Office for Statistics Regulation

UK Statistics Authority

Review of compliance with the Code of Practice for Statistics

# Mid-year population estimates for Scotland

Statistics producer: National Records of Scotland
Report by: Office for Statistics Regulation

November 2026

## The Office for Statistics Regulation

**Statistics should serve everyone,** helping enhance knowledge about every section of society and the economy, and people's place within them.

The Office for Statistics Regulation (OSR) provides independent regulation of official statistics produced in the UK. Official statistics are statistics produced by Crown bodies and other organisations listed within an Official Statistics Order, on behalf of the UK Government or the devolved governments. We help ensure that statistics serve the public good as public assets that are widely used to provide insight, inform understanding and shape action.

We aim to enhance public confidence in statistics produced by government by setting the standards that they must meet in the Code of Practice for Statistics (the Code). We ensure that producers uphold these standards by conducting reviews of statistics against the Code. We also report publicly on system-wide issues and on the way statistics are being used, celebrating when the standards are upheld and challenging publicly when they are not.

## Compliance review

A compliance review is a review of any official statistics (or accredited official statistics) to establish the extent to which they meet the standards of Trustworthiness, Quality and Value in the Code of Practice for Statistics. We might undertake a review with a view to accrediting a set of statistics (this type of compliance review is called an assessment), focus on a specific issue or involve a high-level check of ongoing compliance. A range of factors determine the scope of and approach to a compliance review, including the type of statistics, their accreditation status, the producer history, the profile of the statistics and the reasons for initiating the review.

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# Overview

At the time of this report, the National Records of Scotland (NRS)'s mid-year population estimates (MYE), small area population estimates (SAPE) and population estimates for centenarians in Scotland are published as accredited official statistics. See the Annex for the full list of statistical publications covered in this compliance review.

These statistics provide the official headline measure of the population in Scotland and council areas, on an annual basis. Small area estimates provide more granular geographic breakdowns of the population for data zones and other geographies. The statistics currently have a wide variety of uses within central government, local authorities and health bodies, other public bodies, commercial companies and individuals in the private and academic sector. These statistics are used for allocating financial resources from central government, planning services, and calculating ratios for births and deaths at different geographical scales. Centenarians' estimates are also important for policy development, particularly for health and welfare services, and are used to calculate mortality rates.

This review assesses the extent to which the MYE for Scotland continue to meet the standards of Trustworthiness, Quality and Value of the Code of Practice for Statistics (the Code).

## Why we did this review

These statistics are important and used extensively by a wide range of users. OSR last assessed these statistics in July 2015. We published a review of the Office for National Statistics (ONS)'s mid-year population estimates in England and Wales in May 2026, and a review of Welsh Government's outputs in October 2026. We are also starting a review of NISRA's mid-year population estimates in Northern Ireland.

OSR's review involved conducting desk research and speaking to a range of population statistics users in Scotland to help inform our judgements and findings.

## Highlighted findings

- NRS demonstrates its commitment to transparent decision making and balancing user needs with analytical constraints through its review of statistical publications and by setting out its priorities and plans in its published 2026-27 annual statistical work programme.
- Many users we spoke to reported positive interactions with NRS in requesting further information and responding to queries. However, users highlighted some data gaps, and there were concerns about the communication of delays to

statistical releases. There was also a desire for additional engagement activities beyond what NRS offers currently.

- NRS provides users with various ways to access the statistics. Users valued the outputs and visualisations but reported that navigating NRS's website and supporting tools (such as interactive charts) is not always straightforward. Some supporting documents are also only available as PDF, making them less accessible and harder to navigate.

- NRS uses a range of administrative and supplementary data sources to produce and quality assure its population estimates, and clearly explains its main data sources. However, its published Quality Assurance of Administrative Data (QAAD) reports are outdated and describe only basic assurance of key administrative sources.

