

Article

Update on research and plans for population estimates and projections: January 2022

Outline of work to address the recommendations in the Office for Statistics Regulation (OSR) review of ONS population estimates and projections, and future developments.

Contact:
Nigel Henretty
pop.info@ons.gov.uk
+44 1329 447934

Release date:
28 January 2022

Next release:
To be announced

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1 . Overview of ONS population statistics

The Office for National Statistics (ONS) Centre for Ageing and Demography produces a range of population statistics including [mid-year population estimates](#), [national population projections](#), [subnational population projections](#) (England) and [household projections](#) (England).

In addition, we are continuing work on the [transformation of the population and migration system](#). This is a long-term project, which aims to change our approach to producing population and migration statistics by transitioning to use primarily administrative data sources into these statistics.

In July 2021, we published our [future plans for research on population estimates and projections](#), which described how we plan to meet the recommendations of the Office for Statistics Regulation's (OSR) [review of population estimates and projections](#). Since then we have completed a number of work items we committed to and have initiated further work identified.

This article provides an update on our progress towards meeting the OSR's recommendations and provides information on our latest plans for continuing this work and the wider transformation of population statistics.

2 . Wider context to population statistics in 2022

First results from the 2021 Census of England and Wales are provisionally scheduled for publication in late spring 2022. These will provide estimates of the size of the usually resident population by age and sex in households and communal establishments on the night of 21 March 2021 for local authority districts. Later census releases will provide data for smaller geographical areas and other topics. For Northern Ireland, the first 2021 Census results are also planned for publication around the same time as the results for England and Wales.

The mid-2021 population estimates for England, Wales and Northern Ireland will be based primarily on the results of the 2021 Censuses adjusted for births, deaths and migration in the period between Census day and mid-year 2021. These are provisionally scheduled for publication in September 2022. Mid-2021 population estimates for Scotland will be rolled forward from 2020 because the census in Scotland is taking place in March 2022.

In addition to official estimates of the population from the census and mid-year estimates, we are continuing the development of population estimates that draw upon admin data and new methods. In 2022, we plan to publish "experimental" monthly age and sex profiles for local authorities on a 2022 base, starting with a proof of concept as soon as possible after the Census 2021 results are released.

We have published a [blog post, Building the richest picture of our population](#), on what official population statistics to expect in 2022. It explains how, with new census statistics and more frequent administrative data estimates available, we will have richer and more timely sources of data than ever before.

The [dataset that accompanies this article](#) shows the different types of population estimate that are planned for publication in 2022 and early 2023. It contains information about whether it is an official estimate of the population or used only for wider research, the periodicity and planned publication date, along with a summary of the main uses and comparability issues for the estimate.

3 . Progress and plans for responses to the Office for Statistics Regulation's review

This section outlines our work to address the Office for Statistics Regulation's (OSR's) recommendations. As we progress through this work plan and publish our findings, we will continue to update the OSR and our users through [our regular Population Statistics newsletter](#) and subsequent published updates, making clear the contributions of these items in addressing the recommendations. Where possible, we aim to meet the recommendations by May 2022. Where we are not able to implement a recommendation within this timeframe, such as longer-term work to transform the population statistics system, we will state what has been accomplished and continue to advise users on when we plan to complete the necessary work.

The following section lists the recommendations made by the OSR and provides a summary of the main actions suggested by the OSR (in the subheadings beneath each recommendation). It also includes details of the work we are planning to carry out to meet these recommendations and to further develop population estimates and projections.

Recommendation 1: Ensuring future population statistics are based on sound methods and suitable data

Complete detailed case studies on cities with large student populations

We have been developing the selection criteria used to determine which areas to conduct case studies for. The selection criteria will allow for different types of student areas to be included. For example, it will enable areas with a student population that forms part of a large city to be selected as well as smaller areas for which the student population is likely to comprise a relatively large proportion. The initial selection of areas will be limited to no more than 10 local authority districts, as it is impractical to conduct detailed analysis on every area. However, we will review the selection after the first publication of case studies, and seek feedback on the selection, with a view to carrying out further case studies subsequently, as we develop our methods and data sources.

