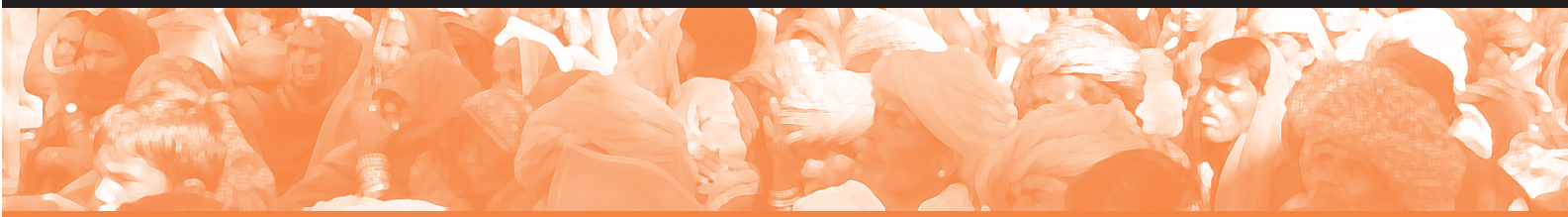
RESEARCH FINDINGS November 2008



ETHNIC RESIDENTIAL SEGREGATION OVER TIME AND AGE COHORTS IN ENGLAND AND WALES

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The 1991 and 2001 Censuses of Population in England and Wales have provided comprehensive data of ethnic groups from national to local areas, thus stimulating analytical new research on the changing residential patterns of ethnic groups (Dorling and Rees, 2003; Johnston *et al*., 2002; Simpson, 2007). However, such comparisons can be misleading if inconsistencies between censuses are not allowed for.

The project studies ethnic residential segregation over time and age cohorts in England and Wales between 1991 and 2001. The objectives of this research project are: (1) to examine the marginal changes that occur when a complete and consistent time series for small areas in England and Wales with ethnic group and age-sex detail is used; and (2) to provide a new window to fill the gap in knowledge about residential segregation across life-stages.

Key findings of the research are as follows:

- Overall, the analysis that corrects for the census' incompleteness demonstrates that, by using complete mid-year estimates, the index values of segregation are likely to change. Although the outcome of less residential segregation over time has been validated with both sources of data, the use of complete mid-1991 and mid-2001 population estimates has provided evidence of greater differences over time, with ethnic groups more evenly spread across localities.

- Inner-city areas in which the highest concentrations of ethnic groups were found in 1991 have become more evenly distributed despite the growth *in situ* of ethnic groups. This finding is consistent with the evidence of spreading diversity suggested by the analysis of population change after taking into account non-response not included in the census output. Similarly, this idea of dispersal of ethnic minorities to outer-city areas is also supported by other research (Johnston *et al*., 2002; Hussain and Stillwell, 2008; Simpson *et al*., 2008).

- The interpretation of change in segregation indices can be altered and misleading when data directly from the census is used. An increase in segregation can be purely artefactual, reflecting solely ward boundary changes between 1991 and 2001. After converting census data from 1991 to 2001 wards, a decrease in residential segregation is observed for all groups, with alterations in the index values that can be greater than the impact of changes over time.

- Residential segregation is greater at some life stages, particularly during the middle adulthood phase, which is interpreted as a result of the concentration of ethnic groups in their middle ages in predominantly urban areas, thus manifesting the demographic consequences of relatively recent and past immigration streams. In contrast, the index values for younger and post-retirement ages suggest that segregation is much lower during these life stages. Segregation decreases over the period for young adults (ages 17-26) and the experience of the Chinese ethnic group is different from the rest.

- The life pattern of segregation does not differ significantly between ethnic groups. Despite the differences between individual ethnic groups in the level of segregation, a similar life pattern of residential segregation is found. Thus, depending on the life stage reached, the level of measured segregation can differ greatly regardless of ethnicity, suggesting that the residential pattern of ethnic groups measured by the indices is not simply a consequence of residential segregation but rather an interrelated aspect of different life stages.

