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# Census Flow data

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7 December 2017

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# Presentation

- Introduction
  - About Flow data
- The 2011 Census data
  - Census questions
  - Data sets
  - Available data
- Practical exercises
  - Retrieving data using the flow-data website
  - Comments are given about how to carry out tasks in the browser and using Excel etc.



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# What are flow data?

- Flow data are also known as 'interaction data' or 'origin-destination data'
- The data consist of counts of flows between two locations
- Data are produced at different spatial scales
- In the case of census flow data, we can also identify moves *within* an area
  - These flows are not always captured by other data
- As well as 'normal' areas, flows may be associated with various aggregate and pseudo-spatial areas
  - 'Overseas', 'Works at home', 'Works off-shore' etc.
- There has been different handling of cases such as these over time



# Census questions

The various data sets all stem from questions on the Census form:

- **Migration tables**
  - Flows between an origin and a destination
    - based to question 21: What was your usual address one year ago?
- **Student tables**
  - A subset of migration data
    - a subset of migration tables for people who indicated that their address one year ago was a student / school address
- **Workplace tables**
  - Journey to work. Flows between a residence and a workplace
    - based on question 40: In your main job, what is the address of your workplace?
- **Second residence tables**
  - Several different sets of flows, e.g. second residence to work, first residence to second residence etc.
    - based on questions 5 and 6 for England and Wales only: Do you stay at another address for more than 30 days a year? What is that address?



# Progression of flow data sets

1981



Special Migration Statistics

Special Workplace Statistics

1991



SMS

SWS

2001



SMS

SWS

Special Travel Statistics

2011



SMS

Special Student Statistics

Special Residence Statistics

SWS



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# Access to data

- Data from 1981, 1991, 2001 are now considered to be publically available
- Data from 2011 is much more confusing
  - Multiple levels of access
  - Trade off between spatial detail and attribute detail
  - Different routes to using the data

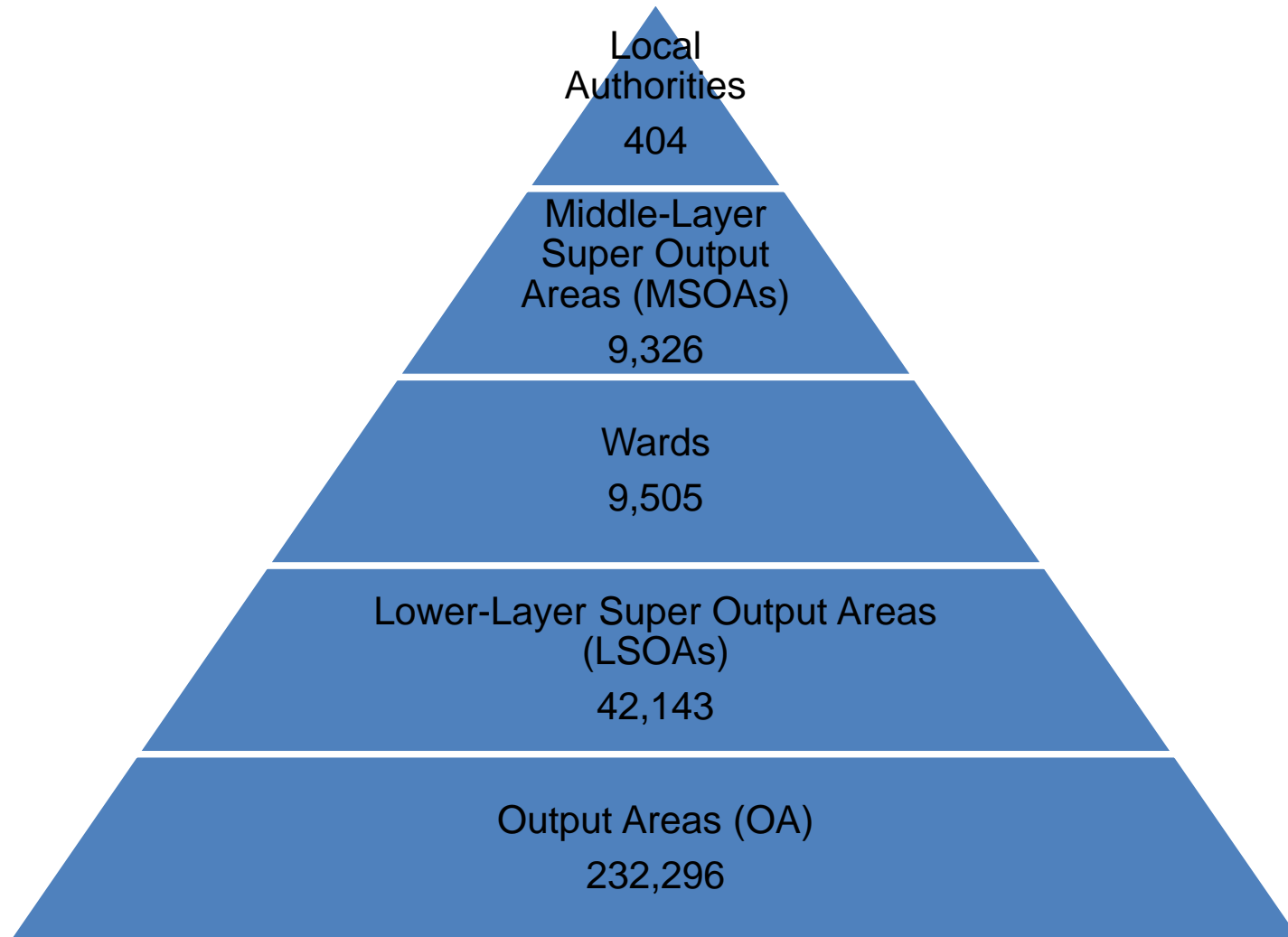


# Three levels of user access

- Different tables available at one of three levels:
  - **Public:** available via ONS, nomisweb and UK Data Service-CS to any users via Open Government Licence (OGL) without the need to register or login to any system
  - **Safeguarded:** available via UKDS to members of academia, local and central government, NHS, and UK parliaments and assemblies via End User Licence (EUL) so need to register and login
  - **Secure:** available to approved researchers via Approved Researcher Licence (ARL) via the ONS Virtual Microdata Laboratory - soon to be rebranded as Secure Research Service (SRS)



# 2011 Census Spatial scales (sample)





# Types of table counts

**Flow  
(headcount)**  
[MF02UK]

{Origin and destination}	Persons
Total	1

**Univariate**  
tables relate  
to one  
variable  
[MU02UK]

{Origin and destination}	Persons
All categories: Family status	1
Not in a family: aged 65 and over	2
Not in a family: aged under 65	3
In a couple family: member of couple	4
In a couple family: dependent child of one or both members of the couple	5
In a couple family: non-dependent child of one or both members of the couple	6
In a lone parent family: parent	7
In a lone parent family: dependent child of parent	8
In a lone parent family: non-dependent child of parent	9
Not in a household	10

**Multivariate**  
tables where  
one variable  
is cross-  
classified by  
at least one  
other  
variable  
[MM02UK]

{Origin and destination}	All categories: Sex	Male	Female
All categories: Family status	1	2	3
Not in a family: aged 65 and over	4	5	6
Not in a family: aged under 65	7	8	9
In a couple family: member of couple	10	11	12
In a couple family: dependent child of one or both members of the couple	13	14	15
In a couple family: non-dependent child of one or both members of the couple	16	17	18
In a lone parent family: parent	19	20	21
In a lone parent family: dependent child of parent	22	23	24
In a lone parent family: non-dependent child of parent	25	26	27
Not in a household	28	29	30

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# Flow (headcount) data sets: Security classification

Geography	SMS	SRS	SSS	SWS
LA to LA	Public	Public	Public	Public
Ward to Ward MSOA to MSOA	Safeguarded	Safeguarded	Safeguarded	Safeguarded
OA to OA OA to WPZ	Safeguarded	Safeguarded	Safeguarded	England & Wales: Public UK: Safeguarded



# Univariate data sets: Security classification

Geography	SMS	SRS	SSS	SWS
LA-LA	<b>Sex, Age:</b> <b>Public</b>  <b>Others:</b> <b>safeguarded</b>	<b>Sex, Age:</b> <b>Public</b>  <b>Others:</b> <b>safeguarded</b>	<b>Sex, Age:</b> <b>Public</b>  <b>Others:</b> <b>safeguarded</b>	<b>Sex, Age, Method of travel:</b> <b>Public</b>  <b>Others: safeguarded</b>
Ward - Ward MSOA-MSOA	<b>Sex, Age:</b> <b>Safeguarded</b>  <b>Others:</b> <b>Secure</b>	<b>Sex, Age:</b> <b>Safeguarded</b>  <b>Others:</b> <b>Secure</b>	<b>Sex, Age:</b> <b>Safeguarded</b>  <b>Others:</b> <b>Secure</b>	<b>Sex, Age, Method of travel:</b> <b>Public</b>  <b>Others: Safeguarded</b>
OA to OA	<b>All:</b> <b>Secure</b>	<b>All:</b> <b>Secure</b>	<b>All:</b> <b>Secure</b>	<b>All:</b> <b>Secure</b>
OA to WPZ				



# Multivariate data sets: Security classification

Geography	SMS	SRS	SSS	SWS
LA-LA	<b>Sex by Age:</b> <b>Public</b>  <b>Some vars:</b> <b>safeguarded</b>  <b>Other vars:</b> <b>Secure</b>	<b>Sex by Age:</b> <b>Public</b>  <b>Some vars:</b> <b>safeguarded</b>  <b>Other vars:</b> <b>Secure</b>	<b>Sex by Age:</b> <b>Public</b>  <b>Some vars:</b> <b>safeguarded</b>  <b>Other vars:</b> <b>Secure</b>	<b>Sex by Age:</b> <b>Public</b>  <b>Some vars:</b> <b>safeguarded</b>  <b>Other vars:</b> <b>Secure</b>
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OA to OA	<b>All:</b> <b>Secure</b>	<b>All:</b> <b>Secure</b>	<b>All:</b> <b>Secure</b>	<b>All:</b> <b>Secure</b>
OA to WPZ				



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# Accessing the data

- Walk through and practical task
- The data are available in a variety of forms
  - Download of complete tables
  - Download for use with SASPAC software (Small Area Statistics PACKage)
  - Download of subsets (selected tables)



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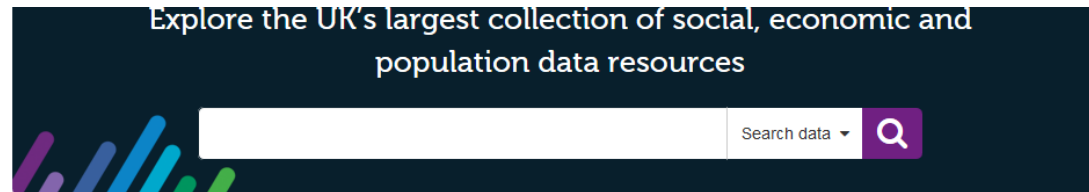
# Getting started

- Turn on the PC if it is not already started...
- Log in using account provided
  - details / screenshot to follow
- Start up a browser
- Screenshots of process



# UK Data Service website

- Go to: <https://ukdataservice.ac.uk/>
- Click 'Census data'



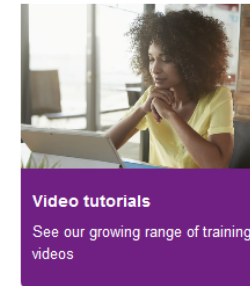
## About the UK Data Service



## Guides and resources

- Dataset guides
- Topic guides
- Methods and software guides
- Guides to exploring online

[See more >](#)



## Data types

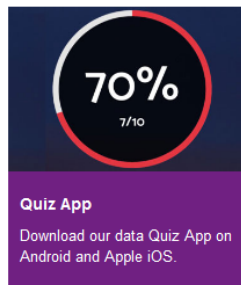
Census data

International macrodata

Longitudinal studies

Qualitative/mixed methods

UK surveys



## Our impact

Find out how data from the UK Data Service collection are used to inform research, influence policy and develop skills.

