

Article

2016-based subnational population projections for England: changes to methodology and source data

Summarises changes to source data and methodological improvements being implemented for the 2016-based subnational population projections for England.

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1 . Introduction

Office for National Statistics (ONS) produces subnational population projections (SNPPs) every two years. They provide an indication of the future population size and age structure of local authorities in England. They need to meet your needs but also be produced in a consistent way across all areas. This means that they can be used as a common framework for informing local planning. Their uses include:

- informing local planning of healthcare, education and other services
- forming the basis for other products such as household projections
- providing a basis for researchers and other organisations that also produce their own projections

The 2016-based SNPPs have been pre-announced for May to June 2018. We aspire to publish in late May but are not yet able to commit to a definite date. The SNPPs will provide indicative figures of the population from mid-2016 to mid-2041, based on the continuation of recent trends, and will be consistent with the 2016-based national population projections for the UK, published on 26 October 2017.

Any new set of SNPPs would be expected to differ from the previous one to reflect the changing levels of births, deaths, migration and total population in the intervening period. However, the 2016-based SNPPs will also benefit from new source data and improvements to the projections methodology:

- they will be based on revised mid-2016 population estimates, which are scheduled to be published in March 2018 along with a revised back series of population estimates from mid-2011 onwards (this refers to the period starting at mid-2011, so the first set of estimates that will actually change is the mid-2012 estimates)
- the revised population estimates will use new methods for both emigration and foreign armed forces; these new data will also feed into the SNPPs
- the development of a new system has allowed us to introduce improvements to the actual SNPPs methodology and will also allow greater flexibility in future

This article provides an overview of SNPPs methodology and then more information on these developments.

2 . Feedback

We welcome your feedback on the changes to the 2016-based subnational population projections (SNPPs). Please respond between 19 January and 2 March 2018. We are especially interested in:

- feedback via email on any issues with the changes that are being applied and whether there is anything we have not considered
- comments on any activities that you would find helpful at the time of the SNPPs release

Please email pop.info@ons.gov.uk by 2 March 2018, indicating in the title of your email that you are responding to the SNPPs user engagement and who you are representing. Although Office for National Statistics does not intend to publish any individual responses, we may if required publish responses to this article under a Freedom of Information request.

Whilst all feedback will be considered it is only in exceptional cases where special adjustments may be implemented; these will be judged on a case by case basis. Any resulting changes will be detailed in the methodology article accompanying the release.

3 . Overview of methodology

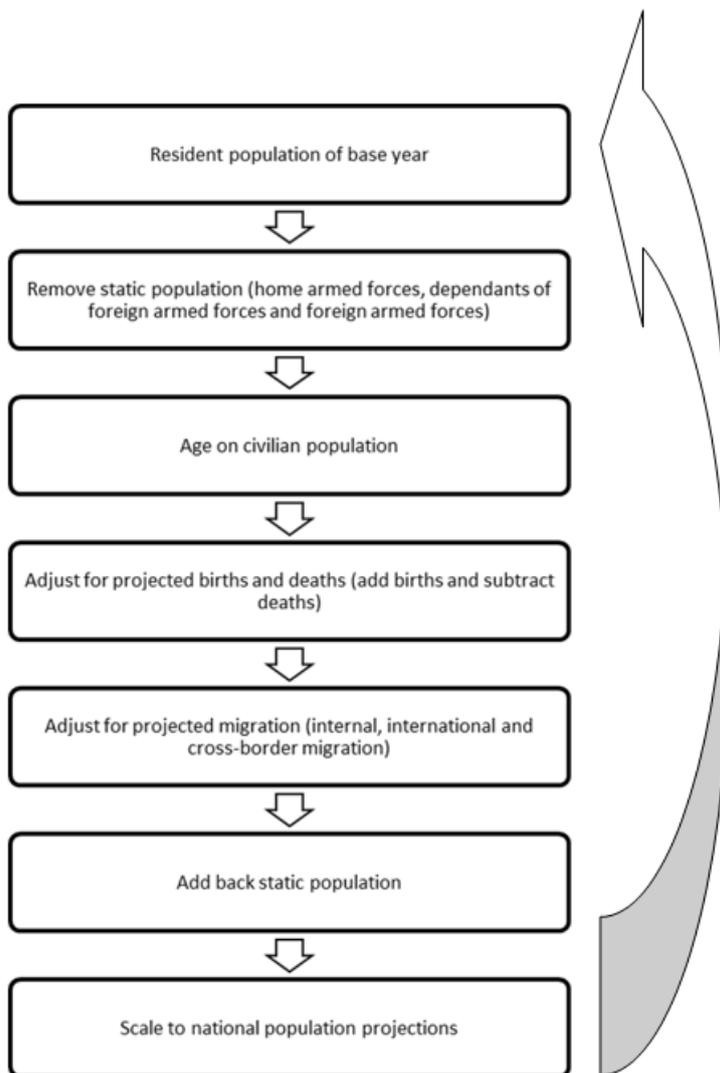
The subnational population projections use the internationally accepted cohort component methodology. They take the local authority mid-year population estimates as their starting point and assume that recent demographic trends continue. To model recent trends, data for up to five preceding years are used, so for example, in the 2016-based projections, trends are based on data from mid-2011 to mid-2016. These project forward 25 years from the base year for each local authority, by age and sex.

