Socio-economic deprivation and duration of hospital stay in severe mental disorder

MELANIE AMNA ABAS, JANE VANDERPYL, ELIZABETH ROBINSON, TRIX LE PROU and PETER CRAMPTON

Summary Adults from South Auckland, New Zealand who required acute admission to hospital were followed from admission to discharge. After adjusting for demographic factors, diagnosis, chronicity, severity, consultant psychiatrist and involuntary admission, the length of stay for those from more deprived areas was significantly longer by 7 days than for those from less deprived areas. Information on socio-economic deprivation should be used in discharge planning and in optimising access to community care. Research is needed on group-level factors that may affect recovery from mental disorders.

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Socio-economic deprivation, which measures the disadvantage of an individual or group relative to the local community or wider society (Townsend, 1987), is an indicator of socio-economic position. Three studies have shown an association between area deprivation and length of psychiatric admission (Hirsch, 1988; Thornicroft *et al*, 1993; Glover *et al*, 1998), but did not control for potentially important confounders. In this study we used the level of deprivation of area of residence as an indicator of individual socio-economic position (Salmond & Crampton, 2001).

METHOD

Counties Manukau Mental Health Services cover the mostly urban South Auckland district which has 378 000 residents. South Auckland has a high proportion of Maori (18%) and Pacific Islanders (17%) and is deprived relative to most of New Zealand. The study site was the 45-bedded psychiatric in-patient unit, which is managed by three consultants. Community care is provided by five teams, with no day hospital. The cohort comprised consecutive admissions from within the district from 1 November 1999 to 31 July 2000. We excluded patients from outside the area, patients readmitted during the study period and homeless people who had no address to code for area deprivation.

Deprivation was measured using the NZDep96 deprivation index, which was created from 1996 census data (Salmond *et al*, 1998) available for all small areas in New Zealand. A small area is defined as one meshblock (the smallest geographical area for statistical purposes (median population about 90 persons)) or two meshblocks. The NZDep96 index is a weighted combination of the proportions, in a small area, of nine variables, such as being on a means-tested benefit or lacking a specified resource (e.g. qualifications or a household telephone). The index is split into a quintile scale where 1 represents the least deprived 20% of small areas and 5 the most deprived 20%.

An independent firm assigned a geographical small area code to each patient's address at the time of admission, which enabled the correct area deprivation score to be derived. We defined the most deprived as those living in one of the areas ranked as the most deprived 20% (in accordance with the New Zealand definition of 'poor populations'), the least deprived as those living in areas ranked among the least deprived 60% and the moderately deprived as those living in areas ranked among the intermediate 20%.

The length of hospital stay was the number of days for the index admission in the study period. Potential confounding variables at individual patient level were obtained from case notes and from interviews with the patient's primary nurse, using structured questionnaires, such as the 10-item form of the Health of the Nation Outcome Scales (Amin *et al*, 1999), the Global Assessment of Functioning (American Psychiatric Association, 1994) and the Reasons for Admission schedule (Flannigan *et al*, 1994). We used the DSM–IV principal diagnosis and any comorbid diagnosis stated in the discharge summary.

We analysed the data using STATA version 6 using the log of the length of stay and the geometric mean, because of the log-normal distribution of length of stay. We used generalised linear modelling for the effect of deprivation, in three categories, using a multiplicative model.

RESULTS

Of the 379 index admissions in the study period, 7 patients were homeless and 50

Table 1 Multiple regression showing the effect of deprivation on the length of hospital stay for index admissions (n=291)

Deprivation	Comparison with least deprived group	Length of stay, days[1]	Likelihood ratio test for effect of deprivation, (d.f.=2) χ^2	P
Least deprived (quintiles 1–3)		11.8		
Moderately deprived (quintile 4)	0.52	19.8	13.48	0.001
Most deprived (quintile 5)	0.55	20.5		
Adjusted for demographic factors; diagnosis; severity; non-adherence; physical disability; and service factors[2]				
Least deprived (quintiles 1–3)		15.3		
Moderately deprived (quintile 4)	0.33	21.3	6.09	0.048
Most deprived (quintile 5)	0.36	21.9		

1. All other variables in the model at baseline values.
2. Age, gender, ethnicity, urban residence and marital status; principal diagnosis, any comorbid diagnosis; severity/function/chronicity (total Health of the Nation Outcome Scales score, severe aggressive or overactive behaviour on admission, severe problems with alcohol or drug-taking, Global Assessment of Functioning score, number of previous admissions, length of mental illness); medication non-adherence on admission; severe physical illness or physical disability; service factors (identity of responsible consultant psychiatrist, admitted under the New Zealand Mental Health Act (Compulsory Treatment) 1992, distance from home to hospital).

