

Navigating numbers: Census

Student toolkit

Explore census data and its significance in understanding population dynamics.



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Overview

The census is a count of every household in England and Wales, which has been undertaken by the Office for National Statistics every 10 years. It asks questions about you, your household and your home. Information from the census helps the government and local authorities to plan and fund local services, such as education, doctors' surgeries and roads.

Explore the census and its significance in understanding population dynamics. Use the Census maps tool, Build a custom area profile tool and a real-world dataset from the census to explore how statistical inferences are made about populations. Compare and contrast different places or change in the same place over time and consider the role of census data in decision-making.



Overview

Featured tools

[Census maps](#): An interactive tool to find out what people's lives were like across England and Wales in March 2021, down to a neighbourhood level. You can see the geographic distribution of people and households with simple and dot density maps in addition to percentages and change over time for selected variables.

[Build a custom area profile](#): Create your own profile for local areas in England and Wales using Census 2021 data. You can find an area by name or postcode or draw your own area on a map, choose different topics from Census 2021 data then export your area profile as an image or spreadsheet in CSV format.



Overview

Census 2021 datasets and publications

- [Demography and migration](#)
- [Ethnic group, national identity, language and religion](#)
- [Labour market and travel to work](#)
- [Housing](#)
- [Sexual orientation and gender identity](#)
- [Education](#)
- [Health, disability and unpaid care](#)
- [UK armed forces veterans](#)
- [Welsh language](#)

Additional resources

- [Sample design and estimation](#)
- [How your area has changed in 10 years: Census 2021](#)
- [How your area has changed in 10 years: data download \(XLSX, 1,525 KB\)](#)

Maths: Census vs samples

Your goal is to research census and sampling methodology and uses to understand how statistical inferences are made about populations. You will compare some sample-based inferences with actual census data, to gain insights into the accuracy and limitations of different sampling techniques.

Check out these videos on sampling methods before getting started:

- [The making of Census 2021](#)
- [Population Vs Census Vs Sample](#)

Learning objectives

- Understand the difference between census data and samples.
- Explore various sampling methods and their implications.
- Apply sampling techniques to draw inferences about populations.
- Compare sample-based inferences with census data to assess accuracy and reliability.



Maths: Census vs samples

Get started: source your sample data

Research different sampling methods, such as random sampling, stratified sampling and cluster sampling. You will need some sample-based data to compare with census data.

Some reliable sources of sample data might include:

- YouGov
- World Values Survey (WVS)
- IPSOS
- British Social Attitudes survey

Or you could design and conduct your own survey to sample students at school using different sampling techniques.



Maths: Census vs samples

Next steps

You can come up with your own project you'd like to find answers for, but if you are stuck for ideas, here is some inspiration.

- **Compare the demographic characteristics such as age, sex, race and ethnicity of your sample data to the corresponding census data.** Are there any notable differences or discrepancies? What might be the reasons behind these differences?
- **Analyse the geographic distribution of your sample data compared to census data.** Are there any regions or neighbourhoods where the

sample data differs significantly from the census data? What factors might contribute to these differences? For example, migration patterns or sampling bias.

- **Investigate disparities between your sample data and census data.** For example, educational attainment, employment patterns or housing and living arrangements.



Maths: Census vs samples

Using the tools

How to use the tools to answer your question or test your hypothesis.

- Analyse your sample data and make predictions about the entire population based on their findings then map your sample data against census data for comparison.
- Evaluate any differences and the factors that might have influenced these differences, such as sampling bias or variability.



Things to think about

- Where will you source additional data if you need it and how will you combine that with ONS data?
- How will you make sure your charts and graphs are understandable?



Business: Market research project

Your goal is to act as a business owner and come up with recommendations for expansion, new products, marketing or target audiences. You will explore how you can use census data to inform decisions. This could include:

- analysing consumer demographics
- identifying target markets
- inferring demand for certain products or services
- analysing factors like population density and consumer preferences

Learning objectives

- Understand how businesses can use census data for location decisions and market research.
- Analyse factors such as population density and consumer preferences in relation to business decisions.
- Explore the concept of target markets and how census data can help identify them.