- Users value NRS's clear and transparent communication of the MYE methodology and strengths and limitations of the estimates to help inform use. Internal migration, a component of the estimates, relies on people notifying their GP of a change of address. Typically, young adults, including higher education students, tend to be more mobile and are less likely to update their GP records. Whilst a known limitation, beyond its reconciliation exercise following Scotland's 2022 Census, there is no quality information on the extent and scale of the potential underestimation of moves by young adults in Scotland.

- NRS opts for a qualitative approach to communicating uncertainty to its users, using language such as 'estimate' within its publications. Year-on-year changes are reported more definitively yet subject to future revisions. At present, NRS does not publish quantitative estimates of uncertainty, such as credible intervals for the MYE.

## Our judgement

We conclude that the mid-year population estimates produced by NRS continue to meet the standards of the Code of Practice for Statistics and should retain their accredited official statistics status. The statistics offer important insight for users in Scotland on the size, demographic breakdown, and geographical distribution of Scotland's population. Users expressed confidence in the quality and value of these statistics across a range of use cases within central government, local authorities, and the private and academic sectors. NRS provides clear statistical outputs and methodological information. NRS is also taking positive steps to consider its broader statistical portfolio through its public engagement activity, supporting transparency in its decision making.

There are opportunities for NRS to strengthen the statistics further by improving how it communicates uncertainty, limitations and changes in the data, and by making its statistics more accessible to a wider range of users. Further work to strengthen its quality assurance

information and investigate known areas of uncertainty, including internal migration, would also enhance the quality and transparency of the statistics.

## Next steps

OSR expects NRS to share a public update on its progress to meet the recommendations at the time of its next planned MYE release in summer 2027. We will continue to engage with NRS regarding its planned improvements and progress against our recommendations.

# Recommendations

Based on the findings of this review, we have identified seven recommendations that National Records of Scotland (NRS) should address to further enhance the statistics' Trustworthiness, Quality and Value.

**Recommendation 1:** To keep users informed and support transparency, NRS should ensure that any delays to future population estimate releases are communicated promptly and prominently to users.

**Recommendation 2:** To widen engagement and reach new users, NRS should explore the use of additional user engagement activities, taking into consideration user suggestions.

**Recommendation 3:** To further improve transparency about how it responds to user needs, NRS should explain known data gaps, constraints on meeting user requests, and planned developments in its MYE and SAPE publications.

**Recommendation 4:** Prior to the next release of each of its next population statistics publications, NRS should transition all supporting documents from PDF to HTML to enhance accessibility of its MYE publications for users. NRS should also prominently signpost its links to the interactive charts within the main publication and improve navigation between old and current releases.

**Recommendation 5:** To strengthen the description of its quality assurance practices, NRS should conduct a review of its processes and update its documentation where necessary to reflect all QA activities. As part of this review, NRS should consider its description of the level of assurance applied to administrative data used in the production of the MYE and SAPE, in particular health data.

**Recommendation 6:** NRS should investigate the scale and extent of underestimation of young adults in the MYE internal migration flows, exploring the use of alternative data sources such as the Higher Education Statistics Agency (HESA) data and new methods as part of its research. An update on this work should be provided at the time of the next MYE publication in summer 2027.

**Recommendation 7:** NRS should consider its approach to communicating trend changes and enhance its description of uncertainty associated with the MYE (including SAPE) for the next publication. For MYE, this should include the possibility of illustrating uncertainty to supplement existing explanations with more detail on geographic areas or factors that may contribute to greater or less confidence in the estimates.

# Introduction

## Background to the statistics

1.1 Population statistics provide a fundamental evidence base for understanding Scotland's population and how it changes over time. Produced by the National Records of Scotland (NRS), the mid-year population estimates (MYE) provide the official annual estimate of the resident population of Scotland and are widely used across government, local authorities, the NHS, academia and the voluntary sector. The estimates inform funding allocations, service planning, policy development and demographic analysis, and are used as inputs into a range of other statistical outputs. The MYE provide the basis for a range of related population outputs, including small area population estimates (SAPE) and population estimates for centenarians, helping to ensure coherence across Scotland's demographic statistics.

