

# The future ethnic mix of UK local populations, 2007 to 2051

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## Presentation by Phil Rees

**4th ESRC Research Methods Festival  
5-8 July 2010, St Catherine's College Oxford,  
Session 20, Research Methods for Population Projection, Tuesday 6 July**

Online Information on the project: <http://www.geog.leeds.ac.uk/projects/migrants/>

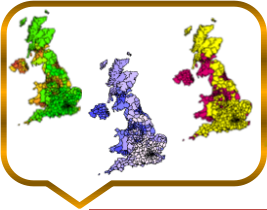
Full details of project results are given in:

Pia Wohland, Phil Rees, Paul Norman, Peter Boden and Martyna Jasinska (2010) Ethnic population projections for the UK and local areas, 2001-2051. Working Paper 10/02, School of Geography, University of Leeds. Online at:

[http://www.geog.leeds.ac.uk/fileadmin/downloads/school/research/projects/migrants/WP\\_ETH\\_POP\\_PROJECTIONS.pdf](http://www.geog.leeds.ac.uk/fileadmin/downloads/school/research/projects/migrants/WP_ETH_POP_PROJECTIONS.pdf)

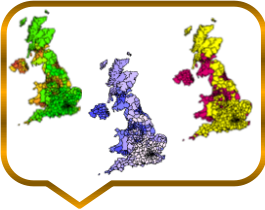
### *Acknowledgements*

- ESRC ONS GROS NISRA OS UKBORDERS CDU ESDS



# Aim, review, model and component estimates

Aim	To project UK ethnic group populations for local areas
Review	<p><b>Previous projections:</b> national or selected local areas, five broad groups</p> <p>Method: cohort-component model</p> <p>Single region models - ONS, Coleman, Rees and Parsons, Simpson et al</p> <p>Multi-region models – GLA (Hollis, Bains et al)</p>
Model	<p><b>Bi-regional</b> cohort-component model with conditional probabilities of migration given survival within the UK</p>
Components	<p><b>Ethnic mortality estimates</b> developed combining deaths data and proxy illness data</p> <p><b>Ethnic fertility estimates</b> developed from a combination of census, LFS and vital statistics data</p> <p><b>International migration estimates</b> based on administrative data with ethnic conversion using country of origin/ethnicity tables from the census (Trend projections use TIM estimates)</p> <p><b>Ethnic internal migration probabilities</b> developed from the census updated using Patient Register Data for 2000-1 to 2007-8</p> <p><b>Ethnic mixing probabilities</b> developed from census tables of mothers and children under one by ethnicity</p>



# Projection model features

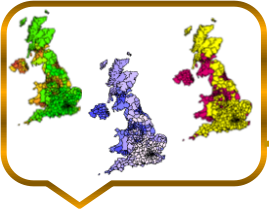
**Coverage:** whole of the United Kingdom

**Groups:** all 16 ethnic groups in the 2001 Census

**Spatial units:** 352 local authorities in England with Wales, Scotland & Northern Ireland

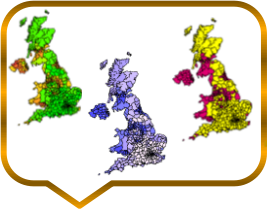
**Migration:** bi-regional model to overcome small number issue of multi-regional model and isolation issue of single-region model

**Group interaction:** parallel ethnic groups except mothers can give birth to children who have different ethnicities



# The planned projections and assumptions

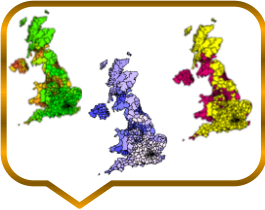
Projection	Assumptions	Status
<b>Benchmark EF/ER</b>	Uses 2001 data & applies component rates using constant assumption	Done
<b>Trend EF</b>	Develops trends in the key drivers for each component using best knowledge (following NPP assumptions)	Done
<b>UPTAP EF /ER</b>	Develops trends in the key drivers for each component using best knowledge- PPPP assumptions	Done
<b>Sensitivity (Trend EF)</b>	Tests the sensitivity of projections to different assumptions e.g. ethnic mortality versus all group mortality	Done
<b>Impact</b>	Develops “What if” scenarios such as “What if mortality rates decrease by 0%, 1% or 2% per annum?”	Planned
<b>Convergence/ Divergence</b>	Develops scenarios in which ethnic differences reduce/increase & spatial differences reduce/increase	Planned
<b>Variant</b>	Develops high & low variants of the trend projection	Planned



# Example of model outputs

Outputs for each Local Authority (352 + 3) and ethnic group (16)

Component		Men	Women
Age		B 0.....100+	B 0.....100+
Start	Population		
	Deaths		
	(Births)		
	Infants		
	Out-migration		
	In-migration		
	Emigration		
	Immigration		
End	Population		



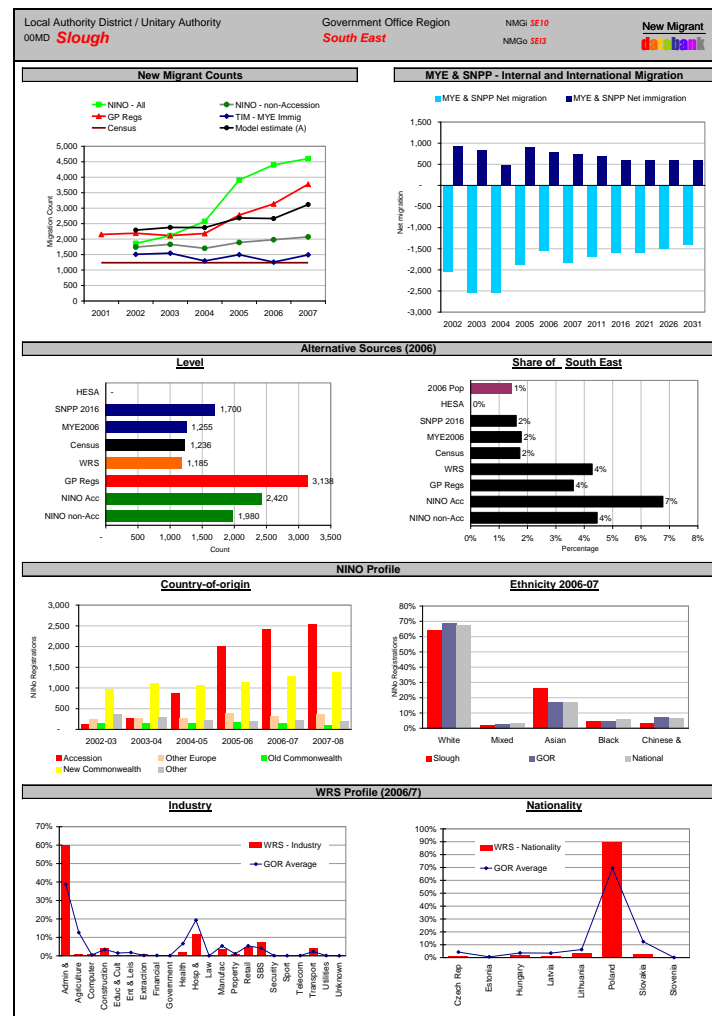
# New Migrant databank

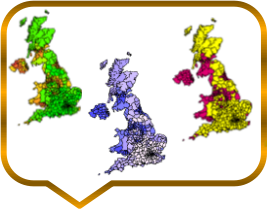
Please select Area

Slough

July 2009  
Version 2.2

School of Geography  
FACULTY OF ENVIRONMENT  
UNIVERSITY OF LEEDS





# Assumptions: ethnic group & geography...

**Fertility, Mortality**

**Subnational & International Migration**

**Benchmark:** Uses 2001 data & applies component rates using constant assumption

**Trend:** Develops trends in the key drivers for each component using assumption adapted from ONS 2008 NPP

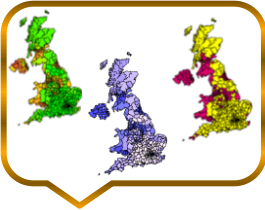
**UPTAP:** Develops trends in the key drivers for each component

