Ageing, ethnic diversity and myths of migration

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This contribution on population change will look closely at the changing ethnic diversity of Britain and the contribution of immigration, internal migration, fertility and of ageing. I will explain that what I mean by ageing is not so much a growing elderly population, though that is certainly part of it, but the momentum for population growth that accompanies a relatively young population as it ages. This growth is a result of the greater number of births than deaths and is expected in most populations originating in relatively recent migration of young adults.

This paper will show that although migration is the focus of news about population change in Britain, it is not now the main cause of Britain's changing population. After describing projections for Birmingham to illustrate its contribution of momentum to population growth, this insight into the dynamics of population growth is used to discuss changing neighbourhood diversity, so-called school segregation, and the growth of the elderly minority population. The paper develops one of the themes of *'Sleepwalking to segregation'? Challenging myths about race and migration* by Nissa Finney and myself[1]. For shorthand and to cheekily encourage its use I will refer to evidence in its chapters, and cite it simply as '*Sleepwalking to segregation?'*.

Introduction: population growth is news

Does immigration generate a competition for resources?

Population growth is often in the news and is usually taken to indicate either vibrancy or a threat. Local authorities hate their population going down. This is not just because their Chief Executives are paid more if their area's population is greater, but because the sense that a declining population means declining resources informs public service staff's sense of well-being. In Japan public debate is currently bemoaning its decreasing and ageing population.

However, 'extra' people can also represent extra demands, and population growth as a threat is perhaps more often the tenor of the news at present. James Lovelock, who developed the 'Gaia' theory which sees the Earth as a self-regulating 'superorganism', has said

that people from countries in the South will come to countries like Britain as *'climate change refugees'*:

"Because we will be one of the life boat nations we should be preparing for a flood of people who will be refugees from climate change even from Europe … The nation is already a large city and it will become even larger, with that will come the need to support people. We do not want starving refugees - that will be worse - so we have to spend a lot of money on infrastructure."[2]

As in James Lovelock's scenario the reason for a potentially larger population is usually seen as immigration. His comments in this case are laudably empathetic to immigration. He also warns that population change impacts on all of us through a need for more resources, but this can be contested. If the extra population contributes productively and the environment is cared for, then population change need not be seen as threatening in this way. It need not be a zero-sum game.

Linking immigration to a competition for resources is often the starting point for a litany of evils that encompasses overcrowded cities, minorities who live segregated, parallel lives, which in turn prevents integration and stokes Britain (or whichever country is referred to) with violent cultural clashes. This in spite of the facts that most immigrants are white, half of the UK's non-White population were born in the UK, and study after study shows that minorities and immigrants contribute economically about the same as or more than the average. Although there are also strong voices that oppose that politically divisive equation of immigration with minorities and with dangerous population change, it has been a long-standing part of British politics.

I want to suggest that the connection of population increase with ethnic diversity is correct, but that the further connection of these with immigration is not an accurate one. In particular that *ageing*, the theme of this conference, is seldom talked about as a source of population growth but is the major reason for the growth of population and ethnic diversity in Britain today.

Is migration the main source of population change?

While at a global level, fertility is the recognised main cause of population change, in the UK migration is now seen as the main motor of change. We are used to the idea that the world has undergone a population explosion due to mortality improvements to record low levels, and that the explosion would have been far more shocking had it not been for the strong small-family policies of China, India and other countries, supported by a focus on family planning in many international health and social programmes.

As far as the global human population goes, migration doesn't have a part to play, until the human race settles on other planets. But when talking of the UK and other countries, especially those where fertility has for several decades been below replacement level, it is not fertility or mortality but migration that is usually identified as having the major impact on population change, in theory as well as in politics.

Migration is identified as having pre-eminent importance locally as well as for a country as a whole, so that UK regional economic and housing policies aim to retain population in an area or attract new population. Most migration *is* local. Fertility and mortality changes are remarkably similar across the UK, while migration creates new towns and empties others. Writing in 1993, Tony Champion was able to say that "with the decline in rates of natural increase, migration has assumed a much more important role than twenty years ago in determining whether places grow or decline in population size." [3]

Mobility has steadily increased over the last century, both within countries and between them, while spatial differences of fertility and mortality have either reduced or remained similar over time. In the case of mortality the stability of spatial inequalities has become a major policy challenge.