## Latest data

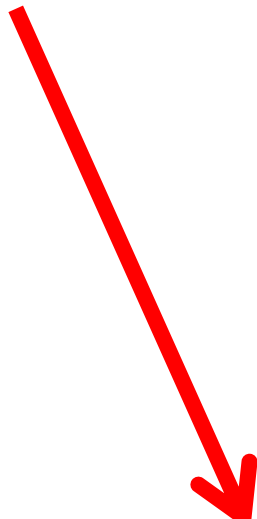
IMF Balance of Payments Statistics, 1967-2017

OECD National Accounts, 1955-2017

IMF World Economic Outlook, 1980-2022

OECD Main Economic Indicators Databank, 1960-2017

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Census Support



# Census Service website

- Select 'Flow data'

The UK Data Service makes use of browser cookies.  
By continuing to use this website you are agreeing to our use of cookies. [Tell me more](#)

UK Data Service home Site Search FAQ Help

UK Data Service  
Census Support

About Census Support Get census data Use census data Census news and events

## Census microdata

Data about individuals which have been anonymised  
[Read more](#)

STOP

LOGIN / REGISTER

DISCOVER UK DATA SERVICE

Search and browse the UK Data Service  
Census Support data collection:

GO

Census Data  Website

Want to search wider? [Search the whole of the UK Data Service](#)

LATEST TWEETS

RT @ukces: How does your local area compare for work experience opportunities? Maps based on our EPS data

LATEST NEWS

UK DATA SERVICE CENSUS SUPPORT

QUICK ACCESS TO

- UK Data Service
- Aggregate data
- Flow data**
- Microdata
- Boundary data

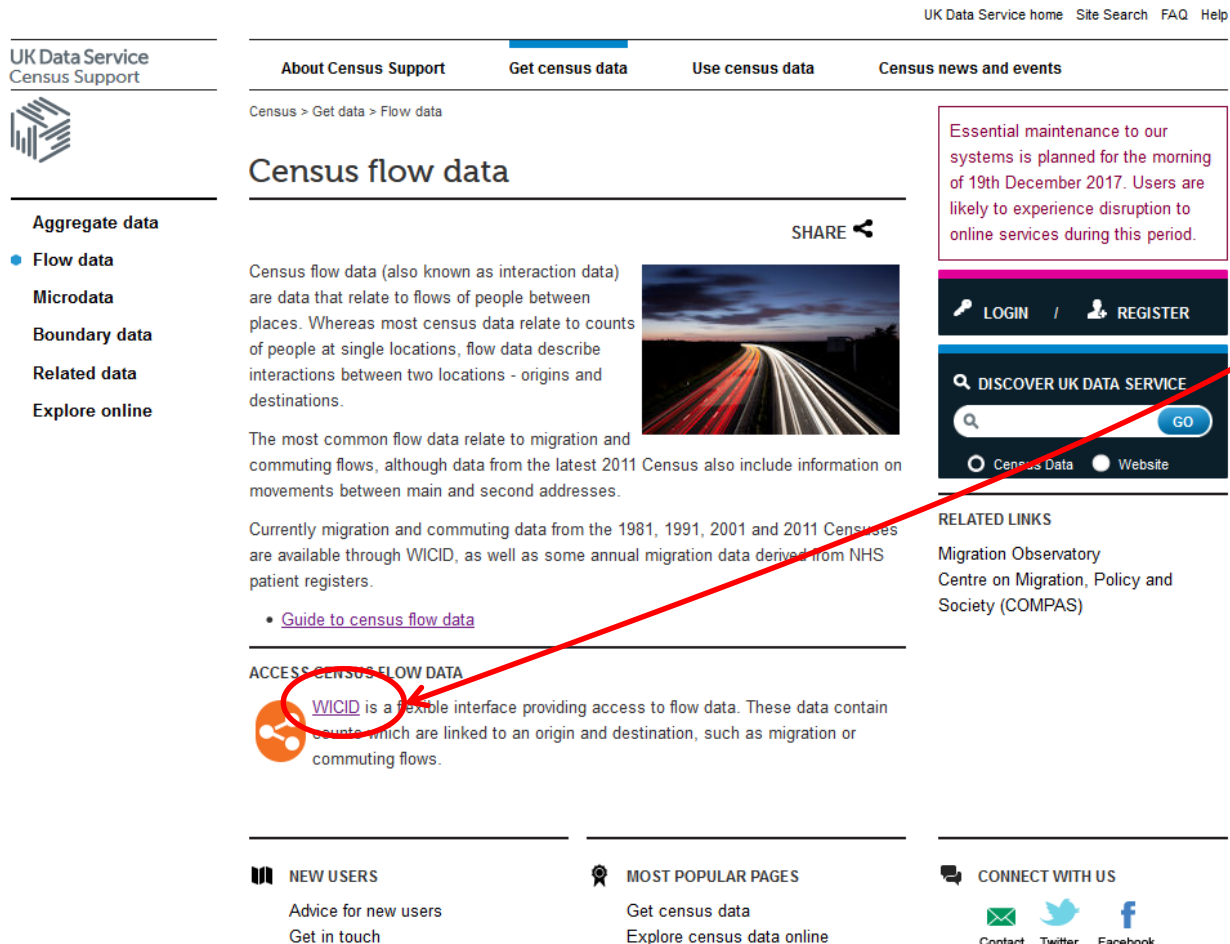
UK Data Service  
Census Support





# Flow data summary at Census Support

- 'Flow data' is the top level
  - 'WICID' is part of the Flow Data site



UK Data Service home Site Search FAQ Help

UK Data Service  
Census Support


About Census Support **Get census data** Use census data Census news and events

Census > Get data > Flow data

## Census flow data

SHARE

Census flow data (also known as interaction data) are data that relate to flows of people between places. Whereas most census data relate to counts of people at single locations, flow data describe interactions between two locations - origins and destinations.



The most common flow data relate to migration and commuting flows, although data from the latest 2011 Census also include information on movements between main and second addresses.

Currently migration and commuting data from the 1981, 1991, 2001 and 2011 Censuses are available through WICID, as well as some annual migration data derived from NHS patient registers.

- [Guide to census flow data](#)

### ACCESS CENSUS FLOW DATA

**WICID** is a flexible interface providing access to flow data. These data contain counts which are linked to an origin and destination, such as migration or commuting flows.

Essential maintenance to our systems is planned for the morning of 19th December 2017. Users are likely to experience disruption to online services during this period.

LOGIN / REGISTER

DISCOVER UK DATA SERVICE

GO

Census Data Website

### RELATED LINKS

Migration Observatory  
Centre on Migration, Policy and Society (COMPAS)

NEW USERS  
Advice for new users  
Get in touch

MOST POPULAR PAGES  
Get census data  
Explore census data online

CONNECT WITH US  
Contact Twitter Facebook



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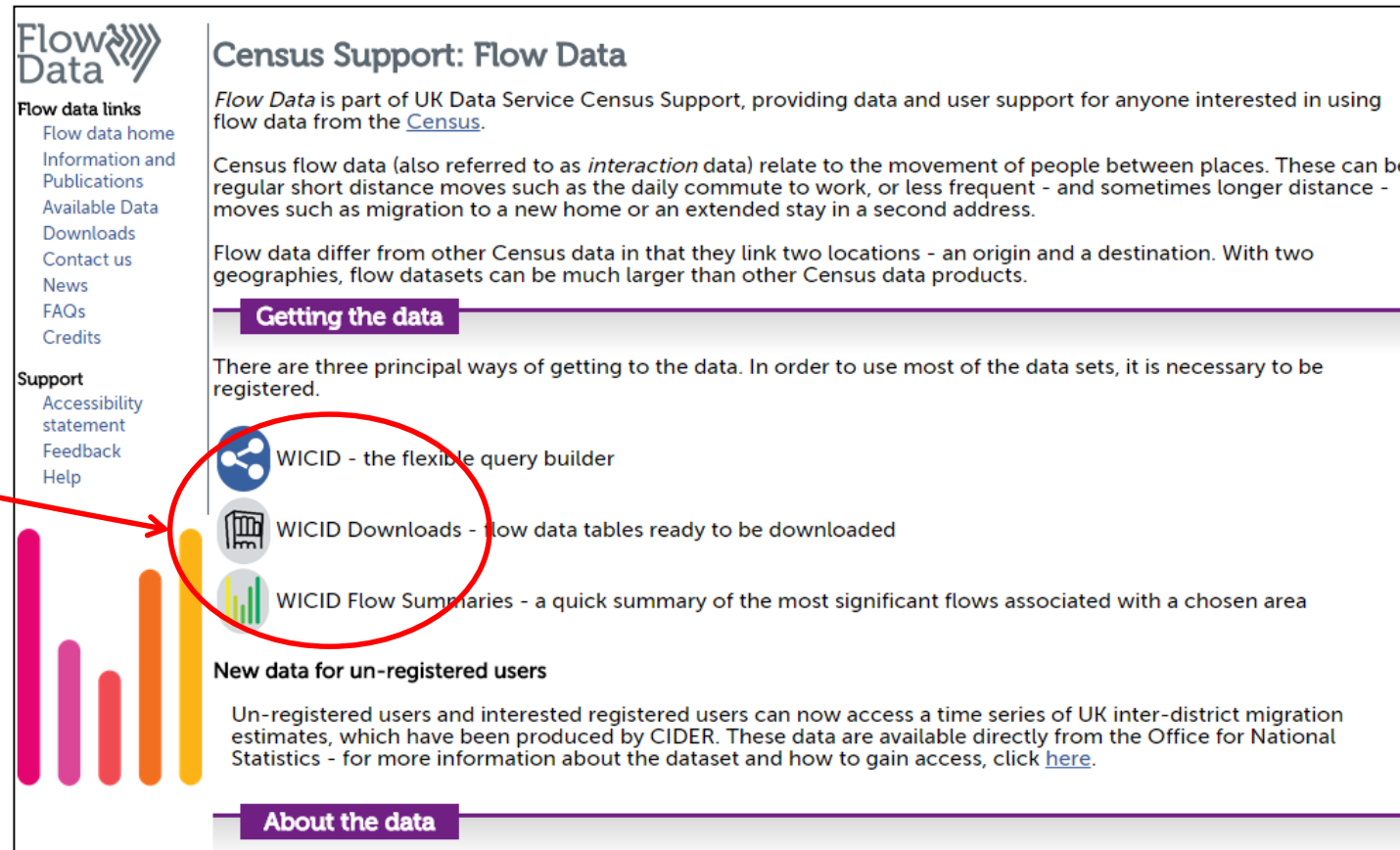
# Flow data website

- For the practical, follow the link to
  - [wicid.ukdataservice.ac.uk/](http://wicid.ukdataservice.ac.uk/)
- Technically, WICID is just one part of our site
  - It is the most commonly used part
  - We are sometimes collectively referred to as 'WICID'
- WICID is an acronym
  - Web Interface to Census Interaction Data



# Flow data homepage (i)

- Three main routes to data
  - Flexible queries
  - Downloads
  - Summaries



**Flow Data**

**Flow data links**

- Flow data home
- Information and Publications
- Available Data
- Downloads
- Contact us
- News
- FAQs
- Credits

**Support**

- Accessibility statement
- Feedback
- Help

## Census Support: Flow Data




Flow Data is part of UK Data Service Census Support, providing data and user support for anyone interested in using flow data from the [Census](#).

Census flow data (also referred to as *interaction* data) relate to the movement of people between places. These can be regular short distance moves such as the daily commute to work, or less frequent - and sometimes longer distance - moves such as migration to a new home or an extended stay in a second address.

Flow data differ from other Census data in that they link two locations - an origin and a destination. With two geographies, flow datasets can be much larger than other Census data products.

### Getting the data

There are three principal ways of getting to the data. In order to use most of the data sets, it is necessary to be registered.

-  WICID - the flexible query builder
-  WICID Downloads - flow data tables ready to be downloaded
-  WICID Flow Summaries - a quick summary of the most significant flows associated with a chosen area

### New data for un-registered users

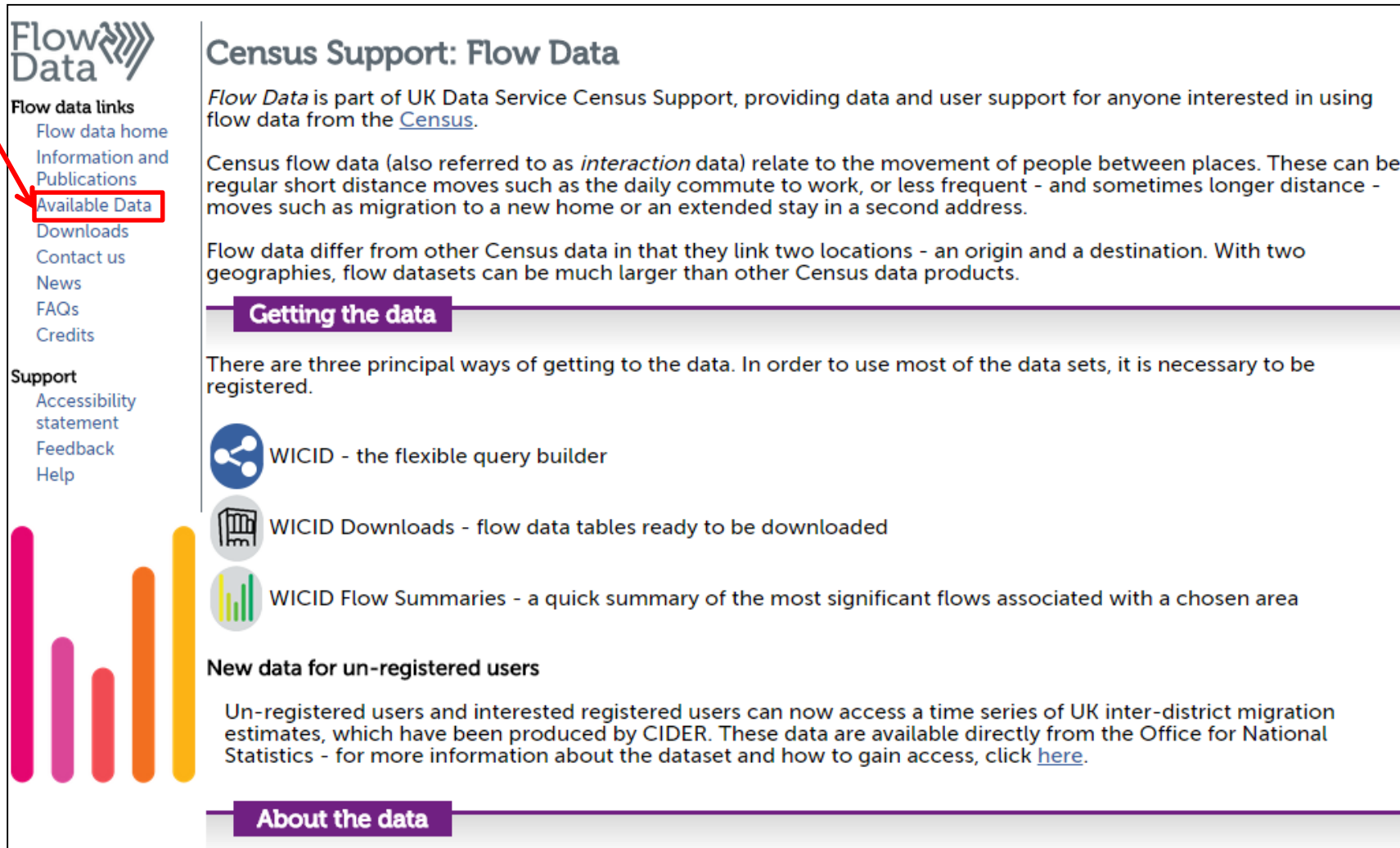
Un-registered users and interested registered users can now access a time series of UK inter-district migration estimates, which have been produced by CIDER. These data are available directly from the Office for National Statistics - for more information about the dataset and how to gain access, click [here](#).

