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Schizophrenia and Bipolar Disorder in Urban Areas

Elizabeth H Bartlett [1], Rabia Bourkiza [1], Lucy R Crosland[1], Sian Edwards[1], Angela Cooke[1], Tariq Mahmood[2]

[1] University of Leeds School of Medicine
[2] Leeds Mental Health Teaching NHS Trust

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Abstract

Background

Earlier studies have shown that schizophrenic patients are more likely to be living in densely populated inner city areas, whereas bipolar patients are more widely distributed. These studies, however, were generally carried out in the pre-community psychiatry era.

Aim of this study

To examine the geographical distribution of cases of schizophrenia and bipolar disorder in an urban area of West Yorkshire to see if the drive towards care in the community has led to wider dispersion of cases.

Method

Admissions of schizophrenic and bipolar patients to in-patient facilities of Leeds Mental Health Teaching NHS Trust over a 3-year period were mapped to the electoral wards in which they were living at the time of admission.

Results

949 cases of schizophrenia and 930 cases of bipolar disorder were hospitalized over this period. At the time of admission significantly more schizophrenic and bipolar patients were residing in inner city areas of Leeds.

Conclusion

Closure of large mental hospitals and the trend towards management of psychiatric patients in the community does not appear to have had an appreciable effect on the concentration of schizophrenic patients in densely populated inner city areas. Surprisingly, the bipolar population is also following the same trend.

Competing Interests

Nil

Details of contributors

This study was carried out by a group of 4th year medical students, as the Selected Study Component of their Psychiatry, Primary care and Public Health module.

Dr T Mahmood, as supervisor, planned the study and critically revised the draft.

Key Words: Schizophrenia, Bipolar, Epidemiology, Urban, Rural

Introduction

Better provision of mental health services for the seriously mentally ill, particularly those with schizophrenia (SZ), is one of the principal targets of the National Service Framework (Department of Health 1999). NICE Guidelines (2006) for bipolar disorder (BP) have been published with a similar goal. Both illnesses are known to have a life-time prevalence of approximately 1% (Weiser et al 2005, Belmaker 2004); however, accurate planning of services requires not only the prevalence rates, but also needs data regarding the geographical location of these cases.

Striking variations in geographical distribution, particularly of schizophrenic cases, were reported by earlier epidemiological studies. Faris and Dunham (1939) found that many SZ patients were located in inner cities and those areas with a high level of social deprivation. Several other research groups have reproduced these findings (Hare 1956, Hollingshead & Redlich 1954).

Unlike schizophrenia, cases of BP, however, are more evenly distributed as was found in Hare's (1956) Bristol study. A more recent study in Ontario, Canada has confirmed the earlier reports that cases of bipolar disorder are more evenly distributed (Parikh et al 1995).