The projections for each year are calculated by first removing the population of armed forces (including dependants of foreign armed forces), who are treated as a “static population” whose size and age-sex structure does not change over the projection period. The population from the previous year is then aged on (that is, the population is made one year older; for example, the one-year-olds from the previous year become the basis for the two-year-olds in the next year) and local fertility and mortality rates are applied to calculate projected numbers of births and deaths. The population is then adjusted for projected internal, cross-border and international migration flows, including asylum seekers and persons granted humanitarian protection.

Each of these components (except internal migration, which sums to zero at national level) is scaled to its respective total from the corresponding principal national population projections, and once the static population has been added back, the sum of projected population for each local authority is scaled to the national population projections total for England. This process is repeated for each year of the projection period.

Figure 1 illustrates the projection process.

Figure 1: Subnational population projections process



4 . Information on new source data

A revised back series of population estimates covering the period mid-2011 to mid-2016 (so affecting the actual estimates from mid-2012 to mid-2016) will be published in March 2018. This will mean the starting population for the 2016-based subnational population projections (SNPPs) will differ from the current mid-2016 estimates.

The following outlines the new methods that have been used to create the revised back series. The methods for all other aspects of the revised back series are unchanged.

Emigration

The International Passenger Survey (IPS) is the main source of information on international migration. It is a voluntary sample survey of passengers travelling through airports, seaports and the Channel Tunnel, providing information on the number of people intending to stay in, or leave, the UK for at least 12 months.

Local authority estimates for immigration (which remain unchanged) are created by distributing migration estimates directly from the national to local authority level using administrative data sources. Estimates of emigration for local authorities are created by using a statistical model based on the IPS and other data sources to create robust estimates. This statistical model has been improved and the latest information is available in the [Population statistics research update](#) and this will be updated in early February 2018.

Dependants of US Armed Forces

Foreign armed forces, like home armed forces, constitute a separate special population. They are not aged forward in the same way as the general population in the cohort component model. Instead, data on foreign armed forces are obtained from US Air Force statistics that show the precise age and sex of such individuals in England and Wales at the mid-year point.

The change that has been implemented in the population estimates relates to dependent family members of US armed forces personnel.

Dependants of US armed forces were recorded in the 2011 Census but have relatively little interaction with the standard administrative sources used in the population estimates process. As a result, the usual methods of estimating migration do not work well for this population sub-group. The dependants continued to be included and aged on in the population estimates when, in reality, they were likely to have moved back to the US and been replaced by the dependants of the latest foreign armed forces personnel to be on their tours of duty. Further data on the age and sex of dependants have therefore been obtained, allowing such people to be treated as a special population alongside armed forces personnel.

Internal migration

The proposals to improve the estimation of internal migration have not been taken forward in the new back series.

For more detailed information on the proposed changes in the methods used to produce the population estimates for local authorities in England and Wales, please refer to [Appendix 2: Proposed changes in methods](#) of the [Methodology guide for mid-2016 UK population estimates \(England and Wales\), June 2017](#).

A final methods paper on the population estimates back series will be published in early February 2018.

