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THE UNITED KINGDOM'S MULTI-ETHNIC FUTURE: HOW FAST IS IT ARRIVING?

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1. THE CONTEXT FOR ETHNIC POPULATION PROJECTIONS

1.1 Why demographic projections are important

Knowledge of the future population is very useful for economic and social planning at international, national and subnational scales. The Population Division of the United Nations (UN) produces projections of the populations of UN member states every two years (UN 2014). These populations are used in the forecasting of key indicators such as per capita national income, in which Gross Domestic Product estimates for countries are divided by the forecast population. The United Nations produces GDP forecasts as well, but they are only for the short term. National Governments, on the other hand, have a requirement to forecasts GDP and population over a term longer enough to compute the assets and liabilities of state pension schemes. The UK's forecast of GDP (OBR 2012, 2013a) relies in heavily on the National Population Projections (NPP) of ONS, where choice of mortality scenario affects the numbers surviving to pensionable age and the choice of migration variant influences the growth path of national debt (OBR 2013b). For a country like the United Kingdom with its high net immigration the United Nations' Projections are of little use because of their assumption that rates will trend to zero.

1.2 Projections by education add knowledge and skills to the population

However, national fiscal planning requires forecasts of economic activity and employment rates in addition to demographic projections to produce labour product forecasts. These rates are subject, in the short term, to economic cycle fluctuations but in the longer term they depend on the acquisition of knowledge and skills together with linked capital investment that will enhance productivity (product per capita). One of the most important determinants of productivity is the educational composition of the population. Projections of world country projections by educational level have recently been produced by a team of researchers at the Wittgenstein Centre for Demography and Human Capital (WIC)[1] in Vienna (Lutz et al. 2014).

[1] The Wittgenstein Centre is a collaboration between the International Institute for Applied Systems Analysis, the Vienna Institute of Demography and the Vienna University of Economic and Business.

1.3 The role of international migration

One of the innovative features of the WIC projections is the estimation of a 1990 to 2010 series of country to country international migration flows (Sander et al. 2014, which are used to project country populations. Prominent in the flow charts of migration between and within world regions (Figure 7.3 in Sander et al. 2014) are large migrant streams into Europe from South Asia, South East Asia, Latin America and Africa, and, within Europe, from Eastern EU states to Western and Northern.

These migration flows into Europe are a product of labour demand in the highest income countries, the later addition of family members to prior labour migrant, the demand for higher education in the origin regions, the desire for safe havens by refugees and asylum seekers and the search for basic employment by people in poverty. One of the factors creating labour demand in European countries is their entry since the early 1970s into the Second Demographic Transition (van der Kaa 1987), characterized by below replacement fertility and increasing life expectancy. The net balance of immigration over emigration into higher income European countries has two effects: the population growth increases and the age structure becomes more youthful, relative to the position without these international migration flows (Kupiszewski and Kupiszewska 2010). Coleman (2006) has termed this combination of low fertility, increasing longevity and inward migration the Third Demographic Transition.

1.4 International migration changes the composition of the population by ethnic origin

This transition has further ramifications for the United Kingdom beyond a contribution to labour supply and a postponement of population decline. The composition of national populations in terms of country of birth becomes more diverse with the continuation of inward migration. But the process of compositional change does not stop with the immigration of the foreign born. If the new immigrants settle and raise families, a new generation of native-born children of foreign born parents will be created. Later this new generation will marry or partner and have children who will be the grandchildren of the foreign born immigrants, though, of course, many family histories will be more complex than this. In most European countries there is no official tracking of the country of birth ancestry of these new generations. Further generations are assigned to the native born part of the population. However, communities with such foreign birth origins continue to retain cultural and spatial characteristics associated with their origins, while at the same time assimilating into or integrating with the native born population. In the UK it was recognised in the 1970s that there was a need to monitor groups of distinct ethnic origin because of obvious discrimination in employment and housing markets. An ethnic classification was introduced in the 1980s into the UK Labour Force Survey, using a self-reporting question. After an attempt to introduce an ethnic question into the 1981 Census failed because of some ethnic minority anxiety, a question was used in the 1991 Census, with positive ethnic minority support, and has been used in the 2001 and 2011 Censuses. In the UK we can therefore examine the progress of

the ethnic transition from 1991 onwards and use this knowledge to forecast the country's ethnic composition.