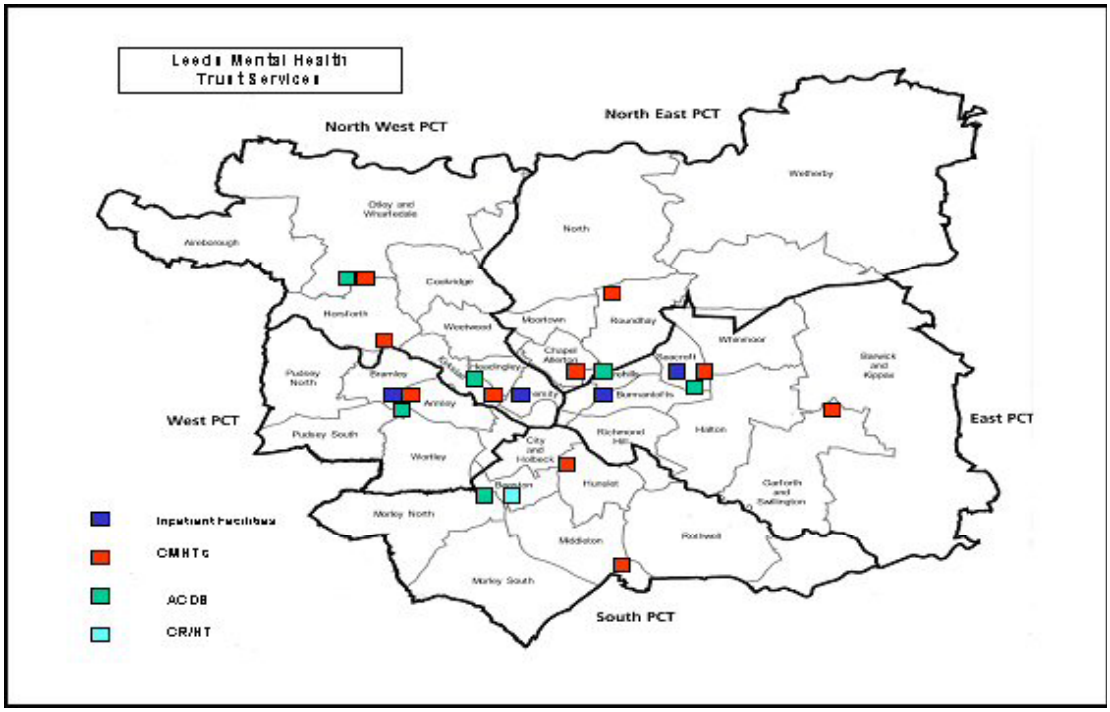
The earlier studies, however, were carried out before the closure of large mental hospitals. Therefore, it will be interesting to re-examine the question, to see as to whether the introduction of community care has resulted in wider dispersal of these patients. Our study was carried out in Leeds, which is a medium-sized city with a population of approximately 700,000. At the time it was serviced by 5 Primary Care Trusts and a mental health trust. The mental health services are organised along functional lines with 3 in-patient facilities based on general hospital sites and 14 community mental health teams. A crisis service is operating and assertive outreach and early intervention services are being developed. Figure 1 shows the distribution of mental health facilities across Leeds.

Aims

- To map the distribution of patients requiring admission for schizophrenia and bipolar affective disorder, according to electoral wards determined by patients' home postcodes.

- To identify whether the distribution of local mental health services matches the spread of serious mental illnesses.

Figure 1: Leeds Mental Health Teaching NHS Trust (unpublished report)



Methods

Coded data was obtained from the information technology department of the Leeds Mental Health Trust (LMHT), for all psychiatric adult in-patients with the ICD-10 (W.H.O. 1992) diagnoses F20 / schizophrenia and F31 / bipolar affective disorder for the 3-year period (January 2002 to February 2005).

Date of birth, age, gender, home postcode and the corresponding electoral ward were recorded.

Cases whose home postcode did not correspond to a Leeds electoral ward were not included in the analysis.

Figures for total population, urbanisation (population density), proportion of single person households, education and unemployment levels for the 33 electoral wards in Leeds were obtained from the 2001 census data.

Socio-economic data obtained from the Leeds City Council was used to calculate the Index of Multiple Deprivations (IMD), produced by the Department of Transport, Local Government and the Regions (DTLR). This takes into account six domains, namely: income, employment, health, education, housing and geographical access to services to generate a composite score. A high IMD score indicates greater deprivation. We ranked the electoral wards according to their IMD scores with the highest ranking given to the ward scoring the highest on the deprivation index.

Ethical considerations

The special study projects approval panel of the University of Leeds, School of Medicine, approved the study design. Submission for ethical approval was not required as the study did not involve any contact with the patients or their case notes.

Analysis

Outcome variables

The primary outcome measure was the case density of each of the two diagnostic groups. Population data was used to calculate case density, expressed as the number of in-patient cases per thousand people living in the ward.

