BRIEFING
The Impact of Migration on UK Population Growth

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Based on official population estimates and population projections, this briefing examines the impact of migration on recent and future UK demographic trends.

**Key Points**

More than half (55%) of the increase of the UK population between 1991 and 2016 was due to the direct contribution of net migration.

Differences in net migration assumptions between the ‘low migration’ and the ‘high migration’ variant projections produce a range of variation of 5 million in the projected size of the UK population in 2041 (between 70.4 and 75.4 million).

In the principal projection the cumulative net inflow of post-2016 migrants accounts for over half (61%) of total population growth until 2041. A further 16% of projected population growth is attributable to the additional contribution of new migrants to natural change (i.e. births and deaths).

The projected contribution of net migration to population change considerably differs across the four UK constituent nations. Without net immigration Scotland’s and Wales’ populations are expected to stagnate over the next decade and decrease in the longer term.

Net migration assumptions have been continually revised in the projections released since the mid-1990s, reflecting rising levels of net migration and the high uncertainty of migration forecasting. As a result, the projected size of the UK population at the beginning of the 2030s based on the latest projections is 10 million higher than in the 1994-based projections.
Understanding the evidence

Key concepts
In the UK statistical system long-term international migrants are defined as people who move into and out of the country for at least 12 months. Net migration is the balance between immigration and emigration over a given time period. In demographic terms, natural change – i.e. the difference between the number of births and deaths – measures the contribution of vital events to the dynamics of the population. Immigration and emigration contribute to population change not only by altering the number of individuals in the country at a given time (direct contribution) but also by affecting natural change (indirect contribution).

Population estimates
The Office for National Statistics (ONS) produces annual estimates of the resident population of England and Wales and estimates for the UK as a whole by collating data provided by the Northern Ireland Statistics and Research Agency (NISRA) and by the National Records for Scotland (NRS) (ONS 2015a). The population at 30 June of a given year (stock) is obtained by annually updating the most recent census population count with data on demographic events contributing to population change between these two dates (births, deaths and migration flows). Population estimates made between census years are revised retrospectively so as to provide a consistent series of population estimates over time. The revised estimates for the intercensal period 2001 to 2011 resulted in an adjustment of 497,500 (0.8%) largely due to the underestimation of net migration in the previous series (ONS 2013). Mid-year population estimates are also used as the base-year population of demographic projections.

Population projections
Population projections are calculations showing the future development of a population based on a set of assumptions about fertility, mortality and net migration. Official UK projections are revised every two years by updating base-year population estimates and assumptions underlying future demographic dynamics so as to reflect the latest available information. Current projections take mid-2016 as the beginning of the projection period. The projection outputs consist of one principal projection reflecting the most likely population developments on the basis of recently observed trends, and 16 variant projections, intended to capture the uncertainty of the assumptions by showing the impact on population dynamics if one or more components of demographic change differ from the principal projection (ONS 2015b). In the principal projection, net migration is assumed to level off at +165,000 per year from 2021-22 onward. For comparative purposes, an important variant projection is the ‘zero net migration’ (aka ‘natural change only’), which assumes migration inflows and outflows exactly equal at all ages throughout the projection period (with same fertility and life expectancy as the principal projection). In this scenario future population change is driven only by natural change. The comparison between the principal projection and the zero net migration variant projection allows one to assess the overall impact of net migration on population trends – i.e. including both the direct contribution and its impact on natural change. Two other variant projections illustrating the demographic impact of higher or lower net immigration (also assuming the same fertility and life expectancy as the principal projection) are also available: a high migration variant (long-term annual net migration at +245,000) and a low migration variant (+85,000 per annum).
Net migration exceeded natural change for most of the past two decades
Population estimates show that net migration was a major component of population growth over the past two decades (Figure 1).

In particular, annual net migration substantially increased from the beginning of the 1990s, exceeding natural change as a driver of UK demographic trends in all years from mid-1998 to mid-2011. However, natural change has remained positive throughout the last two decades and has also continually increased from 2001 onwards, in particular due a rise in the number of births. As a result of a significant drop of net migration (by almost 100,000), 2011-12 and 2012-13 were the first years after more than a decade when natural change contributed more to the growth of the UK population than net migration – but net migration exceeded natural change again from 2013-14. Overall, between mid-1991 and mid-2016 net migration resulted in an addition of 4.5 million people to the UK population, accounting for just over half (55%) of total population growth.