1.2 NRS produces the MYE using the cohort component method, updating the latest population estimates annually using data on births, deaths, migration, and special populations (armed forces and prisoners). Following each census, NRS rebases the estimates to the census-based population count and revises the intercensal series. Following the 2022 Census, NRS revised estimates for mid-2011 to mid-2021, incorporating improvements to migration estimates and other components of population change. In 2025, NRS published rebased SAPE for the new 2022 data zones, bringing these estimates in line with the rebased MYE series.

1.3 OSR's compliance review takes place against the backdrop of NRS's wider portfolio of official statistics publications covering population, migration, households and vital events. In October 2026, NRS published its first annual statistical work programme for 2026-2027. It set out high-level priorities for NRS statistics, as well as proposed changes to existing official statistics, including for some population statistic series covered as part of this review. For SAPE, NRS proposes to release only final estimates and no provisional figures. For population estimates for centenarians in Scotland, NRS proposes to incorporate these statistics within the MYE publication, rather than publishing in a separate report. As NRS seeks to improve and modernise its statistics, the findings and recommendations of this review should be used to help inform NRS's priority areas going forward.

# Findings

## Transparent communication and decision making

2.1 NRS is taking active steps to balance user needs with analytical constraints while supporting transparency of its decisions by setting out high-level priorities in its first annual statistical work programme for 2026-2027. Through its review of statistical publications, NRS has assessed the value, impact, legal requirements and feasibility of its publications to create space for improvement and modernisation activity. It has used this evidence to develop proposals for changes to existing statistics, including population statistics, and is seeking user feedback. As part of the review, NRS proposes to publish its population estimates on centenarians within the MYE publication, and no longer as a standalone release. NRS also proposes not to publish provisional estimates for SAPE (unlike MYE). It is important for NRS to continue with its transparent approach and to continue to involve users in decision making. The annual statistical work programme also provides an opportunity for the Population and Migration Statistics team to alert users to, and seek user feedback on, any planned future developments for the MYE in Scotland.

2.2 NRS relies on ONS's long-term international migration (LTIM) estimates to account for international migration in its population estimates, meaning changes to the data, revisions or its availability can affect MYE publication timings. ONS's LTIM are currently official statistics in development with changes underway to improve the data sources and methods used to produce these statistics. As a result of these data and methods changes and definition of a long-term migration, revisions are inevitable. NRS outlines its own approach to future revisions transparently in the MYE bulletin. It is important that NRS continues to manage user expectations about revisions, especially in the context of its proposal to release final estimates for SAPE without any provisional figures.

2.3 NRS releases its population estimates in an orderly way, pre-announcing upcoming publications via its release calendar. NRS communicates publication delays through the ScotStat mailing list, meaning non-subscribers may not receive these updates. Users considered the annual release frequency appropriate but highlighted delays to SAPE and poor communication about release dates as areas for improvement. Users would value more reliable and consistent release dates alongside clearer communication when delays occur. Feedback also suggested aligning MYE and SAPE publication dates.

**Recommendation 1: To keep users informed and support transparency, NRS should ensure that any delays to future population estimate releases are communicated promptly and prominently to users.**

## Meeting user needs

2.4 NRS has established strong relationships with users, who value the Population and Migration Statistics team's responsive, helpful and personalised engagement, including providing information and additional breakdowns for bespoke purposes. The team primarily uses the ScotStat mailing list to update users about upcoming releases and relevant developments. The team also engages with the ScotStat Board for official statistics and the NRS-led Population and Migration Statistics Committee (PAMS) to enable input and challenge from expert users across Scottish Government and the Scottish public sector. The team can draw on the NRS Customer Advisory Panel, recently established to involve customers in strategic service planning and decision making.

