Office for National Statistics

Article

Admin-based population estimates: local authority case studies, England and Wales, mid-2024

Case studies to analyse differences between the admin-based population estimates and the official mid-year population estimates.

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1 . Overview of population estimates

This research article shows results of comparisons between two methods of estimating the population for a small number of local authorities. These methods are our long-established official mid-year population estimates (MYEs) and our more recent model-based method, referred to as admin-based population estimates (ABPEs). This is part of our ongoing development in using administrative data to measure the population. While our Assessment of criteria for moving to admin-based population estimates as official estimates of population, England and Wales: 2026 has led to our decision to continue to produce population estimates using the established MYE method, it is helpful to compare the impact of the alternative ABPE approach at the local-authority level.

Admin-based population estimates have been published as official statistics in development. They do not replace official mid-year population estimates and should not be used for decision making. These statistics should not be used without this warning.

As set out in our Admin-based population estimates; England and Wales engagement plan 2025 to 2026, we have worked with a range of users to understand how the differences between ABPEs and official estimates affect uses, such as funding allocations and service planning. This research article helps users understand those differences and is part of a wider set of evidence that supports our continued publication of official MYEs through established methods. Some additional evidence, comparing the performance of a research-only version of the ABPEs with the MYEs from 2011 to 2021, is provided in our Evaluating the accuracy of the admin-based population estimates for England and Wales methodology article.

Although ABPEs do not replace official estimates, we are using the research and experiences of developing ABPEs to continuously improve the population estimates, whereby we will continue to make iterative improvements to the data and methods.

Understanding admin-based population estimates

Both the admin-based population estimates (ABPEs) and official mid-year population estimates (MYEs) use the same input data for the population flow components for births, deaths, and migration. The ABPEs also use a population stock derived independently for each year from a wide range of administrative data. The MYEs use the estimated population flow components to roll forward census population stock estimates between censuses.

As we move further away from a census, MYEs become less accurate, or "drift", because inaccuracies can build each year as the population is rolled forward. The level of drift between censuses varies by local authority. Further information is available in our Reconciliation of mid-year population estimates with Census 2021 at local authority level report.

The ABPE methods balance the population stocks and flows over time, accounting for uncertainty, data quality limitations, and challenges in measuring migration flows. Coverage adjustment addresses coverage errors in the population stocks using census data. The coverage ratios are held constant after 2021. If trends from Census 2021 diverge in the years following the census, it reduces their accuracy. This is because Census 2021 took place during the coronavirus (COVID-19) pandemic. Having a reliable method for measuring and adjusting for coverage error in the population stock will help improve our population estimates.

There are methodological and data source differences between the ABPEs and MYEs. The two estimates tend to be most similar in census years 2011 and 2021. This is because we use census-based MYEs, which have relatively low levels of uncertainty, as the population stock for the ABPEs. Full details of the methodology can be found in our Mid-year admin-based population estimates for England and Wales quality and methods guide.

The census and our census-based MYEs have provided the best understanding of the population at a moment in time for many years. However, we recognise that there are iterative improvements that can be made to the data and methods that underpin the components of population change.

2 . Comparing estimates overall

Differences between the total admin-based population estimates (ABPEs) and official mid-year population estimates (MYEs) are small for most local authorities. Only 2 of 318 local authorities have a total MYE that is outside the ABPE credible intervals between mid-2022 and mid-2024: the City of London in mid-2022, and Coventry in mid-2024. Variation can be measured using a credible interval, which means that the probability that the true value lies within the credible interval is 95%. When an estimate falls within the credible interval of a second estimate, it gives confidence that the two measures are comparable. Further information about credible intervals is available in Section 9: Glossary.

The MYEs by age and sex in mid-2024 are outside the ABPE credible intervals in 2.8% of instances. Of these, a slightly higher proportion of MYEs are lower than the ABPE credible intervals (55%), than above (45%). Females account for over two-thirds (69%) of all instances where the MYEs are below the ABPE credible intervals, compared with males (31%). This may indicate that the ABPEs are better at estimating women than the MYEs because they interact more often with administrative data sources that feed into the ABPEs.

