

# Household projections in England QMI

Quality and Methodology Information (QMI) report for household projections in England, detailing the strengths and limitations of the data, methods used, and data uses and users.

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Release date:  
29 June 2020

Next release:  
To be announced

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# 1 . Methodology background

<b>National Statistic</b>	
<b>Survey name</b>	Household projections in England
<b>Frequency</b>	Every two years (variants published alongside principal)
<b>How compiled</b>	Administrative data, survey data and projections methodology
<b>Geographic coverage</b>	National, regional and local authority

## 2 . About this Quality and Methodology Information report

This Quality and Methodology Information (QMI) report contains information on the quality characteristics of the data (including the European Statistical System's five dimensions of quality) as well as the methods used to create it.

The information in this report will help you to:

- understand the strengths and limitations of the data
- learn about existing uses and users of the data
- understand the methods used to create the data
- decide suitable uses for the data
- reduce the risk of misusing the data

## 3 . Important points

- Projections relate to the usual resident population and do not include people who come to or leave the country for less than 12 months.
- They are not forecasts and do not attempt to predict the impact of future political and economic changes or local development policies.
- Since household projections are produced in the same way for all local authorities, they can be used as a common framework for informing local-level policy and planning; they should be seen as a starting point for calculating future housing needs.
- Users should be aware that projections become increasingly uncertain as they go forward into the future, particularly for smaller geographic areas and detailed age and sex breakdowns.
- Trends in household projections are a result of trends in household formation between the census years, 2001 and 2011, and population change indicated by the subnational population projections (SNPPs).

# 4 . Quality summary

## Overview

These are the second set of household projections published by the Office for National Statistics (ONS). Previously, they were published by the Ministry of Housing, Communities and Local Government (MHCLG). Household projections show the number of households<sup>1</sup> there would be in England in the future if a set of assumptions about the size and structure of the population and that population's patterns of household formation were realised in practice.

## Uses and users

Household projections have a number of uses, both direct and indirect, informing policy decisions at a national and local level.

Uses of the data include:

- assessing potential need and demand for housing and associated services
- planning future service provision such as household waste and recycling, school places, adult and child social services, and health and social care
- macroeconomic forecasting, central government policy simulation and planning

## Strengths and limitations

Household projections provide users with valuable insight into the changing patterns of household formation in England. They are produced using the same methods for all local authorities in England, so that data for one local authority are comparable with other local authorities, within a set of projections.

Since projections are produced in a consistent way, they can be used as a common framework for informing local-level policy and planning; local areas are advised to supplement them with any local information they have.

The assumptions used in the household projections are based on past trends. However, demographic behaviour is inherently uncertain, so projections become increasingly uncertain the further they are carried forward. This is particularly so for smaller geographic areas and detailed age, sex and household type breakdowns. Changes in factors such as fertility, housing affordability and availability, and family formation can change these assumptions.

Household projections are also limited by what data are available to inform detailed breakdowns of household population and households by the age and sex of the household reference person (HRP) at the local authority level. For example, the age distribution of the local authority prison population is modelled using assumptions based on the prison population of England and Wales as a whole.

Household projections are not forecasts. They do not attempt to predict the impact of future government or local policies, changing economic circumstances, or other factors that may influence household growth, such as the number of houses built. Household projections are not a prediction or forecast of how many houses should be built in the future. Instead, they show how many additional households would form if the population of England keeps growing as it did between 2011 and 2018 and keeps forming households as it did between 2001 and 2011. Therefore, household projections should be used as a starting point for calculating the future housing needs of a local area.

In most cases, each set of projections is superseded when the next scheduled release is published. However, should there be cause to revise a specific set of projections – for example, because of an error in production – we would consider the best approach in line with the [revisions policy for population statistics](#).

## Recent improvements

[Variant household projections](#) have also been produced using similar methods to the principal projections, with specific differences applied dependent on the variant in question.

In the 2018-based publication, the household population has been constrained to both regions and England; this was not done in the 2016-based projections.

