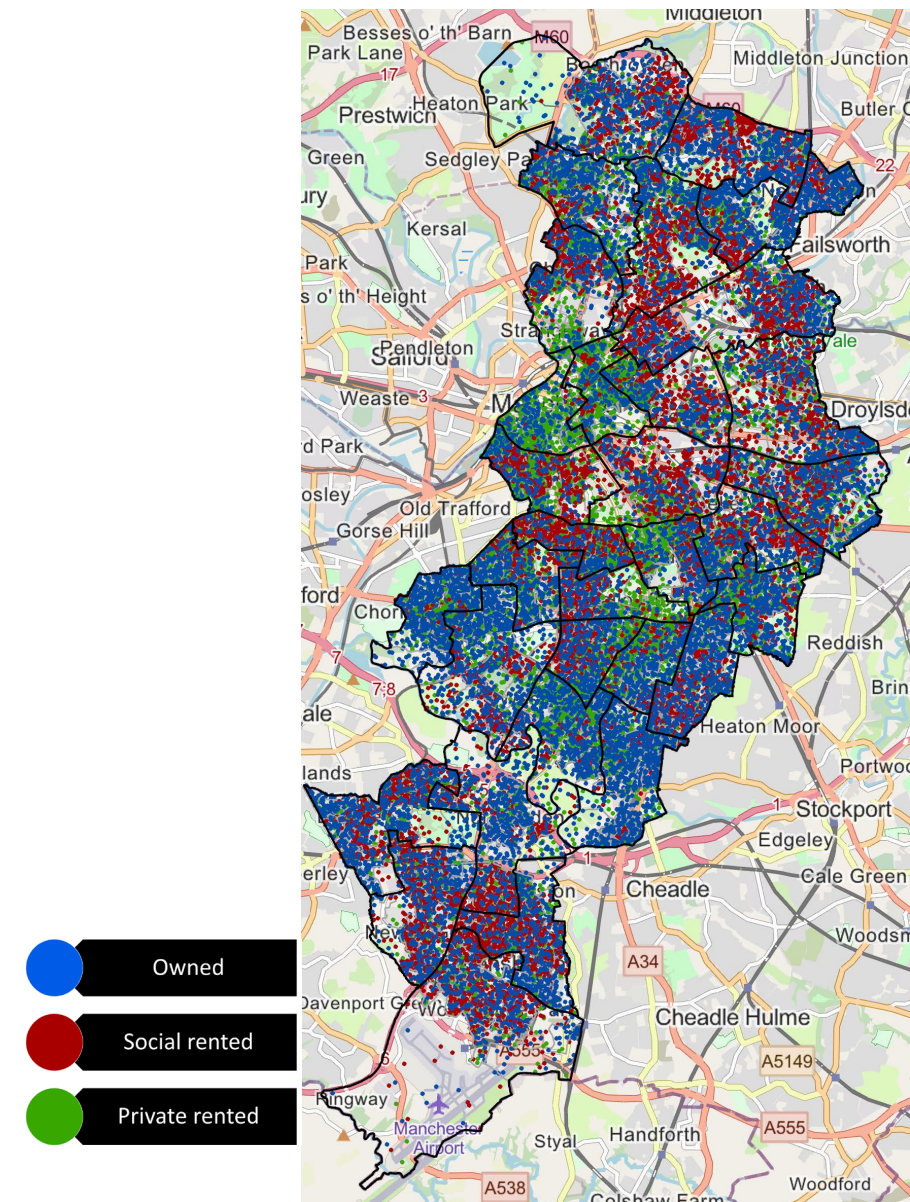


# Teaching with census data

Workshop

22 October 2024

## Tenure in Manchester 2021



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# Context

Three statistical authorities – England and Wales, Northern Ireland and Scotland.

England and Wales and Northern Ireland census in 2021 – Scotland in 2022.

Univariate and multivariate tables available. Microdata and flow data from England and Wales. Northern Ireland due 2024 and Scotland 2025.

Ambition to move to population data derived from administrative data – used significantly in producing the census estimates. Robust individual level testing on quality of data.

# What we will cover

Census outputs

Geography

Data

Tools

Practical exercises

Reflections

# Census outputs

1

Geographical data

2

Univariate data - topic summaries and area profiles

3

Multivariate data – pre-defined and flexible tables

4

Flow data, Microdata, Alternative population bases, Small populations



# Geographical data

Boundary data		
Administrative e.g. Local authority, Health (LA available others to follow)	Electoral e.g. constituency, ward (due this month)	Statistical areas built on output areas (available now)

# Defining geographical scope

Country / region / local authority

Country / constituency

Country / local authority / MSOA / LSOA / OA

*Country / workplace*



# Output area geography

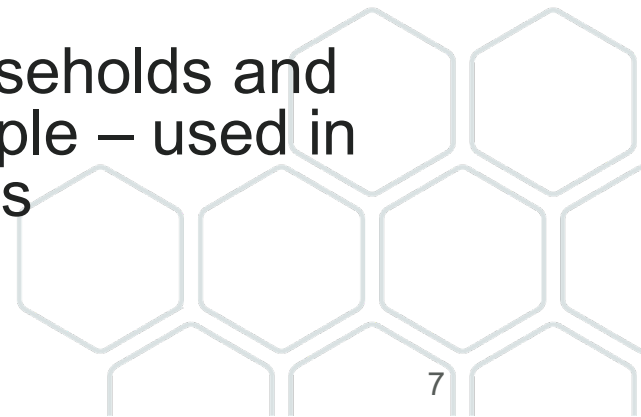
Output area minimum 40 households and 100 residents, average target 125 households, maximum 250 households and 625 people

- introduced in 2001
- aim for more homogeneous population through matching characteristics of population
- but try to minimise changes

Built into larger super output areas

- lower level super-output areas (LSOAs) minimum 400 households and 1,000 people, maximum 1,200 households and 3,000 people – used in published statistics e.g. IMD, recorded crime
- Mid-level super output areas (MSOAs) minimum 2,000 households and 5,000 people, maximum 6,000 households and 15,000 people – used in published statistics e.g. educational attainment, Covid cases

