

Community Mental Health Care for Former Hospital In-Patients Predicting Costs from Needs and Diagnoses

MARTIN KNAPP, JENNIFER BEECHAM, ANDREW FENYO and ANGELA HALLAM

Background. In the UK the replacement of long-term in-patient care with community-based support has been part of central government health policy for many years. One of the challenges of implementing such a policy is the prediction of support and service needs in the community and the associated costs.

Method. Using research data from north London analyses were undertaken to examine the associations between service use and costs in the community and the characteristics of hospital in-patients.

Results. Although clinical diagnosis was not a useful predictor of either service utilisation or costs, more than a third of the variation in community care costs could be explained by symptoms, behaviour and personal characteristics at least one year earlier.

The replacement of in-patient care with community-based support for people with long-term mental health problems is a key component of health policy in many countries. In the UK it has been central government policy for many years. Since the emergence of the policy into politics in the early 1960s, through policy documents such as *Better Services for the Mentally Ill* (Department of Health and Social Security (DHSS), 1975), the creation of financial mechanisms such as joint health and social services finance (DHSS, 1983), and numerous documents re-affirming the commitment to hospital closure, successive governments have encouraged the development of community services to facilitate the closure of large, old, often remote psychiatric hospitals (DHSS, 1985; Department of Health (DH), 1989). Mental health policy in England is directed towards the closure of all long-stay hospitals by the year 2000 (DH, 1992).

Among the many challenges of such a policy is the prediction of the service needs of people in the community, and the associated costs. Research we are conducting in north London explores service utilisation, estimates the costs of community support, and examines the characteristics of hospital in-patients associated with variations in those costs. In this paper we report the prediction of community support costs, following up work undertaken with a smaller sample of former in-patients (Knapp *et al*, 1990).

Our concern here is not the links between costs and outcomes or revealed needs in the community – that is, we are not presenting evidence on the efficiency or equity with which community mental health services are delivered – but the predictability of community costs from a hospital baseline.

The Friern/Claybury closure study

Local commitment to national policy was affirmed in the North East Thames region of the National Health Service (NHS) in the early 1980s, when the decision was taken to put Friern and Claybury Hospitals in the vanguard of the region's hospital closure programme. Capital resources were concentrated on provision of replacement services for these two hospitals alongside the creation of a revenue transfer mechanism (so-called "dowries") which re-allocated hospital resources to community services for long-stay patients. In 1985/86, Friern Hospital had 945 beds and Claybury had 870. In both cases, there had been significant reduction since the 1930s. Both hospitals were planned to close in 1993; Friern closed in March 1993, and the closure of Claybury has been delayed. Research was commissioned by the Regional Health Authority from the Team for Assessment of Psychiatric Services (TAPS) and the Personal Social Services Research Unit (PSSRU), University of Kent at Canterbury. The research was to feed process, outcome and cost findings into the continuing development of local community care.

Method

Although slightly arbitrary, it is convenient to distinguish and describe annual cohorts of leavers from the two hospitals, each cohort running from September to August. This paper examines data from the first five cohorts of leavers, focusing on former long-stay patients (at least one year's continuous in-patient duration) who, if aged over 65, do not have a current diagnosis of dementia. We have data for

442 people, but comprehensive service receipt and costs data for only 341 of them. This costed sample is smaller than the full leaver group because of delays in data collection, accounts information not being available, refusal to be interviewed in the community, deaths before the interview date, and a small number of former in-patients who could not be traced (Knapp *et al.*, 1993).

We have previously suggested four basic rules to be followed in cost evaluations: costs should be measured comprehensively, and include all components of care packages; differences in cost between clients should not be overlooked but examined and explained; any comparisons drawn from these examinations should be on a like-with-like basis; and cost information is of most use when combined with outcome evidence (Knapp & Beecham, 1990). In order to measure costs, a schedule developed at the PSSRU, the Client Service Receipt Interview (CSRI), was used to interview a key carer for each former in-patient. The schedule asks for retrospective information on all components of care packages: accommodation, services, service-related issues, and income (Beecham & Knapp, 1992). This detailed individual information allows calculation of the comprehensive cost of each individual 'care package' and support arrangements in the 12 months after discharge from hospital, although adjusted for infrequently but regularly used services throughout the year. The costs attached to services are estimates of their long-run marginal opportunity costs (Allen & Beecham, 1993; Knapp, 1993).