The initial case studies will build on our work towards [understanding students across administrative data in England and Wales](#), which we published in November 2021. This analysis used a combination of admin data on health and higher education to ascertain, among other things, how well the data highlight moves of students into and out of student accommodation. Our case studies will provide analysis of these features in more detail at the local level, and the first analysis is expected for publication in March 2022.

We will liaise with local authority experts for areas to be included in the case studies and seek their feedback on the analysis conducted to guide further detailed analysis and developments. In addition, once results from the 2021 Census are available, we will assess the scale of the impact of the Higher Education Leavers Methodology on student areas as part of our work on the reconciliation and re-basing of the mid-year population estimates, which is provisionally scheduled for completion in early 2023.

Discuss evidence provided to the OSR in the review concerning the effect of assumptions being rolled forward

We have engaged with experts to seek their feedback on our current plans for the methods to be used for the mid-2021 population estimates. These estimates are provisionally scheduled for publication in September 2022 and will largely be based on 2021 Census data plus the latest births, deaths and migration estimates that are being developed to provide estimates rolled forward from Census day to the mid-year point of 2021. We will publish detailed information about our proposed method in July 2022.

We are also reviewing our previous user engagement and considering options for future engagements ahead of the next set of subnational population and household projections, provisionally planned to be the 2021-based sets of projections for publication in 2023. This user engagement will explore how we can further include local insights and information in our population estimates and projections.

Consider current method and concerns while developing admin-based population estimates (ABPEs)

Our latest update on our [research into admin-based population and migration estimates](#) provides more detail on our progress and considerations about methods, data sources and quality. We will continue to engage with users on the outcomes of this research as we build towards the 2023 recommendation.

We also plan to publish "experimental" monthly age and sex profiles for local authorities on a 2022 base, starting with a proof of concept as soon as possible after the Census 2021 results are released, which are provisionally scheduled for late spring 2022.

Recommendation 2: Enhancing the transparency of developments concerning the quality of the statistics

Integrate a more flexible and responsive approach to methodological changes

We have begun work to consider the most appropriate methods to use for the mid-2021 population estimates, which are provisionally scheduled for publication in September 2022. The estimates will use Census 2021 data as a base and be rolled forward to 30 June 2020 using the latest data on births, deaths and migration. We will publish our planned methods and approach in July 2022.

We will also continue to explore monthly population estimates by age and sex, and provide information on how these will be used, along with Census 2021 data, to inform the rebasing of population estimates in early 2023.

Share insights from work to understand the changing nature of migration and population

In November 2021, we published our latest [overview of how we are improving our population and migration statistics](#). Alongside this overview we published a [research update on our admin-based population and migration estimates](#), which explored how new methods and admin data sources can be used to inform our transformation of population statistics. As part of this work we published the latest analysis of [developing our admin-based population estimates](#) for England and Wales, which cover the period 2016 to 2020. We also plan to continue using user feedback to inform future work.

In addition, the blog post published in January 2022 provides a summary of the major population statistics that will be published in 2022. This blog contains a summary of each estimate and helps users understand the differences between census, mid-year estimates and admin-based population estimates.

Recommendation 3: Continuation of plans for the future of migration data

Being open with users about short-term solution to bridge the gap of migration data

In November 2021, we published the latest [estimates of long-term international migration](#). These are our best current estimates for international migration, and we described how they are modelled figures based on experimental research and subject to a high level of [uncertainty](#).

In the publication we confirmed that we continue to use a time series approach to model international migration during Quarter 3 (July to September) and Quarter 4 (October to December) 2020. Detail on our original assumptions and methods is available in Section 8 of the [Methodology Working Paper](#).

These figures will be updated in March 2022 as we bring together new sources of data to give the best picture of international migration, and we will continue to be open with users about the methods we are developing.

Recommendation 4: Enhancement of approach to quality assurance

Collaborate with others to learn from best practice

We have engaged with academics and other experts in developing our plans for the methods to be used in producing the mid-2021 population estimates, details of which we will publish in July 2022.

We will also continue to investigate sensitivity analysis around the estimates to further enhance our approach to quality assurance. To assist users of official population estimates in understanding quality in more detail, the Quality and Methodology Information (QMI) report will be updated in March 2022. The updated QMI will contain a compendium of our existing quality indicators and statistical measures of [uncertainty](#) that can be used to highlight local authorities that score highly on the basis of a set of quality risk factors.

