Office for National Statistics

Understanding mid-year admin-based population estimates for local authorities in England and Wales

This methodology brings together important information about our mid-year admin-based population estimates for England and Wales.

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Release date:
30 July 2025

Next release:
To be announced

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1 . Status of mid-year admin-based population estimates

We are developing population statistics that make greater use of administrative data. Our mid-year admin-based population estimates (ABPEs) for England and Wales are official statistics in development, while we refine our methods and the data sources used to estimate the usual resident population. ABPEs do not currently replace accredited official mid-year population estimates or international migration estimates, and should not be used for policy or decision making.

We are aiming for ABPEs to become the official mid-year population estimates in 2026. We have made considerable progress over the last year in developing the methods for ABPEs, and in transferring ABPEs from a research to a production environment. We are confident that ABPEs will provide the best estimates of the population in the future.

We are working to meet the Criteria for moving to ABPEs as official estimates of the population. Our progress and further work needed to meet some of the criteria are described in our Assessment of criteria for moving to ABPEs as official estimates of population, England and Wales: 2025 article.

We are also working to meet the standards expected ofaccredited official statistics and we will engage with the Office for Statistics Regulation on the timing for an assessment of the ABPEs.

We published mid-2024 ABPEs for local authorities in England and Wales in July 2025. Commentary for our July release is provided in our Population estimates for England and Wales: mid-2024 bulletin, alongside the latest official estimates. This allows users to compare the ABPEs with official population estimates.

2 . Developing population statistics to make greater use of administrative data

We are continuously working to improve our statistics, including providing more frequent population statistics of consistent quality every year. For over 200 years, the census has provided the basis of population statistics, offering a detailed understanding of society at a national and local level every ten years. However, census-based population estimates become less accurate as we move further from the census date, and local detail on important topics is not available between census years.

Policy users and decision makers have often reported that they would benefit from more frequent and timelier statistics. We are developing outputs that make greater use of administrative data to help us meet these needs. Using a range of sources from across government and the public sector, we can produce more frequent and timelier national and local statistics about the size and structure of the population.

3 . How we estimate the population using administrative data

Our mid-year admin-based population estimates (ABPEs) are produced using the dynamic population model (DPM).

The DPM builds on the cohort component method that has been used to produce our accredited official mid-year population estimates (MYEs) for many years. It extends our existing MYE methods, incorporating statistical modelling to take account of underlying demographic trends, and to allow for the differing levels of coverage and uncertainty associated with input data. The DPM supports the use of an increasing range of data sources, enabling us to maximise and optimise the use of administrative data.

The DPM estimates the size of the population each year for all local authorities by single year of age and sex, using independently estimated population stocks, flows and demographic trends. Using independent population stocks for each year reduces the increase in uncertainty that occurs as we move further away from a census year, compared with the current population estimates produced using the cohort component method.

The DPM can take account of any quality limitations in the underlying data sources and draws strength across the wide range of data sources being used. It balances input data on population (stocks) at specific points in time, with the components of population change (flows of births, deaths, and migrants) over time. This results in a distribution of potential population and migration counts.

Our ABPEs are the average (mean) value from the distribution. The uncertainty around the ABPEs is illustrated by 95% credible intervals, which show the range of possible estimates.

The DPM has been developed using a software environment for statistical computing, known as "R". As part of our commitment to continuous improvement and transparency, we have published the R code that we use for estimating a demographic account and disaggregating combined migration flows to estimate international and internal flows. Further code and updates to existing code will be made available on the Office for National Statistics (ONS) Digital GitHub.

We have published our Mid-year ABPEs for England and Wales quality and methods guide, which provides a detailed explanation of how our ABPEs are produced.

Our accredited official MYEs methodology is detailed in our Population estimates for England and Wales: methods guide.

4 . Publishing similar content to accredited official mid-year population estimates

We published similar content for the admin-based population estimates (ABPEs) and the accredited official mid-year population estimates in July 2025. Our ABPE dataset now provides:

- components of change for migration disaggregated into internal and international migration
- population density
- median age

As a result of user feedback, including from our survey to help shape published content for population estimates, we have ensured the ABPE dataset is machine-readable and accessible. We welcome further feedback on the layout of the dataset.

