Factors explaining the use of psychiatric services by general practices

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SUMMARY

Background. *Referral rates from general practitioners to hospital services vary up to 25-fold, and several studies have sought reasons for this apparent inconsistency in clinical practice. However, few studies have concentrated on, or indeed included, psychiatric patients or psychiatric referral rates.*

Aim. *To determine the effect of population, general practice, and mental health service factors on use of specialist mental health services by general practices.*

Method. *Cross-sectional data from computerized records used in managing clinical care on all patients aged 16 to 64 years who had been in contact with any mental health service staff over a two-year period. Twenty-three practices in Huntingdon Health District were studied, with a list population of 87 643 patients aged 16 to 64 years, served by one inpatient ward and three community mental health teams. The main outcome measures were the relation between age-standardized utilization ratio and markers of morbidity, deprivation, community mental health provision, and practice prescribing.*

Results. *Variation between practices in the use of mental health services was relatively limited, especially compared with the use of other secondary medical and surgical services. Three factors together explained 60.8% of the variance in use between practices: a census-based index of long-term limiting illness in females registered with the practice, use of one of the three community mental health teams, and average quarterly defined daily doses of hypnotics prescribed per practice population. Relatively high prescribing of hypnotics was associated with lower service use.*

Conclusion. *Population morbidity and factors in the mental health service explain a substantial part of the variation in the use of mental health services between practices. Further work is needed to replicate these findings and explore why team factors and prescribing patterns influence utilization ratios. This study underlines the importance of examining population, practice, and specialist service factors in explaining variation in the use of secondary care by general practices.*

Keywords: secondary care; psychiatric services; general practice; mental health services.

Introduction

REFERRAL rates from general practitioners (GPs) to hospital services vary up to 25-fold, and several studies have sought reasons for this apparent inconsistency in clinical practice.[1-6] Most attention has been focused on indicators of practice characteristics, including practice arrangements, age of doctors, and postgraduate qualifications,[7] but success has been limited.[8-11] Markers of population morbidity, including deprivation, have been explored, but explain only a proportion of the variation.[12] In addition, no definite relationship between high or low referral rates and quality of care offered to patients has been established.[13,14]

Thus far, few studies have concentrated on, or indeed included, psychiatric patients or psychiatric referral rates[15,16] despite the high prevalence of mental disorders in primary care and the substantial contribution they make to disability in adults.[17] Goldberg and Huxley have shown both that GPs recognize and treat only a proportion of the patients with mental illness presenting to them, and that the establishment of community mental health teams greatly increases the proportion of practice populations in secondary psychiatric care.[18] We therefore hypothesized that the use of psychiatric services would be highly variable but partially explained by indicators of population morbidity and factors in the provision of secondary services. To test this, we examined data covering total use of adult psychiatric services by 23 general practices in the Huntingdon district over a two-year period. An explanatory model using available indicators of all three relevant factors —population, practice, and secondary care — was employed.

Method

Computerized records of every patient contact, inpatient and outpatient, with any health professional within the Huntington District Mental Health Services for the period between 1 April 1994 and 31 March 1996 were obtained. The district is predominantly rural, with a population of 150 000, concentrated in three main towns: Huntingdon, St Ives, and St Neots. Only patients in the age range 16 to 64 years were included. Each patient had a unique identifying code to avoid replication. Recorded details included patient age and sex, source of referral, general practice, as well as diagnosis and number of contacts with the psychiatric services. Duplicate entries were deleted, and missing information was obtained from staff and case notes. Because every single episode of contact was examined, referral obviously does not always equate with mental illness but rather reflects use of psychiatric services by general practices. Because the diagnosis was made by whichever member of the health team performed the initial assessment and not always by a consultant psychiatrist, diagnostic material was not used in this paper's results.

Age-standardized utilization ratios were calculated for each practice by dividing actual numbers of patients seen by the mental

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health service by the expected number, expressed as a percentage. Expected numbers were derived from age-specific rates in specialist psychiatric treatment across all practices, multiplied by the numbers within each age group in each practice population. We included both 'old' and 'new' patient contacts in our analysis. New patients were defined as those not seen for at least seven months into the study period, avoiding biases owing to notional retention of patients on case loads despite lack of contact.

Of 24 practices in the Huntingdon health district, 23 refer exclusively to the local psychiatric service; the remaining practice was excluded from this analysis. Only two of the practices were fundholding and this factor did not exert a significant effect on referral rates. The practices varied from one single-handed practice to several practices with four to six partners. Practice size varied from 569 patients to 13 405, with a mean practice size of 5827 patients.