Does migration produce racial segregation?

Is it also true that migration is now the main cause of growing minority populations, and of racial segregation? This is certainly often claimed to be the case.

The architect of government community cohesion policy Ted Cantle has noted the reduced White population of Birmingham and other major cities and the simultaneous increase in non-White populations taken as a whole (Table 1), and concluded that 'White flight' and the unwillingness of minorities to mix are major factors in producing a lack of ethnic diversity and the growth of polarised communities leading 'parallel lives'. This view that migration has been damagingly racially selective has been championed by the leadership of the government Commission for Racial Equality (now within the Equality and Human Rights Commission), but is quite wrong, as we shall see.

Table 1: Population change for selected city districts, 1991 and 2001

	White	All other groups
Birmingham	-80,000	+60,000
Manchester	-27,000	+17,000
Bradford	-22,000	+24,000
Leicester	-17,000	+18,000
Coventry	-10,000	+9,000
Oldham	-10,000	+11,000
Luton	-4,000	+16,000
Tower Hamlets	No change	+35,000

Source: 1991 and 2001 Censuses, enhanced to full mid-year population estimates[4]

Similarly, school racial segregation has been often claimed from no more evidence than the high number of schools which have proportions of White pupils that are lower than in the past. A typical conclusion is that 'A majority of pupils in many areas of the country … have little contact with children from different ethnic backgrounds, even though they live in close proximity'[5]. In that conclusion, changing school diversity is assumed to be a result of choice by pupils or parents to attend schools where their own ethnicity is more likely to be found. But as we shall see, this is also a misleading interpretation of the evidence.

Population projections are always a hot news topic. Government projections for the UK have suggested that 83% of projected growth is due to immigration, a key claim used by the campaign against immigration MigrationWatchUK. Its advisory council member Professor David Coleman provides population projections with an ethnic group dimension that show the 'foreign population' – all minorities, plus all foreign-born, and all their children – will grow to a majority of Britain's population by 2086. Political and academic discussion often accepts wrongly that migration is the leading engine of population change.

Population change and its component parts, including the momentum of age structure

A cursory acquaintance with demography provides an understanding that populations have grown as mortality has improved (decreased), but stabilised as fertility has fallen. The sequence of falling mortality and fertility in the past century has become known as the

demographic transition. It is often associated with economic and social development that provides for improved basic sanitary facilities of waste management and piped drinking water, as well as family planning and moves to productive forces less reliant on the family.

Migration over borders also affects the population in a territory. Demography is the formalised part of the broader study of human populations' size and structure. It combines natural change and migration in what is often described as the fundamental equation of demography, decomposing population change from time *t* to time *t+1* into births, deaths and migration during that period:

$$P(t+1) - P(t) = B(t,t+1) - D(t,t+1) + InM(t,t+1) - OutM(t,t+1)$$

$$\text{Population change} = \text{Natural change} + \text{Net migration}$$

The first two terms of change, the balance of births and deaths, together refer to 'natural change', and the last two terms to the net impact of migration. In the 1920s and 1930s, demography as a formalised discipline took off. It especially developed the understanding of fertility rates to complement the life tables that had already described mortality in a way useful for actuarial science. The combination of fertility and mortality studies gave rise to formal population projections as we now know them.

The first demography teaching post in the UK was the appointment of Robert Rene Kuczynski to the London School of Economics in 1934. He had already formalised and popularised the calculation of the Net Reproduction Rate, which expresses the number of children expected to be born to each female, given current fertility rates and taking into account the reduction to the cohort of women from mortality before child-bearing ages[6]. The Net Reproduction Rate neatly represents the implications for population change of current fertility and mortality, a value of 1 representing replacement of women by the same number of their children.