**Sensitivity:** Tests the sensitivity of projections to different assumptions e.g. ethnic mortality versus all group mortality

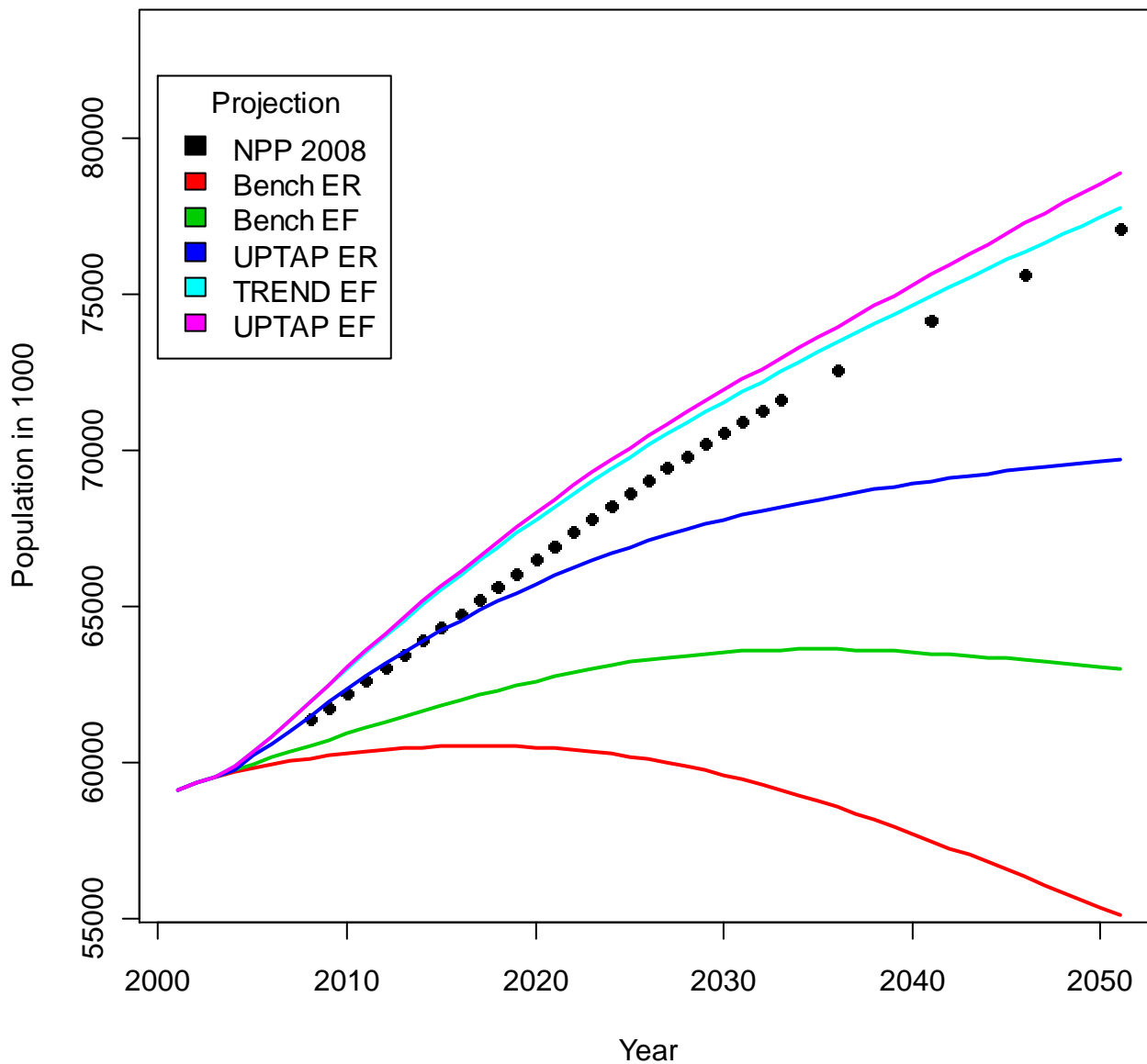
**Impact:** Develops “What if” scenarios such as “What if fertility rates rise to replacement?”

**Convergence:** Develops scenarios in which ethnic differences reduce & spatial differences reduce

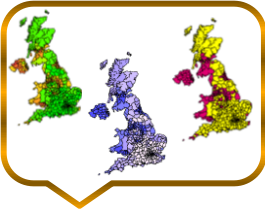
**Variant:** Develops high & low variants of the trend projection



# Forecasts for the whole UK population







# Trend projection for ethnic group populations

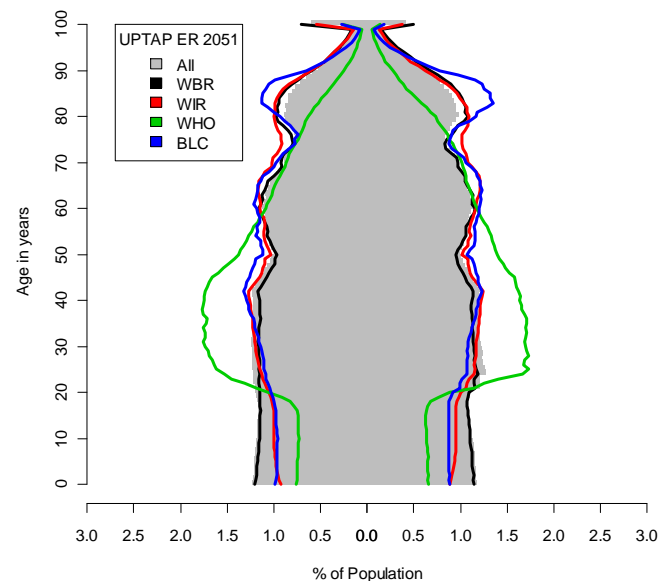
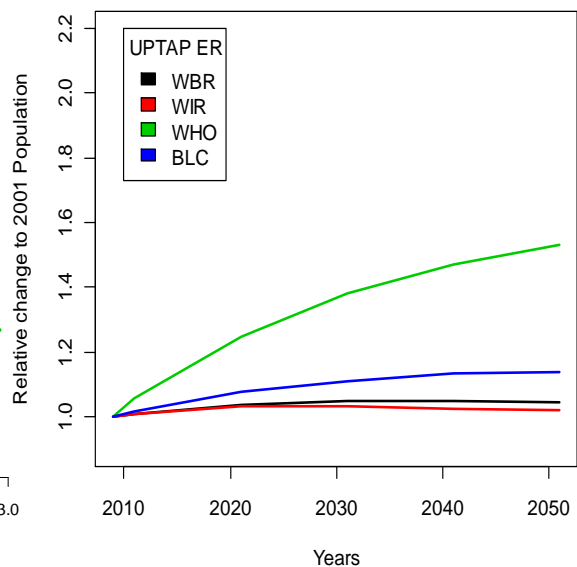
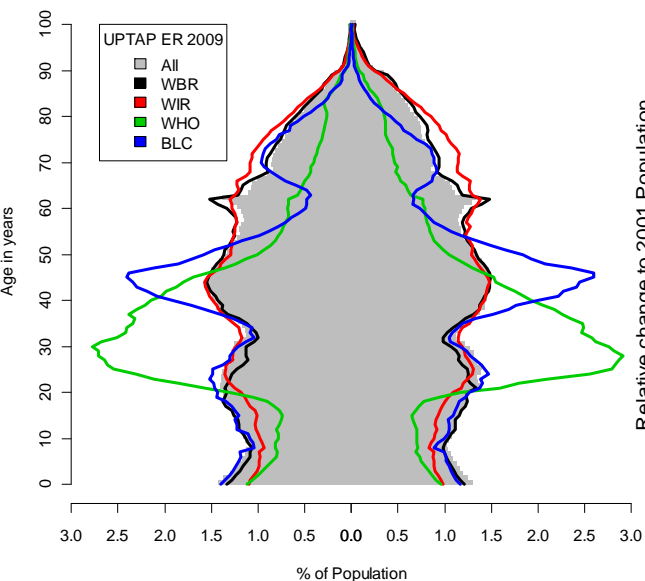
## (1) – low growth or declining groups

