

Methodology used to produce the 2022-based subnational population projections for England

Methods, data and components used to produce subnational population projections

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1 . Introduction

This article documents the methodology and data used in producing the [2022-based principal and variant subnational population projections for England](#), published on 24 June 2025. It also discusses the impact that the methodology or data used may have had on the resulting projections.

Data have evolved since our 2018-based release, published in March 2020. Since this release, we are using rebased population estimates and components of change that were developed as part of the reconciliation and rebasing process following Census 2021. Broadly, the methodology for 2022-based subnational population projections (SNPPs) has been re-used from our 2018-based SNPPs. There have been changes to source data for international migration, and some input data sources are no longer used. The changes to data are summarised in our [Annex A: Changes to the subnational population projections' methodology of the Methodology used to produce the 2018-based subnational population projections for England](#).

The 2022-based subnational population projections for England provide an indication of the possible size and structure of the future population, based on the continuation of recent demographic trends, and are produced on a consistent basis across all local authorities in England. This release is based upon the 2022 mid-year estimate for England and a revised back series from Census 2021 (England). Population projections for English regions, counties, Sub Integrated Care Boards (SICBs) are also produced.

Although we normally publish subnational projections every two years, we postponed the production of subnational population projections to benefit from using Census 2021 for England, Wales, and Northern Ireland and Census 2022 for Scotland as a base year. The production cycle will resume on a biennial basis, generally within six months of the release of national population projections (NPPs).

The projections make assumptions about future fertility, mortality and migration levels based on trends in recent estimates, over a five-year reference period. The projections are not forecasts and generally take no account of policy or development aims that have not yet had an impact on observed trends.

We also produce household projections, and the subnational population projections are used as an input into producing these figures. The projections are also used by the Department of Health and Social Care (DHSC) for healthcare planning, by central and local government for modelling and longer-term planning, and by various other groups for planning and research.

2 . Overview of methodology

The subnational population projections use the internationally accepted cohort component method, which makes the projections for successive years running from one mid-year to the next. The 2022-based projections take the [Population estimates for England and Wales: mid-2022](#) as their starting point. For most calculations, data for the preceding five years are used, so trends are based on data from the years ending mid-2018 to mid-2022. The projections based on these trends are constrained to the totals used in the corresponding [National population projections: 2022-based](#) for England (for example, the SNPP migration category variant is constrained to the equivalent NPP).

The projections model splits population between the armed forces population, prison population and civilian population, and it treats them differently. The population of armed forces (including dependants of foreign armed forces) and the prison population are treated as "static populations" such that they retain the same size and age-sex structure throughout the projection period.

The projections for each year are calculated by first removing these static populations to produce a civilian population. The civilian population from the previous year is then aged on, local fertility and mortality rates are applied to calculate projected numbers of births and deaths, and the population is adjusted for internal migration (movement between areas within England), cross-border migration (movements between England and the other countries of the UK) and international migration (movements between England and countries outside of the UK). Finally, the static population is added back in to reach the projection next year. For example, for the first year of the projections, the mid-2022 to mid-2023 change is applied to the mid-2022 base to produce the mid-2023 population projection.

Each component (except internal migration) is constrained to its respective total in the principal 2022-based national population projection for England. Similarly, once the static population has been added back, the projected population is constrained to the total in the principal 2022-based national population projection for England for that year. This process is repeated for each year of the projection period. The following list of stages illustrates the projection process:

- stage one: begin with the resident population of base year
- stage two: remove the static population (home armed forces, dependants of foreign armed forces and prisoners)
- stage three: determine the age of the civilian population
- stage four: adjust for projected births and deaths (add births and subtract deaths)
- stage five: adjust the figure for projected migration (internal, cross-border and international)
- stage six: add the static population that was removed earlier in the process
- stage seven: scale the figure to national population projections
- stage eight: repeat for each year of projection

The population at the end of each cycle becomes the base population of the next cycle. The process in each stage is discussed in more detail in later sections of this article.

Projections for Sub Integrated Care Boards (SICBs) are not produced directly. Instead, they are based on the projections created for local authorities.