Available data on referring practices including age-specific practice populations were obtained from the local health authority. Eight morbidity and deprivation indices derived from the 1991 Census were also obtained. These were based on the postcode sectors of registered patients.[19] Eight available indicators included the Jarman UPA8 score, the Townsend and Department of Environment deprivation scores, indices of long-term limiting illness (standardized morbidity ratios) in males and females, and standardized mortality ratios. These indicators were derived for each general practice by using information from FHSA patient registers. In the course of the work on population estimates, all patients had been allocated to wards and, thereafter, the ward distribution of patients registered with each practice was determined. This information was then combined with the ward indicators mentioned above to calculate (for each practice) a patient-weighted average of the ward values for each indicator.

Service provision was entered into the analysis by identifying which of the three community mental health teams was used by the practice. The service had one inpatient ward and two consultant psychiatrists during the study period. Data on the total number of defined daily doses prescribed by each practice were obtained from the Prescription Pricing Authority. Drug groups corresponded to the British National Formulary chapter and section headings and included hypnotics, barbiturates, anxiolytics, tricyclic antidepressants, monoamine-oxidase inhibitors (MAOI), serotonin inhibitors (SSRIs), and other psychotropic agents. The data covered six quarters from 1 July 1994, thus including the 18 months in the middle of the study period. Average quarterly prescribed doses were divided by the practice's total registered population to provide a quarterly rate.

Pearson's correlation coefficients between the various measures of deprivation and the standardized utilization ratios were computed to select the variable with the strongest association from this highly intercorrelated group. The standardized morbidity ratio in women was selected as the best indicator (see below). This and the seven other variables (Table 1) were included in the primary analyses, all of which were weighted by relative practice size and excluded the one outlying practice. All analyses used SPSS for Windows (Version 6.13), and multivariate models used stepwise multiple linear regression. Local ethics committee approval was obtained.

Results

A total of 3684 out of 87 643 (4.2%) people aged 15 to 64 years registered in 23 practices were seen by the local psychiatric services during the study period; 2393 (65%) patients were women. Age-standardized utilization ratios for practices are shown in Table 1. Standardized ratios fell between 56% and 131%, except for one outlying practice (more than two standard deviations from the mean) at 182%.

Statistically significant correlations were present between standardized overall utilization ratios and all measures of social deprivation in the practice populations, and morbidity and premature mortality in females (Table 2). However, the index of limiting long-term illness in females had the closest association among this highly intercorrelated group of indicators, with a Pearson's correlation coefficient of 0.633 ($P = 0.001$), only marginally stronger than that for the Jarman Index (Pearson's correlation = 0.632; $P = 0.001$). (Figure 1 plots the standardized morbidity ratio in women for the practice population against the practice's standardized utilization ratio of psychiatric care.)

Proportions of practice populations aged 15 to 64 years being seen in secondary care varied by community team from 3.5% in one through to 4.5% and 4.7% for the other two; and this low use team was evident on both univariate and multivariate models (Table 3). On univariate examination of prescribing rates, no significant associations were present with standardized utilization ratios.

In a stepwise multiple regression model, three factors were retained in the final model (Table 3). These were the standardized morbidity ratio in women, community team 'A', and average quarterly doses of hypnotics prescribed per practice. These three factors explained 60.8% of the variance. (Figure 3 plots the predicted and actual standardized utilization ratio for the practice using the latter three-factor model.) Carrying out the analysis without weighting by relative practice size marginally reduces the adjusted r^2 to 57.1%. Exclusion of the outlying practice increases the r^2 of this model to 65%.

After the above model was tested, additional analyses were undertaken to explore possible effects of practice size and numbers of partners, but neither of these factors was significant.

To explore the possibility that high rates of referral were asso-

Table 1. Number of cases seen by specialist mental health services per 100 registered patients aged 15 to 65 years for each practice, with age-standardized utilization ratios and 95% confidence intervals.

