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

Paul Norman, Pia Wohland, Peter Boden and Phil Rees

Presentation by Phil Rees

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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:

Acknowledgements
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What happens when international migrants settle? Ethnic group population trends and projections for UK local areas
**Aim, review, model and component estimates**

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

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

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

<table>
<thead>
<tr>
<th>Component</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Group</td>
<td>B 0 .......................... 100+ B 0 .......................... 100+</td>
<td></td>
</tr>
<tr>
<td>Start</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td>..............................</td>
<td>..............................</td>
</tr>
<tr>
<td>Deaths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Births)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infants</td>
<td>..............................</td>
<td>..............................</td>
</tr>
<tr>
<td>Out-migration</td>
<td>..............................</td>
<td>..............................</td>
</tr>
<tr>
<td>In-migration</td>
<td>..............................</td>
<td>..............................</td>
</tr>
<tr>
<td>Emigration</td>
<td>..............................</td>
<td>..............................</td>
</tr>
<tr>
<td>Immigration</td>
<td>..............................</td>
<td>..............................</td>
</tr>
<tr>
<td>End</td>
<td>Population</td>
<td></td>
</tr>
</tbody>
</table>
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

![Graphs showing population projections for different ethnic groups.](image-url)
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

Age in years

Relative change to 2001 Population

% of Population

Years

% of Population
Home country summary of the trend projections

- **England**
- **WA**
- **SC**
- **NI**

The charts display the percentage of total population from 2009 to 2051, categorized by various home countries. Each chart shows a breakdown of the population by different groups, with color-coded segments indicating the proportion of each group over the projected years.
Trend projections for regions

NW

YH

EM

EE

LO

SE

SW

WM

NE

NW

YH

EM

EE

LO

SE

SW

WM

NE

NW

YH

EM

EE

LO

SE

SW

WM

NE

NW

YH

EM

EE

LO

SE

SW

WM

NE

NW

YH

EM

EE

LO

SE

SW

WM

NE

NW

YH

EM

EE

LO

SE

SW

WM

NE
Spatial redistribution of ethnic groups:
(1) Indexes of Dissimilarity

<table>
<thead>
<tr>
<th>Group</th>
<th>Change 2051-2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td></td>
</tr>
<tr>
<td>British</td>
<td>WBR -11</td>
</tr>
<tr>
<td>Irish</td>
<td>WIR -14</td>
</tr>
<tr>
<td>Other White</td>
<td>OWH  3</td>
</tr>
<tr>
<td>Mixed</td>
<td></td>
</tr>
<tr>
<td>W &amp; B1 Caribbean</td>
<td>WBC -12</td>
</tr>
<tr>
<td>W &amp; B1 African</td>
<td>WBA -14</td>
</tr>
<tr>
<td>White &amp; Asian</td>
<td>WAS  -3</td>
</tr>
<tr>
<td>Other Mixed</td>
<td>OMI  -6</td>
</tr>
<tr>
<td>Asian or Asian British</td>
<td></td>
</tr>
<tr>
<td>Indian</td>
<td>IND  -3</td>
</tr>
<tr>
<td>Pakistani</td>
<td>PAK  -11</td>
</tr>
<tr>
<td>Bangladeshi</td>
<td>BAN  -16</td>
</tr>
<tr>
<td>Other Asian</td>
<td>OAS  -12</td>
</tr>
<tr>
<td>Black or Black British</td>
<td></td>
</tr>
<tr>
<td>Black Caribbean</td>
<td>BCA  -16</td>
</tr>
<tr>
<td>Black African</td>
<td>BAF  -15</td>
</tr>
<tr>
<td>Other Black</td>
<td>OBL  -26</td>
</tr>
<tr>
<td>Chinese or Other</td>
<td></td>
</tr>
<tr>
<td>Chinese</td>
<td>CHI  -2</td>
</tr>
<tr>
<td>Other Ethnic Group</td>
<td>OET  -8</td>
</tr>
</tbody>
</table>

Index of Dissimilarity 2001 vs. Index of Dissimilarity 2051

Comparison of ethnic group distributions, 2001 and 2051

\[ y = 0.66x + 6.7 \]

2051=2001
Spatial diffusion of selected ethnic groups: (2) Density

<table>
<thead>
<tr>
<th>Ethnic group</th>
<th>% of population 2006</th>
<th>Change in % 2006 to 2051</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LOD</td>
<td>LMD</td>
</tr>
<tr>
<td>White British</td>
<td>23</td>
<td>16</td>
</tr>
<tr>
<td>White Irish</td>
<td>59</td>
<td>4</td>
</tr>
<tr>
<td>Other White</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Mixed: WBC</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Mixed: WBA</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Mixed: WAS</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Other Mixed</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Indian</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Pakistani</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Bangladeshi</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Other Asian</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Black Caribbean</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Black African</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Other Black</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Chinese</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>Other Ethnic</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>All</td>
<td>22</td>
<td>14</td>
</tr>
</tbody>
</table>
Location quotient 2001 and 2051

Indian

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
Conclusions: component estimates

- 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
Conclusions: ethnic re-distribution

• 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.