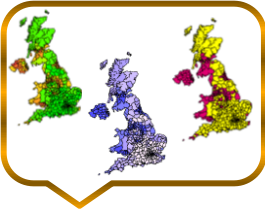
White Other

Black Caribbean

White British

White Irish





# Trend projection for ethnic group populations

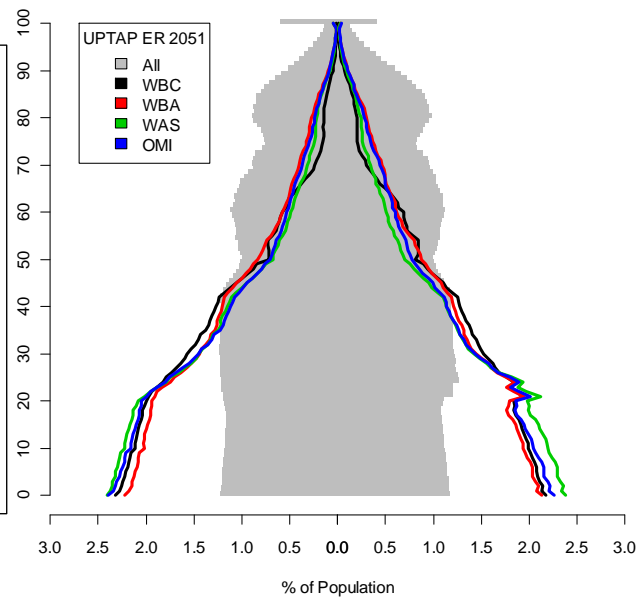
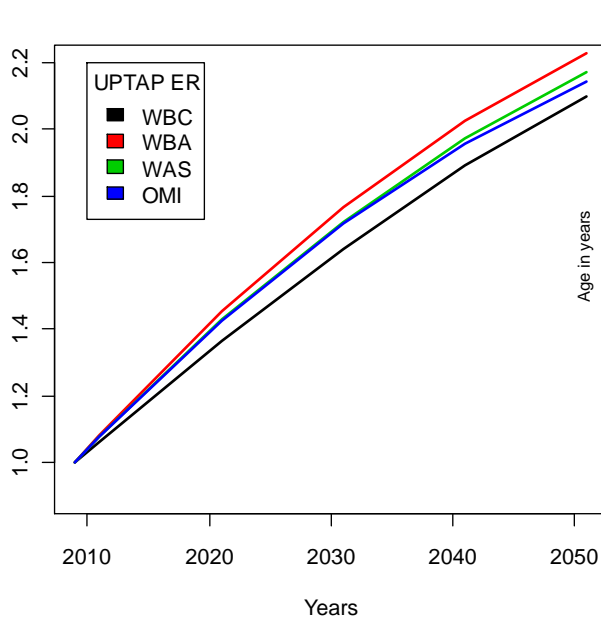
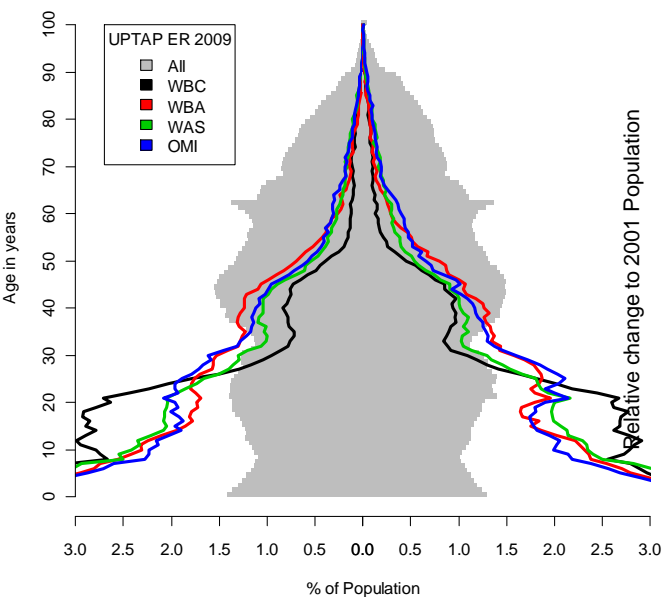
## (2) - mixed groups

