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Ethnic Group Population Trends and Projections for UK Local Areas

Phil Rees, Paul Norman, Pia Wohland and Peter Boden

Presentation to a Stakeholder Meeting
1330 to 1600, Thursday 18th December, 2008
GLA, City Hall, The Queen's Walk, More London, London SE1 2AA

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

ESRC Research Award RES-165-25-0032, 01.10.2007- 30.09.2009
What happens when international migrants settle? Ethnic group population trends and projections for UK local areas

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Agenda of the meeting

1330 Welcome and introduction
John Hollis

1335 Overview of the project: the projection model and the internal migration model
Phil Rees


1355 Progress with estimating ethnic fertility
Paul Norman

1415 Ethnic mortality estimates
Pia Wohland

1435 International migration estimates and the New Migrant Databank
Peter Boden

1455 Tea break

1515 Stakeholder comments, general discussion, summary of advice



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Aims and Outline

Research Aim: to project the ethnic populations of local areas (authorities) in the UK over the next 50 years


Presentation Aim: to explain the model design being developed

The projection model:

- State space of model
- Accounting framework
- Model structure

Internal Migration Model

Questions



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Models used for population projections

Population projection models:

- Single region models (POPGROUP)
- Multi-region models (SPA, ABM, LIPRO, UKPOP)
- ONS sub-national model (SNPP)
- GLA London Boroughs model
- Nested multi-region models (MULTIPOLES)

Ethnic population models

- Single region models (Rees & Parsons 2006: UK regions; Coleman and Scherbov: UK; Coleman 2006 on European models)
- Mixture models (Statistics New Zealand)
- Bi-region models (Wilson: NT Australia)



Our model design

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Multi-region model: to capture the flows of migrants from origin areas to destination areas

Single year of age: in order to project year by year

Parallel ethnic groups: with two exceptions
 births to parents of different ethnicities
 Migrants are re-classified when they move from one home country to another

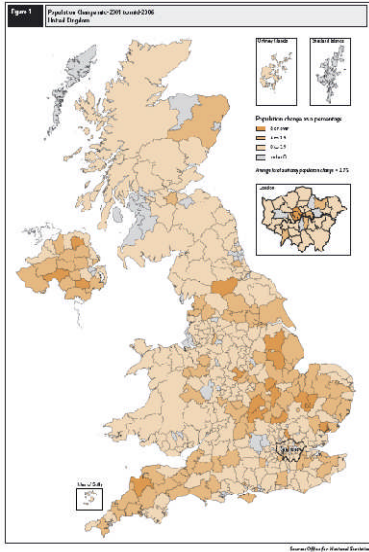
Transition-based model: because we use census data to estimate migration probabilities

A program to implement the model: we use FORTRAN95 because it is an efficient number crunching language



State space

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Home countries (4) and local areas (432) (O) and (D)

England	352LAs (2 pairs)
Wales	22 UAs
Scotland	32 CAs
Northern Ireland	26 DCs

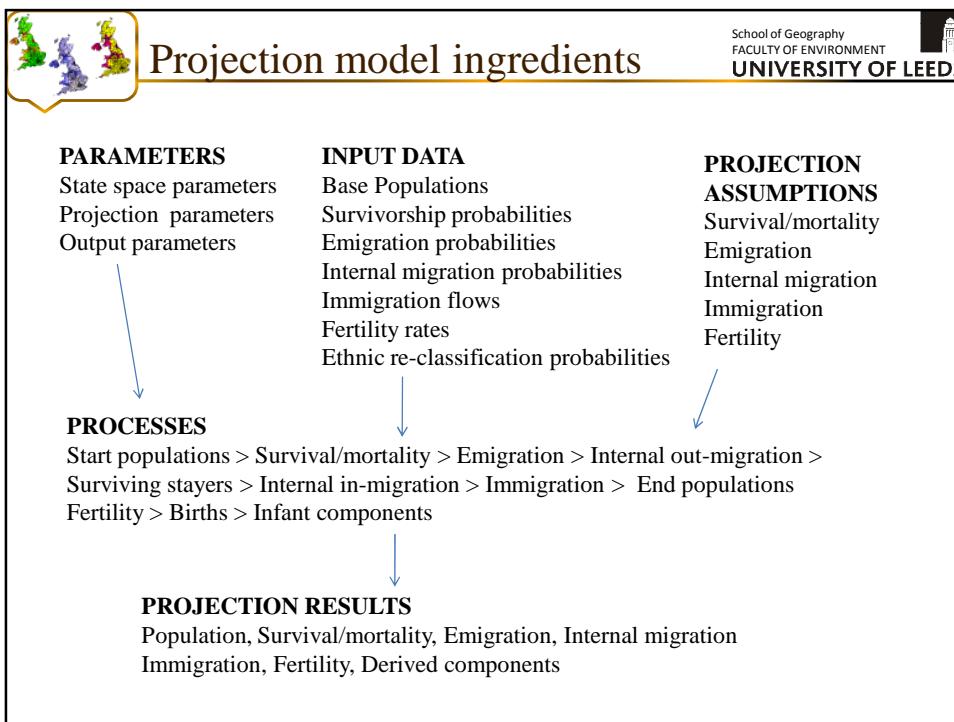
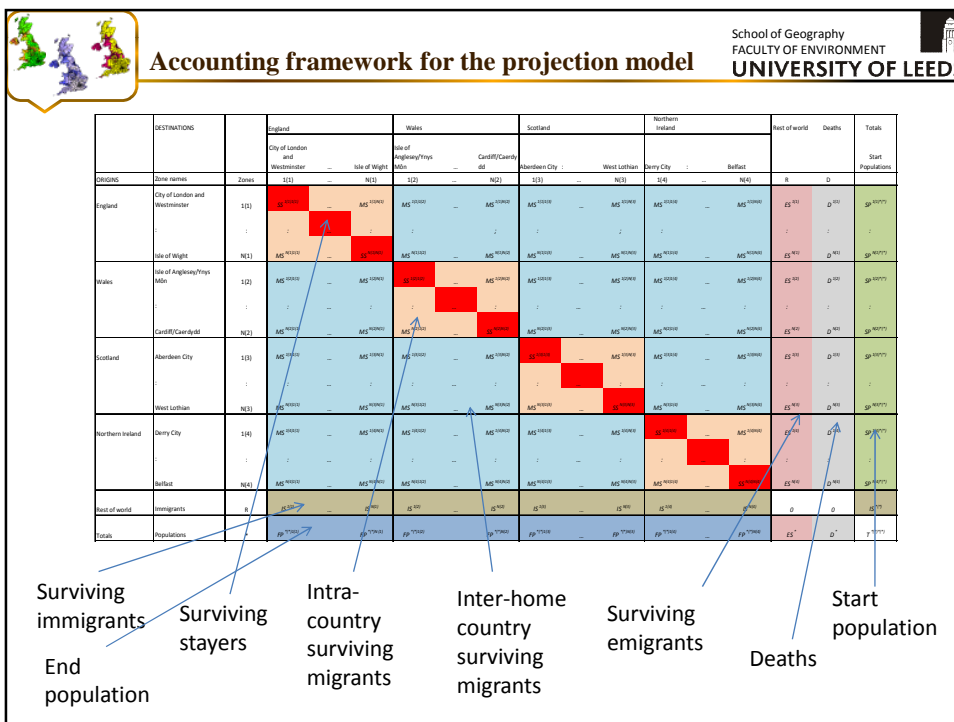
Ages (102 period-cohorts) (A)
 Bto0, 0to1, 1to2, ..., 99to100, 100+to101+


Sexes (2) (S)
 Males, Females

Ethnic Groups (16) (E)
 16 Groups from the 2001 Census

Time intervals (T)
 2001-2, 2002-3, ..., 2050-51

Source: Dunnell (2007)






Ethnic specific features

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Ethnic groups are treated as **independent** populations

Except:
There should be **mixed births** (parents of different ethnicity) [Sebastian Coe, Ryan Giggs] because mixture is the future

There will be an opportunity for **re-identification**. This is difficult to estimate but we need to introduce it when migrants cross from one “home country” to another. We could use alternatives to the census ethnic classifications in N Ireland (e.g. Protestant, Catholic, Others) or Wales (e.g. Welsh speakers, Wales born English speakers, England born English speakers)



Internal migration model

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Because there are a huge number of variables involved in internal migration, we will need to simplify things.

We cannot estimate the saturated model:

$$O_{432} D_{432} E_{16} S_2 A_{102}$$


We will start with an independence model to get the projections underway:

$$O_{434} + D_{434} + E_{18} + S_2 + A_{102}$$

We will then adopt a compromise drawing on other work (van Imhoff et al. 1997, Raymer et al. 2008, Hussain and Stillwell 2008) such as:

$$A_{102} S_2 + O_{432} D_{432} E_7 + E_{16}$$

age-sex + origin-age, origin-destination-broad ethnicity + detailed ethnicity



Survey of internal migration sources


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2001 Census:
 Commissioned tables: ODAS (Stillwell and Dennett)
 Commissioned tables: ODEAS (Stillwell and Hussain)
 Commissioned tables: AS (Champion)
 Special migration statistics: ODE (Duke-Williams)
 Standard area statistics: O,D
 Samples of anonymised records (ISAR): ODEAS (Norman, Stillwell & Hussain;
 Finney and Simpson)
 Samples of anonymised records (SAM): ODEAS
 England ethnic population estimates

After the 2001 census:
 Patient Register Data System: OD, OAS, DAS
 Labour Force Survey: ODE, ODAS (Raymer and Giuliatti, Raymer and Smith)
 Annual Population Survey: ODE, ODAS

Note Bene: Each data set has a different set of categories

We will use IPF to make the estimates of the internal migration probabilities we need in the model




Questions and Comments

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Model design

Ethnic classification (Wales, Scotland and Northern Ireland)

Internal migration data (what have we missed)




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Estimating fertility by ethnic group

Paul Norman

GLA
December 18th 2008

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An informed projection needs ...

Past fertility trends for LAs

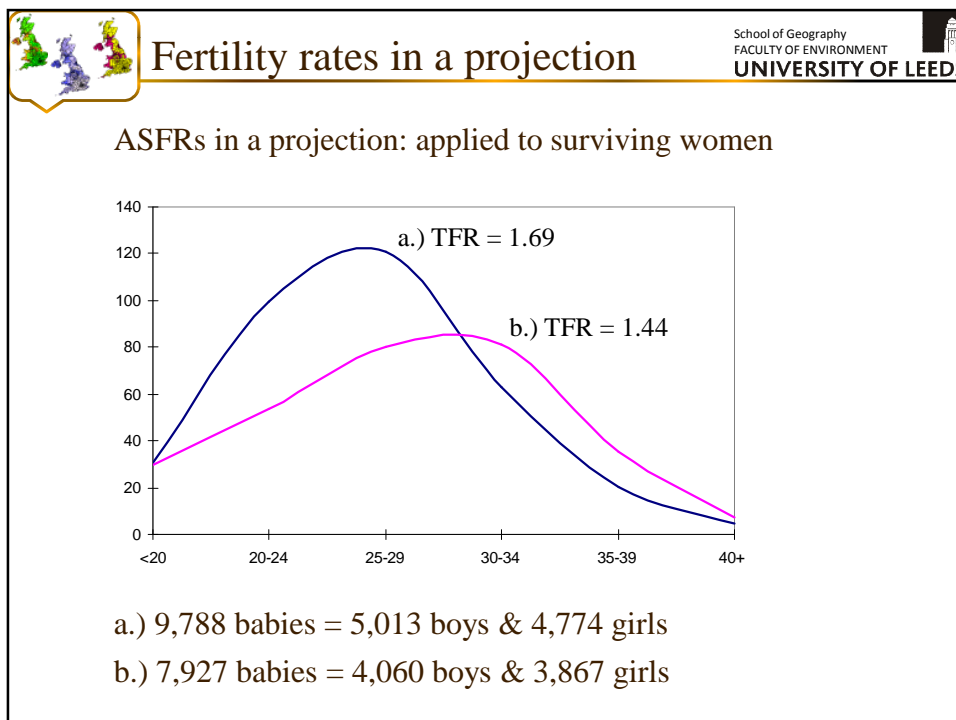
- All persons
- Estimates by ethnic group

A range of plausible assumptions by ethnic group

- Age-Specific Fertility Rate (ASFR)
- Total Fertility Rate (TFR)

Factors on which to focus, by ethnic group

- ~ Trends in TFRs & ASFRs, 'ageing' of curves
- ~ 'Convergence' to the White group?



