

Online tools for accessing and analysing census data from the UK Data Service

Workshop 3: Accessing and analysing census microdata using Nesstar

Rihab Dahab & Patty Doran

UK Data Service, University of Manchester

Manchester

16th December 2020

Today ...

- Introduction
 - The census
 - Census microdata
 - Accessing and analysing census microdata using Nesstar
- Demonstration – **exploring census microdata with Nesstar**
- Activity – in your own time, 10 mins
- Feedback from activity
- Questions and discussion

Introduction

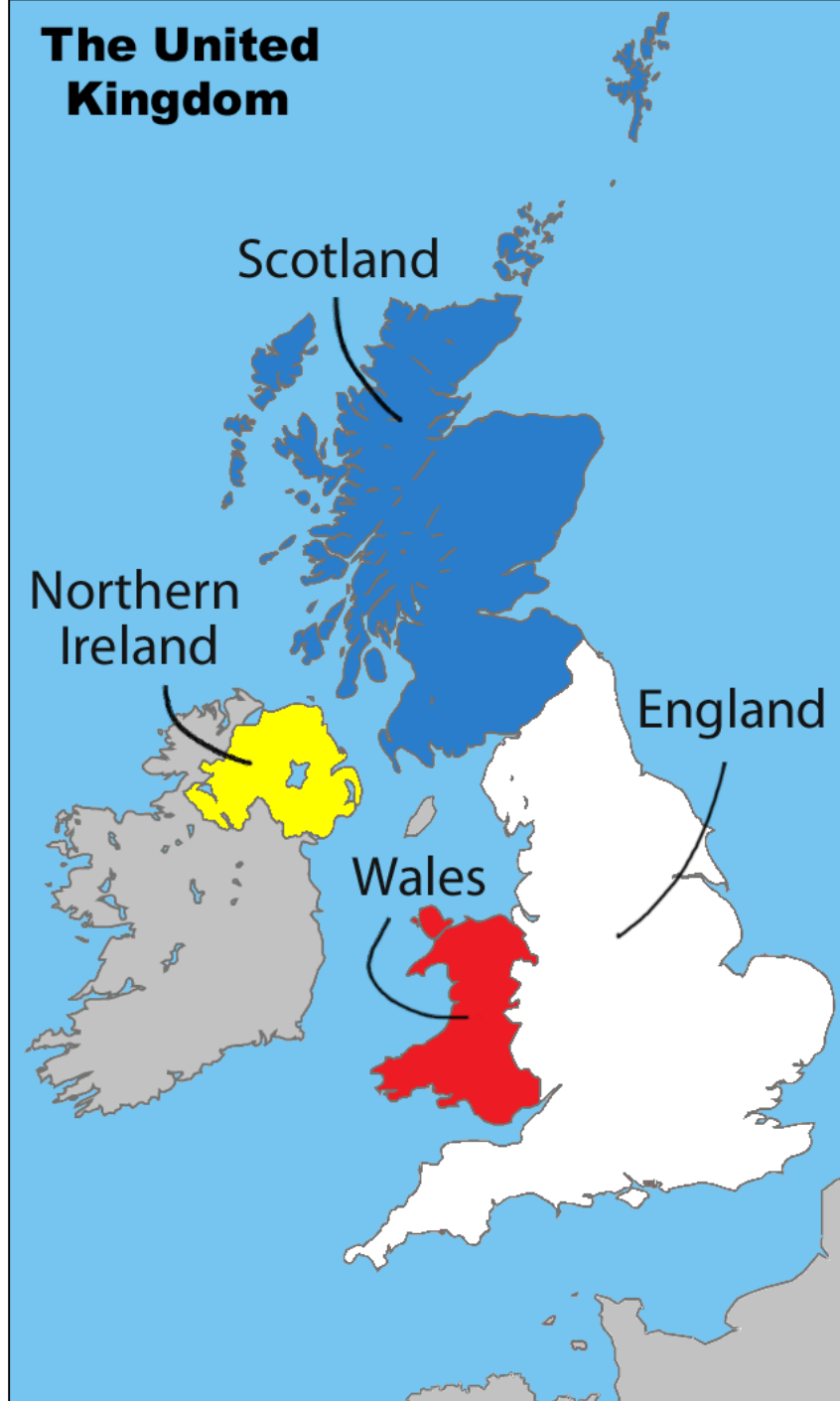
Our aim is to ...