We have also published a Quality and methods guide for our ABPEs. This provides a full account of our methods for a broad range of users. Links to further information are provided for those who require more detail. We welcome your feedback on our first published version of this guide to help inform future updates and ensure we best meet user needs.

5 . Revisions and our publication schedule

Our Publication schedule for admin-based population and migration statistics article explains our proposed approach to revisions and the availability of data in our admin-based population and migration statistical system.

To meet user requirements for timely estimates using administrative data sources, we initially produce provisional estimates; we then revise these as more data become available. Revisions are a standard part of producing timely estimates.

When the admin-based population estimates (ABPEs) become the official population estimates, we plan to revise the population estimates data time series back to 2022 using the ABPE back series. We have selected 2022 because the ABPEs are very similar to the official mid-year estimates in 2021. This is because Census 2021 data are used to produce both estimates.This will ensure that users have a consistent time series after Census 2021.

6 . Provisional, first-updated and second-updated population estimates

We produce admin-based population estimates (ABPEs) at several points in time, using the best data available.

Provisional ABPEs

We are exploring how we can provide provisional ABPEs that give an early indication of the size of the population in England and Wales. We plan to publish provisional ABPEs around six months after the mid-year reference period.

Provisional ABPEs are early estimates for the latest year. These make use of data that have become available since the previous ABPE release, and include assumptions and adjustments to the data that are likely to be revised. Caution is advised when using provisional estimates for policy and funding decisions.

First-updated ABPEs

First-updated ABPEs are improved estimates. These include additional data that have become available alongside refined assumptions and adjustments. These are produced around 12 months after the reference period.

Second-updated ABPEs

Second-updated ABPEs are our best estimates, where more adjustments and assumptions are replaced with data. They are produced around two years after the reference period. Second-updated estimates should be used for any work that requires greater stability in the data.

Our Publication schedule for admin-based population and migration statistics article explains our proposed approach to revisions and the availability of data in our admin-based population and migration statistical system.

7 . Counting people where they usually live

Like our accredited official mid-year population estimates, our admin-based population estimates (ABPEs) are consistent with the UN definition of usual residence outlined on page 40 of the Principles and Recommendations for Population and Housing Censuses (PDF, 2.36MB). This definition includes people who reside, or intend to reside, in the country for at least 12 months, whatever their nationality. Visitors and short-term migrants who enter or leave the UK for less than 12 months are not included.

For some groups, the concept of usual residence is more difficult to define. Specific rules are used for these groups:

- higher education students and schoolchildren living away from home are considered usually resident at their term-time address
- members of the armed forces are considered usually resident at the address where they spend most of their time
- prisoners are usually resident in the prison estate if they have a sentence of twelve months or more

Population estimates include UK Armed Forces (UKAF) who are overseas on operations and temporary assignments, if their last permanent station was in England and Wales. UKAF on overseas postings, and any accompanying partners and children are not included.

The usually resident population does not always coincide with the number of people found in an area at a particular point in time. Temporary residents who live in an area for less than 12 months, for example, draw on the same local services and amenities as usual residents. We are considering population estimates using alternative definitions and user requirements for these, starting with temporary international migrants; early estimates for these were published in our Population and migration estimates - exploring alternative definitions: May 2023 article.

8 . Population stocks and flows

Mid-year admin-based population estimates (ABPEs) are produced by balancing data on population stocks and flows.

Population stocks are estimates of the population at specific points in time; we use population stocks relating to mid-year (30 June).

Flows estimate changes to the population stock over time, using data on:

- births
- deaths
- international migration, where people move between the UK and the rest of the world
- internal migration including cross-border moves, where people move between local authorities in England and Wales, or between countries within the UK.

The flow estimates we use cover the 12-month period to mid-year (30 June).

9 . Uncertainty around the population estimates

Measures of statistical uncertainty provide users with information about the quality of population estimates. Mid-year admin-based population estimates (ABPEs) are subject to uncertainty related to the measurement of population stocks at specific points in time and the components of population change over time.