Data sources

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1981 to 2001 for all women

- Vital Statistics & Mid Year Estimates (LAs)

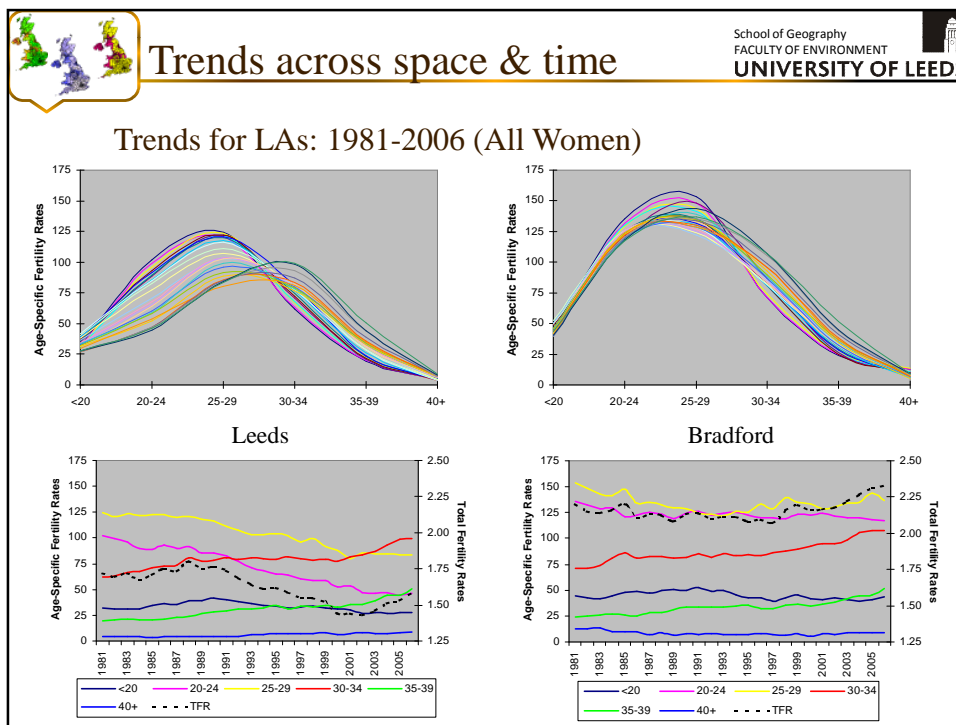
1991 & 2001 by ethnic group

- Census populations & Mid Year Estimates (LAs)
- Samples of Anonymised Records (National)

1980s to 2008 by ethnic group

- Labour Force Survey (National)

Source	White	Black	Indian	Pakistani & Bangladeshi	Chinese & Others			
Labour Force Survey	White	Black	Indian	Pakistani & Bangladeshi	Chinese & Others			
1991 & 2001 Census common	White	Black-Caribbean	Black-African	Indian	Pakistani	Bangladeshi	Chinese	Others
2001 Census	White	Black-Caribbean	Black-African	Indian	Pakistani	Bangladeshi	Chinese	Others



Trends across space & time
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Population Trends 133
Autumn 2008

30 FOCUS LIVING

Mothers and the age debate: when is it best to have babies?

Mothers in the north are up to 10 years younger when they start a family than their southern counterparts. Lucy Rock and her friend Carmen Reid typify the difference. Here they examine how their choices have affected their lives, and their children.

MAMA AT 35

The great baby divide

Ten-year age gap opens up between new mothers in the North and South

By Steve Doughty
Sociology Correspondent

WOMEN in the South of England are having children up to ten years later than mothers in the North, figures revealed yesterday.

A new mother in the most prosperous southern half of the country is likely to be in her 30s, their friend.

But women on the other side of the North/South divide are also giving birth, with the peak child-bearing years in the North between 20 and 25.

The emergence of a difference in the age of having a family is the latest evidence of a widening gap between the two halves of the country, with the South long seen as broadly wealthier, better paid and healthier than the North.

The Government's Office for National Statistics, which published the breakdown, pointed to differences in education and earnings as a possible reason for the gap.

Large numbers of women have children before they are 30, the latest data on Cambridge, it said, where large numbers of students are intent on higher education and establishing careers before they start families.

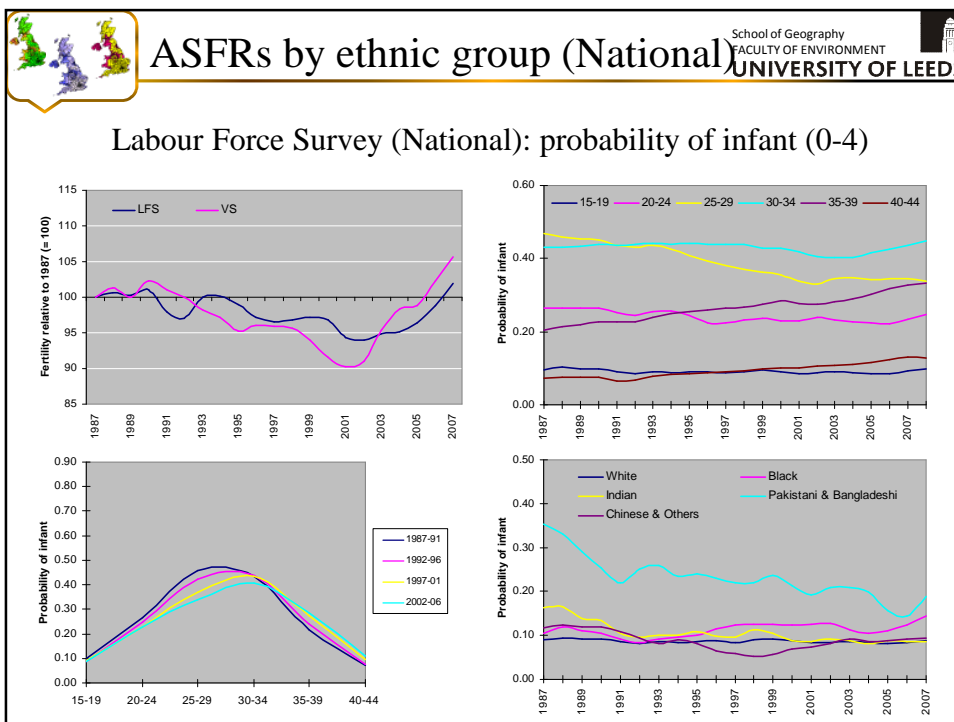
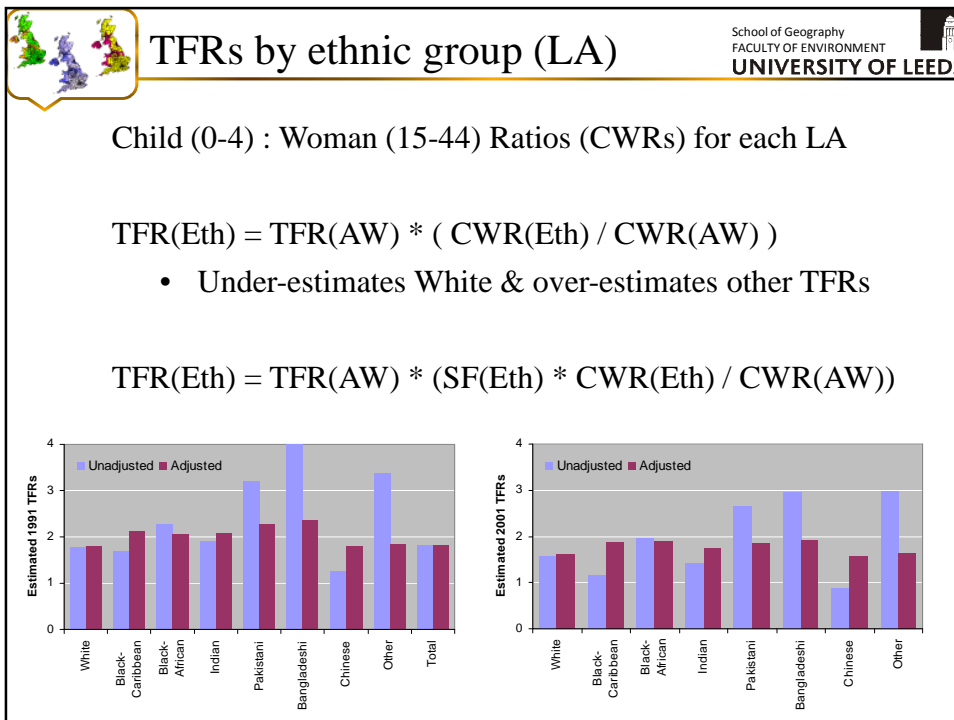
In Hullford, North London, which has a high proportion of educated and well-paid women, the country's first-born mothers are on average three years older in the country's first-born mothers.

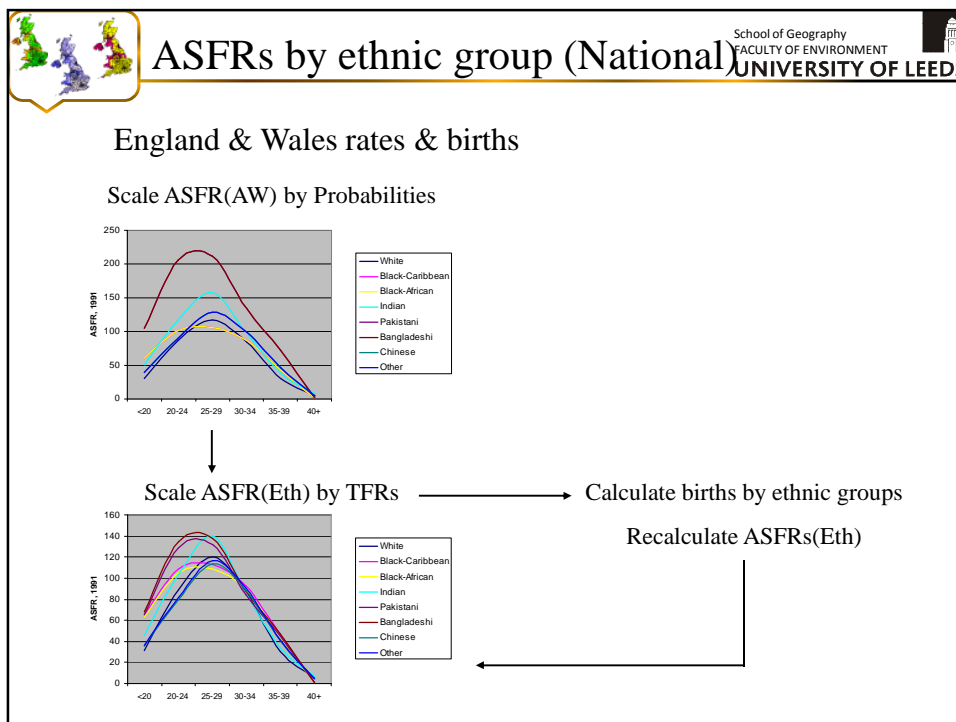
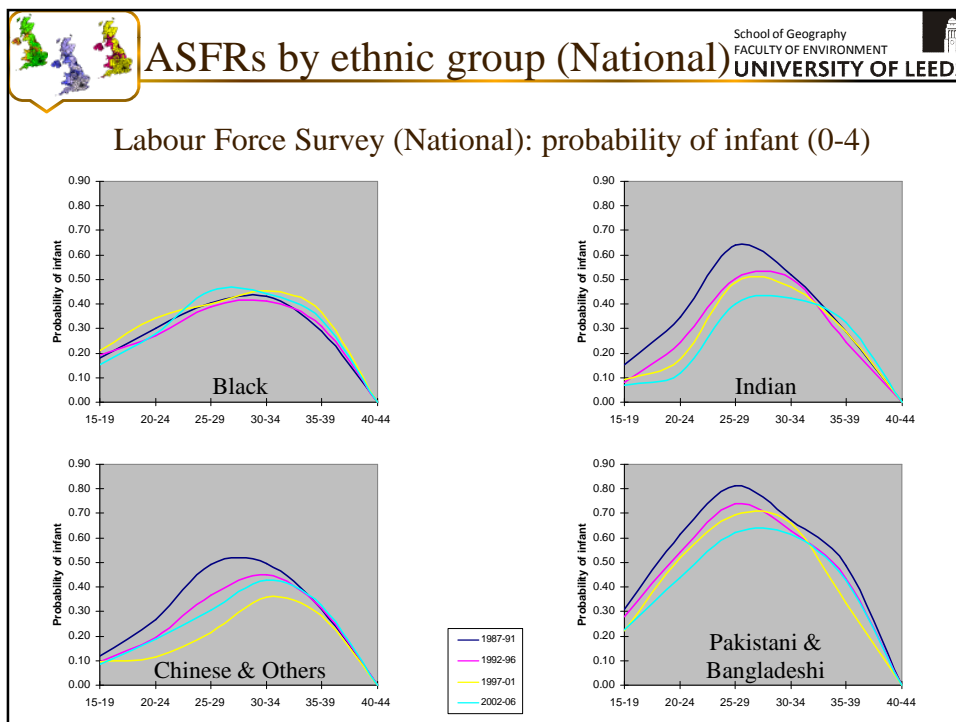
The data divide was revealed in the ONS's report figures showing the growing impact of immigration on birth rates. Numbers of babies born shot up by 3 per cent to just over 600,000 in 2006, and 23 per cent were born to mothers who were aged 30 or more in 1997 that percentage was 23.5.