- Provide an overview of census microdata
- Show how to access census microdata from the UKDS
- Demonstrate how to explore census microdata and perform simple analysis online using **Nesstar**
- Gain an understanding of what census microdata could be used for

Census Data

- Census Act 1800. Enabled the first census on 1801.
- Until 1831 the census was a head count of everyone in the country on a given day.
- Currently, the census is defined as the “count of all people and households”, incorporating gradually more information of the population.





What is census?

- Main function to count the population at one or more locations
- Obtain some characteristics about the population
- Outputs for small geographies

What is census for?

- Informs public spending/policy making process
- Used as a basis for other statistical systems
- Used by Central and Local Governments, NGOs, and for research purposes (which helps in informing public policy)

What questions were asked?

Demographics

- Age
- Sex
- Country of Birth
- Short-term residence
- Ethnicity
- Religion
- Passports
- Language
- National identity
- Marital status

Household

- Tenure
- Accommodation type
- Cars
- Central heating
- No. of bedrooms

Socio-economic

- Health
- Unpaid care
- Qualifications
- Economic activity
- Occupation
- Industry
- Travel to work
- FT / PT

Census Outputs

1. Supported by the UK Data Service

- **Microdata**
 - **Anonymised samples of census records**
 - **Detail limited to protect confidentiality**
- Aggregated data
 - Counts of combinations of characteristics for areas
- Flow data
 - Counts of migrants from origin to destination
 - Or, between first and second address
 - Or home and place of work
- Boundary data
 - Geographical Information System (GIS) formats
 - Shape files to enable these to be mapped

2. Supported by CALLS

- Longitudinal microdata for each country

How census microdata looks...

	agegpt	aprxsocgr	cofbt	econac1t	ethew1t	famcomp	health1
1	55 to 64	DE	UK	Economica...	White	Married/sam...	Good health
2	35 to 44	C2	UK	Economica...	White	Lone parent f...	Very good health
3	35 to 44	DE	UK	Economica...	White	Cohabiting c...	Very good health
4	16 to 24	C1	UK	Economica...	White	Cohabiting c...	Good health
5	45 to 54	C1	UK	Economica...	White	Cohabiting c...	Very good health
6	55 to 64	C2	UK	Economica...	White	Married/sam...	Good health
7	35 to 44	C2	UK	Economica...	White	Lone parent f...	Good health
8	0 to 15	No code re...	UK	No code re...	White	Cohabiting c...	Good health
9	65 to 74	C1	UK	Economica...	White	Married/sam...	Very good health
10	55 to 64	DE	UK	Economica...	White	Not in a family	Fair health

Types of 2011 census microdata

- **Open files**
 - Teaching files – available from census offices and UKDS (1% regional taster file)
- **Safeguarded**
 - Regional files (5%)
 - Grouped local authorities files (5%)
- **Controlled access**
 - Individual files (10%) England and Wales
 - Household files (10%) England and Wales

Safeguarded census microdata topic guide (1991-2011)

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Topic	1991				2001			2011				
2	Demographic	HHD GB	HHD NI	Ind GB	Ind NI	I-SAR	H-SAR (lic)	SAM	EW Safeg Reg	EW Safeg LA	Sc Safeg Reg	Sc Safeg LA	NI Safeg Re
3	Sex	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	Age	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	Exact pension age	.	.	.	.	.	.	.	Yes	Yes	Yes	Yes	Yes
6	Person of pensionable age	.	.	.	.	.	.	.	Yes	Yes	Yes	Yes	Yes
7	Marital Status	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	Living arrangements	.	.	.	.	.	.	.	Yes	Yes	Yes	Yes	Yes
9	Cohabiting same-sex couple	.	.	.	.	.	.	.	Yes	.	.	.	Yes
10	Household head/reference person	Yes	Yes	Yes	.	.	Yes	Yes	.	.	.	.	.
11	Family head/reference person	Yes	Yes	Yes	.	.	Yes	.	.	.	.	.	.
12	Relationship to HH head/reference person	Yes	Yes	Yes	Yes	Yes	Yes	Yes	.	Yes	Yes	.	Yes

<https://census.ukdataservice.ac.uk/use-data/guides/microdata>

Why use census microdata?