The costs of community care

One of the particular foci of this paper is the influence of diagnosis on service utilisation and cost. People were assigned to diagnostic groups, based on ICD-9 (WHO, 1978), according to the diagnoses recorded in case notes at the time of first contact with psychiatric services. As we shall demonstrate, there

are few differences between diagnostic groups in relation to community accommodation and service utilisation. Hospital residents moved to a variety of community accommodation settings (Table 1). Where possible hospital staff, community services and users chose the type of community accommodation to suit needs and wants, although shortages of suitable facilities presented constraints. There were no differences between diagnostic groups in relation to type or sector of accommodation (public, voluntary, private).

The former hospital residents used a large number of services in the community (Table 2), but only utilisation of occupational therapy showed a significant difference by diagnostic group. Clearly, support and treatment for people with mental health problems is coordinated, funded and delivered in a mixed economy. Health and social services are provided by government, non-profit and for-profit agencies, other support services come from a similarly diverse range of organisations, but there were few inputs from family or other 'informal' carers. Funding, in the main, comes from local and health authorities and social security benefits, themselves funded from tax revenues.

The costs associated with individual services are not detailed here. The pattern is similar to that in Table 2, although costs obviously also pick up intensity of utilisation. Only occupational therapy registers a significant inter-diagnostic group difference singly, although accommodation and total costs show significant differences between diagnostic groups (Table 3). The contributions of non-accommodation services vary significantly by type and sector of accommodation (Knapp *et al.*, 1993). People with affective disorders have a mean cost which is £87 lower than the mean for other diagnostic groups, the difference being mainly due to the accommodation placement. Community support of people with either schizophrenia or learning disability (mental handicap) is the most costly. The cost variations within and

Table 1
Community accommodation one year after leaving hospital

Type of accommodation	Organic disorder	Schizophrenia	Affective disorder	Neurosis/personality disorder	Learning disability (mental handicap)	Significance (F-test) <i>P</i>
	%	%	%	%	%	
Residential or nursing home	75	48	54	38	67	0.203
Hostel	0	19	14	16	33	
Staffed group home	0	2	4	3	0	
Unstaffed group home	17	3	0	0	0	
Sheltered housing	8	12	11	19	0	
Adult foster placement	0	9	11	3	0	
Independent living	0	8	7	22	0	
Sample size	<i>n</i> = 12	<i>n</i> = 263	<i>n</i> = 28	<i>n</i> = 32	<i>n</i> = 3	

Table 2
Service utilisation by diagnostic group

Services used in the community	Organic disorder %	Schizophrenia %	Affective disorder %	Neurosis/personality disorder %	Learning disability (Mental handicap) %	Significance (F-test) P
DHA in-patient	17	16	25	13	0	0.659
DHA out-patient	25	24	25	28	33	0.988
DHA day centres	42	24	21	28	0	0.527
SSD day centres	33	21	18	31	33	0.539
Voluntary sector day centres	8	23	11	6	33	0.100
Social clubs	0	7	7	6	0	0.900
Case review	0	6	0	6	0	0.595
Education	0	7	0	6	0	0.567
Police	0	7	4	3	0	0.675
GPs	100	79	82	84	100	0.356
Drugs (depot)	17	17	7	16	0	0.672
Nursing care	33	31	29	31	0	0.837
Psychiatry	67	63	46	53	67	0.438
Social work	50	27	29	38	0	0.249
Chiropody	50	42	43	28	100	0.137
Dentists	25	24	29	19	67	0.431
Opticians	0	17	29	22	33	0.210
Occupational therapy	0	11	11	3	67	0.008
Pharmacy	0	4	4	9	0	0.568
Psychology	8	16	18	19	67	0.171
Psychotherapy	8	2	4	0	0	0.494
Miscellaneous	17	12	7	13	0	0.865
Travel	25	24	25	34	0	0.600
Volunteers	0	3	4	3	0	0.971
Sample size	n = 12	n = 262	n = 28	n = 32	n = 3	

between diagnostic groups summarised in Table 3 are wide, but are they predictable? A thoroughly reasonable expectation about mental health services is that the costs of community care would not fluctuate randomly. With the accumulation of experience on the needs and preferences of people with long-term mental health problems living outside hospital, the growing emphasis on efficiency in the utilisation of public resources, a long-standing commitment to horizontal equity, and the growing tendency to coordinate services through care management and

care programme procedures (North & Ritchie, 1993; Schneider, 1993), it would be reasonable to hypothesise strong associations between costs and individual characteristics (other things being equal).