All boundaries constrained within local authorities

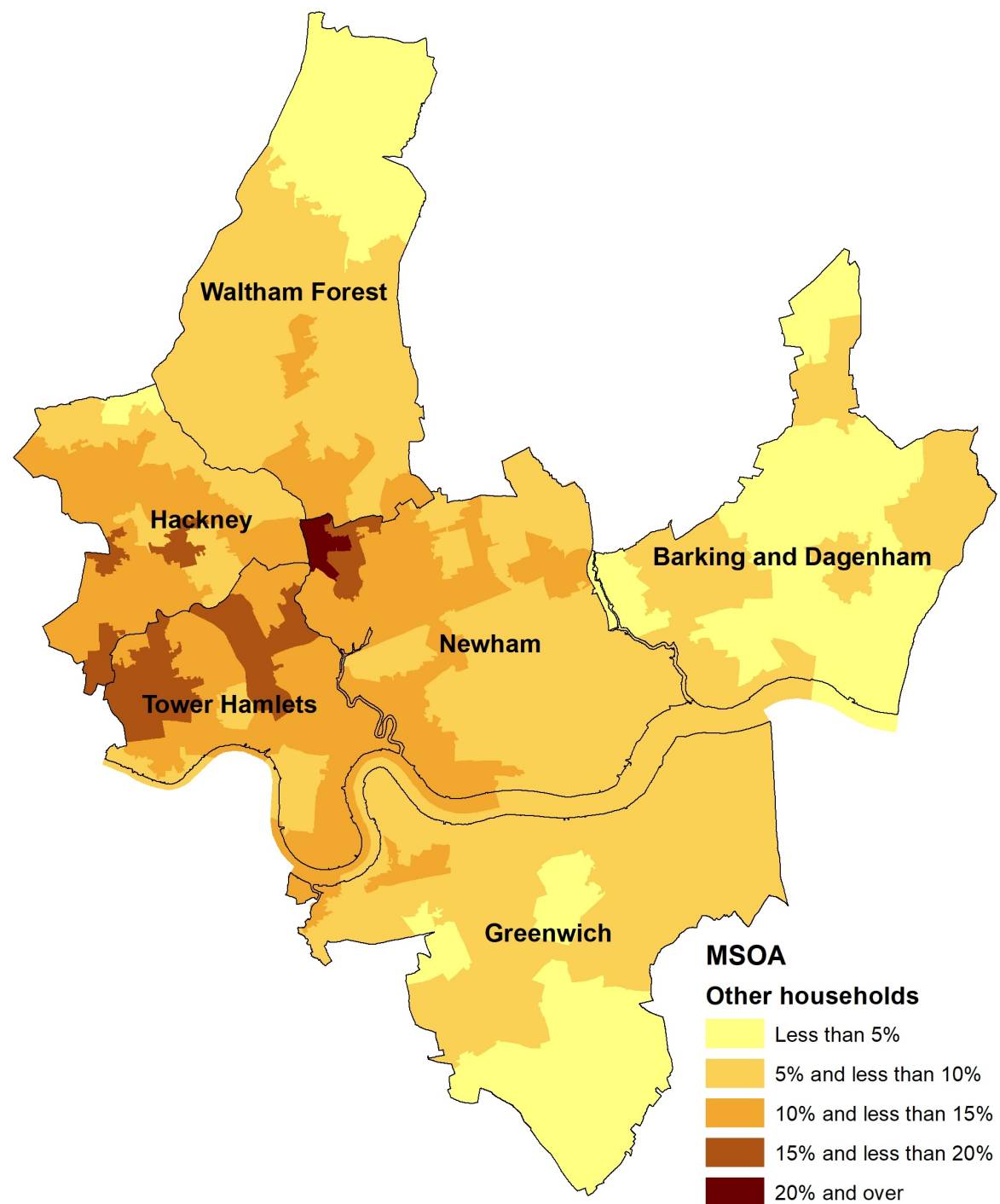


# Geography

## MSOA level

Using other households as a proxy measurement for houses under multiple occupation.

They contain unrelated adults (no children).



