Sociodemographic and morbidity indicators of need in relation to the use of community health services: observational study

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Abstract

Objective: To examine whether the sociodemographic and morbidity characteristics of populations influence their use of the following community health services: district nursing, health visiting, chiropody, community maternity, community mental illness, and the professions allied to medicine.

Design: Observational study.

Setting: Nationally representative sample of provider trusts in England.

Main outcome measures: Activity levels for each service calculated for enumeration districts within the catchment areas of the sample of trusts and standardised to allow for differences in age structure. Regression analysis to determine whether the standardised activity rates for each service could be predicted by a range of socio-demographic and morbidity proxies.

Results: Morbidity or deprivation, or both, seemed to influence the use of services in each of the care programmes examined.

Conclusions: The allocation of funds for community health services should allow for differences in the health and socio-demographic characteristics of health authorities.

Introduction

The target allocation of funds to health authorities used to be determined by formulas that adjusted raw population data to allow for three factors—age, need

(as measured by a variety of socio-demographic indicators), and market forces (to allow for differences in health authority costs). These formulas, which were derived from work undertaken at the University of York, applied separate adjustments to those portions of health authority budgets that covered expenditure on general and acute services and psychiatric services.¹⁻³ When we undertook this study, however, no weighting for special needs was being applied to expenditure on community services. This had caused concern that the ability of the York recommendations to redistribute budgets had been lessened.⁴ The second report of the House of Commons health select committee considered the situation unsatisfactory and called for a weighting to be applied with effect from April 1997.⁵ We report work that examines the evidence for such weighting.

Methods

Ideally, we would have liked to have replicated, for community services, the study based on national data undertaken at the University of York. Unfortunately, no national data on community health services comparable to the hospital episode statistics currently exist. We were, however, able to obtain information from seven provider trusts, who supplied information on six programmes of care (not all trusts gave information on all programmes). Table 1 shows these programmes. The trusts served a mix of urban and rural areas. Table 2 gives the social demography of the areas served by these trusts and comparable figures for England. Small differences between the trusts and national averages exist, but none was significant. Nor was there any consistent pattern to suggest that the trust samples were more or less disadvantaged than England generally.

For each community health programme we determined an age adjusted use for each enumeration district in our sample and used a set of plausible socio-demographic variables to explain variations from this expected use. The postcode addresses of the patients were assigned to enumeration districts by using the methods suggested by Majeed et al.⁶ This established a link with sociodemographic data from the 1991 census. Since enumeration districts are too small for their standardised mortality ratios to be reliable, we attributed the standardised mortality of the relevant

Table 1 Number of enumeration districts for which excess use has been calculated, number of districts making no use of these, and level of usage in seven community trusts

Service	Districts for which excess use calculated	Districts with no contacts with the service	No of contacts included in analysis	Mean contacts per person per year
General patient care (including district nurses)	4987	640	1 262 971	0.54
Professional advice and support (including health visitors)	4353	474	412 031	0.21
Other community health (including paramedical services)	3931	454	360 830	0.20
Chiropody	3425	1061	180 082	0.10
Community mental illness	2588	980	126 355	0.08
Community maternity services	1283	526	117 874	0.16

Table 2 Demographic characteristics in the seven trusts compared with England. Values are given as percentage (range)

Demographic characteristics	Trusts	England
Average age (years)	38.3 (36.9-40.4)	37.9
Owner occupiers	72.9 (67.7-76.5)	72.6
Residents without central heating	20.6 (12.0-38.3)	17.3
Residents without a car	27.7 (20.0-36.1)	29.7
Head of household born in New Commonwealth	2.7 (0.8-8.3)	3.5
Pensionable age living alone	31.2 (28.5-36.1)	32.7
Dependents in household with single carer	18.9 (15.7-22.4)	19.2
People in lone parent households	7.8 (5.8-9.5)	8.3
Dependents in households with no carer	15.0 (13.4-17.4)	14.4
Unemployed	5.0 (3.6-5.9)	5.1
Aged 18+ with some qualification	13.0 (10.4-18.6)	13.4
People with head of household in social class 1 or 2	36.6 (30.9-49.4)	37.6
Households with ≥ 3 children	5.1 (4.5-5.8)	5.1
Single, widowed, or divorced	50.9 (48.8-53.7)	52.1

ward to its constituent enumeration districts. We used multiple regression analysis (from release 6.1 of SPSS for Windows) with dummy variables to capture any effects specific to individual trusts (for example, differences in the availability of resources or attitudes toward the use of services). Rather than risk spurious correlations by including all possible population descriptors, we restricted our dataset to those factors shown by a review of the medical literature to be probable determinants for community services. A difficulty arose because trusts do not have clearly defined boundaries. Accordingly, we decided to exclude data from all enumeration districts in those wards that seemed to lie on the periphery of trust catchment areas.

Results

We examined the correlations between our potential explanatory variables and found that many were highly intercorrelated. In such a situation we would have

expected our model to be “fragile”—those variables selected in the model and the magnitudes of their regression coefficients might have differed substantially in response to minor changes in the dataset. This does not necessarily imply, however, that predictions from the model will be incorrect. Models for the individual care programmes (table 3) were parsimonious (with no single formula using more than four explanatory variables) and highly significant. All regression coefficients had the expected sign, with greater use of services associated with higher levels of deprivation or morbidity.

Discussion

Our general approach is similar to that used by the researchers at the University of York.¹⁻³ Consequently, it is subject to some of the same criticisms. As the York researchers observed, “No study using a methodology based on utilization can capture variations in health care needs that are not reflected in utilization.” Our technique essentially abstracts the systematic component of historical decisions. If historical decisions have been systematically incorrect, as might occur if the “inverse care law” applies to community health services, our conclusions will be too.⁷ The assumption implicit in our method is that while individual decisions in the past may have been wrong, the use of community healthcare services has generally reflected the needs of patients.