Cost predictions

For the cost predictions, data on the individual characteristics of hospital in-patients are taken from interviews and assessments conducted by TAPS in

Table 3
Accommodation and total costs in the community (weekly, at 1989/90 price levels)

	Organic disorder £ ¹	Schizophrenia £	Affective disorder £	Neurosis/personality disorder £	Learning disability (mental handicap) £	Significance (F-test) P
Accommodation costs						
mean (s.d.)	327 (172)	354 (177)	268 (131)	293 (179)	441 (127)	0.042
range	188-722	69-733	49-515	70-732	295-515	
Total costs						
mean (s.d.)	374 (187)	418 (184)	323 (135)	343 (178)	462 (144)	0.022
range	192-742	90-1429	59-544	86-749	296-545	
Sample size	n = 12	n = 262	n = 28	n = 32	n = 3	

1. Pounds sterling per week.

hospital, usually before a patient's participation in a hospital-based rehabilitation programme, and certainly before discharge. Information includes personal characteristics (gender, age, ethnic group, marital status, in-patient experience including length of stay and original diagnosis) and detailed clinical, behavioural and social characteristics (O'Driscoll & Leff, 1993). The main instruments used are described briefly.

The *Present State Examination* (PSE, 9th edition; Wing *et al*, 1974) was used to create a dozen sub-scores, including: general anxiety, specific anxiety syndrome, specific neurotic syndrome, non-specific neurotic syndrome, delusions and hallucinations, blunting of affect, and behaviour, speech and other problems. A negative symptoms score is computed (0 to 6) indicating the presence of poverty of content of speech, blunting of affect, inattention, apathy, and sociability.

The 1984 version of the *Social Behaviour Schedule* (SBS; Sturt & Wykes, 1986) allowed three measures to be calculated: total score, positive symptoms sub-score, and anxiety sub-score.

The *Social Network Schedule* (SNS; Dunn *et al*, 1990; Leff *et al*, 1990) provided information on reported quantity and quality of social contacts such as acquaintances, relatives, other clients, non-professionals and staff. It is based on people named and seen by patients during one month.

The *Physical Health Index* (PHI; O'Driscoll & Leff, 1993) provided data on physical health problems (degree and disability), with one sub-score measuring daily nursing care requirements (higher scores indicating greater need). Five disabilities of especial importance in this evaluation were: incontinence, impaired mobility, dyskinesia, and impairment of vision or hearing (each scored '1' if any level of disability is present, and '0' otherwise).

We examined the links between these baseline (hospital) characteristics and the subsequent costs of support in the community. Because we are only using information available before each patient left hospital we are not attempting to model the responsiveness of services to the changing needs and preferences of people as they develop more independence and confidence in the community, nor are we looking at the links between costs and outcomes (Beecham *et al*, 1991). Instead, our aim is to build up a prediction equation which might assist service planners to structure community support for people with long-term mental health problems leaving hospital.

In order to examine the predictions we took average cost per week of community support for each individual as the dependent variable in a series of multiple regression equations, using the baseline data

to generate a set of potential explanatory factors. Ordinary least squares estimation was employed, since the dependent variable was relatively normally distributed. Clinical and other characteristics were introduced into the regression equations singly and in multiplicative combinations (including higher powers) to capture possible nonlinear effects. The aim was to maximise the predictive power of the estimated equation while ensuring the statistical significance of individual coefficients, parsimony and accordance with logic. Inter-correlation between the explanatory variables (multicollinearity) does not affect the predictive power of the equation, but makes it more difficult to disentangle the contributions of correlated variables.

Results and discussion

The 'best' prediction equation is given in Table 4. The sample size has fallen to 217 because we do not have social network data (using the SNS) on all in-patients, due to their inability or unwillingness to be interviewed. We also examined the relationship between cost and diagnosis after the effects of other factors had been included (see base of Table 4). The main equation in Table 4 'explains' 35% of the observed variation in community cost. This is a slightly lower percentage of variance explained than the 39% achieved with a smaller sample of early leavers (Knapp *et al*, 1990). This small reduction in predictive power is not surprising given the increase in sample size, increased heterogeneity of in-patient characteristics among leavers, and changes in local policy and practice, which all leave their mark on service responses to presented needs.

