

Data in the spotlight: Census and population studies

David Rawsley

UKDS Senior Technical Co-ordinator

November 18th 2021



Quiz time

- A – 2,467
- B – 27,229
- C – 176,632
- D – 390,870
- E – 1,156,221



In 2011 how many people in the UK identified their religion as Jedi?

Aggregate data are data about
populations, groups, regions or countries



59



35



17



22



The Census of Population

- Every 10 years
- First modern census in 1841
- Data held secure for 100 years
- Digitised censuses from 1971 (1961 ongoing)
- Last ever census?

A UK Census?

- Different nations, different governments, different ideas.
 - Office for National Statistics
 - National Records of Scotland (formerly GROS)
 - Northern Ireland Statistics and Research Agency
- Different Geographies
- Different Questions
- Different Outputs
- Lots of harmonisation

England and Wales Census

21st March 2021

- 97 % response
- Average completion time – 23 minutes
- Census Coverage Survey
- Census Quality Survey
- Output consultation

Northern Ireland Census

21st March 2021

- Census Coverage Survey
- Outputs consultation
- Add geographies
- Statistical Disclosure Control
- Quality Assurance

Scotland Census

1st March 2022

- Census rehearsal
- Data processing rehearsal
- Work ongoing to ensure that people are not counted twice or not counted at all.

Census Outputs

- Should start to appear July 2022
- Headline figures first
- Ready made tables
- Tables that flex
- Build your own tables
- Links to administrative data


What can the census aggregate data tell us?

- The most complete source of information about demographic and socio-economic characteristics of the UK population.
 - Population
 - Employment, occupation, socio-economic class, qualifications
 - Ethnicity, religion, national identity, language
 - Housing, tenure, residence type
 - Household and family composition, occupancy
 - Carers and caring
 - Long term health problems or disability
 - Travel to work, migration

New questions

- Gender – England, Wales, Scotland, Northern Ireland
- Voluntary

27 Is the gender you identify with the same as your sex registered at birth?

 This question is **voluntary**

Yes

No, write in gender identity

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

4 Do you consider yourself to be trans, or have a trans history?

- ◆ This question is **voluntary**
- ◆ Answer only if you are aged 16 or over
- ◆ Trans is a term used to describe people whose gender is not the same as the sex they were registered at birth
- ◆ Tick **one** box only

No


Yes, please describe your trans status (for example, non-binary, trans man, trans woman):

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

New questions

- Sexuality – England, Wales, Scotland
- Voluntary

26 Which of the following best describes your sexual orientation?

 This question is **voluntary**

Straight/Heterosexual

Gay or Lesbian

Bisexual

Other sexual orientation, write in

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

8 Which of the following best describes your sexual orientation?

◆ This question is **voluntary**

◆ Answer only if you are aged 16 or over

◆ Tick **one** box only

Straight / Heterosexual

Gay or Lesbian

Bisexual

Other sexual orientation, please write in:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

New questions

- Veteran status – England, Wales, Scotland

32 Have you **previously** served in the UK Armed Forces?

↻ **Current serving members** should only tick "no"

- Yes, previously served in **Regular** Armed Forces
- Yes, previously served in **Reserve** Armed Forces
- OR** no

26 Have you **previously** served in the UK Armed Forces?

◆ **Current serving members** should only tick 'No'

- No
- Yes, previously served in **Regular** Armed Forces
- Yes, previously served in **Reserve** Armed Forces

New questions

• Health conditions – Scotland, Northern Ireland

18 Do you have any of the following, which have lasted, or are expected to last, at least 12 months?

◆ Tick all that apply

- Deafness or partial hearing loss**
- Blindness or partial sight loss**
- Full or partial loss of voice or difficulty speaking** (a condition that requires you to use equipment to speak)
- Learning disability** (a condition that you have had since childhood that affects the way you learn, understand information and communicate)
- Learning difficulty** (a specific learning condition that affects the way you learn and process information)
- Developmental disorder** (a condition that you have had since childhood which affects motor, cognitive, social and emotional skills, and speech and language)
- Physical disability** (a condition that substantially limits one or more basic physical activities such as walking, climbing stairs, lifting or carrying)
- Mental health condition** (a condition that affects your emotional, physical and mental wellbeing)
- Long-term illness, disease or condition** (a condition, not listed above, that you may have for life, which may be managed with treatment or medication)
- Other condition**, please write in:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
- No condition**

21 Do you have any of the following conditions which have lasted, or are expected to last, at least 12 months?

➡ Tick all that apply.