Data

Although the 1991 and 2001 Censuses in Great Britain have measured the principal variables to compare populations over time and space, such comparisons are subject to four types of bias that make comparisons of populations over time difficult (Sabater and Simpson, 2009). These biases relate to:

- the definition of who is a resident;

- the treatment of non-response which varied between ethnic groups, areas and ages;
- key classifications, including ethnic group and age in standard outputs; and
- geographical boundaries used for standard census outputs.

Since these aspects are likely to affect the empirical behaviour of indices of segregation, the sources of data are both the 1991 and 2001 Census of Population (Table S06 for 1991 and CAST03 for 2001), and complete mid-1991 and mid-2001 population estimates in England and Wales.

Since harmonised data for the same years by ethnic group for postcode sectors in Scotland are not available, these sub-national areas have not been included in the analysis. In order to examine the outcomes of the indices of segregation, seven ethnic groups are used to make more suitable comparisons between 1991 and 2001: White, Black Caribbean, Black African, Indian, Pakistani, Bangladeshi and Chinese. This classification reflects those ethnic groups for whom self-definition is most constant over time according to ONS.

Population change

The demonstration that complete mid-1991 and mid-2001 population estimates make a difference to sub-national comparison of population change of ethnic groups over time is displayed with Figure 1. This Universal Data Map (Dorling and Durham, 2006) is used to show the total impact of adjusting each census for a consistent treatment of students, non-response and the move from census date to mid-year. The map showing census output is adjusted only so that 1991 figures refer to 2001 district boundaries.

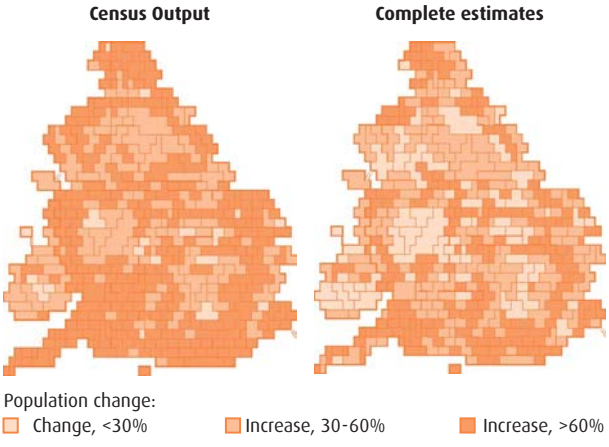

FIGURE 1. PERCENTAGE POPULATION CHANGE BETWEEN 1991 AND 2001 FOR NON-WHITE GROUPS FOR 2001 DISTRICTS IN ENGLAND AND WALES *Source: Adapted from Sabater and Simpson (2009).*

The results for both the census and the full population estimates display a widespread population growth of the non-White groups in districts in England and Wales. Many districts experience a growth in the total non-White populations of over 60%, with only three districts showing a decrease due to the withdrawal of USA armed forces during the 1990s (Suffolk Coastal, Cherwell and Forest Heath). The greater population growth experienced outside the urban centres of London, West Midlands and Yorkshire highlights the spreading out of cultural diversity beyond the main cosmopolitan areas.

Despite the census and the complete population estimates showing trends of minority population growth and spreading diversity, the detail of the maps reveals that the census output is misleading on both trends. First, there are many more areas of slower population change indicated on the map of full population estimates because of the better capture of non-response within the 2001 Census. As a consequence, the unadjusted census over-estimates increases in the non-White population. Second, the over-estimation of non-White population growth is mainly in the urban areas where the census undercount is greatest, thus making the spreading of diversity understated by the census.

Index values nationally over time

Whilst the direction of change in the geographical spread of ethnic groups is similar with both sources of data, the level of change is significantly higher when complete mid-year estimates are used. Table 1 displays the values of the Index of Dissimilarity (*ID*) and the Index of Isolation (P^*), both ranging from 0 (min.) to 100 (max.).