### About the data



# Flow data homepage (ii)

- 'Available data' allows users to browse catalogue of data



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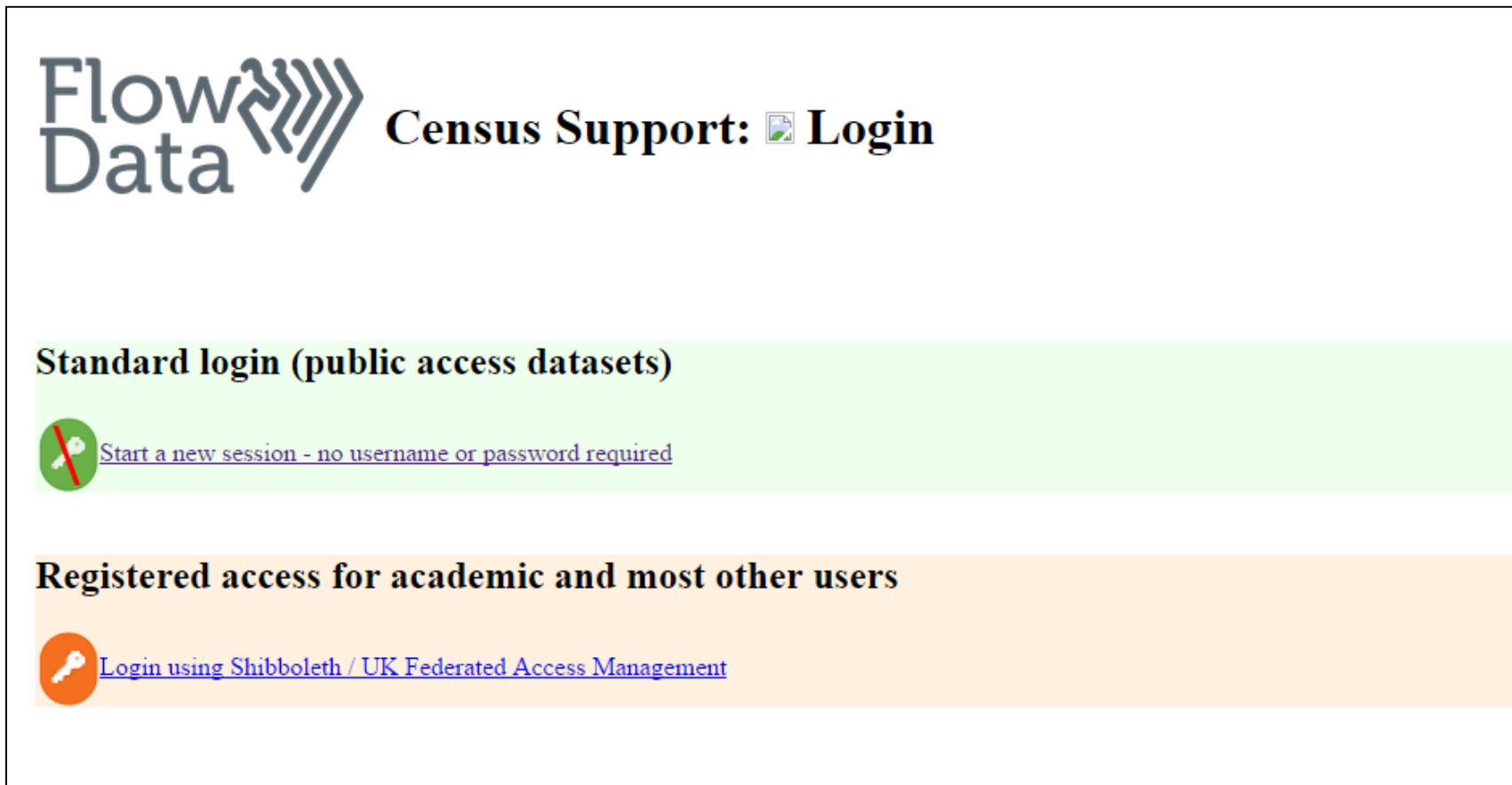
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**About the data**




# Login screen


- For use with OGL/Public data, we can use 'Standard Login'
  - Registered access offers open data AND safeguarded data




The screenshot shows the 'Flow Data' logo on the left, followed by the text 'Census Support: Login'. Below this, there are two main sections: 'Standard login (public access datasets)' and 'Registered access for academic and most other users'. The first section has a green background and contains a key icon with a red slash and the text 'Start a new session - no username or password required'. The second section has an orange background and contains a key icon and the text 'Login using Shibboleth / UK Federated Access Management'.

**Flow Data** Census Support:  **Login**

**Standard login (public access datasets)**

 [Start a new session - no username or password required](#)

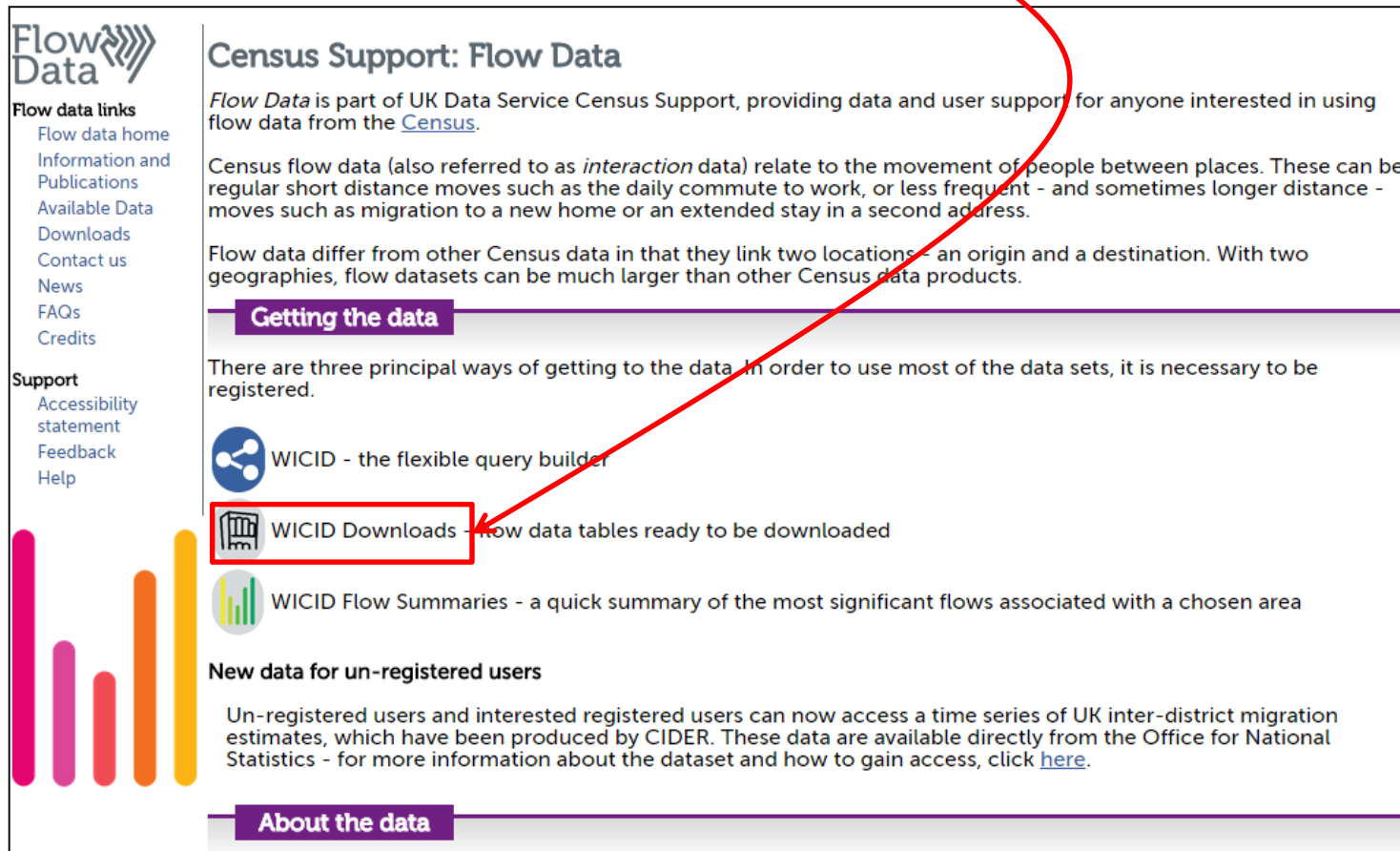
**Registered access for academic and most other users**

 [Login using Shibboleth / UK Federated Access Management](#)



# Data downloads

- We will now look briefly at the second access route: downloads
  - The latest data are first made available as a Download
  - **Select 'WICID Downloads' icon**



**Flow Data**

**Flow data links**

- Flow data home
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### About the data



# Data downloads

- One or more panels are shown, depending on your account status
- Here, only public data are shown

UK Data Service  
Census Support

[Home] > FlowData downloads page

Logged in as: guest [ Logout now ]

## FlowData downloads page

In this page you can find various files to download. Click on the category titles to expand the available files.

[2011 Census United Kingdom - Open](#)

**Flow data links**  
Flow data home  
Information and Publications  
Available Data  
Downloads  
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**Support**  
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Help

Census Support Flow Data (formerly The Centre for Interaction Data Estimation and Research), now based at UCL forms part of the UK Data Service Census Support Service, and provides access to Census Interaction Data through services running at the University of Essex



UK Data Service  
Census Support



# Data downloads

- Download links are provided for each table

Table ID

Download link

Table name	Table title	Table population	Geographic coverage	Geographic breakdown	Download
<a href="#">MF02EW</a>	Origin and destination of international migrants (expanded country origin)	All usual residents who were living outside the UK one year ago	England and Wales	2011 Census Merged local authority districts	<a href="#">Download</a>
<a href="#">MF02NI</a>	Origin and destination of international migrants (expanded country origin)	All usual residents who were living outside the UK one year ago	Northern Ireland	Local government district	<a href="#">Download</a>
<a href="#">MF02UK</a>	Origin and destination of international migrants (expanded country origin)	All usual residents who were living outside the UK one year ago	United Kingdom	2011 Census Merged local authority districts	<a href="#">Download</a>
<a href="#">MM01CEW_all</a>	Origin and destination of migrants by age (broad grouped) by sex	All usual residents who were living at a different address one year ago	England and Wales	2011 Census Merged local authority districts	<a href="#">Download</a>
<a href="#">MM01CEW_non_uk</a>	Origin and destination of international migrants by age (broad grouped) by sex	All usual residents who were living outside the UK one year ago	England and Wales	2011 Census Merged local authority districts	<a href="#">Download</a>
<a href="#">MM01CNI_all</a>	Origin and destination of migrants by age (broad grouped) by sex	All usual residents who were living at a different address one year ago	Northern Ireland	Local government district	<a href="#">Download</a>





# Sets v Tables

- In the case of 1981, 1991 and 2001, the flow data were grouped into sets (e.g. '1991 SMS Set 1'; '2001 SWS Level 2'; etc.)
  - Each set consisted of several tables
  - Generally all tables in each set were defined by the same combination of geographies
    - An origin geography (e.g. wards, districts, etc.)
    - A destination geography
    - In some cases, a few additional non-spatial categories
- In the 2011 data, there are not explicit sets in the same way
  - Each family (SMS, SWS etc.) consist of many tables, and crucially these do *not* have common geography definitions



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# Table IDs

- The tables cannot be grouped into sets as easily as before
- The Table IDs describe aspects of the data
  - [M/W/S/R] – first letter: migration, workplace, student or (second) residence
  - [F/U/M] – second letter: flow (headcount), univariate or multivariate
  - nn(m) – table number, sometimes with suffix A/B/C further splitting the table up
  - [UK/EW/NI/etc] – suffix indicating whether table relates to flows in whole of UK, or England and Wales, Northern Ireland etc.



