OPEN CITY AND THE FUTURE OF LONDON

Churning population? New ways of understanding population change in real time

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https://warwick.ac.uk/fac/soc/sociology/research/projects/isc/opencity/

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Outline

- Introduction
- Churn: 1981-2011 (Census data trends)
- Churn: 2011- present day (Consumer data based)
- Conclusion and discussion

Introduction

Why does churn matter

- Knowing the population and the quality of services
- Capitation and budget estimates based on headcounts
- Democracy and community engagement

The scale of churn in London

- Scale of change: the 2011 census showed that in some parts of London almost half of the population churned in a single year before the census date

Introduction

There are multiple causes of churn

- Dynamics of population growth, migration into, away from and within the city, tenure change, gentrification, ‘white flight’

There are multiple types of churn: one typology

- ‘escalator’ areas, where residents whose circumstances improve move out of the area
- ‘gentrifier’ areas, where better off households move into the area
- ‘transit’ areas, where households move in and out, to and from less deprived areas; and
- ‘isolation’ areas, where households move in and out, to and from similarly or more deprived areas.

(DCLG, Scanlon, Travers and Whitehead, 2010)

Measuring population churn

Population churn

- long-term international inflow + long-term international outflow
- internal inflow + internal outflow
- movement within the area

Population turnover

- long-term international inflow + long-term international outflow
- internal inflow + internal outflow

- NB: this is the way Camden Council used to define ‘churn’:

  Churn measures migration flows relative to population size, calculated as the sum of in- and out-migration divided by the total population. Churn is 28% in the year to mid-2019 but includes university student moves to and from Camden (Camden profile, 2021)

London’s churning population

Evidence from the Censuses

- Overview
- Census-based churn rates
- Characteristics of churning population

Churn rates by borough (1981-2011)