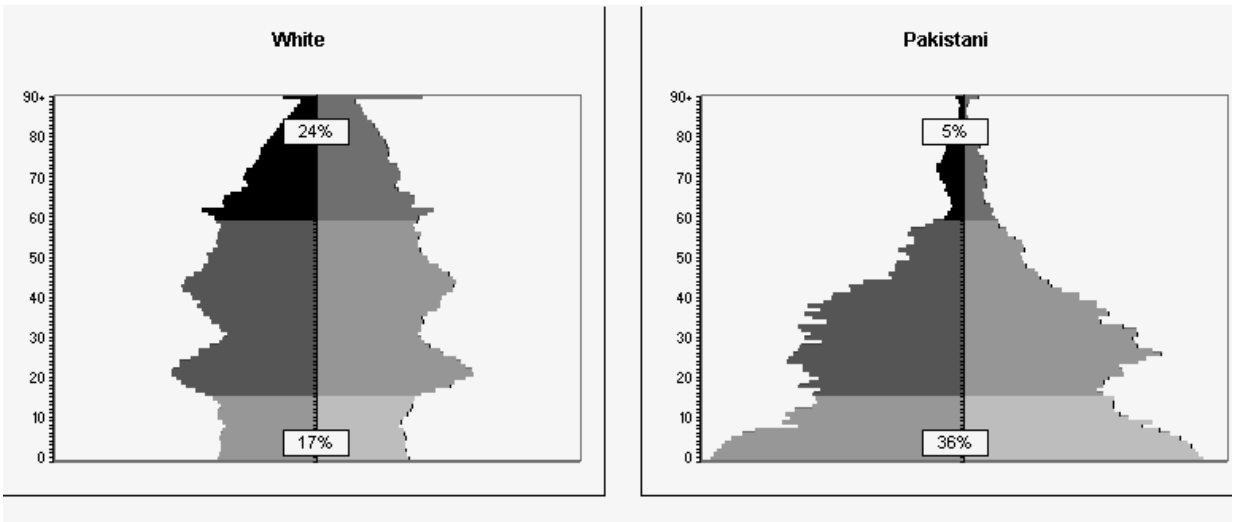
That the Net Reproduction Rate was falling in Europe at the time and would fall below 1 before long, was viewed with concern not only from the widely accepted eugenic perspective that concerned itself mostly with the vitality of the ruling races and classes. Government ministers concerned with the impending threat of war also worried that low fertility would mean too few recruits to the army, especially as the Nazi regime pursued programmes to encourage women to provide more children for the German fatherland.[7]

But fertility and mortality *rates* do not fully define the natural change to a population. Later it was understood that although the Net Reproduction Rate correctly shows the long term growth of a stable

population, the actual growth that will be observed for several generations depends also on the current age structure. As there were relatively many young adults in most European countries and relatively few elderly in the 1930s, there would be more births than deaths for many years even though fertility rates were falling. The *positive momentum* of the young age structure would contribute to a growing population for some decades. To a very significant degree, the short and medium-term development of a population is determined by the numerical balance between its younger and older adults, rather than demographic rates.

The relevance of this observation today is clear when one compares the population pyramids for ethnic groups in most cities of Britain today. When a population is relatively young as for the Pakistani group shown in Figure 1 for Birmingham, then positive momentum is the major element of natural change. The reverse situation may be reached when fertility rates have been low for two or three generations, and in particular after cohorts not suffering from high infant mortality have reached older ages. Then a relatively elderly population has a *negative momentum* and can expect to reduce in size even if fertility rates rise again. This understanding of the relevance of age structure to the evolution of population is nowadays incorporated into some population projections and demographic theory[8], but is often overlooked in both academic and popular accounts of population studies.

Figure 1. Age-sex structure of Birmingham City, projected to 2009: White and Pakistani groups



Males on left, females on right. Elderly (60 and older) and young (0 to 16) shaded distinctly and labelled with the percentage of total population. Source: see note 9.

The fundamental equation of demography can be rephrased as:

P(t+1) – P(t) = Momentum due to age structure + Impact of the Net Reproduction Rate + Net impact of migration

The term 'natural change' has been replaced by two terms that capture the impact of the current age structure on the balance of births and deaths, and the remaining impact of the net reproduction rate which reflects whether fertility and mortality rates imply a growth more or less than reproduction.