1.5 Why projecting ethnic group populations is important

It is important to be able to monitor ethnic group numbers in order to measure the degree of disadvantage that groups face and discrimination on grounds of ethnicity after controlling for other factors that determine achievement or well-being. Of course, other dimensions of difference such as disability or sexuality or social class may also produce disadvantage and discrimination, but the projection of the population by these dimensions is less developed. Although most focus is on the monitoring of minority ethnic groups, majority group disadvantages can also be present, as in the poorer performance of White working or lower class boys in school examinations, compared with immigrant pupils in similar socio-economic circumstances.

It could be argued that projections of ethnic group populations are unnecessary because the latest census provides a wealth of information to support investigations. However, censuses are only administered every decade in the UK and, if we add the time needed for processing, production and quality checking of outputs, on occasion it is necessary to use data that are from one to thirteen years out of date. Projections fill the gap, though these will inevitably drift away from the actual path of population development. When population forecasts are used to provide information for current years, they have been called "nowcasts". Projections also supply information for a few years into the future that many government policies require (e.g. central government to local agency funding allocations).

For what purposes is ethnic population information needed? The health needs of groups different by ethnicity that is related to genetics (sickle cell anaemia), food consumption (in relation to cardio-vascular disease) though socio-economic deprivation plays the most important role in determining health status. In health studies, where an outcome is found to differ by ethnic group, a regular discussion point is the likely increase in ethnic inequalities and burden to health care providers given the increasing size of minority populations (particularly South Asian groups) expected in the future (e.g. van Laar *et al.,* 2010; Harron *et al.,* 2011; Fraser *et al.,* 2012; Dawes *et al.,* 2014; Norman and Fraser, 2014). Businesses also benefit from knowledge of the ethnic composition of their potential consumers where tastes differ in food or clothing choices. Politicians need to know about the future ethnic compositions of constituency electorates because voting preferences vary by ethnic group. In 2014 the think tank Policy Exchange commissioned a re-working of previously published ethnic projections for Parliamentary constituencies (Rees and Clark 2014). Another important use for ethnic population outputs is to provide context variables for individual level studies. This work recognizes the need to measure impact of spatial community characteristics on behaviour or conditions in addition to individual level variables. Information on future ethnic compositions of local populations is needed for planning and consultation purposes, as is testified by

their production for a number of years by the Greater London Authority (GLA 2014). Ethnic group projections also have a role to play in informing public debate about the way national and subnational populations are changing.

1.6 Aim of the chapter

If ethnic population projections are to fulfil these many roles, they must of the highest quality. The aim of this chapter is to pause between a completed round of such projections based on the 2001 Census (Wohland et al 2010, Wohland et al 2014, Rees et al. 2011, 2012a, 2012b) and a new round of projections based on the 2011 Census (Rees et al. 2015) to evaluate how well the 2001 based projections reproduced the 2011 Census results and to interpret the differences.

1.7 Outline of the chapter

Section 2 provides some brief background on 2001-2011 changes in the ethnic composition of the population. In section 3, we summarise the way we implemented the projections and discuss key results. In section 4, we compare our projections with the results of the 2011 Census and suggest reasons for the differences observed. Section 5 discusses how fast the ethnic transition in England and Wales's population is happening.

2. THE CHANGING ETHNICITY OF THE POPULATION

The population of the England and Wales[2] has been changing in ethnic composition since 1945 as a result of the immigration of a wide range of origin groups. Many of these groups have settled, raised families, inter-married with other British people. As a result, the *White* share of the England and Wales population has declined from 93% in the 1991 Census to 91% in the 2001 Census and 85% in 2011 Census (Jivraj 2012, from Census statistics). The *White British* share of the 2011 Census population was 80% of the 85. So the (not White) ethnic minority share of the England and Wales population increased from 7% in 1991 to 9% in 2001 and 15% in 2011. These statistics indicate some speeding up of the transition during the 2001-2011 period compared with 1991-2001.

By ethnic group we mean people who identify themselves as belonging to a sub-population with national origins outside the United Kingdom, both those born abroad and their descendants. Ethnicity is based on self-identification when answering a survey or census question. Ethnic status has legal recognition in the Equality Act 2010 (EHRC 2013) which replaces earlier acts with a unified framework for monitoring and acting on evidence of disadvantage or discrimination on grounds of gender, ethnicity, disability or sexual orientation. It is important to compare the numbers of ethnic group members in work compared with the numbers available for work, for example.

[2] The ETHPOP projections are for the UK but we focus here on England and Wales where ethnic group definitions can be harmonised easily.