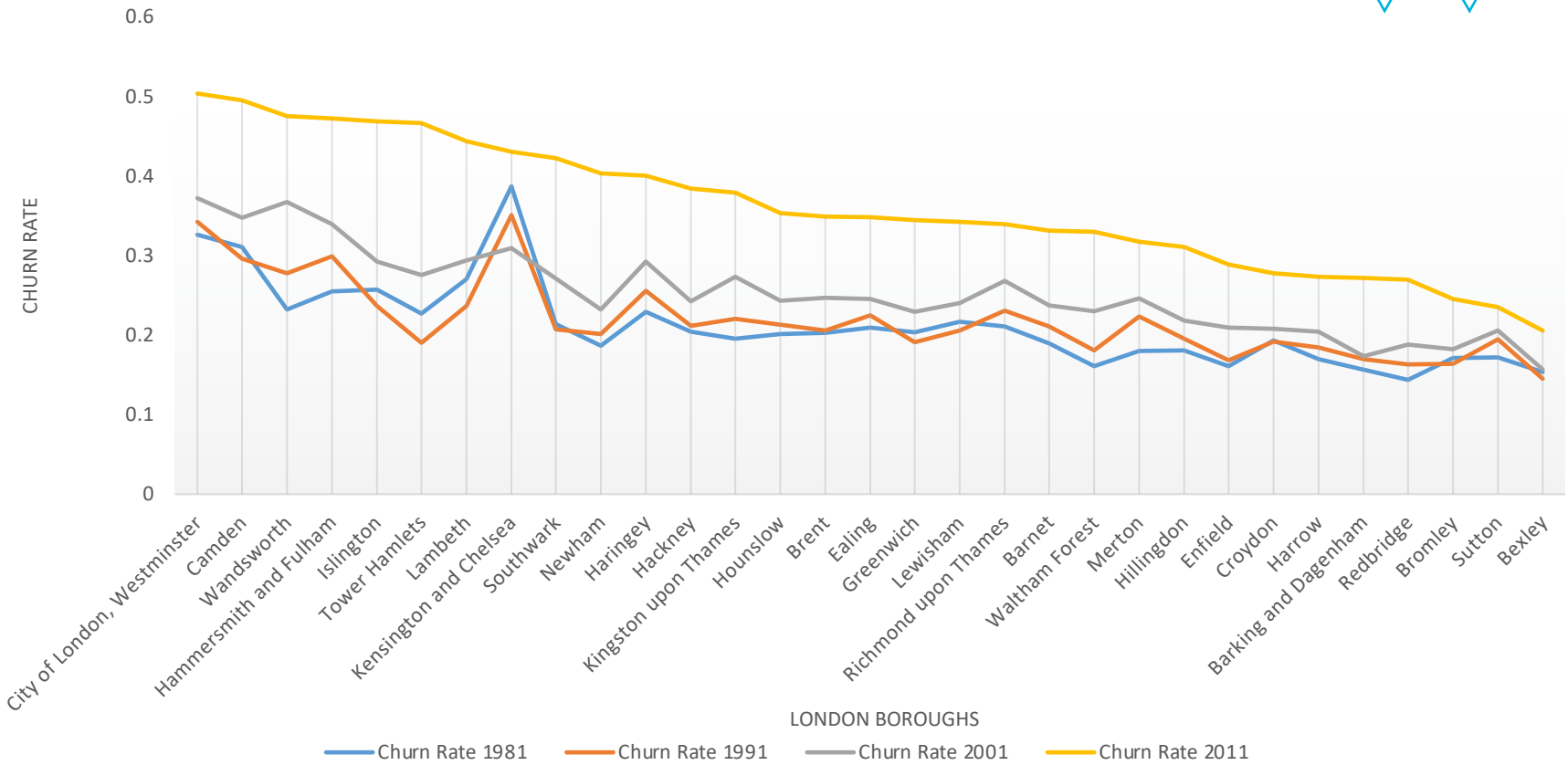


Figure 1 Churn rates by borough (Source: 1981, 1991, 2001 and 2011 Census)

Changes in churn rates by borough (1981-2011)