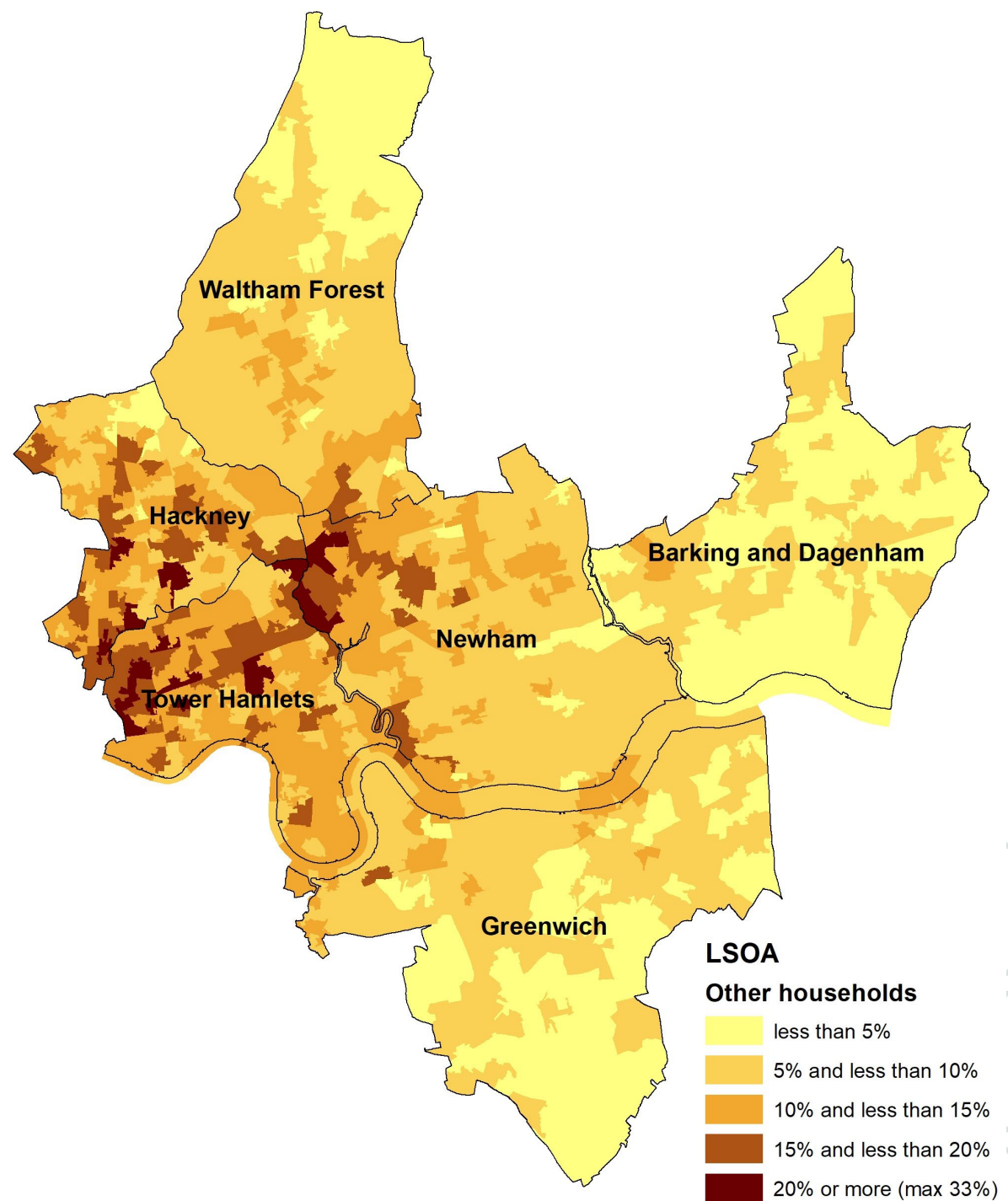


# Geography

## LSOA level

Using other households as a proxy measurement for houses under multiple occupation.

They contain unrelated adults (no children).

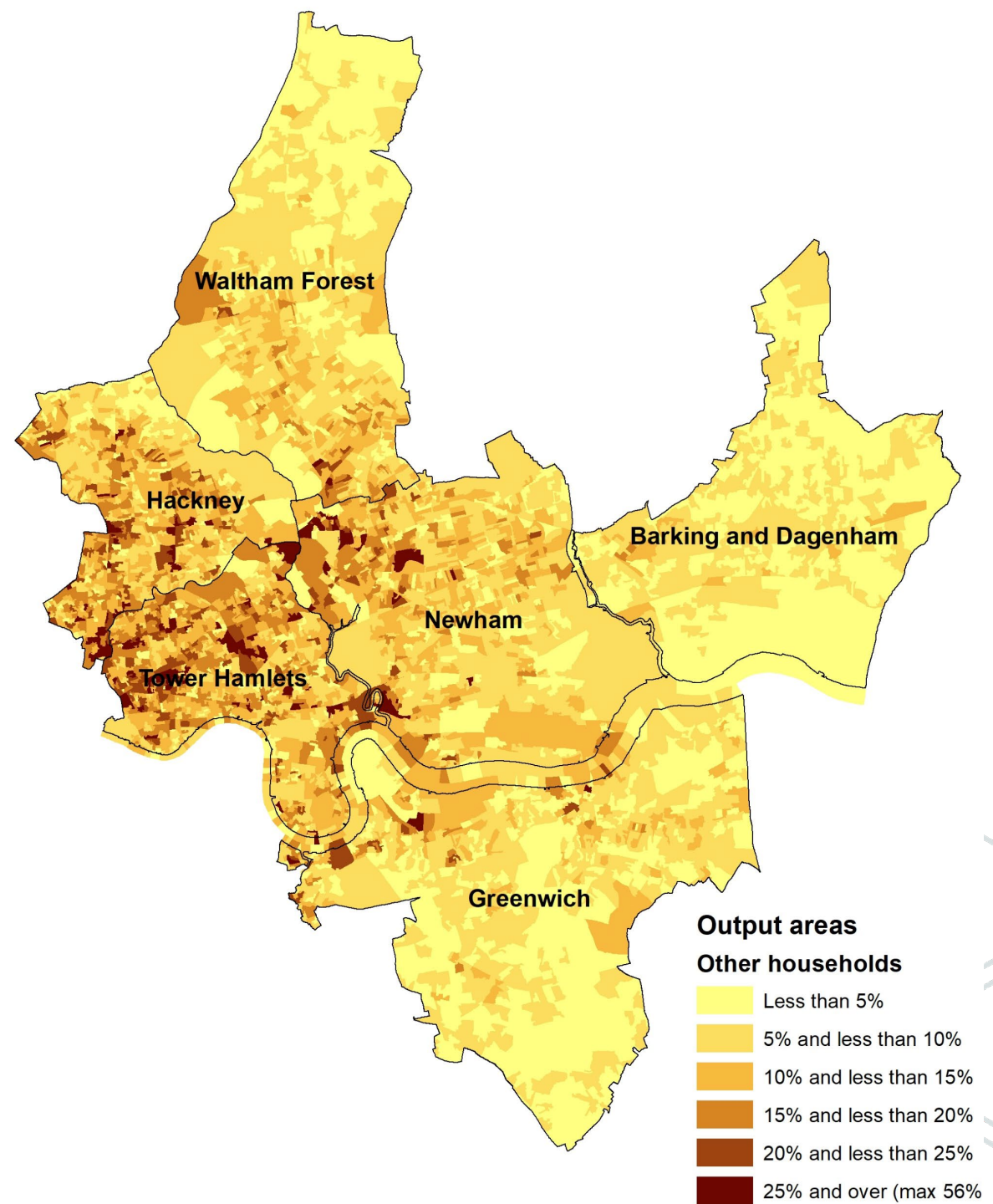


# Geography

## OA level

Using other households as a proxy measurement for houses under multiple occupation.

They contain unrelated adults (no children).