- Very flexible
- Large sample size
- Can create regional and local authorities aggregated variables
- Can complement survey data
- Allows to undertake several type of statistical analysis
- Allows looking at change over time

But

- Sample data, hence results are estimates
- Geographical detail is limited in safeguarded data

Research on microdata

Housing disadvantage



jems Journal
Journal of Ethnic and Migration Studies >
Latest Articles

Enter keywords, authors, DOI etc.

208 Views
2 CrossRef citations to date

Special Issue: Opportunities and challenges doing interdisciplinary research: What can we learn from studies of ethnicity, inequality and place?

Slippery discrimination: a review of the drivers of migrant and minority housing disadvantage

Sue Lukes ✉, Nigel de Noronha & Nissa Finney
Published online: 18 Jul 2018

G GEOGRAPHICAL JOURNAL
Geographical Society with IBG
Advancing geography and geographical learning

REGULAR PAPER | Open Access |

Ethnic internal migration: The importance of age and migrant status

Frances Darlington-Pollock ✉, Nik Lomax, Paul Norman

First published: 07 November 2018 | <https://doi.org/10.1111/geoj.12286>

Internal migration

Self-employment



SMALL BUSINESS ECONOMICS
An Entrepreneurship Journal

[Small Business Economics](#)
April 2017, Volume 48, [Issue 4](#), pp 1047-1069 | [Cite as](#)

Self-employment amongst migrant groups: new evidence from England and Wales

Authors [Authors and affiliations](#)

Ken Clark, Stephen Drinkwater ✉, Catherine Robinson

Finding data

Where to find census microdata

Open data

Available in spreadsheet format (csv files) from census offices:

ONS, NRS and NISRA

Also available as SPSS/Stata/Nesstar from the UK Data Service
without registration

Safeguarded data


From 1961 to 2011, available from the
UK Data Service, **requires online registration**

Controlled- Secure data

Via census offices only: ONS, NRS and NISRA

Accessing census microdata from the UKDS

UK Data Service
Census Support



[About Census Support](#) **Get census data** [Use census data](#) [News](#)

Census > Get data > Microdata

Census microdata

Aggregate data


Flow data


Microdata

Boundary data

Related data

Explore online

SHARE 



We provide access to cross-sectional census microdata, these are anonymised individual level records sampled from a single census. They are large individual level files which resemble the sort of data that might be collected directly from a questionnaire. Because individual records contain a wide range of individual and household characteristics, the data enable multivariate analyses for a wide range of purposes.

The UK Data Service holds contemporary data from the 1981 to 2011 Censuses and microdata samples from 1961 onwards.

- [Guide to census microdata](#)

Microdata files are available at four levels, two of which can currently be accessed through the UK Data Service in the same manner as survey data.

Finding the data

[COVID-19](#) [Site search](#) [Accessibility](#) [FAQ](#) [Help](#) [Contact](#) [New users](#) [Sitemap](#)

UK Data Service

[About us](#)

[Get data](#)

[Use data](#)

[Manage data](#)

[Deposit data](#)

[News and events](#)



 [Register / Login](#)

Explore the UK's largest collection of social, economic and population data resources

census microdata

Search data



Online access through **Nesstar**

Access to teaching files

- No registration required

Access to safeguarded files

- Can explore variables and run frequency tables
- Requires registration for more advanced analysis

- Registered users access with their login details
- Students and members of staff at UK institutions of higher or further education can login with their university username and password

The way to Nesstar 1...