- Deafness or partial hearing loss
- Blindness or partial sight loss
- A mobility or dexterity difficulty that requires the use of a wheelchair
- A mobility or dexterity difficulty that limits basic physical activities (for example walking or dressing)
- An intellectual or learning disability (for example Down syndrome)
- A learning difficulty (for example dyslexia)
- Autism or Asperger syndrome
- An emotional, psychological or mental health condition (for example depression or schizophrenia)
- Frequent periods of confusion or memory loss (for example dementia)
- Long-term pain or discomfort
- Shortness of breath or difficulty breathing (for example asthma)
- Other condition (for example cancer, diabetes or heart disease)
- No condition

What the census cannot tell us

- Wealth and income
 - Derived deprivation data
- Personal identification
 - Data blurring and obfuscation

The Tricky Issue of Census Geography

- Building block is the Output Area
- These are used to create Super Output Areas (SOA)
 - Two types – Lower layer SOA (LSOA) and Middle layer SOA (MSOA)
 - In Scotland – Data Zones (DZ) and Intermediate Geographies (IG)
 - In Northern Ireland – just LSOA
- None of the above relate to anything ‘real’.
- Regions, Counties, Local Authorities, Wards and Electoral Divisions
- No postcode geography
- <http://geoconvert.digitalresources.jisc.ac.uk/>

Accessing census aggregate data

- Infuse - <http://infuse.ukdataservice.ac.uk/>
 - Data from 2001 and 2011 censuses
- Casweb - <http://casweb.ukdataservice.ac.uk/>
 - Data from 1971, 1981, 1991 and 2001 censuses
 - Boundary data with 1991 & 2001 censuses
- DKAN - <https://www.statistics.digitalresources.jisc.ac.uk/>
 - Currently only 2011 but currently loading 2001 and plans for censuses back to 1971

Activity 1

InFuse - <http://infuse.ukdataservice.ac.uk/>

Worksheet -

<https://stats2.digitalresources.jisc.ac.uk/training/handout1.pdf>

10 minutes.

Deprivation data

- Derived from room occupancy, house ownership/tenancy, car availability, employment status etc...
- A number of recipes
 - Carstairs
 - Townsend
 - Index of Multiple Deprivation/Indices of Deprivation
 - <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019>

Matching Geographies

- GeoConvert - <http://geoconvert.digitalresources.jisc.ac.uk/>
 - Uses address points to calculate an area population
 - Clever proportioning
 - Caveats
 - Think about what you are attempting to do.
 - Postcodes change
- Supporting documentation - <http://geoconvert.digitalresources.jisc.ac.uk/help/documentation.html>

Activity 2

GeoConvert - <http://geoconvert.digitalresources.jisc.ac.uk/>

Postcode file -

<http://stats2.digitalresources.jisc.ac.uk/training/postcodes.csv>

Data file - <http://stats2.digitalresources.jisc.ac.uk/training/data.csv>

Census bulk data

- DKAN - <https://www.statistics.digitalresources.jisc.ac.uk/>
- Whole tables for geographical areas
- Easy to search
- Metadata
- Expanding all the time

Activity 3

DKAN - <https://www.statistics.digitalresources.jisc.ac.uk/>

- Find the “Age by Ethnic group by Long-term health problem or disability by Sex (England and Wales) 2011” table.
- What ‘Units’ are used?
- What is the definition of a “Long-term health problem or disability”?
- For England and Wales what is the total number of men in the Asian /Asian British category that considered themselves to have a Long-term health problem or disability?

What is the UK Data Service?

- A comprehensive resource funded by the Economic and Social Research Council (ESRC)
- A single point of access to a wide range of secondary social science data
- Support, training and guidance



Online resources

- Guides
- Videos
- Webinars
- Data Skills Modules

Methods and Software Guides

For example:

- **Software guides**
 - What is Stata?
 - Using R to analyse key UK surveys
- **Survey data**
 - What is weighting?
 - What is complex sample design?
 - What are hierarchical files?



Contents

1. Introduction.....	4
1.1. What is R?	4
1.2. The pros and the cons of R.....	5
2. Using R: essential information.....	7
2.1. Installing and loading user-written packages.....	9
2.2. Getting help	10
2.3. Interacting with R: command line vs graphical interface.....	12
2.4. Objects in R.....	13
2.5. Deleting object from the R environment using the rm() function.....	14
2.6. Saving in R.....	14
3. R Studio	17
4. Opening UK Data Service datasets in R	19
4.1. Which version of UK Data Service datasets can I use in R?	19
4.2. Variables types.....	21
5. Essentials of data manipulation.....	23
5.1. Identifying and selecting variables and observations.....	23
5.2. Creating and recoding variables.....	24
5.3. Renaming variables and categories	25
5.4. Missing values	26
6. Descriptive statistics using R - continuous variables	29
6.1. Distribution graphs	30
6.2. Significance testing of correlation	33
6.3. Tables of summary statistics.....	33
6.4. Bar charts and plots of summary statistics.....	35
6.5. Saving and importing a graph in a Word document.....	38
6.6. Weighted descriptive statistics.....	39
7. Categorical variables: contingency tables	41
7.1. One way frequency tables	41
7.2. Creating bar plots of one-way frequency tables.....	41
7.3. Two way or more contingency tables.....	42
7.4. Test of association between categorical variables	45
7.5. Univariate and bivariate graphs for categorical variables.....	46
8. Plotting simple maps in R	48
8.1. Acquiring and downloading the data	48

