care facilities, including day hospital services, available to mentally ill patients. Decision-making with respect to placement is now even more important given the changes currently taking place on the supply side.
Method: The study examines the factors that influence placement decision-making between inpatient care and day hospital care in one Health Board in Ireland. Placement was examined over a 9 month period for all patients presenting for treatment in one particular area with a population of 39 000 people. Patients were not randomized between the two settings due to ethical concerns about the randomization process. The issue of placement is analysed using a logit estimation procedure.
Results: The results suggest that two variables have a significant affect on placement for the population under review: whether the patient is accompanied at the time of admission and the domicile of the patient.
Conclusions: Greater flexibility with respect to the opening hours of day hospital facilities, linked to improved transport facilities, together with further analysis on the process of admission to hospital, particularly the dynamics of the interaction between providers, patients, and accompanying persons, may improve placement decision-making for mentally ill patients. Copyright © 1999 John Wiley & Sons, Ltd.

Introduction

The two main objectives of the mental health services in Ireland are to promote mental health and to restore the mentally ill to as independent and normal a life as possible.[1] These objectives have their origins in the *Planning for the Future* report, which set out a new strategy for mental health care in Ireland.[2] The main thrust of the new strategy is the replacement of institutional beds with a range of community-based resources, including day hospital and day

care facilities. The emphasis on community care in Ireland is in keeping with the general trend of de-institutionalization for psychiatric patients in most countries of Western Europe. There is now a good deal of agreement that a comprehensive psychiatric service can operate with the minimum use of inpatient facilities.[3–6]

The reduction in the number of beds in recent years has placed a major emphasis on the process of admission to inpatient care. Decision-making with respect to placement is now even more important given the changes on the supply side. The problem is that not enough is known about the factors that make some mentally ill people more likely to end up in a hospital bed than in alternative, community-based, forms of care. This is particularly the case in Ireland, where the evaluation of psychiatric services, economic or otherwise, is only in its infancy. This paper is an attempt to widen the information base by investigating the factors that affect placement decision-making for people with mental illness, between inpatient care and day hospital care, in one Health Board in Ireland.

The placement of mentally ill people between the broad sectors of community and inpatient care is an inexact science. Providers must consider the likely costs and benefits of alternative regimes of care in relation to the type and severity of the patient's illness. In practice, there is a wide margin within which health care providers make decisions about placement. Placement procedures are not so well developed as to allow mentally ill people to be slotted easily into the most efficient regime of care, except between broad parameters. For some categories of people, there may be uncertainty about whether community or inpatient care provides the largest net social gain when all costs and benefits are taken into account. The identification of factors which determine the actual placement of people, particularly people in marginal categories, has important implications for the overall organization and efficiency of service provision. Adjustment, at the margin, to any of these factors will affect both resource use and outcomes for people with psychiatric illness. This paper is concentrated on the issue of placement. The methodology and model used in the study are set out in the following section. The results are presented in the next section. The paper concludes with a discussion of the results and policy implications arising from the analysis.

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Methodology and Model

Since 1987 psychiatric services in the Mid-Western Health Board have been divided geographically into five sectors, each with a multi-disciplinary team consisting of a consultant psychiatrist, two psychiatric senior house officers, three psychiatric nurses, a psychologist, a social worker, an addiction counsellor and an occupational therapist, all based in a day hospital or mental health care centre. Psychiatric services for each sector are organized from these centres. The sector in which this study is based, sector B, is the largest sector in the region with a total population of 39 000 people. The geographical area encompasses Limerick city. East and South, and the rural area of Limerick East. St. Anne's Day Hospital in the city is the primary access and contact point for psychiatric services in this sector between the hours of 9.00 am and 5.30 pm, Monday to Friday. Referrals are accepted only from general practitioners and other health professionals. All patients referred for assessment, either emergency or routine, are seen, in the first instance, in the day hospital. A comprehensive range of community-based services are offered from the day hospital. Emergency referrals that arise outside core day hospital hours are seen by the psychiatric registrar or senior house officer on duty in the inpatient acute care unit at Unit 5B in the Regional Hospital in the city. Acute inpatient beds for sector B patients are also located in Unit 5B.