About us

Get data

Use data

- About our data
- Key data
- Data by theme
- Data by geography
- Open data
- How to access
- Other providers
- Explore online
- Data access policy
- Thesauri



The way to Nesstar 2...



About us

Get data

Use data

- About our data
- Key data
- Data by theme
- Data by geography
- Open data
- How to access
- Other providers
- **Explore online**
- Data access policy
- Thesauri



About our data

Key data

Data by theme

Data by geography

Open data

How to access

Other providers

● Explore online

Data access policy

Home > Get data > Explore online

Explore online

A selection of data are available to explore via our online tools.

Nesstar

Nesstar is the online data exploration system used by the UK Data Access Centre to provide access to a wide variety of datasets. All visitors to our Nesstar Catalogue can view metadata, variable frequencies and use the simple and advanced search tools. Registered users can also create simple online cross-tabulations, download subsets of variables in a variety of formats.

Census

The way to Nesstar 3...



Home > Get data > Explore online

Explore online

About us

Get data

Use data

- About our data
- Key data
- Data by theme
- Data by geography
- Open data
- How to access
- Other providers
- Explore online
- Data access policy
- Thesauri



About our data

Key data

Data by theme

Data by geography

Open data

How to access

Other providers

About our data

Key data

Data by theme

Data by geography

Open data

How to access

Other providers

● Explore online

A selection of data are available to explore via our online tools.

Nesstar

Nesstar is the online data exploration system used by the UK Data Access Service to provide access to a wide variety of datasets. All visitors to our Nesstar Catalogue can view metadata, variable frequencies and use the simple and advanced search tools. Registered users can also create simple online cross-tabulations, download subsets of variables in a variety of formats.

Home > Get data > Explore online > Nesstar

Nesstar

SHARE

Accessing data using Nesstar:

Nesstar is available at: nesstar.ukdataservice.ac.uk

Web browser information:

- Internet Explorer users: if you experience a blank screen, or receive an error message, when trying to log in, either use FireFox or follow the instructions given in our [FAQ](#) section about Nesstar

Nesstar...

UK Data Service
Delivering quality social and economic data resources

2011 Census Microdata Individual Safeguarded Sample (Local Authority)

- Metadata
 - Study Description
 - Data Files Description
- Variable Description
 - Communal Establishment
 - Family
 - Household
 - Household or communal establishment
 - Age of individual (grouped)
 - Age of household reference person
 - Number of cars and vans
 - Central heating
 - Country of birth of household reference person
 - Deprivation indicators of a household
 - Ethnic group of household reference person
 - Number of people in household who provide care
 - Number of individuals in household with long-standing illness/disability
 - Type of landlord
 - Wholly moving household indicator
 - Household multiple religion indicator
 - Household reference person NS-SEC

Dataset: 2011 Census Microdata Individual Safeguarded Sample (Local Authority)

Variable Group Household

- Household or communal establishment
- Age of individual (grouped)
- Age of household reference person
- Number of cars and vans
- Central heating
- Country of birth of household reference person
- Deprivation indicators of a household
- Ethnic group of household reference person
- Number of people in household who provide care
- Number of individuals in household with long-standing illness/disability
- Type of landlord
- Wholly moving household indicator
- Household multiple religion indicator
- Household reference person NS-SEC
- Pensioner household
- Number of persons per room
- Type of second address
- Household reference person social grade

Nesstar demo

- ukdataservice.ac.uk
- How to find census microdata
- Catalogue pages: getting information about the census
- How to download the data
- Using Nesstar to view data and do simple analyses online

Activity

1. How many cases are there in the England and Wales 2011 microdata?

Dataset: 2011 Census Microdata Individual Safeguarded Sample (Local Authority)