Explanatory variables

Demographic data was examined to assess whether an association with case density exists. The following variables in each ward were investigated:

- Urbanisation: determined by the population density of a ward, which was calculated as the number of people living in the ward divided by the area in miles^2
- Deprivation: wards were ranked according to the IMD
- Single person households: expressed as the proportion of households in a ward reporting single occupancy
- Unemployment: measured by the proportion of working age inhabitants that were not in paid work
- Education: the proportion of inhabitants with no formal qualifications

Scatter diagrams were plotted to assess the correlation of case density with each of these variables. A best-fit line was derived and the Spearman's rho correlation coefficient, a non-parametric test that does not assume an underlying normal distribution of data, was calculated to formally assess the significance of association between outcome and explanatory variables.

Results

During the study period 949 (38% female, 62% male) patients were admitted to psychiatric hospitals in Leeds with an ICD-10 diagnosis of SZ, and 930 (59% female, 41% male) patients were admitted with BP. The case density for schizophrenia ranged from 0.3 to 3.72 cases/1000 population and 0.34 to 2.25 cases/1000 for BP (Table 1). The geographical spread of admissions for SZ and BP throughout Leeds is shown in Figures 2 and 3 respectively. Cases of SZ appear to be more centrally located. BP, although it is more widely distributed than schizophrenia, does also have some pockets of high density in central areas of Leeds.

Significant correlations were seen between case density and explanatory variables except education (Table 2), with the level of urbanisation and the proportion of single households having the greatest effect.

Table 1 Case density and social variables

Ward	Population	Cases/1000 SZ	Cases/1000 BP	Urbanisation (population density)	Deprivation Rank	Single person households	% With No Qualifications	% Unemployed
Aireborough	25,617	0.66	1.05	3,155	30	27.3	25.6	2.2
Armley	22,034	2.09	1.95	10,549	12	33.8	38.0	3.8
Barwick & Kippax	23,504	0.38	0.60	746	18	23.7	31.2	2.4
Beeston	16,454	2.25	1.70	9,723	9	34.1	41.7	4.7
Bramley	22,298	1.03	1.70	8,866	11	30.4	37.2	3.9
Burmantofts	18,507	1.57	1.51	9,940	4	36.5	48.3	6.1
Chapel Allerton	18,206	3.24	2.03	10,306	8	38.1	31.4	5.0
City & Holbeck	20,676	3.72	2.13	5,421	1	48.2	42.7	6.7
Cookridge	21,405	1.45	0.75	4,978	25	29.8	22.3	2.2
Garforth & Swillington	23,892	0.33	1.30	2,132	24	23.0	30.9	1.9
Halton	22,742	0.35	1.23	3,077	29	26.1	28.8	2.0
Harehills	21,052	2.66	1.90	20,785	3	32.4	44.7	6.3
Headingley	25,945	1.23	1.23	24,442	21	40.4	8.3	2.2
Horsforth	21,562	0.46	1.07	4,828	33	26.9	21.0	1.9
Hunslet	16,155	2.23	1.49	5,563	6	34.0	51.3	5.6
Kirkstall	19,964	1.85	1.60	10,795	15	34.9	26.5	3.7
Middleton	21,002	0.76	0.57	3,945	10	26.3	42.4	4.4
Moortown	21,473	1.07	1.72	10,282	20	31.8	23.2	2.8
Morley North	24,812	0.73	0.48	3,859	23	26.4	31.8	2.0
Morley South	29,239	1.09	0.89	3,683	17	27.9	33.5	2.5
North	22,171	1.67	1.31	1,347	28	29.9	21.3	2.4
Otley & Wharfedale	24,496	0.61	1.14	1,471	31	28	23.4	2
Pudsey North	22,835	0.35	1.23	4,367	27	27.2	26.2	2.1
Pudsey South	22,178	1.04	0.68	6,128	16	28.5	33	2.7
Richmond Hill	17,704	1.36	1.41	4,861	5	33.6	51.7	6
Rothwell	21,010	0.52	0.71	2,618	19	25.1	33.1	2.7
Roundhay	21,823	1.42	1.37	4,869	26	27.9	18.6	2.4
Seacroft	17,725	2.88	1.41	10,702	2	32.6	50.8	6.3
University	21,364	3.28	2.25	11,401	7	55.8	23.7	5
Weetwood	20,721	1.30	1.64	7,581	22	41.6	18.2	2.3
Wetherby	26,473	0.30	0.34	891	32	24.7	22.1	1.7
Whinmoor	17,249	0.93	1.22	3,541	14	28.3	38	3.4
Wortley	23,114	1.04	0.78	4,885	13	29.6	38.9	3.8