We have published [measures of statistical uncertainty](#) for the mid-2020 population estimates and have embedded the measures of uncertainty into the datasets that accompany the main mid-year estimates publication, rather than have them as a separate product only as was previously the case.

We have also sought feedback from users of the variant projections in the national and subnational population projections and in the household projections. We have published case studies on the use of variant projections as part of a [user guide on variant projections](#), which provides information about best practice and user insight. Users of projections can benefit from this best practice and we will use it to guide the development of variants in the 2021-based suite of projections, which are provisionally planned for publication in 2023.

Incorporate local insight and evidence as part of deep dives and investigations into issues

We have been developing case studies of areas that have large student populations, as described in Recommendation 1. We will also use the feedback we will receive from local authorities as part of the Census 2021 quality assurance exercise, and the resulting improvements to census results.

This feedback will not only help ensure the census results are of the highest possible quality, it will also help guide the development of the mid-year population estimates so that the benefits of local insight can be maximised. We will publish our plans for methods to be used in the mid-2021 population estimates in July 2022.

In addition, we are developing a framework for receiving user insight into local population levels and change. This framework will build on the process to receive feedback that is forming part of the local authority census quality assurance exercise, and we will look to expand the remit of data sources and users we engage with from late spring 2022, when the first results from the 2021 Census are planned for publication.

Run sensitivity analyses to accompany the existing estimates and explain to users how these analyses should be interpreted

In addition to the sensitivity analysis described in the development of our QMI for the mid-year population estimates, we will publish a comparison of the mid-2021 population estimates that have been rolled forward from the 2021 Census, compared with the mid-2021 population estimates that have been rolled forward from the 2011 Census.

This will provide a basis for understanding the sources of error and bias that have occurred in the population estimates since the 2011 Census and will help inform our decisions leading to a rebased set of population estimates for the years between mid-2012 and mid-2020, which we plan to publish in early 2023.

Recommendation 5: Supporting users' understanding of the uncertainty associated with ONS statistics

Research and implement additional ways to communicate the uncertainty around the population estimates and projections

In response to the OSR review, we made several changes to the [mid-2020 population estimates release](#) (in June 2021) to assist users in understanding the quality of population estimates. These changes included the use of warning boxes to highlight specific issues with the estimates and a more comprehensive explanation of the range of quality information available alongside each release of the mid-year estimates.

The publication also discussed the incorporation of the 2021 Census data into the mid-year estimates, the OSR review into population estimates and projections, and the development of new international migration estimates. We will build these into the mid-2021 population estimates, which are planned for publication in September 2022.

At present, we publish measures of statistical [uncertainty](#) in ONS local authority mid-year population estimates. The latest report contains the uncertainty measures for the mid-2020 population estimates. We have also embedded these uncertainty measures for each local authority district into the [datasets that accompany the mid-2021 population estimates](#).

We have also begun work to identify the best methods to use in our population estimates reconciliation and rebasing exercise following the 2021 Census. This work is scheduled for completion in early 2023 and will provide the most complete picture of the sources of uncertainty, bias and error in the mid-year population estimates between mid-2012 and mid-2020.

In addition, an indication of the level of uncertainty in the mid-year estimates between censuses will be available when we publish our mid-2021 population estimates, which have been rolled forward from the 2011 Census, alongside the official estimates for mid-2021, which will have been rolled forward from the 2021 Census (as at 21 March 2021).

Provide more specific guidance on interpreting the levels of uncertainty associated with the statistics

We will provide more assistance to users wishing to understand uncertainty by embedding our measures of uncertainty in all subsequent mid-year population estimates datasets. This means that for any local authority district estimates, the data will be accompanied by the associated level of uncertainty in that area. This will help inform decision-makers on the weight to give the estimates in their area, compared with other areas.