In some cases, SICBs areas share boundaries with local authorities or aggregations of local authorities, in which case projections for these areas are calculated by replicating or aggregating the appropriate local authority projections.

Where areas do not share boundaries, SICBs projections are derived from proportions based on SICBs or local authority-level splits using Lower-layer Super Output Area- (LSOA-) level estimates by age and sex for the base year.

The derived proportions are multiplied by the projected local authority figures. The respective SICBs parts are then aggregated to the SICBs level.

3 . Base population, static population and ageing on

The mid-2022 population estimates form the base population for the subnational population projections. The estimates refer to the population at their usual place of residence. This includes all those temporarily away from home (for six months or less) and excludes visitors. Armed forces stationed outside England are not included, but those stationed inside England are included. Asylum seekers and people who enter a country intending to visit but stay 12 months or more to become usual residents now residing in England are included. Students are taken to be resident at their term-time address.

The resident population is divided into two types for the purposes of projection: first, civilian population and second, armed forces (home, foreign and foreign armed forces' dependents) and prisoners (first treated as special population in the 2018-based projections).

The civilian population refers to the usually resident population excluding home armed forces, foreign armed forces and their dependants, and prisoners.

An adjustment is made for the US armed forces' dependants aged under one year to prevent double counting of births. Treating the dependants of US armed forces as a static population counters the inaccurate ageing on of women of childbearing age and reduces the imbalance in the sex ratio in local authorities with a large US armed forces presence.

Data on UK armed forces are supplied by Defence Statistics at the Ministry of Defence, and data on foreign armed forces originate mainly from US Air Force statistics. They will include numbers of home and foreign armed forces usually resident in an area. Resident armed forces populations, including foreign armed forces and their dependants and the prison population, are removed from the usually resident population to create the civilian population at the start of processing for each projection year.

The civilian population is then aged on one year to become the appropriate age in the following year of the projection. For example, 17-year-olds in Birmingham in one year will become the basis for the 18-year-olds in Birmingham for the next year. The population is then adjusted for births, deaths and migration. Then, in the final stage, the resident armed forces, foreign armed forces and their dependants, and prisoners are added back in.

4 . Births

Projected numbers of births are calculated by applying local authority age-specific fertility rates (ASFRs) to the population to derive a number of births, by age of mother. Male and female births are assigned by multiplying the births by an England-level sex ratio derived from five years' worth of local authority data. These births figures for local authorities are constrained to add up to the number of births projected in the 2022-based national population projections for England for each year of the projection.

Data used

Births data come from registered births collected by the General Register Office (GRO) by local authority, age of mother and sex of child. The mid-2022 population estimates are used to calculate fertility rates. ; this means that, when calculating fertility rates, the small number of births to women aged under 15 years or over 44 years are classed as having occurred at age 15 years or age 44 years, respectively.

Detailed methodology

Local authority-level ASFRs are calculated using the most recent five years' worth of data. For the 2022 based projections, these were the years ending mid-2018 to mid-2022.

There are four stages to the methodology:

- stage one: the projection model calculates initial local authority-level ASFRs by dividing the observed number of births by the total number of women of childbearing age for each of the five years in the historical data; this process is repeated for data aggregated at England level to obtain national-level ASFRs
- stage two: an initial fertility differential is calculated by dividing the sum of local ASFRs across the five-year historical period by the sum of their corresponding national ASFRs over the same period for each childbearing age
- stage three: the initial local authority-level differential is multiplied by the national-level ASFRs for the first year of the projection to calculate the final local authority-level ASFRs for that year
- stage four: this process is then repeated for the remaining years of the projection using a rolling five-year average approach where the differentials are calculated using data from the five years prior to the projection year; for example, the final local authority-level ASMRs for 2022 are calculated by multiplying the national mortality rates for the year ending mid-2022 by the differential derived from the years ending mid-2018 to mid-2022

The projected number of births is calculated for each year by multiplying the final local authority-level ASFRs by the number of women of the corresponding age. Projected births are split by sex of child using a national-level sex ratio calculated by dividing the sum of all male births by the total number of births in England over the five-year period covering the years ending mid-2018 to mid-2022. Male births are assigned by multiplying this ratio by the total number of births in the local authority; the remaining births are allocated as female.

