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Ethnicity, deprivation and psychosis: the Glasgow experience

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Dear Editor,

Ever since Odegaard's studies in the early part of the 20th century there has been considerable interest regarding the differences in the rates of psychosis among native and non-native populations (Odegaard, 1932). There is a substantial body of research that demonstrates increased rates of psychosis among the Black African and Caribbean population in the UK (Fearon *et al.* 2006). One of the proposed reasons for the higher rates of psychosis among Black and minority ethnic (BME) groups is the greater level of socio-economic disadvantage among these groups (Morgan *et al.* 2010). Studies have demonstrated higher rates of hospital admission and use of the mental health act (MHA) among BME patients when compared with White patients (Bhui *et al.* 2003). These findings have significant implications for mental health policy and service provision. The aim of our Glasgow-based study was to examine the prevalence of psychosis in BME compared with White population; to compare admission rates and MHA detention rates in these populations; and to examine if prevalence rates of psychosis varied with deprivation status across the ethnic groups.

Method

The dataset analysed in this paper was derived from the Glasgow Psychosis Clinical Information System (PsyCIS), a secondary care case register in use in Glasgow. The register consists of details of adult (aged 18 and above) patients in the Greater Glasgow NHS board area, diagnosed with a psychotic disorder, attending general adult psychiatric services. This includes patients with an ICD10 diagnosis of F20–29, F30–31, F32.3, F06.0–06.2, F06.30–06.31 and F1(x) with psychotic symptoms; and F53 with psychotic symptoms, diagnosed by the patients' responsible consultant psychiatrist. Two research nurses conducted a retrospective medical case note review of all the patients included in the register over a period of 42 months between February 2002 and August 2005 in order to collect a range of relevant clinical and socio-demographic datasets. The data on ethnicity were based on self-reported information collected at the time of contact with psychiatric services. In total more than 8000 case notes were audited and 4438 patients were identified as having a psychotic illness from the inclusive diagnosis list. In this paper, we have analysed the sub-set of patients with diagnosis of schizophrenia and related disorders (ICD10 F20–F29). Further details about the register can also be found in a related paper (Park *et al.* 2008).

Information about the general population was based on census data from 2001. As there were slight differences in the ethnicity categories used by the census and psychiatric services, we grouped related ethnic groups into broader categories. The term 'Black' refers to people of Black African, Black Caribbean and 'Black other' groups. The term 'South Asian' refers to people originating from the Indian subcontinent (India, Pakistan and Bangladesh). We retained a separate group for individuals who identified themselves as Chinese and grouped the remainder into the category 'Other Ethnic Group'. Throughout the paper we use the term 'Black and minority ethnic (BME) group' to refer to any ethnic minority group irrespective of place of birth.

Deprivation status was measured using the Carstairs and Morris Index of Deprivation (Carstairs & Morris, 1990), which is an area-based measure of deprivation derived from census data. The Carstairs index allocates a score for Scottish Postcode sectors based on four variables: overcrowding, male unemployment, car ownership and the proportion of people in households in social class 4 or 5. This is then used to

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define seven DEPCAT groups, from 1 (most affluent) to 7 (most deprived). The most recent DEPCAT scores from the 2001 census were used for the analysis.

Prevalence rates and population odds ratios were calculated for the sample. We also examined if 'ethnic density', defined as the percentage of ethnic minority people living within each DEPCAT area, was associated with variations in prevalence rates of psychosis among the BME group.

Results

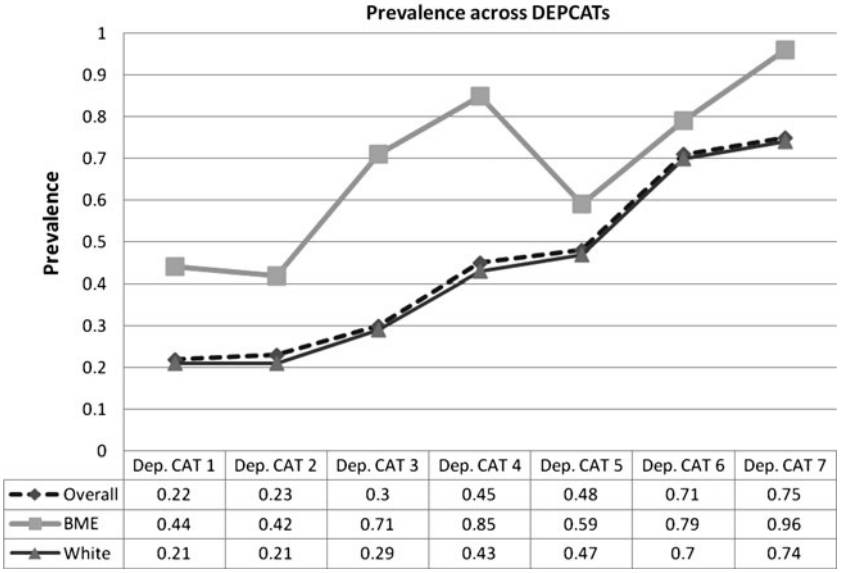
A total of 2871 individuals had a diagnosis of F20–29 (from now, referred to as 'psychosis'). The demographic details collected and breakdown of diagnostic categories are described in a related paper (Park *et al.* 2008).