Young adults (aged 18 to 25 years) account for nearly half (47%) of all instances where the MYEs by age and sex are outside the ABPE credible intervals, with a similar proportion above compared with below. Measuring the young adult population is challenging, as students often move areas for higher education and young professionals relocate for work.

Urban areas (as defined in our 2021 Rural Urban classification) account for more than three-quarters (78%) of the instances where the MYEs by age and sex are outside the ABPE credible intervals. This is likely to be because urban areas experience higher levels of migration, which is associated with greater uncertainty.

To help analyse differences in the population estimates, we have sought local insight from four local authorities:

- Manchester, a densely populated urban area with a large proportion of international students
- Coventry, a mainly urban area with estimation challenges because student accommodation is located across Coventry and Warwick
- Ceredigion, a mainly rural area with a large student population
- Westminster, an ethnically diverse and densely populated area with a high proportion of social and private renters

3 . Comparing estimates for Ceredigion

Population characteristics

Ceredigion, a large, mainly rural area, was one of the least densely populated local authorities in Wales in mid-2024. The population of Ceredigion declined by 5.9% between censuses in 2011 and 2021, while overall the population of Wales increased by 1.4%. Recent official estimates show the population of Ceredigion increased by 2.7% between mid-2021 and mid-2024.

In Census 2021, more than 1 in 10 (13%) of the adult population in Ceredigion were full-time students, higher than England and Wales (7.7%). Ceredigion has a notable student population; this contributes to the relatively high levels of internal migration around student ages to and from the rest of Wales and the other UK countries. Population churn is low outside of the core student ages (18 to 21 years).

Comparing estimates for young adults

The largest differences between the admin-based population estimates (ABPEs) and the official mid-year population estimates (MYEs) in mid-2024 are for young adults in their late teens and early 20s. The MYEs are higher than the ABPEs and are above the upper credible interval for women aged 19 to 22 years and men aged 21, 24 and 25 years. This pattern is consistent with mid-2022 and mid-2023.

Some of the differences can be explained by the coverage adjustment process used to produce the ABPEs. Coverage adjustment addresses undercount or overcount in our estimated population stocks. It does this by comparing the mid-2021 population stock with the mid-2021 census-based MYEs, then applying those ratios to the mid-2024 population stock. Coverage adjustment ratios remain fixed for subsequent years, which can reduce accuracy if trends start to diverge from those in 2021. Coverage adjustment is explained in more detail in our Mid-year admin-based population estimates for England and Wales quality and methods guide.

The Statistical Population Dataset (SPD) is one of the population stocks used in the ABPEs. For Ceredigion in mid-2024, coverage adjustment lowers the unadjusted SPD for ages 18 to 21 years by 5.0%, making it much lower than the MYEs. Without coverage adjustment, the SPD that feeds into the ABPEs would have been higher for this age group and more similar to the MYEs. This pattern is common in local authorities with universities. Coverage adjustment reduces the unadjusted SPD for those aged 18 to 21 years in around two-thirds (63%) of local authorities with universities, and increases them in around 9 in 10 (91%) of those without universities.

Figure 1: Differences between the ABPEs and MYEs are greatest for females in their early-20s

Admin-based population estimates (ABPEs), mid-year estimates (MYEs), adjusted Statistical Population Dataset (SPD) and unadjusted SPD, females, Ceredigion, mid-2024

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Young adults aged 18 to 25 years are particularly hard to estimate using administrative data because they are a highly mobile group. Accurate SPD estimates depend on addresses being updated in a timely manner on health, tax and benefit systems when people move between local authorities.

There are some limitations in the current coverage adjustment method, which can partially explain the trends seen for young adults. Differences in how students were recorded in the 2021 Census compared with the Higher Education Statistics Agency (HESA) data, which feeds into the SPD are a factor.