The dynamic population model, which produces the ABPEs, generates a sample of potential population and migration counts for each mid-year reference point. The sample counts represent a set of plausible values, given the uncertainty of the inputs.

Our ABPEs are the average (mean) value from the sample distribution. The uncertainty around the ABPEs is shown by credible intervals, which give the range of possible estimates. Credible intervals are published alongside the ABPEs. The probability that the true value lies in the credible interval is 95%.

Before July 2025, credible intervals were provided for local authority totals and each age and sex within each local authority. This has been expanded to include credible intervals for:

- regions, countries and national totals
- internal, cross-border, and international migration flows

Credible interval bounds cannot be summed to provide credible intervals for combined population groups, such as age-groups.

Estimates of uncertainty are available in our ABPEs for local authorities in England and Wales dataset, published in July 2025.

Further information on our ABPEs and their quality assurance, appropriate uses and strengths and limitations, is available in our Mid-year admin-based population estimates for England and Wales quality and methods guide.

10 . Data sources

Our Statistical Population Datasets (SPDs) generally provide the population stock. However, this information can also come from other sources, including the NHS Personal Demographics Service (PDS) or the census. The specific data sources used can vary based on availability; the PDS often becomes available before other data sources. Information on the data used to compile each population stock used within each ABPE release is outlined in the data sources worksheet in our published datasets.

Population stock estimates for mid-2011 onwards are derived independently for each year, and are split by:

- age, in years
- sex
- local authority of usual residence

SPDs are linked administrative data to which a set of inclusion rules are applied. These look for signs of activity, so that we can approximate the usually resident population. SPDs for each year are created by combining a variety of data sources including:

- income datasets
- health datasets
- education datasets covering schools, further education and higher education
- prisoners' data
- death registrations

Coverage adjustment of the population stocks is required to allow for coverage errors. These occur when a member of the population is:

- not counted (undercoverage)
- counted more than once (overcoverage)
- counted in the wrong location

Our current proxy coverage adjustment method for population stocks uses census data. The data from a census in 2031 would provide a high-quality point of comparison to understand the quality of our population stocks. Our long-term aim is to create coverage ratios using administrative data, but this requires improvements in the quality of the data and a more stable supply of data.

Data estimating population flows also inform the estimation process and include:

- counts of live births and death registrations recorded by the General Register Office
- our estimates of internal migration, including cross-border moves between countries of the UK, which are primarily based on PDS data
- our estimates of long-term international migration, which are based on different data sources and methods for each nationality grouping

The methods and data sources used in our estimates of internal migration and cross-border flows are described in our Mid-year admin-based population estimates quality and methods guide. Methods and data sources used in our estimates of long-term international migration are described in our Methods to produce provisional long-term international migration estimates methodology.

More information about the data sources used, including why they have been selected, how the data are collected, their quality, bias, strengths and limitations is provided in our Quality overview of data sources used in mid-2024 admin-based population estimates article. Information on the wider set of administrative sources that have been used in our development of population and migration statistics is available in our Data source overviews article.

11 . How we quality assure our methods

The methods and data sources used to produce our mid-year admin-based population estimates (ABPEs) are continually developed and enhanced as we seek to improve the quality of our outputs in line with our quality strategy.

Our methodological work for the ABPEs has previously been presented to our independent Methodological Assurance Review Panel (MARP), consisting of a panel of recognised experts.

A subgroup of MARP, consisting of Bayesian statisticians, was set up in March 2025 to provide advice on the methods developed for and used in the dynamic population model (DPM).

All papers presented to both panels are available in the papers section of the UK Statistics Authority website.

The methods have also been presented and discussed at a cross-government demographic and methodology working group.