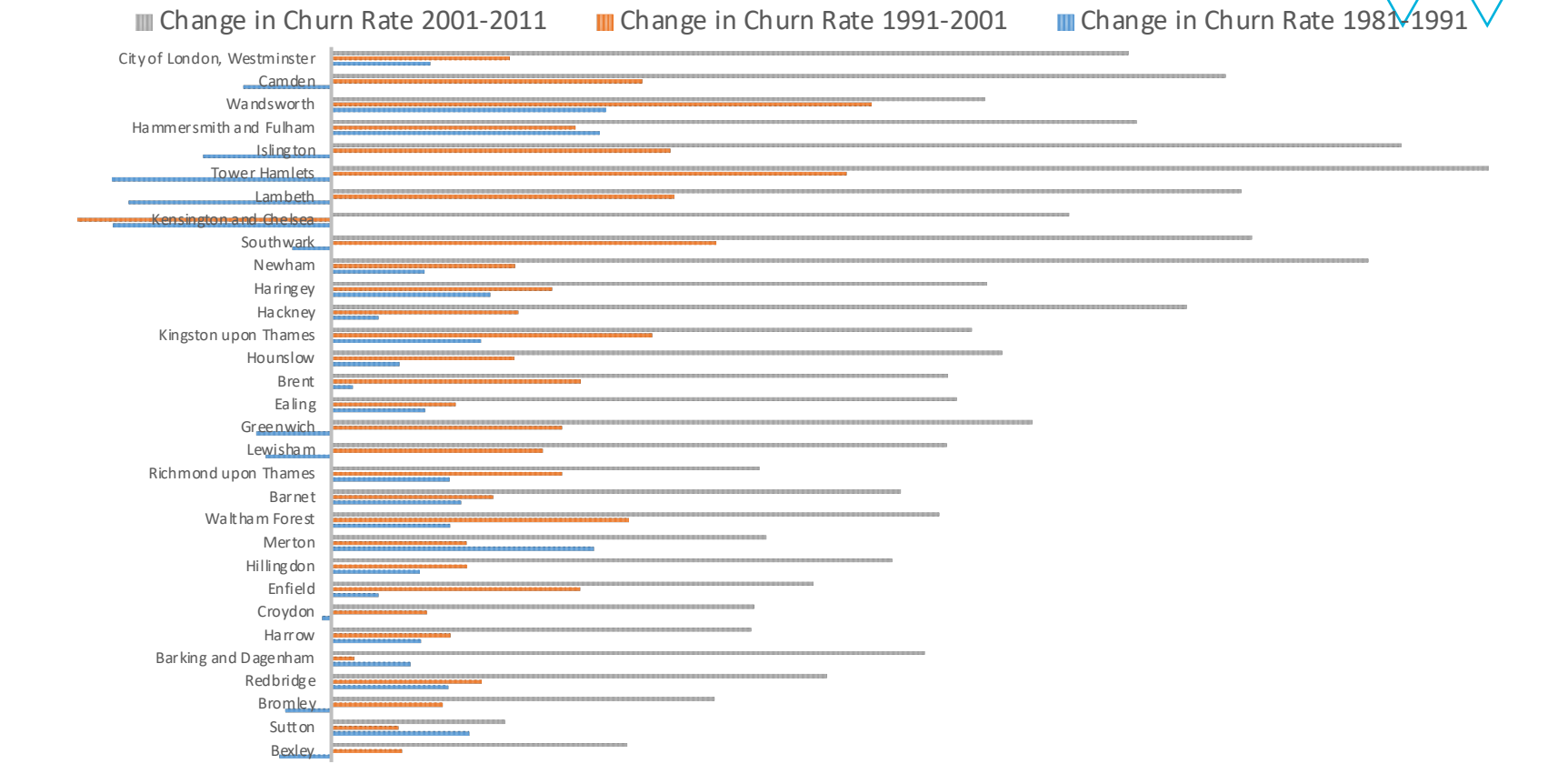


Figure 2 Change in churn rates by borough (Source: 1981, 1991, 2001 and 2011 Census)