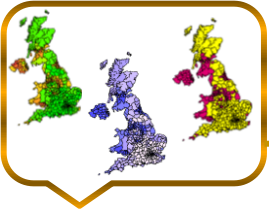
W& Black African

W& Asian

Other mixed

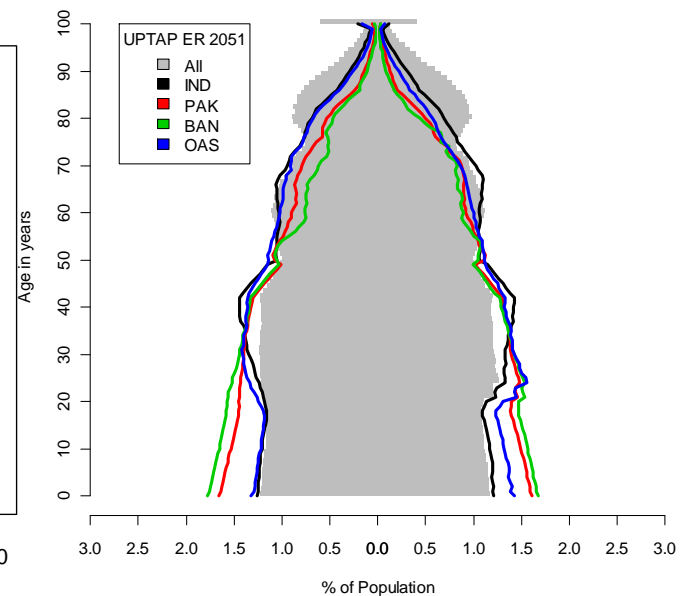
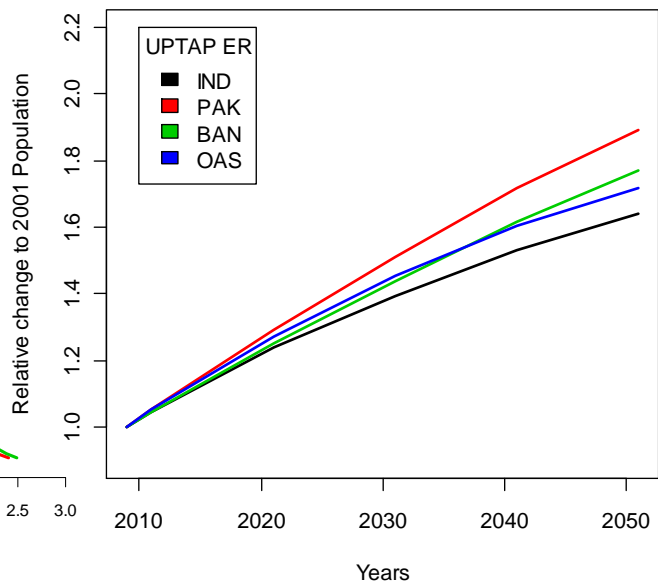
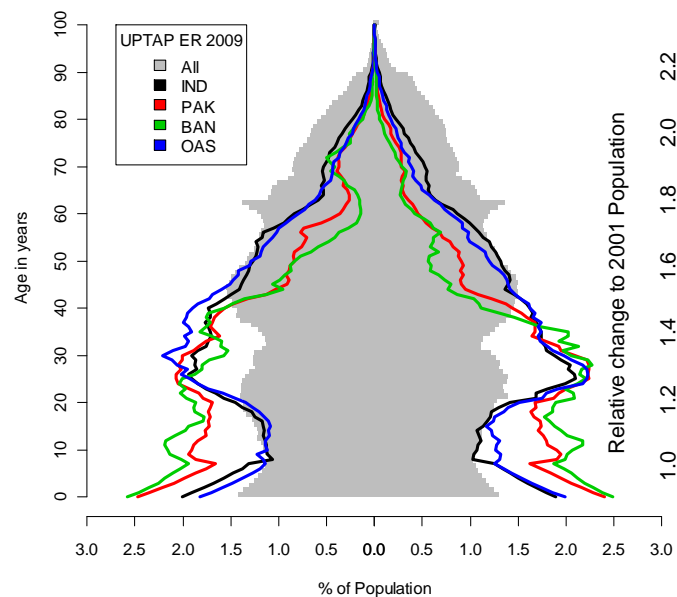
W& Black  
Caribbean

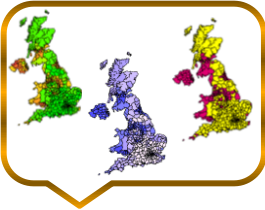




# Trend projection for ethnic group populations (3) – “traditional” groups

Pakistani    Bangladeshi    Other Asian    Indian





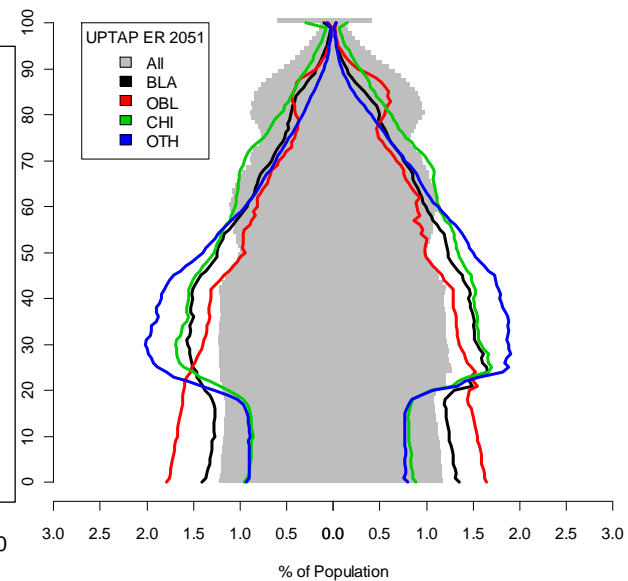
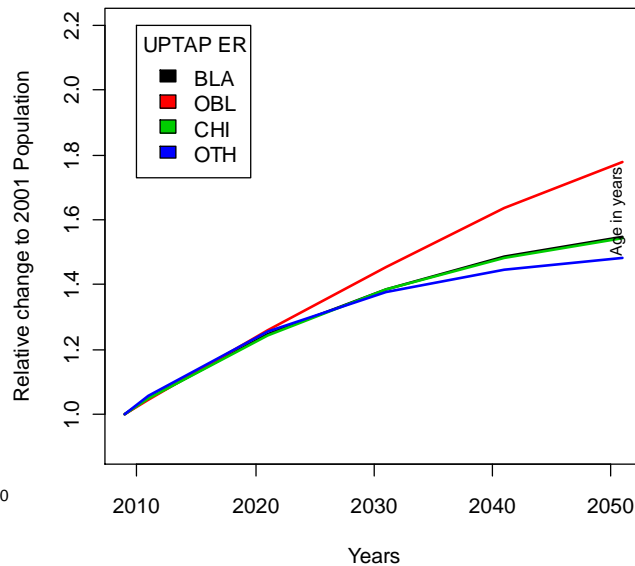
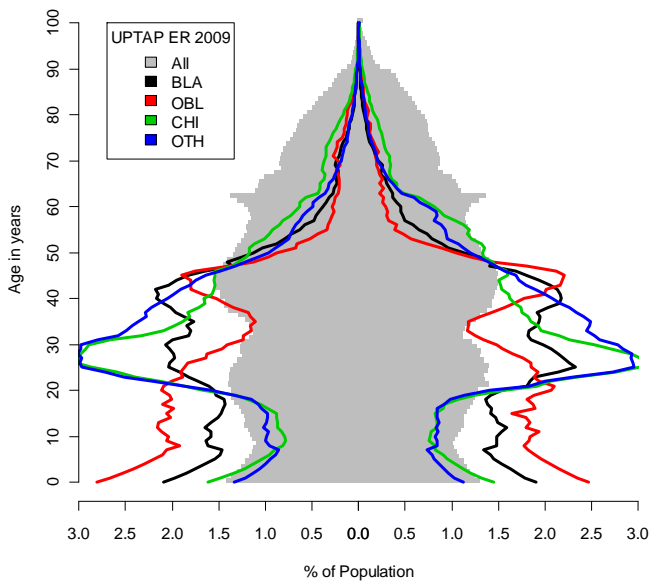
# Trend projection for ethnic group populations (4) – “newer” groups