2.5 While NRS has positive relationships with known users, to enhance this approach further NRS should consider how to reach potential or new users of these statistics. NRS is developing its first public involvement and engagement strategy to support NRS's organisational user engagement approach. For its population statistics, NRS should consider ways to enhance its user reach. As an example, some users suggested hosting webinars alongside the release of future statistical outputs to explain key messages and make complex outputs more accessible. NRS should use OSR's guidance on user engagement to help it consider ways to widen user activities.

**Recommendation 2: To widen engagement and reach new users, NRS should explore the use of additional user engagement activities, taking into consideration user suggestions.**

2.6 In general, the feedback OSR received from users on the quality of these statistics was positive, with users confident in their application across a range of uses. These uses include monitoring of demographic trends across geographies, researchers and academics developing their own population projections, and council users tracking population trends and developing area profiles for their council areas. On the other hand, users also identified data gaps. Some users desired more detailed population data for data zones, including language and ethnicity, while others sought a mechanism for requesting changes to data zone boundaries. NRS told us that the Office of the Chief Statistician in Scottish Government is responsible for the Data Zones and Intermediate Zones geographies, while producing population estimates by language and ethnicity would require all input data sources to hold this data, which is not the case. More generally, due to resource constraints and data sharing and governance issues with other bodies such as PHS, it can be difficult for NRS to action some specific requests.

**Recommendation 3: To further improve transparency about how it responds to user needs, NRS should explain known data gaps, constraints on meeting user requests, and planned developments in its MYE and SAPE publications.**

## Navigation and accessibility

2.7 NRS provides users with various ways to access its MYE and SAPE, including bulletins, interactive maps and visualisations. However, users did highlight some areas for improvement in website navigation and accessibility. For example, some users thought that the front page of the NRS website could prioritise publications by statistical importance or theme, rather than what is most popular – balancing general and expert user needs. In response to feedback shared with NRS during this review, NRS is considering a 'latest release' label to improve navigation between old and current releases. NRS publishes its main statistical outputs in HTML, while supporting quality and methodology documents remain in PDF. NRS should prioritise its plans to improve accessibility of these outputs.

2.8 Users valued the statistical outputs and visualisations, finding the bulletins clear and useful, with insightful commentary on trends. One user suggested improving the granularity of chart axes (with smaller increments in years). While the interactive MYE charts allow users to tailor data and chart settings, NRS could more prominently signpost links to these and make them easier to find from the MYE publication.

**Recommendation 4: Prior to the next release of each of its next population statistics publications, NRS should transition all supporting documents from PDF to HTML to enhance accessibility of its MYE publications for users. NRS should also prominently signpost its links to the interactive charts within the main publication and improve navigation between old and current releases.**

## Assured methods

2.9 NRS uses the internationally recognised cohort component method to produce its MYE and SAPE. Starting from the latest census, NRS updates the population annually by ageing it one year and adjusting for births, deaths and migration to estimate the population at 30 June. The methods used to produce MYE and SAPE are well established and generally trusted by users. Users value NRS's transparent, clear and helpful methodological information. Between censuses, the estimates tend to drift as they move further away from the baseline until they can be rebased again using data from the next census. For SAPE, NRS completed its rebasing exercise for 2011 to 2022 estimates in September 2026 and published estimates for 2023 and 2024 at the same time. For centenarians' estimates, the Kannisto-Thatcher (KT) method is used (explained in the centenarians methodology guide), combining historical and current deaths data to produce estimates.

2.10 The Population and Migration Statistics Committee (PAMS) offers an independent forum for NRS to seek assurance on its developments to population statistics as and when needed. NRS is transparent about methodological changes and

revisions, helping users understand how estimates evolve over time. The Office for National Statistics (ONS) is improving its methods for estimates of long-term international migration (LTIM), including further work to improve the disaggregation of LTIM data to lower geographies that include Scottish council areas. It is important for NRS to continue to make users aware of changes in methods and any effect this may have on the statistics, such as those developed by ONS for LTIM, and continue to update relevant documentation.