We are in the process of revising the [Quality and Methodology Information \(QMI\)](#) that accompanies the mid-year population estimates, such that it will contain a compendium of quality indicators that highlight local authorities that score highly on the basis of a set of quality risk factors. These risk factors may include population churn, the estimated proportion of students and armed forces personnel, and [confidence intervals](#) from census data. The quality risk factors to be included in the QMI will provide users with a clear indication of areas where uncertainty in the mid-year population estimates is high relative to other areas. We plan for the updated QMI to be published in March 2022.

Recommendation 6: Maximising the use of ONS variant projections

Develop case studies of where variant projections have been used in practice

In November 2021, we published case studies on the use of variants in the projections as part of a [user guide on variant projections](#), which provides information about best practice and user insight. This guidance is for those wishing to understand and use variant projections in policy and planning. It covers the national population projections, subnational population projections and household projections.

Following planned revisions to the mid-2012 to mid-2020 population estimates at the national level, using Census 2021 data, we plan to review the accuracy of population projections over the decade from 2011. This review, together with ongoing feedback from users, will provide an indication of the accuracy of projections and will assist in setting assumptions for future projections.

Recommendation 7: Ensuring that ONS statistics remain relevant to users

Take a more open and constructive approach to user engagement by improving complaints procedure

We welcome and value all feedback. In addition to our work on developing a framework for receiving user insight into local population levels and change as described in Recommendation 4, we have also begun reviewing information about the complaints procedure for population estimates and projections. In June 2022, we plan to publish clear information on how complaints can be raised and what steps we will take to resolve them.

Identify potential solutions and best practice from the User Engagement Strategy for Statistics

All user feedback is important to us, and our development of the local population insight feedback and our complaints procedure is being developed in line with the best practice described in the [User engagement strategy for statistics](#). Together this will provide a sustainable mechanism for users to share ideas and feedback and enable us to take a structured approach to responding to that feedback.

Recommendation 8: Increasing public value of ONS statistics and supporting their use

Carry out user engagement to understand who is using the data and for what purposes

User engagement and ensuring the relevance and suitability of our statistics is important to us. Following the publication of our [user feedback report for the national and subnational population projections](#) in 2021 we published the [2020-based interim national population projections](#) in January 2022. We will again engage with users to ascertain the latest needs for 2021-based projections and beyond, before the planned early 2023 publication of these projections.

For mid-year population estimates, we will publish our proposed approach to the methods and data sources in July 2022, ahead of the planned publication of the estimates in September 2022.

Collaborate with experts to frame the statistics for different audiences and scenarios

In addition to the case studies published for the population and household projections, and the case studies for areas with large student populations currently under development, we have also liaised with demography experts to seek their feedback on our current plans for the methods to be used for the mid-2021 population estimates, as described in Recommendation 1. The feedback received from experts at both the national and local level will be considered in the development of the methods to be used for the mid-2021 population estimates, and those methods will be published in July 2022.

4 . Further developments and feedback

We continue to welcome feedback on the planned approach we have outlined to respond to the Office for Statistics Regulation (OSR) review and on our statistics and methods. Please provide us feedback at pop.info@ons.gov.uk.

We are committed to reviewing population statistics through using Census 2021 data and the wider transformation of the population and migration statistics system, which will embed administrative data sources into population and migration estimates.

As we continue to address the recommendations made by the OSR, we will provide further updates on the findings from the work we complete and resulting changes to our processes and plans, so all users are aware of the changes we make. We will continue to report back to the OSR on a quarterly basis, outlining our progress, and publish an update to this report in May 2022.

[Sign up to the Office for National Statistics migration and population statistics mailing list](#) to receive the latest updates and the Population Statistics newsletter. [Read privacy information for our stakeholders](#).

5 . Related links

[National population projections: 2020-based interim](#)

Bulletin | Released 12 January 2022

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

[How we are improving population and migration statistics](#)

Article | Released 15 November 2021

Find out more about our population and migration statistics transformation journey.

[Future plans for research on population estimates and projections](#)

Article | Released 29 July 2021

Outline of our work plan to address the recommendations in the Office for Statistics Regulation (OSR) review of ONS population estimates and projections.

[Population estimates for the UK, England and Wales, Scotland and Northern Ireland: mid-2020](#)

Bulletin | Released 25 June 2021

National and subnational mid-year population estimates for the UK and its constituent countries by administrative area, age and sex.