Table 2: Case density and socio-economic variables

	Schizophrenia		**Bipolar affective disorder**	
	Spearman's rho	p-value	Spearman's rho	p-value
Urbanisation	0.736	<0.001	0.687	<0.001
Deprivation	0.713	<0.001	0.544	0.001
Single Person Households	0.861	<0.001	0.781	<0.001
Education	0.330	0.061	0.181	0.314
Unemployment	0.776	<0.001	0.603	<0.001

Discussion

With the closure of large mental hospitals and the introduction of community care, it was hoped that more patients would be managed closer to home. However, the hope does not seem to have been fulfilled, as we found higher density of schizophrenia and bipolar disorder in inner city areas of Leeds. Goldberg and Morrison (1965) in their seminal work on schizophrenia and social class had found that a great majority of these patients had drifted into inner cities and were not born there. This observation seems to hold true for Leeds, as the majority of supported housing establishments are located in densely populated inner city areas. Easy availability of large run-down houses in inner city areas such as Beeston, Burley, Holbeck and Hyde Park, which were easier to convert into hostels and nursing homes, was possibly the reason for choosing these areas for relocating the long-time residents of mental hospitals.

Peen et al's (2003) suggestion that a higher number of admissions from inner city areas are due to greater concentration of chronic patients in these areas, seems to be applicable to Leeds; however, it is not the full explanation. Like most inner cities, these areas of Leeds have a preponderance of unqualified and unemployed people living as single-person households in low-cost housing (Pederson et al 2004, Spauwen et al 2004, Marcelis et al 1999). The social deprivation, as shown by high IMD scores, possibly creates a more demanding everyday environment, resulting in mental stress and perhaps acting as a contributory factor in the development and progression of mental illnesses (Paykel et al, Peen et al 2003, Peen et al 2004). We found significant correlations between case density and urbanisation, single-person households and unemployment. However, in contrast to previous work (Sundquist et al 2004) our study did not show a statistically significant correlation between education and case density. Nonetheless, it is worth noting that 3 out of 4 areas with the highest density of SZ and BP cases have high rates of people with no academic qualification.

In contrast to the negative findings of previous studies of rural / urban divide in bipolar disorder (Hare 1954, Robins et al 1984, Parikh et al 1995), we found pockets of high density in central areas of Leeds. This may be explained by the higher incidence of bipolar disorder in black and other ethnic minorities reported by Lloyd et al (2005) in south-east London, Nottingham and Bristol. The areas of Leeds where we found a higher

prevalence of bipolar disorder have higher representation of ethnic minorities e.g. Harehills, a small ward with an area of one square mile, has 40% of its population consisting of ethnic minorities compared to 8% for Leeds in general (National Census 2001).

It is reassuring to note that the provision of mental health services in Leeds (Figure 1) roughly matches the geographical distribution of SZ and BP, the two most serious psychiatric disorders, and is in line with NSF recommendations. However, if the findings of our study are accurate and there is a higher concentration in inner city areas of not only patients with schizophrenia but also of those with bipolar disorder, then an even greater input is needed by these areas.

A study relying solely on inpatient admissions was obviously going to exclude cases that did not need admission during the study period. Homeless people were another group who were not included because they were without a home postcode and thus were not mapped to any of the electoral wards. A larger community based survey is, therefore, required to overcome these limitations and get a complete picture of the distribution of the seriously mentally ill in large urban centres.

Conclusion

In view of the higher number of admissions of severely mentally ill patients from inner city areas, it is fair to say that the closure of large mental hospitals and the introduction of care in the community have not had a major impact on the geographical distribution of cases of schizophrenia, and in the case of bipolar disorder the move is in the unexpected direction of inner cities.