The characteristics which predict the cost of community care can be considered in turn.

Marital status

Nearly three-quarters of the sample were single at the time of baseline interview. The prediction equation indicates that the costs of community support are higher for this group and also higher for divorced or separated men (6% of the sample). These people are less likely to enjoy support from family members, although it must be stressed that few sample members moved to 'informal care arrangements'. There are differences in individual characteristics by marital status (for example, single people have lower scores for non-specific neurotic syndrome, higher PSE negative symptoms scores, and spent more of their life in hospital), but the prediction equation will already have taken these influences into account. The impact of marital status on cost

Table 4
Regression of community cost on client characteristics in hospital prior to discharge (at least one year earlier)¹

	Coefficient	t-statistic	Significance (P)
Constant	169.35	3.39	0.001
Male, divorced or separated ²	143.86	2.65	0.009
Single ²	75.467	2.73	0.007
Age in years, squared	-0.01286	-1.69	0.093
Total previous time in mental hospital, in months squared ³	-5.92 × 10 ⁻⁴	-2.00	0.047
Per cent of life in hospital	543.33	2.82	0.005
Per cent of life in hospital, squared	-448.79	-1.73	0.084
Non-specific neurotic syndrome (PSE)	6.1723	3.05	0.003
If male ² , delusions and hallucinations (PSE)	-4.2207	-1.80	0.073
Negative symptoms (PSE)	23.068	2.56	0.011
Total SBS score	28.498	3.00	0.003
Total SBS score, squared	-2.1523	-2.64	0.009
If male ² , daily nursing care squared	77.500	2.34	0.020
No. of ex-patients named and seen (SNS)	-15.146	-1.71	0.089
No. of hospital staff named and seen	6.9368	1.71	0.090
If male ² , total persons named and seen	-5.2335	-3.31	0.001
R ²		0.35	
F-statistic		7.27	0.00
Marginal impact of adding diagnostic group variables			
Organic ²	1.0024	0.01	0.989
Schizophrenia ²	-	-	-
Affective disorder ²	-21.206	-0.53	0.599
Neurosis/personality disorder ²	-70.724	-1.67	0.096
Learning disability ²	4.7632	0.06	0.956
R ²		0.36	
F-statistic		5.86	0.00

1. Sample size = 217.

2. Dummy variables taking the value 1 if an individual had the named characteristic or diagnosis, and the value 0 otherwise.

3. Excludes current admission.

occurs over and above any effect of clinical or behavioural factors.

Age

The high intercorrelation between three of the variables in the equation – age, previous time in psychiatric hospitals, and percentage of life spent in hospital – make it hard to disentangle their individual effects, but do not alter the overall predictive power of the equation. Age has a negative effect on cost – older people receive community support packages which cost less. The gradient of the relationship becomes steeper with age. This is similar to what we found for the early leavers (Knapp *et al*, 1990). Older patients are probably perceived as being less demanding in so far as they are not expected to need, say, employment programmes or further education. Although less likely to have moved from hospital in the first three cohorts (Jones,

1993), it appears that the older patients can be accommodated in the community at lower cost. There is no evidence to suggest that their outcomes after one year are worse.

Total time in psychiatric hospitals

The costs of community support, other things being equal, are lower for people who have spent longer periods in psychiatric hospitals prior to the current period of stay. We should not make too much of this effect, despite its statistical significance, for the absolute impact is modest (the cost difference between the first and ninth deciles of the variable, for example, is only £17 per week). It should be seen as a minor modifier of the effect of proportion of life spent in hospital (see below). We found no relationship between community cost and length of stay in *current* admission, unlike our finding with the earlier analyses (Knapp *et al*, 1990).

Life in hospital

A variable for percentage of total life spent in hospital was computed as a crude indicator of institutional experience. The variable enters with both linear and quadratic terms, suggesting that cost in the community increases with the proportion of life spent in hospital until around 60%, then declines. Less than 20% of sample members fall in the latter range. The percentage of life spent in hospital ranges from 1% to 99% around a population median of 32%. (The first and last deciles are 5 and 66% respectively.) Community costs are generally higher for those people who have spent higher proportions of their lives in hospital, an association interpretable as an institutionalisation effect.