# Data downloads: example

## MM01CEW\_all

M – migration  
M – multivariate  
01C – table number 01, part C  
EW – for England and Wales  
\_all – main body of flows within UK

## MF02UK

M – migration  
F – flow (head count)  
02 – table number 02  
UK – for United Kingdom

Table name	Table title	Table population	Geographic coverage	Geographic breakdown	Download
MF02EW	Origin and destination of international migrants (expanded country origin)	All usual residents who were living outside the UK one year ago	England and Wales	2011 Census Merged local authority districts	<a href="#">Download</a>
MF02NI	Origin and destination of international migrants (expanded country origin)	All usual residents who were living outside the UK one year ago	Northern Ireland	Local government district	<a href="#">Download</a>
MF02UK	Origin and destination of international migrants (expanded country origin)	All usual residents who were living outside the UK one year ago	United Kingdom	2011 Census Merged local authority districts	<a href="#">Download</a>
MM01CEW_all	Origin and destination of migrants by age (broad grouped) by sex	All usual residents who were living at a different address one year ago	England and Wales	2011 Census Merged local authority districts	<a href="#">Download</a>
MM01CEW_non_uk	Origin and destination of international migrants by age (broad grouped) by sex	All usual residents who were living outside the UK one year ago	England and Wales	2011 Census Merged local authority districts	<a href="#">Download</a>
MM01CNI_all	Origin and destination of migrants by age (broad grouped) by sex	All usual residents who were living at a different address one year ago	Northern Ireland	Local government district	<a href="#">Download</a>



# Data information

UK Data Service  
Census Support

[Home] > FlowData downloads page

Logged in as: guest [Logout now]

## FlowData downloads page

In this page you can find various files

**2011 Census United Kingdom - Open**

Public tables from 2011 Census

Table name	Table title	Table population	Coverage	Geography	Download
MF02EW	Origin and destination of international migrants (expanded country origin)				<a href="#">Download</a>
MF02NI	Origin and destination of international migrants (expanded country origin)	All usual residents who were living outside the UK one year ago		Northern Ireland	<a href="#">Download</a>
MF02UK	Origin and destination of international migrants (expanded country origin)	All usual residents who were living outside the UK one year ago	United Kingdom	2011 Census Merged local authority districts	<a href="#">Download</a>
MM01CEW_all	Origin and destination of migrants by age (broad grouped) by sex	All usual residents who were living at a different address one year ago		England and Wales	<a href="#">Download</a>
MM01CEW_non_uk	Origin and destination of international migrants by age (broad grouped) by sex	All usual residents who were living outside the UK one year ago		England and Wales	<a href="#">Download</a>

### MF02UK

Table information

Table number	Table title	Table population	Coverage	Geography
MF02UK	Origin and destination of international migrants (expanded country origin)	All usual residents who were living outside the UK one year ago	United Kingdom	2011 Census Merged local authority districts

CSV columns count: 3

- 1 Area of usual residence
- 2 Country of address one year ago
- 3 Persons

Close

Release date: 25-07-2014 09:30:00  
Publisher: ONS  
Release: OD.1

geographic breakdown

2011 Census Merged local authority districts



# Exercises

- Save the download data
  - Behaviour will depend on browser used (e.g. Firefox, Chrome below)
  - Find download folder

## FlowData downloads page

In this page you can find various files to download. Click on the category titles to expand the available files.

2011 Census United Kingdom - Open

Public tables from 2011 Census

Table name	Table title		Geographic coverage	Geographic breakdown	Download	
MF02EW	Origin and destination of international migrants country origin		the UK one	England and Wales	2011 Census Merged local authority districts	📄
MF02NI	Origin and destination of international migrants country origin		the UK one	Northern Ireland	Local government district	📄
MF02UK	Origin and destination of international migrants (expanded country origin)	All usual residents who were living outside the UK one year ago	United Kingdom		2011 Census Merged local authority districts	📄
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Release date: 25-07-2014 09:30:00  
Publisher: ONS  
Release: OD.1

Opening mf02uk\_v4.zip

You have chosen to open:

**mf02uk\_v4.zip**  
which is: Compressed (zipped) Folder (110 kB)  
from: https://wicid.ukdataservice.ac.uk

What should Firefox do with this file?

Open with Windows Explorer (default)

Save File

Do this automatically for files like this from now on.

OK Cancel



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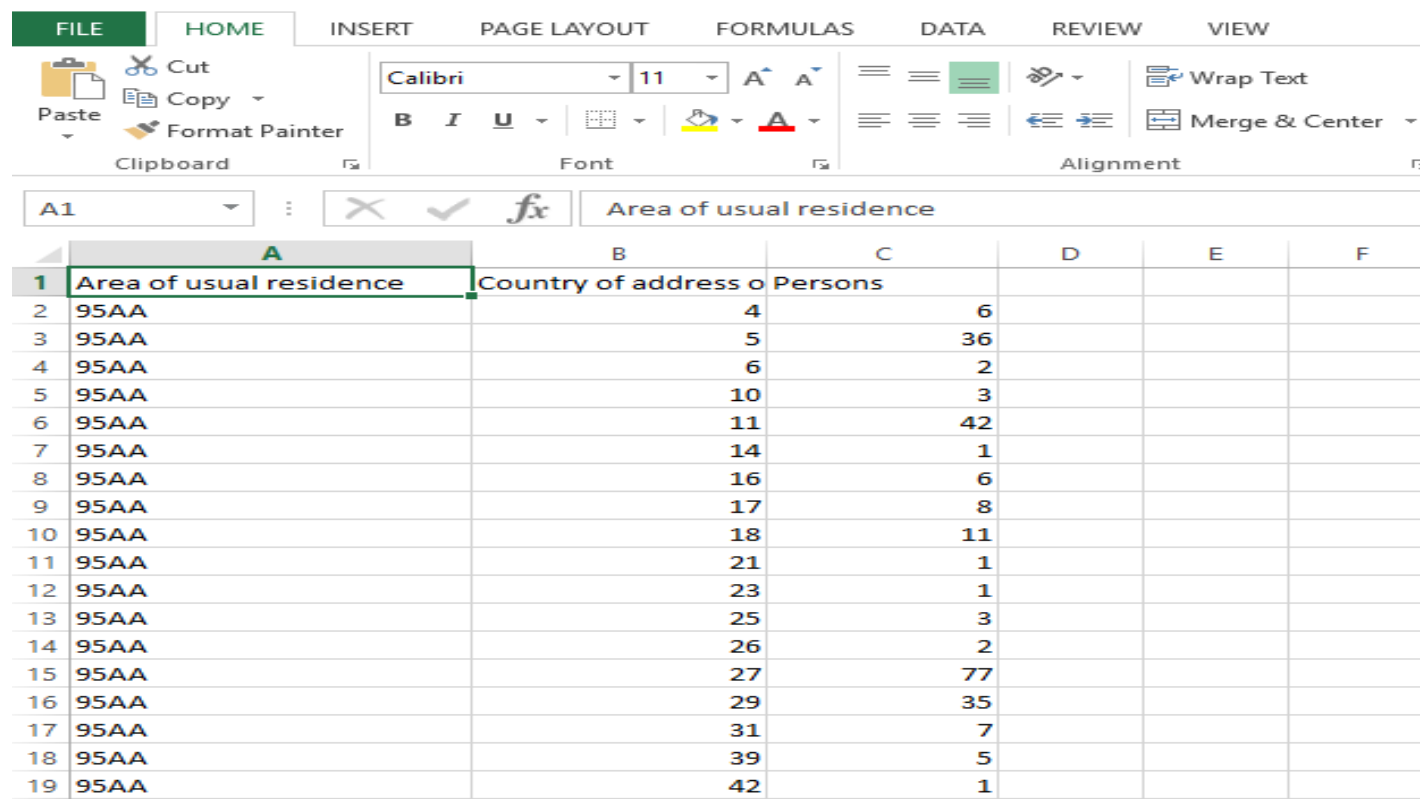
# Exercises

- Open / unzip the download file
  - Contains .txt file with additional information about the table
  - Contains .csv data file
- Open the data file
- The data files often require some explanation...
- The first two columns show area codes not names
  - For migration tables ONS uses a reverse order. First column is destination (in this case location of usual residence) and second is origin (country of address one year ago).



# A sample table...

- MF02UK
  - Col A 'Area of usual residence' i.e. at time of Census = destination
  - Col B 'Country of address 1 year ago' = origin
  - Normally with migration data we'd show origin first
  - Col C shows the number of people who have migrated



The screenshot shows the Microsoft Excel interface with the 'HOME' tab selected. The ribbon includes options for Clipboard, Font, and Alignment. The active cell is A1, containing the text 'Area of usual residence'. Below the ribbon, a table is displayed with the following data:

	A	B	C	D	E	F
1	Area of usual residence	Country of address 1 year ago	Persons			
2	95AA	4	6			
3	95AA	5	36			
4	95AA	6	2			
5	95AA	10	3			
6	95AA	11	42			
7	95AA	14	1			
8	95AA	16	6			
9	95AA	17	8			
10	95AA	18	11			
11	95AA	21	1			
12	95AA	23	1			
13	95AA	25	3			
14	95AA	26	2			
15	95AA	27	77			
16	95AA	29	35			
17	95AA	31	7			
18	95AA	39	5			
19	95AA	42	1			



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# Exercises

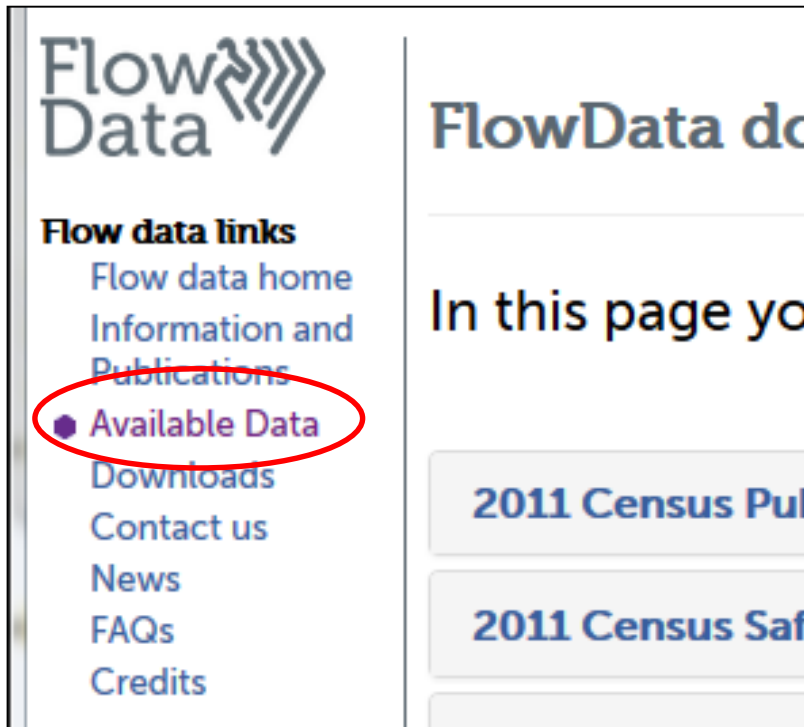
- The download files are as created by ONS, and we provide them unaltered. All of them are in pair-wise format.
- However, we also provide additional information that can help you work out which place is which
- You will immediately notice that the identity of that area is a mystery, unless you happen to know which ID code represents which area...





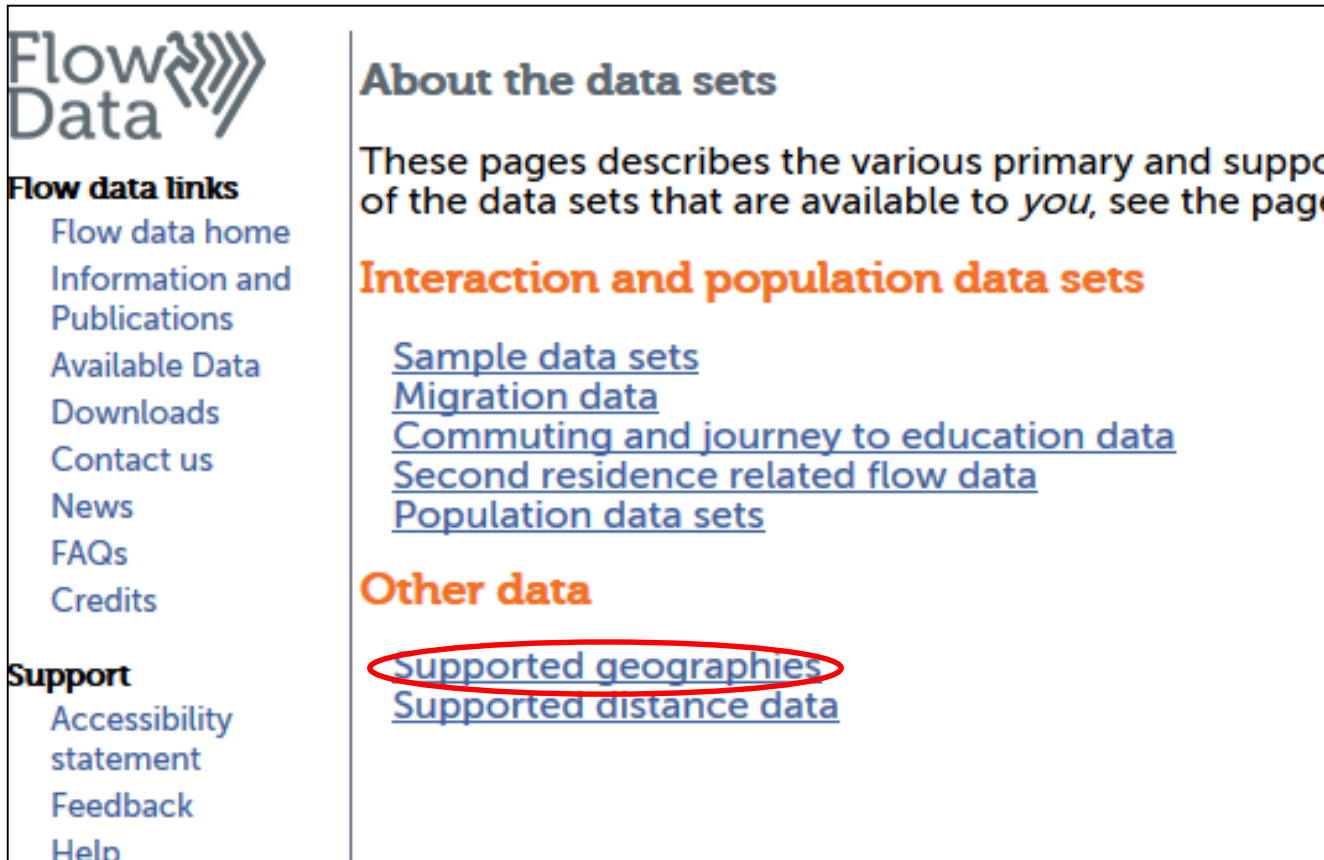
# Matching up area codes and names

- Return to your web browser
- In the left hand menu, select 'Available data'



# Available data

- Select the option 'Supported geographies'
  - This lists all geographies known to the system, and gives (auto-generated) information about them



The screenshot shows the 'Flow Data' website interface. On the left is a navigation menu with sections for 'Flow data links' and 'Support'. The main content area is titled 'About the data sets' and contains several sub-sections: 'Interaction and population data sets' with links for 'Sample data sets', 'Migration data', 'Commuting and journey to education data', and 'Second residence related flow data'; 'Population data sets'; and 'Other data' with links for 'Supported geographies' (circled in red) and 'Supported distance data'.