Variable lastyrwrkg: Last year worked

Values	Categories	N	
1	In employment	1337980	63.8%
2	Last worked in 2011	25456	1.2%
3	Last worked in 2010	98084	4.7%
4	Last worked in 2008 or 2009	100852	4.8%
5	Last worked in 2006 or 2007	62332	3.0%
6	Last worked in 2004 or 2005	53019	2.5%
7	Last worked in 2002 or 2003	43911	2.1%
8	Last worked in 2000 or 2001	46822	2.2%
9	Last worked in 1996 to 1999	77905	3.7%
10	Last worked in 1991 to 1995	84464	4.0%
11	Last worked before 1991	166175	7.9%
-9	Not applicable	751149	

SUMMARY STATISTICS

Valid cases	2097000
Missing cases	751149
Minimum	1.0
Maximum	11.0

Total cases = 2,097,000 + 751,149 = 2,848,149

2. What proportion of the population is usually in work?

Dataset: 2011 Census Microdata Individual Safeguarded Sample (Local Authority)

Variable hours: Hours worked per week

LITERAL QUESTION

In your main job, how many hours a week (including paid and unpaid overtime) do you usually work?

Values	Categories	N	
1	Part-time:15 hours or less worked	129589	9.7%
2	Part-time:16 to 30 hours worked	261719	19.6%
3	Full-time: 31 to 48 hours worked	769355	57.5%
4	Full-time: 49 or more hours worked	177317	13.3%
-9	Not applicable	1510169	

SUMMARY STATISTICS

Valid cases	1337980
Missing cases	1510169
Minimum	1.0
Maximum	4.0
This variable is numeric	

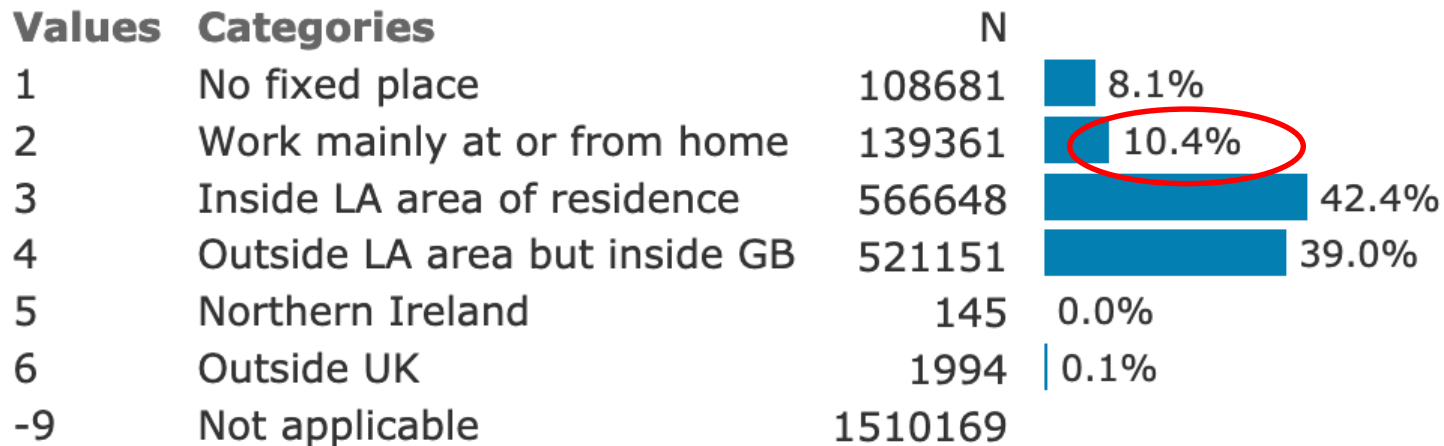
$$\text{Total cases} = 1,337,980 + 1,510,169 = 2,848,149$$

$$\% \text{ working} = 1,337,980 / 2,848,149 = 47.0\%$$

3. How many adults in employment are usually working from home?

Dataset: 2011 Census Microdata Individual Safeguarded Sample (Local Authority)

Variable wrkplaceew: Workplace



SUMMARY STATISTICS

Valid cases 1337980
Missing cases 1510169
Minimum 1.0
Maximum 6.0
This variable is numeric