### Notes: Quality summary

1. The household projections are based on the 2011 Census definition of a household: “one person living alone, or a group of people (not necessarily related) living at the same address who share cooking facilities and share a living room or sitting room or dining area.” This includes sheltered accommodation units in an establishment where 50% or more have their own kitchens (irrespective of whether there are other communal facilities) and all people living in caravans on any type of site that is their usual residence. This will include anyone who has no other usual residence elsewhere in the UK. A household must contain at least one person whose place of usual residence is at the address. A group of short-term residents living together is not classified as a household and neither is a group of people at an address where only visitors are staying.

## 5 . Quality characteristics of the household projections data

This report provides a range of information that describes the quality of the data and identifies the issues that should be noted when using the output.

We have developed [guidelines for measuring statistical quality](#) based on the European Statistical System’s five dimensions of quality. This report addresses the quality dimensions and important quality characteristics, which are:

- relevance
- accuracy and reliability
- output quality
- coherence and comparability
- concepts and definitions
- geography
- accessibility and clarity
- timeliness and punctuality

More information is provided about these quality dimensions in the following sections.

## Relevance

(The degree to which the statistical product meets users' needs for both coverage and content.)

A robust and objective methodology is employed to create household projections that are relevant for all types of users. The projections take no account of local development aims, policies on growth, capacity to accommodate population change, or economic factors that could impact the population in the future. As with the national and subnational population projections (SNPPs), they also do not try to predict any potential demographic consequences of political, social or economic changes occurring after the base year of the projections or in the future, including the coronavirus (COVID-19) pandemic of 2020 and the UK's recent withdrawal from the EU.

Household projections are currently produced up to 25 years ahead from the base year. This provides a sufficiently long time series to enable analysis and planning, but it avoids going too far into the future when values become increasingly uncertain.

Household projections do not predict changing demographic patterns over time – they simply provide an indication of household levels arising if the underlying assumptions are realised.

Local authorities use household projections as a starting point for local-level planning and monitoring. The household projections are used in the calculation of local rates and measures, which provide indicators for future requirements of local services.

In the run-up to the 2016-based projections, users were consulted on proposed changes to the household projections, and a household projections collaborative group to provide advice and feedback on research was established. For the 2018-based projections, no consultation was required, but we have met with our main stakeholder and have informed them that there are no significant methodological changes in these projections.

The [Centre for Ageing and Demography](#) within the Office for National Statistics (ONS) routinely considers what user needs are not being met by their published statistics. This is done using evidence from user engagement activities and contact with users. This process enables the Centre to understand unmet user needs and, if appropriate, consider the inclusion of new outputs in the Centre for Ageing and Demography workplan.

## Accuracy and reliability

(The degree of closeness between an estimate and the true value.)

The household projections use the latest available SNPPs and are inevitably dependent on the accuracy of these data. SNPPs are demographic, trend-based projections indicating the likely size and age structure of the future population if the underlying trends and assumptions about future levels of components of change are realised. SNPPs are based on levels of births, deaths and migration observed over a five-year reference period leading up to the base year. However, projections are not forecasts and, because of the inherent uncertainty of demographic behaviour, any set of projections will inevitably differ from actual future outcomes to a greater or lesser extent.

As such, the household projections should be used as a starting point and supplemented with other information for planning purposes.

For further information on the accuracy of the SNPPs, refer to the [Quality and Methodology Information \(QMI\) report for SNPPs](#). Household projections take no account of the following factors, which could lead to differences between the projections and actual change in the numbers of households:

- local development aims
- policies on growth
- capacity of a given area to accommodate population change
- changes in the stock of dwellings and communal establishments (CEs) (for example, new builds, demolitions and changes of use)
- political or economic factors that could impact the population in the future
- future changes to the housing market, such as house prices or changes to the private or social renting sectors
- changes in marital status, income, economic activity or any other demographic factors or international factors that may affect the UK population – for example, the coronavirus pandemic or the UK's exit from the EU in 2020

## Output quality

For users to gain an understanding of the level of accuracy and coherence of the household projections, the latest accuracy paper compares current and past household projections with household estimates and other sources.