The census has been the main source of information on local and national ethnic populations but society can benefit from more frequent knowledge of changing ethnic composition. Updates can be provided through two methods. The first method is to roll forward ethnic group populations from the latest census to successive mid-years, using estimates of the components of population change, which has been done for mid-year 2002 to 2009 for local authorities by the Office for National Statistics (ONS 2011a). The second method is to carry out a representative social survey each year, such as ONS's Annual Population Survey (APS) (ONS 2013a). ONS is currently carrying out an assessment of the reliability of their ethnic population estimates (ONS 2011b) and has suspended the production of local estimates, pending an evaluation against the results of the 2011 Census (ONS 2011c).

We also need a view about how the ethnic composition of the population of England and Wales is likely to change in the future. As ONS are doing, we have embarked on an evaluation of our projections through comparison with the results of the 2011 Census. The main research question we try to answer is "How well did we do in projecting ethnic group populations for local authorities in England?"

3. METHODS, DATA AND RESULTS OF THE ETHNIC PROJECTIONS

The projection model used is a bi-regional cohort component model (Rees et al. 2012). This means we project the population disaggregated by age and sex, accounting for migration within the United Kingdom as outflows from each area and as inflows from the rest of the country. The model is applied separately to each ethnic group using suitable estimates of rates and flows. However, the groups are connected when babies are born to mothers and fathers from different groups and are placed by their parents in mixed ethnic categories. We use single years of age to 100+ and the sixteen ethnic groups in the 2001 Census. The coverage of the projections is the United Kingdom. For spatial units**,** we use 352 local authorities[3] in England together with Wales, Scotland and Northern Ireland (355 zones in total).

Selecting from a wide set of projections, we focus here on two scenarios (Table 1) which use assumptions aligned to those in the National Population Projections (2008-based) but which differ in one model feature. The first scenario (TREND) projects the future flows of emigrants along with an equivalent immigration series, which together match the ONS net international migration assumption of +180 thousand net international migrants. The second scenario (UPTAPER) projects emigration as a product of emigration rates and the changing populations at risk in the 355 zones. Since 2008 the net immigration level has been both higher (2009-2011) and lower (2012) than 180 thousand (ONS 2013b). The argument for the second approach is that we should make the emigration flows functions of the population at risk resident in the UK zones, which will change over the projection. The argument against such an approach

[3] Two LAs with very small populations are merged with a larger neighbour: City of London with City of Westminster and Isles of Scilly with Penwith.

is that emigrants face many barriers to migration, some determined by destination country policy just as immigration to the UK is influenced by UK government policy.

[Table 1 about here]

Figure 1 shows the results of these two projections for the UK starting from a base population at mid-year 2001. The graphs show the projected changes for the 16 ethnic groups relative to the population at mid-year 2001. The White British and White Irish populations fail to grow in the UPTAPER projection and increase only a little in the TREND projection, falling back toward mid-century. The Black Caribbean population grows quite slowly, experiencing high emigration, low fertility and a loss of children to the mixed White and Black Caribbean group. The other minority ethnic populations have much higher future trajectories, experiencing growth of 2 to 3.2 times in the UPTAPER projections between 2001 and 2051 and 2.5 to 6 times in the TREND projections. These projections show that the diversity of the UK population will increase substantially over the first half of this century.

[Figure 1 about here]

Figure 2 shows diversity patterns for local authorities in England, measured using the Simpson Index of Diversity (DI), mapped using a population cartogram[4], in which the extent on the map of a zone is proportional to a population at risk (2001 population). The minimum DI is zero (no diversity) when only one group is present in an area. The maximum diversity depends on the number of groups considered. With 16 groups each having an equal share of the population, the DI would be 0.9375. The ethnic diversity of the local authority populations increases substantially over the 50 years. By 2051, under the TREND projection, almost all areas are in the top two diversity quartiles, which were found in London only and some big cities in 2001. In the UPTAPER projection the increase in diversity is more subdued.

[Figure 2 about here]

A note of caution is necessary before we accept this picture of the future ethnic composition of the UK population. The projections are liable to error from three sources: (1) the estimates of the ethnic fertility, mortality, internal and international migration indicators used as projection inputs may be wrong, (2) the assumptions about the future behaviour of the inputs may be wrong, and (3) the model may be wrongly specified. So, it is sensible to validate the projections against the recent 2011 Census. We report on this evaluation in the next section.