5 . 2016-based subnational population projections methodological improvements

The 2016-based subnational population projections (SNPPs) have undergone changes in methodology to improve the robustness of the projections. The changes have impacted on the SNPPs in the following areas:

- international emigration
- dependants of United States foreign armed forces
- UK armed forces (and dependants) returning from Germany
- cross-border migration
- people granted humanitarian protection
- asylum seekers

6 . International emigration

The subnational population projections (SNPPs) use the published international migration component of population change as used in the published population estimates series, which is derived from the International Passenger Survey (IPS) and other admin data sources. The SNPP method for calculating local authority estimates for immigration has remained unchanged.

The old SNPP method for calculating local authority estimates for emigration used a model that applied a complex weighting system to the emigration estimates for the last six years, including using the New Migration Geography, out (NMGo), which is no longer used in the estimates. This was felt to be overly complex without clear benefit.

The main changes are:

- using the improved emigration estimates from mid-2011 to mid-2016
- New Migration Geographies, out (NMGos) are removed
- projected outflows are derived based on a simple five-year average of historical trend data

The new methodology ensures consistency between projecting subnational population projections international outflows and inflows with all other components of change. It also offers more clarity through improved transparency of the method.

7 . UK Armed forces (and dependants) returning from Germany

The revised mid-2016 population estimates planned for publication in March 2018 provide the starting point for the base data for the 2016-based subnational population projections (SNPPs). These estimates refer to the usually resident population. The resident population is divided into two types for the purposes of projection:

- the civilian population
- armed forces (both home and foreign)

The civilian population refers to the usually resident population excluding home and foreign armed forces. Home and foreign armed forces constitute two separate population types and are treated as separate static populations in that their size and age and sex structures are assumed to remain constant over the projection period. Data on UK armed forces are supplied by Defence Statistics, Ministry of Defence and will include numbers of home armed forces (HAF) usually resident in an area.

In the 2014 based SNPPs, an adjustment was made for Wiltshire, which had evidence for expecting a large number of armed forces personnel returning from Germany. Previously, all other returning armed forces, and their dependants, were distributed across the country based on the distribution of international immigration.

The Army Basing Programme (ABP), which involves the return of the UK armed forces (UKAF) and their dependants to bases across the UK by 2020, means the 2016-based national population projections incorporate 9,500 HAF and their dependants. In the SNPPs, these will be allocated to the local authority where their unit is due to be based, in the year they are due to return. This means that compared with the 2014-based SNPPs, the distribution will better match the expected reality. The UKAF will become part of the static population in each area, while their dependants will be included in the civilian population and therefore aged on with the civilian fertility, mortality and migration rates applied in subsequent years.

The main changes are:

- returning UKAF and dependants will be allocated to the local authority where their unit is due to be based (rather than based on the number of immigrants they receive)
- dependants will be entered into the civilian population and UKAF into the static home armed forces population

The age and sex distributions of the returning UKAF and dependants are as provided in the British Forces Germany data. The methodology ensures consistency between the subnational and national population projections.

8 . Dependants of US Foreign Armed Forces

As noted in Section 4, the revised population estimates treat the dependants of US armed forces as a special population rather than including them in the civilian population. This is because dependants of US armed forces are recorded in the census but have relatively little interaction with the standard administrative sources used in the population estimates process.

We will also take this approach in the subnational population projections (SNPPs), where foreign armed forces constitute a separate population type, like home armed forces, and are treated as separate static populations in that their size and age and sex structures are assumed to remain constant over the projection period.

The main changes are:

- dependants of US armed forces are included in the foreign armed forces as a static population in the subnational population projections
- an adjustment will be made for the US armed forces dependant under one-year-olds to prevent double-counting of births

These changes, which treat dependants of US armed forces as a static population meaning the subnational population projections will be consistent with the mid-year population estimates, will reduce the inaccurate ageing on of women of child-bearing age and will reduce the imbalance in the sex ratio in local authorities with a large US Foreign Armed Forces presence.

The adjustment for the US Armed Forces dependant under one-year-olds will prevent double-counting of births. The age-sex profile of these local authorities is closer to that which would be expected (fewer women older than 35 years, more younger women and a decreasing number of children as age increases from 0 to 18 years).