This study is a retrospective analysis of the factors affecting the placement of people between inpatient care and day hospital care in Sector B. The data was originally collected for a study set up in 1994 to examine different aspects of psychiatric services in the Mid-Western Health Board.[7] During the period of the original study, between 1 June 1994 and 28 February 1995, a total of 186 admissions occurred to either inpatient care or the day hospital in the sector under investigation. In all, 116 patients made up the 186 admissions. Six patients declined to be interviewed for the study, while data was incomplete for a further six patients. This left 104 patients in the present study; 80 attached to inpatient care and 24 to the day hospital. Information on patients was collected from both health board administrative records and from interviews conducted with patients and their relatives using trained researchers. The breakdown between inpatient and day care reflects the *de facto* allocation of patients between the two regimes of care, since, for ethical reasons, patients were not randomly allocated between the two forms of care.

During the period of the study 22 per cent of the population had more than one admission to in-patient care, while 4 per cent of the population had more than one admission to the day hospital. Thirteen patients or 11 per cent of the study population had admissions to both inpatient care and the day hospital. For people with admissions to both places it was decided that the initial place of admission would determine whether an admission was considered to be an inpatient or day patient admission for that person. This is not ideal but causes fewer statistical problems than the alternative approach of assigning placement on the basis

of where the majority of admissions took place. Fortunately, the problem of dual admissions was reduced somewhat in this paper, in that seven of the 12 patients excluded from the original population had received treatment in both places. This left only six dual patients who were classified on the basis of initial place of admission.

The issue of placement of mentally ill patients is analysed using a logit estimation procedure.[8] The emphasis is on the factors likely to influence placement; in particular, the issue is whether factors which significantly increase the probability of a person receiving care as an inpatient rather than as a day patient can be identified. The choice of independent variables reflects the descriptive analysis of the study population contained in the original work[7] and information on placement derived from the general literature on psychiatric care,[9–12] together with insights gleaned from discussions with health care professionals working in the area of mental health. The variables included in the model are as follows: socio-economic group, age, whether the patient was accompanied by another person on admission, domicile, Brief Psychiatric Rating Scale (BPRS) score on admission, gender and marital status.

Socio-economic group is dichotomized into two broad categories: 'disadvantaged SEGs' comprising semi-skilled manual, unskilled manual, farm labourers, and the 'unknown' groups: and 'advantaged SEGs' comprising the remaining SEGs. Age is broken down into those below 45 years of age, those between 45 and 64 years and those aged 65 years and over. The age categories are chosen to reflect the spread of ages in the data and are a compromise to overcome functional form problems associated with continuous representation. Similarly, the Brief Psychiatric Rating Scale (BPRS), which is used to measure people's mental state on admission, is divided into two broad categories, low and high, reflecting scores below and above the average score for the two groups of patients. The cut-off score between low and high is 17, which is the mid-point of the mean BPRS scores on admission to the two care settings. People admitted to inpatient care had only marginally higher BPRS scores than day hospital patients. Domicile is characterized as either urban or rural. The area under review includes patients from urban and rural areas and distance from the day hospital may affect placement. The accompaniment on admission variable tests for the effect that presenting alone may have on placement decision-making between inpatient and day hospital provision. We also explore whether gender and marital status influence the likelihood of ending up in one care regime rather than another.

Results

The descriptive statistics on the independent variables are shown in **Table 1**. There is very little difference in the population in each location for the variables: advantaged socio-economic group, living alone, married, male and age 45–64. Differences do emerge on the other variables, some more so than others. Only 3 per cent of the day hospital population are aged 65 years and over, compared to 16 per

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Table 1. Descriptive statistics for the independent variables in the study population: inpatient care and day hospital care (%)

Variable	Inpatient care (%)	Day hospital care (%)
Advantaged socio-economic group	49	42
BPRS ≤17	49	64
Urban domicile	59	82
Living alone	14	21
Married	39	32
Age 45–64	33	41
Age 65+	16	3
Male	45	47
Unaccompanied	22	62

cent in that age category in the inpatient setting. Just under two-thirds of the day hospital population have a BPRS score less than or equal to 17. Surprisingly, half of the people registered as inpatients have a BPRS score less than or equal to 17. The major differences between the two populations occur in the unaccompanied and domicile variables. In the case of admission to inpatient care, only 22 per cent of admission are unaccompanied at the time of admission. It may, therefore, be the case that the decision to admit to hospital is influenced by the presence of an accompanying person in the remaining four-fifths of admissions. A much higher percentage of the day hospital population are unaccompanied at the time of admission. The majority of day hospital users live in urban areas. Indeed, only 18 per cent of people attending the day hospital live in a rural area. The corresponding figure for the inpatient population is 41 per cent.