4. COMPARISON OF CENSUS 2011 AND ETHPOP PROJECTED POPULATIONS

[4] The boundaries were supplied by Bethan Thomas of the University of Sheffield.

To compare the 2011 Census results and the ETHPOP projections, we harmonize the ethnic group definitions and the boundaries of the local authorities. Table 2 shows the correspondence of the 16 ethnic groups in the 2001 Census and the 18 ethnic groups in the 2011 Census in England and Wales. We merge the two new groups in 2011 into the matching larger group in 2001. To harmonize the zones used in the two censuses we aggregated the 2001 Census local authorities into unitary county authorities created in April 2009 and used in the 2011 Census. In 2001 England and Wales was made up of 353 zones; in 2011 there were 327 zones. The final adjustment made was to combine the 2011 TREND and UPTAPER projected populations because these figures bracketed the 2011 Census population for England and Wales as a whole and because the arguments for and against each approach are unresolved. We did not correct for the 3 month timing difference between the Census (27 March) and the projections (30 June/1 July).

[Table 2 about here]

In Table 3 we compare results for England and Wales from the 2011 Census with the average of our two ETHPOP projections for five broad ethnic groupings. Our projection of the All Groups population is very close (an error of less than 3 in 10,000). Our projection of the White groups is close (3% error) but the projected population is greater than the census population. This means that we under-projected the growth of the ethnic minority groups. Our projection of the Asian groups was 18% under the 2011 Census figure. For the Black groups the under-projection was also 18%. The under-projection of the Mixed groups was 17%. The projection of the "Other" groups was the worst at 23%. Overall we have under-projected the growth of ethnic minority populations and hence the pace at which England and Wales population has diversified. Instead of the White/Ethnic Minority population split being 88.5%/11.5% in 2011 (our projections), the Census measured the composition as 86.0% White and 14.0% ethnic minority.

[Table 3 about here]

Table 4 shows comparisons for the 16 harmonized groups. Within the White groups, the White British group is over-projected by 3% and the White Irish group by 25%. We may have under-estimated the emigration of White British people and over-estimated their survival into old age. For the White Irish group we may have under-estimated the extent that their children born in the 2000s were assigned White British ethnicity and some of the group may have changed their identities between censuses. The White Other group was under-projected by 7%, probably because we under-estimated the level of immigration from other European countries and over-estimated emigration.

[Table 4 about here]

Within the Mixed groups, under-projections of the White and Black Caribbean and White and Black African groups were twice as large as the under-projection of White and Asian and Other Mixed groups. These groups grow because children are born to parents of two different ethnicities. The only information available on this process came from a 2001 Census commissioned table. Mixed partnerships may have increased from the 2001 level because more opportunities for mixing became available.

Within the Asian groups, the Indian group were only slightly under-projected (by 1%), but the Pakistani and Bangladeshi groups were under-projected by 12 and 17% respectively. It is likely we under-estimated the strength of continuing immigration associated with marriage for these groups and over-estimated the falls in their fertility. The Chinese group was under-projected by 8%; there was a growing influx of students from China from 2001, which we may have under-estimated. The Other Asian group, with varied origins in the smaller countries in Asia, was the most under-projected of all the groups at 58%. We likely under-estimated the inflows from crisis countries such as Iraq, Afghanistan, Iran and the student intake from emerging countries in South-East and East Asia (Malaysia, Thailand, Vietnam, South Korea).

The Black Caribbean group was over-projected by 8%. We may have under-estimated the return emigration stream to the West Indies. This is an important process for the older members who arrived in England and Wales in the 1950s and who entered the retirement ages in the 2000s. We under-projected the Black African group by 24%, probably under-estimating immigration. Immigration from sub-Saharan Africa is composed of increasing student numbers, (e.g. from Nigeria and Ghana), flows of refugees and asylum seekers (e.g. from Somalia, Eritrea and Zimbabwe). The Other Black group is under-projected by 55%. People in other Black groups may have changed their identity between censuses and new groups may have started immigration in the 2000s from Latin America and the South West Pacific, for example.

Finally, the residual group, the Other Ethnic Group was under-projected by 22%, reflecting the increasing diversity of origins of immigration to England and Wales.

Separate comparisons can be made for age groups (not reported here in detail). The patterns of over-projection (White groups) and under-projection (BAME groups) are repeated for children ages 0-15), working age adults (ages 16-64) and the old (ages 65+). The relative differences from Census populations are a little higher for the childhood ages than for all ages, suggesting some under-estimation of ethnic minority fertility. For the working ages, the relative differences a little lower than for all ages but with the same pattern across groupings. For the older ages we have over-projected the White groups by more than the total population and over-projected the Black groups as well. For the Asian grouping the older ages are closely projected but for the Mixed and Other Ethnic groups there is substantial under-projection.

