Size and clustering of ethnic groups, and rates of psychiatric admission in England.

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Abstract:

Aims and Methods: To compare rates of admission for different types of severe mental illness between ethnic groups and to test the hypothesis that larger and more clustered ethnic groups will have lower admission rates. This is a descriptive study of routinely collected data from the NHS in England.

Results: There was an eightfold difference in admission rates between ethnic groups for schizophreniform and mania admissions, and a fivefold variation in depression admissions. On average Black and Minority Ethnic (BME) groups had higher rates of admission for schizophreniform and mania admissions but not for depression. This increased rate was greatest in teenage years and early adulthood. Larger ethnic group size was associated with lower admission rates. However greater clustering was associated with higher admission rates.

Clinical implications: Our findings support the hypothesis that larger ethnic groups have lower rates of admission. This is a between group comparison rather than within each group. Our findings do not support the hypothesis that more clustered groups have lower rates of admission. In fact they suggest the opposite: groups with low clustering had lower admission rates. The BME population in the UK is increasing in size and becoming less clustered. Our results suggest that both these factors should ameliorate the over-representation of BME groups amongst psychiatric inpatients. However this over-representation continues and our results suggest a possible explanation namely changes in the delivery of mental health services, particularly the marked reduction in admissions for depression.

Introduction:
It has been known for some time that Black and Minority Ethnic (BME) groups are over represented among psychiatric inpatients in the National Health Service.[1] The Count Me In census confirmed that this over-representation persists and may be becoming more pronounced.[2] The census also consistently demonstrated significant variation between BME groups; with most having higher rates but some having lower admission rates when compared with the national average. These differences in admission rates are likely to be explained by three main factors: differences in the incidence and rates of mental disorder; service-related factors such as pathways into inpatient care; changes in the size and distribution of the ethnic minority groups in the UK.[1,3,4,5]

One of the earliest demonstrations of the ethnic density hypothesis was on psychiatric admission rates in Chicago by Faris and Dunham.[6] Several subsequent studies have supported this idea of a 'protective' ethnic density effect whereby individuals living in areas with a greater proportion of people of the same ethnicity have better health.[7,8,9,10] However not all studies have consistently found results that support the ethnic density hypothesis.[11] A study at a wider regional scale in England failed to show any effect within individual ethnic groups, but there was some evidence to support differences between ethnic groups.[12]

In response, Halpern argued that within group ethnic density operates at a local level, for example by reducing levels of ethnic discrimination and increasing levels of social support, and may not be detected when the scale of investigation is at a regional or national level.[13] Halpern made two predictions about between group effects that might be evident at a larger scale: (i) smaller ethnic groups will tend to have higher psychiatric admission rates than larger groups, and (ii) groups that have a stronger tendency to cluster together will tend to have lower admission rates.
We aim to empirically test these two predictions at a national level in England by linking NHS mental health admission rate data from 2005/06 to UK census ethnic group population estimates. We will achieve this by examining national level mental health admission rates for each BME group according to the population size of each group, and the degree of clustering of each group across England.

Methods:
Rates of admission were calculated for the 16 ethnic groups as used in the UK census, whilst controlling for age and symptom type.

Population**:**
The population size of each ethnic group was obtained from 'Understanding Population Trend and Processes' section of Ethnic Group Population Projection (ETHPOP) Database. This is a web resource maintained by the University of Leeds which provides projections of each ethnic group at various levels including at national level.[14]

The Index of Dissimilarity was used as a measure of clustering of each ethnic Group.[15] This ranges from 0 indicating full integration and 100 indicating full segregation. Less than 40 indicate low levels of segregation and 40 or more indicates moderate to high levels of segregation.[16] Data was obtained from the Centre on Dynamics of Ethnicity website.[17]

Number of admissions and symptom type:
Routine clinical data was used. The number of inpatient episodes in the NHS (Finished Consultant Episodes) in 2005/06 was obtained for three broad diagnostic

groups: schizophreniform (schizophrenia and related disorders); mania (manic episodes); and depression (unipolar and bipolar depressive episodes).

Age at admission:
Five age bands were created: 10-19; 20-29; 30-39; 40-49;50-59. The age range was restricted to 10-59 years for two reasons. Firstly, there are far fewer admissions for these diagnostic groups prior to teenage years. Secondly, beyond 60 years of age the population size of several ethnic groups is so small even at the national level, that there are too few admissions for the calculation of meaningful rates to be possible.