During the coronavirus pandemic, HESA recorded remote students at their term-time address if they would normally be studying in person. Census also recorded remote students at their term-time address unless they did not intend to return during the 2020 to 2021 academic year, then they were recorded at their census day address. This definitional difference resulted in discrepancies, particularly for local authorities with high numbers of international students. Ceredigion had a high count of international students in Census 2021 (fourth highest in Wales), so this issue is likely to have affected it. The impact of the pandemic on student data has been investigated in our report Students: Census 2021 and HESA's report The impact of the COVID-19 pandemic on 2020/21 Student data.

For Ceredigion, coverage adjustment appears to be more effective at correcting coverage errors for those aged 30 years and over. Figure 1 shows that the unadjusted SPD is much lower than the MYEs, whereas the coverage-adjusted SPD and the resulting ABPEs closely align with the MYEs.

The SPD is still under development, if the ABPEs were to be reproduced after further developments to the SPD, the results may be different.

4 . Comparing estimates for Westminster

Population characteristics

Westminster, an inner London borough, is the 11th most densely populated local authority in England and Wales in mid-2024. Only other London boroughs are more densely populated.

The borough has several universities and boarding schools and was one of the top 10 local authorities with the most international students in Census 2021. These communal establishments contribute to the borough's high level of population churn from both internal and international migration.

Westminster was one of only three London boroughs to see its population decline between the 2011 and 2021 censuses, a decrease of 6.9%. Overall, the population of London increased over the decade by 7.7%. The pandemic may have affected where people were usually resident for Census 2021. Since then, official mid-year estimates (MYEs) for Westminster show the population increasing.

In Census 2021, nearly three-quarters of households in Westminster were living in social or private rented properties (72%). In addition to the usual resident population, one of the greatest challenges is the use of many Westminster homes on a part-time basis, such as short-term lets, second homes, and short-term migrants.

Young adults aged under 25 years

In mid-2024, Westminster shows a similar trend to Ceredigion for young adults aged 19 to 21 years. The official mid-year population estimates (MYEs) are above the admin-based population estimate (ABPE) and the ABPE upper credible interval. Again, these differences appear to largely result from coverage adjustment and challenges estimating international students in 2021.

Adults in their mid-20s and 30s

In mid-2024, the MYEs are higher than the ABPEs and above the ABPE upper credible interval for women aged 27, 28 and 30 years, and men aged 34 years. Figure 2 shows some of these differences can be explained by coverage adjustment. For example, for women aged 27 years, coverage adjustment reduces the unadjusted Statistical Population Dataset (SPD) by 6.5% and is the main reason for the lower ABPEs.

There are challenges in capturing some populations in the administrative data sources, such as those employed in the informal economy and those who access private education and healthcare. We continue to explore ways of better capturing these populations.

Women in their 50s

The MYEs for mid-2024 have a peak for women aged 55 to 57 years, which is above the ABPE upper credible interval. This peak appears to be caused by a cohort effect, since it can be seen ageing on from persons aged 53 to 55 years in mid-2022. This peak appeared in the 2021 Census data and is the result of the uncertainty associated with disaggregating age group estimates to single year of age within the estimation process. Only the neighbouring borough of Kensington and Chelsea shows a similar trend.

These two local authorities had the joint lowest response rate (89%) to the 2021 Census compared with England and Wales (97%). The age groups 20 to 24 years and 50 to 54 years had the lowest response rates overall. As a result, relatively large amounts of adjustment and imputation were required to derive the 2021 census-based population estimates for these local authorities. Uncertainty around the estimates was greater than for many other local authorities, for further details see our Measures showing the quality of Census 2021 estimates methodology.

Figure 2: The MYEs and SPD show a peak in the early-50s, likely because of the low Census 2021 response rate affecting estimates through to 2024

Admin-based population estimates (ABPEs), mid-year estimates (MYEs), adjusted Statistical Population Dataset (SPD) and unadjusted SPD, for females by age, Westminster, mid-2024

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5 . Comparing estimates for Manchester

Population characteristics

Manchester, a city and metropolitan borough, was the most densely populated local authority in the North West in mid-2024. It has a large student population and the highest number of international students and short-term residents among all local authorities in England and Wales, according to the 2021 Census. These factors contribute to the area's high levels of in and out migration.