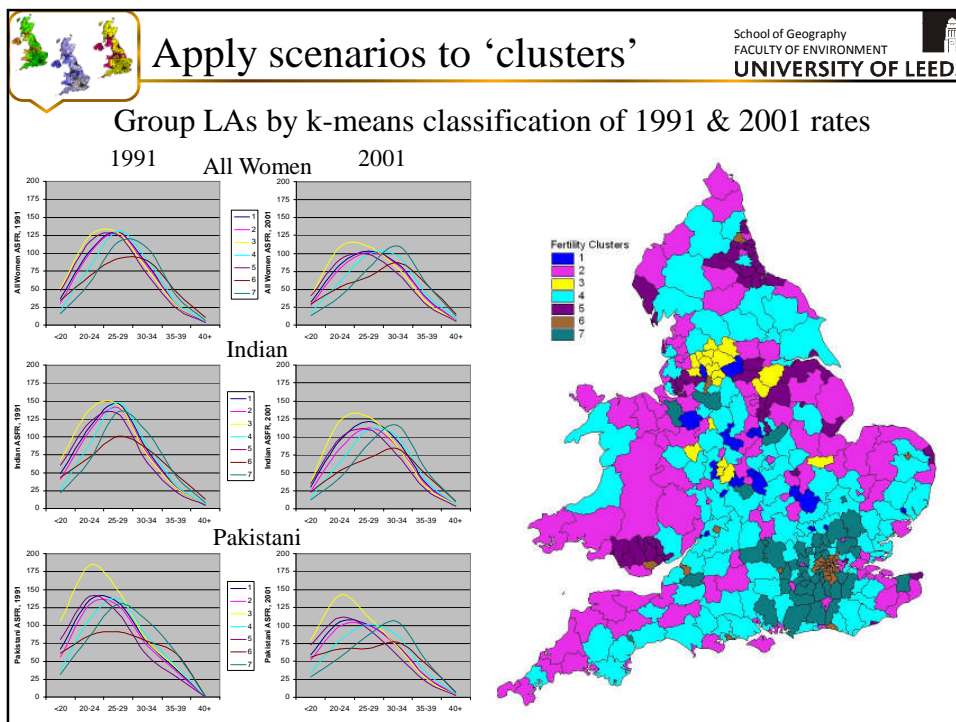
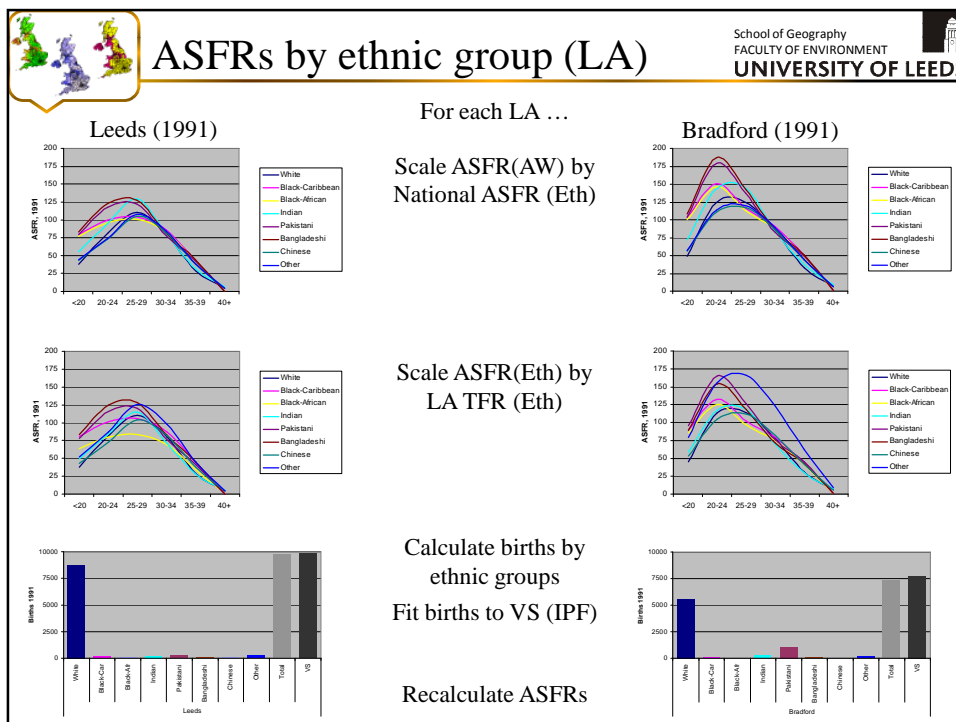
However, in Bradford, which was one of the poorest areas in the country when it first began to rise in the mid-1980s, the peak age of motherhood was in the late 20s in nearly every year since 1997.

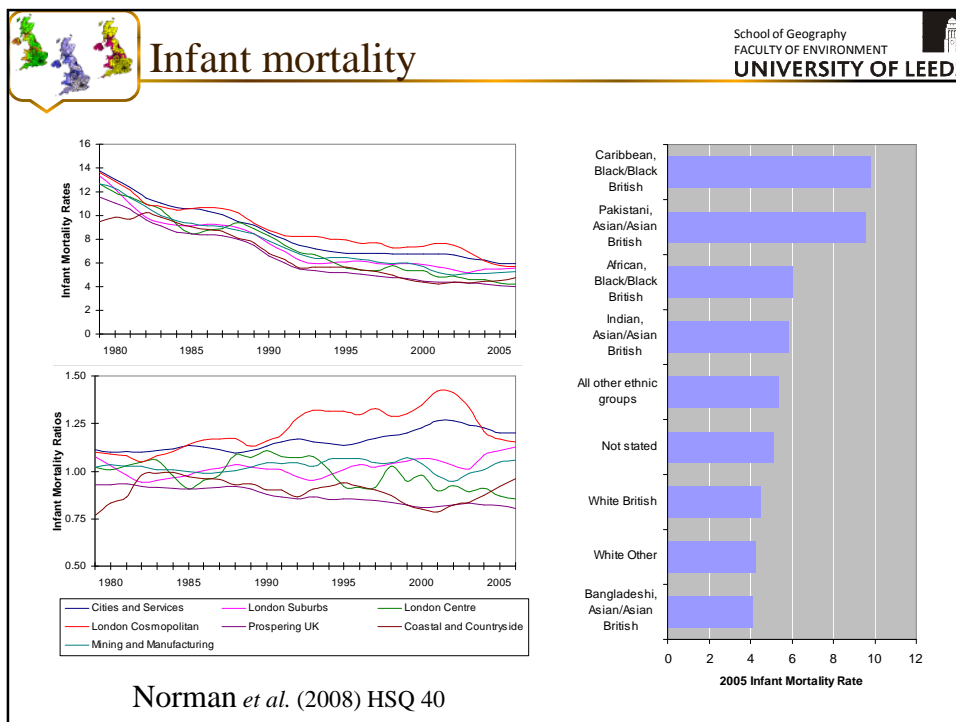
Since then the continuing rise in numbers of women going to university and pursuing careers while


Daily Mail, Friday, September 26, 2008












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Estimating Ethnic Mortality

Pia Wohland

GLA
December 18th 2008

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We have.....

Ethnic population estimates and projections in the UK

BUT

No ethnic specific mortality

Except:

- Longitudinal Study
- ONS ethnic group infant mortality (2008)

Introduction


Model outline

Input:
Ethnic fertility

Input:
Ethnic Mortality

- Introduction
- Method
- Results

Input:
New migrant data bank



Introduction

Model outline

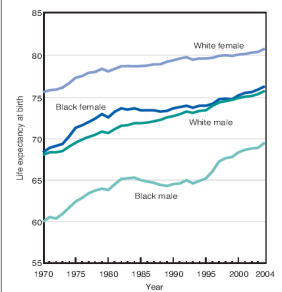
Input:
Ethnic
fertility

**Input:
Ethnic
Mortality**

- Introduction
- Method
- Results

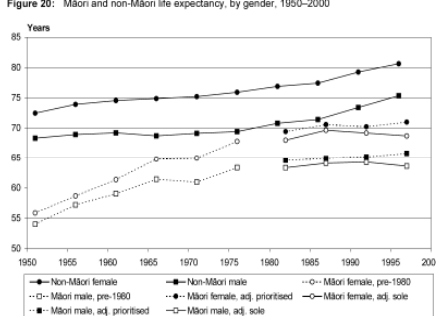
Input:
New migrant
data bank

Is ethnic group mortality of importance?




United States

Figure 1. Life expectancy at birth, by race and sex: 1970-2004
Arias E. United States life tables, 2004. National vital statistics reports: vol 56 no 9. Hyattsville, MD: National Center for Health Statistics, 2007.



New Zealand

Figure 20: Māori and non-Māori life expectancy, by gender, 1950-2000
Ajwani S, Blakely T, Robson B, Tobias M, Bonne M. 2003. Decades of Disparity: Ethnic mortality trends in New Zealand 1980-1999. Wellington: Ministry of Health and University of Otago.



Introduction

Model outline

Input:
Ethnic fertility

**Input:
Ethnic Mortality**

- Introduction
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- Results

Input:
New migrant
data bank

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Surrogate data?

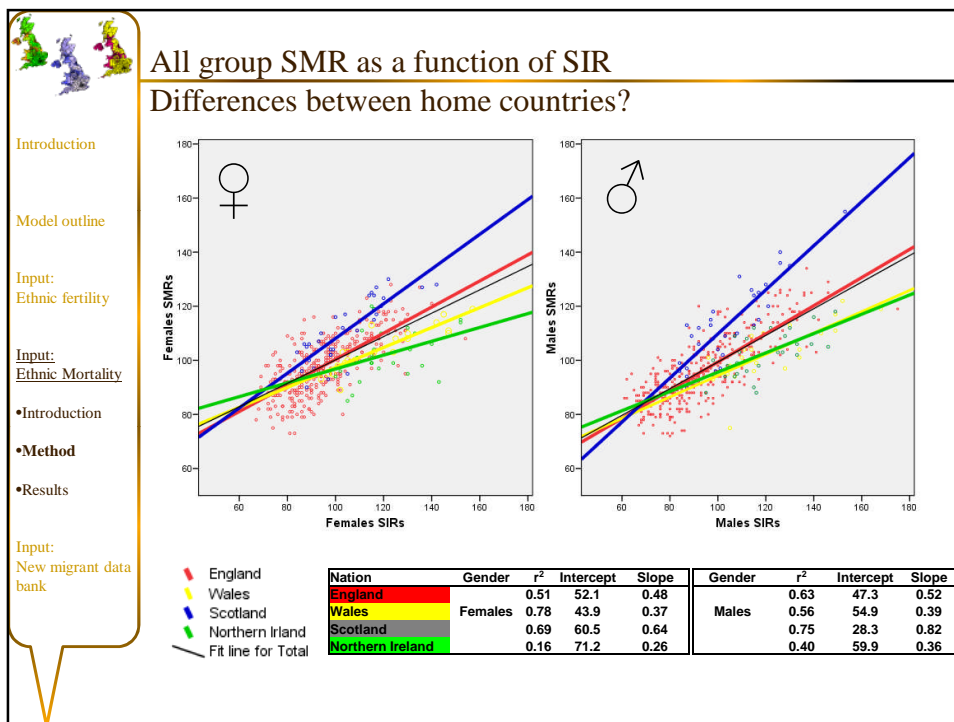
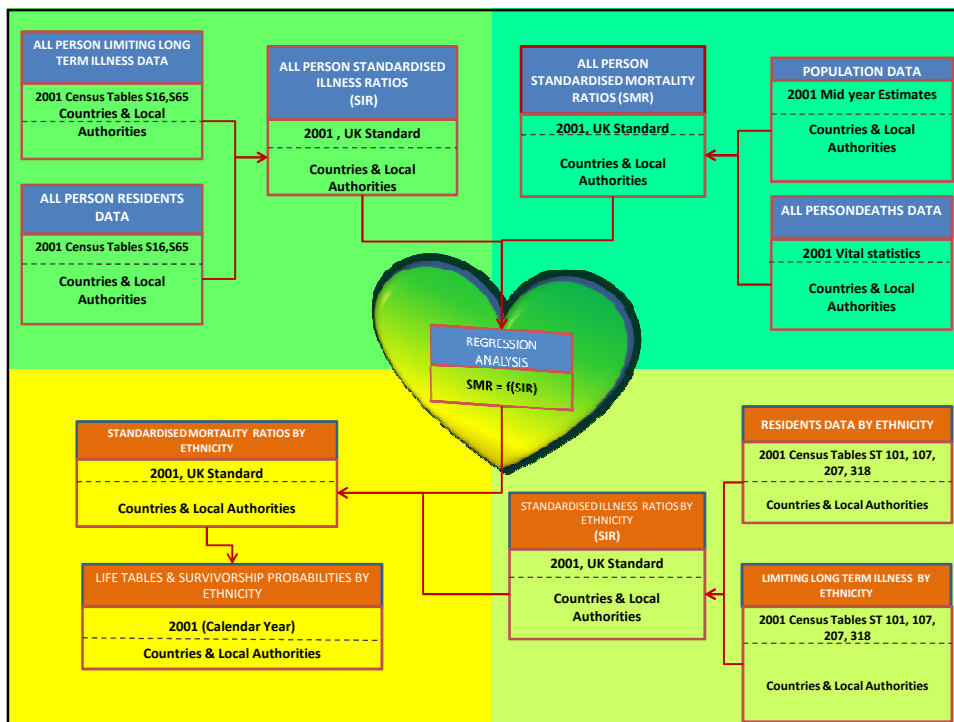
Self-reported health