Rates:
Rates of admission were calculated per 100,000 population for each ethnic group. Age standardisation was used to compare the 16 groups by assuming each group had the same population as the European Standard.

Relative rates:
The average rate of admission for BME groups was compared with the white British group to calculate relative rates for each of the 10-year age bands.

Outlier:
One group (Other Black) had rates that were consistently outside the spread of the other groups. Subsequent years of the Count me in Census showed that this was the one group that decreased in size as self-recording of ethnicity improved instead of staff recording of ethnicity. An adjustment was made for this by distributing the excess admissions among four other groups (black Caribbean, black African, mixed white and black Caribbean, mixed white and black African). For more information please consult Appendix 1.

Results:

Rates of admissions
The average (sd, range) age standardised rate of admission per 100,000 was 139.3 (89.9, 46.7–335.0) for schizophreniform, 30.0 (16.3, 6.6-53.5) for mania and 66.9 (23.9, 21.9–106.6) for depression. There was an eight fold difference in rates of schizophreniform and mania admissions, and a fivefold difference in the rate of depression admissions between ethnic groups. The rate of admission in the white British group was within the range for all three types of admission, albeit in the lower end of the range for schizophreniform (59.3) and mania (14.3), and the middle of the range for depression (63.7).

Relative rate of admission
In each of the 10 year age bands the average relative rate of admission for BME groups was higher than the white British group for schizophreniform and mania admissions, but not for depression. These differences were most pronounced in younger age bands and tended to decrease with age. The relative rate of admission for mania dropped the most from 3.5 (1.6-5.4) to 1.7 (1.2-2.3). The relative rate of admission in schizophreniform dropped from 2.9 (2.0-4.0) to 2.3 (1.6-3.1). In depression the relative rate was 1.5 (0.9-2.2) in those aged 10-19 years and 1.1 (0.8-1.3) in those aged 50-59 years. See Figure 1.

Association of rate of admission with group size and clustering

The mean (sd) index of dissimilarity score for the 16 ethnic groups (including white British) was 46% (13) with a range of 27% to 67%. The average population size for those aged 10-59 years was 2,116k with a range of 65k to 28,170k. There was a moderate positive rank correlation between the index of dissimilarity score and rates of admission for schizophreniform, and a weak correlation with rates of admission for mania, and no correlation with rates of admission for depression. In contrast there was a weak or moderate negative rank correlation between the size of each of the 16 ethnic groups and the corresponding age standardised rate of each category of admission. See Table 1.

Ethnic groups with populations age between 10 and 59 years that were larger than half a million had relatively low rates of admission. Smaller ethnic groups with low levels of clustering (< 40% index of dissimilarity) also tended to have lower rates of admission. Smaller ethnic groups with high levels of clustering (> 40% on the Index of Dissimilarity) had higher rates of admission.

Table 2. About here.

This pattern was most evident in schizophreniform admissions where rates were three times higher on average in small clustered groups, and twice as high for mania admissions. This increase was least evident in depression admissions where rates were about 60% higher in small clustered groups. See Table 2.

Discussion:

In line with previous studies our results demonstrate an increased rate of admission in the majority of BME groups. There was a significant amount of variation in admission rates between ethnic groups, and there appeared to be an interaction with age. Our results showed the greatest increase in admission rates was in teenagers and young adults. In contrast the AESOP study indicated that the incidence of psychosis remains raised in ethnic minority groups throughout the age range of our study.[18] This may indicate a reduced risk of re/admission with increasing age in BME groups relative to the white British population.

Our findings provide support for the hypothesis that larger ethnic groups have lower rates of admission. This is a between group effect rather than a within group effect. In this study located in England which had a population age 10-59 years of 40 million, ethnic groups with populations over half a million had lower rates of admission. Our findings do not support that hypothesis the more clustered groups have lower rates of admission. In fact they suggest the opposite: groups with low clustering had lower admission rates. Again it is important to emphasise that this study only looked at between group effects, and did not investigate within group effects.