Other Black

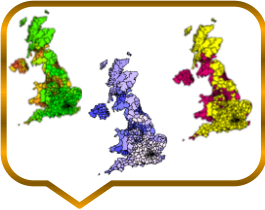
Chinese

Black African

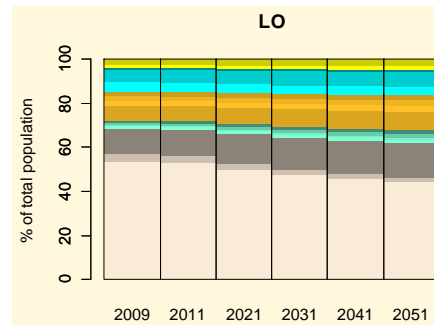
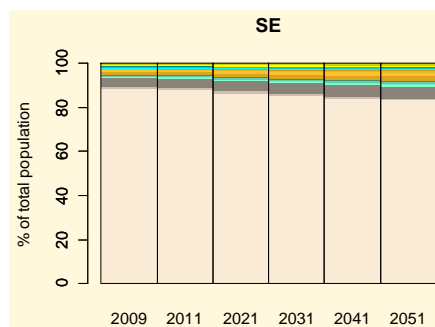
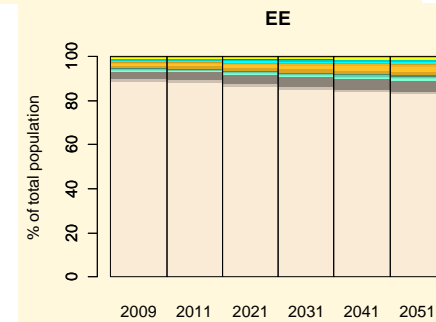
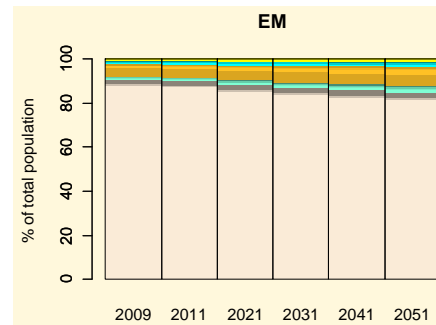
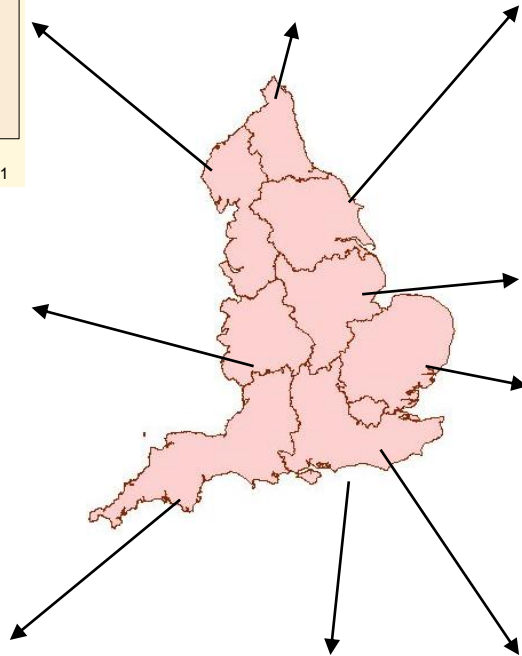
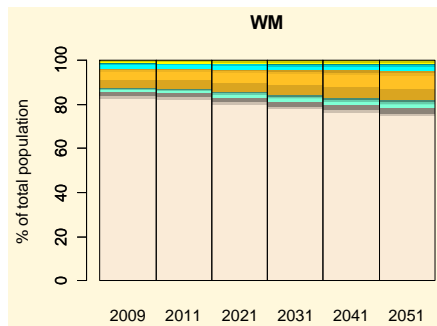
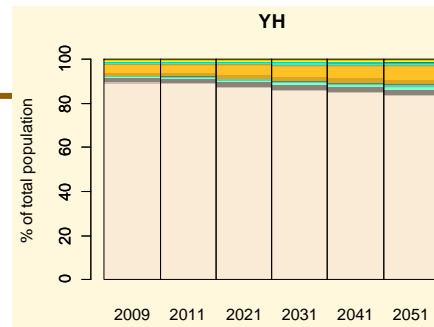
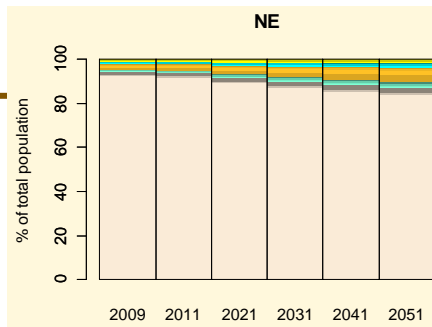
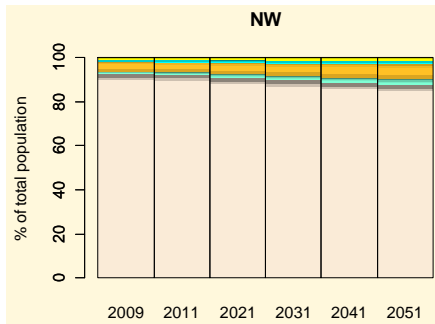
Other ethnic groups