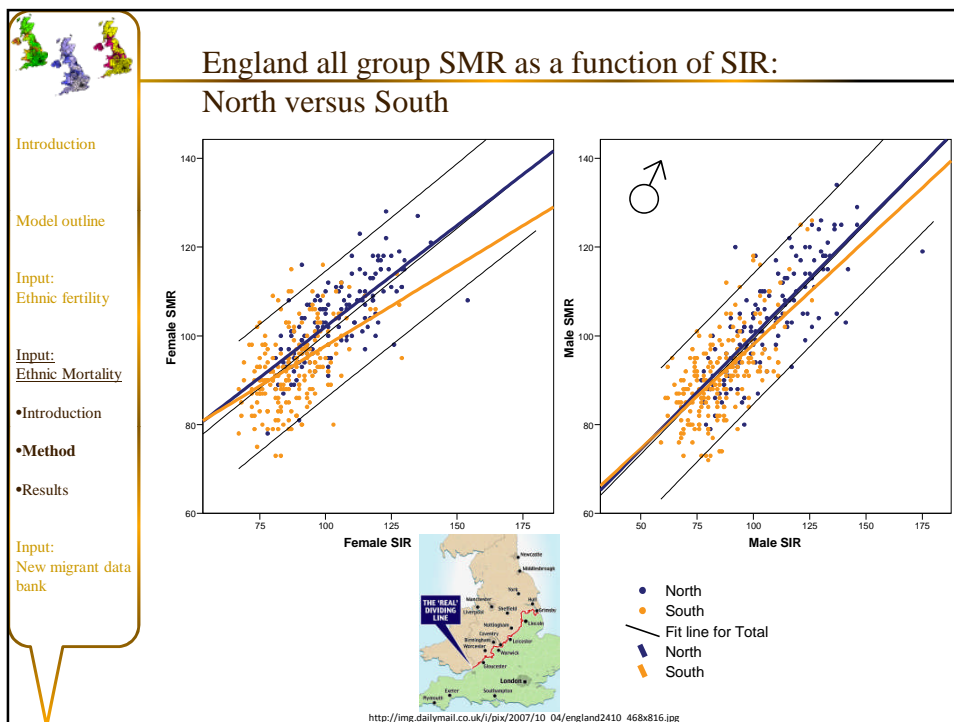
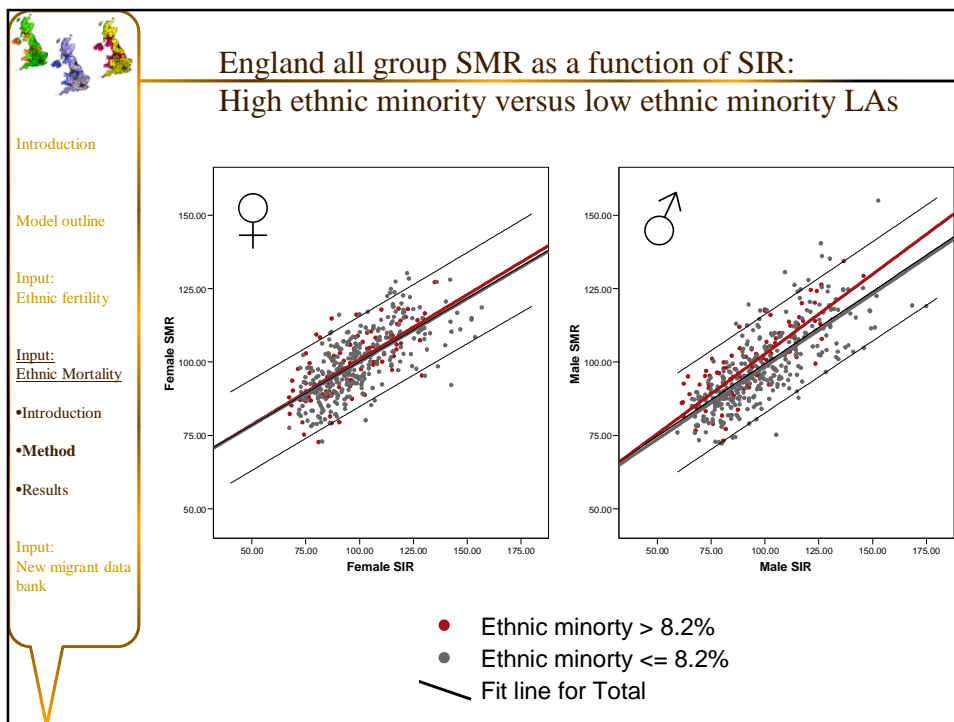
- a strong predictor of subsequent mortality.
(Burstrom and Friedlund 2001, McGee et al. (1999) Heistaro et al. (2001) Helwig-Larson et al. (2003) Franks et al. (2003), Singh and Sialpush (2001)

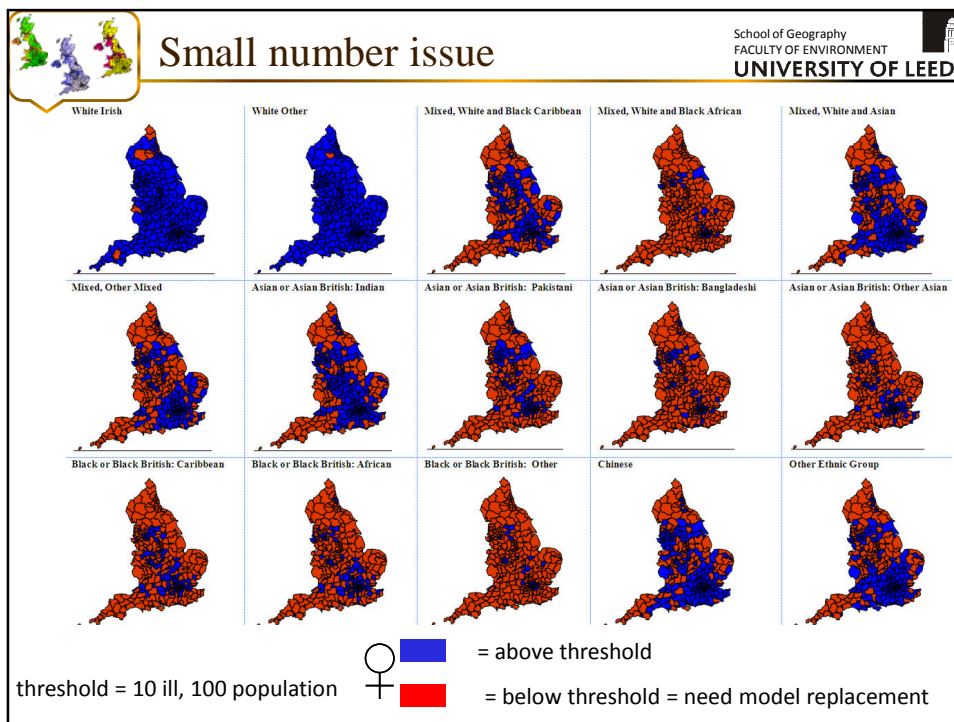
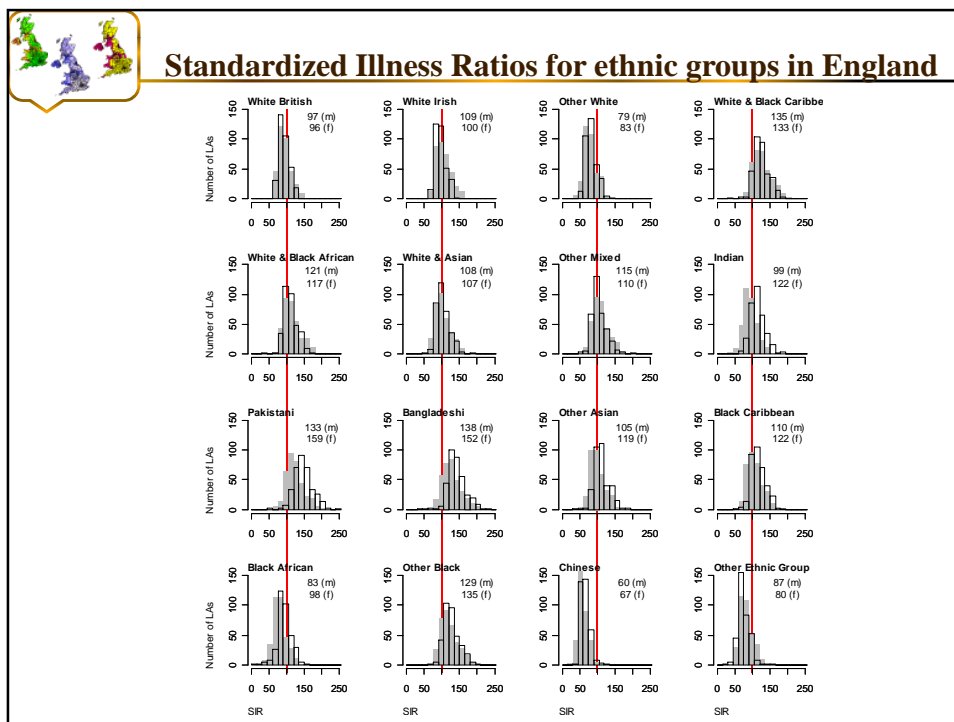
- The relationship for men is different from that for women.
- Socioeconomic factors are important in explaining mortality variation across groups but self-reported health status still has a significant influence after controlling for them.
- There is variation between racial/ethnic groups in the self-reported health-mortality link but it is not huge.
- There is an important influence of immigrant generation with the first generation having better self-reported health and mortality than subsequent generations.


13 Do you have any long-term illness, health problem or disability which limits your daily activities or the work you can do?
* Include problems which are due to old age.