Variant household projections have been produced, based on the SNPP variants published on 24 March 2020. There are five variants in total: four show alternative assumptions of migration and one is a continuous projection of the household representative rates (HRRs), which were held constant from 2022 onwards in the principal projection.

## Coherence and comparability

(Coherence is the degree to which data that are derived from different sources or methods, but refer to the same topic, are similar. Comparability is the degree to which data can be compared over time and domain, for example, geographic level.)

### Coherence

Household projections, household estimates, and other sources of household and planning data are produced differently for different purposes; figures from different sources and methods should not be expected to match exactly.

[Household estimates](#) produced by the Demographic Analysis Unit at the ONS are an example of this; these are survey estimates derived from the Labour Force Survey (LFS) and so do not match data in the household projections.

Household projections may be produced using different methodologies and assumptions to those used for the ONS household projections and, therefore, produce different results.

An example of this is comparing the 2014-based (and earlier) household projections produced by the [Ministry of Housing, Communities and Local Government \(MHCLG\)](#) with 2016-based and 2018-based household projections produced by the ONS. Given the different methodologies, input data sources and assumptions used, there are limitations in the ability to create a time series of these data; although MHCLG data go back as far as 1971, data going back this far have been produced differently to data for 2001 onwards, so these are not easily comparable.

Important methodological differences to consider when comparing different sets of household projections in general include:

- different assumptions about the household population projections, for example, other organisations may have more detailed knowledge of the population that resides in CEs
- different assumptions about future patterns of household formation
- different assumptions about the future population of a geographic area, such as levels of future migration, fertility and mortality

## Comparability

In relation to the household projections, each set of household population projections is unique and is produced using trends based on the best data available at that time, including the latest population estimates. Therefore, each new set of projections supersedes the previous set. Although projections are broadly comparable over time, like-for-like comparisons are not straightforward. However, it is possible to observe what effect the most recent demographic trends, when built into projections for the future, have on the possible future population of local areas.

There are two important differences between the HRRs used in the 2018-based household projections and previous sets of household projections, produced by the MHCLG (up to 2014-based). First, the demographic groups used for calculating the HRRs in the 2018-based household projections are based on geography, age group and sex and do not include marital status, unlike previous projections produced by the MHCLG. Secondly, we use a different definition of household reference person (HRP), which is referenced in the concepts and definitions subsection.

There are two important consequences of this HRP definitional change. First, it allows full information from the 2011 Census to be used in the methodology for calculating HRRs. Previous sets of household projections had only been able to use partial information from the 2011 Census, because complex adjustments<sup>1</sup> were required to enable 2011 Census data to align to the eldest male definition of HRP. By using the current definition, these adjustments to the 2011 Census data are no longer required.

Secondly, the change of HRP definition means it is no longer possible to use the 1971, 1981 and 1991 Census data used in the previous methodology in the production of household projections. Household data from these censuses used the eldest male definition of HRP. Therefore, to include data from these censuses in the methodology would require making complex adjustments of a similar nature to the adjustments made to 2011 Census data in the previous methodology.

## Concepts and definitions

(Concepts and definitions describe the legislation governing the output and a description of the classifications used in the output.)

The [overview of population and migration statistics](#) explains the concepts and definitions used in population projections.

## Conceptual framework

A [conceptual framework](#) for population and migration statistics (including the population estimates) is available.

## **Average household size**

The average household size is the average number of people within a household (including children). It is calculated by dividing the household population by the number of households for a given geography and/or age group.

## **Communal establishment (CE) population**

The CE population (also known as the institutional population) includes all people not living in private households. CEs provide managed residential accommodation, for example, nursing homes, student halls of residence, military barracks and prisons. The full definition of a CE can be found in the [2011 Census glossary](#).