Videos

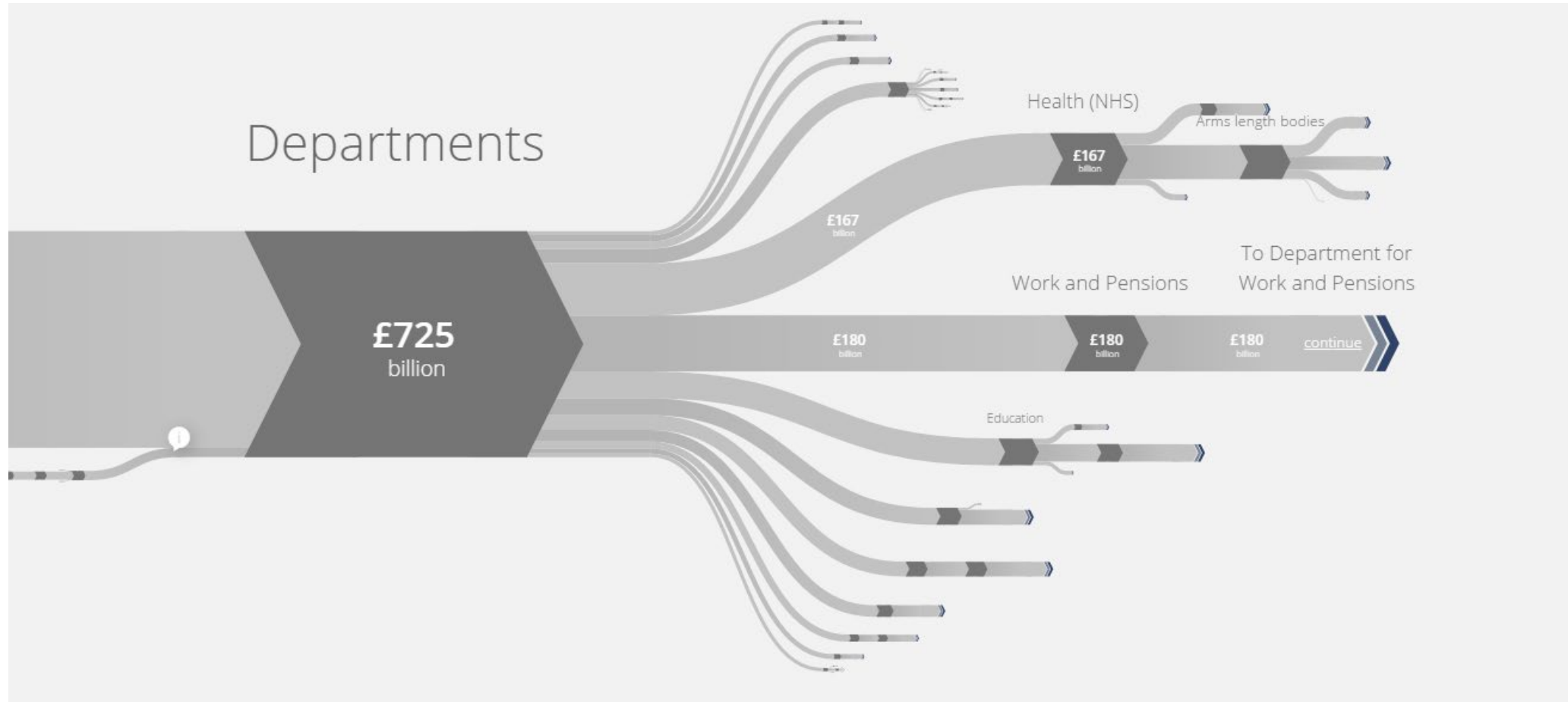
Go to the [UK Data Service YouTube channel](#) for video tutorials and recordings of events

Data Skills Modules

- Survey data
- Aggregate data
- Longitudinal data
- Exploring crime surveys with R

Find them in the [UK Data Service Learning Hub](#)

Census data: shaping policy



<https://uk.wikibudgets.org/w/united-kingdom-budget-2015>

Thank you

web: <https://ukdataservice.ac.uk/>

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

email: help@ukdataservice.ac.uk

Twitter: @UKDataService