The total number of births is then constrained to the projected total of births in the principal national population projection for England by dividing the national population projection births data by the aggregated local authority births data for each combination of age of mother against sex of child. This gives scaling factors for each age or sex combination, which are then applied to the local authority data for each year of the projection.

The following adjustments were made in the 2022-based subnational projections to improve the projections of births in local areas:

- fertility rates were capped to be no greater than five times the national fertility rate
- for the Isles of Scilly, fertility rates were replaced by the assumed fertility rates used in the national population projections for England; this is because fertility rates for this area are highly volatile owing to its small population size
- where fertility rates were zero for an individual age or sex for an area, these were replaced by the projected national rate for that age or sex; this adjustment affected local authorities in which the population is relatively small

5 . Deaths

Projected number of deaths are calculated in a similar way to births. They are calculated by applying local authority age- or sex-specific mortality rates (ASMRs) to derive numbers of deaths, by age and sex. The deaths figures for local authorities are then constrained to add up to the number of deaths projected in the [National population projections: 2022-based](#) for England for each year of the projection. The deaths figures are subtracted from the aged-on population.

Data used

Data are collected from information supplied through the death registration process via the Local Registration Service, on behalf of the General Register Office (GRO), by local authority, age and sex. Our [Population estimates for the UK, England, Wales, Scotland, and Northern Ireland: mid-2022](#) are used to calculate mortality rates.

Detailed methodology

Local authority-level ASMRs are calculated using the most recent five years' worth of data. For the 2022-based projections, these were years ending mid-2018 to mid-2022.

There are four stages to the methodology:

- stage one: the projection model calculates initial local authority-level ASMRs by dividing the observed number of deaths by the civilian population for each of the five years in the historical data; this process is repeated for data aggregated at England level to obtain national-level ASMRs
- stage two: an initial mortality differential is calculated by dividing the sum of local ASMRs across the five-year historical period by the sum of their corresponding national ASMRs over the same period for each year
- stage three: the initial local authority-level differential is multiplied by the national-level ASMRs for the first year of the projection to calculate the final local authority-level ASMRs for that year
- stage four: this process is then repeated for the remaining years of the projection using a rolling five-year average approach where the differentials are calculated using data from the five years prior to the projection year; for example, the final local authority-level ASMRs for 2022 are calculated by multiplying the national mortality rates for the year ending mid-2022 by the differential derived from the years ending mid-2018 to mid-2022

The projected number of deaths is calculated for each year by multiplying the final local authority-level ASMRs by the civilian population.

The total number of deaths is then constrained to the projected total of deaths in the principal national population projection for England by dividing the national population projection deaths data by the aggregated local authority deaths data for each year. This gives scaling factors for each age or sex combination, which are then applied to the local authority data.

The following adjustments were made in the 2022-based subnational projections to improve the projections of deaths in local areas:

- mortality rates were capped to be no greater than five times the national mortality rate
- for the Isles of Scilly and the City of London, mortality rates were replaced by the assumed mortality rates used in the national population projections for England; this is because mortality rates for these areas are highly volatile owing to their small population size
- where mortality rates were zero for an individual age or sex for an area, these were replaced by the projected national rate for that age or sex; the adjustment was mostly applied to people of younger ages where there tend to be fewer deaths

6 . Migration

Adjusting for the expected number of people entering and leaving a local authority by age and sex is done separately for internal, cross-border and international migration using different methodologies.

Internal migration

An internal migrant is defined as someone who changes their local authority of residence between one year and the next. In the subnational population projections, internal migration is defined as migration between areas within England only. For some other uses, internal migration is defined as including migrant flows between England, Wales, Scotland and Northern Ireland, but in the subnational projections these are referred to as cross-border flows.

The internal migration estimates that we produce provide an origin-destination matrix that provides information on moves from each local authority in England to every other local authority in England, by sex and single year of age. To project internal migration moves, five-year data are used to derive the average proportion of the population, for each sex and age, that has left each local authority and where they have moved to. By applying these proportions to the population figures, estimates of internal migration flows between areas are calculated. By adding up the estimated number of outflows of internal migrants from every other authority into an authority, the inflows into that authority are calculated.