The BME population in the UK is increasing in size and becoming less clustered.[16] Our results suggest that both these factors should ameliorate the overrepresentation of BME groups amongst psychiatric inpatients. However the Count Me In census indicated that this over-representation continues. The answer may lie in changes in the delivery to mental health services. We have previously shown that that whilst rates of admission have fallen across England, one of the largest reductions has been in admissions for depression, whilst admissions for

schizophrenia and mania have shown only a modest if any reduction.[19]

In this paper we have shown that the increased rate of admission for BME groups was confined to schizophreniform and mania but was not found in depression. So all other things being equal, reducing the rate of admissions for depression alone will have the unintended consequence of increasing the overrepresentation of BME groups in the psychiatric inpatient population. The same applies to interventions that are more effective in reducing admissions in adults over 35 years of age than in younger adults such as crisis resolution home based treatment.[20]

Limitations
Gender specific data were not available; hence standardisation by gender was not possible. The diagnostic information was from routine clinical practice. For the majority of patients ethnicity was self-determined, but for a minority of patient the ethnicity category would have been picked by staff.

It is impossible to avoid ecological fallacy while analysing population level data. . This ecological study is undertaken at national level and therefore the results may be affected by the ecological fallacy (i.e associative results observed at this national level are not necessarily replicated at the individual or smaller geographical level.[21] However the finding of an association between ethnic groups and higher rates of detention that we present is fully consistent with a number of studies that have found higher rates of psychosis and admission amongst individuals from BME groups.

Local area of residence is likely to reflect aspects of group membership dynamics such as local ethnic density, dissimilarity, and sense of membership. These are likely to be more fluid than individual level variables. We argue that ethnicity may operate at different levels, including at the individual level, local area, regional, national and perhaps even beyond national boundaries but our national level data did not allow us to investigate these nuances.

This study has information on the number of admission in England for each ethnic group. It does not have any individual level data or local area data. A further study is required with a more detailed data set with detention outcomes recorded at an individual, local area, regional and national level and corresponding explanatory variables as our previous study.[22] We need to think about dual diagnosis, specific substance use and multiple admissions in future studies.

Clinical Implications
If these associations are replicated then this study has several implications. The first is that as ethnic groups increase in size and become more evenly spread, relative rates of admission will fall.

Secondly any change in the pattern of admission, according to broad diagnostic groups and symptom type, or age is likely to affect the ethnic make-up of the psychiatric inpatient population. For example home based treatment as an alternative to admission has been shown to be more effective for depression and for adults over the age of 35. An indirect consequence of this could be an exacerbation of the over representation of BME groups amongst the remaining inpatient population.

Future research in this area will model the impact that population change and changes in psychiatric practice since 2005/6 have had on the psychiatric inpatient population over the subsequent decade.

Table 1. Spearman's correlation between age standardised rates of admission and ethnic group population size and the index of dissimilarity score for each group. The data are for 16 ethnic groups in England.

	Schizophreniform	Mania	Depression
Index of dissimilarity	rho = + 0.50 p = 0.047 N = 16	rho = + 0.20 p = 0.464 N = 16	rho = + 0.04 p = 0.888 N = 16
Population size aged 10 - 59	rho = - 0.39 p = 0.141 N = 16	rho = - 0.47 p = 0.064 N = 16	rho = - 0.21 p = 0.444 N = 16

Table 2. The rate of admission in 16 ethnic groups including white British for schizophreniform, mania and depression according to large or small group population size and high or low group clustering.

	Population > 500,000 aged 10-59	Population < 500,000 aged 10-59		ANOVA
		Index of dissimilarity		
		< 40 %	**> 40 %**	
No. ethnic groups	**N = 4**	**N = 4**	**N = 8**	
Schizophreniform 95% CI	71.6 38.2, 105.0	73.0 7.1, 138.8	206.4 141.1, 271.7	F = 9.51 p = 0.003
Mania 95% CI	17.9 8.0, 27.7	19.3 - 4.1, 42.3	41.3 30.6, 52.1	F = 6.98 p = 0.009
Depression 95% CI	56.9 21.9, 92.0	50.8 0.0, 101.6	80.0 68.8, 91.1	F = 3.16 p = 0.076

Figure 1. The average relative rate (with confidence intervals) of admissions for BME groups compared with white British group. Data shown separately for schizophreniform (red), mania (blue) and depression (black). Data is for England 2005/6.