However, this retrospective analysis does not account for the contribution of past migration to natural change – mainly to births. The number of births over a given period is determined both by the size and age structure of the female population and by fertility rates (i.e. the average number of children per woman in each age group). Migration impacts on both factors – i.e. it affects the number of women of childbearing age and, if migrant women have different fertility patterns, the total fertility rate of the population as a whole. A recent ONS report (Dormon 2014) using the latest Census data for England and Wales has shown that births to foreign-born women made up 25.5% of all births in 2011, up from 16.4% one decade earlier (2001). However, this was mainly due to the increase in the number of foreign-born women of childbearing age – total fertility rates of non-UK born women remained constant between 2001 and 2011 (2.21 in both years), resulting in a decreasing gap with the fertility levels of UK-born women that increased from 1.56 to 1.84 over the same period (Dormon 2014: 2). For a shorter period (2001-07) and for the UK as a whole, Tromans et al. (2009: 33) estimated the overall contribution of foreign-born women to the increase in the number of births at 65%. While these figures point to the significant indirect contribution that immigration is making to UK population trends, it has to be stressed that this analysis, by referring to country
of birth: i) considers a temporally broad definition of the migrant population (i.e. the overall impact on births of in-migration over the past three or more decades, not only the contribution of those who moved to the UK during the observed period) and ii) does not single out the effect of emigration (of both UK- and foreign-born women) and of immigration of UK-born women.

**UK population projected to grow to 70-75 million by 2041**

Figure 2 shows the projected size of the UK population in the period to 2041 according to different net migration assumptions.

![Projected UK population: 2016–2041](chart.png)

In the principal projection, in which net migration is assumed to level off at 165,000 annually, the size of the UK population is projected to increase by almost 7.3 million – from 65.6 million in 2016 to 72.9 million by 2041 (+11%). In this demographic scenario, the UK population will reach 70 million by 2029. The different net migration levels assumed in the high migration and low migration variants (+80,000 per year) lead to a variation after 25 years of ±2.5 million people – or, in relative terms, a 7% difference between the low migration and high migration variant.

The 2016-based projections for population growth are lower than the previous, 2014-based projections. Based on 2014 data, ONS had projected that net migration would be 185,000 per year in the long term and that by 2039 the population would be 74.3m under the principal projection. The more recent 2016-based projections reduced the assumption for long-term net migration levels to 165,000 (the level that it had been in the earlier, 2012-based projections), and also changed other assumptions related to fertility and life expectancy. As a result, the projected population in 2039 fell to 72.5m.
Figure 3, which refers to the 2016-based principal projection, shows the breakdown of the projected population increase into three components: the natural change that would occur in the absence of migration during the projection period (zero net migration variant); the direct contribution of post-2016 net migration (i.e. the number of individuals who will migrate to the UK minus the number of those who will leave the country); and the indirect contribution of post-2016 net migration, i.e. its effect on natural change.

The UK population is projected to rise both because of positive natural change and because of positive net migration. Population growth in the absence of further net migration would total 1.7 million over the next 25 years. However, the size of the UK population with no additional net migration would level off at 67 million over the next two decades and would eventually start to decline after 2035.

In the principal projection the cumulative net inflow of new migrants accounts for 61% of total population growth, i.e. an addition of 4.4 million. The additional (indirect) contribution of post-2016 immigrants to natural change until 2041 is estimated at 1.1 million, i.e. 16% of projected population growth. In total, therefore, 77% of the expected increase in the UK population is attributable, directly or indirectly, to future net migration. It should also be emphasised that, while these calculations are based on the same assumptions about future fertility and mortality rates irrespective of the assumed level of net migration, fertility and mortality rates for recent migrants are likely to differ, to some extent, from those for the long-established population – e.g. assuming higher fertility rates for post-2016 immigrant women would imply a larger indirect contribution of migration to natural change.
Figure 4

Scotland’s and Wales’ population would decline without future migration

Figure 4 compares projected population growth rates in England, Wales, Scotland and Northern Ireland between 2016 and 2041, in the principal projection and in the zero net migration variant.

Demographic and migration trends differ considerably across the four UK constituent nations, and future population scenarios reflect these differences. According to the principal projection, England will experience by far the largest population growth (+12% over the next 25 years), while Scotland and Wales are projected to have the slowest rate of increase (5%). The overall (i.e. direct and indirect) contribution of net migration to population change will also vary across UK nations. Net migration will be the major component of demographic change in England, accounting for 57% of projected population growth respectively in the principal scenario. In Scotland and Wales, net migration is the only determinant of long-term population growth: without net immigration their respective populations would remain essentially stable for the next decade and decrease over a longer time horizon. In contrast, in Northern Ireland (which has the highest fertility rate amongst UK nations) natural change is projected to be by far the main driver of future population trends, with net migration having very little impact.