The period prevalence of psychosis in the total population was 0.53% ($n = 2871$; male = 1886, female = 985). BME groups formed just over 7% of the total number of cases. As a group, the prevalence of psychosis was greater among BME groups (0.74%) when compared with the Caucasian population (0.52%) (OR = 1.42; 95% CI = 1.22–1.65). BME females as a group and individual subgroups were more likely to be diagnosed with psychosis than White females (OR = 2.03; 95% CI – =1.6–2.55). BME males as a group were no more likely to be diagnosed with psychosis than White males (OR = 1.1; 95% CI = 0.9–1.3). However, the 'Other Ethnic' subgroup had greater prevalence of psychosis compared with White males (OR = 1.5; 95% CI = 1.03–2.2).

There was a gender difference in the prevalence of psychosis among the White population. White males were two times more likely to be diagnosed with a psychosis compared with their female counterparts (0.73% *v.* 0.34%; OR = 2.16(1.98–2.3)). This gender difference was not present among the BME (0.8% *v.* 0.68%; OR = 1.17(0.87–1.5)) population. On examining individual ethnic groups, risk of being diagnosed with psychosis was greater among South Asian (0.68%; OR = 1.3; 95% CI = 1.07–1.59), Black (1.002; OR = 1.93; 95% CI = 1.14–3.27) and Other Ethnic groups (0.89%; OR = 1.7; 95% CI = 1.25–2.3) but not in the Chinese (0.69%; OR = 1.3; 95% CI = 0.89–2) group, compared with the White.

Across the DEPCATs, there was a steady rise in the prevalence rates of psychosis, among the White population (Fig. 1 and Table 1). Those in the most deprived category were 3.5 times more likely to be diagnosed with psychosis, compared with those in the least deprived. However, this trend was absent among the BME population.

When comparing BME with White, the BME population was more likely to be diagnosed with psychosis only in DEPCAT2, 3, 4 and 7. Since the number of BME in each DEPCAT, especially the less deprived areas were small, we grouped the data based on the Scottish average DEPCAT score of 4 into two broad categories indicative of relatively more deprived areas (DEPCAT5, 6 and 7) and less deprived areas (DEPCAT1, 2, 3 and 4). The results of this analysis are shown in Table 2. On the whole, we found higher prevalence of psychosis in the more deprived



	Dep. CAT 1	Dep. CAT 2	Dep. CAT 3	Dep. CAT 4	Dep. CAT 5	Dep. CAT 6	Dep. CAT 7
Overall	0.22	0.23	0.3	0.45	0.48	0.71	0.75
BME	0.44	0.42	0.71	0.85	0.59	0.79	0.96
White	0.21	0.21	0.29	0.43	0.47	0.7	0.74

Fig. 1. Prevalence of F20–29 diagnoses across DEPCAT. Dotted lines depict the prevalence across DEPCAT in the population as a whole.

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Table 1. *Prevalence of F20–29 disorders in the more deprived and the less deprived*

Ethnic group	Affluent F20	Affluent total	Prevalence affluent	Prevalence ratio – reference white	Deprived F20	Deprived total	Prevalence deprived	Prevalence ratio – reference white
White	704	223 846	0.31	1	1985	291 392	0.68	1
South Asian	44	6655	0.66	2.102 (1.53–2.87)[#]	59	8439	0.7	1.026 (0.78–1.337)
Chinese	5	1342	0.37	1.185 (0.435–2.939)	19	2113	0.9	1.32 (0.82–2.103)
Black	4	416	0.96	3.05 (0.98–8.34)	10	981	1.01	1.496 (0.76–2.84)
Other ethnic	6	1430	0.42	0.89 (0.285–2.450)	35	3144	1.11	1.63 (1.15–2.3)
BME	59	9843	0.6	1.91 (1.45–2.5)[#]	123	14 677	0.83	1.230 (1.022–1.48)[#]
Total	763	233 689	0.33		2108	306 069	0.69	2.109 (1.94–2.29)[*,#]

Groups based on the Scottish average – (DEPCAT scores 1–4 considered as affluent and 5–7 considered deprived). *Prevalence ratio compared with affluent population as a whole. [#]Statistically significant.