**Flow Data**

**Flow data links**

- Flow data home
- Information and Publications
- Available Data
- Downloads
- Contact us
- News
- FAQs
- Credits

**Support**

- Accessibility statement
- Feedback
- Help

**About the data sets**

These pages describes the various primary and support of the data sets that are available to *you*, see the page

**Interaction and population data sets**

- [Sample data sets](#)
- [Migration data](#)
- [Commuting and journey to education data](#)
- [Second residence related flow data](#)

**Population data sets**

**Other data**

- [Supported geographies](#)
- [Supported distance data](#)



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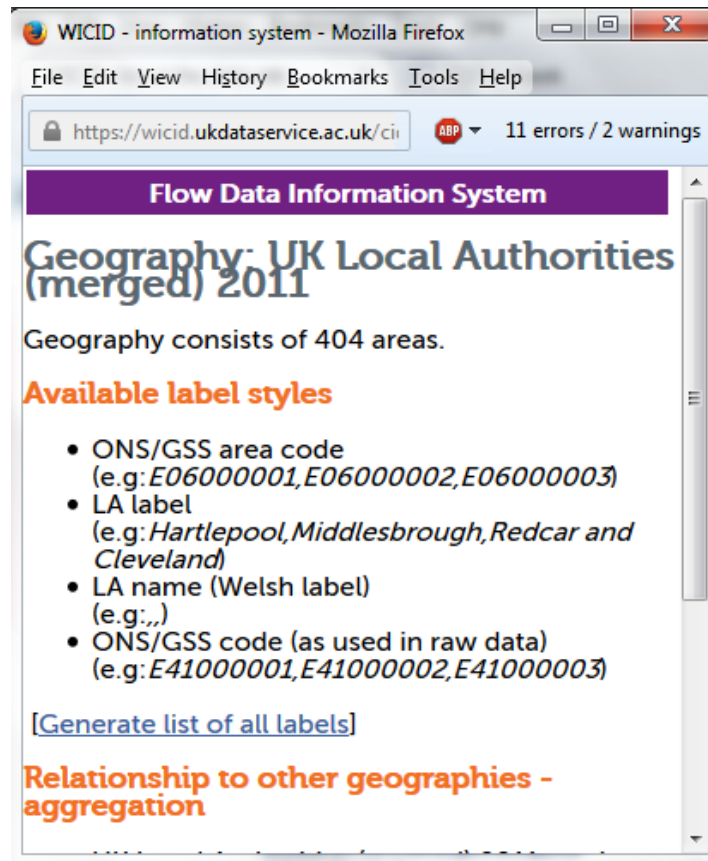
# Supported geographies

- All known geographies are listed
- They are grouped in to
  - 'Origin or destination' – covers most geographies
  - 'Origin only'
  - 'Destination only'
- Look through the list for 'UK Local Authorities (merged) 2011' (near the end of the main section)
  - The names for all geographies are the names used within WICID, these should match up reasonably well with terms used elsewhere, but sometimes the wording is slightly different
- Click on the link...



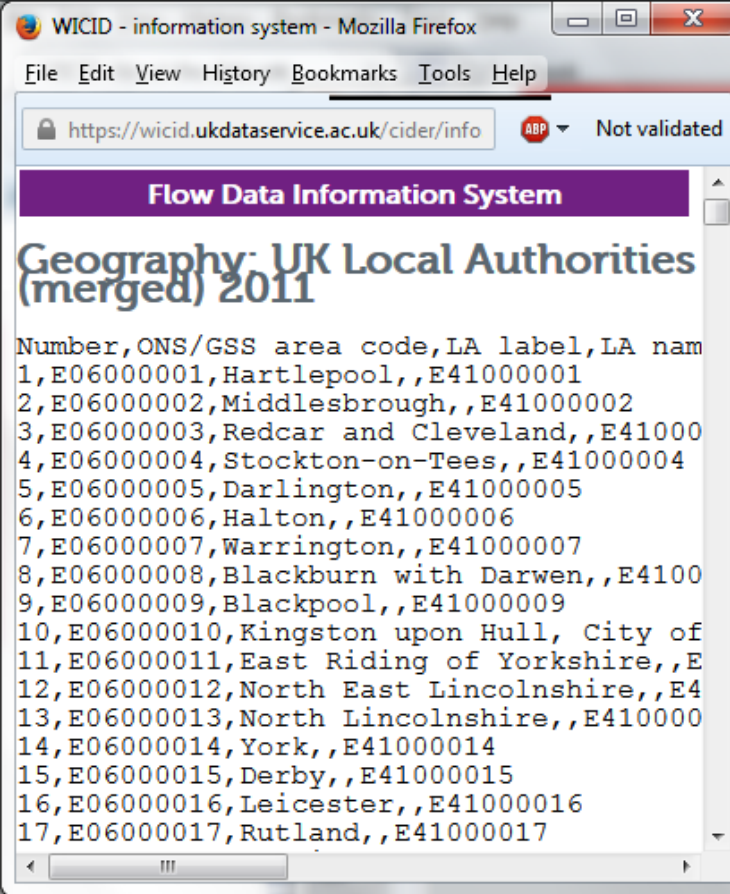
# Supported geographies

- A pop-up window shows the known information about that geography
- Click on the link 'Generate list of all labels'



# List of all labels in a geography

- A list is created of all areas in that geography, together with primary and additional labels
  - In WICID, we have made the 'regular' code the primary label, and the merged district code an additional label'
- The list can be explored via browser search functions
- Or, select all the text and paste into a new excel window etc
- Less user-friendly than ideal...
- ...but probably more useful than the raw 'E41' codes



```
Number,ONS/GSS area code,LA label,LA nam
1,E06000001,Hartlepool,,E41000001
2,E06000002,Middlesbrough,,E41000002
3,E06000003,Redcar and Cleveland,,E41000
4,E06000004,Stockton-on-Tees,,E41000004
5,E06000005,Darlington,,E41000005
6,E06000006,Halton,,E41000006
7,E06000007,Warrington,,E41000007
8,E06000008,Blackburn with Darwen,,E4100
9,E06000009,Blackpool,,E41000009
10,E06000010,Kingston upon Hull, City of
11,E06000011,East Riding of Yorkshire,,E
12,E06000012,North East Lincolnshire,,E4
13,E06000013,North Lincolnshire,,E410000
14,E06000014,York,,E41000014
15,E06000015,Derby,,E41000015
16,E06000016,Leicester,,E41000016
17,E06000017,Rutland,,E41000017
```



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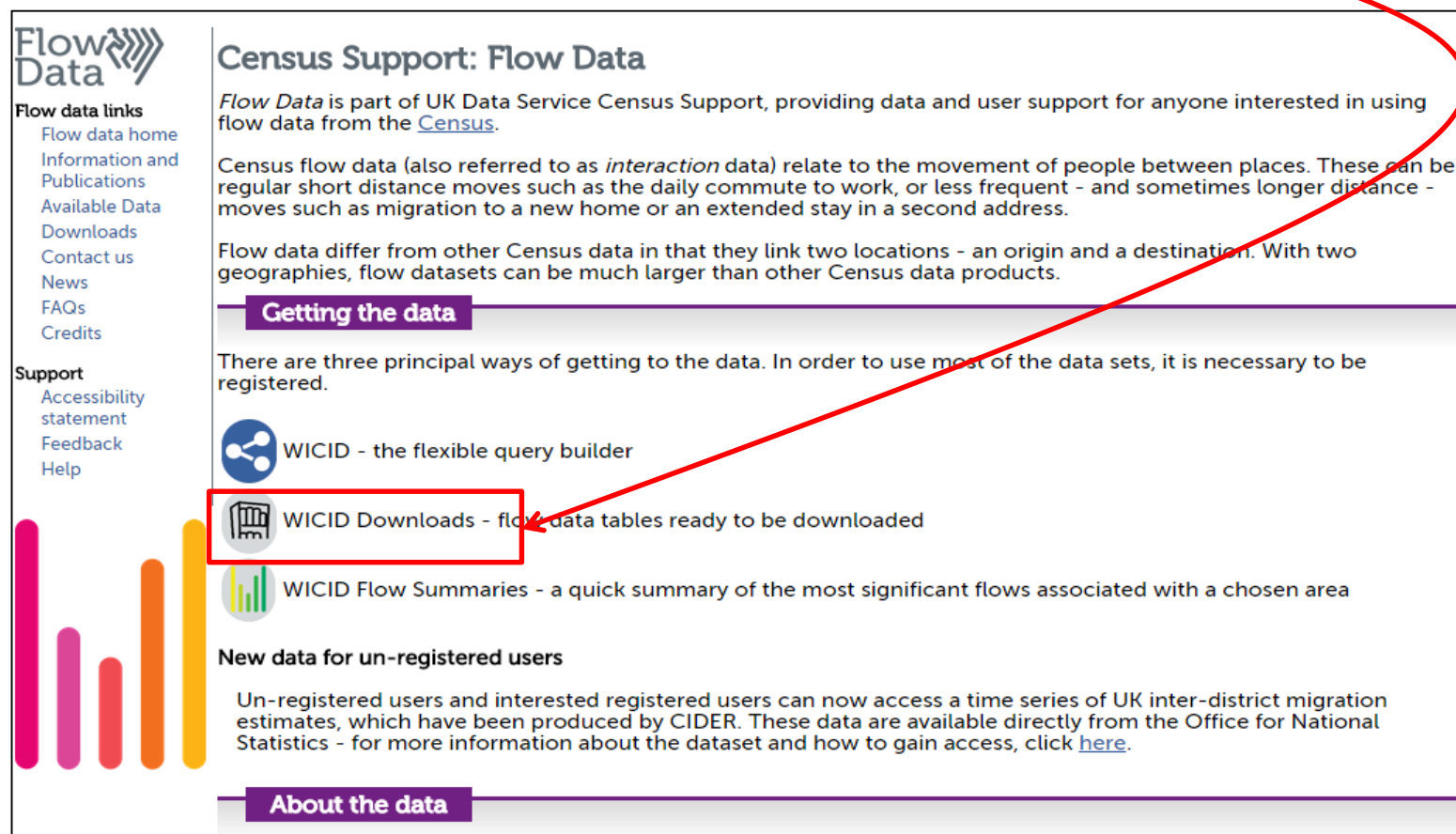
# Downloads recap

- The downloads section offers files as originally circulated by ONS
  - Some of the zip files incorporate some additional detail (e.g. explanation of country codes for non-UK files such as MF02UK)
  - Only area codes not place names are used
    - These area codes are not necessarily the preferred ones
- They are useful if you want to use all of the data for analysis
- Quite a bit of background knowledge is sometimes needed
- The query builder is more useful for many purposes...



# WICID Query builder

- The WICID general query builder allows users to identify and extract a subset of flows in which they are interested
  - It also provides built-in support for area code labelling
  - **Select 'WICID flexible query builder' icon**



**Flow Data**

**Flow data links**

- Flow data home
- Information and Publications
- Available Data
- Downloads
- Contact us
- News
- FAQs
- Credits

**Support**

- Accessibility statement
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- Help

## Census Support: Flow Data




Flow Data is part of UK Data Service Census Support, providing data and user support for anyone interested in using flow data from the [Census](#).

Census flow data (also referred to as *interaction* data) relate to the movement of people between places. These can be regular short distance moves such as the daily commute to work, or less frequent - and sometimes longer distance - moves such as migration to a new home or an extended stay in a second address.

Flow data differ from other Census data in that they link two locations - an origin and a destination. With two geographies, flow datasets can be much larger than other Census data products.

### Getting the data

There are three principal ways of getting to the data. In order to use most of the data sets, it is necessary to be registered.

-  WICID - the flexible query builder
-  WICID Downloads - flow data tables ready to be downloaded
-  WICID Flow Summaries - a quick summary of the most significant flows associated with a chosen area

### New data for un-registered users

Un-registered users and interested registered users can now access a time series of UK inter-district migration estimates, which have been produced by CIDER. These data are available directly from the Office for National Statistics - for more information about the dataset and how to gain access, click [here](#).