## **Dependent child**

Any person aged 0 to 15 years living in a household or a person aged 16 to 18 years in full-time education and living in a family with their parent(s) or grandparent(s). It does not include any people aged 16 to 18 years who have a spouse, partner or child living in the household.

## **Household**

The household projections are based on the 2011 Census definition of a household: “one person living alone, or a group of people (not necessarily related) living at the same address who share cooking facilities and share a living room or sitting room or dining area.” This includes sheltered accommodation units in an establishment where 50% or more have their own kitchens (irrespective of whether there are other communal facilities) and all people living in caravans on any type of site that is their usual residence. This will include anyone who has no other usual residence elsewhere in the UK. A household must contain at least one person whose place of usual residence is at the address. A group of short-term residents living together is not classified as a household and neither is a group of people at an address where only visitors are staying.

## **Household headship rate**

In past sets of household projections, the household headship rate was the proportion of individuals in a specific group considered the head of household, defined by geography, age group, sex and household type. The formula differed from the HRR formula as it used the variable of household type, rather than relationship status.

## **Household population**

The household population is the difference between the total usual resident population and the usual resident population living in CEs.

## **Household reference person (HRP)**

The HRP is a person chosen for statistical reasons because of economic activity, age and/or sex as the representative of a household. The 2018-based household projections define the HRP as the eldest economically active person in the household, then the eldest inactive person if there was no economically active person. 2014-based (and earlier) sets of stage 1 household projections defined the HRP as the eldest male within the household, then the eldest female if there was no male. The full explanation of the current HRP definition can be found on [page 23 of the 2011 Census Glossary](#).

## **Household representative rate (HRR)**

The HRR is the proportion of people in a particular demographic group (for the 2018-based household projections, this is based on geography, age group and sex) who were the HRP. The value of the HRR will be between zero and one.

## **Household type**

Household types classify each household by the number of adults and dependent children living within it and the nature of those relationships.

## **Institutional population**

The institutional population is another name for the CE population, used more frequently in past sets of household projections.

## **Quinary age group**

The five-year age groups used in the 2018-based household projections are:

- 16- to 19-year-olds
- 20- to 24-year-olds
- 25- to 29-year-olds
- 30- to 34-year-olds
- 35- to 39-year-olds
- 40- to 44-year-olds
- 45- to 49-year-olds
- 50- to 54-year-olds
- 55- to 59-year-olds
- 60- to 64-year-olds
- 65- to 69-year-olds
- 70- to 74-year-olds
- 75- to 79-year-olds
- 80- to 84-year-olds
- 85- to 89-year-olds
- those aged 90 years and over

## Stage 1

Stage 1 household projections provide projected numbers of households by the age group and sex of the HRP, for England and its regions and local authorities.

## Stage 2

Stage 2 household projections provide projected numbers of households by household type, for England and its regions and local authorities.

## Usually resident

The usual resident population includes people who reside, or intend to reside, in the country for at least 12 months, whatever their nationality.

## Geography

Household estimates are produced by the ONS, for England and its regions and local authorities.

## Accessibility and clarity

(Accessibility is the ease with which users are able to access the data, also reflecting the format in which the data are available and the availability of supporting information. Clarity refers to the quality and sufficiency of the release details, illustrations and accompanying advice.)

Household projections are available online and can be downloaded free of charge in CSV and Excel file types. Graphs, textual background information and supporting documents are provided as part of each release.

Any additional enquires regarding household projections can be made via email to [pop.info@ons.gov.uk](mailto:pop.info@ons.gov.uk) or by telephone on +44(0)1329 444661. It may be possible to meet additional data requests, but these may be chargeable depending on the time required to produce the additional data requested. Metadata describing the limitations of additional data are provided with individual requests. [User-requested data](#) are also published on the ONS website.

Our recommended format for accessible content is a combination of HTML web pages for narrative, charts and graphs, with data being provided in usable formats such as CSV and Excel file types. We also offer users the option to download the narrative in PDF format. In some instances, other software may be used or may be available on request.