The term for net migration remains the same in this equation. One could take the formal equations much further because the age structure of the net balance of migrants also has very important implications for the momentum of population change. I want rather to use this concept of population momentum to explore population change in Britain at present, and to evaluate the claims already listed above for the primary role of migration in population change.

As one might expect, the impacts of age structure, fertility, mortality, and migration, are different for different sections of the population. Whether one cuts the population of Britain into geographical areas or into social strata of class, ethnicity or religion, populations have different age structures, different fertility and mortality experiences, and different preferences and constraints on migration. Some of the differences are small and unimportant; some are big and affect the development of the population in Britain as a whole.

Example – Birmingham's population change

Birmingham City Council have published population projections for its city boundaries, for each of eight ethnic groups, using knowledge largely gained from comparing consistent estimates of the population in 1991 and 2001, and detailed analysis of the 2001 Census. Table 2 below summarises the population in its first row, in which the Pakistani, Indian and Caribbean are the largest populations (each with about fifty thousand people or more) after the majority White population of 690 thousand. These three populations are currently the most settled non-White minority groups in Birmingham, with roots in significant immigration to the UK between 1945 and 1975, in response to labour shortages in public services and manufacturing industries. The second row shows the percentage change expected during the next twenty five years, if current trends were to continue. The Chinese and African groups are expected to grow proportionately very fast, but remain relatively small in total population. The White population is expected to lose between a fifth and a quarter of its size. The largest

minority populations are expected to grow; the Pakistani population is expected to double in size.

Table 2. Population projection for Birmingham City, 2001-2025, eight ethnic group categories, decomposed into components of population change

	Birming-ham	White	Carib-bean	African	Indian	Pak-istani	Bangla-deshi	Chinese	Other
Population 2001 ('000s)	985	690	48	7	56	106	21	5	51
Percentage change 2001-2026	+12%	-23%	-15%	+599%	+11%	+119%	+125%	+155%	+164%
Impact by 2026 of each factor									
Age momentum	+16%	+6%	+17%	+39%	+31%	+44%	+49%	+31%	+50%
Fertility	-4%	-9%	-18%	+7%	-12%	+23%	+27%	-27%	+21%
Migration in UK	-16%	-22%	-8%	+206%	-16%	-1%	-16%	+7%	-3%
Migration overseas	+9%	-1%	-11%	+280%	+1%	+31%	+41%	+105%	+59%
Constraint to ONS projection	+8%	+2%	+5%	+67%	+7%	+21%	+23%	+40%	+37%

Source: see note 9.

Age momentum

The subsequent rows decompose this total population growth into its component parts, through a series of alternative scenarios. Scenario (a) shows that if there were no migration and if each group had fertility at replacement level (a Net Reproduction Rate of 1), then any population change would be due entirely to the age momentum created by the current age structure of the population[10]. In Birmingham the age structure of each of these eight ethnic groups produces a positive momentum, that would overall add 16% to the city's population over 25 years.

This growth due to age-structure is not the same for each group. The minorities would grow at a significantly faster rate than the White group, if there were no migration as in scenario (a). This different growth would remain, even if there were migration that was in the same direction for each group. Thus it is a false inference, though

frequently made, that a city with decreasing White population but growing minority populations must have communities that are moving away from each other.

Other sources of population change

Each of the successive rows in the table show the impact of the addition of a further element of population change (scenarios (b) to (e)). The extrapolation of recent differences in fertility from replacement level (scenario (b)) create significant additional growth for the Bangladeshi and Pakistani populations: their fertility is relatively high, even though much reduced from its levels when families were established soon after immigration. Although fertility is higher than replacement for the Pakistani and Bangladeshi populations, fertility's contribution to growth is less than the momentum from a young age structure or from immigration, and it is decreasing over time (while the White fertility in Britain has been steadily low and has recently risen slightly).