Table 2. *Prevalence rates and ratio of F20–29 in BME compared with white (Caucasian) population*

DEPCAT	BME F20 No.	BME total population No.	BME prevalence %	Prevalence ratio with DEPCAT 1 as reference	White F20 No.	White total population No.	White prevalence %	Prevalence ratio with DEPCAT 1 as reference	Prevalence ratio with white as reference group
DEPCAT 1	4	912	0.44	1	51	23 965	0.21	1	2.06 (0.75–5.7)
DEPCAT 2	18	4315	0.42	0.95 (0.32–2.8)	138	64 352	0.21	1.01 (0.73–1.3)	1.95 (1.19–3.1)*
DEPCAT 3	12	1682	0.71	1.63 (0.52–5.07)	149	51 262	0.29	1.36 (0.99–1.87)	2.46 (1.36–4.4)*
DEPCAT 4	25	2934	0.85	1.9 (0.67–5.5)	366	84 267	0.43	2.04 (1.52–2.7)*	1.97 (1.3–2.9)*
DEPCAT 5	16	2714	0.59	1.34 (0.45–4.01)	245	51 733	0.47	2.22 (1.64–3.00)*	1.24 (0.75–2.06)
DEPCAT 6	35	4447	0.79	1.86 (0.63–5.07)	659	93 864	0.7	3.31 (2.49–4.4)*	1.12 (0.79–1.5)
DEPCAT 7	72	7516	0.96	2.18 (0.80–6.02)	1081	145 795	0.74	3.5 (2.6–4.64)*	1.29 (1.01–1.64)*
Total	182	24 520	0.74		2689	515 238	0.52		1.42 (1.22–1.65)*

DEPCAT – Carstairs and Morris Index of Deprivation categories.
*Statistically significant.

population (0.69% *v.* 33%; OR = 2.109; 95% CI = 1.94–2.29). The prevalence of psychosis among BME groups was significantly higher in both less deprived and more deprived areas. South Asians were twice as likely to be diagnosed with psychosis in less deprived areas, while the 'Other Ethnic' group was 1.6 times more likely to be diagnosed with psychosis in the more deprived areas.

Compared with the White Caucasian group, BME group in general was 1.5 (95% CI = 1.12–2.15) times more likely to be admitted and 2.12 (95% CI = 1.5–3.06) times more likely to be detained in the previous 12 months. People in 'Other Ethnic' group were more likely to be admitted or detained. South Asians and Black Africans were more likely to be detained.

Ethnic density (of BME group as a whole) was not significantly different between the less deprived (average of 4.12% in DEPCAT1, 2, 3 and 4) and the more deprived regions (average of 4.8%) (OR = 1.1; 95% CI = 0.3–4.5). There was a negative correlation between ethnic density and prevalence rates of psychosis among BME in each DEPCAT; however, this did not reach statistical significance ($r = -0.31$; $p = 0.4$).

Discussion

Greater Glasgow has a higher concentration of deprived areas as compared with the rest of the country. Thirty percent of the population in Greater Glasgow belonged to the most deprived 7% of the Scottish population (McLoone, 2004). We found that those in the more deprived group based on Scottish average were twice as likely to be diagnosed with psychosis compared with those in the less deprived group. Interestingly, the prevalence of psychosis showed a step wise increase across the DEPCATs, with the most deprived showing a 3-fold increase compared with the least deprived. Previous work in this population has shown similar results (Allardyce *et al.* 2005). Allardyce *et al.* (2005) demonstrated an association between admissions for psychosis and population-based measures of material deprivation over the period of 1989–1993. They found that admission rates were 2.3 times greater in the most deprived compared with the least deprived.

These results imply that there may be a dose–response relationship between socio-economic status and psychosis. However, the gradient of increase in the prevalence was present only in the White population, and not in the BME population. There was no significant difference in prevalence of psychosis across the DEPCAT groups among the BME population. We could therefore assume that belonging to an ethnic minority group may be a risk factor for being diagnosed with psychosis, independent of socio-economic deprivation.

This assumption is strengthened by the finding that the difference in prevalence between BME and White population, was present primarily in the less deprived DEPCAT2, 3 and 4 areas, and not in the more deprived DEPCAT5 and 6 areas, where the prevalence rates were similar. It is tempting to suggest that socio-economic deprivation takes its toll irrespective of ethnicity, thereby increasing the prevalence of psychosis in the most deprived group in general. However, there may be an additive effect, where deprivation may further increase the prevalence in the BME population – as seen in DEPCAT7. Indeed, Morgan *et al.* propose a 'socio-developmental pathway' hypothesis that underpins the higher rate of psychosis among the BME population, where adverse life situations like deprivation interact with neurodevelopmental substrates increasing the susceptibility to psychosis (Morgan *et al.* 2010).