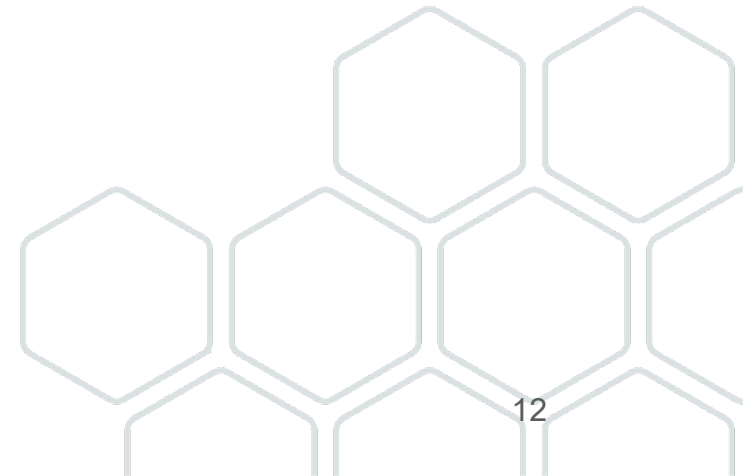
# Aggregate data products

Focussing on England and Wales releases but broadly applicable to Northern Ireland and Scotland

# Univariate data

## Topic summaries

- demography and migration
- ethnic group, national identity, language, and religion
- health, disability, and unpaid care
- housing
- labour market and travel to work
- sexual orientation and gender identity
- education
- UK armed forces veterans



# Multivariate data

Defined sets of tables including two or more variables at different geographical scales

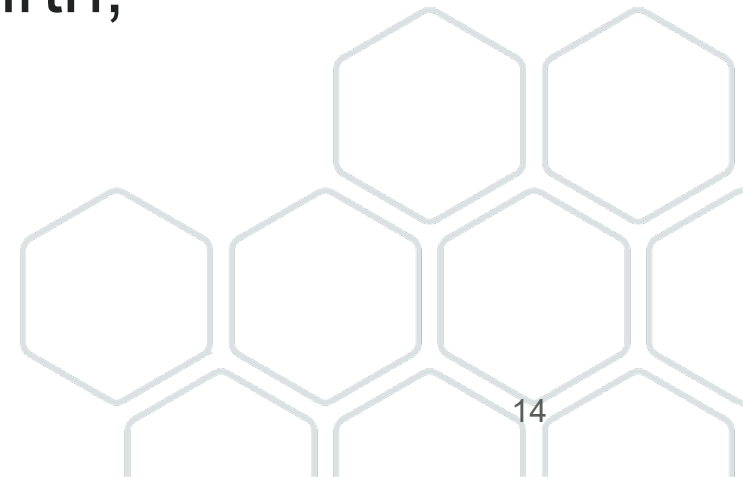
Flexible table builder (incorporating statistical disclosure control)

The variable categories will vary between univariate and multivariate tables based on statistical disclosure control.

This is likely to mean the need to balance geographical scale and the level of detail available.

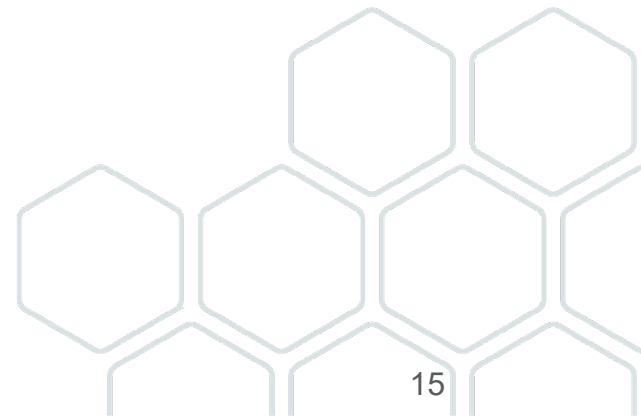
# Other types of data

- Flow data - origin destination data covering migration flow, workplace flow, second address flow, student flow
- Microdata – multivariate sample from the census
- Alternative population bases – workplace, workday, out-of-term, second address
- Small populations - Ethnic group, Country of birth, Religion, National identity



# Potential topics of interest

- Exploring population:** migration / living arrangements
- Exploring identity:** ethnicity, national identity, religion and language
- Exploring work:** economic activity, hours worked, industry, occupation
- Exploring education:** studying or highest qualification
- Exploring housing:** household size, tenure, car or van availability, accommodation type, central heating, occupancy levels
- Exploring health:** general health, long-term health problem or disability, provision of unpaid care



# Accessing the data

UK Data Service (UKDS), NOMIS and ONS provide topic summaries for individual variables.

UKDS and NOMIS present a defined set of multivariate tables. They use less detailed categories in many cases.

ONS interface allows you to select variables to create a custom dataset and select the number of categories. The interface tells you the effect of statistical disclosure control.

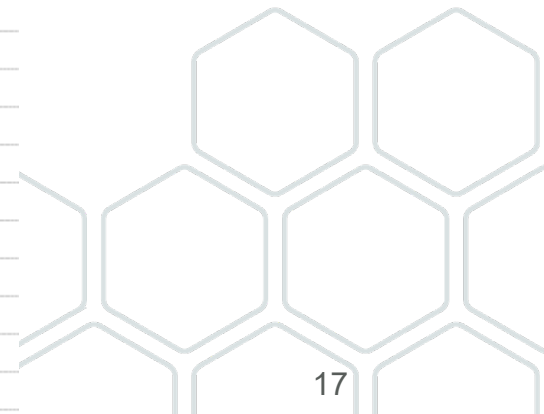
NOMIS output is tabular, UKDS and ONS has a line for each category.