Psychiatric symptoms

The PSE gave a rich and informative description of present psychiatric state for almost every patient. Three constructed PSE measures were significant: non-specific neurotic syndrome, negative symptoms, and delusions and hallucinations. The first and second exerted positive effects, the third a negative effect, though only for males. This last is counter-intuitive. Higher scores indicate higher needs, which one would expect to be linked to higher cost if the community mental health system is targeting effectively. Our earlier work had found a positive link between negative symptom scores and costs, but no other significant associations.

Social behaviour

Scores computed from the SBS enter the cost prediction equation in both linear and quadratic fashion. Higher scores (greater staff-reported ratings of abnormal behaviours) indicate higher needs, and these predict higher costs. Patients with more social behaviour problems are supported in the community at greater cost than those with fewer such problems, other things being equal.

Daily nursing care

Another significant predictor of cost is a measure of the number of areas in which daily nursing care is required. Once again, therefore, the prediction equation shows that higher needs mean higher costs, though this effect only applies to males (see Gender below).

Social networks

The instrument used to gather data on social networks (the SNS) requires an interview with each

patient. Schedules could not be completed for everyone. Three SNS sub-scores appear in the final prediction equation. Higher SNS scores mean more social contacts, and in two cases this translates into lower costs: the more communicative and gregarious people are less costly. The exception is that hospital in-patients who saw more hospital staff cost more in the community, though the absolute effect on cost is very modest. Interestingly, the effect of the total SNS score (all persons named and seen) is confined to men, and a female leaver's social network exerts no influence on cost. This is the same result as found in our previous prediction work.

Gender

The effect of gender is mediated through a number of other influences, as noted at various stages above. Although large social networks and (counter-intuitively, but marginally) the presence of delusions and hallucinations pull costs down, the general effect is for the costs of community support of male former in-patients to exceed that for women. This gender effect is observed after standardising for mental health state and all the other factors in the equation. In the placement of long-stay patients in community accommodation and in the planning and delivery of support services, we conclude that it appears to be assumed that men are less capable of completing basic self-care tasks unassisted, and are either directed towards more highly staffed accommodation or offered more closely supportive (more costly) care packages.

Diagnosis

Does cost in the community bear any relation to diagnosis for these former long-stay in-patients? The answer from the regression equations reported in Table 5 is a resounding 'no'. Diagnostic-related groups would be utterly unhelpful when seeking to predict the community support needs and costs of people with long-term mental health problems. We also examined the impact of diagnosis within the context of other influences on costs, adding the diagnosis indicator variables to the otherwise best equation (see base of Table 4). None is significant. It is the underlying psychiatric, behavioural, social network and other characteristics of in-patients which predict downstream costs, not the diagnostic label. This last point is confirmed by the figures in Table 6, which describe those characteristics appearing in the prediction equation, arranged by diagnostic group. Statistical tests of association between diagnostic groups reveal some differences in relation

Table 5
Regression of community cost on diagnosis¹

Regressors ²	Coefficient	t-statistic	Significance (P)
Organic disorder	2.6017	0.03	0.974
Schizophrenia	405.81	30.44	0.000
Affective disorder	-66.379	-1.62	0.108
Neurosis/personality disorder	-90.111	-2.14	0.032
Learning disability	56.108	0.55	0.580
R ²		0.03	
F-statistic		1.77	0.136

1. Sample size = 217.

2. For each diagnosis: 1 = patient had the named diagnosis, 0 = other diagnosis. Note that the regression equation has no separate intercept term because of our inclusion of all five diagnostic groups.

to almost all of the predictors of community care costs, the exceptions being gender ($P=0.123$), SBS score ($P=0.448$), PSE negative symptoms score ($P=0.516$) and the sub-scores from the social network schedule. Table 6 includes only those people who moved from hospital.

Extrapolations to future leavers

The equation in Table 4 was used to predict community care costs for those long-stay Friern and Claybury in-patients who had not left hospital in the first five annual cohorts. With the exception of SNS data, all of the predictor variables were available for most remaining in-patients. We predict that community care will cost 7% more ($P<0.01$) for non-leavers (to date) than for the leavers in the first five cohorts. (Again we restrict our attention to patients with at least one year's continuous residence and no current dementia diagnosis.) Those who remain to leave in the final years of closure are more dependent on average than earlier leavers.