Manchester has a large young working-age population. It has the lowest median (average) age of all local authorities (30.4 years in mid-2024), nearly a decade lower than England and Wales (40.3 years). Young working-age adults make up the majority of migration into and out of Manchester and are difficult to estimate accurately because of their high mobility.

Young adults aged under 25 years

In mid-2024, the admin-based population estimates (ABPEs) and official mid-year population estimates (MYEs) for Manchester show similar trends across most ages with differences among young adults, consistent with the other local authorities in this article. The MYEs are higher than the ABPEs for this group and are above the ABPE upper credible interval for females aged 20 to 22 years and males aged 21 to 22 years.

In this case study we have focused on explaining the differences for males because they provide a good example of instances where the lower Statistical Population Dataset (SPD) is the primary cause of the differences between the ABPEs and MYEs. Figure 3 shows that the SPD and ABPE are similar for young men aged 20 to 22 years in mid-2024. Coverage adjustment has little impact on this age group, increasing the unadjusted SPD by just 0.91%.

Figure 3: For men in their early-20s the MYEs are higher than the ABPEs

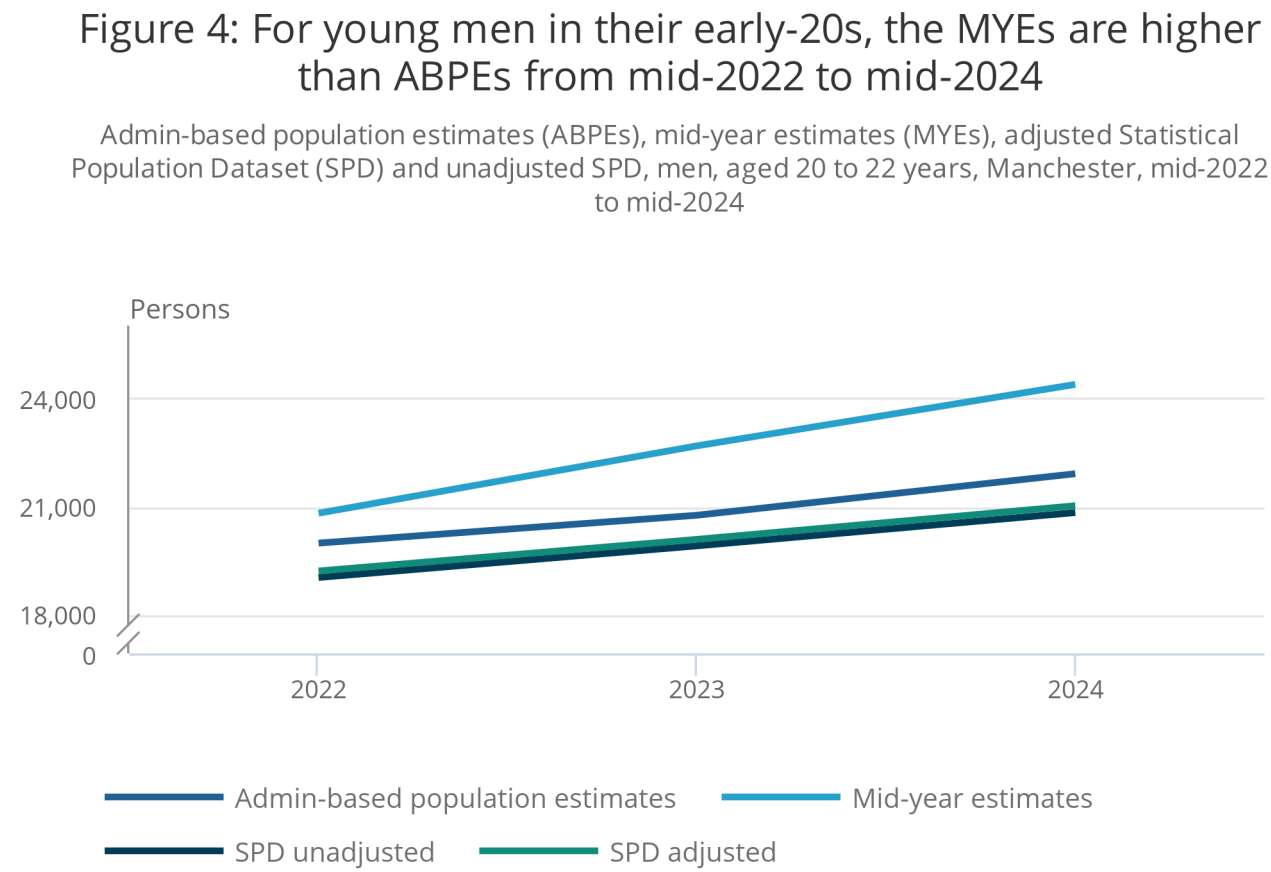
Admin-based population estimates (ABPEs), mid-year estimates (MYEs), adjusted Statistical Population Dataset (SPD) and unadjusted SPD, males, by age, Manchester, mid-2024