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Figure 2: Distribution of schizophrenia admissions, case density by ward

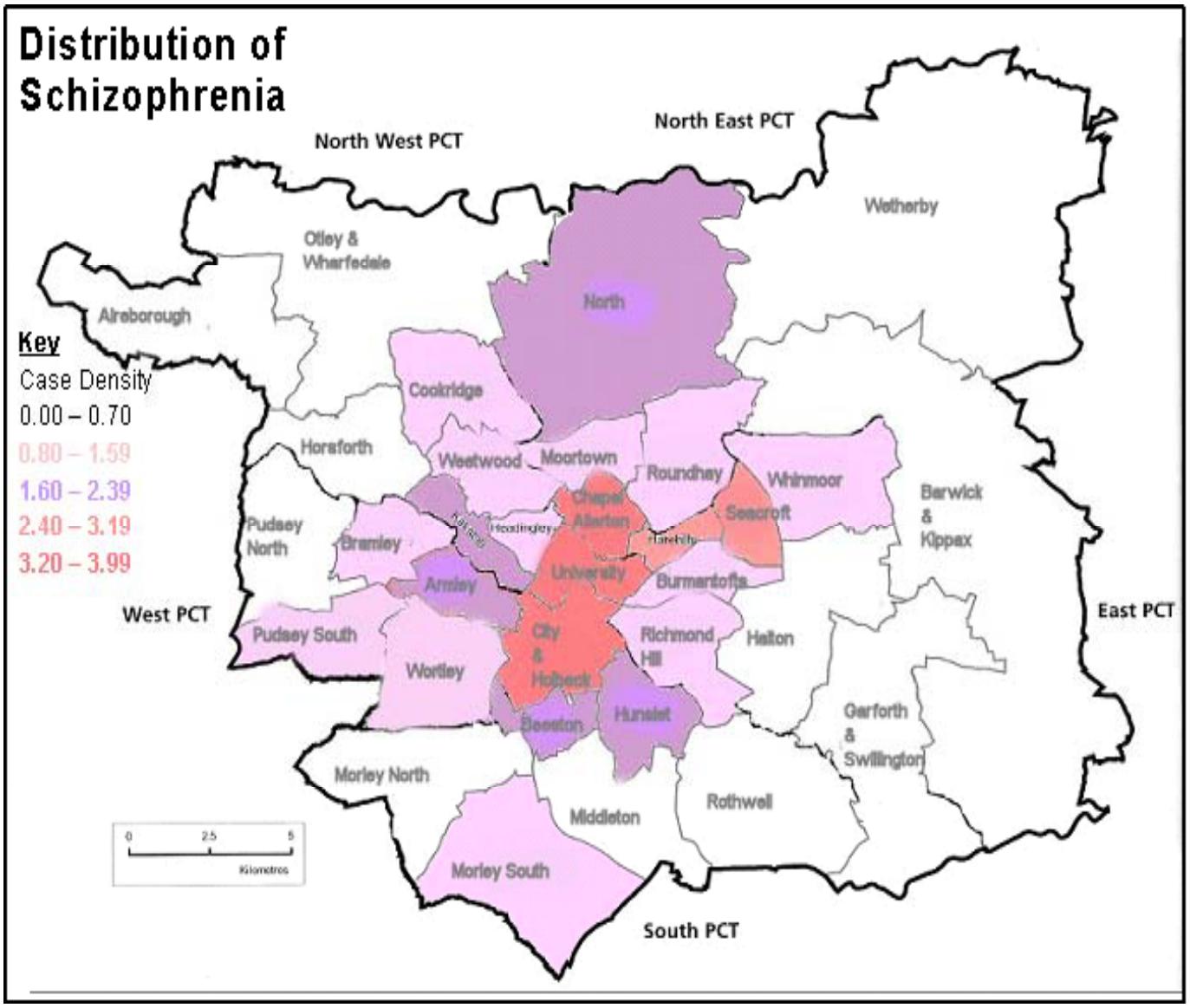