For information regarding conditions of access to data, please refer to the following:

- [Terms and conditions \(for data on the website\)](#)
- [Freedom of information](#)
- [Accessibility](#)

## Timeliness and punctuality

(Timeliness refers to the lapse of time between publication and the period to which the data refer. Punctuality refers to the gap between planned and actual publication dates.)

Household projections follow the publication of SNPPs, typically published around two years after the base year. This time frame occurs because the SNPPs are based on input data that are not available until late in the year after the base year. The time between the availability of data and the publication is needed for the production and quality assurance of the projections.

Household projections are typically published a few months after the SNPPs. In the future, we would like to publish the household projections and SNPPs at a similar time.

This timetable ensures that the projections are available to two important customers, the MHCLG and Department of Health and Social Care (DHSC), for their use in resource allocation and planning.

In special circumstances, interim sets of population and household projections may be produced, using modified methods and the most recent data available. An example of this is the interim 2011-based SNPPs and household projections, which were produced shortly after the 2011 Census results. This set of projections was published to satisfy a strong user requirement for projections that took on board the results of the 2011 Census sooner than the normal publication timetable.

For more details on related releases, the [release calendar](#) provides 12 months' advance notice of release dates. In the unlikely event of a change to the pre-announced release schedule, public attention will be drawn to the change and the reasons for the change explained at the same time, as set out in the [Code of Practice for Statistics](#).

### Notes: Quality characteristics of the household projections data

1. These adjustments are described on pages 4 to 5 and 13 to 16 of [Household Projections 2014-based: Methodological Report](#).

## 6 . Methods used to produce the household projections data

### Main data sources

This subsection provides a list of all the input data sources used in the production of the 2018-based household projections for England, for users wishing to carry out their own analysis or modelling.

To produce the household population projections, the following data sources are used:

- mid-2001 to mid-2018 population estimates by age and sex, [detailed time series](#)
- [2018-based subnational population projections](#) by age and sex
- 2001 Census data on [communal establishment \(CE\)](#) and [total usual resident](#) populations by age and sex
- 2011 Census data on [\(CE\)](#) and [total usual resident](#) populations by age and sex
- prison population data from [offender management statistics quarterly](#)

To produce base household representative rates (HRRs), the following data sources are used:

- 2001 Census data – household reference persons (HRPs) by age and sex; these data were obtained from 2001 Census-commissioned table C1092\_01 and this table is [listed as a 2001 Census-commissioned table](#) and can be obtained free of charge from [Census Customer Services](#)
- 2001 Census data – [household populations by age and sex](#)
- 2011 Census data – [HRPs by age and sex](#)
- 2011 Census data – household populations by age and sex (the 2011 household population was derived by subtracting the [CE](#) population from the [total usual resident population](#))

## Use of other data sources in the projection of HRRs

The 2014-based household projections used Labour Force Survey (LFS) data in the projection of HRRs, to adjust the 2011 census data point to reflect the new HRP definition, to combine the two fitted trends used to project forward the five Census points of data, and to make further adjustments at the England level for 2002 to 2011 data.