12 . Ensuring coherence across the population statistics system

Our admin-based population estimates (ABPEs) are official statistics in development. Our accredited official mid-year population estimates are used:

- as a base for other population statistics, such as population projections, and population estimates for the very old
- to produce population estimates for lower geographical levels and alternative geographies
- for weighting surveys, such as the Labour Force Survey and other social surveys, to ensure they are representative of the total population (and adjusted to remove persons living in communal establishments, where necessary)
- as a denominator for various rates and ratios relating to population, health, crime and the economy

We are working towards ABPEs becoming the accredited official population estimates for England and Wales. We will ensure coherence across the population statistics system, as we make this transition.

13 . Estimates for higher-level geographies and subgroups of the population

Our Admin-based population estimates (ABPEs) for local authorities in England and Wales dataset provides estimates of the population and components of population change for all local authorities by single year of age and sex. These are summed to give higher-level estimates, such as total population within a local authority, region, country, or age group.

Credible intervals are published alongside the ABPEs and show the range of possible estimates. Before 2025, credible intervals were provided for local authority totals and each age and sex within each local authority. We now provide 95% credible intervals for our population estimates by:

- single year of age and sex within each local authority
- local authority totals
- regional totals
- country totals
- England and Wales total

Our ABPE dataset includes estimates of uncertainty for 2022 to 2024.

14 . UK estimates

We compile and publish population estimates for the UK, using official mid-year estimates:

- for England and Wales, produced by us at the Office for National Statistics (ONS)
- for Scotland, produced by the National Records of Scotland (NRS)
- for Northern Ireland, produced by the Northern Ireland Statistics and Research Agency (NISRA)

Estimates for the UK will be compiled using ABPEs when they become the official population estimate for England and Wales.

The NRS and NISRA are also investigating alternative methods and data sources for producing population estimates. The NRS has published research on Administrative data based population, household and ethnicity estimates, and NISRA has also published Research into using administrative data for population estimates. We are all sharing information to support each other's work, in line with the Concordat on Statistics and its supplementary statement of agreement. By taking similar approaches, we will be able to maximise the coherence of UK estimates.

15 . Estimates for small areas and other geographies

The dynamic population model and the traditional cohort component method cannot be used to produce population estimates below local authority level or for other geographies, for example national parks. This is because we do not have all the necessary data sources available for these geographies. Instead, we use a ratio change method to generate population estimates for super output areas from local authority estimates. This method is explained in more detail in Section 6 of our Population estimates by output areas, electoral, health and other geographies quality and methodology information. This method can continue to be used with the admin-based population estimates (ABPEs).

We are investigating options for improving methods for small area population estimates, as explained in our Small area population estimates in the transformed population estimation system methodology article. One potential approach is to make use of geospatial methods and data sources. Our working paper, Geospatial methods for small area population estimates: proof of concept, was reviewed by the Methodological Assurance Review Panel in August 2024.

16 . Disaggregated migration: international, internal, and cross-border flows

The dynamic population model (DPM) estimates the population and population change.

The DPM models migration as combined inflows and combined outflows for each local authority in England and Wales. To better understand changes in the size of local authority populations, combined migration flows are disaggregated to provide estimates of international and internal migration. The disaggregated flows provide the origin and destination for people moving:

- between local authorities in England and Wales
- within the UK, between local authorities in England and Wales, and Scotland or Northern Ireland
- between local authorities in England and Wales, and countries outside the UK

17 . Time series for mid-year admin-based population estimates

Our mid-year admin-based population estimates (ABPEs) published in July 2025 provide a fully comparable time series for 2022 to 2024. This takes account of methodological improvements, and new and updated data sources, including new estimates for migration. This time series is not comparable with our previously published time series, which covers 2011 to 2023.

When the ABPEs become the official population estimates, we plan to revise the population estimates data time series back to 2022, using the ABPE back series. We have selected 2022 because the ABPEs are very similar to the current mid-year estimates in 2021. This is because Census 2021 data are used to produce both estimates. This will ensure that users have a consistent time series after Census 2021.

18 . Comparing mid-year admin-based population estimates with official mid-year population estimates

The different methods used to produce the mid-year admin-based population estimates (ABPEs) and the accredited official mid-year population estimates (MYEs) mean that we do not expect these two sets of estimates to match exactly. ABPEs are produced using independent population stocks for each year, which reduces the increase in uncertainty as we move further away from a census, compared with population estimates produced using the cohort component method.