Yes No



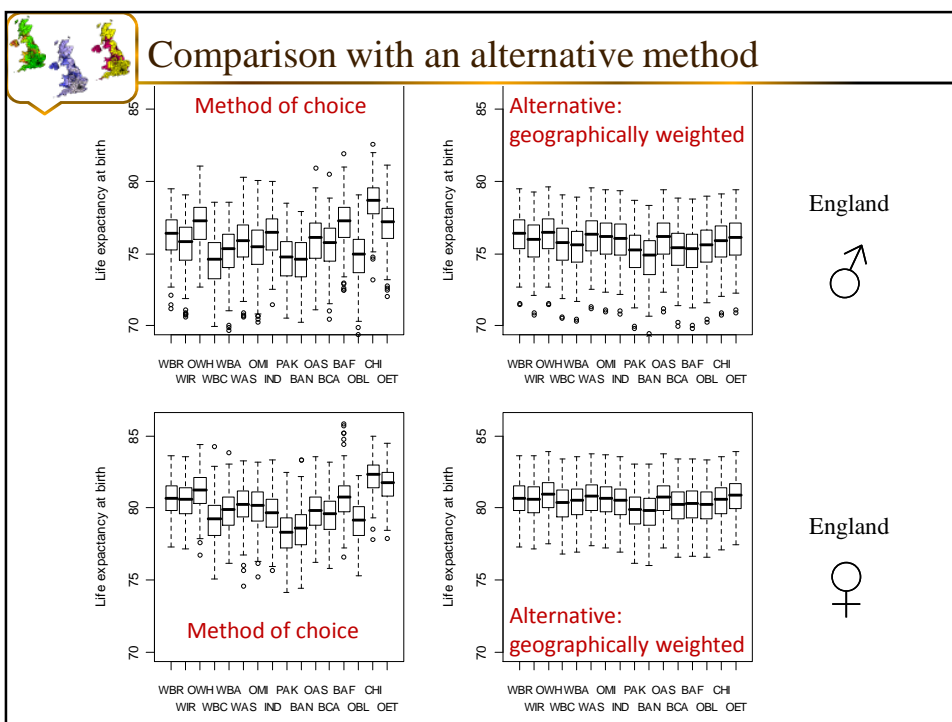


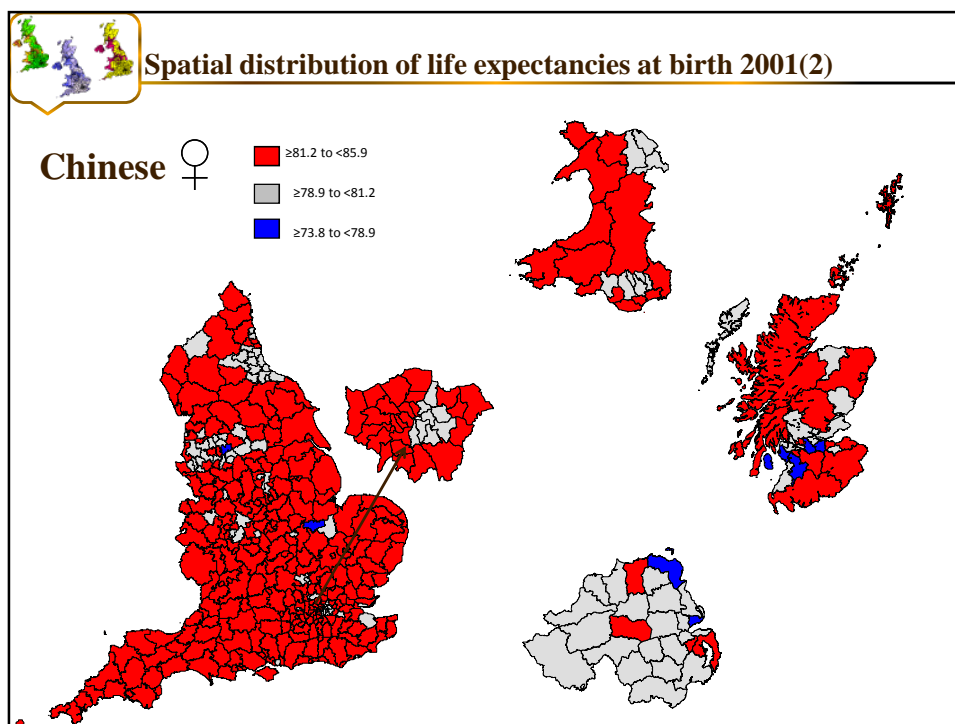
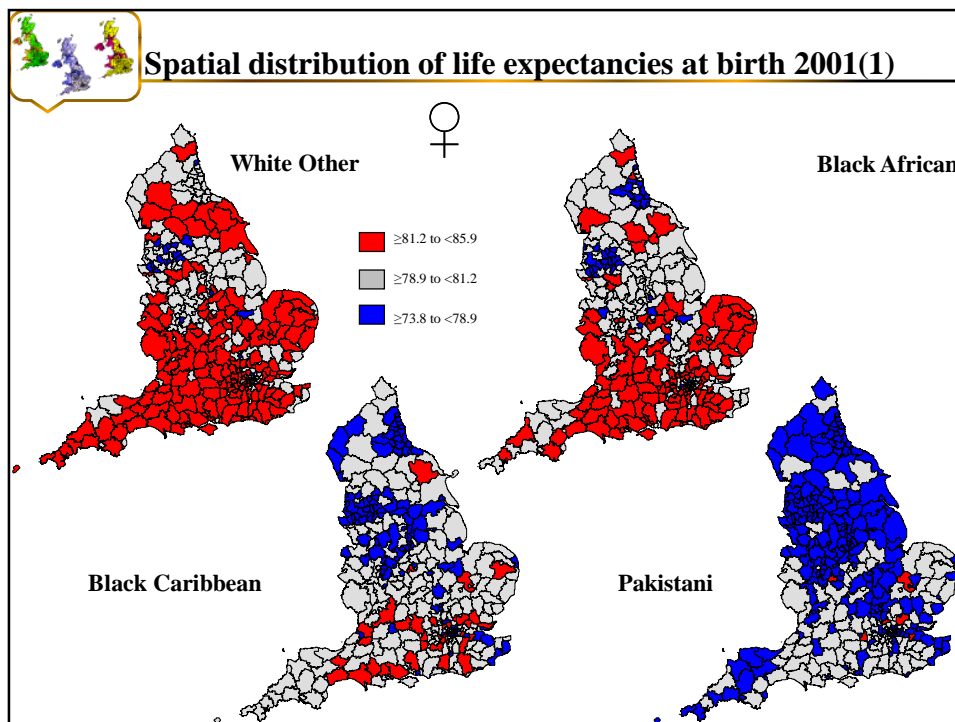


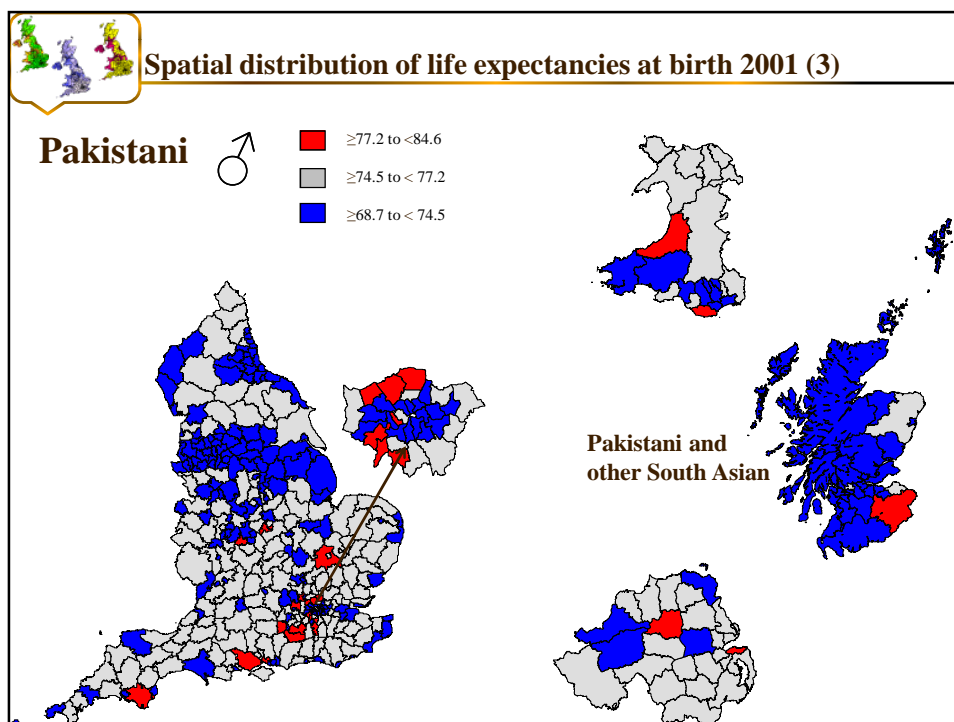



The ranking of mean life expectancy for ethnic groups, men and women, England, 2001

Rank	Ethnic group	Mean e_0		Rank	Ethnic group	Mean e_0	Ethnic group	Years		Rank
		Women	Men					$\bar{e}_0 - \bar{e}_1$	$\bar{e}_0 - \bar{e}_2$	
1	Chinese	82.1	1	Chinese	78.1	Indian	3.8	5		
2	Other Ethnic	81.5	2	Other White	76.9	Chinese	4	0		
3	Other White	81.3	3	Other Ethnic	76.2	Pakistani	4.2	1		
4	White British	80.5	4	Black African	76.1	Other Asian	4.3	2		
	All groups	80.5		All group	76	Black African	4.3	1		
5	Black African	80.4	5	White British	75.9	Other White	4.4	1		
6	White-Irish	80.3	6	Indian	75.5	All group	4.5	0		
7	White-Asian	80	7	Other Asian	75.2	White British	4.6	-1		
8	Other Mixed	79.9	8	White-Asian	75.1	Black Caribbean	4.7	1		
9	Other Asian	79.5	9	White-Irish	74.9	White-Asian	4.9	-1		
10	White-Black African	79.5	10	Other Mixed	74.6	Bangladeshi	5	-1		
11	Indian	79.3	11	Black Caribbean	74.4	Other Black	5.1	1		
12	Black Caribbean	79.1	12	White-Black African	74.2	Other Ethnic	5.3	-1		
13	White-Black Caribbean	78.7	13	Other Black	73.4	White-Black African	5.3	-2		
14	Other Black	78.5	14	White-Black Caribbean	73.4	White-Black Caribbean	5.3	-1		
15	Bangladeshi	77.7	15	Pakistani	73.1	Other Mixed	5.3	-2		
16	Pakistani	77.3	16	Bangladeshi	72.7	White-Irish	5.4	-3		







 **Summary**

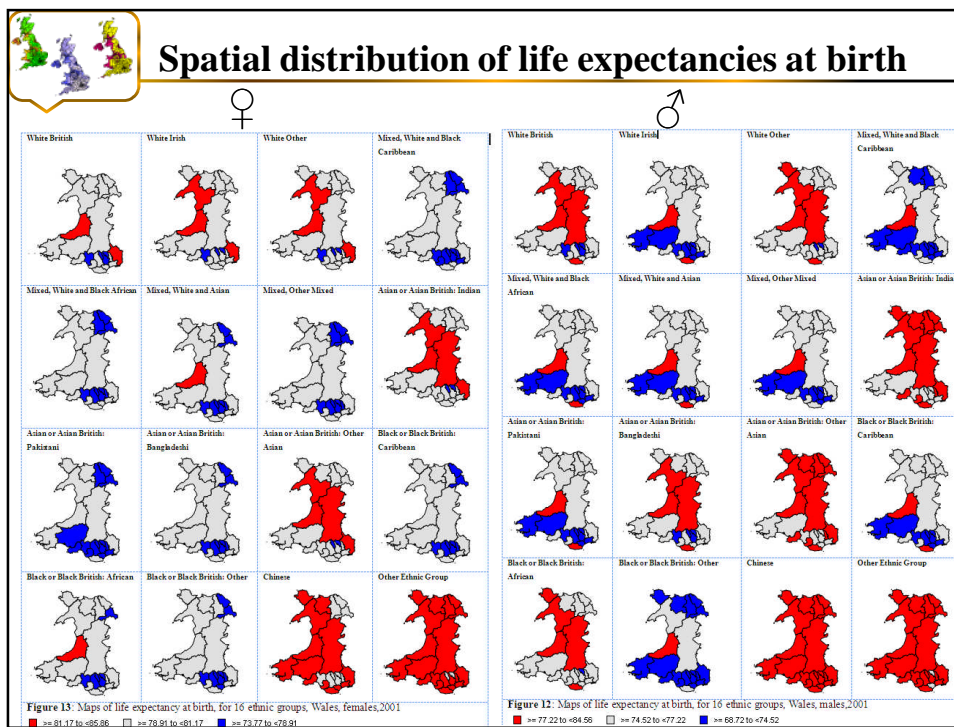
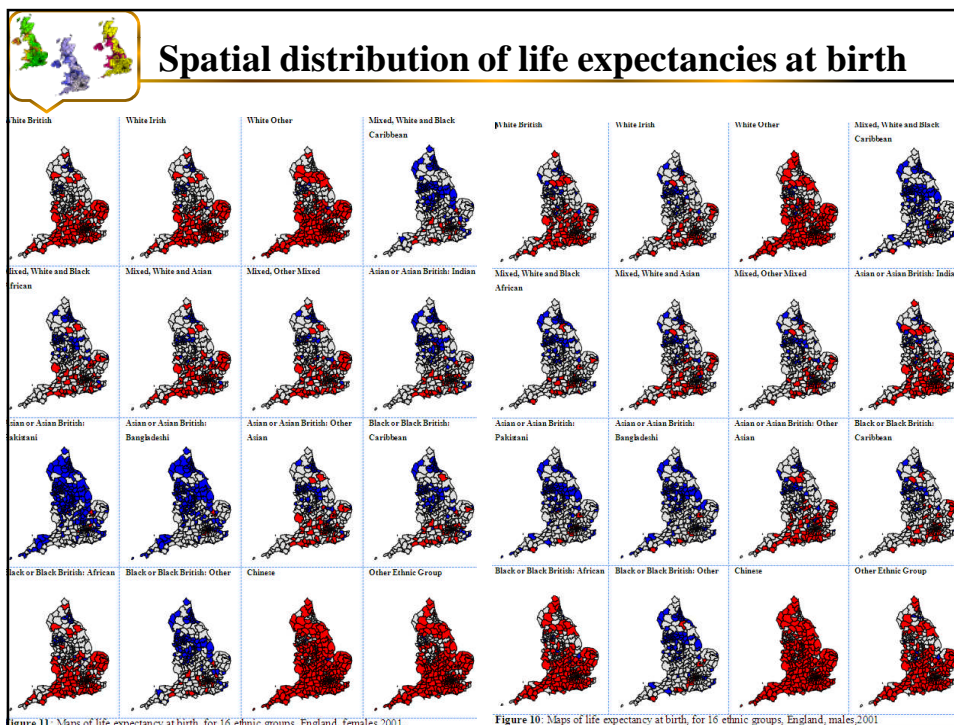
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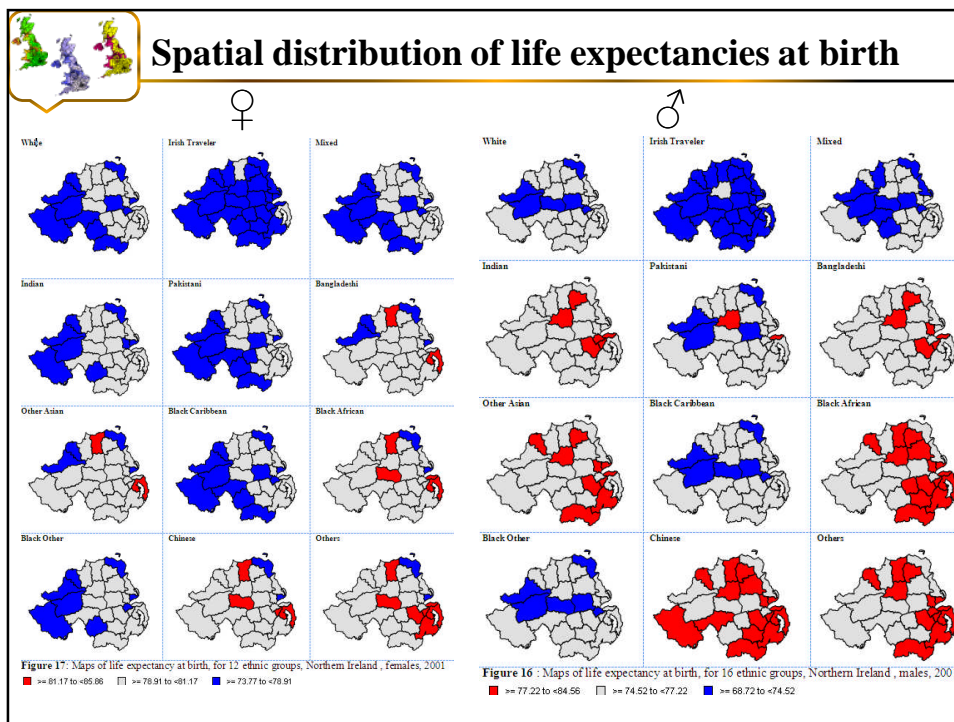
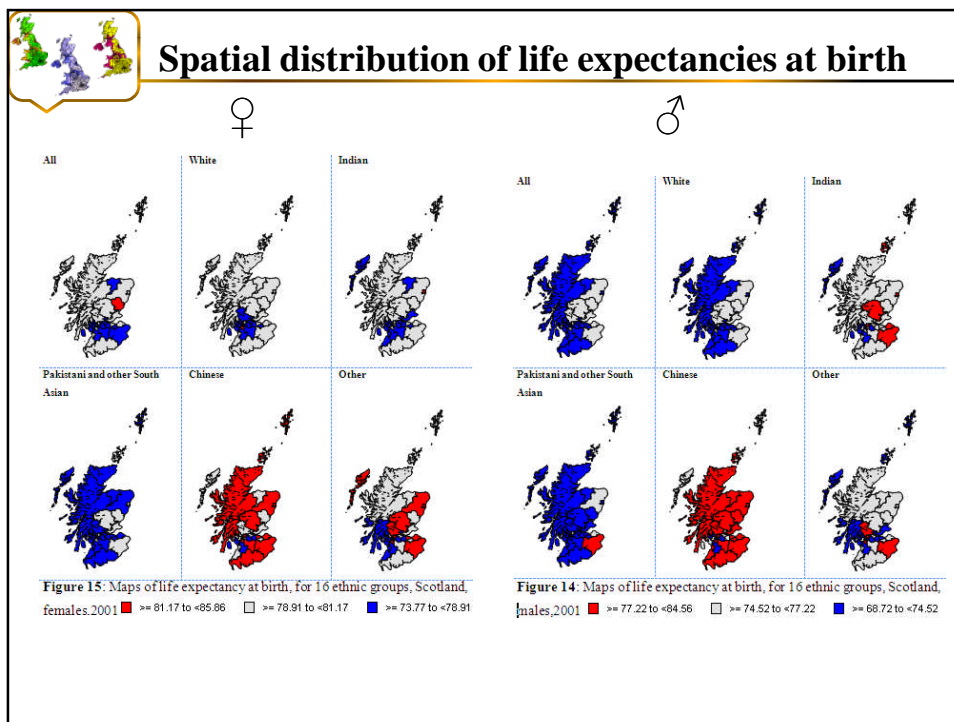
So far we calculated mortality rates (and survivorship probabilities) for 2001 by single year of age to 100+ and Local Authority for all 4 home countries, using the ethnic groups from Census 2001.