These differences suggest we have been too optimistic in our mortality decline assumptions and again failed to capture increasing immigration of Other Ethnic groups.

So far we have compared Census and ETHPOP results for England and Wales. Data are available for repeating this analysis across all 326 local authorities in England. Here we just look at the pattern for All Groups, the White British, Indian and Other Asian groups in series of maps (Figure 3), based on population cartograms, using the method of Gastner and Newman (2004). The indicator used in the cartograms is the ratio of Census 2011 Population to ETHPOP 2011 Populations. Darker shades indicate that the Census population is higher than the ETHPOP projection, i.e. we have under-projected. Lighter shades indicate the Census population is lower than the ETHPOP projection, i.e. we have over-projected.

[Figure 3 about here]

In the top left map for All Groups, we see that the majority of the population lives in local authorities which are reasonably well projected (mid-grey). Most local authorities which have been under-projected are found in Greater London. However, Greater London also contains Boroughs in which the populations have been over-projected, including Westminster, Barking, Dagenham and Barking and Kingston upon Thames. It is likely these differences stem from errors in the projection of the internal migration component between 2001 and 2011 or in the estimation of the immigration and emigration components between 2001 and 2005, before revisions improving reliability were introduced.

The top right map presents the projection errors for the White British group. The most extreme values are seen in Great London, with over-projection in most London Boroughs, except for outer boroughs in the south east and south centre of Greater London. Clearly, our projections have under-estimated the increase in ethnic diversity in London, in which the share of the White British population has shrunk. The Indian group (bottom left map) was, by and large, well projected. There are some local authorities around the conurbation cores in which the group was under-projected (blue shades). In some London Boroughs there was some over-projection, along with some remoter rural local authorities in Cornwall, Devon, Norfolk, Cumbria and the North East. It is likely that the internal migration pattern has shifted over the decade in ways we were unable to capture. Our projections perform worst for the Other Asian group (bottom right map). The local authorities where the under-projection is greatest are in southern England outside of Greater London. However, there are many Local Authorities in the Midlands and northern England as well where the Other Asian population was under-projected.

5. DISCUSSION

Here we summarise the findings of our analysis and experiment with various adjustments of our ethnic population projections. We also reflect on the question posed in the title of the paper.

Overall the average of our two projections was aligned closely to inter-census change. The White groups were over-projected and the ethnic minority groups were under-projected. The ordering from least to most under-projected was: Asian, Black, Mixed and Other, though the differences in degree of under-projection were not large. Examination of the detailed ethnic groups suggests that as time passes from the first wave of immigration the growth of a group slows down. The White Irish and Black Caribbean groups have been in England and Wales longest and have the slowest growth. This is a function of much lower current immigration and ageing of the settled populations of the group. The biggest wave of South Asian immigration was in the 1960s and 1970s and these groups have aged and converged in fertility towards the national norm. They experienced moderate growth. The groups which have experienced immigration most recently such as the Black African, Other Asian or Other Ethnic groups, had the greatest growth between 2001 and 2011, which our projections under-estimated. The Mixed groups also grew more than we had anticipated, which suggests we did not capture fully the increase in mixed partnerships. Overall, the England and Wales population is diversifying much faster than we projected.

The most important conclusion is that the ethnic group projections need to be revised in the light of the 2011 Census. This will involve re-estimating the components of change by ethnicity and locality using a full decade of demographic information and data from the two "book-end" censuses. We need also to make assumptions for the future informed by the errors of the past decade, developing fully the transition theory suggested in the previous paragraph. This work is underway in a new ESRC funded project (Rees et al. 2015a).

Is there any way to fix our ETHPOP projections until revisions can be effected? Table 5 presents some alternatives applied to the 2051 average of the TREND and UPTAPER projections (second column). The third column applied the difference ratio for 2001-2011 given in the last column of Table 4 to the 2051 projected populations over 5 decades. The results are implausible: the White British population is halved to 27 million and the Other Asian population grows to 25 million. More realistic are the adjustments in the fourth column which add or subtract 5 times the 2001-2011 error. The results are more plausible but it is unlikely that the same errors will occur over the next four decades as happened in the previous decade (because, for example, one-off events such as the EU enlargement to include the A8 accession states will not happen again; thought they may be other anticipatable surprises). The fifth column of Table 5 simply uplifts the 2051 projected populations by the 2011 error, which is probably too conservative an adjustment. We have carried out further experiments with uprating the ETHPOP projections using knowledge of the 2001-2011 differences for the Policy Exchange (Rees and Clark 2014), the Government Office for Science (Rees et al 2015b) and as part of a PhD thesis (Clark 2015).