Practice	Cases per 100 population aged 15–65 years	Standardized utilization ratio (%)	95% confidence interval
1	2.4	56	45–68
2	2.4	57	40–78
3	2.7	63	51–78
4	2.8	64	53–76
5	2.9	71	54–90
6	3.0	72	37–126
7	3.4	79	62–100
8	3.8	87	71–107
9	3.8	88	78–98
10	3.9	91	81–101
11	3.8	91	75–109
12	4.0	95	65–134
13	4.1	96	81–112
14	4.2	99	86–112
15	4.2	100	88–113
16	4.4	103	84–124
17	4.3	104	90–118
18	5.1	114	92–138
19	5.0	118	94–145
20	5.2	121	111–133
21	5.7	130	119–143
22	5.8	131	100–170
23	8.1	182	156–212

Table 2. Pearson's correlation coefficients for practice age-standardized utilization ratios against various measures of mortality, morbidity, and deprivation (for 23 practices, weighted by relative list population size). (SMR = standardized mortality ratio.)

	Age-standardized utilization rate	SMR, all cases	Standardized mortality ratio (men)	Standardized mortality ratio (women)	Standardized morbidity ratio (men)	Standardized morbidity ratio (women)	Jarman index	Townsend deprivation index
SMR, ALL CASES	0.430[a]							
Standardized mortality ratio (men)	0.142	0.458[a]						
Standardized mortality ratio (women)	0.398	0.474[a]	0.189					
Standardized morbidity ratio (men)	0.268	0.326	0.579[b]	0.496[a]				
Standardized morbidity ratio (women)	0.510[a]	0.671[b]	0.657[b]	0.722[b]	0.812[b]			
JARMAN INDEX	0.504[a]	0.737[b]	0.459[a]	0.735[b]	0.378	0.811[b]		
Townsend deprivation index	0.383	0.672[b]	0.532[b]	0.819[b]	0.532[b]	0.868[b]	0.941[b]	
Department of Environment deprivation index	0.422[a]	0.548[b]	0.370	0.662[b]	0.262	0.692[b]	0.897b	0.871

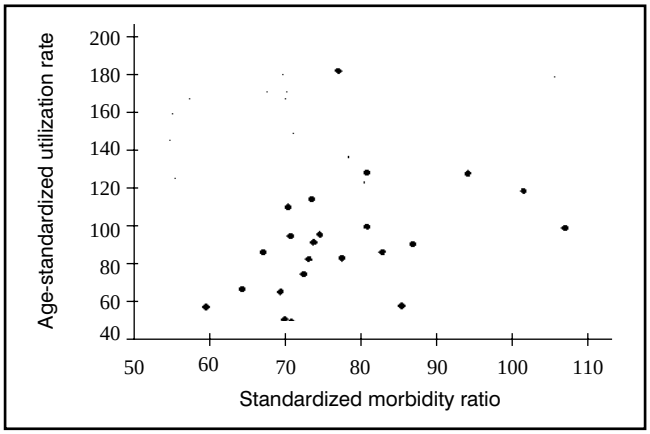

Figure 1. Plot of standardized morbidity ratio in women for each practice population (based on census long-term limiting illness questions) against standardized utilization rate (based on percentage of the practice list in specialist mental health care).

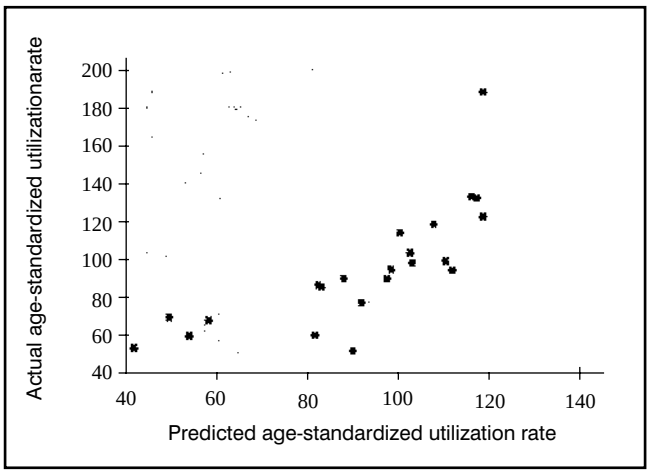

Figure 2. Plot of actual standardized practice secondary psychiatric care utilization ratio against predicted ratios from a multiple regression model incorporating the standardized morbidity ratio for women in the practice population; the practice quarterly average prescription of hypnotics in defined daily does per practice population and use of a specific local community psychiatric team (team 'A').

ciated with high proportions of cases being seen only briefly, correlation coefficients between standardized utilization ratios and the proportions of practice patients who had been seen only once or twice were examined. However, correlations were small and statistically insignificant. On the other hand, there was a positive correlation between standardized utilization and the proportion of cases from practices having more than 10 contacts during the study period (Pearson's correlation = 0.57; $P = 0.005$, excluding the outlier). That is, higher utilization practices tended to have higher proportions of intensively supported and (presumably) more severely ill patients.