Movement of members of the armed forces is not included in the internal migration estimates. The Personal Demographics Service (PDS) is the national electronic database of NHS patient demographic data, produced by NHS England. While the PDS records movements of people into and out of the armed forces, movements of serving members are not fully recorded. Similarly, movement of prisoners is also not included in the internal migration estimates.

Data used

Internal migration describes moves made between local authorities within England. The 2018-based subnational population projections onwards use the updated methodology for internal migration, which is in line with the mid-year population estimates. This methodological change relates to how we account for the movements of the highly mobile population leaving higher education. We introduced the higher education leavers methodology (HELM) to better address this. HELM builds on methodology introduced to the population estimates in 2012 by moving those who have finished higher education but have not updated the information we use, such as NHS Patient Register information.

The 2018-based population projections' internal migration data used two-year averages. All 2022-based SNPP variants except for the 10-year migration variant use five-year averages for internal migration. At present, we plan for future projections to use five-year averages for internal migration.

Detailed methodology

The proportion of people moving from one local authority is calculated by dividing the number of people moving out of the area by the number of people living there. This is calculated separately for males and females by single year of age for each of the trend years individually and then a five-year average is calculated to produce rates of out-migration by age and sex.

In some local authorities with small numbers of moves and/or populations, this can lead to atypical rates, which produce unrealistic results in the projected population. To overcome this, adjustments are sometimes made to smooth the data. These can take the form of upper limits (or caps) on migration rates or the replacement of rates with appropriate alternatives. The following adjustments were applied in the 2022-based projections: the assumed proportion of people of any individual age and sex group moving out of an area was capped at a maximum rate of 0.75, while for Oadby and Wigston, the internal out-migration probabilities for males were replaced by those for females for ages 19 to 25 years; this was to overcome a known issue in the population estimates regarding a first year University of Leicester student hall of residence situated in Oadby and Wigston.

The out-migration rates are applied to the aged-on civilian population (after adjusting for births and deaths) in each authority to estimate the number of internal out-migrants for the projected year.

To distribute the projected out-migrants to a destination local authority, we use the origin-destination matrix. The probability of a person moving from local authority A to local authority B, given that they are moving from local authority A, is calculated by dividing the number of people moving from local authority A to local authority B by the total number moving out of local authority A using five years of data.

The total inflow for each local authority is calculated by adding the outflows from every other local authority into this particular local authority.

The net internal migration adjustment for each local authority, by age and sex, is calculated by subtracting outflows from inflows. The total net internal migration adjustment across all local authorities in England must sum to zero, as these are movements within the country, not between countries.

Impacts of methodology and data used

The internal migration assumptions are set in terms of the probability of moving out of an area. For the majority of areas and most ages, the calculated probabilities are realistic even though there are delays in some people registering with a General Practitioner (GP) after moving. However, for some age groups in some areas, there are reasons why they may not be similar.

Areas with large numbers of students incur issues in estimating internal out-migration. This is partly because of the known issue of students, especially males, delaying re-registering with a GP when they move out of an area at the end of their studies. Care should be taken in using or interpreting age distributions in the early 20s for local authorities with substantial student populations. The impact of this will be an overestimation of the migration rates at some ages and an underestimation at other ages. The new methodology introduced in the 2018-based subnational projections aims to lessen the impact of overestimation and underestimation, but caution is still advised.

A specific adjustment is made in the mid-year population estimates to allow for migration to and from a large university campus, which is allocated, based on its postcode, to Coventry but has halls of residence on both sides of the border between Coventry and Warwick. The subnational projections reflect this adjustment in the base population for the projection. However, the adjustment is not replicated in the projections themselves. The impact of this process is complex but is liable to have a minor impact over time on the size and age structure of Coventry and Warwick's projected populations.

Cross-border migration

Cross-border migration is the moves made by people between England and the rest of the UK.

Data used

Cross-border migration between England and the constituent countries of the UK is captured in a similar way to internal migration flows. Flows between England and Wales are produced using the same data sources as for internal migration.