[Table 5 about here]

So, the answer the question posed in the title of this piece is that "our multi-ethnic future" is arriving a good deal faster than we thought. There is an urgent need to revise the ethnic group projections, which will be accomplished in 2015-16.

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Table 1: ETHPOP scenario projections: assumptions

Scenario Projection	Assumptions
TREND	Fertility, mortality and international migration assumptions follow those of ONS's 2008-based National Population Projections 2008 factored to reflect local authority differences. Internal migration assumptions are based on the 2001 Census updated using NHS Patient Register data to 2008
UPTAPER	Uses the same assumptions as the TREND projection by changes the model for projecting emigration from assumptions about emigration flows to assumptions about emigration rates which are multiplied by local authority populations

Sources: For details see Wohland et al. (2010) and Rees et al. (2012a)

Table 2: The correspondence of ethnic groups in the 2001 and 2011 Censuses

2001 Census Ethnic Group (16 Groups)	**2011 Census Ethnic Group (18 Groups)**
White: British	White: English/Welsh/Scottish/Northern Irish/British
White: Irish	White: Irish
White: Other white	White: Gypsy or Irish Traveller
	White: Other White
Mixed: White and Black Caribbean	Mixed/multiple ethnic group: White and Black Caribbean
Mixed: White and Black African	Mixed/multiple ethnic group: White and Black African
Mixed: White and Asian	Mixed/multiple ethnic group: White and Asian
Mixed: Other Mixed	Mixed/multiple ethnic group: Other Mixed
Asian or Asian British: Indian	Asian/Asian British: Indian
Asian or Asian British: Pakistani	Asian/Asian British: Pakistani
Asian or Asian British: Bangladeshi	Asian/Asian British: Bangladeshi
Chinese or Other Ethnic Group: Chinese	Asian/Asian British: Chinese
Asian or Asian British: Other Asian	Asian/Asian British: Other Asian
Black or Black British: Black African	Black/African/Caribbean/Black British: African
Black or Black British: Black Caribbean	Black/African/Caribbean/Black British: Caribbean
Black or Black British: Other Black	Black/African/Caribbean/Black British: Other Black
Chinese or Other Ethnic Group: Other Ethnic	Other ethnic group: Arab
	Other ethnic group: Any other ethnic group

Note: Darker lines show how the 16/18 detailed groups are combined into 5 broad groupings.

Table 3: The England and Wales populations of five ethnic groupings: Census 2011 and ETHPOP 2011

Ethnic grouping (2011 definitions)	Census Population CD 2011 (thousands)	Average of TREND and UPTAPER Projections, MY2011 (thousands)	Difference = Average Projection minus Census (thousands)	100 × (Difference /Census) (%)
All Groups	56,076	56,057	-18	-0.03
White	48,209	49,609	1,400	2.90
Black	1,865	1,521	-344	-18.44
Asian	4,214	3,469	-744	-17.66
Mixed	1,224	1,017	-207	-16.90
Other	564	440	-124	-21.92

Sources: Census 2011 – ONS (2013c), Crown Copyright.
Projections – ETHPOP (2013), funded by ESRC.
Notes: CD = Census date (27 March 2011), MY = Mid-YEAR (30 June/1 July).

Table 4: The England and Wales populations of 16 harmonized ethnic groups: Census 2011 and ETHPOP 2011

16 Harmonized Ethnic Groups	Census CD2011 Populations (thousands)	Average of TREND and UPTAPER Projections MY2011 (thousands)	Difference = Average minus Census (thousands)	100 × (Difference /Census) (%)	Difference Multiplier = (Census Change /ETHPOP Change) 2001-2011
All Groups	56,076	56,057	-18	0.0	1.00
White British	45,135	46,572	1,437	3.2	0.97
White Irish	531	663	132	24.8	0.80
White Other	2,544	2,374	-169	-6.7	1.07
White and Black Caribbean	427	331	-96	-22.5	1.29
White and Black African	166	132	-34	-20.2	1.25
White and Asian	342	299	-43	-12.6	1.14
Other Mixed	290	256	-34	-11.9	1.13
Indian	1,413	1,394	-19	-1.3	1.01
Pakistani	1,125	990	-134	-11.9	1.14
Bangladeshi	447	369	-78	-17.4	1.21
Chinese	393	361	-33	-8.3	1.09
Other Asian	836	355	-481	-57.6	2.36
Black Caribbean	595	641	46	7.8	0.93
Black African	990	754	-236	-23.8	1.31
Other Black	280	126	-154	-55.0	2.22
Other Ethnic Group	564	440	-124	-21.9	1.28