## Suitable data sources and quality assurance

2.11 NRS makes effective use of administrative data sources to produce its population estimates. For estimates of migration within Scotland and between nations in the UK, patient registration data is drawn from the NHS Central Register, Personal Demographic Service, and Community Health Index registrations for Scotland. International migration estimates draw on Home Office Borders and Immigration data and the Department for Work and Pensions' Registration and Population Interactions Database. In the statistical bulletins and methodology guides, data sources are clearly stated, and the use of administrative data in producing estimates is explained in detail within dedicated sections.

2.12 NRS is also committed to increasing its use of Reproducible Analytical Pipelines (RAP) and automation to modernise its statistical production. Its National Records of Scotland Strategy 2025/26–2030/31, published in March 2026, sets out NRS's ambition to modernise and reform its services and become more efficient, further supported through its published statistical work programme. This work should further enhance the quality assurance process for the MYE through automation and clear data quality assurance points.

2.13 NRS provides clear links to quality assurance information, including Quality Assurance of Administrative Data (QAAD) reports and methodology guides. However, the QAAD reports have not been updated since 2020 and describe only a basic level of assurance for the administrative data sources, such as the National Health Service Central Register (NHSCR). Using QAAD's risk/profile matrix, NRS considers that the data sources have a low risk of quality concerns. This is partly because key input data sources such as the NHSCR are owned by NRS, with strong data supplier relationships, quality checks and agreements in place. However, this information is not documented in detail within the QAAD reports. Given the high-profile use of these statistics, it is important that it is made clear that strong quality assurance processes are in place. Updating these reports and reviewing the level of assurance applied would strengthen users' understanding of the data quality and NRS's quality assurance process.

2.14 NRS also uses additional data sources to compare with the estimates before publishing as part of the quality assurance process. For example, NRS uses child benefit data, the Scottish schools census, and data on new buildings specifically to

assess any population changes at data zone level. However, information on this type of comparison is not included as part of published quality assurance information at present.

**Recommendation 5: To strengthen the description of quality assurance practices, NRS should conduct a review of its processes and update its documentation where necessary to reflect all QA activities. As part of this review, NRS should consider its description of the level of assurance applied to administrative data used in the production of the MYE and SAPE, in particular health data.**

## Importance of understanding limitations

2.15 In our view, the statistics are of sufficient quality to meet their intended uses based on user feedback. Overall, most users were confident in the quality and robustness of the population estimates. Users commented that they valued and trusted these statistics because of their accredited official statistics status. Users also noted that, outside of the census, these estimates represent the highest standard available. NRS provides clear information on the strengths and limitations of its estimates across its population statistics releases. NRS is clear in its explanation of the inherent limitation of MYE requiring a census as its population stock base, whereby uncertainty increases as the MYE draw further from the last census.

2.16 The MYE are estimates and subject to uncertainty. There is the possibility that estimates, particularly at data zone level, can differ from those expected by councils. Through our user engagement, we heard from one Scottish council that the MYE for its area was lower than expected and that it had similar concerns about its population estimate following Census 2022. Our investigation of these concerns found that NRS engaged with all council areas as part of its Census 2022 quality assurance process and reconciled estimates following lower than expected response rates. An adjustment to the estimate was made due to additional council tax data and evidence provided by the council. The council was content with the adjustment made and NRS's response. While no concerns were raised regarding the recent MYE, this reinforces the importance for NRS to be clear in its communication of limitations if and when they arise.

2.17 Births and deaths data are based on registered events, with most uncertainty for components of MYE associated with migration. NRS reports limitations and uncertainty associated with migration flows clearly. More could be done, however, on the estimation and communication of the potential underestimation of young adults in an internal migration context. Internal migration estimates (moves within Scotland and cross-border with other UK countries) rely on people notifying their GP of a change of address. While use of health data is consistent with the other UK statistical offices (ONS and Northern Ireland Statistics and Research Agency [NISRA]), there is risk of an undercount of moves by young adults (particularly