Discussion

In previous studies, very large variations between general practices have been found in the utilization of hospital medical and surgical services. Some have argued that this apparent inconsistency in medical practice is related to uncertainty over the effectiveness of interventions.[20] As mentioned, there has been very little information on referral patterns to psychiatric services. As GPs differ substantially in their attitudes to mental illness,[21,22] it

Table 3. Univariate and multivariate analysis parameters explaining practice age-adjusted utilization rate for secondary psychiatric care (n = 23 practices, analyses weighted for relative population).

	Univariate model				Multivariate model (r^2 = 60.8%)	
Variable	r^2 (%)	Constant	Beta-coefficient	P-value[a]	Beta-coefficient	P-value[a]
Standardized index of long-term illness in females	26.0	9.4	1.1	0.01	1.24	0.001[b]
Community teams						
Team 'A'	24.5	107.0	-26.1	0.02	-22.1	0.001[b]
Team 'B'	4.8	93.9	11.4	0.31	0.14	0.52
Team 'C'	8.1	93.5	1811.5	0.19	-0.14	0.52
Prescribed doses per practice population						
Hypnotics and anxiolytics	7.5	117.2	-15.8	0.21	0.23	0.89
Hypnotics only	2.6	106.1	-17.4	0.18	-22.4	0.01[b]
All antidepressants	0.0	98.2	-0.1	0.99	-0.28	0.07
MAOIs and tricyclics only	0.0	92.4	6.0	0.78	-0.15	0.40
SSRIs only	0.0	102.1	-8.6	0.74	-0.26	0.10

[a]Significance of *t* statistic for beta, three factors included stepwise in multivariate model. [b]Factors retained in model.

would be reasonable to expect that variations in use of psychiatric services should be at least as large as those for other specialties. In this study, however, variation was limited, and much of it is explained by population morbidity and secondary care service factors.

While this is a relatively small study, it does have several strengths. The study district was chosen because of the presence of a computerized data system used by clinicians to schedule care and not merely for administrative purposes. All activity over a two-year period was included, increasing numbers and reducing confidence intervals. Some elements of variation have clearly been avoided: practices vary to a limited extent in population deprivation, with Jarman indices falling between -16.2 and 16.5. The mental health service is also relatively homogeneous, with one inpatient ward and two consultant psychiatrists. These factors therefore provide an ideal opportunity to study variation between general practices, with other sources of variation much reduced. However, because the area studied is predominantly rural, these results may not be reflected in a city area, and replication of these findings on a national and urban basis is needed.

The results show that the range of utilization rates were relatively constrained, varying from 44% below to 31% above expected, excluding one gross outlier. Contrary to our hypothesis, a large proportion of this variation was explained by indicators of relative morbidity in the population and the effect of differences between community team provision. From the database used in this study it was not possible to examine the precise characteristics of the community teams that influence referral rates, and this clearly needs further investigation, perhaps in a more qualitative form. Higher rates of use of hypnotic agents, currently regarded as a sign of poor mental health prescribing,[23] also played a role in explaining the lower use of the psychiatric service. It should be noted that there is a strong association between hypnotic and anxiolytic prescribing rates, and that the latter factor could have been included in the model with only slightly lower explanatory effect. Higher use of secondary services is sometimes assumed to be associated with inappropriate use; for example, with higher rates of patients being seen once or twice for minor morbidity. In fact, high-use practices in this study also had higher proportions of their cases seen intensively.

These findings are important at a number of levels. At GP level more knowledge is needed on the use of hypnotics (and anxiolytics) and on why those prescribing more of these drugs should use the specialist services less often. At a mental health service level, efforts to manage demands on secondary care should examine factors within the specialist service itself, and perhaps changes in provision should favour practices serving deprived populations. At the funding level, the study has implications for the setting of budgets for local commissioning of mental health services. On a more general level, this analysis underlines the importance of examining population indices and factors in secondary care provision, as well as factors in the practices themselves, in seeking explanations for variation in use of specialist services.

Conclusion

The use of mental health services in this study showed less variation than expected, and much of the variation present was associated with three factors: population, morbidity, and the effect of provider differences within secondary care. Factors within general practices provide little additional explanation, with the exception of relative rates of use of hypnotic and anxiolytic medication. If confirmed elsewhere, these findings are important for efforts to manage demand and allocate budgets and services locally.

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