Currently we are working on extending out estimates to a time series from 2001 till 2007.

Preliminary results suggest that education has the most influence on life expectancy.

Data are with ONS at the moment for quality assurance.








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New Migrant databank

Peter Boden

GLA
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Context

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- There are few parts of the UK and its economy that remain unaffected by the impact of international migration
- Employers, local communities, schools, housing, health and social services, emergency services, retail and financial services providers, unions and advice agencies.....
- All are constrained by an incomplete knowledge of the true scale, distribution and profile of migration – from national to local level
- Population statistics firmly in the spotlight



This presentation...

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- Report on the development of our New Migrant Databank (NMD)
- Illustrate patterns and trends in immigration evident from alternative sources
- Illustrate alternative methods for sub-national estimation




New Migrant databank

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Purpose:


- ‘Single view’ of alternative statistics
- Clarity of conceptual and measurement differences
- Framework for analysis of trends and patterns in migration
- Analysis of short-term and long-term migration measurement
- Derivation of ethnic-group migration estimates



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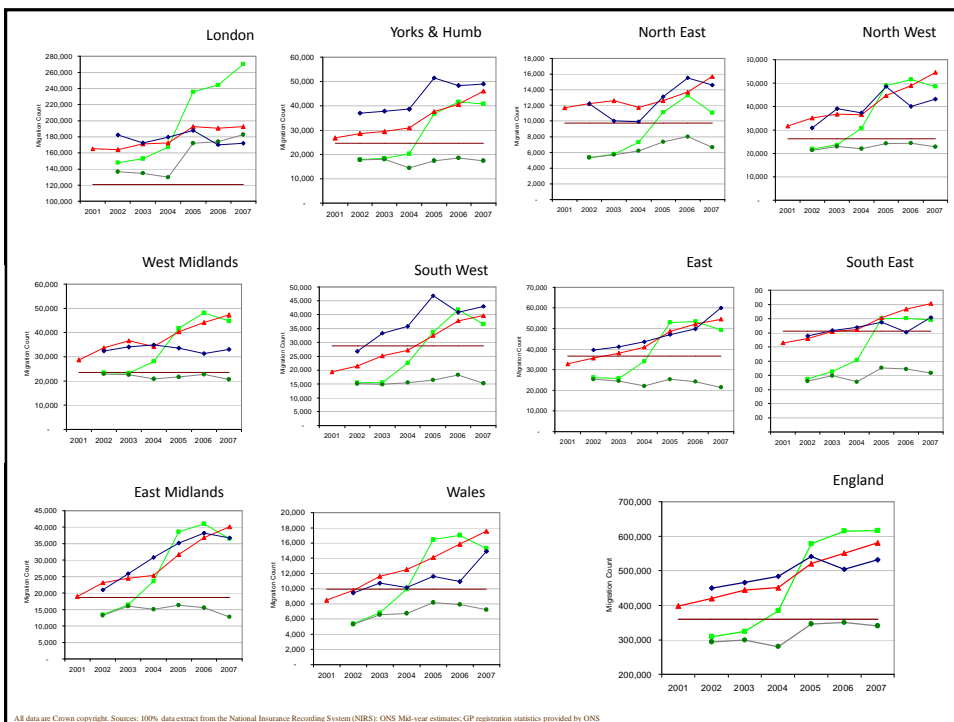
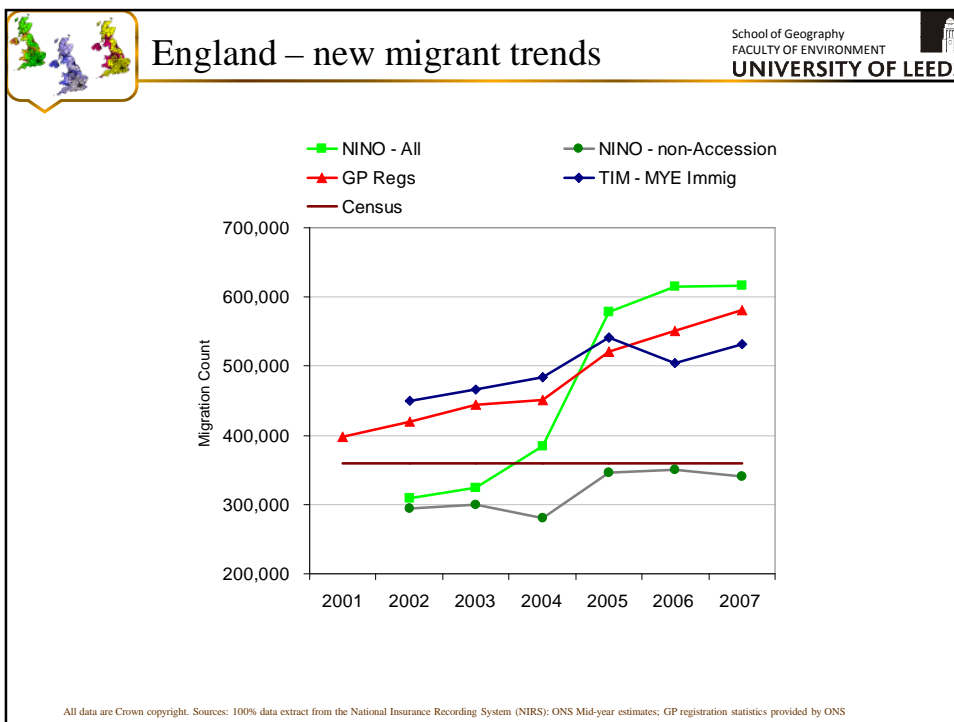
New Migrant
databank


Demonstration



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Patterns & Trends





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Estimation Methods



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National Statistics
Estimates of international migration

International Passenger Survey
Primary source

+


Home Office
Asylum seekers and dependants

+

Irish CSO
Migration between UK and Irish Republic

+

Adjustments
Visitor switchers & Migrant switchers



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National Statistics

Sub-national immigration estimates

International Passenger Survey
England & Wales

↓


IPS/Labour Force Survey
GOR / Wales level
10 zones

↓

IPS (smoothed) & LFS (London)
Intermediate Geography (NMGi)
63 zones

↓

Census 2001
Local Authority District / Unitary Authority
376 zones



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National Statistics

Sub-national emigration estimates

International Passenger Survey
England & Wales

↓

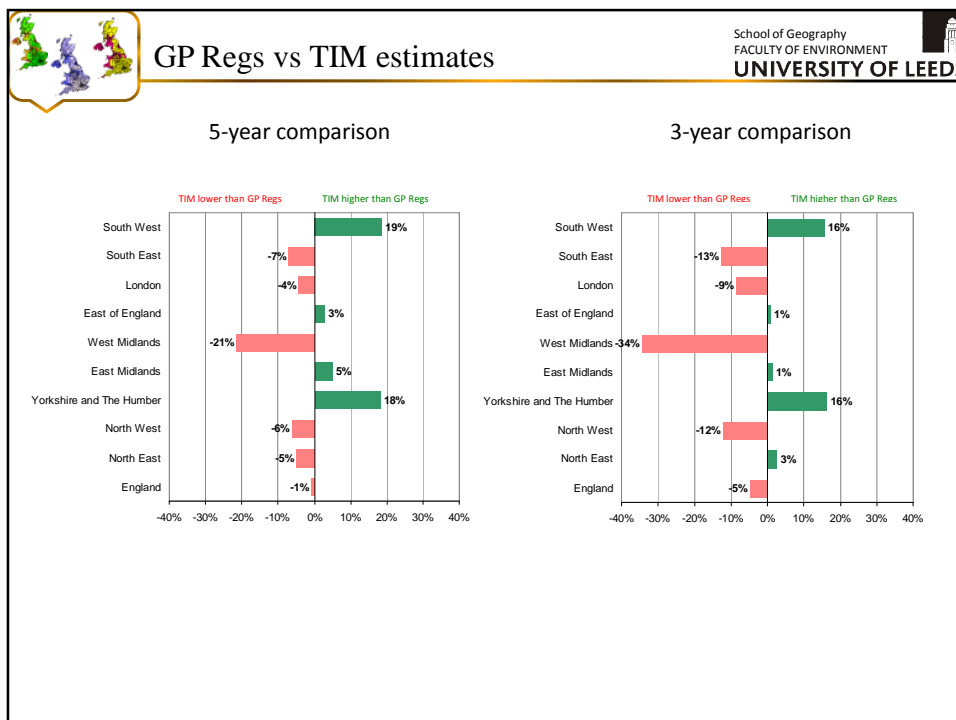
International Passenger Survey
GOR / Wales level
10 zones

↓

IPS (smoothed)
Intermediate Geography (NMGi)
63 zones

↓

Propensity to migrate model
Local Authority District / Unitary Authority
376 zones