Conclusion

The former long-stay residents of Friern and Claybury Hospitals moved to a variety of community accommodation settings where they were supported by numerous health, social care and other services. The relocation of care from long-stay hospitals to

Table 6
Selected characteristics of hospital in-patients who moved to the community

	Organic disorder	Schizophrenia	Affective disorders	Neurosis/personality disorder	Learning disability	Significance (F-test) (P)
Marital status ¹ (%)						
single	47	74	40	51	100	0.000
married/cohabiting	11	4	10	10	0	
divorced or separated	26	13	28	18	0	
widowed	5	6	19	21	0	
Gender (%)						
male	63	57	38	46	50	0.123
Age (years, mean)	53	54	62	50	60	0.008
Previous time in mental hospitals (months, mean)	15.6	52.5	27.4	22.8	84.3	0.021
Percentage of life in hospital (% , mean)	16	36	16	26	60	0.000
Social Behaviour Schedule (SBS)						
total (cut off at 2)	5.05	4.49	3.83	3.82	5.50	0.448
Present State Examination (PSE)						
negative symptoms	0.89	1.21	1.00	0.97	1.00	0.516
behaviour, speech and others	2.68	3.71	2.68	2.38	3.75	0.007
delusions and hallucinations	0.63	4.17	0.98	1.69	2.25	0.001
non-specific neurotic syndrome	4.53	3.86	7.27	9.77	1.50	0.000
specific neurotic syndrome	2.05	1.81	4.44	5.92	1.25	0.000
specific anxiety syndrome	0.26	0.21	0.49	1.05	0.00	0.000
general anxiety	0.32	0.25	0.66	0.95	0.25	0.000
Physical Health Index (PHI)						
daily nursing care	0.42	0.09	0.12	0.05	0.25	0.008
Social Network Schedule (SNS)						
ex-patients (no. named & seen)	0.25	0.42	0.38	0.26	0	0.883
hospital staff (no. named and seen)	3.83	3.33	3.68	4.19	2.25	0.516
total (no. named and seen)	11.50	9.40	11.62	11.26	8.00	0.325
Sample size	n = 19	n = 341	n = 42	n = 39	n = 4	

1. Not listed is the category 'other' for this characteristic.

community-based facilities has meant receipt of packages of care comprising a surprisingly wide range of services, provided by a diversity of agencies both within and outwith the public sectors. Promotion of care in the community, therefore, has stimulated the mixed economy of care and considerably enhanced the provider roles of the independent sectors. Anderson *et al* (1993) report that the outcomes for these former in-patients after one year in the community were at least as good as their 'matched' counterparts who had remained in hospital. Moreover, their mental state and social disabilities were stable, the leavers had more diverse social networks, lived under less restrictive conditions, and preferred life in the community (op. cit., p. 55).

We have found that the costs of community care one year after people left hospital can be predicted, in part, by their personal characteristics as measured in hospital. Clinical and behavioural measures, age, marital status, psychiatric history and social networks all play a part in explaining variation in community care costs. Services in the community are responding to need along a number of dimensions, including clinical measures.

The need for a wide range of services obtained through a variety of providers is evident. This multi-disciplinary approach is encouraged by the introduction of care programming and care management, intended to ensure more comprehensive and better coordinated services (Secretaries of State, 1989). The arrangements introduced to facilitate the closure of Friern and Claybury Hospitals anticipated these policy and practice changes by making transfers of finance contingent on provision of satisfactory care arrangements by the receiving NHS district and the acceptance of responsibility for the patients. Although much of the transferred money was earmarked for accommodation-related services we believe the evidence suggests that the care packages were closer to a comprehensive model of care than might have been the case without these regulatory arrangements.

In contrast, the traditional focus in mental health treatment – the diagnostic group – is of little assistance in predicting either service requirements or costs of community care. There was no significant difference in either use or cost of component services by diagnostic group. This is not to say that a standardised package of care should be provided for all hospital leavers but, as our analyses showed, the costs associated with community care varied with respect to symptoms, behaviours and personal characteristics rather than a classification of psychiatric illness. The information base from which decisions on community provision and placement

are made should therefore include data that are easily available, such as age and gender or psychiatric hospital admissions, and data which are not routinely collected, such as social networks and some psychiatric symptoms.

The prediction equations reported in this paper leave a large part of the observed variation in community cost unexplained but, as earlier work has shown, much of this can be linked to changes in individual need (outcomes) during the first year in the community (Beecham *et al*, 1991). Nevertheless, our finding that 35% of the variation in community care cost can be explained provides a basis for community care planners to predict the service and cost consequences of hospital discharge.