Information on moves into, and out of, Scotland and Northern Ireland in the population estimates are collected and treated differently from moves within England and Wales, by using data from National Records of Scotland (NRS) and the Northern Ireland Statistics and Research Agency (NISRA). Further information is available in our [Section 5 of Population estimates for England and Wales, mid-2023: methods guide](#).

Detailed methodology

To calculate cross-border moves, an average of five years' cross-border estimates data from the years ending mid-2018 to mid-2022 is used to give an average number of moves, by age and sex, between each local authority in England and each of the other constituent countries of the UK (Wales, Scotland and Northern Ireland).

Cross-border migration assumptions at the national level have been set as rates rather than as a fixed number of migrants. This means that cross-border migration varies throughout the course of the projection and is not held constant beyond a particular point in time. The flows in the 2022-based subnational projections are constrained to the flows in the respective national population projections for each year.

The methodology for producing cross-border migration rates in the national population projections (NPPs) is explained in more detail in our [Method for incorporating cross-border migration rates into the UK NPPs report \(PDF, 399KB\)](#). Cross-border migration is calculated using data from the mid-year population estimates.

International migration

The national population projections' international migration assumptions are made in terms of inflows and outflows of international migrants into and out of England at an overall level, including asylum seekers and those granted humanitarian protection.

These streams are also used in the subnational population projections with the inflows (immigration), outflows (emigration), including asylum seekers and people granted humanitarian protection. Our latest projections, 2022-based, are produced using methods that are based predominantly on administrative data. Previously, the international migration component of the mid-year estimate was produced using a complex set of methods using a variety of administrative and survey data sources. These methods were designed to complement international migration estimates from the International Passenger Survey (IPS). A detailed description of the methods used to produce international migration estimates prior to mid-2021 is available in [Section 12: Summary of historical methods of our Population estimates for England and Wales, mid-2023: methods guide](#). The data sources and methods are described for each stream in the following sections.

The outflows from each stream are subtracted from their respective inflows to calculate the net flow for each stream by local authority, age and sex.

Further information on our methodology can be found in our [National population projections, background, methodology and assumption setting: 2022-based methodology](#). Further information on variant projections can be found in our [National population projections, variant projections: 2022-based methodology](#).

Data used

Recent changes to improve our projections include using the latest admin-based international migration estimates from our [Long-term international migration bulletin](#). Adjustments are made to account for people who enter or leave the country initially for a short stay but subsequently decide to remain for a year or more and people who originally intend to be migrants but stay in the UK or abroad for less than a year.

The 2022-based subnational population projections use the published international migration component of population change as used in the published population estimates. They use a five-year average of international migration estimates, covering the years ending mid-2018 to mid-2022.

Local authority estimates for immigration are created by distributing migration estimates directly from the national to local authority-level using administrative data sources. More information on this methodology can be found in [Section 6: International migration of Population estimates for England and Wales, mid-2023: methods guide](#)

Estimates of emigration for local authorities are created using a statistical model. The model uses the latest admin-based international migration estimates from our [Long-term international migration](#) and other data sources. This approach helps create a more robust estimate of emigration at the local authority level. The statistical model has been improved, and these improvements have been implemented in the population estimates. These population estimates provide the trend data for emigration used in the population projections.

The 2022-based subnational population projections trend data for international migrants are already adjusted for those staying for longer or shorter than intended, so they are being modelled as part of the international migration flows.

Detailed methodology

For immigration (international inflows), an average of five years' historical trend data from the year ending mid-2018 to the year ending mid-2022 have been used to give a five-year average of trend data of international migrants into local authorities in England. The assumption is that this average remains constant for the whole projection period; however, as with the other components, this inflow is constrained to the national population projections, by age and sex for each year. This means that, dependent on the national projected immigration, the local authority-level figures may be scaled up or down.

Some impacts of constraining to the national population projections

Constraining to the 2022-based national population projections' migration assumptions will entail scaling of the local trends calculated. Therefore, there may be a step change between recent trends locally and the assumptions used in the subnational population projections. In most cases, five years of data are used to create the local trends in the subnational population projections; however, the national population projections use a much longer time series in setting the national long-term assumptions. Therefore, it is not unusual for the assumptions made for international migration to be at a different level to a simple average of the latest local data.