Business: Market research project

Create a business profile

Things to include in a fictional business profile.

- Business Name.
- Business Description: Brief overview.
- Industry or niche: Specify the industry or niche your business operates in. For example, retail, food and beverage, technology or healthcare.
- Current Target Market: Demographics such as age, sex and education level, geographic location, lifestyle and preferences.
- Products or Services.
- Geographic Location: Where your business operates.
- Marketing Strategy: Overview of marketing strategy, including advertising channels and promotional activities.



Business: Market research project

Conduct your research

Examples of questions to guide and focus your market research.

- Can you use census data to determine the best location for opening a new store or expanding operations?
- Can you use census data to identify and target specific demographic groups for your products or services?
- What role does population density play in your decisions regarding market expansion or product and service offerings?

- Can you use data about consumer preferences in different areas to adjust pricing strategies or tailor marketing campaigns?
- How can you use census data to develop new products or improve existing ones?



Business: Market research project

Using the tools

There are several ways you can use the tools to help your research and inform your recommendations.

- **Demographic Profiling:** Analyse demographic trends, such as age distribution, sex ratio, ethnicity, household composition and socioeconomic status. This will help you to better understand your target market and tailor products or services to meet the needs of specific demographic groups.
- **Market Segmentation:** Segment the population into distinct groups based on shared characteristics. This will help you identify niche markets with unmet needs or to customise marketing strategies for different segments.
- **Consumer Behaviour Analysis:** Look at additional datasets, such as consumer trends, household expenditure and employment to analyse purchasing habits, employment status, commuting patterns or housing preferences. This will help you gain insights into consumer preferences and lifestyle choices.
- **Location Analysis:** Explore population distribution and density to identify optimal locations for opening new stores or branches.

Business: Market research project



Things to think about

- Where will you source additional data if you need it and how will you combine that with ONS data?
- How will you make sure your charts and graphs are understandable?



Sociology or Geography: Making comparisons

Your goal is to explore historical and current census data to compare and contrast different places or change in the same place over time. By looking at census data, you will gain insights into demographic trends and how these can influence human and physical geography of a place.

Learning objectives

- Understand how to analyse historical and current census data.
- Make comparisons and contrasts between different places or changes over time.
- Explore differences in social demographics between places, or in a place, over time.
- Investigate factors that influence social disparities.
- Analyse census data related to demographics and place.



Sociology or Geography: Making comparisons

Get started

Examples of questions to answer or hypotheses to test

- How has the population size changed in a specific area over the past decade? What are the primary factors driving population growth or decline in different regions?
- How has the demographic composition, for example, age, sex or ethnicity of a particular area evolved over time? How do these changes affect infrastructure development, housing and public services?
- Are there significant differences in population density between urban, suburban and rural areas within the same region?
- How have changes in the population affected voting patterns and political representation in different areas?
- Are there noticeable disparities in access to healthcare, transportation or other essential services based on demographic factors?
- How do demographic trends intersect with environmental factors, such as land use changes or climate adaptation strategies?

Sociology or Geography: Making comparisons

Using the tools

Use the datasets to help answer your question or test your hypothesis. You might like to:

- investigate social demographics, such as age, sex, ethnicity and socio-economic status and how these differ within a region over time or between regions
- look at different factors to understand social disparities, such as education levels, employment rates and access to resources
- explore the cultural diversity within a population by analysing census data related to language, religion and ethnicity
- use appropriate data visualisation techniques, such as maps, charts and graphs to illustrate spatial patterns and trends in the data



Sociology or Geography: Making comparisons



Things to think about

- **Consider how you will source relevant data.** Is it available from surveys, research studies, government reports and other databases? Ensure that the data you are using are reliable and accurate. Understand any potential biases or limitations in the data collection methods.
- **Consider the comparability of data over time and across different geographic areas.** Changes in census methodologies or boundary definitions may affect comparability.
- **Determine which demographic variables and indicators are most relevant to your research questions.**
- **Contextualise your findings within broader social, economic and political contexts.** Consider how historical events, policy changes, or economic trends may have influenced demographic patterns.