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were from outside the catchment area. For 291 of the remaining 322 patients (90%), enough information was available to enable coding at small area level. There were 166 males (57%) and the mean age of the sample was 36 years. Ninety-nine patients (34%) identified themselves as Maori, 116 as European (40%), 32 as Pacific Islander (11%) and 44 as Asian or other (15%). Three-quarters of the sample were single, widowed, divorced or separated and 43% lived in areas defined as 'most deprived', compared with 20% of the national population. One hundred and forty-three patients (49%) had a principal diagnosis of schizophrenia, 108 (37%) of a mood disorder and 41 (14%) another principal diagnosis, with 140 (48%) having a comorbid diagnosis. The geometric mean length of hospital stay was 16.6 days. One hundred and ninety-eight patients (68%) had been admitted involuntarily. The mean number of previous admissions to the psychiatric in-patient unit was 1.6 and the mean length of illness was 101 months.

For those from most deprived areas, the length of hospital stay was 21 days, compared with 12 days for those from the least deprived areas. After full adjustment for confounding variables (Table 1), this was 22 days for those from the most deprived areas, compared with 15 days for those from the least deprived areas. Those from moderately deprived areas also had a longer length of stay than those from the least deprived areas.

Principal diagnosis was the main contributor to variance (13%), followed by psychiatric symptom severity/function/chronicity (8%), small area deprivation (6%) and the identity of the consultant psychiatrist (3%).

Individual measures of socio-economic position (individual unemployment, occupational class, housing tenure, being on a benefit) each added only 1–2% to the explanatory power of a model for length of hospital stay containing demographic, clinical and service factors.

DISCUSSION

Lower socio-economic position, as measured by deprivation of small area of residence, was independently associated with increased length of hospital stay. Although principal diagnosis explained more of the variance, the association between deprivation and length of hospital stay remained after accounting for demographic and clinical factors and differences between clinicians. This is consistent with ecological studies (Hirsch, 1988; Glover *et al*, 1998) and with a study which stratified according to diagnosis (Thornicroft *et al*, 1993). Our findings may be at variance with a study that found no association (Weinberg *et al*, 1998) because we used a measure of deprivation (the NZDep96) that is less prone to measurement error, being applied at a spatial level of 90 persons (Salmond *et al*, 1998; Salmond & Crampton, 2001).

Selection bias is an unlikely explanation, as healthcare is geographically sectorised and little private care is available. Furthermore, the association remained after diagnosis, severity and length of illness had been controlled for. We controlled for most potentially important confounders other than social support. We are not able to say whether the effect of deprivation is at the individual, household or area level. Our data suggest that place may be at least as important as person and that moderate deprivation also has an effect.

Conditions in deprived neighbourhoods (few employment opportunities, restrictive work environments, social fragmentation and poor services) might have an adverse effect on those with mental disorders and their carers (Macintyre *et al*, 2002; Allardyce *et al*, 2005). Several study participants would have been left alone all day if discharged, either because they lived alone or their families worked long and unsociable hours. This, combined with poor opportunities for local employment and poor public transport, contributed to a long length of hospital stay while awaiting daytime placement. Other patients had comorbid physical illness which was aggravated by poor housing. Individual, household and neighbourhood social circumstances should be taken into account in discharge planning and in optimising access to community care. Research is needed to develop hypotheses about group-level factors that may explain the onset and outcome of mental disorders (O'Campo, 2003).

MELANIE AMNA ABAS, MD, Division of Psychiatry, University of Auckland, New Zealand, and Health Services Research Department and Institute of Psychiatry, London, UK; JANE VANDERPYL, PhD, Mental Health Services, Counties Manukau District Health Board, Auckland; ELIZABETH ROBINSON, MSc, Department of Community Health, University of Auckland; TRIX LE PROU, MHSc, Mental Health Services, Counties Manukau District Health Board, Auckland; PETER CRAMPTON, PhD, Department of Public Health, Wellington School of Medicine and Health Sciences, Wellington, New Zealand

Correspondence: Dr Melanie A. Abas, Section of Epidemiology, Institute of Psychiatry, London SE5 8AF, UK. E-mail: Melanie.abas@dsl.pipex.com

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