7 . Armed forces returning from Germany

Previous subnational population projections releases included returning UK armed forces as a separate flow.

UK armed forces become part of the static population in each area, while their dependants are included in the civilian population and therefore aged on with the civilian fertility, mortality and migration rates applied in subsequent years.

8 . Asylum, refugee, and Vulnerable Persons Resettlement Schemes (special change for 2022-based projections)

Data on asylum seekers and their dependants, as well as people from Syria granted humanitarian protection under the Vulnerable Persons Resettlement Scheme (VPRS), are provided by the Home Office and the National Asylum Support Service. The Subnational Population Projections (SNPPs) include people who migrated to the UK as refugees or through the Vulnerable Persons Resettlement Scheme in the years ending mid-2023 and mid-2024 and before. This is because the admin-based migration estimates, which are available for these years, include this type of migration. However, the migration assumptions in the principal projection do not attempt to separately project these types of migration, because they project based on overall assumed levels of future migration.

9 . Final constraining stage

At the England level, the subnational population projections are consistent with the 2022-based national population projections for England. The underlying assumptions used in the national projections were agreed in liaison with the devolved administrations following consultation with leading stakeholders and after seeking expert advice. Data and supporting documentation for [National population projections: 2022-based](#) are available.

The births, deaths and migration components of the population projection are constrained to the corresponding England data (in the national population projections) for each projection year. However, the subnational population projections' components of change do not always fully explain the change in the national population between one year and the next. This is because of a difference in the processing order and the way mortality and fertility rates are applied in the national population projections and the subnational population projections.

Consequently, a final constraining step takes place to ensure that the subnational population projections add up to the national population projections by both age and sex. This is done as the last process in the cycle of producing the population projection for a year, which then forms the base population for the next year's calculation. This process is repeated to produce each year's subnational population projections.

10 . Methods used for subnational population projections for other parts of the UK

We produce subnational population projections for areas in England. Equivalent subnational projections for the constituent countries of the UK are produced by the Welsh Government, National Records of Scotland (NRS), and the Northern Ireland Statistics and Research Agency (NISRA).

11 . Variant subnational population projections

The 2022-based subnational population projections (SNPPs) focus on the subnational population projections migration category variant projection, which takes the place of the principal projection for this release.

Our use of the migration category variant projection, in place of a principal projection, is in line with our advice on use of the corresponding variant in our [National population projections: 2022-based bulletin](#). We are now recommending use of this variant because of its better fit than the principal projection with the release [Long-term international migration, provisional: year ending December 2024 bulletin](#).

In total, we released six 2022-based variant subnational population projections.

The six variants are produced using broadly the same methods across all variants, with a few differences. The differences in methods between the main subnational population projections release (the migration category variant) and the variant methods are outlined in this section.

Migration category variant

The 2022-based migration category variant has been used to produce our headline and bulletin statistics because it fits with the release [Long-term international migration, provisional: year ending December 2024](#). This variant is specifically focussed on observed levels of immigration types and its implications on stay rates and levels of emigration. In the short-term it has a steeper decline in net international migration compared with our principal projection. This reflects the recent rise in immigration, particularly of students, which may lead to higher emigration and thus lower net migration in the short term. Further information on the method can be found in the University of Oxford's [Why are the latest net migration figures not a reliable guide to future trends? report](#). This type of method has also been used by the Office for Budget Responsibility, as described in their [Net migration forecast and its impact on the economy report](#).

Five-year migration variant

What has been called the five-year migration variant is consistent with the 2022-based national population projections (NPPs) principal projection. This uses five years of historic migration data and constraints from the NPPs. As with most of the other subnational population projection (SNPP) variants, in the five-year migration variant the disaggregation to the local authority level is based on a five-year average (for the years ending mid-2018 to mid-2022) of international migration data, split by age and sex. Five years of births, deaths and other migration data has also been included.

Zero net migration

The 2022-based zero net migration variant uses data from the national projections zero net migration variant, which is built on the assumption that net international and cross-border migration is zero from the base year onwards. For the subnational projections, we do still assume that internal (local authority to local authority) migration will occur. This variant allows users to understand population change in their area in the absence of any international or cross-border migration.