The impact of continuing the recent levels of migration *within the UK* is to movement away from Birmingham for all groups except Chinese and African (scenario (c)). Its impact on the White population is most, though not much more than its impact on the Indian and Bangladeshi populations. In most cities there is a suburbanising and counter-urbanising pattern to migration. The population already living nearest the city boundaries – largely White – is most likely to cross the boundary.

International migration reflects the recent streams from Africa and the Far East (scenario (d)). The final row (scenario (e)) shows an adjustment needed to take the projection based on recent trends, up to the population projected for Birmingham as a whole by the government Office for National Statistics. The government in its 2003-based round of projections expected the overseas immigration to be greater than in the past (and it has since revised this expectation downwards).

For each of the long-settled and largest non-White minorities (Caribbean, Indian and Pakistani, as well as for the Bangladeshi population), the momentum of their age structure has a greater impact on their population than does fertility or migration.

The observation that momentum is more important than migration for Birmingham also holds for Britain as a whole. The impact of natural growth has contributed more than overseas migration to the population increase of the Indian, Pakistani and Bangladeshi populations in Britain in recent years[11]. Immigration is not the engine of the growing ethnic

diversity of Britain. That growing diversity – a more equal ethnic mix than in the past – would continue even if immigration stopped tomorrow.

The limits of population projections

In these projections there is of course a degree of approximation. One approximation is that populations categorised by ethnicity conveniently stay apart. In fact ethnicity is not fixed nor always inherited, and this is most clearly the case in the children of mixed unions. The levels of this most intimate sign of social cohesion are great enough to make the 'mixed' population the fastest growing in Britain. For the Birmingham study, the 'mixed' groups were subsumed within the 'Other group' along with further relatively small groups who did not easily fit the other categories. Table 2 shows that age momentum is greatest for that residual 'Other group': it has a particularly young age structure.

Anyone with their eyes open in Britain can see that among young people there is a great deal of social mixing in and out of work among people with different ancestral origins. The research evidence shows a rate of marriage outside one's own group for South Asians equal to that for the White population. It also shows that most minority young people have friendship groups that include half or more White friends (a variety of this and further evidence is cited in *Sleepwalking to Segregation?*, Chapter 5: The myth that minorities do not want to integrate).

Projections of population with an ethnic group dimension can be affected by the philosophy of their producer. David Coleman's projections used by MigrationWatchUK contain the notion of a 'foreign population' undermining British democracy. The Commission for Racial Equality's projections of Leicester's diversity were devised to warn of democratic and social challenges. This minefield of politics (*Sleepwalking to Segregation?,* Chapter 7: The myth of Minority White Cities) is one reason that government has not yet implemented its intention to create projections of population by ethnic group. Currently the main technical studies are made not by central government but by or for local authorities or the academic sector[12].

Such projections are helpful locally to understand the likely mix of services for future planning, from housing and education to care of the elderly. The precise figures are less useful than the major trends. The future will be responsive to local and national economic fortunes, and to the provision of housing and its cost. Shifts of population within cities are much harder to predict than the changes for a city as a whole.

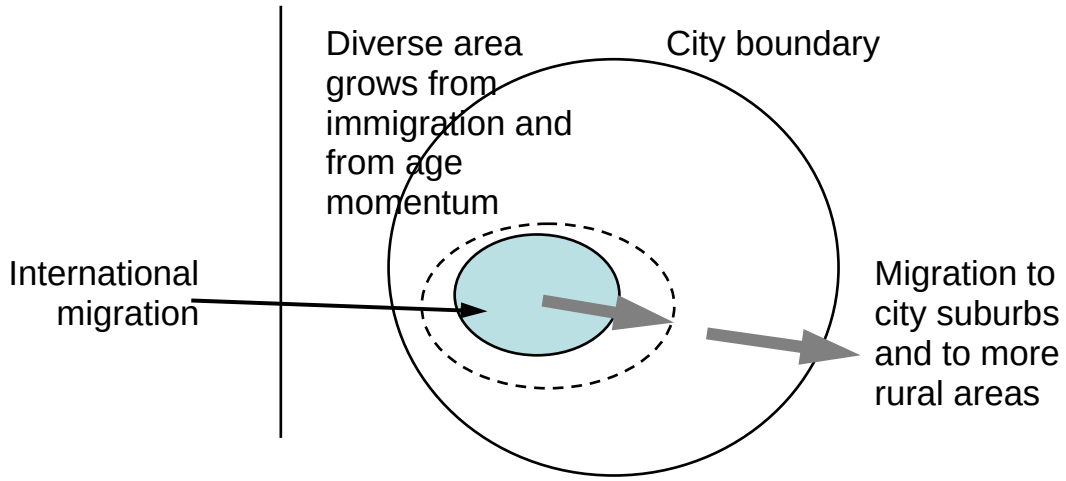
The most certain element of projections is that of age momentum, since it depends entirely on the current age structure, which is fairly accurately estimated. The increase in Britain's diversity arising from age momentum is in no doubt.