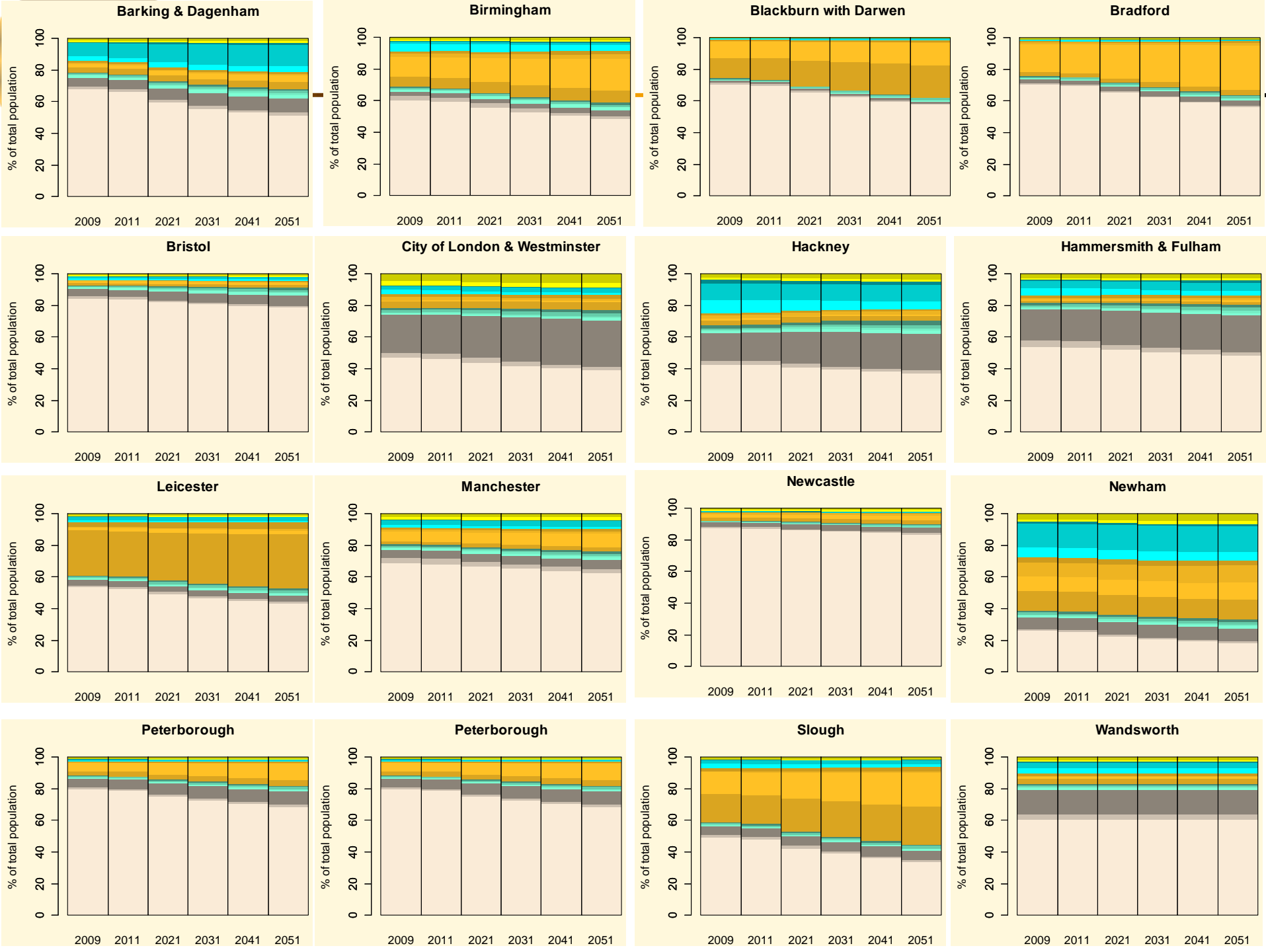


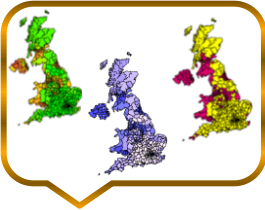




# Trend projections for regions





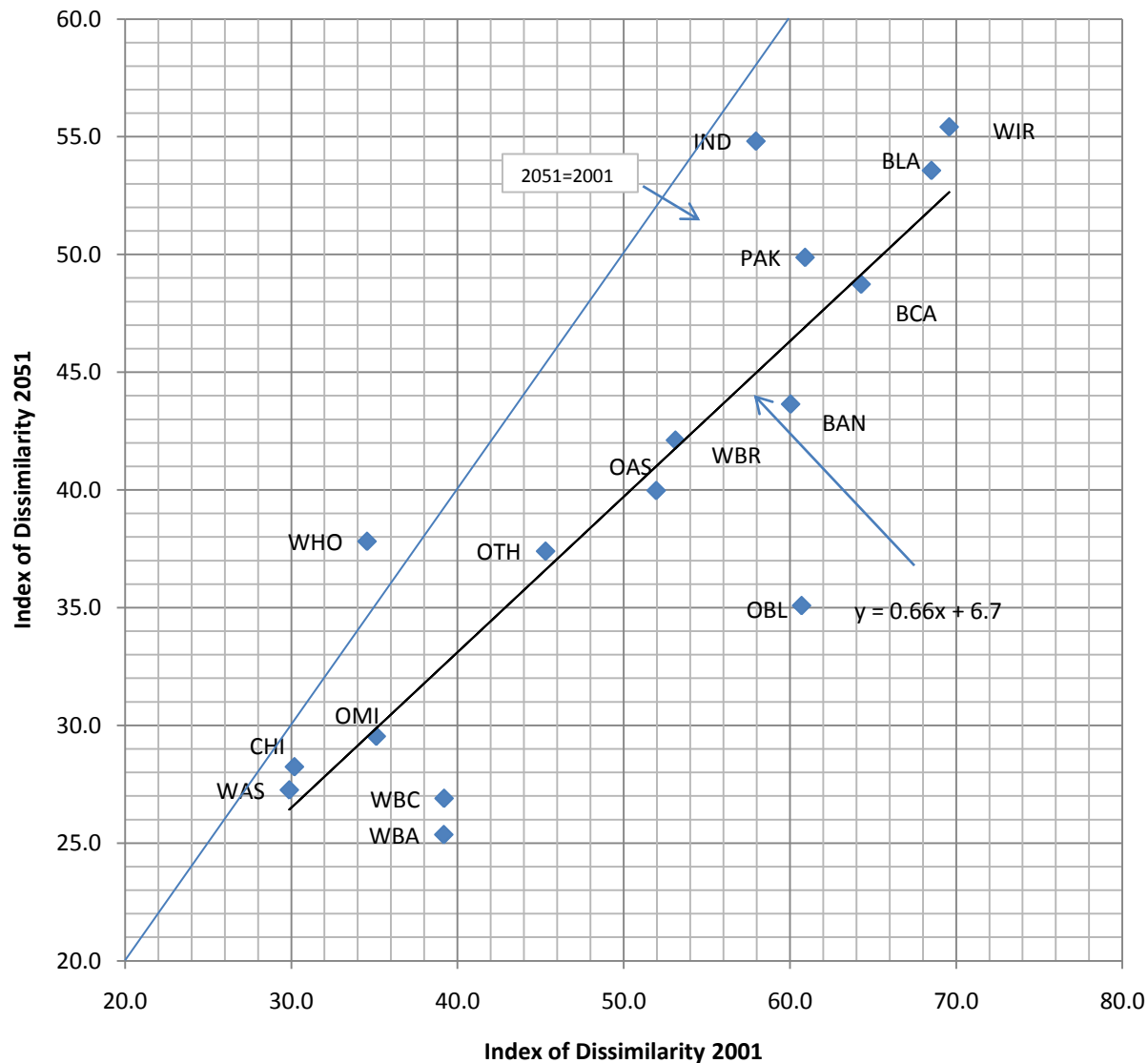


# Spatial redistribution of ethnic groups:

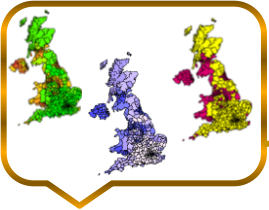
## (1) Indexes of Dissimilarity

Comparison of ethnic group distributions,  
2001 and 20051

Group		Change 2051- 2001	
White	British	WBR	-11
	Irish	WIR	-14
	Other White	OWH	3
Mixed	W & BI Caribbean	WBC	-12
	W & BI African	WBA	-14
	White & Asian	WAS	-3
	Other Mixed	OMI	-6
Asian or Asian British	Indian	IND	-3
	Pakistani	PAK	-11
	Bangladeshi	BAN	-16
	Other Asian	OAS	-12
Black or Black British	Black Caribbean	BCA	-16
	Black African	BAF	-15
	Other Black	OBL	-26
Chinese or Other	Chinese	CHI	-2
	Other Ethnic Group	OET	-8



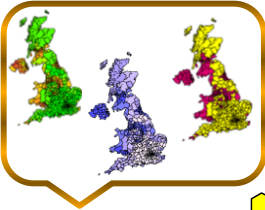




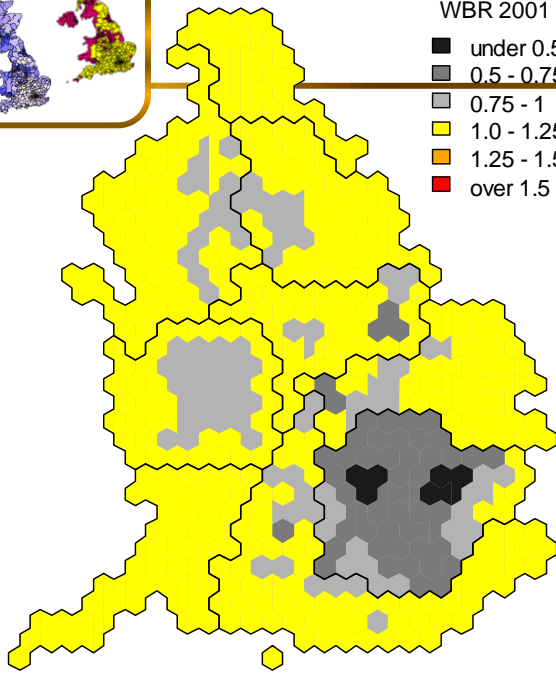
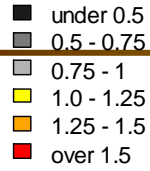
# Spatial diffusion of selected ethnic groups: (2) Density