### About the data



# WICID query home page

General query interface

UK Data Service  
Census Support

[Home] > General query builder

Logged in as: guest [Logout now]

Flow Data

Flow data links

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Support

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WICID Data Geography Finalise Run Output

## General query interface

WICID is the **Web-based Interface to Census Interaction Data**. It allows you to flexibly construct queries to extract data, then analyse it and produce output tables.

The tabs above will guide you through the query process - when you have a set of green lights, your query is complete.

Return to this page to see the progress of your query by clicking on the WICID tab

### Summary of current query

Geography	
Origins	0 Nothing selected yet
Destinations	0 Nothing selected yet

Interaction data	
Data items	0 Nothing selected yet

Options

UK Data Service  
Census Support





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# WICID query home page

- The query builder steps you through the selection of data and of areas of interest
- A traffic light metaphor is used in the icons to show how far you have progressed through the query
- We start with data selection; there are several ways of selecting data
- Click on the 'Data' tab...



# WICID data selection

- There are three main forms of data selection
  - Using Nomis table-finder
  - Quick selection – provides access to various totals
  - Selection by dataset and table – browse through all tables
  - Selection by variable – find tables featuring a preferred variable
  - We will start with the 'Quick selection' mode...

The screenshot shows the WICID data selection interface. At the top, there is a navigation bar with tabs for 'WICID', 'Data', 'Geography', 'Finalise', 'Run', and 'Output'. The 'Data' tab is currently selected. Below the navigation bar, the 'Data' section is active, showing a status message: 'Status: 0 data items currently selected' with links for '[Unselect all]' and '[Show list]'. The interface is divided into several sections:

- General selection tools**
  - Table - Finder:** The easiest way to locate a 2011 Census flow-data table. Search using free text, multiple parameters and criteria. It will redirect to an external website (NOMIS) which will lead back to WICID if you select a data set available through UKDS. - **\*new\***
  - Quick Selection:** Some data sets include predefined totals - total migrants for example - that can be easily selected using this method.
  - Select by Dataset and Table:** This method allows you to select cells within tables as described in published documentaion.
  - Select by Variable:** This method allows you to select from a list of variables; you will then be presented with a list of all tables in which your chosen variables appear
- Other data**
  - Population Data** Select population counts - **\*if you wish to calculate migration or commuting rates you will need a population denominator. Only select population data AFTER you have selected your flow data. Consult the WICID help system for a full guide to downloading populations with your flows.\***
- Data manipulation tools**
  - Edit list** Edit a list of selected variables. This option will become active when you select some data to tabulate.
  - Derive** Derive new variables by combining variables that you have already selected This option will become active when you select some data to tabulate.



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# WICID: Quick data selection

- The quick selection method lists a number of totals
- For some data sets, there is more than one total offered
  - As shown in the previous slide, data sets for which you do not currently have permission are shown grayed out
- Select the total '2011 SMS Merged LA/LA [Origin and destination of international migrants (expanded country origin)] - MF02UK - Open'
  - This is the same Local Authority level SMS (international migration) data for the UK, and is an 'Open' or public data set
- You will then be shown a confirmation page; click on the 'Select geography origins' icon...



# WICID: Quick data selection

WICID

Data

Geography

Finalise

Run

Output

Data

Status: 0 data items currently selected  
[Unselect all][Show list]

## Quick data selection

Sample data sets		
Data period	Data set	Total
1991	<i>i</i> Sample data	<a href="#">Total migrants</a>
Migration data		
Data period	Data set	Total
Census 2010-11	<i>i</i> 2011 SMS Merged LA [Origin and destination of migrants by ethnic group (detailed)] - MU01AEW_all - Safeguarded	All usual residents who were living at a different address one year ago
	<i>i</i> 2011 SMS Merged LA [Origin and destination of migrants by ethnic group (grouped)] - MU01BEW_all - Safeguarded	All usual residents who were living at a different address one year ago
	<i>i</i> 2011 SMS Merged LA [Origin and destination of migrants by passport held (detailed)] - MU06AEW_all - Safeguarded	All usual residents who were living at a different address one year ago
	<i>i</i> 2011 SMS Merged LA [Origin and destination of migrants by passport held (grouped)] - MU06BEW_all - Safeguarded	All usual residents who were living at a different address one year ago
	<i>i</i> 2011 SMS Merged LA [Origin and destination of migrants by passport held by sex] - MM06EW_all - Safeguarded	All usual residents who were living at a different address one year ago
	<i>i</i> 2011 SMS Merged LA [Origin and destination of migrants by religion] - MU05EW_all - Safeguarded	All usual residents who were living at a different address one year ago
	<i>i</i> 2011 SMS Merged LA [Origin and destination of migrants by Welsh language skills] - MU03W_all - Safeguarded	All usual residents in Wales aged 3 and over who were living at a different address one year ago
	<i>i</i> 2011 SMS Merged LA [Origin and destination of migrants by whether in a wholly moving household] - MU02EW_all - Safeguarded	All usual household residents who were living at a different address one year ago
	<i>i</i> 2011 SMS Merged LA/LA [Origin and destination of international migrants (expanded country origin)] - MF02UK - Open	<a href="#">All usual residents who were living outside the UK one year ago</a>
	<i>i</i> 2011 SMS Merged LA/LA [Origin and destination of international migrants by age (broad grouped) by sex] - MM01CUK - Open	<a href="#">All usual residents who were living outside the UK one year ago</a>
	<i>i</i> 2011 SMS Merged LA/LA [Origin and destination of migrants by age (broad grouped) by sex] - MM01CUK_all - Open	<a href="#">All usual residents who were living at a different address one year ago</a>
	<i>i</i> 2011 SMS Merged LA/LA [Origin and destination of migrants by age (grouped - mid) by sex (including those aged under 1)] - MM01BUK_all - Safeguarded	All usual residents who were living at a different address one year ago (including those aged under 1)
	<i>i</i> 2011 SMS Merged LA/LA [Origin and destination of migrants by age (grouped) by sex] - MM01AUK_all - Safeguarded	All usual residents who were living at a different address one year ago
<i>i</i> 2011 SMS Merged LA/LA [Origin and destination of migrants by age (grouped)] - MU01BUK_all - Open	<a href="#">All usual residents who were living at a different address one year ago</a>	

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# Data selection – confirmation page

UK Data Service  
Census Support



[\[Home\]](#) > [Query](#) > [Data](#) > Quick selection

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## Flow data links

- [Flow data home](#)
- [Information and Publications](#)
- [Available Data](#)
- [Downloads](#)
- [Contact us](#)
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## Support

- [Accessibility statement](#)
- [Feedback](#)
- [Help](#)



WICID Data Geography Finalise Run Output

Data



Status: 1 data items currently selected

[\[Unselect all\]](#) [\[Show list\]](#)

### Quick data selection

→ Added 'All usual residents who were living outside the UK one year ago(2011 SMS Merged LA/LA [Origin and destination of international migrants (expanded country origin)] - MF02UK - Open)' to list of selected data.

You have not yet selected any origins  
You have not yet selected any destinations  
You have successfully selected some data

Recommended next move - select geography origins



### Alternative options

- [Return](#) to list of data totals for quick selection
- [Return](#) to general data selection page
- [Return](#) to general query interface

Census Support Flow Data (formerly The Centre for Interaction Data Estimation and Research), now based at UCL forms part of the UK Data Service Census Support Service, and provides access to Census Interaction Data through services running at the University of Essex



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# WICID: Geography selection

- As with selecting data, there are various ways of selecting areas
  - Sometimes we want to select many areas, sometimes only a few...
- Quick selection: select all areas in a given geography
- List selection: select from a list of choices
- Type-in selection: enter a full or wild-carded name
- Map selection: select desired areas through a modern interactive environment (only available for 2011 data).





# WICID: Geography selection

UK Data Service  
Census Support



[\[Home\]](#) > [Query](#) > [Geography](#) > Select origins

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## Flow data links

[Flow data home](#)  
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## Support

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WICID Data Geography Finalise Run Output

Origins



Status: 0 origins currently selected  
[\[Unselect all\]](#) [\[Show list of selected areas\]](#)

[Switch](#) to selection of destinations

### General selection tools

- Quick selection This method allows you to select all areas in a particular geography in one go.
- List selection This method shows a list of all areas in your selected geography. It is useful if you do not know the code numbers to use the type-in method; but the list is cumbersome for geographies that have a large number of components.
- Copy selection Set origins to be the same as currently selected destinations, or *vice versa*.
- Type-in box This method allows you to select areas by typing their sequence numbers, OPCS codes or names into a text box. It is quick if you already know the OPCS codes of areas in which you are interested, or if you want to search the whole country by placename.
- Postcode selection This method allows you to select an area by typing in its postcode. At present only a limited set of geography types are directly selectable.
- Map selection This method allows you to select areas via a map interface. **\*NEW for 2011 data\***

### Manipulation tools

- Edit list Edit a list of selected areas. This option will become active when you select some areas.

[Help](#)

Census Support Flow Data (formerly The Centre for Interaction Data Estimation and Research), now based at UCL forms part of the UK Data Service Census Support Service, and provides access to Census Interaction Data through services running at the University of Essex

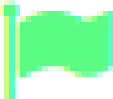



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# Example of geography selection

- We are going to use the quick selection approach
  - You will be shown a list of all known geographies
  - Those that are not compatible with your current data selection (or, can only be used with data to which you do not have access) will be grayed out
  - The geographies supported for the selected data will be on top and will be selectable
  - Notice the icon next to the available geographies.
-  The green flag indicates that the geography is natively supported. A table may contain multiple native geographies.
-  The red cubes indicate that the geography is generated by aggregating flows to a higher level compatible geography so users' won't have to do the conversion themselves.










# Selecting from all known geographies

- Select '2011 SMS Foreign origins – expanded' as origins. Notice that in WICID origins and destinations for migration tables have been swapped to their 'natural' order.

Geography	Number of areas
<b>Main Geographies</b>	
 <a href="#">2011 SMS Foreign origins - expanded</a> 	184
 Great Britain <sup>†‡</sup>	1
 GB Countries 1991 <sup>†‡</sup>	3
 GB Standard Regions 1991 <sup>†‡</sup>	10
 GB Counties 1991 <sup>†‡</sup>	67

- Confirm and proceed to destinations. Select quick selection again and then 'UK Location Authorities (merged) 2011'

Geography	Number of areas
<b>Main Geographies</b>	
 <a href="#">UK Local Authorities (merged) 2011</a> 	404
 <a href="#">2011 English Regions plus rest of UK</a> 	12
 Great Britain <sup>†‡</sup>	1
 GB Countries 1991 <sup>†‡</sup>	3
 GB Standard Regions 1991 <sup>†‡</sup>	10



---

# Output: extracting records

- Our query is now ready – we have identified data and geography that we want to use, but we have not yet executed the query
- The 'Run' screen allows us to carry out the query
- It also has a number of other options to store the query (if we are logged in) and to modify it – we'll ignore these for today
- Click the 'Run your query' icon
- This loads a new page after the query is complete; from here click 'Continue to output pages'



# Produce output

UK Data Service  
Census Support

[\[Home\]](#) > [Query](#) > [Geography](#) > [Destinations](#) > Quick selection

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- Flow data links**
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- WICID
- Data
- Geography
- Finalise
- Run
- Output

## Destinations



Status: 404 destinations currently selected

[Switch](#) to selection of origins

Selected all areas from geography 'UK Local Authorities (merged) 2011' as destinations

You have successfully selected some origins  
You have successfully selected some destinations  
You have successfully selected some data

Recommended next move - Produce Output



### Alternative options

- [Return](#) to list of geographies for quick selection
- [Return](#) to general destinations selection
- [Return](#) to general query interface

[Help](#)



Census Support Flow Data (formerly The Centre for Interaction Data Estimation and Research), now based at UCL forms part of the UK Data Service Census Support Service, and provides access to Census Interaction Data through services running at the University of Essex



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Census Support



# About to extract data...

The screenshot shows a web browser window with the URL <https://wicid.ukdataservice.ac.uk/cider/wicid//query/refine.php>. The page header includes the UK Data Service logo and navigation links: [Home] > Query > Refine query. It also shows the user is logged in as 'guest' with a 'Logout now' link. A progress bar at the top indicates the current step is 'Run', with other steps being 'WICID', 'Data', 'Geography', 'Finalise', and 'Output'. The main content area is titled 'Refine and review query' and contains sections for 'Refine options' (with a link to 'Intra-area flow filters'), 'Review options' (with links to 'Show a summary of your query' and 'Save your query'), and 'Next...' (with buttons for 'Run your query' and 'Return to query start'). A 'Help' button is located at the bottom left of the main content area. The left sidebar contains 'Flow data links' and 'Support' sections. A decorative bar chart is visible at the bottom left of the page.