The effect of these variables on placement is explored using a logit model. The results suggest that the logit model fits the data well, with the goodness of fit statistic satisfying conventional levels of significance. The McFadden R^2 of 0.30, reported in **Table 2**, is a satisfactory result since, in general, logit models are unlikely to provide a very strong overall fit. The percentage of correct predictions generated by the model is also used as a measure of robustness of the model. Using this criterion, the proportion of correct predictions at 83 per cent is, once again, encouraging in terms of the goodness of fit of the model. Explanatory variables with positive coefficients are associated with a higher probability of being an inpatient; variables with a negative coefficient are associated with a reduced probability of being an inpatient. The results show that the variables 'unaccompanied' and 'urban domicile' are negatively signed and significant. 'Unaccompanied' is significant at the 1 per cent level, whereas 'urban domicile' is significant at just above the 5 per cent level. No other variable in the model achieves conventional levels of significance.

The results confirm that an unaccompanied person is significantly less likely to become an inpatient than a person who is accompanied by a family member, or friend, at the time of admission. The reasons for this are not obvious from the data, but may be related to severity of illness. The presence of an accompanying person may simply reflect the fact that the patient is too ill to present on their own. The variable may, therefore, be picking up severity effects, although when we tested for this interaction the relationship was weak. The significance of the unaccompanied variable may also reflect the advocacy role played by relatives in pursuing one form of care over another, in particular circumstances. This may be tied to the location and time of assessment, and the status and experience of the physician responsible for admission to inpatient care. We could not, however, test for these various qualitative effects using the data available to us.

Domicile influences the likelihood of being looked after in one care regime rather than another. The reason for including a variable for domicile in the logit equation is to test whether the accessibility problem associated with living in a rural area is likely to have a positive and significant effect on the likelihood of a mentally ill person ending up as an inpatient, rather than a day hospital patient.[13,14] The hypothesis that urban domicile is likely to lead to a decreased

Table 2. Estimation results for the logit model on placement alternatives for mentally ill people in the study population

Variable	Coefficient	Absolute t statistic	p value	Marginal effect (%)
Constant	2.28	2.51	0.0120	—
Advantaged socio-economic group	0.67	1.12	0.2619	11.9
BPRS ≤17	−0.35	0.57	0.5684	−6.2
Urban domicile	−1.48	1.90	0.0580	−26.2
Living alone	0.18	0.23	0.8198	3.2
Married	0.57	0.80	0.4284	10.1
Age 45–64	0.12	0.19	0.8518	2.2
Age 65+	1.86	1.47	0.1408	32.9
Male	0.98	1.49	0.1342	17.5
Unaccompanied	−2.39	3.99	0.0001	−42.3
Sample size	104			
Log likelihood	−39.378			
McFadden R^2	0.30			
% correct predictions	82.7			

likelihood of inpatient care due to ease of access to the day hospital facility is confirmed in this study.

The most interesting non-result is the absence of significance on the 'BPRS score below 17' coefficient implying that mental state, as measured here, does not influence the decision to admit a person as an inpatient. While the sign is negative, implying that a person scoring below 17 on the BPRS is less likely to be admitted as an inpatient, relative to a person scoring 17 or higher, it is not significant. We applied sensitivity tests to this variable, altering upwards the cut-off point between 'severe', and 'not severe', in the search for a significance result. Sensitivity analysis does not, however, change the result in terms of the impact of this variable, presumably because of the small number of patients above the cut-off point, as severity levels are raised.