High international migration

The high international migration variant is produced in the same way as the migration category variant subnational population projection except that the migration component totals are constrained to match those in the 2022-based high migration variant national population projection for England. This has a higher long-term net migration total of 476,500 per year from the year ending mid-2030 onwards, compared with 306,600 in the migration category variant projection.

The high migration variants differ from the migration category variant in both immigration and emigration levels for England as a whole. From the year ending mid-2030 onwards, the high migration variant assumes immigration levels that are up to 30.0% higher and emigration levels up to 7.5% higher than the migration category variant.

While these differences are also typical at the local authority level, there is some variation because of the complexity of the constraining process. The fertility and mortality rates are unchanged from the principal projection. In each area, the higher number of migrants will affect the subsequent numbers of births, deaths, and internal and cross-border migrants.

As with most of the other subnational population projection (SNPP) variants, in the high international migration variant the disaggregation to the local authority level is based on a five-year average (for the years ending mid-2018 to mid-2022) of international migration data split by age and sex.

Low international migration

The low international migration variant is produced in the same way as five-year migration variant subnational population projection except that the migration component totals are constrained to match those in the 2022-based low migration variant national population projection for England. This has a lower long-term net migration total of 108,500 per year from the year ending mid-2030 onwards, compared with 306,600 in the migration category variant projection.

The low migration variant differs from the migration category variant in both immigration and emigration levels for England as a whole. From the year ending mid-2030 onwards, the low migration variant assumes immigration levels that are up to 1.8% higher and emigration levels up to 60.8% higher than the migration category variant.

While these differences are also typical at local authority level, there is some variation because of the complexity of the constraining process. The fertility and mortality rates are unchanged from the principal projection. In each area, the lower number of migrants will affect the subsequent numbers of births, deaths, and internal and cross-border migrants.

As with most of the other SNPP variants, in the low international migration variant the disaggregation to the local authority level is based on a five-year average (for the years ending mid-2018 to mid-2022) of international migration data split by age and sex.

10-year migration

The 10-year migration variant is produced in the same way as most other SNPP variants except that it uses a 10-year average (for the years ending mid-2013 to mid-2022) for internal migration, international migration, and cross-border flows split by age and sex. The 10-year migration variant is consistent with the five-year subnational population projection variant in that all components are constrained to the principal 2022-based national population projection for England. However, because it uses 10 years' worth of international migration input data, rather than five years' worth, and 10 years of internal migration data rather than five years' worth, the distribution of migration at the local authority level is different.

12 . Changes to the subnational population projections' methodology

For information on changes to methods and data in past rounds of subnational population projections, please see the [Annex A: Changes to the subnational population projections' methodology, of our Methodology used to produce the 2018-based subnational population projections for England](#).

13 . Related links

[Subnational population projections for England: 2022-based](#)

Bulletin | Released 24 June 2025

Indicate potential future population size of English local and health authorities. Widely used in planning - for example labour market, housing, health and education.

[Subnational population projections QMI](#)

Methodology | Released 24 June 2025

Quality and Methodology Information (QMI) report for subnational population projections, detailing the strengths and limitations of the data, methods used, and data uses and users.

[Subnational population projections across the UK: a comparison of data sources and methods](#)

Article | Released 10 March 2021

User guidance, uses, assumptions and methodology for the subnational population projections for each constituent country of the UK.

[Comparing subnational population projections to estimates report](#)

Methodology | Released 24 June 2025

Methodology article comparing the 2012-, 2014-, 2016- and 2018-based subnational population projections for 2021 with the 2021 mid-year estimates for England. Analysis includes the impact of rebasing and different components of change on SNPP accuracy.

[National population projections: 2022-based](#)

Bulletin | Released 28 January 2025

The potential future population size of the UK and its constituent countries. These statistics are widely used in planning, including fiscal projections, health, education and pensions.

14 . Cite this methodology

Office for National Statistics (ONS), released 24 June 2025, ONS website, methodology, [Methodology used to produce the 2022-based subnational populations projections for England](#)