9 . Cross-border migration

The old method used an average of five years of cross-border migration estimates to calculate an average count of moves between local authorities in England and other countries of the UK. The average counts were then scaled to the principal national population projection (NPP) cross-border migration flows by age and sex. Subnational population projection (SNPP) cross-border migration was held constant after just a few years, however, final population consistency with the NPP was maintained through the final scaling process.

The main changes are:

- the average counts are scaled to the principal NPP cross-border migration flows by age and sex for each UK country (Wales, Scotland and Northern Ireland) – for example, cross-border flows between England and Scotland are now scaled to the NPP cross-border flow between England and Scotland; previously, SNPP cross-border migration was scaled to total NPP cross-border migration to and from England without accounting for country of destination or origin
- SNPP cross-border flows are now scaled to NPP cross-border flows for the entire projection period
- NPP cross-border migration now uses a rates-based method and the dynamic cross-border flows will be reflected in the 2016-based SNPPs

Calculating projected cross-border moves by country of origin or destination offers a more robust projection. For example, the local authority with the highest cross-border inflow from a country would be allocated the greatest additional inflow if total flows to England from that country were to increase.

10 . People granted humanitarian protection

The 2016-based national population projections (NPPs) included for the first-time people from Syria granted humanitarian protection under the Vulnerable Persons Resettlement Scheme (VPRS). Those granted humanitarian protection are different from asylum seekers in that there is no main applicant or dependants, therefore, humanitarian protection is granted individually. Currently, the NPPs contain around 10,000 people expected to be granted humanitarian protection in England between mid-2016 and mid-2020.

As this is a new flow that has only existed since the year commencing mid-2015, the distribution will be based on the proportion, according to Home Office data, that were received in each local authority over the period between mid-2015 and mid-2017, which we consider to be the best distribution available. For the 2016-based subnational population projections, including people from Syria who have been granted humanitarian protection under the VPRS will provide consistency with NPPs.

The main changes are:

- people granted humanitarian protection (people from Syria granted protection under the VPRS) have been included as a new ad hoc flow in the 2016-based subnational population projections
- these people are allocated to local authorities based on the best available distribution data for this population sub-group

The projected number of people granted humanitarian projection flows, together with asylum seeker flows, are added to local authorities' international migration flows. These total international migration flows are scaled to the final international migration figures in the NPPs. The age and sex structure of flows of people granted humanitarian projection from the mid-year estimates datasets is preserved.

11 . Asylum seekers

Data on asylum seekers and their dependants are provided by the Home Office and the National Asylum Support Service. Applications for asylum provide the basis for estimated inflows of asylum seekers; these exclude an estimate of those removed from the UK within one year and a small number of asylum seekers captured by the International Passenger Survey (IPS). Data on removals, refusals, withdrawals and appeals for principal applicants and dependants are used to estimate outflows of asylum seekers leaving the UK after 12 months or more.

In the old method, the most recent year of data available for asylum seekers was assumed to remain constant throughout the entire projection period. In each projected year, the local authority level asylum seeker flows were scaled to the national population projections (NPPs) for the corresponding year. When scaling asylum seeker flows, the difference between the NPPs and subnational population projections (SNPPs) flows was allocated to local authorities according to the proportion of asylum seekers assumed to be present in the local authority. However, the method produced inconsistent results with the mid-year population estimates.

The main change is that a five-year average for asylum seeker flows is calculated using the most recent five years of data available. The average flows are then scaled at local authority level to the NPPs for the projection period. This change produces SNPPs closer to the actual asylum seeker estimates observed in the mid-year population estimates datasets.

For more detailed information on the SNPPs methodology and the other components (births, deaths, internal migration) that have unchanged methods, please refer to the [Methodology used to produce the 2014-based subnational population projections for England](#).

12 . Annex 1: Questions and answers

Will the projections and migration assumptions be based on any known local plans for future housing provision?

No – the projections show what would happen if recent migration trends continue into the future and do not reflect policies on provision of housing.

Under what circumstances would ONS consider making changes to the subnational population projections methodology?

There may be exceptional cases where special adjustments may be implemented; these will be judged on a case by case basis.