An alternative method, which does not rely on this assumption and is therefore robust in the face of problems that might arise from the effects of the inverse care law, exists. This would be to identify the important diseases treated in the community, then to determine the relation between those diseases and various proxies for need. With further information about the cost of treatments we could synthesise resource needs based on the relation between illness and social characteristics rather than rely on the relation between the historical

Table 3 Coefficients of estimated regression models (95% confidence intervals) for utilisation of community care services in relation to indicators of need*

	General patient care	Professional advice and support	Chiropody	Community maternity	Other community health	Community mental illness
No central heating	—	0.088 (0.049 to 0.126)	—	—	—	—
No car	0.263 (0.202 to 0.325)	—	0.108 (0.034 to 0.126)	—	0.108 (0.038 to 0.179)	0.128 (0.030 to 0.226)
Head of household born in New Commonwealth	—	—	0.139 (0.085 to 0.193)	—	—	—
Pensionable age living alone	—	0.172 (0.067 to 0.277)	—	—	—	—
Dependents in households with single carer	—	—	—	0.265 (0.071 to 0.125)	—	—
Lone parent households	—	0.069 (0.023 to 0.114)	—	—	—	0.130 (0.056 to 0.202)
Dependents in households with no carer	—	0.169 (0.110 to 0.228)	—	—	—	—
Aged ≥ 18 years with some qualification	—	—	-0.115 (-0.184 to -0.045)	—	—	—
Households with ≥ 3 children	0.142 (0.077 to 0.208)	—	—	—	—	—
Head of household single, widowed, or divorced	—	—	—	—	0.532 (0.162 to 0.908)	0.800 (0.297 to 1.304)
Standardised mortality ratio, age 0-74 years	0.424 (0.152 to 0.697)	—	0.725 (0.416 to 1.034)	—	—	0.519 (0.187 to 0.851)
Adjusted R ² (%)	8.3	23.1	18.0	28.7	24.9	21.3

*Provider effects have been omitted.

use of services and social factors. We explored the feasibility of adopting such an approach but found that some important items of data were not available. Information on the case load of community services in relation to disease was poor and that on diseases treated in the community (as best we could identify them) and social factors was incomplete. A large scale survey would be necessary to collect this information—we had neither the time nor the resources.

A further fundamental problem, for which no simple remedy exists, arises from the “ecological fallacy.” Our method assumes that the social and other characteristics of the enumeration districts in our study have influenced the use of services. Users of community services may not be typical members of the communities in which they live, but our decision to analyse data in relation to the small enumeration districts should have minimised the dangers of adopting this general approach.

Our results suggest that an adjustment to the community element of the weighted capitation formula should be made to allow for the socio-demographic and morbidity characteristics of the populations that health authorities serve. Such an adjustment might be achieved simply by extending the existing indices to that area of expenditure. Our calculations suggest, however, that the existing psychiatric index differs from the community mental illness index we have estimated in the extent to which they redistribute resources. It also imposes the restrictive assumption that the ranking of areas by needs for community health services is the same as that for inpatient services. Perhaps for these reasons, our results have now been incorporated into the Department of Health’s formula for the allocation of resources to health authorities.

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Key messages

- Previous work to determine an appropriate target allocation of funds for health authorities has concentrated on inpatient services
- The portion of health expenditure estimated to be necessary for community health services has been given a zero weighting by the Department of Health
- This decision has attracted considerable criticism
- This study shows that deprivation and other demographic characteristics influence the use of community health services
- These findings have been used to help inform the target allocation of funds to health authorities

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A memorable patient

Sometimes a detailed examination is warranted

A 17 year old woman presented to the accident and emergency department with a letter from her GP requesting a fast track physiotherapy referral. She had a four month history of a painful stiff neck, unresponsive to analgesia, which the GP thought might be relieved by intermittent traction or ultrasound treatment.

My initial thought as the casualty senior house officer was that a trial of diazepam, as a muscle relaxant, might break the pain-spasm-pain cycle, but my second thought was one of unease because of the length and severity of her symptom, which was disabling and interfering with sleep.

This unease prompted me to take a thorough history and perform a thorough examination. The patient was studying for A levels, leaning over her texts and the stiff neck had gradually worsened. She had been suffering headaches, as had her friends who were studying too, which were not worse on waking, although one month previously, over the course of one week she had had five migraine like attacks with visual disturbances. She felt “doped up” having taken various analgesics including codeine. Cervical spine x ray examinations taken privately appeared normal.

I performed a detailed neurological examination, including heel-toe coordination, and, by the time I had satisfied myself of

the normality of her anal tone, I started to think that my thoroughness was over the top. A quick glance at her optic fundi, however, revealed gross papilloedema. Computed tomography showed a massive posterior fossa tumour, which was removed the following day, and the patient has done well.

I marvel at my good fortune that I did look in her eyes and I think that I was influenced by a case history, which I read many years ago in the Medical Defence Union’s magazine. A child had consulted the GP repeatedly with headaches and the GP had examined the child repeatedly and found nothing. The child had a posterior fossa tumour, coned, and died—the only criticism of the GP was that if the neurological examination had included heel-toe coordination this might have possibly led to the diagnosis. I felt distressed at reading this case history as I believed that I too would have missed the diagnosis. It did prompt me to make my neurological examinations more thoroughly and when in doubt to take the cautious approach of good history and examination.

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