Evidence gaps and limitations

Population projections are not forecasts, i.e. they do not attempt to predict the impact of changes in the political, economic, social and cultural realm which may affect demographic patterns and trends. They are in general purely mechanical calculations that show the outcomes of sets of assumptions made for the three components of demographic change (fertility, mortality and migration). Projections are typically reliable for the short to medium term, but uncertainty increases the further they are carried forward in time. Any upward or downward changes in fertility, mortality and migration assumptions, compounded over time, can lead to significant variations in the projected population size and structure. Future international migration is more difficult to project than fertility and mortality because migration flows are often affected by sudden changes in economic, social, or political...
factors which are hard to predict or quantify – as exemplified by the sharp decline of immigration to the UK in 2011-12 resulting from both the restrictions introduced by the 2011-12 immigration reform and the unfavourable economic climate. Migration assumptions are therefore the major source of uncertainty for long-term population projections, particularly in demographic regimes such as the UK which are characterised by below replacement fertility and low mortality levels.

In order to reflect the information provided by the most recently observed demographic trends, assumptions of future levels of fertility, mortality and migration are continually updated in subsequent revisions of population projections. In particular, the high volatility of recent migration inflows and outflows has resulted in sizeable revisions of future migration assumptions made in different sets of population projections released throughout the 1990s and 2000s. In the 1994-based principal projection net migration was assumed to return to zero in the long-term, reflecting the balance between immigration and emigration proximate to zero observed during the 1980s and early 1990s. As a result, the size of the UK population was projected to peak at 61 million in 2023 and then start to decrease (figure 5).

Figure 5

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual net migration (long-term)</th>
<th>Total Fertility Rate (long-term)</th>
<th>Life expectancy at birth (2031)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Men</td>
</tr>
<tr>
<td>1994</td>
<td>0</td>
<td>1.80</td>
<td>78.3</td>
</tr>
<tr>
<td>1998</td>
<td>95,000</td>
<td>1.80</td>
<td>79.2</td>
</tr>
<tr>
<td>2004</td>
<td>145,000</td>
<td>1.74</td>
<td>81.4</td>
</tr>
<tr>
<td>2008</td>
<td>180,000</td>
<td>1.84</td>
<td>82.9</td>
</tr>
<tr>
<td>2012</td>
<td>165,000</td>
<td>1.89</td>
<td>83.3</td>
</tr>
<tr>
<td>2014</td>
<td>185,000</td>
<td>1.89</td>
<td>82.9</td>
</tr>
<tr>
<td>2016</td>
<td>165,000</td>
<td>1.82</td>
<td>82.2</td>
</tr>
</tbody>
</table>

Source: Office for National Statistics; Government Actuaries’ Department
In the subsequent sets of projections, upward revisions of assumed net migration levels were introduced to reflect the rapid increase in migration flows to and from the UK – and due to some improvement in survey coverage and procedural changes in the estimation of long-term flows. As a result of these adjustments, projected population growth rates have also progressively increased: in the latest revision (2016-based) the projected size of the UK population in 2031 is 10 million higher than in projections produced in the mid-early 1990s. Increases in net migration assumptions were the main drivers of the higher projected demographic growth rates in most subsequent revisions, while changes in fertility and mortality assumptions have been comparatively less significant. However in projections released from the second half of the 2000s net migration assumptions were subject to less sizeable adjustments (in the range 165-200K), resulting in rather similar population trajectories.

The ONS does not attempt to model the impact of policy changes when setting its migration assumptions, and thus current projections do not reflect a prediction about how Brexit might affect international migration. However, it is possible that further revisions will be made to the assumptions as we come to know more about post-Brexit migration patterns.

References


Further readings


With thanks to Phil Rees, Sarah Spencer and former colleagues of the Migration Observatory for their helpful comments on an earlier version of this briefing.
The Migration Observatory
Based at the Centre on Migration, Policy and Society (COMPAS) at the University of Oxford, the Migration Observatory provides independent, authoritative, evidence-based analysis of data on migration and migrants in the UK, to inform media, public and policy debates, and to generate high quality research on international migration and public policy issues. The Observatory’s analysis involves experts from a wide range of disciplines and departments at the University of Oxford.

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The Migration Observatory is based at the ESRC Centre on Migration, Policy and Society (COMPAS) at the University of Oxford. The mission of COMPAS is to conduct high quality research in order to develop theory and knowledge, inform policy-making and public debate, and engage users of research within the field of migration.

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