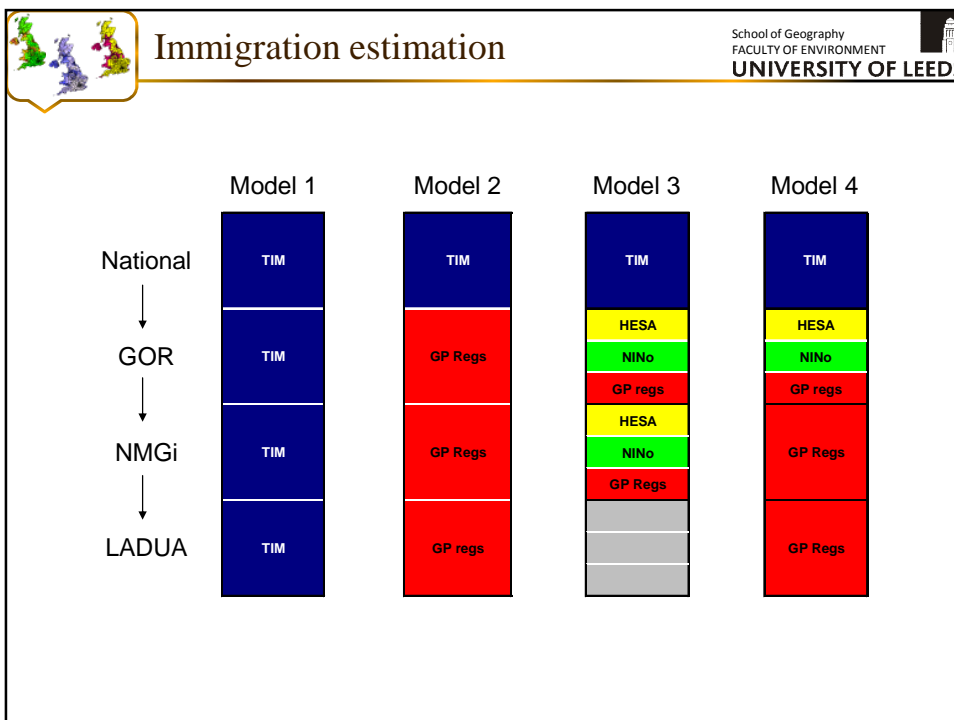
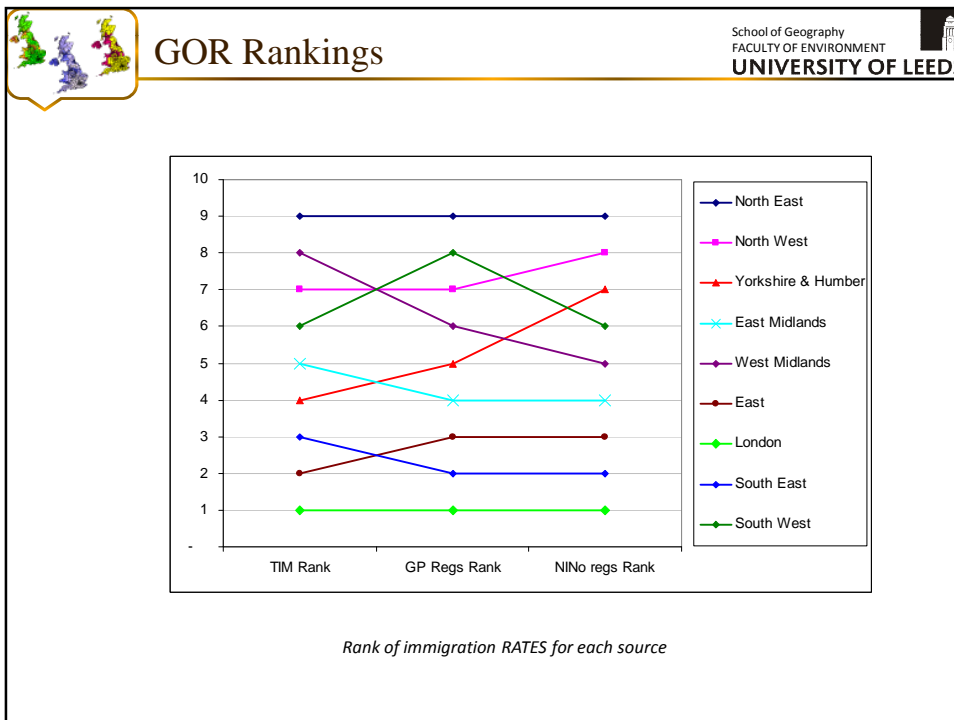


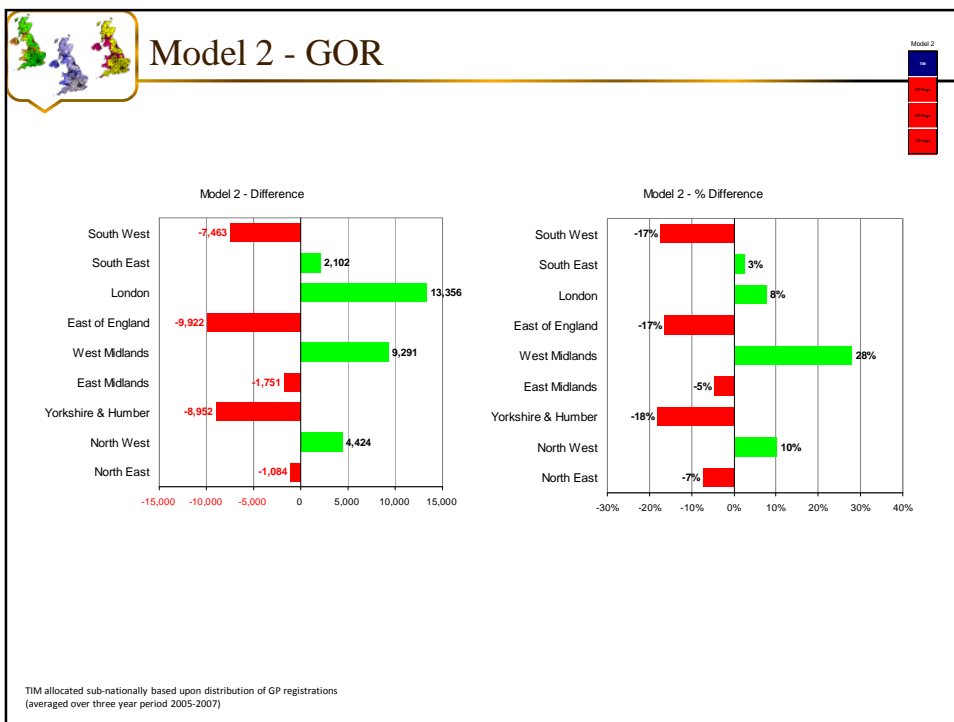
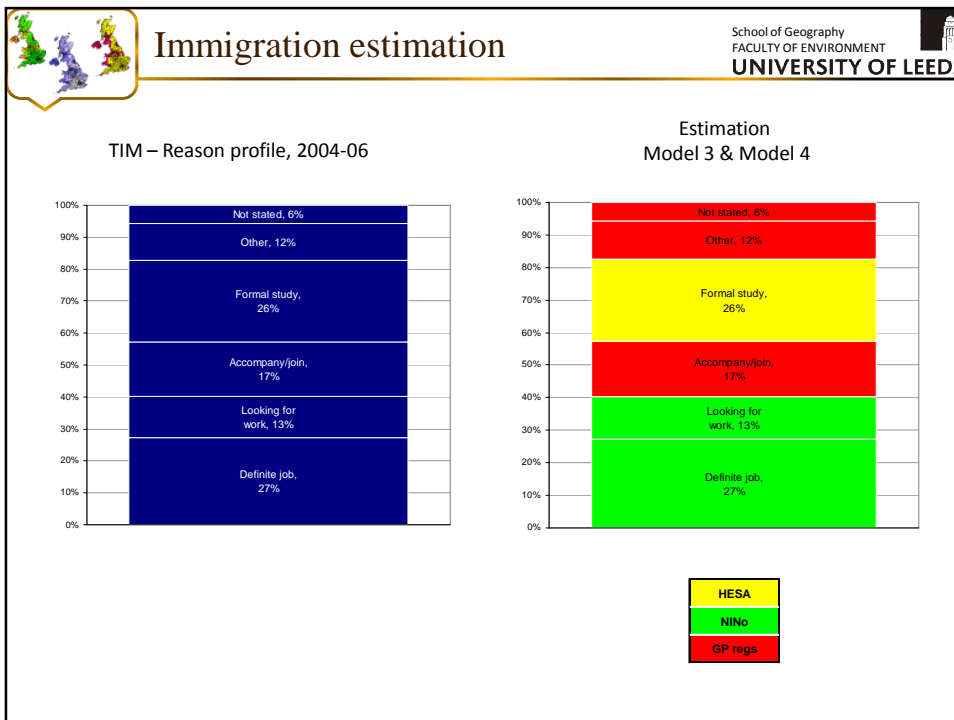
Immigration Rates


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	POP 2006	TIM rate	GP Rate	Ratio TIM:GP rate
London	7,512	22.9	25.7	89%
East	5,607	10.7	9.7	110%
ENGLAND	50,763	10.5	11.5	92%
South East	8,238	9.8	11.0	89%
Yorkshire & Humber	5,142	9.5	9.0	106%
East Midlands	4,364	8.4	9.2	91%
South West	5,124	8.4	7.7	108%
North West	6,853	6.3	8.0	79%
West Midlands	5,367	6.2	8.8	70%
North East	2,556	5.7	6.1	93%

Rates of immigration per 1000 resident population of receiving GOR







NMGi

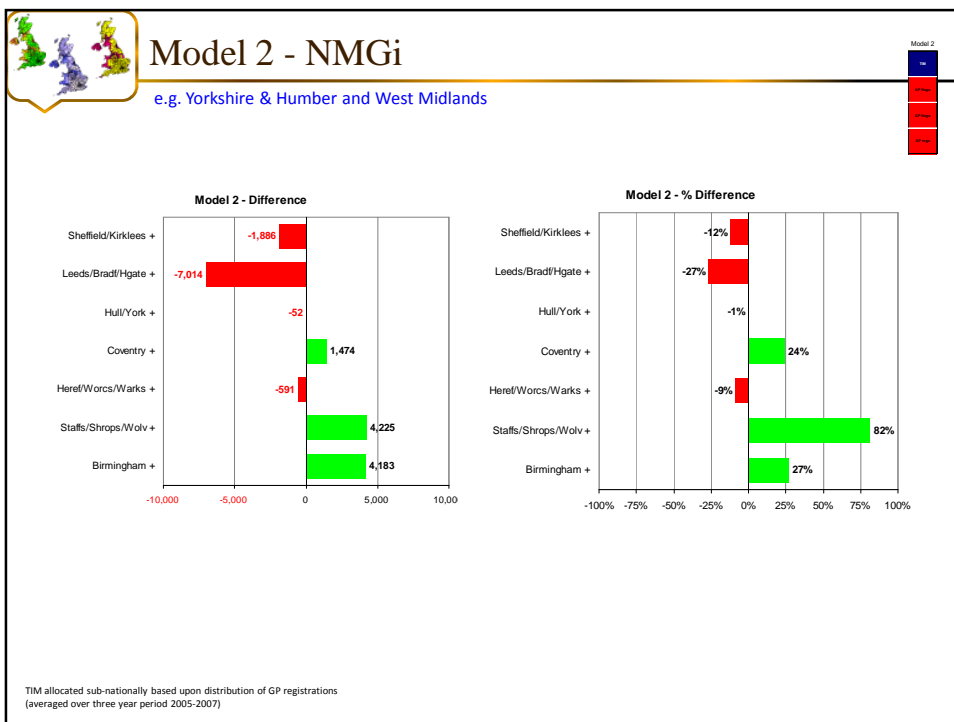
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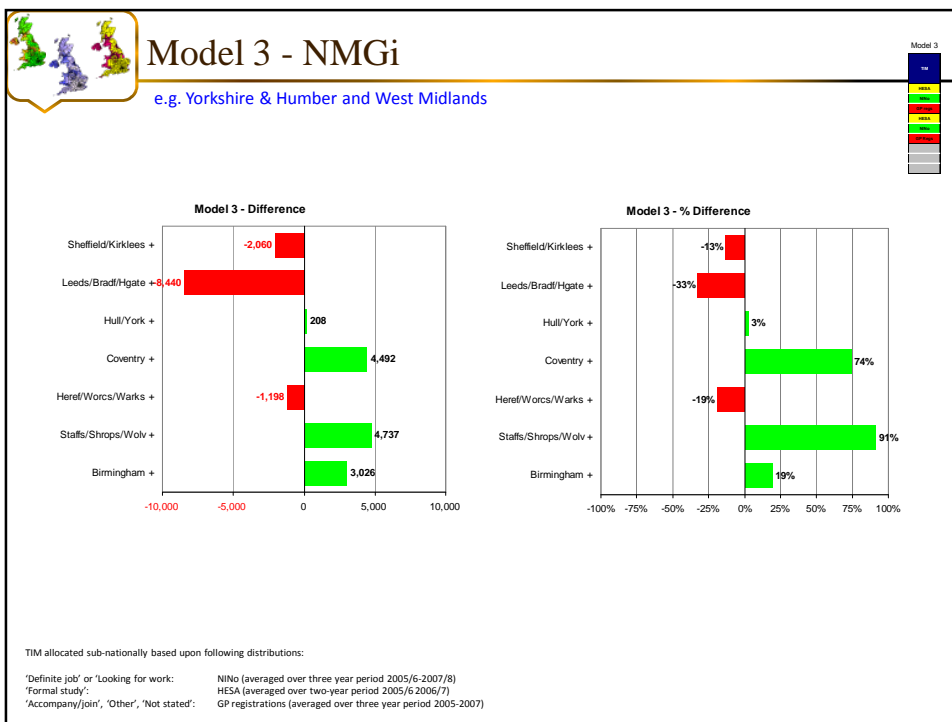
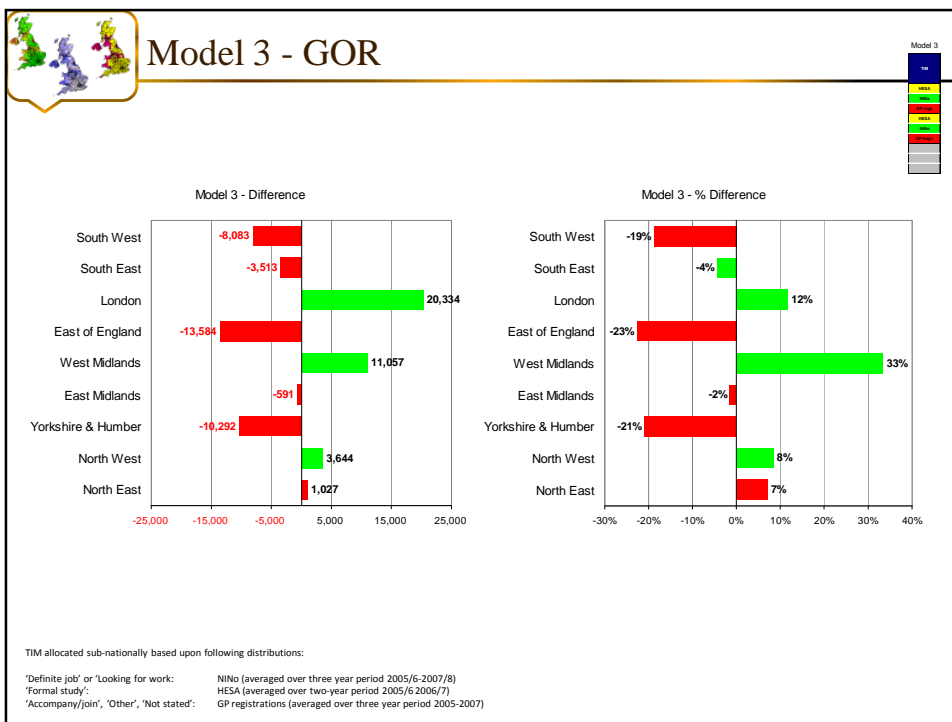
West Midlands