# Data formats (NOMIS)

1	<b>RM032 - Ethnic group by sex by age</b>					
2	ONS Crown Copyright Reserved [from Nomis on 18 October 2024]					
3						
4	population	All usual residents				
5	units	Persons				
6	date	2021				
7	area type	local authorities: county / unitary (as of April 2023)				
8	area name	Cardiff				
9	sex	All persons				
10						
11	<b>Ethnic group</b>	<b>Aged 24 years and under</b>	<b>Aged 25 to 34 years</b>	<b>Aged 35 to 49 years</b>	<b>Aged 50 to 64 years</b>	<b>Aged 65 years and over</b>
12	Asian, Asian British or Asian Welsh: Bangladeshi	3,308	1,071	1,634	650	223
13	Asian, Asian British or Asian Welsh: Chinese	2,314	971	906	518	308
14	Asian, Asian British or Asian Welsh: Indian	3,367	1,597	2,183	1,104	585
15	Asian, Asian British or Asian Welsh: Pakistani	3,835	1,372	1,911	991	504
16	Asian, Asian British or Asian Welsh: Other Asian	2,302	1,015	1,484	615	211
17	Black, Black British, Black Welsh, Caribbean or African: African	5,114	1,737	2,512	939	285
18	Black, Black British, Black Welsh, Caribbean or African: Caribbean	285	150	250	416	252
19	Black, Black British, Black Welsh, Caribbean or African: Other Black	1,139	155	310	263	90
20	Mixed or Multiple ethnic groups: White and Asian	2,339	502	404	251	76
21	Mixed or Multiple ethnic groups: White and Black African	1,557	321	369	247	115
22	Mixed or Multiple ethnic groups: White and Black Caribbean	2,334	744	608	453	158
23	Mixed or Multiple ethnic groups: Other Mixed or Multiple ethnic groups	2,301	649	627	297	150
24	White: English, Welsh, Scottish, Northern Irish or British	84,811	38,913	46,123	49,128	47,558
25	White: Irish	452	390	476	521	495
26	White: Gypsy or Irish Traveller	436	75	80	50	31
27	White: Roma	228	166	142	43	14
28	White: Other White	4,875	4,197	4,749	2,004	973
29	Other ethnic group: Arab	3,274	1,281	1,272	588	209
30	Other ethnic group: Any other ethnic group	2,127	1,003	1,370	612	258



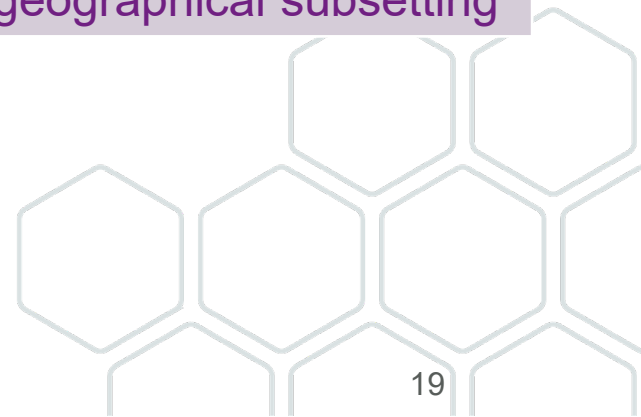
# Data formats (UKDS and ONS)

	A	B	C	D	E	F	G
	Lower tier local authorities Code	Lower tier local authorities	Age (6 categories) Code	Age (6 categories)	Ethnic group (20 categories) Code	Ethnic group (20 categories)	Observation
1	W06000015	Cardiff	1	Aged 15 years and un	-8	Does not apply	0
2	W06000015	Cardiff	1	Aged 15 years and un	1	Asian, Asian British or Asian Welsh: Bangladeshi	2127
3	W06000015	Cardiff	1	Aged 15 years and un	2	Asian, Asian British or Asian Welsh: Chinese	704
4	W06000015	Cardiff	1	Aged 15 years and un	3	Asian, Asian British or Asian Welsh: Indian	1680
5	W06000015	Cardiff	1	Aged 15 years and un	4	Asian, Asian British or Asian Welsh: Pakistani	2407
6	W06000015	Cardiff	1	Aged 15 years and un	5	Asian, Asian British or Asian Welsh: Other Asian	1239
7	W06000015	Cardiff	1	Aged 15 years and un	6	Black, Black British, Black Welsh, Caribbean or African: African	3122
8	W06000015	Cardiff	1	Aged 15 years and un	7	Black, Black British, Black Welsh, Caribbean or African: Caribbean	112
9	W06000015	Cardiff	1	Aged 15 years and un	8	Black, Black British, Black Welsh, Caribbean or African: Other Black	781
10	W06000015	Cardiff	1	Aged 15 years and un	9	Mixed or Multiple ethnic groups: White and Asian	1478
11	W06000015	Cardiff	1	Aged 15 years and un	10	Mixed or Multiple ethnic groups: White and Black African	1052
12	W06000015	Cardiff	1	Aged 15 years and un	11	Mixed or Multiple ethnic groups: White and Black Caribbean	1482
13	W06000015	Cardiff	1	Aged 15 years and un	12	Mixed or Multiple ethnic groups: Other Mixed or Multiple ethnic group	1601
14	W06000015	Cardiff	1	Aged 15 years and un	13	White: English, Welsh, Scottish, Northern Irish or British	42241
15	W06000015	Cardiff	1	Aged 15 years and un	14	White: Irish	94
16	W06000015	Cardiff	1	Aged 15 years and un	15	White: Gypsy or Irish Traveller	321
17	W06000015	Cardiff	1	Aged 15 years and un	16	White: Roma	118
18	W06000015	Cardiff	1	Aged 15 years and un	17	White: Other White	2111
19	W06000015	Cardiff	1	Aged 15 years and un	18	Other ethnic group: Arab	2083
20	W06000015	Cardiff	1	Aged 15 years and un	19	Other ethnic group: Any other ethnic group	1241
21	W06000015	Cardiff	2	Aged 16 to 24 years	-8	Does not apply	0
22	W06000015	Cardiff	2	Aged 16 to 24 years	1	Asian, Asian British or Asian Welsh: Bangladeshi	1181
23	W06000015	Cardiff	2	Aged 16 to 24 years	2	Asian, Asian British or Asian Welsh: Chinese	1611
24	W06000015	Cardiff	2	Aged 16 to 24 years	3	Asian, Asian British or Asian Welsh: Indian	1687
25	W06000015	Cardiff	2	Aged 16 to 24 years	4	Asian, Asian British or Asian Welsh: Pakistani	1428
26	W06000015	Cardiff	2	Aged 16 to 24 years	5	Asian, Asian British or Asian Welsh: Other Asian	1063
27	W06000015	Cardiff	2	Aged 16 to 24 years	6	Black, Black British, Black Welsh, Caribbean or African: African	1992
28	W06000015	Cardiff	2	Aged 16 to 24 years	7	Black, Black British, Black Welsh, Caribbean or African: Caribbean	173
29	W06000015	Cardiff	2	Aged 16 to 24 years	8	Black, Black British, Black Welsh, Caribbean or African: Other Black	358
30	W06000015	Cardiff	2	Aged 16 to 24 years	9	Mixed or Multiple ethnic groups: White and Asian	861