those aged 16 to 29, and specifically young men) within the MYE. People within this age group typically have greater mobility, are less likely to update their GP records, and include higher education students who may move for study purposes. To help address this limitation, in England and Wales ONS uses the Higher Education Statistics Agency (HESA) data and Higher Education Leavers Methodology (HELM) to help understand the internal movement of students. ONS is also seeking to explore data sources and methods to improve its internal migration flows in England and Wales. NRS has used HESA data on student enrolments by country of domicile to explain the increase in international migration for its rebased population estimations (2011 to 2021). However, it does not include HESA data as part of its production of population estimates in Scotland. While NRS is clear in its communication of the limitation, beyond its reconciliation exercise following the 2022 Census, there is no quality information on the extent and scale of the underestimation of young adults in internal migration moves within Scotland. NRS should actively engage and learn from ONS's work in addition to carrying out its own research to consider how its own statistics could be strengthened.

**Recommendation 6: NRS should investigate the scale and extent of underestimation of young adults in the MYE internal migration flows, exploring the use of alternative data sources such as the Higher Education Statistics Agency (HESA) data and new methods as part of its research. An update on this work should be provided at the time of the next MYE publication in summer 2027.**

## Communicating uncertainty

2.18 NRS communicates uncertainty associated with the statistics through the use of language, for example, using words like 'estimate' and 'estimated'. NRS also includes explanations of the limitations alongside the statistics and is clear that the population estimates will be subject to future revisions due to updated international migration data. At present, NRS does not publish any quantitative estimates of uncertainty, such as credible intervals for the MYE. Without detail on the extent of uncertainty associated with estimates for lower geographic breakdowns or specific populations, there may be a risk that too much weight is placed on a specific figure. Therefore, it is important for NRS to provide more detail on characteristics associated with greater uncertainty to help inform appropriate use, for example by drawing on its Census 2022 reconciliation exercise. Some users suggested visualising uncertainty, for example through uncertainty fan charts. Exploring further ways to communicate uncertainty, alongside exploring the potential underestimation of moves by young adults, should help to identify areas with greater uncertainty that NRS can use to strengthen its communication.

2.19 NRS clearly communicates trend changes, both at a Scotland level, by age and sex structure, and at geographic breakdowns. However, in the context of small changes and likely revisions, it is important for NRS to consider how it reports changes over

time. For example, OSR noted an accompanying news release where NRS uses definitive language to report a marginal increase: ‘Scotland’s population increased by 2,200 in the year to mid-2025, according to new figures from National Records of Scotland (NRS)’. We note that subsequent sections of the news release did mention that the figures were estimates. 2023 and 2024 figures for Scotland were revised downwards (5,800/3,600 respectively) due to international migration and new methods. Therefore, there is a likelihood that the most recent figure for 2025 will also change when revised.

**Recommendation 7: NRS should consider its approach to communicating trend changes and enhance its description of uncertainty associated with the MYE (including SAPE) for the next publication. For MYE, this should include the possibility of illustrating uncertainty to supplement existing explanations with more detail on geographic areas or factors that may contribute to greater or less confidence in the estimates.**

# Annex: Statistics reviewed

| Statistical output | Frequency | Included in this Compliance Review |
|---|---|---|
| Mid-Year Population Estimates Scotland | Annual | Yes |
| Population Estimates by Scottish Index of Multiple Deprivation (SIMD) 2016 | Annual | Yes, included as 'Other Geographies' data tables as part of Small Area Population Estimates |
| Population Estimates by Urban Rural Classification | Annual | Yes, included as 'Other Geographies' data tables as part of Small Area Population Estimates |
| Population Estimates for Scottish Centenarians | Annual | Yes |
| Scottish Parliamentary Constituency Population Estimates | Annual | Yes, included as 'Other Geographies' data tables as part of Small Area Population Estimates |
| Small Area Population Estimates Scotland | Annual | Yes |
| UK Parliamentary Constituency Population Estimates | Annual | Yes, included as 'Other Geographies' data tables as part of Small Area Population Estimates |