Figure 4 shows for young men aged 20 to 22 years the MYEs remain higher than the ABPEs between mid-2022 and mid-2024, with the differences increasing over time. In mid-2022, the MYEs were 4.0% higher than the ABPEs and by mid-2024 the MYEs are 10% higher than the ABPEs. This trend is caused by the lower population stock (SPD) in the ABPEs. Figure 4 shows the ABPEs and SPD show a similar rate of growth between mid-2022 and mid-2024.

This report has found the ABPE method tended to estimate fewer people at the core student ages 19 to 21 years for local authorities with large student populations compared with the MYEs, although it is unclear which estimate is more accurate. Engagement with this local authority has suggested that the administrative data sources may not fully capture some highly mobile populations, such as recent graduates. We are looking at ways to further improve their coverage.

Figure 4: For young men in their early-20s, the MYEs are higher than ABPEs from mid-2022 to mid-2024

Admin-based population estimates (ABPEs), mid-year estimates (MYEs), adjusted Statistical Population Dataset (SPD) and unadjusted SPD, men, aged 20 to 22 years, Manchester, mid-2022 to mid-2024



Source: Population estimates from the Office for National Statistics

6 . Comparing estimates for Coventry

Population characteristics

Coventry, a mainly urban area, is among the top 20% most densely populated English local authorities and the second largest city in the West Midlands in mid-2024. It has a relatively young population, with a median (average) age of 34.3 years in mid-2024, more than five years lower than England and Wales (40.3 years).

Coventry has a large student population, some university accommodation stretches across the boundary with Warwick, making it challenging to estimate. A special population adjustment is made to both the official mid-year population estimates (MYEs) and admin-based population estimates (ABPEs) to allow for this. More information is available in our University of Warwick halls of residence data: quality assurance of administrative data used in population statistics, June 2019 report.

Adults aged under 30 years

In mid-2024, Coventry is the only local authority where the total MYE is outside the ABPE credible interval. The total MYE is 2.0% higher than the ABPE. Young adults show the largest differences between the ABPEs and MYEs, similar to the other local authorities in this article. The MYEs are higher than the ABPEs and are above the upper ABPE credible interval for females aged 19 to 23 and 28 years and for males aged 19 to 22 years.

Some local authorities had data quality issues, which resulted in very low estimates of uncertainty going into the model for a small number of data points. The ABPE credible intervals that came out of the model were therefore implausibly narrow for those points. While this affected the credible intervals, it had little effect on the primary estimates. In instances where this issue occurred, the MYEs often fall outside of these very narrow credible intervals. This affected young adults in Coventry aged 19 to 22 years, shown in Figure 5.

Coverage adjustment is the main reason for differences between the MYEs and ABPEs for young adults. For men aged 19 years, the unadjusted Statistical Population Dataset (SPD) is 2.6% higher than the MYE, while the coverage-adjusted SPD is 17% lower than the MYE. Coventry had the third highest count of international students in Census 2021. Differences in how international students were counted in the census and administrative data, explained in Section 3, will have contributed to these differences.