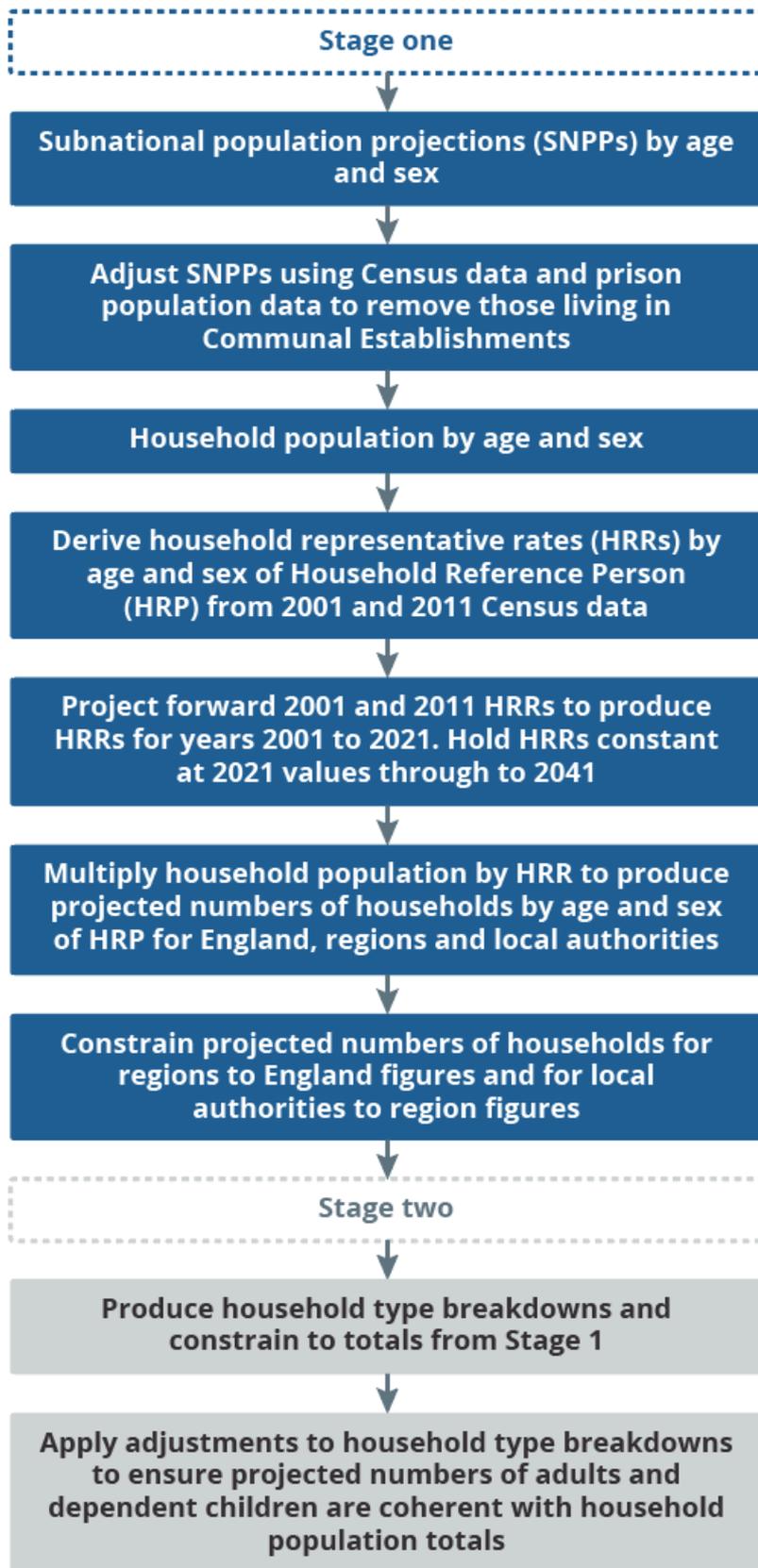
We have decided not to incorporate the LFS or any other data sources into the projection of the HRRs for the 2018-based household projections. This is primarily to reduce the complexity of the method. As we are no longer using the eldest male definition of a HRP, we no longer need to use the LFS to adjust the 2011 Census data to refer to this definition. As we are using only two census points and a different projection model, we no longer need to use the LFS to combine the two fitted trends in the previous model. The assumption about projecting HRRs for 2011 to 2021 has been informed by analysis of HRRs from LFS data, although neither the LFS nor any other data sources have been incorporated into the model itself.

In the future, we intend to carry out further research about how other data sources (particularly administrative data sources) might be used to provide more recent trends for projecting HRRs.