The higher values of *ID* for non-White groups simply indicate more concentration in particular areas, with the largest values of unevenness among groups whose history of immigration to the UK is most recent, such as the Pakistani, Bangladeshi and Black African groups. The results suggest that the average clustering has decreased over the decade by 2-5%, with the largest percentage changes when complete mid-year estimates are used. This would indicate that overall the introduction of adjustments that take into account changing definitions, quality of data and changes in geographical units have contributed to a reduction of *ID* values for each ethnic group. The decrease in the *ID* values using complete estimates would be in line with the results on population change of ethnic minority groups shown in Figure 1. The better capture of non-response with the complete estimates adds to the minority groups and to the rest of the population with the same geographical pattern, which increases the similarity of each ethnic group with the rest of the population.

The second dimension, exposure, largely reflects the national composition of ethnic groups across wards in England and Wales. The values of P^* for both 1991 and 2001 display how the White group is by far the most exposed compared with the rest of the population followed by South Asian minority groups. However, the value of P^* for the White group has decreased over the decade. Contrarily, P^* values show an increase of exposure for the Black African, Pakistani and Bangladeshi groups whose population growth has been in full operation during the decade. Despite these gains, the highest local concentration of ethnic groups in 2001 ranges between 13 and 17%, implying that, on average, the groups with most

exposure to others live in areas where more than 80% of the population are from other groups.

Finally, Table 1 also shows how a decrease in *ID* and *P** is recorded after converting the same census data from 1991 to 2001 wards for all ethnic groups, thus indicating that the harmonisation of boundaries de-emphasises segregation. This would be consistent with the reduction in the number of wards between the two years from 9,509 to 8,850, with an average population size increasing from 5,247 to 5,880 respectively.

Index	Group	Census			Complete estimates	
		1991	1991† 2001b	2001	1991	2001
Evenness						
ID	White	61.4	60.9	58.8	60.5	57.3
	Black Caribbean	68.9	68.6	67.1	68.0	65.7
	Black African	71.1	70.7	70.6	69.6	69.4
	Indian	65.3	64.8	62.1	64.2	60.9
	Pakistani	75.1	74.5	71.8	74.2	69.7
	Bangladeshi	74.2	73.1	71.7	72.7	67.9
	Chinese	42.2	41.0	42.0	42.5	37.5
Exposure						
*P**	White	95.3	95.3	93.5	94.9	93.3
	Black Caribbean	7.6	7.4	7.3	7.9	7.1
	Black African	4.3	4.2	8.2	4.6	8.0
	Indian	15.6	14.7	15.5	15.5	15.2
	Pakistani	13.9	13.4	17.4	14.0	16.8
	Bangladeshi	10.9	10.3	13.7	10.9	13.2
	Chinese	0.8	0.8	1.2	0.9	1.1

TABLE 1. RESIDENTIAL SEGREGATION OF ETHNIC GROUPS ACROSS WARDS IN ENGLAND AND WALES, 1991-2001

Note: † denotes 1991 Census data with 2001 boundaries.

Index values nationally across life stages

The degree of ethnic residential segregation among various age cohorts is shown in Figure 2, where the complete mid-1991 and mid-2001 population estimates have been used for eight different age cohorts across wards in England and Wales.

The residential pattern indicates how the level of unevenness for each age cohort in 1991 and ten years later is generally higher among ethnic groups other than White, with the exception of the Chinese, whose geographical distribution appears to be more widely dispersed than the rest of ethnic groups. One view is that *"links to restaurants and takeaways catering for the total population would produce such a degree of dispersal of small pockets of population"* (Peach, 1996: 224).