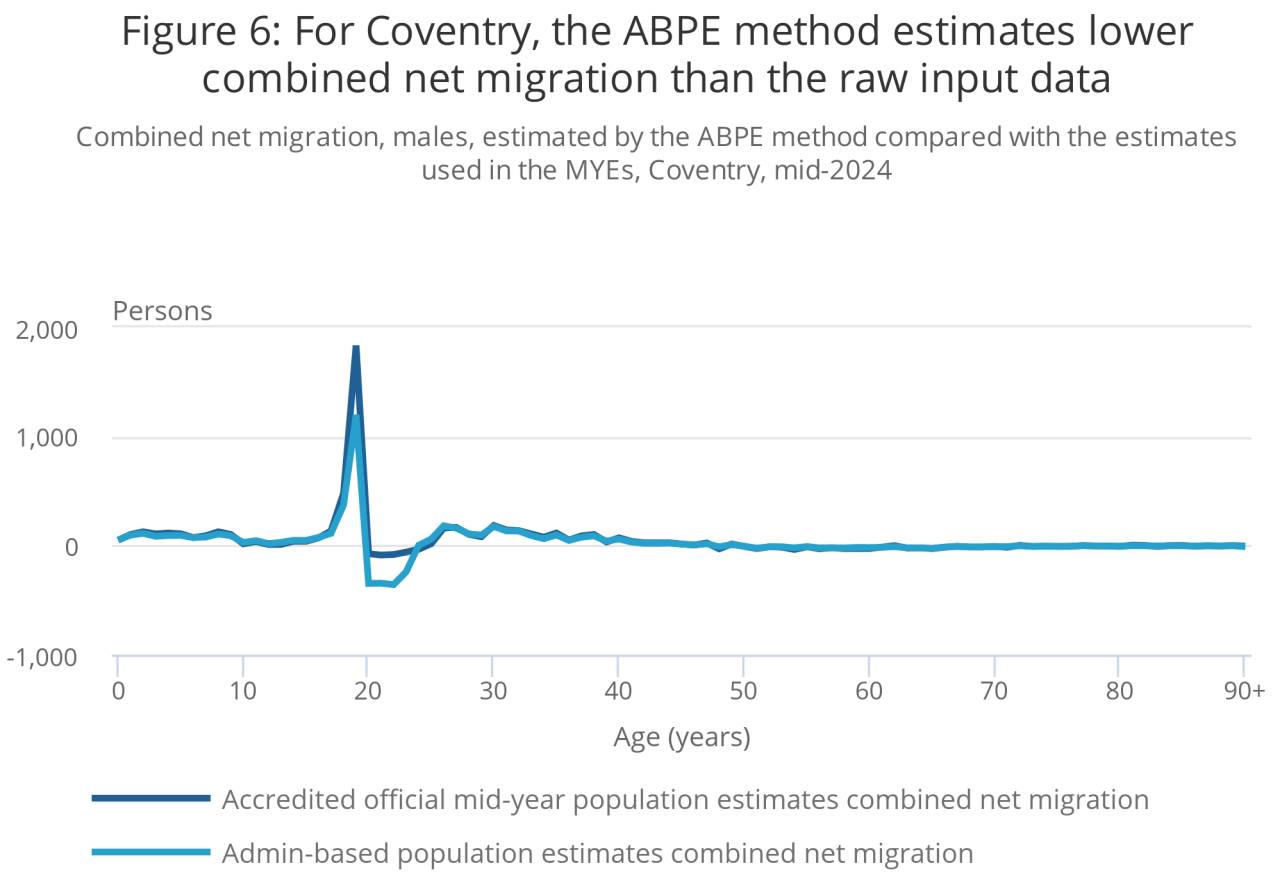
Figure 5: Coverage adjustment is the main reason for the differences between the ABPEs and MYEs for men in their early 20s

Admin-based population estimates (ABPEs), mid-year estimates (MYEs), adjusted Statistical Population Dataset (SPD) and unadjusted SPD, males, by age, Coventry, mid-2024

The lower adjusted SPD figures also affect the ABPE population flows. The ABPE method balances the input data on population stocks and flows, weighting them based on uncertainty. Because the stock estimate is lower, the estimation process reduces net migration for 19-year-old men compared with the input figures that are used directly in the MYEs. This contributes to the lower estimated population for 19-year-olds in the ABPEs.