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References

- ALLEN, C. & BEECHAM, J. (1993) Costing community services: ideals and reality. In *Costing Community Care: Theory and Practice* (eds A. Netten & J. Beecham). Aldershot: Ashgate.
- ANDERSON, J., DAYSON, D., WILLIS, W., *et al* (1993) The TAPS Project. 13: Clinical and social outcomes of long-stay psychiatric patients after one year in the community. *British Journal of Psychiatry*, **162** (suppl. 19), 45–56.
- BEECHAM, J., KNAPP, M. & FENYO, A. (1991) Costs, needs and outcomes. *Schizophrenia Bulletin*, **17**, 427–439.
- & ——— (1992) Costing psychiatric interventions. In *Measuring Mental Health Needs* (eds G. J. Thornicroft, C. R. Brewin & J. K. Wing). London: Gaskell.
- DEPARTMENT OF HEALTH AND SOCIAL SECURITY (1975) *Better Services for the Mentally Ill*. London: HMSO.
- (1983) *Care in the Community*, HC(86)3, LAC(83)5. London: HMSO.
- (1985) Mental illness: policies for prevention, treatment, rehabilitation and care. Annex 1 to *Government Response to the Second Report from the Social Services Committee 1984–85*, Cmnd 9624. London: HMSO.
- DEPARTMENT OF HEALTH (1989) *Caring for People: Community Care in the Next Decade and Beyond*, Cm 849. London: HMSO.
- (1992) *The Health of the Nation*, Cm 1523. London: HMSO.
- DUNN, M., O'DRISCOLL, C., DAYSON, D., *et al* (1990) The TAPS Project. 4: An observational study of the social life of long-stay patients. *British Journal of Psychiatry*, **157**, 842–848.
- JONES, D. (1993) The TAPS Project. 11: The selection of patients for reprovision. *British Journal of Psychiatry*, **162** (suppl. 19), 36–39.
- KNAPP, M. (1993) Principles of applied cost research. In *Costing Community Care: Theory and Practice* (eds A. Netten & J. Beecham). Aldershot: Ashgate.
- & BEECHAM, J. (1990) Costing mental health services. *Psychological Medicine*, **20**, 893–908.

- , BEECHAM, J., ANDERSON, J., *et al* (1990) Predicting the community costs of closing psychiatric hospitals. *British Journal of Psychiatry*, **157**, 661–670.
- , ———, HALLAM, A., *et al* (1993) The costs of community care for people with long-term mental health problems. *Health and Social Care in the Community*, **2**, 193–201.
- LEFF, J., O'DRISCOLL, C., DAYSON, D., *et al* (1990) The TAPS Project. 5: The structure of social-network data obtained from long-stay patients. *British Journal of Psychiatry*, **157**, 848–852.
- NORTH, C. & RICHIE, J. (1993) *Factors Influencing the Implementation of the Care Programme Approach*. Report by Social and Community Planning Research to the Department of Health. London: HMSO.
- O'DRISCOLL, C. & LEFF, J. (1993) The TAPS Project. 8: Design of the research study on the long-stay patients. *British Journal of Psychiatry*, **162** (suppl. 19), 18–24.
- SECRETARIES OF STATE (1989) *Caring for People*, CM 849. London: HMSO.
- SCHNEIDER, J. (1993) Care programming in mental health: assimilation and adaptation. *British Journal of Social Work*, **23**, 383–403.
- STURT, E. & WYKES, T. (1986) Assessment schedules for chronic psychiatric patients. *Psychological Medicine*, **17**, 485–493.
- WING, J. K., COOPER, J. & SARTORIUS, N. (1974) *The Measurement and Classification of Psychiatric Symptoms*. Cambridge: Cambridge University Press.
- WORLD HEALTH ORGANIZATION (1978) *Mental Disorders: Glossary and Guide to their Classification in Accordance with the Ninth Revision of the International Classification of Diseases (ICD-9)*. Geneva: WHO.

Martin Knapp; Jennifer Beecham; Andrew Fenyo; Angela Hallam, Personal Social Services Research Unit, University of Kent at Canterbury, Canterbury, Kent CT2 7NF; and Centre for the Economics of Mental Health, Institute of Psychiatry, London SE5 8BB