None of the remaining variables are significant, implying that these variables do not influence the probability of being an inpatient rather than a day hospital patient. Both 'advantaged SEGs' and 'married' have a positive sign, in contradiction to our expectations for the two variables. We expected poorer and more occupationally disadvantaged patients to be more likely to end up in hospital. This is the case nationally, where people from disadvantaged socio-economic groups are disproportionately represented in the data on admissions to psychiatric hospitals.[15] We also expected the sign on the 'married' coefficient to be negative, implying that non-single people are less likely to end up as inpatients. The justification for this view is that people who are married are more likely to have the necessary family support structures, and social networks, to allow them to remain in their own homes while receiving treatment for their illness, *ceteris paribus*.[16] Similarly, 'age 65+' has a positive sign, in contradiction to our expectation that people above 65 years of age are less likely than younger age categories to be admitted as acute psychiatric inpatients.[17] However, the absence of significance on each of these variables means that we cannot read too much into the sign on the coefficient. Similarly, a number of interaction relationships, including 'BPRS score' by 'unaccompanied', were also investigated. These variables are not shown in **Table 2** due to their overall weak effects. They made no contribution to the model in terms of improving goodness of fit, or increasing the proportion of cases correctly predicted.

Table 2 also shows the marginal effects, calculated as percentages, for each of the explanatory variables included in the model. The marginal values quantify the effects of each variable on the likelihood of being an inpatient relative to attendance at day hospital. The marginal effect is given by the following expression:

$$\frac{\delta p_i}{\delta x_{ji}} = p_i(1 - p_i)\beta_j$$

where p_i = prob(inpatient=1); x_{ji} = jth explanatory variable at observation i; β_j = the coefficient on explanatory variable j.

The results suggest that an unaccompanied person is 42 per cent less likely than an accompanied person to be an inpatient. Urban domicile reduces the probability of admission by 26 per cent. A person scoring less than 17 on the BPRS index is estimated to reduce the probability of being an inpatient by only 6 per cent. The results of the marginal analysis should, however, be interpreted with caution. The analysis only provides information on explained variance and correlation, and causal relationships should be not be inferred.

Discussion and Conclusion

The decision-making process leading to the placement of a person in residential care is one of the most critical issues in psychiatric care. For some people, decision-making with regard to placement is non-problematic. Those with less severe illness live at home, either alone or with family and friends. Those with very severe illness are usually cared for in some form of inpatient or residential care. The most interesting people, at least from a policy perspective, are those of intermediate severity, on the margin between domiciliary and inpatient care. Not enough is currently known about the factors that make some mentally ill people more likely to end up in a hospital bed than in alternative, community-based, forms of care. This is particularly the case in Ireland where the continuum of care is only beginning to take shape, and where day hospital provision is still a relatively new and innovative form of care. While it is more correct nowadays to discuss psychiatric care in terms of a continuum, encompassing a broad range of community and residential facilities, important insights can be gleaned by concentrating on day hospital care versus inpatient care for mentally ill people.

The relevance of the analysis in this paper is in raising critical issues about the future placement of mentally ill people. A number of crucial variables are identified, which may serve either to increase or decrease the likelihood of inpatient care, or its alternative. Two factors are particularly important in placement decision-making: whether the mentally ill person is accompanied or not at the time of admission and the domicile of the person as a proxy for access to day hospital care. If a person is accompanied by a relative or friend on referral, then inpatient care is more likely than if the patient is unaccompanied. Similarly, if a person lives far away from the day hospital then inpatient care is more likely than if they live close to the day hospital facility. Both of these variables achieved conventional levels of significance in the logit analysis.

The decision to admit people to hospital is influenced by the presence of an accompanying person. The problem is that the data does not allow us to explore what it is that an accompanying person brings to the decision-making process. Information is likely to be the source of the influence of accompanying persons with the precise effect depending on the particular circumstances of each case. It may be that the accompanying person provides insights into both the severity of illness and the burden of care associated with the illness. It may also be the case that the accompanying person provides valuable information on the social circumstances of the person with the illness which make it impossible for them to remain at home with the illness. In

the case of the day hospital, the absence of an accompanying family member or carer raises some interesting issues. The viability and success of the day hospital approach depends to a great extent on the acceptance and co-operation with this model of treatment by family or carers. It may, therefore, pose a problem when a family member or carer is not there to discuss treatment with the psychiatrist, psychiatric nurse and other staff on admission. The data does not allow us to explore why family or carers have not taken the opportunity to accompany the patient to the day hospital. More than likely, however, non-accompaniment is related to the restrictions in the opening hours of the day hospital. Extending opening hours during the week and providing a weekend service may facilitate greater involvement by relatives who due to other commitments may be unable to visit during normal office hours.