Mid-2024 ABPEs published in July 2025 are very similar to the accredited official MYEs; the total ABPE for England and Wales is 0.1% lower than the MYE.

Our Population estimates for England and Wales: mid-2024 bulletin provides more detail on how the two sets of estimates compare.

19 . How we engage with users

We engage with users and seek feedback through a range of activities including:

- webinars which include question and answer sessions
- conferences
- meetings and working groups, such as by the Central Local Information Partnership, the UK Population Theme Advisory Board, British Society for Population Studies, Administrative Data Research UK and the Royal Statistical Society
- a working group to consider impact of changing population estimate methods on funding formulae, models or other processes
- focused meetings with selected local authorities that represent some important population features seen in some local areas; these local authorities are listed in Section 3 of our January 2025 quarterly update
- consultations; of most relevance to the ABPEs is our Help shape our published content for population estimates consultation
- asking for feedback in all our publications

On 29 June 2023, we launched a consultation on the future of population and migration statistics in England and Wales. A total of 706 responses were received. We published a report on the consultation's findings (PDF, 4.2MB).

The valuable feedback received through these engagement activities is used to guide our work. Some examples can be found in our Admin-based population estimates; England and Wales engagement plan 2025 to 2026. We continue to explore new opportunities for collecting user feedback, to help us understand how best to meet user needs.

20 . Comparing data sources for admin-based population estimates and mid-year estimates

Data sources used to produce both MYEs and ABPEs

Data sources used to produce both the admin-based population estimates (ABPEs) and the accredited official mid-year population estimates (MYEs) include:

- the 2011 Census and Census 2021
- birth registrations data
- death registrations data
- NHS Personal Demographics Service (PDS)
- our Long-term international migration estimates
- estimates of internal migration created using the PDS and Higher Education Statistics Agency data

Estimates of cross-border moves between countries of the UK used to produce both the MYEs and ABPEs include:

- the PDS
- health cards from Business Services Organisation Northern Ireland
- the NHS Central Register for Scotland

Estimates of special populations used to produce both the MYEs and ABPEs include:

- UK armed forces data from the Ministry of Defence and British Forces Germany
- census data for the home armed forces
- data on the United States military
- prisoner data from the Ministry of Justice

Data sources used to produce ABPEs only

Health data

- Hospital Episode Statistics for England.
- Admitted Patient Care, Outpatient and Critical Care Data Sets for Wales.
- Emergency Care Data Set for England.
- Emergency Department Data Set for Wales.

Education data

- English School Census.
- Individualised Learner Record for England.
- Welsh School Census.
- Lifelong Learning Wales Record.

Tax and benefits data

- HM Revenue and Customs (HMRC) Corporate Data Frameworks.
- HMRC P14.
- HMRC and Department for Work and Pensions child benefits.

Information about the data sources used for the ABPEs, including why they have been selected, how the data are collected, their quality, bias, strengths, and limitations is provided in our Quality overview of data sources used in the mid-2024 ABPEs article.

Our Mid-year ABPEs for England and Wales quality and methods guide explains how we turn the data into statistics.

21 . Further information on population statistics

User feedback plays an essential part in our ability to improve our statistics. Please email any questions or feedback to pop.info@ons.gov.uk.

Updates on publications and events can be found in our monthly newsletter, including our planned programme of webinars on population and migration statistics. Our Quarterly update on population and migration statistics articles series explains our progress and future plans.

Further information relating to admin-based population estimates (ABPEs), the dynamic population model and transforming population statistics are available in our:

- ABPE articles series
- Mid-year ABPE quality and methods guide
- The future of population and migration: a statistical design methodology
- How our population and migration estimates are evolving article

Information relating to our accredited official mid-year population estimates (MYEs) is available in our MYE quality and methodology information report.

22 . Cite this methodology

Office for National Statistics (ONS), published 30 July 2025, ONS website, article, Understanding mid-year admin-based population estimates for local authorities in England and Wales