Britain's changing racial geography

The growth inherent in a relatively young but ageing population, is also relevant to understanding the local dynamics of Britain's racial geography. The growth of inner city neighbourhoods with significant black and Asian populations takes place irrespective of migration, because of the age momentum of their young populations.

Figure 2 shows the processes at work. Within a British city, the most ethnically diverse area is likely to be at its centre, further from the city boundary than other more White areas. International migration adds population mostly to the diverse area. That area grows also from age momentum, as its young population produces more births than it suffers deaths. As the minority born-in-Britain generations reach adulthood, many of them move from the diverse area both because of lack of local housing and because their aspirations are for a better environment and better housing, much like the aspirations of White young adults. The diverse area enlarges to a greater area as well as a greater population. The suburbanising movement is non-racial (it is observed for all ethnic groups), but the White population has more people who live near the city boundary and therefore more who move over it to another district. A combination of processes that are not racially configured lead to a drop in the city's White population while the city's minority populations and its most diverse areas grow.

Figure 2. The local dynamics of ethnic diversity



Neither internal migration towards diverse areas, nor immigration, is required to make those inner city populations grow. The population statistics from the 2001 Census, unfortunately the latest source of local migration and population change, show this clearly (and are further discussed by *Sleepwalking to Segregation?* Chapter 6: The myth that Britain is becoming a country of ghettos):

- Internal migration is away from the most ethnically diverse (least White) Districts and neighbourhoods of Britain, at a very similar rate for their minority populations and their White population. White flight is at least a misnomer, as it could be equally called brown flight or black flight.
- Births to the minority populations in the most ethnically diverse areas outnumber migration: natural change is a greater source of growth than immigration.
- Of the 35 districts in Britain with a minority White electoral ward, for the area with most minority populations and least White population:
    - In 8 districts, there was White movement *in* to the least White areas, and minority movement out. This is the opposite of White flight. These districts include Bradford, Leicester and Wolverhampton.
    - In 22 districts (the majority) the movement is away from the least White areas, for both ethnic minority populations and White population.
    - In 15 of these, there was more minority movement away than White movement away.

- In three districts, movement was in to the least White area, for both White and minority populations (Trafford, Preston and Hackney).
- In only two districts was there White movement out and minority movement in to the least White area, which might represent a pulling apart of the White and minority populations. These two are Harrow and Walthamstow. Both are areas of outer London to which inner London (mainly minority) residents aspire to move, while many existing residents (mainly White) aspire to move further away to less suburban and more rural areas.

So the evidence stacks up as mainly non-racial migration, and neither white flight nor unwillingness to move to mixed residential areas.

Implications for school ethnic composition

Given this context for population change in Britain, one can take a more considered view of statistics of *school* ethnic composition. It is not surprising either that some schools have much higher proportions of White pupils than others (and consequently much lower proportions of pupils of ethnic group other than White); this is partly an expression of the location of industries where immigrants were first invited to work, and the housing that could accommodate individuals and families with little wealth and low wages.