The disproportionate representation of urban domicile on admissions to the day hospital programme is a striking feature of the data. Transport has long been recognized as a serious constraint on the utilization of outpatient, day hospital and day care facilities in Ireland and is the likely explanation for the significance of the domicile variable in this study.[18] People living close to the day hospital are more likely to use the service than people living far away from the service. Like so many other areas in Ireland the sector under examination has no special transport arrangements to facilitate access to the service. The result is that patients living in rural areas do not have equity of access to day hospital services. The public transport network in rural areas in Ireland is also under-developed. Remoteness and peripherality are likely to exacerbate the transport difficulties faced by people with mental illness living in isolated rural areas. There is an urgent need to address the transport issue for people living in rural areas. This can be done directly through the provision of a designated ambulance service, or through alternative forms of community-based care, for example various kinds of home treatment programmes. If the transport issue is ignored then more people with mental illness will be admitted to inpatient care than is necessary, given their clinical condition. If day hospital services are to develop beyond their present level they will have to be supported by a comprehensive transport service, particularly for people living in rural areas.

The clinical rating of distress, as measured by the BPRS, does not determine admission to one form of care rather than another for these two groups of patients. This result highlights the importance of a comprehensive assessment procedure for people with mental illness and the wisdom of a holistic approach to placement decision-making. Such an approach should especially consider social factors surrounding the patient, including family circumstances and accessibility to services. For some people the crude partitioning of BPRS scores raises more questions than it answers. While the fact that the day hospital is able to handle patients of similar dependency as the inpatient unit is a positive sign for those who believe in community care solutions for mental health problems, the absence of a more clear-cut differentiation in placement based on measured BPRS scores

raises concern about the appropriateness of placement for some hospital patients. Placement decision-making is quite clearly affected by more than clinical outcome measures and involves a range of closely integrated personal and social influences, some of which are picked up in this study.

The model estimated in this paper does not, of course exhaust all possible influences on the likelihood of a mentally ill person ending up in one form of care rather than another. The fact that the analysis is retrospective means that there are likely to be omissions and inconsistencies that would not be present if the analysis of placement were part of the original data collection exercise. For example, we do not have information on the crucial issues of who makes the decision to admit a patient to hospital, particularly when admission occurs at a time when the day hospital is closed. It may be that less experienced, non-consultant hospital doctors are more inclined to admit patients to inpatient care, particularly if under pressure from families. Similarly, the absence of data on family care circumstances and on community care facilities[19] is a serious problem, given the importance of both statutory and family support services in keeping people out of hospital.

Before examining the policy implications of the analysis, two other issues should be mentioned. The first concerns the size of the sample used in the analysis. Maximum likelihood estimation was used to estimate the logit model. This method of estimation generally works best in large samples. A sample of 104 patients is used in our analysis. A larger sample would be more likely to yield additional significant variables; a larger sample would also allow a more comprehensive treatment of the choices with respect to patient care. The number of people in the study who are receiving care at the day hospital is quite small, raising particular questions about the representativeness of the sample in that care setting. The second major problem with the data is the concentration of the analysis in one site only, thereby making it difficult to generalize the results obtained to other sites across the country, or indeed internationally. There was nothing we could do about either of these problems, but they do impose limitations on the study.

Finally, there are practical policy implications associated with the analysis. The most obvious is the role played by the day hospital in keeping people out of hospital. Greater flexibility with respect to opening times, including longer day-time opening and week-end opening, will result in fewer people admitted to inpatient care. However, it is also clear family members play an important role in placement decision-making. If a mentally ill person is accompanied at the time of admission, the likelihood of inpatient care increases. This raises important questions about the process of admission to hospital care, particularly the dynamics of the interaction between providers, patients and accompanying persons. The critical issue of who is involved when the decision to admit a mentally ill person is being taken deserves much closer attention than it has received up to now. The model also confirms the critical role of access in determining placement options and points to the importance

of good transport services in widening the choices of providers and patients.

Acknowledgements

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