# Accessing the data

Source	Data selection	Geographical selection	Data format	Category selection	Historical data
NOMIS	List of tables with variable filters	Yes	Table(/s)	No	Yes but limited before 2011
ONS	List of pre-defined with variable filters Build a custom dataset	Yes	Line for each category	Yes	No
UKDS	List of tables with variable filters	Not currently	Line for each category	No	2025 planned common interface for 1961 – 2021 data with geographical subsetting



# Boundary data products

Focussing on England and Wales releases but broadly applicable to Northern Ireland and Scotland

# Accessing data

Provides data in SHAPEFILE, KML, Mapinfo TAB and CSV format. The data is open access so does not require registration.

- All boundaries for each country or UK
  - [Easy Download](#)
- Selected boundaries to subset dataset
  - [Boundary Data Selector](#)



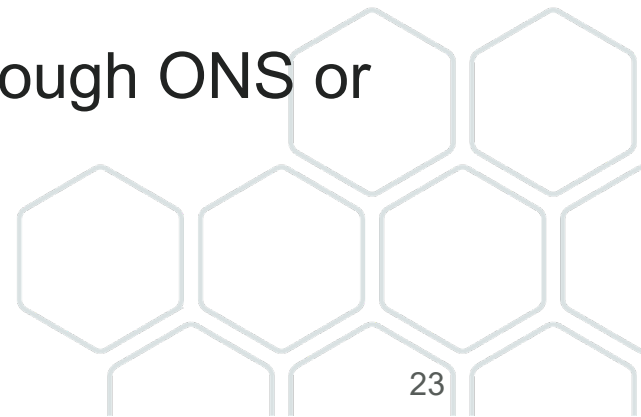
# Microdata products

Focussing on England and Wales releases but broadly applicable to Northern Ireland and Scotland

# Accessing data

Census microdata provides the potential for more complex multivariate analysis

- Open data is available from ONS and UKDS
- Safeguarded data is only available from UKDS and you need to be registered to access it
- Secure data is only available to accredited researchers and is subject to approval of your proposed research. It can be accessed through ONS or UKDS.



# Datasets

## Individual

- 1% **open access** at regional level (18 variables)
- 1% **safeguarded access** IPUMS (internationally deposited)
- 5% **safeguarded access** combined local authority (85 variables)
- 5% **safeguarded access** region (86 variables)
- 10% **secure access** local authority

## Household

- 1% **safeguarded access** household data at regional level (55 variables)
- 10% **secure access** local authority





# Flow data products

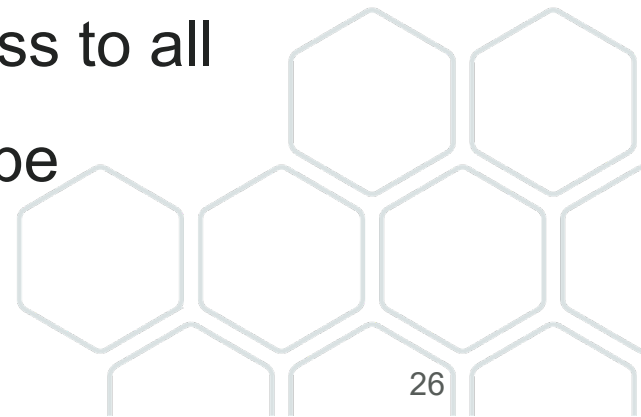
Focussing on England and Wales releases but broadly applicable to Northern Ireland and Scotland

# Flow data

Flow data provides datasets holding origin and destination data for analysis of commuting, internal migration, second homes and student term-time and home address together with individual level variables.

The safeguarded datasets for 1981 – 2011 are available from UKDS and a bulk download is available for 2021 [here](#).

A new interface is being developed and this will provide access to all data. It is expected to be released in early 2025 and we will be providing training and support materials.



# Supporting material

# Events

Regular programme of events on using census data targeted at researchers and analysts. Materials from previous events are available [here](#).



# Learning materials

Asynchronous learning materials are being developed and will become available through 2025. Current materials may have some useful information but will be greatly enhanced. They are available [here](#). In particular, there are explainers for key census variables.