Given the momentum of population growth for the minority populations, it is also not surprising that this range of school composition should continue, and that the number of schools with high and growing proportions of minority pupils should be growing. Those who have looked at school segregation in Britain greatest detail – with arguably inappropriate measures of segregation, but that is another story – find that "there has been some increase in segregation levels in some cities, but only to the expected extent given the changing relative size of the ethnic minority populations there"[13]. The evidence of school segregation by income and by ethnicity is discussed further in *Sleepwalking to segregation?* (Chapter 5: The myth that minorities don't want to integrate).

The elderly population

Finally, for those who were expecting a discussion of the number of elderly Black and Asian residents in Britain, the table below reproduces an extract from population projections made by Phil Rees for the regions of the UK, with four broad ethnic categories. Projections of the elderly are straightforward and the easiest part of

the science of population forecasting: for sixty future years the number of elderly comprises people already born, and for twenty-five future years those elderly are already over 35 and thus unlikely to move from their current area of residence.

In each panel the population size in 2001 is given in thousands, and the change expected by 2010 and 2020 is indexed such that 100 represents no change from 2001. Projected growth of the White elderly aged 60 and older is as much as 30% over the two decades in the South East, though rather less in London. For each of the other four ethnic categories, the growth of the elderly is more than 30% in London and in the South East, albeit from a low starting point.

The population aged 60 and older is expected to more than double for the following region-groups: the 'Chinese and Other' category in Outer London, from 96 thousand; and each of the Mixed, Asian, Black and 'Chinese and Other' categories in the South East, from lower populations totalling 84 thousand in 2001.

The greater growth of minority populations outside their main concentrations in London is repeated for younger age groups too, confirming the claim made above that migration of minorities is on balance dispersing away from their existing settlements, not a retreat towards them.

Table 3: Region-age projections for Outer London and the South East (GOR): counts in 2001, time series indices in 2010 and 2020 (2001=100)

Note: For all years and ethnic groups 2001 = 100

	Outer London				South East			
	0-15	16-59	60+	All ages	0-15	16-59	60+	All ages
White								
2001 (count)	**593**	**2,170**	**582**	**3,346**	**1,485**	**4,517**	**1,616**	**7,617**
2010	91	97	99	96	95	103	114	104
2020	87	95	105	96	95	104	131	108
Mixed								
2001 (count)	**57**	**39**	**21**	**117**	**42**	**26**	**18**	**86**
2010	125	154	139	137	136	169	165	152
2020	152	194	185	172	186	221	245	209
Asian								
2001 (count)	**135**	**321**	**103**	**559**	**49**	**89**	**40**	**177**
2010	106	134	128	126	120	137	146	135
2020	122	157	162	149	148	170	200	171
Black								
2001 (count)	**91**	**152**	**57**	**300**	**11**	**28**	**12**	**51**
2010	121	155	139	142	127	161	163	154
2020	138	196	182	176	157	208	229	202
Chinese and other								
2001 (count)	**20**	**58**	**18**	**96**	**11**	**32**	**13**	**56**
2010	139	170	169	163	143	201	206	191
2020	174	212	229	207	192	260	303	257
All groups								
2001 (count)	**897**	**2,740**	**782**	**4,418**	**1,597**	**4,691**	**1,699**	**7,988**
2010	100	107	108	106	97	105	117	106
2020	104	112	123	112	100	108	136	112

Source: see note 14

Discussion

Britain's diversity will grow. This is partly due to greater world migration that is increasing the variety of recent origins in every country. As this paper has argued, it is also the inevitable result of the momentum for growth in the relatively young minority populations of Britain that ensures that their proportion of the whole will also grow.

The ageing of a young population is accompanied by growth because there are fewer older people to die and more younger adults to have children. This part of fundamental demographics is often overlooked but has helped to explain why simple interpretations of Britain's changing racial geography as 'White flight', 'increasing segregation' and 'the result of immigration' are false. White flight is a myth, made meaningless when Black and Brown movement in the same direction is acknowledged. Increasing segregation is contradicted by the evidence which shows decreasing levels of segregation as minorities move out from their areas of greatest concentration when they can afford to do so.