Discussion

Online resources from the UK Data Service

- Guides
- Videos
- Data Skills Modules

The screenshot shows the UK Data Service website interface. At the top right, there are links for 'COVID-19', 'Site search', and 'Accessib'. The main navigation bar includes 'About us', 'Get data', 'Use data', 'Manage data', and 'De'. The 'Use data' link is circled in red. A dropdown menu is open under 'Use data', listing several options: 'Advice and training', 'Guides', 'Video tutorials', 'Data in use', 'Citing data', 'Secure Lab', 'Teaching with data', 'Student resources', 'Data Skills Modules', and 'Secondary analysis'. The 'Guides' and 'Data Skills Modules' items in the dropdown are also circled in red. On the left side of the page, the UK Data Service logo is visible, along with a blue box containing the text 'We expect to run as normal a information.' and a dark blue box with the word 'Explor'.

Methods and Software Guides

For example:

Software guides

- What is Stata?
- What is SPSS 20 for Windows?
- Using R to analyse key UK surveys

Census data

- [Guide to mapping 2011 Microdata using R.](#)

The screenshot shows the UK Data Service website. The top navigation bar includes 'About us', 'Get data', 'Use data' (circled in red), 'Manage data', and 'Deposit data'. Below the navigation bar is a breadcrumb trail: 'Home > Use data > Guides > Methods and software guides'. The main heading is 'Methods and software guides'. On the left side, there is a sidebar with 'Advice and training' and 'Guides' (with a red dot) and 'Dataset guides'. On the right side, there is a 'SHARE' button with a share icon. Below the main heading, there is a description: 'These include guides to using our collection in standard software, manipulating data and key concepts in reusing data.' Below this, there is a list of guides with 'Software guides' circled in red. The list includes: 'Data in use', 'Citing data', 'Secure Lab', and 'Teaching with data'. The 'Software guides' section lists: 'What is Stata?', 'What is SPSS 20 for Windows?', and 'Using R to analyse key UK surveys'. Below this, there is a 'Census data' section (circled in red) with links: 'Mapping Census data in QGIS' and 'Mapping 2011 Census Microdata using R'.

UK Data Service

About us Get data **Use data** Manage data Deposit data

Home > Use data > Guides > Methods and software guides

Methods and software guides

Advice and training

Guides Dataset guides

SHARE

These include guides to using our collection in standard software, manipulating data and key concepts in reusing data.

Data in use **Software guides**

Citing data [What is Stata?](#)

Secure Lab [What is SPSS 20 for Windows?](#)

Teaching with data [Using R to analyse key UK surveys](#)

Census data

[Mapping Census data in QGIS](#)

[Mapping 2011 Census Microdata using R](#)

Videos

The screenshot shows the UK Data Service website. The top navigation bar includes 'About us', 'Get data', 'Use data' (circled in red), 'Manage data', and 'Deposit data'. The left sidebar lists various resources, with 'Video tutorials' (circled in red) selected. The main content area displays the heading 'Video tutorials' and the text 'Can you show me how to do that?' next to a graphic of five vertical bars of decreasing height in purple, pink, red, orange, and yellow.

Site search Accessibility

UK Data Service

About us Get data **Use data** Manage data Deposit data

Home > Use data > Video tutorials

Video tutorials

"Can you show me how to do that?"

Advice and training

Guides

Video tutorials

Data in use

Citing data

Secure Lab

Teaching with data

Student resources

- YouTube: <https://www.youtube.com/user/UKDATASERVICE>

Webinars



UK Data Service Computational Social Science Drop-in

08 Dec - 09 Feb 2021

Online, 13.00 - 14.00



Coding Demonstrations: Social Network Analysis in Python

13 - 27 Jan 2021

Online, 14.00 - 15.00



Safe Researcher Training

14 Jan 2021

Online



Data pre-processing training series

14 - 28 Jan 2021

Online, 13.00 - 14.00



Safe Researcher Training

02 Feb 2021

Online

<https://ukdataservice.ac.uk/news-and-events/events>

Questions

Patty Doran, patty.doran@manchester.ac.uk

Rihab Dahab, rihab.dahab@manchester.ac.uk