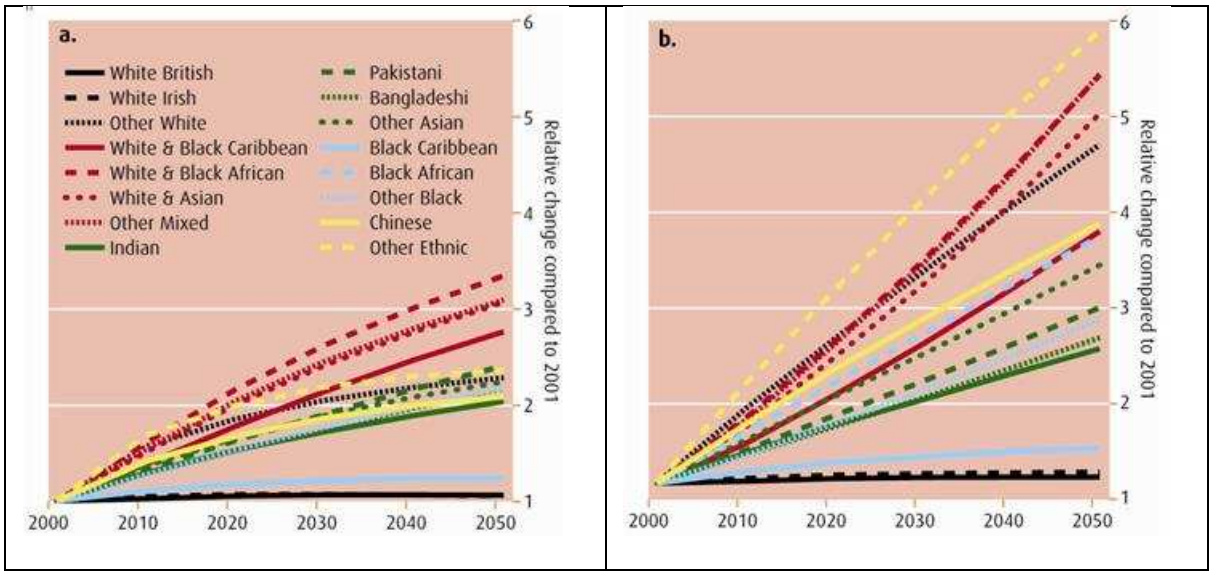
Source and Notes: See Table3.

Table 5: Alternative corrections to the ETHPOP 2051 average projection, England and Wales

16 Harmonized Ethnic Groups	ETHPOP populations Average 2051 (thousands)	ETHPOP populations multiplied by the multiplier 5 times and adjusted to All groups total (thousands)	ETHPOP populations uplifted by 5 × difference 2001-2011 (thousands)	ETHPOP populations uplifted by difference 2001-2011 (thousands)
All Groups	74,477	74,600	74,569	74,496
White British	57,604	27,008	50,417	56,167
White Irish	1,540	279	881	1,408
White Other	3,974	3,074	4,819	4,143
White and Black Caribbean	720	1,411	1,200	816
White and Black African	308	522	476	341
White and Asian	668	717	883	711
Other Mixed	563	581	735	598
Indian	2,380	1,395	2,474	2,399
Pakistani	1,916	1,984	2,587	2,050
Bangladeshi	669	953	1,057	746
Chinese	619	523	782	651
Other Asian	632	25,113	3,036	1,112
Black Caribbean	754	284	522	707
Black African	1,211	2,592	2,391	1,447
Other Black	231	6,857	1,002	385
Other Ethnic Group	691	1,306	1,309	815
Non-White British	16,873	47,591	24,152	18,329

Sources: see Table 3.
Notes: The multiplier for 2001-2011 is shown in the sixth column of Table 4. The difference is shown in the fourth column of Table 4.