Ethnic group	% of population 2006					Change in % 2006 to 2051				
	LOD	LMD	MID	HMD	HID	LOD	LMD	MID	HMD	HID
White British	23	16	15	23	24	0.41	0.79	0.23	-0.51	-0.93
White Irish	59	4	4	8	25	4.27	-0.1	-0.05	-0.63	-3.49
Other White	12	9	9	15	56	-0.1	0.18	0.46	0.79	-1.34
Mixed: WBC	10	8	9	19	54	5.77	2.09	1.15	0.02	-9.03
Mixed: WBA	11	10	9	16	54	2.71	3.42	2.4	1.13	-9.66
Mixed: WAS	10	9	12	21	48	1.84	0.75	1.47	-0.14	-3.92
Other Mixed	10	9	10	17	54	1.94	1.28	1.54	0.77	-5.53
Indian	4	3	6	17	70	6.12	1.49	0.11	-0.02	-7.7
Pakistani	7	3	7	30	52	2.52	3.73	0.61	-1.38	-5.48
Bangladeshi	5	4	5	14	72	3.95	5.75	3.56	3.14	-16.41
Other Asian	7	6	6	14	67	3.24	3.06	1.12	-0.11	-7.31
Black Caribbean	3	3	4	10	79	4.32	3.39	2.22	2.04	-11.97
Black African	5	4	4	9	78	2.93	2.33	2	2.09	-9.33
Other Black	5	6	6	11	73	3.8	4.98	4.57	3.4	-16.76
Chinese	15	7	9	17	52	2.59	0.81	0.54	0.23	-4.18
Other Ethnic	10	7	7	13	63	2.01	1.29	0.56	-0.61	-3.24
All	22	14	13	22	29	-0.2	0.35	-0.08	-0.63	0.56

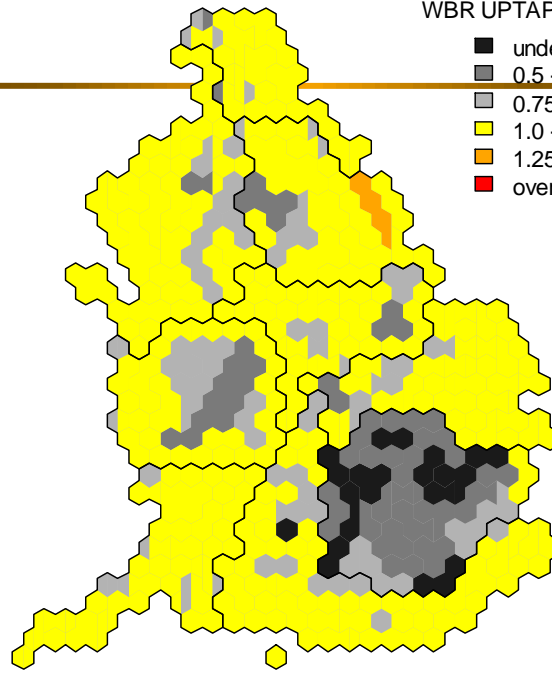
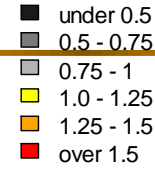
# White British



WBR 2001



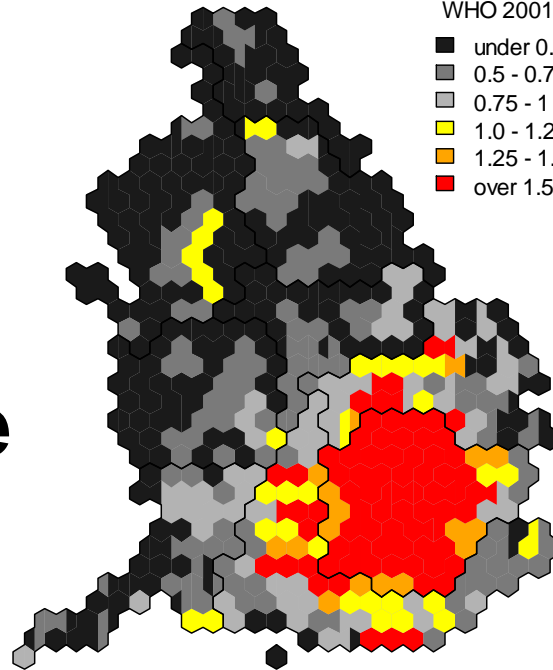
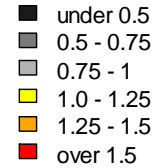
WBR UPTAP ER 2051



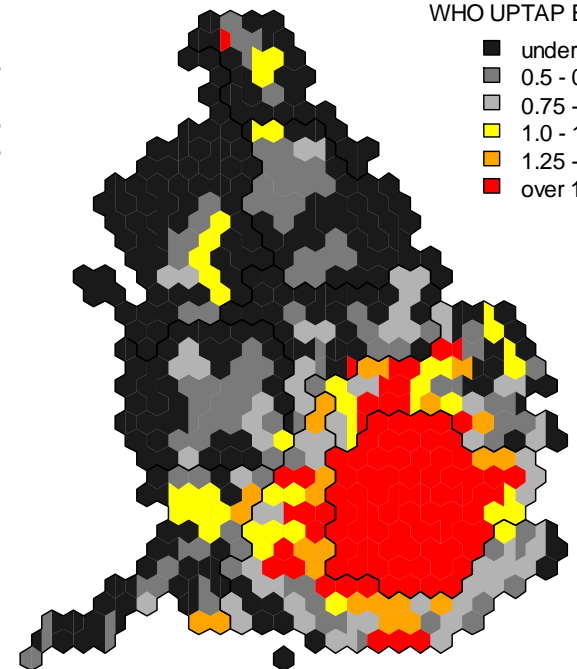
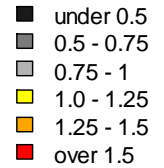
Location quotient  
2001 and 2051

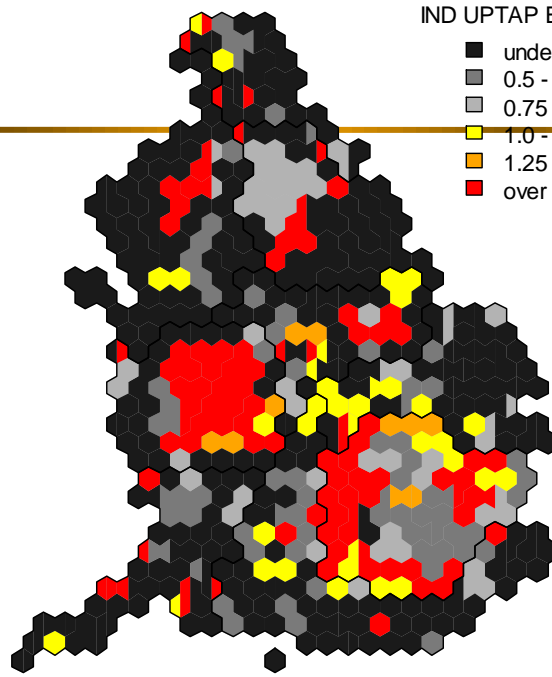
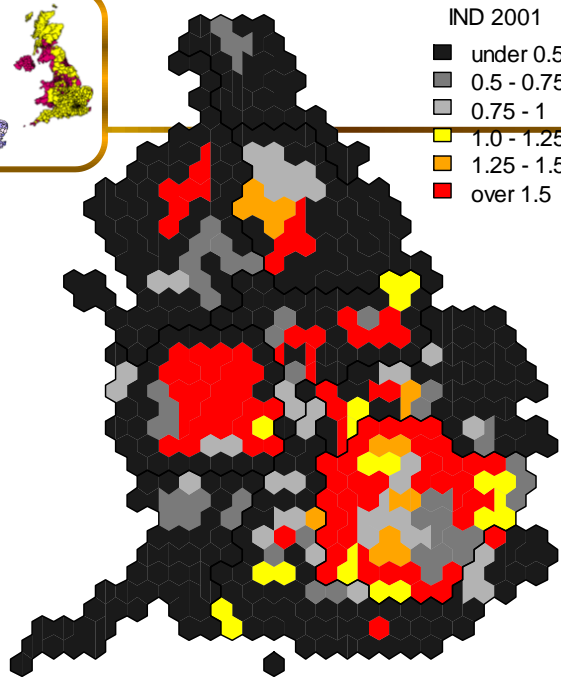
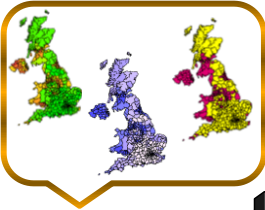
Other White