## How we process the data

The methodology used to produce the projections is detailed in the methodology article. A summary of that methodology is provided in this section and summarised by the flow diagram in Figure 1.

**Figure 1. 2018-based household projections methodology**



Source: Office for National Statistics

As shown in Figure 1, the methodology is split into two stages.

The first stage produces projected total numbers of households, by quinary age group and sex, of the HRP <sup>1</sup> over the projection period for England and its regions and local authorities.

The second stage produces household type breakdowns from the total numbers of households and applies adjustments to these to ensure household population totals are coherent with the total numbers of households.

A step-by-step guide to our methodology can be obtained from our [methodology report](#).

## How we analyse and interpret the data

### Variant household projections

The five variant household projections that have been produced for the 2018-based household projections are:

- a high international migration variant
- a low international migration variant
- an alternative internal migration variant
- a 10-year migration variant
- continuous projection of the HRRs, which were held constant from 2022 onwards in the principal projection

The alternative internal migration variant uses five years of data for internal migration: two using the new method and three using the old method. We have also produced a 10-year migration variant where all migration trends (internal, cross-border and international) are based on 10 years of data. More information on the alternative internal migration variant, and the 10-year migration variant, are discussed in our article on the [Impact of different migration trend lengths](#).

## How we quality assure and validate the data

Rigorous quality assurance is carried out at all stages of production. Specific procedures include:

- scrutinising input data to investigate the accuracy of any abnormal values
- scrutinising trends in the total population, household population and HRRs projected over time for plausibility
- comparing current household projections with previous household projections and household estimates, to see where large changes are taking place and understand the reasons for these
- examining sex ratios to find any areas of imbalance
- comparing local authorities, to check for outliers
- checking output tables to ensure that there are no errors or inaccuracies during the creation of published tables

## How we disseminate the data

Household projections are available online, by local authority and region for 2001 to 2043 (for the 2018-based methodology). [Previous sets of household projections for England are available from the MHCLG](#).

Links from the [release calendar](#) make the release date and location of each new set of household projections clear. Household projections can be downloaded free of charge in Excel format. A statistical bulletin accompanies each publication. The underlying data for the charts and tables in the bulletin can also be downloaded. Supporting documentation is also available on the [household projections web page](#). A [household projections analysis tool](#) is also available, to help compare household projections data for local authorities.

Most queries can be answered from the website datasets or supporting methods documents. Any additional enquires regarding the household projections can be made by emailing [pop.info@ons.gov.uk](mailto:pop.info@ons.gov.uk). It may be possible to meet additional data requests, but these may be chargeable depending on the time required to produce the additional data requested. Metadata describing the limitations of the data for more detailed tables are provided with each individual request.

## How we review the data and maintain the data processes

Future revisions to the household projections may be required to reflect occasional or post-census revisions to the subnational population projections (SNPPs). This is in line with the [Office for National Statistics \(ONS\) revision policy for population statistics](#).

### Notes for: Methods used to produce the household projections data

1. In the 2018-based household projections, the HRP is the eldest economically active person in the household.

## 7 . Other information

### Useful links

[Subnational principal and variant population projections for England](#) are available. Supporting documentation includes a [methodology document](#) and a [Quality and Methodology Information \(QMI\) report](#).

[Household projections for England, comparisons with other sources: 2001 to 2018](#) provides analysis comparing household projections with household estimates and other sources of households and planning data.

The article [Comparing the differences between the 2014-based and 2016-based household projections for local authorities in England](#) provides analysis and guidance about the differences between the 2014-based and 2016-based household projections.

[Methodology used to produce the 2018-based household projections for England](#) provides a detailed explanation of how household projections for England are produced.

[Previous releases of household projections](#) (2014-based and earlier) are available from the Ministry of Housing, Communities and Local Government (MHCLG). In January 2017, the responsibility for household projections was transferred to the Office for National Statistics (ONS). Queries on these projections should be emailed to [pop.info@ons.gov.uk](mailto:pop.info@ons.gov.uk).