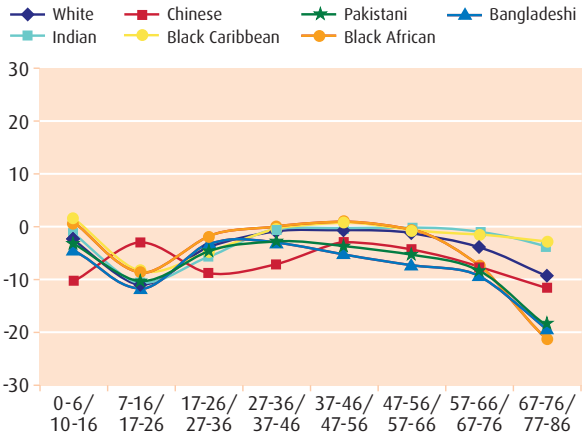

FIGURE 2. RESIDENTIAL SEGREGATION OF ETHNIC GROUPS BY AGE COHORTS ACROSS WARDS IN ENGLAND AND WALES, 1991-2001

The change in evenness across wards shows a reduction of the values for the majority of age cohorts, indicating that all groups and age cohorts have become more evenly distributed between 1991 and 2001. The analysis also reveals a very similar pattern of change in evenness between ethnic groups across age cohorts. Whilst the youngest group (which refers to children living with their parents) and adult ages display similar changes in evenness during the decade, a significant decrease in unevenness is found among young adults, represented by the age cohort 7-16 in 1991 and ten years later. It is apparent that a shift in the residential distribution between schoolchildren and young adult ages (some of them university students) results in much lower levels of segregation. Whilst this explanation seems to be applicable to all groups, an exception is found with the Chinese, whose unevenness has increased from low levels, most likely due to the impact of international migration of overseas students to UK universities.

During the middle adulthood phase, represented by the age cohorts 17-26, 27-36, 37-46 in 1991 and ten years later, the change in the values of *ID* is reduced, with some groups, including the White group, becoming less evenly distributed. The interplay of demand and supply in metropolitan areas from housing to education to language instruction to efficient public transportation for accessing jobs would explain the relative differences between groups in the middle aged phase. From this perspective, those who can afford to will move from big urban concentrations to less urban environments, thus reflecting the extended process of suburbanisation from cities to mixed urban areas (Champion, 1996).

Finally, during the late adulthood phase and post-retirement age, represented by the age cohorts 47-56, 57-

66, 67-76 in 1991 and ten years later, an increase in evenness is observed. Although the results for these ages are likely to be affected by a significant number of neighbourhoods with small numbers of ethnic groups, the increase in evenness for all groups (particularly for the White group) can be interpreted as the effect of post-retirement migration.

The analysis of ethnic residential segregation by age cohorts for selected districts (Figure 3) unveils similar changes in the values of *ID* by age cohort, although local areas are clearly more affected by the transfers of minority members as a result of population movement to areas where they are under-represented and *vice versa*.

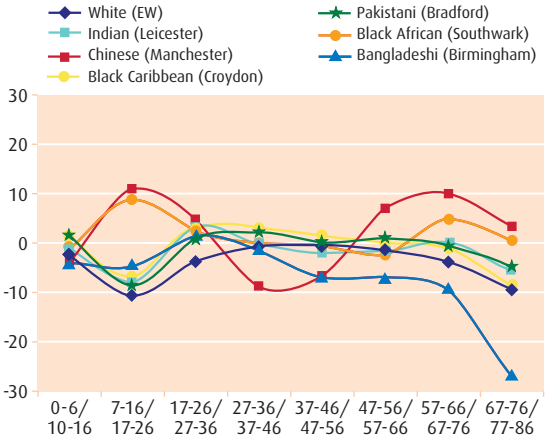

FIGURE 3. RESIDENTIAL SEGREGATION OF ETHNIC GROUPS BY AGE COHORTS ACROSS WARDS IN SELECTED DISTRICTS, 1991-2001

For example, the values of *ID* for those in the early adulthood phase replicate the patterns of greater evenness for these ages, although some groups such as the Black African in Southwark and the Chinese in Manchester appear to be less evenly distributed over the decade, highlighting the likely impact of international migration and in-migration of members of these groups to neighbourhoods where they are already overrepresented.

During the middle adulthood phase, an increase in unevenness is evident for all ethnic minority groups, particularly for the age cohort 17-26. The influence of the population momentum due to the young age structure of ethnic minorities is likely to generate population growth in local areas which also experience the transfer of net migration. Such population dynamic features, combined with the geographically specific labour demands and the pressure on the housing market in urban areas, are the key explanations for the promotion of clusters (Finney and Simpson, 2008; Simpson *et al*., 2008).

Finally, the index values have a tendency to be lower during the late adulthood phase and post-retirement age. As mentioned earlier, these results are likely to hold true for some groups more than others. Although the pace of population ageing is ongoing for all groups, only the White group and some long-established minority groups such as the Indian and the Black Caribbean groups may be worth analysing due to their significance in numbers.

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