Figure 6: For Coventry, the ABPE method estimates lower combined net migration than the raw input data

Combined net migration, males, estimated by the ABPE method compared with the estimates used in the MYEs, Coventry, mid-2024



Source: Population estimates from the Office for National Statistics

7 . Summary of results

As part of our ongoing commitment to improve population estimates, we have evaluated the performance of the admin-based population estimates (ABPEs) with the official mid-year population estimates (MYEs) in local authorities. The comparisons showed that the ABPEs are generally similar to the MYEs across all local authorities. Only 2 of 318 local authorities had a total MYE that was outside the ABPE credible intervals between mid-2022 and mid-2024.

Four local authorities were examined in greater detail and this showed that differences between the two methods were mostly seen in students and young working-age adults. The scale of these differences was affected by the characteristics of the local authority, for example, those with large younger adult populations experienced larger differences. Our engagement with local authorities has informed us that these groups are important populations of interest and this will guide us in future research.

Differences between the methods mainly occur because the ABPEs use independent population stocks adjusted for coverage errors, while the MYEs use rolled-forward census data. Our method in the ABPEs, of adjusting population stocks for coverage, creates some differences between the results for the two methods. However, it is unclear which estimates are more accurate. We are still evaluating the performance of the ABPEs, at present we are not suitably confident that our coverage-adjustment method in the ABPEs is capturing changes to the population after 2021. It is important to note that both the established MYE and ABPE methods use administrative data. Our ambition is to improve upon the MYEs iteratively.

Further details about our decision that the ABPEs will not be adopted as official estimates can be found in our Assessment of criteria for moving to admin-based population estimates as official estimates of population, England and Wales: 2026.

8 . Data on admin-based population estimates

Admin-based population estimates, mid-year population estimates and Statistical Population Dataset version 5.1 for Ceredigion, Coventry, Manchester and Westminster, mid-2024
Dataset | Released 4 March 2026
Admin-based population estimates, accredited official mid-year population estimates and Statistical Population Dataset version 5.1, mid-2024.

Admin-based population estimates for local authorities in England and Wales
Dataset | Released 30 July 2025
Admin-based population estimates for all local authorities in England and Wales from the dynamic population model.

Admin-based population estimates of internal migration between local authorities, England and Wales: mid-2024
Dataset | Released 3 December 2025
Annual internal migration moves into and out of each local authority in England and Wales by origin, destination, age, and sex for the admin-based population estimates (ABPEs).

9 . Glossary

Cohort

In this article, cohort refers to a group of people with the same year of birth, where "year" refers to the year to 30 June.

Coverage adjustment

The population stocks require coverage adjustment to allow for coverage errors. These occur when a member of the population is not counted, is counted more than once, or is counted in the wrong location. Our current proxy coverage-adjustment method from 2021 onwards compares the mid-2021 population stock with the 2021 census-based MYEs. These ratios, which are fixed for subsequent years, are applied to the population stocks.

We are exploring methods using administrative data sources. For more information, see Section 3: Creating initial estimates for coverage ratios, of our Mid-year admin-based population estimates for England and Wales quality and methods guide.

Credible intervals

The range in which the true value of the quantity being estimated is likely to be contained. This is a similar concept to the credible intervals for official mid-year population estimates and census estimates. We use 95% credible intervals in this article by taking 2.5th and 97.5th percentiles from the distributions of counts produced by our estimation process as the lower and upper bounds of our intervals, respectively. The probability that the true value lies in the credible interval is 95%. Credible interval bounds are not symmetrical around the admin-based population estimates (ABPEs); the distance of the lower and upper bound from the ABPE will differ.

Population flows

Flows estimate changes to the population stock over time, using data on births, deaths, international migration and internal migration within the UK. The flow estimates we use cover the 12-month period to mid-year (30 June).

Modelled migration estimates

Migration estimates produced by the ABPE method. These estimates differ from those used in the official mid-year population estimates and as input data for the ABPEs.