# Some examples

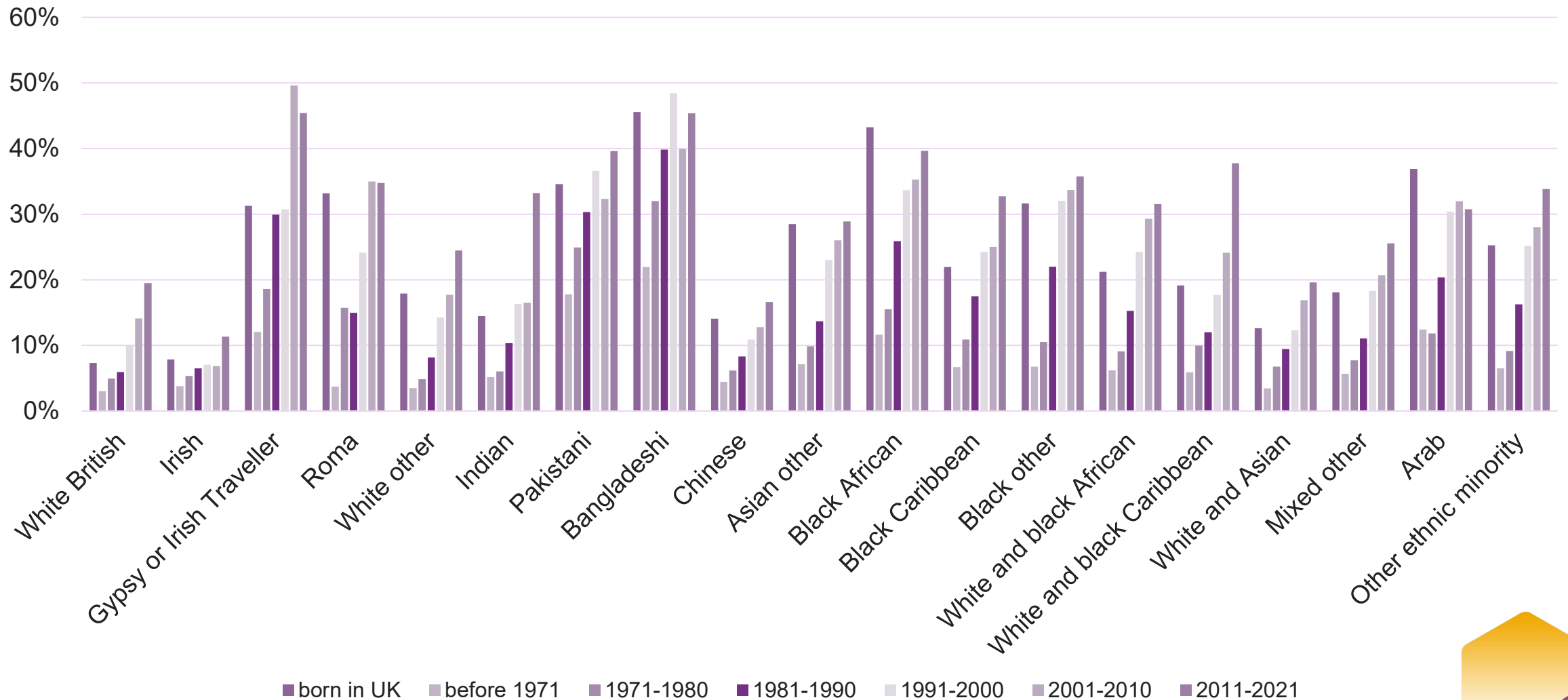
# Exploring housing deprivation

Ethnicity	Deprivation	
	Household	People
White British	992,023 (5%)	3,187,569 (7%)
White Irish	17,090 (6%)	34,328 (7%)
Gypsy or Traveller	5,125 (18%)	21,755 (33%)
Roma	9,453 (20%)	33,649 (34%)
White other	227,407 (14%)	714,485 (20%)
Indian	72,453 (11%)	315,580 (17%)
Pakistani	94,600 (19%)	534,117 (34%)
Bangladeshi	52,982 (25%)	276,610 (43%)
Chinese	18,002 (10%)	51,957 (13%)
Asian other	59,249 (16%)	242,868 (26%)
Black African	145,016 (22%)	552,041 (38%)
Black Caribbean	44,598 (12%)	122,873 (20%)
Black other	13,466 (15%)	90,122 (31%)
White and black African	9,372 (15%)	55,768 (23%)
White and black Caribbean	17,864 (12%)	98,215 (20%)
White and Asian	9,066 (9%)	61,974 (13%)
Mixed other	16,612 (12%)	85,213 (19%)
Arab	25,903 (19%)	102,081 (31%)
Other ethnic group	63,978 (16%)	241,929 (27%)

Nearly 7 million people (12%) and 2 million households (7%) experience housing deprivation\*.

\* Housing deprivation is defined as being overcrowded, lacking central heating, or sharing a kitchen or bathroom.