Churn rates by borough (1981-2011)

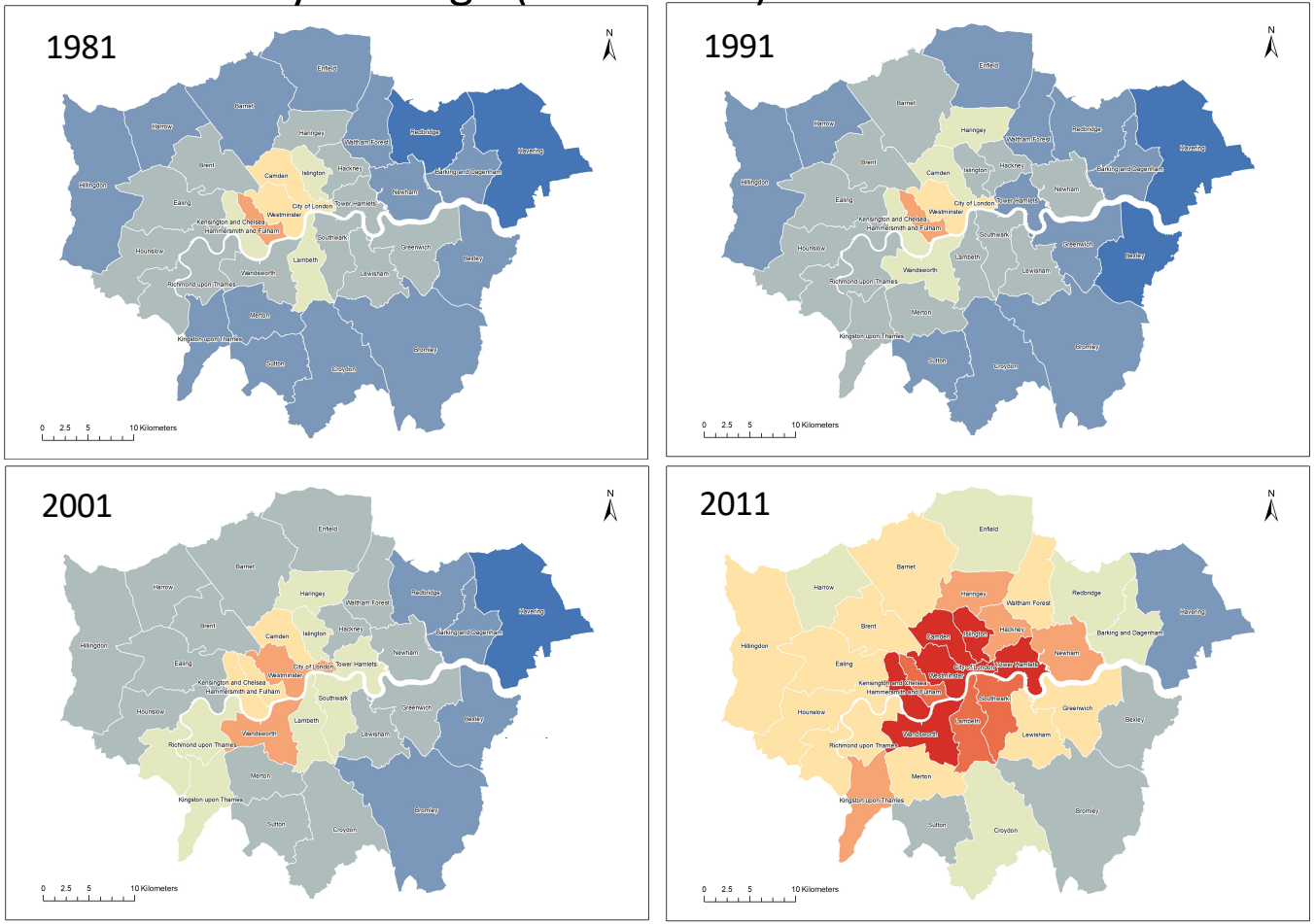
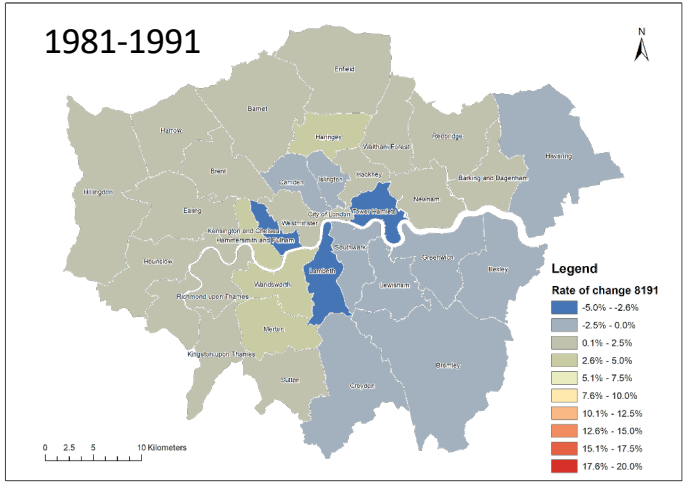
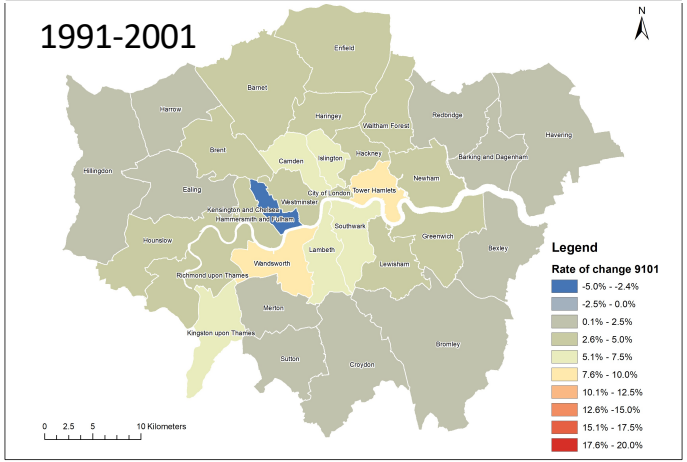