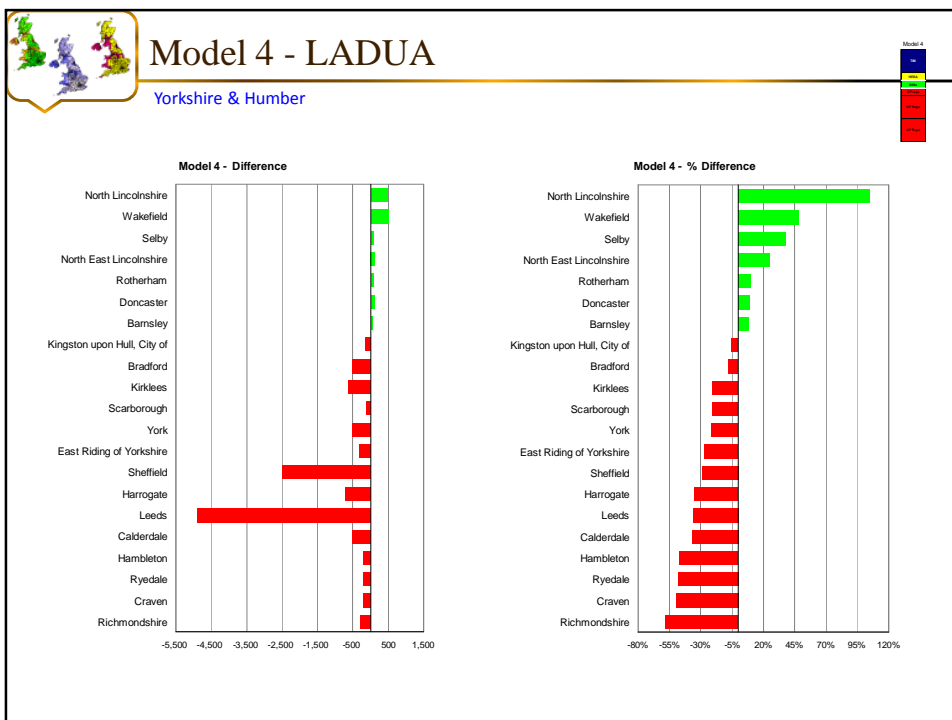
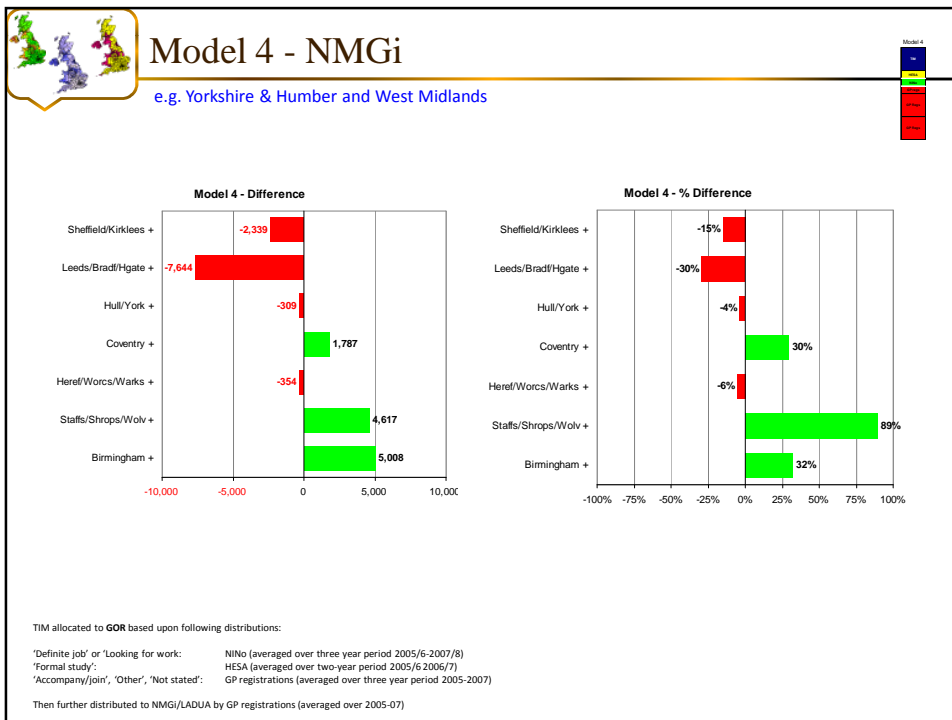
WM1	Birmingham +	Birmingham Bromsgrove Dudley Lichfield NorthWarwickshire Sandwell Solihull Tamworth Walsall
WM2	Staffs/Shrops/Wolv +	Bridgnorth CannockChase EastStaffordshire Newcastle-under-Lyme NorthShropshire Oswestry ShrewsburyandAtcham SouthShropshire SouthStaffordshire Stafford StaffordshireMoorlands Stoke-on-Trent TelfordandWrekin Wolverhampton
WM3	Heref/Worcs/Warwks +	Herefordshire; MalvernHills Redditch Stratford-on-Avon Warwick Worcester Wychavon WyreForest
WM4	Coventry +	Coventry NuneatonandBedworth Rugby

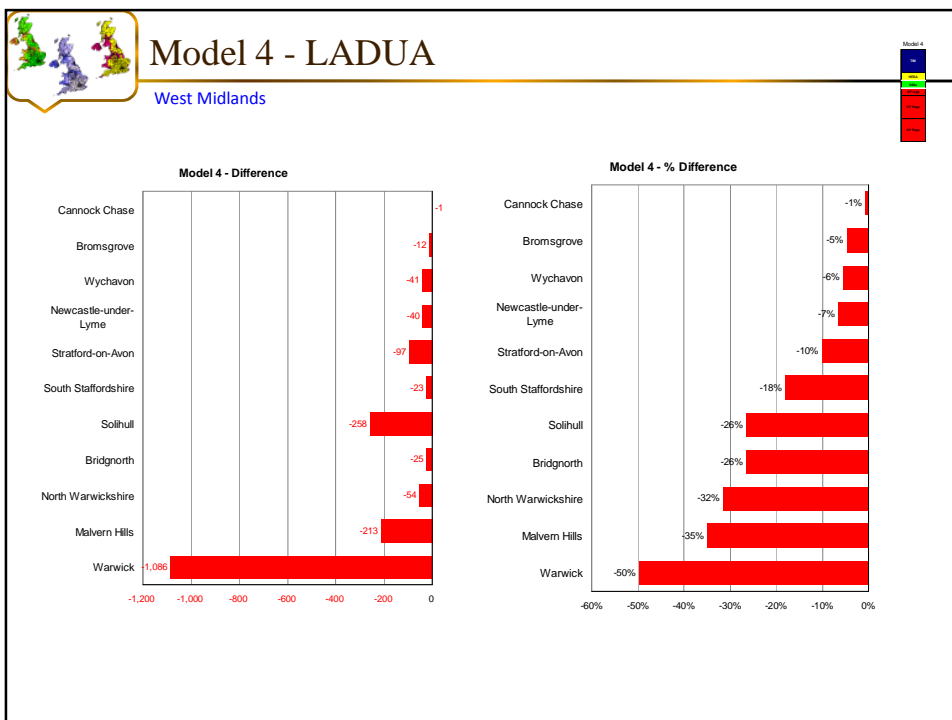
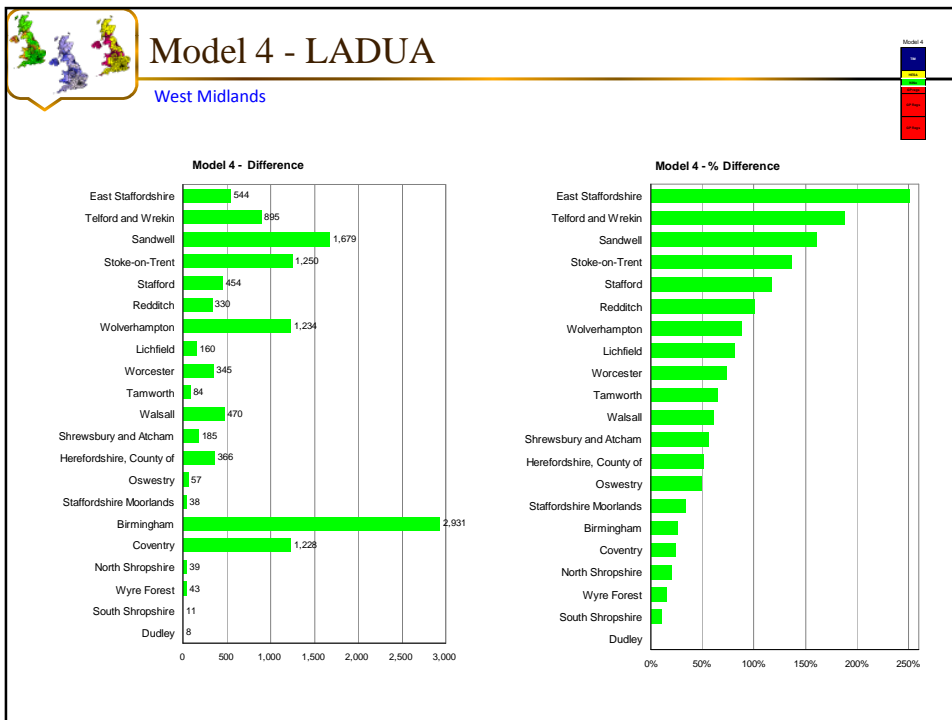
Yorkshire & The Humber


YH1	Hull/York +	EastRidingofYorkshire KingstonuponHull; NorthEastLincolnshire NorthLincolnshire Selby York
YH2	Leeds/Bradf/Harrogate +	Bradford Calderdale Craven Hambleton Harrogate Leeds Richmondshire Ryedale Scarborough
YH3	Sheffield/Kirklees +	Barnsley Doncaster Kirklees Rotherham Sheffield Wakefield












Summary

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- For estimation purposes, trying to make maximum use of most appropriate dataset at each level
- There are inconsistencies in sub-national TIM estimation that are evident when compared to alternative administrative datasets
- Ongoing research:
 - Working towards ‘alternative’ estimates of migration at all levels
 - Continued development of the NMD
 - Development of the analysis of short-term migration and emigration



Our project website:

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[http://www.geog.leeds.ac.uk
/projects/migrants/](http://www.geog.leeds.ac.uk/projects/migrants/)