# Exploring housing deprivation (2)





# Exploring tenure change over time (1)

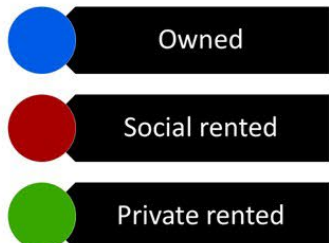
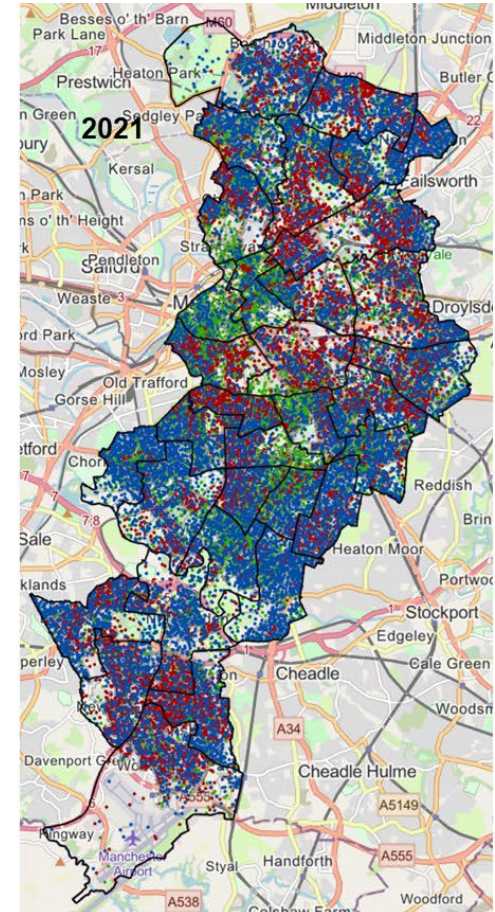
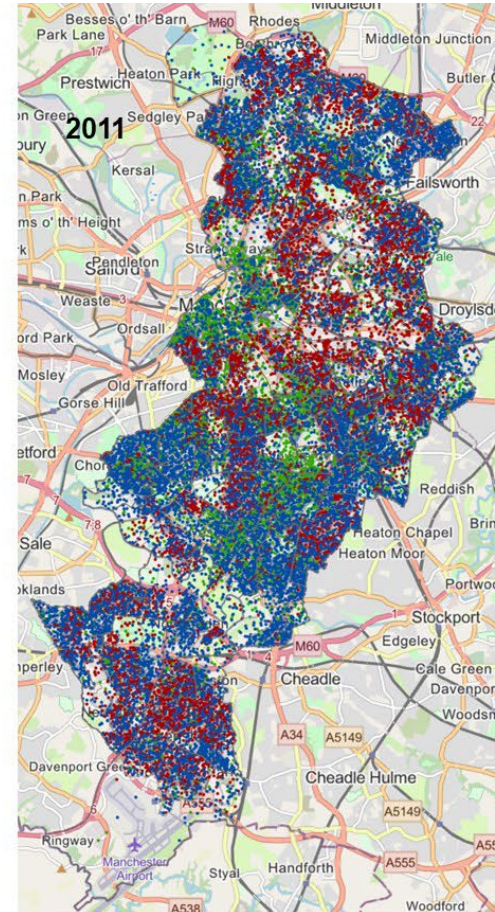
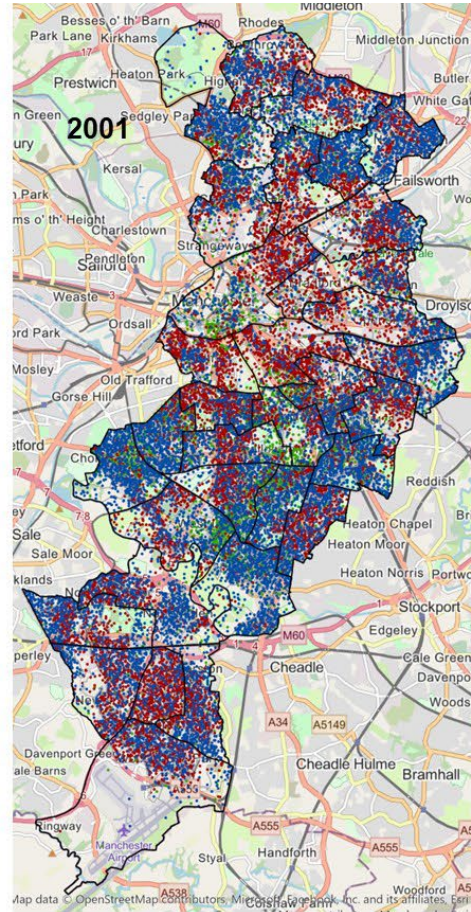
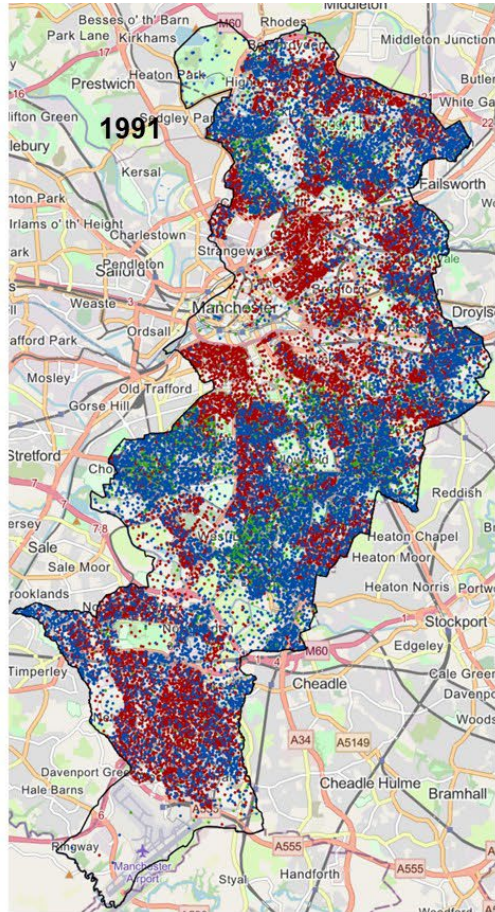
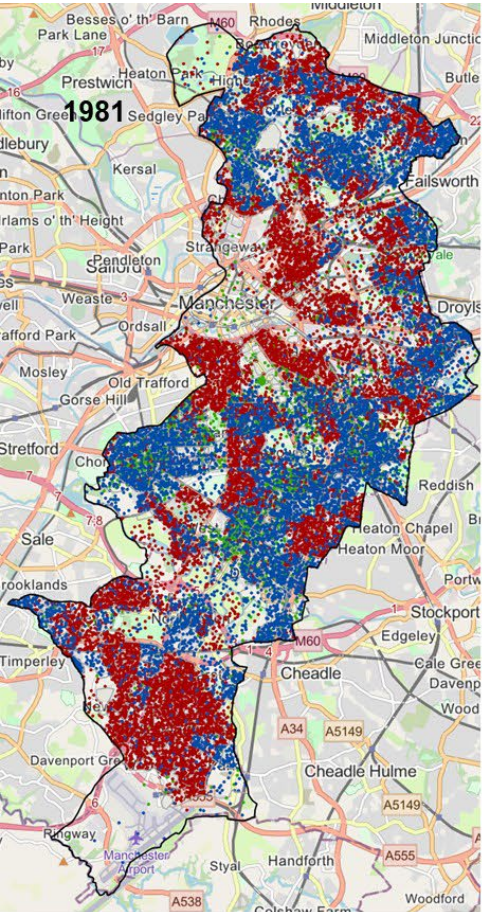
## Miles Platting (Manchester neighbourhood)

Tenure	2021	2011	2001
<b>Owns outright</b>	246	123	109
<b>Owns with a mortgage</b>	663	200	178
<b>Shared ownership</b>	25	6	11
<b>Social rent (council)*</b>	662	831	1,454
<b>Other social rent</b>	572	410	128
<b>Private rented</b>	993	334	130
<b>Rent free**</b>	51	15	92
<b>Households</b>	3,212	1,919	2,102

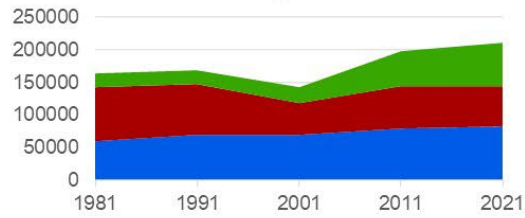
\* ONS suggest that this category is unreliable and recommend just using social rent

\*\* the figure is classified as other in the 2001 and 2011 census so not directly comparable

# Exploring tenure change over time (2)



Tenure change over time



# Reflections on using census data for teaching



# Any questions?

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