Immigration does continue and some of it (less than half) does add to the non-White minority populations. But immigration contributes less to minority population growth than does the internal momentum for growth created by the relatively young population structure. Of course this youthfulness is itself a result of most minority residents' origins in family immigration since 1945. International migrants are much more often aged in their twenties than older, wherever they are leaving and wherever they are going. So immigration has long-term consequences for continuing population growth.

The growth of Britain's ethnic diversity, and the increasing number of neighbourhoods with lower White population will continue without any further immigration.

Overall the message is a positive one of Britain's ability to accept its growing diversity of cultural origins. We as individuals, and government, have the ability to make that diversity work to our advantage. There are also difficulties, for immigrants in particular the difficulties of surviving in a strange and often unwelcoming land, and the difficulties of learning the language and the way things work in this country, including its laws and bureaucracy.

Community is something that is learned and recreated by daily practice. Creation of community can be vibrantly productive when there are a range of experiences and preferences. It is not helped by alarmist views which mis-interpret population change as polarisation. A considered look at the statistics and demography of Britain's diversity provides a clearer view of change and in my view a positive one.

Notes and references

[1] Finney and Simpson (2009) *'Sleepwalking to segregation'? Challenging myths about race and migration*, Policy Press, Bristol. The book discusses the origins and political role of contemporary claims about immigration, segregation, and integration, as well as their lack of basis in fact. Chapters:

[2] The Vanishing Face of Gaia by James Lovelock, Basic Books, New York, 2009. The quote is reported in the Daily Telegraph, 26th February 2009.

[3] p6 in Champion (1993) Population matters: the local dimension, Paul Chapman Publishing, London.

[4] Albert Sabater: http://www.ccsr.ac.uk/research/PopulationEstimates.htm.

[5] The Observer, 27 May 2001, page 1.

[6] R. R. Kuczynski (1928) The balance of births and deaths, The Brookings Institution, New York.

[7] The concern was expressed by eminent social demographers, for example in order of publication: A. M. Carr-Saunders (1936) World Population, Clarendon Press, Oxford; D. V. Glass (1940) Population policies and movements in Europe, Clarendon Press, Oxford; R. Titmuss and K. Titmuss (1942) Parents revolt: a study of the declining birth-rate in acquisitive societies, Secker and Warburg, London.

[8] Bongaarts, J. and Bulatao, R. A. (1999) *Population and Development Review,* **15,** 515-529

[9] Taken from Simpson (2007) Population forecasts for Birmingham, with an ethnic group dimension. http://www.birmingham.gov.uk/Media?MEDIA_ID=191412

[10] In all these scenarios, mortality is assumed equal for all ethnic groups, as is usual in population projections in the UK with an ethnic group dimension. Mortality studies show unclear results that cannot in any case be generalised to future generations, partly because the UK's current minority elderly are the pioneer immigrants. They grew up in very different circumstances from their children born in the UK, and they are a special subgroup of their own generation, those who were healthy enough to emigrate.

[11] Finney and Simpson (2009) Population dynamics: the roles of natural change and migration in producing the ethnic mosaic, Journal of Ethnic and Migration Studies, 35(9): 1479-96.

[12] Web pages for ethnic group projections include University of Manchester (http://www.ccsr.ac.uk/research/egpf.htm); Greater

London Authority (http://www.london.gov.uk/gla/publications/factsandfigures/dmag-update-2008-03.pdf), and University of Leeds (http://www.uptap.net/project36.html).

[13] p1 in Johnston, R., Burgess, S., Harris, R. and Wilson, D. (2006) *Sleep-Walking Towards Segregation? The Changing Ethnic Composition of English Schools, 1997-2003 – an Entry Cohort Analysis*, Working Paper Series No 06/155, Bristol: Centre for Market and Public Organisation, Bristol University.

[14] Appendix 5 in Rees, Phil (2008) 'Chapter 15 Appendices' (to 'What happens when international migrants settle? Projections of ethnic groups in United Kingdom regions' in J. Raymer and F. Willekens (eds), International Migration in Europe: Data, Models and Estimates, London: John Wiley), http://www.wiley.com/legacy/wileychi/raymer/supp/Chapter15_Appendices.pdf

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