Figure 1: Projected populations for ethnic groups under (a) the emigration rates scenario (UPTAPER) and (b) the emigration flows scenario (TREND)



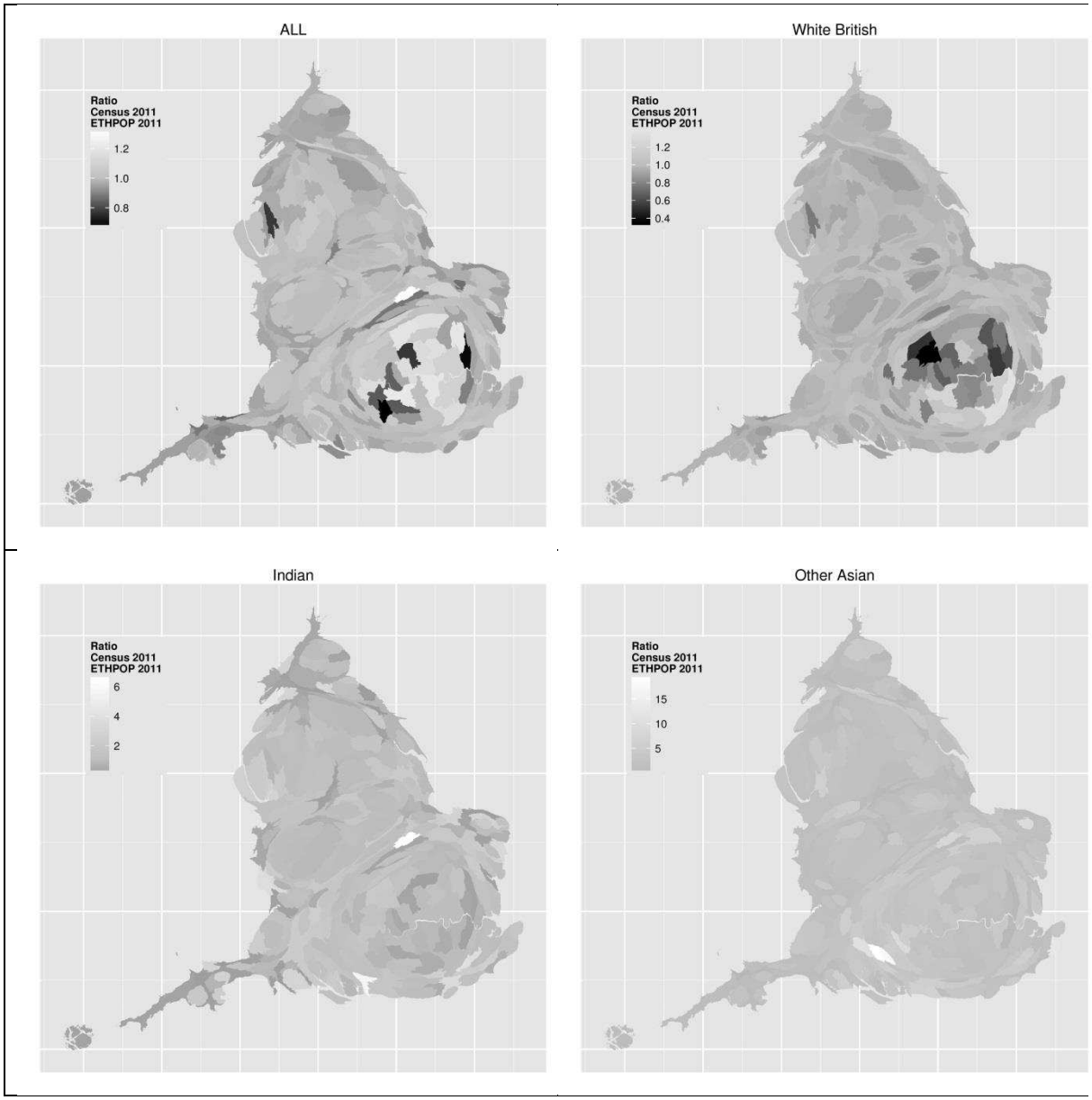
Source: Rees et al. (2011).

Figure 2: Ethnic diversity for LAs in England: TREND projection, 2001 and 2051

Note: Index of Diversity = 1 -$\Sigma_e r_e^2$, where r_e = proportion of the population in ethnic group e.

Source: Wohland et al. (2010).

Figure 3. Maps of local authorities showing over-projection (darker shades) and under-projection (lighter shades) for selected ethnic groups



Source: authors' computations.