

Measures showing the quality of Census 2021 estimates

Measures and interactive tools showing the quality and quality assurance of Census 2021 data in England and Wales.

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1 . Overview

At the Office for National Statistics (ONS), we used a range of measures to help us interpret and quality assure the Census 2021 population estimates. To help users understand the census estimates, we have published:

- a local authority comparison tool version 2
- response rates
- item non-response, edit and imputation rates
- confidence intervals for England and Wales
- Census Quality Survey (CQS) agreement rates

2 . Comparison tool version 2

About the tool

The Census 2021 local authority comparison tool is an Excel spreadsheet. It replicates the age-sex charts from the quality assurance (QA) assessment of each local authority in England and Wales.

[This tool](#) is an updated version of the [tool to compare age-sex estimates in Census 2021](#) published in June 2022.

Users should note that the version of the tool published in June 2022 contained an error in the pop_comparators_2021 background sheet, which affected data displayed in worksheet W05. This error caused the comparator counts for females and males to be switched in the following columns:

- ABPE v2 2020
- ABPE v3 2020
- Mid-year estimate 2020

This issue has been resolved in version 2.

This latest version includes:

- confidence intervals for 2021
- household response rates for 2011
- person response rates by sex and five-year age band for 2011

The tool also contains charts and information at the county and national levels. This means that you can compare data across England and Wales by:

- local authority
- region
- county
- country

For each local authority, the tool also gives:

- estimates of households occupied by usual residents
- response rates by age and sex
- the components of the estimation and adjustment process

Confidence intervals in the comparison tool

You can read the definition of confidence intervals in [uncertainty and how we measure it for our surveys](#).

Rounded data

The data in the tool are the same as rounded population estimates published in our [Population and household estimates, England and Wales: Census 2021 bulletin](#). This means all data in the tool are rounded to the nearest hundred. Please be aware that some table totals may not add up to expected values because of this rounding.

This tool includes data from other sources, which we used to quality assure census estimates. These data were subject to statistical disclosure control processes as agreed with data suppliers.

We also processed the data from other sources before using them in the QA process to ensure they were as consistent as possible with the census definitions.

3 . Response rates

The Census 2021 response rates are provided in an Excel spreadsheet. Response rates are the total number of usual residents whose details were completed on a returned questionnaire, divided by the estimate of the total number of usual residents. The spreadsheet also includes coverage rates and return rates.

The spreadsheet contains charts and information at the levels of:

- Person response at LA, county, country by selected characteristics
- Household response at LA, county, country, by selected characteristics
- Person response at LSOA level

The response rates show characteristics for households and persons by sex at local authority level by:

- accommodation type
- tenure
- household size

For each local authority, person characteristics are shown for:

- age
- sex
- legal partnership status
- ethnic group
- activity last week
- country of birth
- religion
- sexual orientation
- gender identity
- intention to stay
- welsh language proficiency (only local authorities in Wales)

You can find this spreadsheet in the related downloads.

4 . Item non-response, edit and imputation rates

The Census 2021 item non-response, edit and imputation rates are provided in an Excel spreadsheet and cover all returned questionnaires. The spreadsheet contains the item non-response rates, item deterministic editing rates and overall imputation rates for England and Wales, with subtotals for:

- region
- county
- local authority

The population base for item imputation is all people and households that responded, including short-term residents.

The spreadsheet contains information on item non-response, editing and imputation at local authority, county, region and country by:

- household variables
- employment-related variables
- non-employment related variables

Find more information in our [item editing and imputation process for Census 2021, England and Wales methodology](#).

You can find this spreadsheet in the related downloads.

5 . Confidence intervals: England and Wales

The Census 2021 results reflect the whole population of England and Wales and not just those who responded to the census. We use the Census Coverage Survey (CCS) to help us estimate the number and the characteristics of people who did not respond to the census, so we can reflect those people in the results.

As the CCS surveys just a sample of people, the census estimates have an element of sampling error. This means we could have arrived at different estimates just through the chance of who appeared in the survey sample.

A way to express this element of uncertainty in the estimates is as confidence intervals. A confidence interval shows how uncertain an estimate is. It does this by giving a range of values, with an upper and lower limit, likely to contain the unknown true value. They are explained in more detail in the confidence intervals spreadsheet in the related downloads.

The spreadsheet contains 95% confidence intervals for estimates of:

- usual residents in households
- the numbers of households
- activity last week (people living in households)
- sex by age (people living in households)
- ethnic group (people living in households)
- housing tenure

We provide these confidence intervals for England and Wales as a whole and for local authorities in the spreadsheet. We also give intervals for the estimates of residents in households and the number of households for Wales and regional geographies.

You can find this spreadsheet in the related downloads.

6 . Census Quality Survey (CQS) results

The Census Quality Survey (CQS) is a survey that we carried out across England and Wales after the data collection for Census 2021. The CQS allows us to assess how accurately people answered the questions in Census 2021.

The CQS works by asking a sample of people the same questions as they answered on the census and comparing their answers with the census to see if they were the same.

Where people gave different answers, this might be because of a mistake in completing the census or a mistake answering the survey. This means that the CQS does not give us an exact measure of "respondent error" in the census. However, it does indicate which questions might be more subject to that error and the possible scale of such error.

More information on the CQS and the results of the survey can be found in our [Census Quality Survey for Census 2021 in England and Wales methodology](#). There is a full list of CQS agreement rates in our [Census Quality Survey agreement rates, England and Wales: Census 2021 dataset](#).

7 . Using the tools

Comparison tool

You can use the comparison tool to access information from the age-sex charts for any local authority in England and Wales. You can also use it to print individual PDF reports for specific local authorities. To find data for a local authority, you must first select that local authority by using the drop-down selection menu in the first tab of the tool.

Response rates

You can use the response rates to access the percentage of usual residents for whom individual details were provided on a returned questionnaire and the percentage of households containing one or more usual residents, who responded to the census, for any local authority in England and Wales.

Item non-response, edit and imputation rates

You can use the item non-response, edit and imputation rates to access the percentage of non-response on a returned questionnaire on individual and household questionnaires, for any local authority in England and Wales.

Confidence intervals

You can use confidence intervals to interpret statistical uncertainty in the census estimates by selected characteristics, for any local authority in England and Wales.

Census Quality Survey agreement rates

You can use the Census Quality Survey (CQS) rates to access the percentage of people who provided the same response for questions asked on the Census.

Software you need

We have developed the tools to use functionality that Microsoft Excel 2016 and later versions provide. The tools may also work in other open source or free Excel alternatives.

8 . Related links

[Population and household estimates, England and Wales: Census 2021](#)

Bulletin | Released 28 June 2022

Census 2021 rounded population and household estimates for local authorities in England and Wales, by sex and five-year age group.

[How we assured the quality of Census 2021 estimates](#)

Methodology | Released 7 November 2022

Methodology for the validation of Census 2021 population estimates for England and Wales, including the assurance of processes, assessment of estimates, and involvement of local authorities.

[Quality and methodology information \(QMI\) for Census 2021](#)

QMI | Released 28 November 2022

Details the data strengths, limitations, uses, users and methods used for Census 2021, England and Wales.

[Maximising the quality of Census 2021 population estimates](#)

Methodology | Released 28 June 2022

How we maximised the quality of Census 2021 population estimates during the processing and quality assurance of the final statistics.