The ABPE method derives modelled estimates for combined immigration (inflows) and combined emigration (outflows), which cover both international migration and internal migration within the UK. The modelled migration estimates are derived by balancing population stocks and flows over time, using the uncertainty associated with these estimates. Estimates of combined net migration are calculated by subtracting estimates for combined emigration from combined immigration.

Population stocks

Estimates of the population at specific points in time. Population stocks used to estimate the ABPEs relate to mid-year (30 June) and are produced independently for each year. Coverage adjustment of the population stocks is required to account for coverage errors.

Rolled-forward estimates

Population estimates from the last census are "rolled forward" by adding births, subtracting deaths, and adjusting for migration to estimate the population for later years. Our official mid-year population estimates are produced using this approach.

Statistical Population Dataset unadjusted

The Statistical Population Dataset (SPD) before coverage adjustment.

Statistical Population Dataset adjusted

The SPD that has been coverage adjusted.

10 . Data sources and quality

More quality and methodology information

More quality and methodology information on strengths, limitations, appropriate uses, and how the data were created is available in our Mid-year admin-based population estimates for England and Wales quality and methods guide.

User engagement and working with the selected local authorities

The analysis in this article and our engagement with selected local authorities has improved our understanding of why differences exist between the admin-based population estimates (ABPEs) and official mid-year population estimates (MYEs), a useful step in improving our population and migration statistics.

We do not expect the two sets of estimates to match exactly because of differences between the methods and the data sources. More information is available in our Understanding mid-year admin-based population estimates for local authorities in England and Wales article. Through our ongoing engagement with users, including local authorities, we continue to improve our understanding of the strengths and limitations of the ABPEs and work together to understand how we can address any challenges.

Acknowledgements

The Office for National Statistics (ONS) has been supported in this research by the University of Southampton. We would like to thank those involved for their guidance and support.

We would also like to thank the four local authorities explored in this article for their feedback and insight.

Official statistics in development

Admin-based population estimates have been published as official statistics in development. They do not replace our official mid-year population estimates and should not be used for decision making. These statistics should not be used without this warning.

11 . Future developments

The Office for Statistics Regulation (OSR) has assessed the admin-based population estimates (ABPEs) against the standards set out in the Code of Practice for Statistics. We will use the research and experiences of developing ABPEs to continuously improve the population estimates, whereby we will continue to make iterative improvements to the data and methods.

Our population and migration quarterly update article provides the latest information on plans and progress to help keep users informed.

12 . Feedback

User feedback plays an essential part in our ability to improve our statistics. We also want to consider local knowledge that could improve our statistics and we welcome our users' expert opinions on their local areas. Please email any feedback on the quality of our admin-based population estimates (ABPEs) or evidence in relation to any differences between our current population estimates and the ABPEs to pop.info@ons.gov.uk.

You can also sign up to email alerts from the Office for National Statistics Population team for updates on our progress, and to hear about upcoming events and opportunities to share your views.

13 . Related links

Population estimates for England and Wales: mid-2024
Bulletin | Released 30 July 2025
National and subnational mid-year population estimates for England and Wales by administrative area, age and sex.

Mid-year admin-based population estimates for England and Wales quality and methods guide
Methodology | Released 30 July 2025
How we produced the statistics, their strengths and limitations and further quality information.

Understanding mid-year admin-based population estimates for local authorities in England and Wales
Article | Released 30 July 2025
Important information about our mid-year admin-based population estimates (ABPEs) for England and Wales.

Evaluating the accuracy of the admin-based population estimates (ABPEs) for England and Wales
Article | Released 4 March 2026
A research evaluation methodology article comparing the accuracy of the admin-based population estimates (ABPEs) and mid-year population estimates (MYEs) for England and Wales.

Assessment of criteria for moving to admin-based population estimates as official estimates of population, England and Wales: 2026
Article | Released 4 March 2026
Assessment of readiness for admin-based population estimates to become official estimates of population for England and Wales in summer 2026.

Quarterly update on population and migration statistics: March 2026
Article | Released 4 March 2026
Latest article on improvements to how we estimate UK population and migration, providing an update on our progress and plans.

14 . Cite this article

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