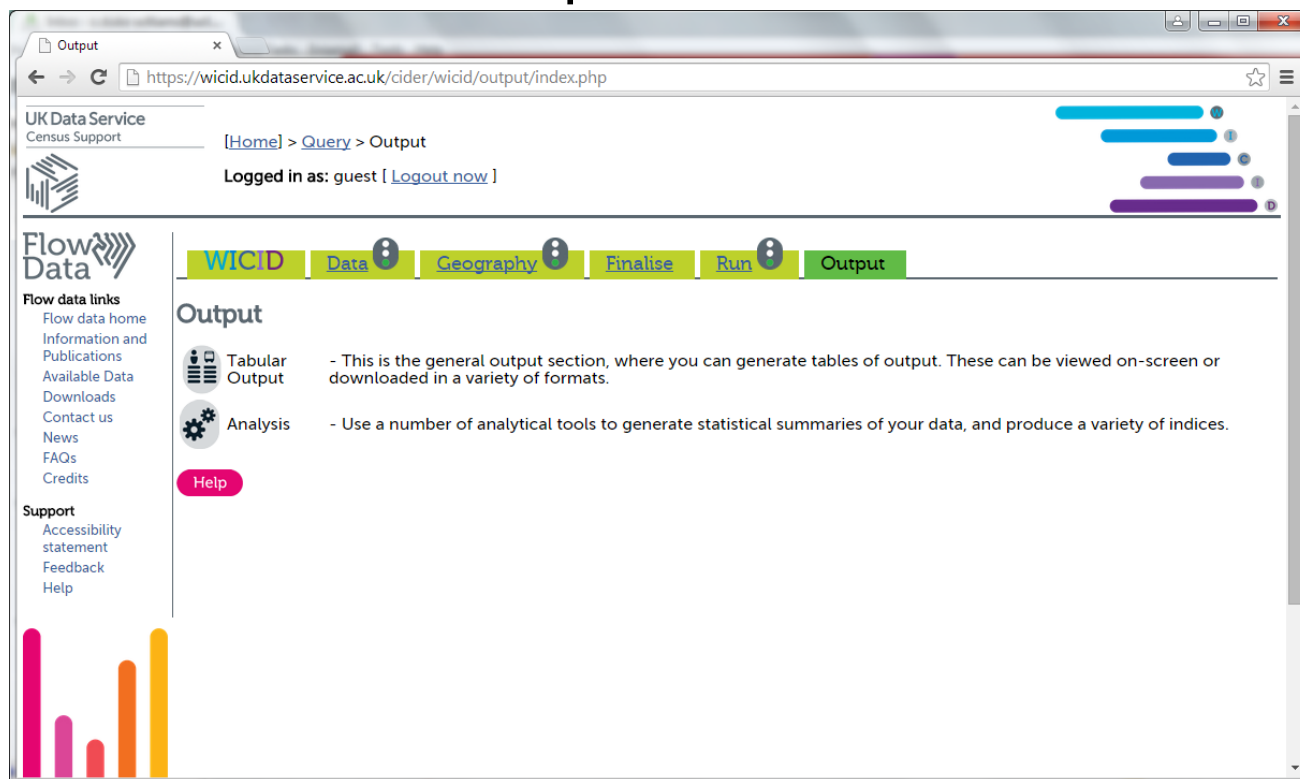
# Query complete

The screenshot shows a web browser window with the URL <https://wicid.ukdataservice.ac.uk/cider/wicid//query/run.php>. The page header includes the UK Data Service logo and navigation links: [Home] > Query > Run. The user is logged in as 'guest' with a 'Logout now' link. A progress bar at the top shows steps: WICID, Data, Geography, Finalise, Run, and Output, with 'Run' currently active. The main content area is titled 'Run query' and features a central box with an hourglass icon and the text 'Query Complete! Your data has now been extracted. Please choose the continue option below to select output options, or alternatively select one of the other options.' Below this, it states 'Extraction took 0.55 seconds'. Under the heading 'Options', there are three links: 'Continue to output pages' (with a right-pointing arrow icon), 'WICID query homepage', and 'CIDER homepage'. The left sidebar contains 'Flow Data' links and 'Support' links. A decorative bar chart is visible at the bottom left of the page.



# Output options

- The output pages offer two sets of pages
  - Tabular output: for viewing and downloading extracted data
  - Analysis pages: for carrying out certain tests
- We'll look at tabular output
- Click the 'Tabular output' icon



The screenshot shows a web browser window displaying the 'Output' page of the UK Data Service Census Support website. The browser's address bar shows the URL: <https://wicid.ukdataservice.ac.uk/cider/wicid/output/index.php>. The page header includes the UK Data Service logo and navigation links: [Home] > Query > Output. It also indicates the user is logged in as 'guest' with a [Logout now] link. A horizontal menu contains tabs for WICID, Data, Geography, Finalise, Run, and Output, with 'Output' currently selected. The main content area is titled 'Output' and contains two options: 'Tabular Output' (described as the general output section for generating tables) and 'Analysis' (described as using analytical tools for statistical summaries). A pink 'Help' button is located below the 'Analysis' option. The left sidebar features 'Flow Data' branding and links for 'Flow data links' (including Home, Information and Publications, Available Data, Downloads, Contact us, News, FAQs, Credits) and 'Support' (including Accessibility statement, Feedback, Help). A decorative bar chart is visible at the bottom left of the page.



# Tabular output planner

- The planner allows you to choose the form of output, and then preview and download output
- There are several output styles
  - Matrix output: creates an origin-destination matrix
  - Pair-list output: creates a set of output records, with one line for each origin-destination pair (similar format to the download files)
  - Framework layout: creates a separate table for each pair of origin and destination areas
- We will look at the matrix mode
- Leave all options as they are and make sure 'comma separated values' is selected in the 'output format' section.
- Click the 'Preview Output and Download' button





# Planning tabular output

WICID

Data

Geography

Finalise

Run

Output

## Tabular output - plan

This page allows you to alter the characteristics of the output.

### Data items to output

You currently have 1 items selected for output

[Change selection](#) of variables to output.


### Layout options

#### Output layout


- Origin - destination matrix
- Origin - destination pair list [\[Advanced settings...\]](#)
- Published table frameworks [\[Advanced settings...\]](#)
- Export data (fast but inflexible)

#### Output format

- HTML table [\[Advanced settings...\]](#)
- Comma separated values

Preview Output and Download 

### Options

 [Return to Output page](#)

### General options

#### Origin and destination labels

Current labels to use in output [\[Change\]](#)

UK Local Authorities (merged) 2011:LA label  
2011 SMS Foreign origins - expanded:Country/ies label

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# Preview output

- The preview screen shows part of the output data
- You can then decide whether to display (or download) the whole table, or whether to modify the appearance
- The default output uses place names, but you can add area codes as well
- From the preview screen you can click on 'Return to output planner' and then on 'Change' on the right hand side where the labels are shown
- It is then possible to change the label type used, or to select multiple label options



# Full output

- When you are happy with the preview, you can view the data on screen or download
- Output is formatted as either HTML or comma separated values (CSV)
- CSV is recommended for import into Excel etc., or for use with statistical packages etc.

UK Data Service  
Census Support

Home > Query > Output > Tabular output  
Logged in as: guest [Logout now]

Flow Data

WVICID Data Geography Finalise Run Output

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Flow data home  
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Tabular output - preview

This is a preview of part of your selected output.

Only the first 5 origins are shown  
Only the first 5 destinations are shown

Output size estimate  
Output will contain up to 74,336 values  
Output size estimated to be around 58119 KB

```
"2011 SMS Merged LA/LA [Origin and destination of international migrants (expanded country origin)] - MF02UK - Open"  
"Origin geography: 2011 SMS Foreign origins - expanded", "Destination geography: UK Local Authorities (merged) 2011"  
"Layer", "All usual residents who were living outside the UK one year ago"  
"Origins", "Destinations",,,  
"Hartlepool", "Middlesbrough", "Redcar and Cleveland", "Stockton-on-Tees", "Darlington"  
"Guernsey", 0, 2, 0, 2, 0  
"Jersey", 0, 0, 0, 1, 1  
"Channel Islands not otherwise specified", 0, 0, 0, 2, 1  
"Isle of Man", 0, 0, 0, 2, 2  
"Ireland", 5, 42, 4, 36, 15  
Notes:  
** Census output is Crown copyright and is reproduced with the permission of the Controller of HMSO and the Queen's Printer for Scotland Source: 2011 SMS Merged LA/LA [Origin and destination of international migrants (expanded country origin)] - MF02UK - Open
```

Output options

- tabulate on screen (only for small amounts of output)
- download output file
- return to output planner

Options

- Return to Output page

Help

Census Support Flow Data (formerly The Centre for Interaction Data Estimation and Research), now based at UCL, forms part of the UK Data Service Census Support Service, and provides access to Census Interaction Data through services running at the University of Essex

B.S.R.C. University of Essex UCL



# Download data

The screenshot shows a web browser window with the URL `https://wicid.ukdataservice.ac.uk/cider/wicid/output/tabular/output_tab_dload.php`. The page header identifies the user as a 'guest' and provides a 'Logout now' link. A navigation bar contains buttons for 'WICID', 'Data', 'Geography', 'Finalise', 'Run', and 'Output'. The main content area is titled 'Tabular output download' and features a 'File download details' section with a text input field containing 'wicid\_output.csv' and a prominent green 'Download now' button with a downward arrow icon. A sidebar on the left lists 'Flow data links' and 'Support' resources. A decorative bar chart is visible at the bottom left of the page.



# Output in WICID. Open data in Excel

Notice the differences compared to the raw downloaded data we saw earlier.

**Research question:**  
What are the top two countries people migrated from for each local authority in the UK?

Origins	Hartlepool	Middlesbrough	Redcar and Cleveland	Stockton-on-Tees	Darlington	Halton	Warrington	Blackburn	Blackpool	Kingston upon Hull	East Riding of Yorkshire	North East Lincolnshire	North Yorkshire	Derby	Leicester	Rutland	Nottingham	Herefordshire	Telford and Wrekin	Stoke-on-Trent	Bath and North East Somerset	Bristol, City of	North Somerset	South Gloucestershire	Plymouth	Torbay	Bournemouth	Poole
Guernsey	0	2	0	2	0	0	0	2	1	0	8	0	0	6	0	1	0	7	5	0	4	20	24	2	9	14	2	14
Jersey	0	0	0	1	1	2	3	0	3	1	1	0	3	42	1	2	6	6	1	2	4	26	24	2	7	31	4	34
Channel Islands	0	0	0	2	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	1	2	0	1	
Isle of Man	0	0	6	2	2	3	1	4	8	4	6	0	3	13	9	6	7	11	0	14	6	5	7	2	9	7	0	5
Ireland	5	42	4	36	15	20	35	6	15	25	43	8	13	76	70	53	2	73	39	23	54	78	140	16	59	41	20	58
Austria	1	0	0	1	0	0	0	3	1	4	1	0	0	11	2	9	1	27	1	2	4	20	29	5	3	5	1	5
Belgium	1	0	0	0	0	0	0	0	0	10	24	3	2	37	12	4	1	37	14	1	4	43	36	3	9	12	2	15
Denmark	0	2	0	0	0	0	0	0	8	6	1	2	8	0	15	0	15	5	0	8	14	22	4	2	6	0	22	0
Finland	3	5	0	1	0	0	5	2	1	5	8	0	2	4	3	34	0	17	3	1	1	8	20	6	7	3	0	13
France	7	27	0	0	0	0	0	0	0	21	11	0	21	10	6	0	0	0	0	0	0	1	1	1	1	74	60	101
Germany	7	22	17	41	65	9	33	33	29	91	110	39	45	239	95	67	37	213	114	100	60	134	223	48	101	109	37	89
Gibraltar	0	0	0	0	0	0	0	0	0	1	0	2	4	0	1	0	7	0	0	8	8	5	1	4	19	2	7	
Greece	0	25	0	0	0	0	0	0	0	21	11	12	8	87	14	47	0	68	4	7	27	54	70	16	22	30	9	26
Italy	1	17	0	25	3	9	6	6	5	34	27	4	9	75	28	70	6	100	6	21	34	97	215	20	24	29	13	62
Luxembourg	0	0	0	1	0	0	0	0	0	1	0	0	0	3	0	0	0	9	0	0	0	7	3	1	4	1	0	2
Netherlands	6	8	11	8	4	1	16	9	8	25	20	7	7	57	11	46	1	39	13	7	67	20	97	12	29	25	4	48
Portugal (incl. Madeira)	1	6	1	3	3	0	10	10	3	13	11	0	20	15	22	117	1	50	15	9	11	21	56	9	22	22	7	50
Spain (incl. Gibraltar)	18	32	37	47	38	31	83	56	90	113	135	46	36	130	82	103	28	201	34	43	69	198	486	137	114	111	65	224
Sweden	0	7	4	7	1	0	2	0	0	13	8	6	4	22	10	9	0	38	1	4	8	14	43	7	9	12	4	27
Other member states	0	0	0	1	0	0	0	1	0	0	0	0	0	0	2	3	3	0	0	0	0	0	0	0	0	0	0	4
Bulgaria	0	2	1	6	2	1	4	3	4	16	12	6	4	15	7	16	2	65	26	4	14	25	41	20	14	13	7	7
Cyprus (EU)	9	8	3	24	8	8	18	3	14	44	37	8	12	44	36	168	12	145	29	11	15	48	54	27	18	36	8	28
Czech Republic	2	10	0	7	6	2	25	1	0	15	5	3	1	15	17	18	0	28	13	3	3	8	42	5	14	11	2	10
Estonia	0	1	0	0	1	0	2	0	6	5	0	1	6	8	5	1	0	6	0	0	0	2	9	0	1	0	0	10
Hungary	2	7	0	1	2	13	75	1	6	12	5	4	0	39	12	18	8	60	33	18	19	104	18	61	5	6	37	
Latvia	8	7	0	3	2	21	36	15	25	184	91	57	39	32	203	165	3	38	22	43	7	7	97	15	46	35	0	31
Lithuania	1	18	2	4	21	17	34	16	8	167	36	4	188	42	52	70	0	103	122	14	12	15	110	32	25	15	6	44
Malta	0	4	0	0	0	1	1	7	5	1	4	2	0	4	0	8	2	11	1	3	10	18	7	4	2	6	0	4
Poland	26	54	6	23	72	28	119	117	89	466	108	79	194	192	181	503	2	532	282	229	103	138	401	91	106	134	56	205
Romania	4	6	7	17	26	1	13	4	12	51	14	4	5	37	12	84	2	66	30	9	16	26	105	22	35	92	8	44
Slovakia	1	8	0	2	3	12	130	7	5	57	3	1	14	9	36	44	1	37	22	6	18	8	29	17	19	11	6	6
Slovenia	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	1	0	0	0	0	0	0	1	0	0	0	0	0
Czechoslovakia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Albania	0	0	2	0	0	0	0	0	0	4	0	3	0	0	2	4	0	6	0	1	0	0	6	1	1	0	5	1



# Exercises with download data

- While in cell B194, start typing **=LARGE(**
- Using your keyboard arrow keys go up to **B189** which is the last row with data. Press **CTRL+Shift+UP** simultaneously and Excel will select all rows up to the top.
- We don't want the 5 top rows as they do not contain any census data. While holding **Shift** key use your **down arrow** until the selection reaches **B6**.
- The formula should now be **=LARGE(B6:B189** . Large function accepts a final argument which allows to select the first largest, second largest etc. Type **,1)** and press **Enter**.
- The complete formula must be **=LARGE(B6:B189,1)** and the result in B194 should be **26**.