In the present study, the ethnicity effect was evident mainly in the female BME population. Although this finding may represent a type two error due to the relatively small BME population, this could also reflect the twofold increase in prevalence of psychosis among males compared with females in the White population (this difference was not present in the BME population). A recent review reported increased incidence of schizophrenia in males (rate ratio – 1.4). However, the same review failed to find increased prevalence among males, even in the absence of sex difference in the standardised mortality ratio (McGrath *et al.* 2008). Our findings should be interpreted with caution, as it contains a mixture of diagnosis including acute and transient psychotic disorders (ATPD). Nevertheless, our findings are in contrast with previous studies (Castagnini & Berrios, 2009) that have reported female preponderance in all forms of ATPD. As the diagnoses were based on clinician diagnosis, rather than an interview schedule, it is possible that women were classified into an affective disorder diagnostic category, due to a preponderance of affective symptomatology in their presentation (Abel *et al.* 2010). However, this should have reflected in the BME population as well.

Our study did not set out to examine potential causative factors implicated in the increased prevalence of psychosis in this population. Some previous studies (Das-Munshi *et al.* 2010) have proposed an ethnic density effect, which describes a phenomenon whereby adverse mental health outcomes among individuals from ethnic minorities are greater in neighbourhoods where they comprise a smaller proportion of the population. As expected there was a negative correlation

between ethnic density and prevalence rates, suggesting that prevalence rates were greater in areas where ethnic density was lower. Although this explained around 9% of the variance in prevalence rates, this was not statistically significant possibly due to the small number of data points in the analysis.

To our knowledge, this is the first of its kind study in Scotland to investigate the relationship between ethnicity and psychosis. Our study adds to a number of previous studies from the UK that demonstrate greater rates of psychosis among BME groups. In one of the most recent studies (Fearon *et al.* 2006), conducted in three UK centres, the incidence of all psychoses was found to be four to six times higher in these populations, compared with the White population. Similar findings have been reported in other European countries and in African–Americans in the USA (Cantor-Graae & Selten, 2005; Bresnahan *et al.* 2007).

South Asians were the biggest ethnic group in our study. Traditionally, South Asian families live in large shared households. It could be argued that this level of social support is protective, helping avoid the social drift phenomenon in this population, and hence the greater prevalence in this population particularly in the less deprived areas.

Our results also reflect the findings of a recent meta-analysis (Singh *et al.* 2007) of 19 studies which found that BME patients were 2–3 times more likely to be detained compared with White patients. These findings support the hypothesis that BME population is indeed more likely to be diagnosed with a severe and enduring mental illness. A number of reasons have been attributed to the greater detention rates seen in BME patients. These include higher rates of psychosis, delayed help-seeking due to social isolation and/or lack of community involvement, and increased referral by police and court authorities. Racial stereotyping and discrimination within psychiatry have also been attributed to this increased number.

There are several limitations to the data including the exclusion of patients in primary care and the limited set of variables explored in explaining our findings. These are inherent limitations of the case register model and not necessarily defects of the data (Bloor, 1995). Although it is possible that individuals with a psychotic disorder may function in the community without contact with secondary services, these numbers are likely to be very small (Foster, 1996). There are indeed some discrepancies in our findings. For example, the prevalence ratio in DEPCAT1 did not reach statistical significance. This could reflect the small numbers in the BME in each DEPCAT. It should be noted that 95.5% of the Greater Glasgow population is White; with BME population forming just about 4.5% (more than twice that of the Scottish average of 2.01%). This is, however, an epidemiological sample and reflects the real world population distribution of one of the largest cities in the UK. There are weaknesses in using DEPCAT as a proxy measure for deprivation. Postcode sectors that are not internally homogenous might contain a mixture of levels of deprived households within that sector. More heterogeneous sectors are likely to end up within DEPCAT3, 4 and 5 as a result, in spite of containing pockets of deprivation. However, this is less likely to be a problem in a dense urban area such as Glasgow. The Carstairs index remains one of the most popular and widely used indicators within health research due to its consistent validity.

The higher rates of psychosis among BME groups have been described as a public health tragedy that remains neglected (Morgan & Hutchinson, 2009). Its determinants are by no means clear or well understood and there remains a pressing need for research in this field.

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Declaration of Interest

None.

Author Contribution

PS, AA and JP were involved in the collection, analysis and interpretation of data, revising the article critically for intellectual content and final approval of the version to be published. JT and MC were involved in the conception and design, revising the article critically for intellectual content and final approval of the version to be published. RK was involved in the analysis and interpretation of data, drafting the article, revising the article critically and final approval of the version to be published.

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