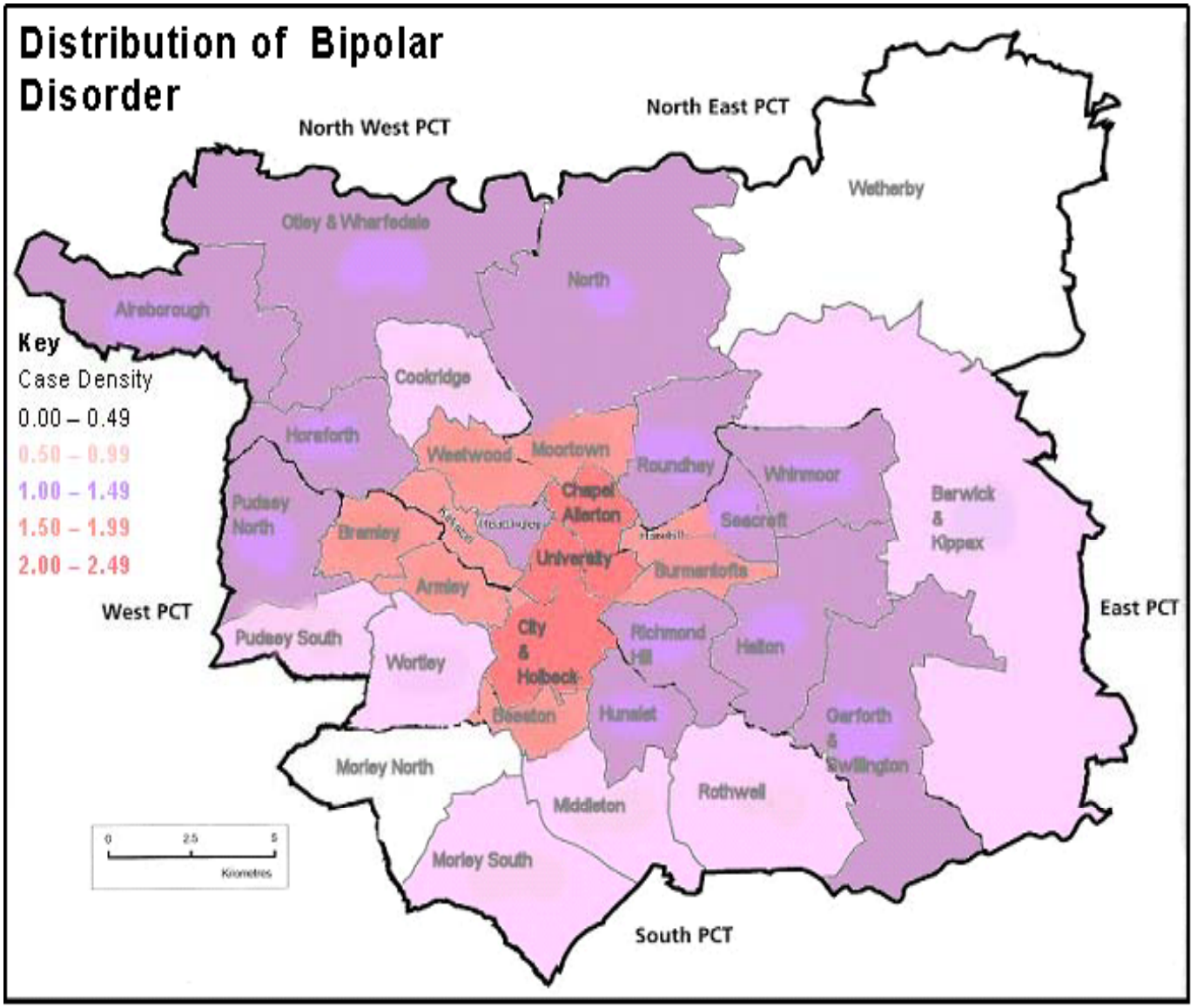


Figure 3: Distribution of bipolar disorder admissions, case density by ward



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