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# Exercises with download data

- We need to find an easy way to repeat this formula for all columns.
- Click on any column in row **189** (the last row containing data). While holding **CTRL** use the **right arrow key**. The active cell should now be the last one **OO189**.
- Move your cursor a bit further down to **OO194** which is the same row with the formula we created earlier. Type anything in, e.g. a number like 1. Press **CTRL+Left key** and the cursor should be move back to our formula cell **B194**.



# Exercises with download data

- Use **CTRL+SHIFT+Right key** to select all columns in row 194 up to column OO.
- Press **F2** to enter Edit mode and Excel will automatically move the cursor back to B194 while keeping the cells selection active. Use **CTRL+Enter** to apply the formula. All columns in row 194 should now contain the largest number for each column (local authority).
- Repeat the process in B195 finding the second largest head count. The initial formula should be **=LARGE(B6:B189,2)**. Expand the formula to OO195 as before.





# Exercises with download data

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	
158	Bolivia	0	0	0	4	0	0	0	0	0	1	0	0	0	0	1	0	0	0	2	0	0	1	3	0	0	0	0	0	
159	Brazil	0	3	1	2	3	0	0	0	0	3	4	3	3	17	5	20	2	13	2	2	1	6	43	0	9	4	1	59	
160	Chile	1	0	0	1	0	0	0	0	0	1	0	0	0	7	3	4	1	17	0	1	0	15	22	0	1	7	0	5	
161	Colombia	0	1	0	0	0	0	1	3	0	3	0	0	1	11	0	2	0	2	1	0	0	11	16	0	5	4	0	41	
162	Ecuador	0	0	0	0	0	0	0	0	1	1	5	0	0	1	3	3	0	4	0	1	0	1	2	0	1	1	0	0	
163	Guyana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	3	1	0	1	2	0	0	0	0	0	
164	Peru	0	0	0	1	0	1	1	0	1	3	3	1	0	3	1	0	0	4	1	1	1	1	12	1	1	0	0	6	
165	Uruguay	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
166	Venezuela	0	1	0	4	0	0	0	2	0	0	0	0	0	2	0	0	0	2	0	0	0	4	2	3	0	0	1	26	
167	Other South America	2	0	0	0	1	0	0	1	1	1	3	2	1	1	0	0	0	2	1	1	0	0	5	3	8	8	0	4	
168	Antigua and Barbuda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	3	0	1	0	0	0	0	0	2	0	0	
169	Bahamas, The	0	0	4	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3	0	0	1	0	0	0	0	3	0	0	
170	Barbados	0	0	0	2	0	0	1	0	0	0	0	1	0	0	0	4	0	8	0	0	0	3	3	1	3	3	4	3	
171	Cuba	0	0	1	0	0	0	0	0	0	0	3	0	0	1	0	0	0	4	0	0	0	0	1	2	0	2	0	0	
172	Dominica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
173	Dominican Republic	0	0	0	0	0	0	0	0	0	1	0	0	0	6	0	2	0	0	0	0	0	0	0	0	0	1	1	4	
174	Grenada	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	
175	Jamaica	0	0	0	1	0	0	1	0	1	0	0	0	0	5	12	1	0	30	0	2	1	1	22	0	1	0	3	0	
176	Montserrat	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	
177	St Kitts and Nevis	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
178	St Lucia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	1	0	0	1	1	0	1	0	0	5	
179	St Vincent and the Grenadines	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	8	0	0	
180	Trinidad and Tobago	0	0	0	4	1	0	0	0	0	0	12	1	0	1	0	1	0	12	0	0	1	2	10	7	1	1	0	0	
181	Other Caribbean	0	0	2	3	0	0	0	2	3	4	3	1	1	11	3	3	5	2	5	1	0	0	4	1	9	11	0	5	
182	Antarctica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	
183	Australia	18	27	25	43	29	30	78	26	28	61	118	29	32	180	48	66	16	156	72	23	24	167	432	109	120	107	62	133	
184	New Zealand	0	14	12	5	20	14	16	7	14	25	47	12	7	62	37	26	8	62	55	27	6	64	131	50	51	43	9	40	
185	Other Australia and New Zealand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
186	Fiji	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	4	3	1	0	0	3	0	1	
187	Papua New Guinea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	
188	Other Oceania	0	0	0	0	1	10	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	4	0	0	0	0	0	
189	Other	0	0	1	3	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	2	1	25	2	0	
190	Notes:																													
191																														
192		* Census output is Crown copyright and is reproduced with the permission of the Controller of HMSO and the Queen's Printer for Scotland Source: 2011 SMS Merged LA/LA [Origin and destination of international migrants (expanded country origin)] - MF02UK - Open																												
193																														
194		26	145	37	47	72	31	130	129	90	466	135	79	194	573	203	1033	37	1073	282	229	206	261	486	137	170	134	65	228	
195		18	137	25	43	65	30	119	117	89	435	119	57	188	239	181	989	31	532	122	100	128	255	480	109	130	111	62	224	
196																														



---

# Exercises with download data

- We now need to match the numbers to the countries. For this purpose we will use a slightly more complex Excel formula.
- We will combine two Excel functions into one formula:
  - **INDEX**: returns a value based on the intersection of a row and column position within a given range
  - **MATCH**: returns the relative position of an item within a given range



# Exercises with download data

- Go to cell B196 and type in the following formula:  
**=INDEX(\$A\$6:\$A\$189,MATCH(B194,B6:B189,0))**

An array of values that contain the labels of the countries. Notice the dollar sign. It instructs Excel to treat the values as fixed. It can become especially handy in situations when we want to apply auto-fill but want to keep this part of the formula fixed.

**B194** is the look-up value which we want to match against the look-up array.  
**B6:B189** is the look-up array defined as a range of cells.  
**0** is the match type. Zero tells Excel to find the first value that is exactly equal to look-up value.



# Exercises with download data

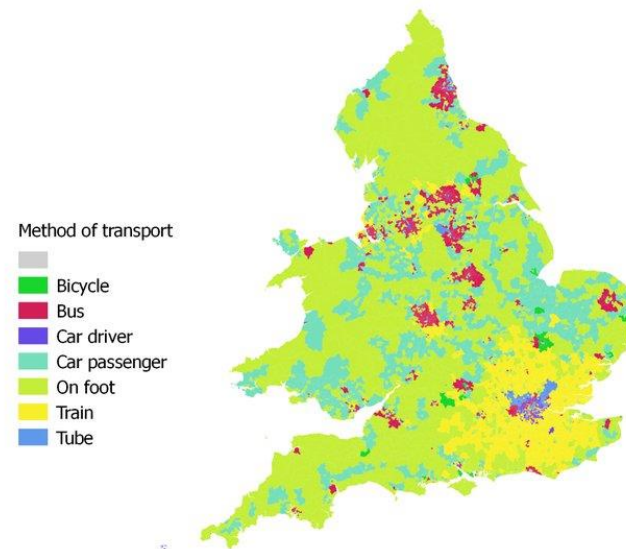
- Apply the auto-fill for formula in B196 in the exact same way as we did before to find the largest number.
- Go to cell B197 and repeat the process with B195 as our look-up value in order to find the second most popular countries of origin.  
**=INDEX(\$A\$6:\$A\$189,MATCH(B195,B6:B189,0))**
- Apply the auto-fill

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	
160	Chile	1	0	0	1	0	0	0	0	0	1	0	0	0	7	3	4	1	17	0	1	0	15	22	0	1	7	0	
161	Colombia	0	1	0	0	0	0	1	3	0	3	0	0	1	11	0	2	0	2	1	0	0	11	16	0	5	4	0	
162	Ecuador	0	0	0	0	0	0	0	0	1	1	5	0	0	1	3	3	0	4	0	1	0	1	2	0	1	1	0	
163	Guyana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	3	1	0	1	2	0	0	0	0	
164	Peru	0	0	0	1	0	1	1	0	1	3	3	1	0	3	1	0	0	4	1	1	1	1	12	1	1	0	0	
165	Uruguay	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
166	Venezuela	0	1	0	4	0	0	0	2	0	0	0	0	0	2	0	0	0	2	0	0	0	4	2	3	0	0	1	
167	Other South America	2	0	0	0	1	0	0	1	1	1	3	2	1	1	0	0	0	2	1	1	0	0	5	3	8	8	0	
168	Antigua and Barbuda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	3	0	1	0	0	0	0	0	2	0	
169	Bahamas, The	0	0	4	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3	0	0	1	0	0	0	0	3	0	
170	Barbados	0	0	0	2	0	0	1	0	0	0	0	1	0	0	0	4	0	8	0	0	0	3	3	1	3	3	4	
171	Cuba	0	0	1	0	0	0	0	0	0	0	3	0	0	1	0	0	0	4	0	0	0	0	1	2	0	2	0	
172	Dominica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
173	Dominican Republic	0	0	0	0	0	0	0	0	0	1	0	0	0	6	0	2	0	0	0	0	0	0	0	0	0	1	1	
174	Grenada	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	
175	Jamaica	0	0	0	1	0	0	1	0	1	0	0	0	0	5	12	1	0	30	0	2	1	1	22	0	1	0	3	
176	Montserrat	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	
177	St Kitts and Nevis	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
178	St Lucia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	1	0	0	1	1	0	1	0	0	
179	St Vincent and the Gren	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	8	0
180	Trinidad and Tobago	0	0	0	4	1	0	0	0	0	12	1	0	1	0	1	0	12	0	0	1	2	10	7	1	1	1	0	
181	Other Caribbean	0	0	2	3	0	0	0	2	3	4	3	1	1	11	3	3	5	2	5	1	0	0	4	1	9	11	0	
182	Antarctica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	
183	Australia	18	27	25	43	29	30	78	26	28	61	118	29	32	180	48	66	16	156	72	23	24	167	432	109	120	107	62	
184	New Zealand	0	14	12	5	20	14	16	7	14	25	47	12	7	62	37	26	8	62	55	27	6	64	131	50	51	43	9	
185	Other Australasia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
186	Fiji	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	4	3	1	0	0	3	0	
187	Papua New Guinea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	
188	Other Oceania	0	0	0	0	1	10	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	4	0	0	0	0	
189	Other	0	0	1	3	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	2	1	25	2	
190	Notes:																												
191																													
192	* Census output is Crown copyright and is reproduced with the permission of the Controller of HMSO and the Queen's Printer for Scotland Source: 2011 SMS Merged LA/LA [Origin and destination of international migrants (expanded country origin)] - MF02UK - Open																												
193																													
194	Largest	26	145	37	47	72	31	130	129	90	466	135	79	194	573	203	1033	37	1073	282	229	206	261	486	137	170	134	65	
195	Second largest	18	137	25	43	65	30	119	117	89	435	119	57	188	239	181	989	31	532	122	100	128	255	480	109	130	111	62	
196	Largest	Poland	Libya	Spain (inc Spain (inc Poland	Spain (inc Slovakia	Pakistan	Spain (inc Poland	Spain (inc Poland	Poland	China	Latvia	India	Germany	China	Poland	Poland	India	China	Spain (inc Spain (inc India	Poland	Spain (inc								
197	Second largest	Spain (inc India	United Stc	Australia	Germany	Australia	Poland	Poland	China	United Stc	Latvia	Lithuania	Germany	Poland	China	United Stc	Poland	Lithuania	Germany	Pakistan	France	China	Australia	United Stc	Spain (inc Australia				
198																													



# Exercises with download data

- The processed data can be used to generate charts or even maps using tools like QGIS by matching the area codes with their boundaries



**Second most common method of transport to work, 2011  
England and Wales, MSOA level**

Boundaries: Office for National Statistics, 2011 Census: Digitised Boundary Data (England and Wales) [computer file].  
UK Data Service Census Support. Downloaded from: <https://borders.ukdataservice.ac.uk/>

Flow data: Office for National Statistics, 2011 Census: Special Workplace Statistics (United Kingdom) [computer file].  
UK Data Service Census Support. Downloaded from: <https://wicid.ukdataservice.ac.uk>

The above map was produced using WU03UK safeguarded table in MSOA level

UK Data Service  
Census Support



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# Thank you!

## Any questions?

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