WHO 2001



WHO UPTAP ER 2051

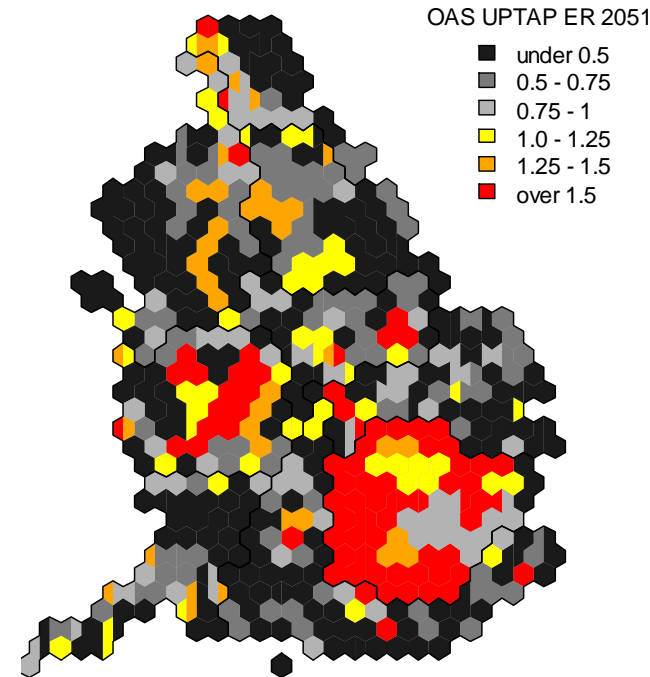
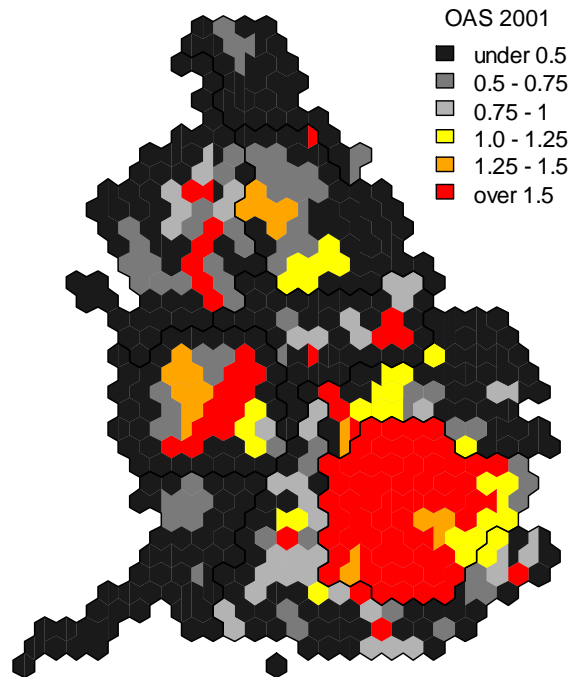


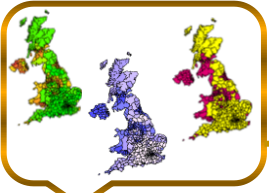


# Indian

Location quotient  
2001 and 2051

Other Asian

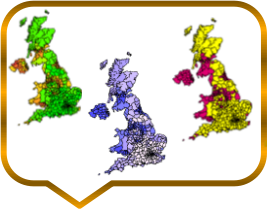




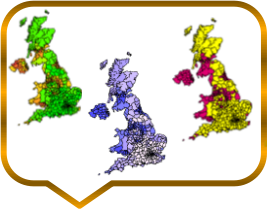
# Conclusions: model innovations

Key **methodological** findings of our research:

- With an **innovative bi-regional model** you can project a large set of interacting populations
- **Ethnic mortality** can be estimated and used in the projection model
- **Ethnic fertility** can be better estimated if you use census, vital statistics and survey data in combination
- Local area estimates of international migration are better based on comprehensive **administrative proxies** than inadequate survey samples
- **Probabilities of internal migration by ethnicity** can be estimated using census tables
- **Handling emigration** as a flow assumption rather than a rate assumption makes a large difference to the populations projected

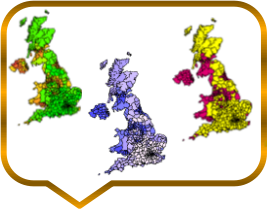


- The **range of life expectancies** for ethnic groups is 5 years, while local variation is about ten years
- **Total fertility rates** vary from a low of 1.47 for Chinese women to a high of 2.47 for Bangladeshi (higher than ONS estimates but lower than Coleman and Dubuque)
- We believe that **better immigration estimates** would lead to fewer immigrants to the South West, East of England and Yorkshire & the Humber and more immigrants to London, the West Midlands, North West and North East
- Internal migration probabilities drive a **significant re-distribution** of ethnic groups across local areas
- The **pattern of internal migration** has been relatively stable in the past decade



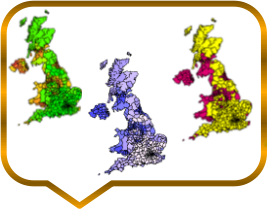
# Conclusions: results for the UK

- Using similar assumptions to ONS we project the UK population in 2051 to be 77.7 million compared with 77.1 in the NPP. The difference can be interpreted as the effect of disaggregation, which was much smaller than expected.
- If we used constant component inputs based around 2001 (Benchmark EF projection), we project the UK population in 2051 to be only 63.0 million. The difference of 14.7 million represents the impact of the demographic shifts of the last decade.
- If we switch the Benchmark projections to using emigration rates rather than flows, the UK population falls to 55.1 million in 2051, 7.9 million lower. This result opens up a debate about the right way to model international migration in a projection.



# Conclusions: ethnic groups

- Our projections (TREND-EF) show huge differences in the potential growth of different ethnic groups for 2001-2051:
  - White British (2%), White Irish (11% ) and White Other (426%)
  - Mixed groups (264 to 464%)
  - Asian groups (163 to 205%)
  - Black groups (43% to 179%)
  - Chinese (327%) and Other Ethnic (568%)
- The ethnic composition of the population will change:
  - White British (-19.6%), White Irish (-0.4%), White Other (+7.4%)
  - Mixed groups (+3.1%)
  - Asian groups (+4.8%)
  - Black groups (+2.0%)
  - Chinese and Other groups (2.6%)
- All ethnic groups will experience significant population ageing



- Ethnic minorities will shift out of the most deprived local authorities and will move into the least deprived local authorities.
- There are significant shifts to LAs with lower ethnic minority concentrations.
- Ethnic groups will be significantly less segregated from the rest of the population.
- The UK in 2051 will be a more diverse society than in 2001 and this diversity will have spread to many more part of the country beyond the big cities where ethnic minorities are concentrated today.