Figure 3 Distribution of churn rates by borough (Source: 1981, 1991, 2001 and 2011 Census)

Changes in churn rates by borough (1981-2011)





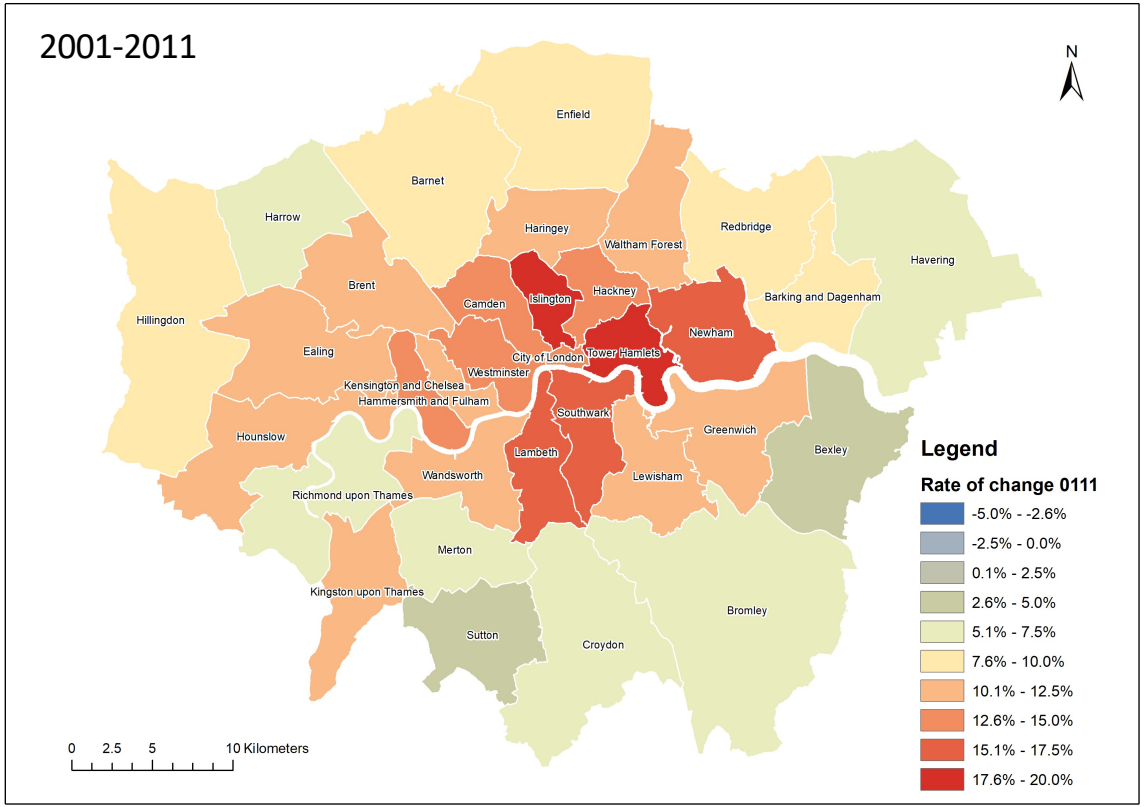


Figure 4 Distribution of change in churn rates by borough (Source: 1981, 1991, 2001 and 2011 Census)

Characteristics of churning population

- Inter-regional flows

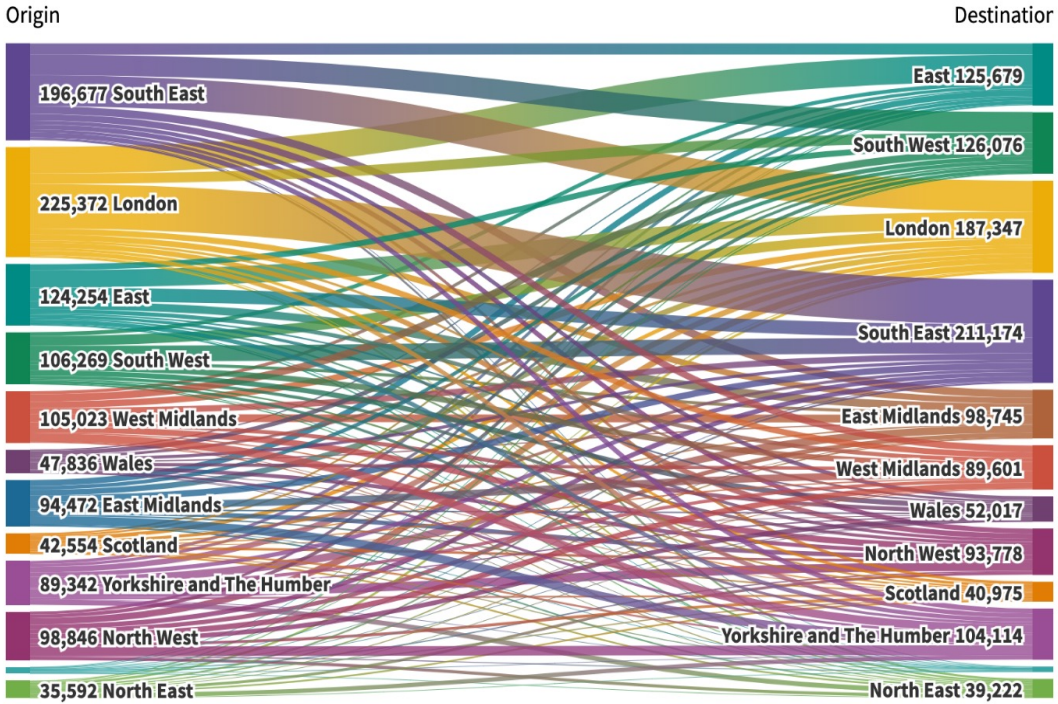
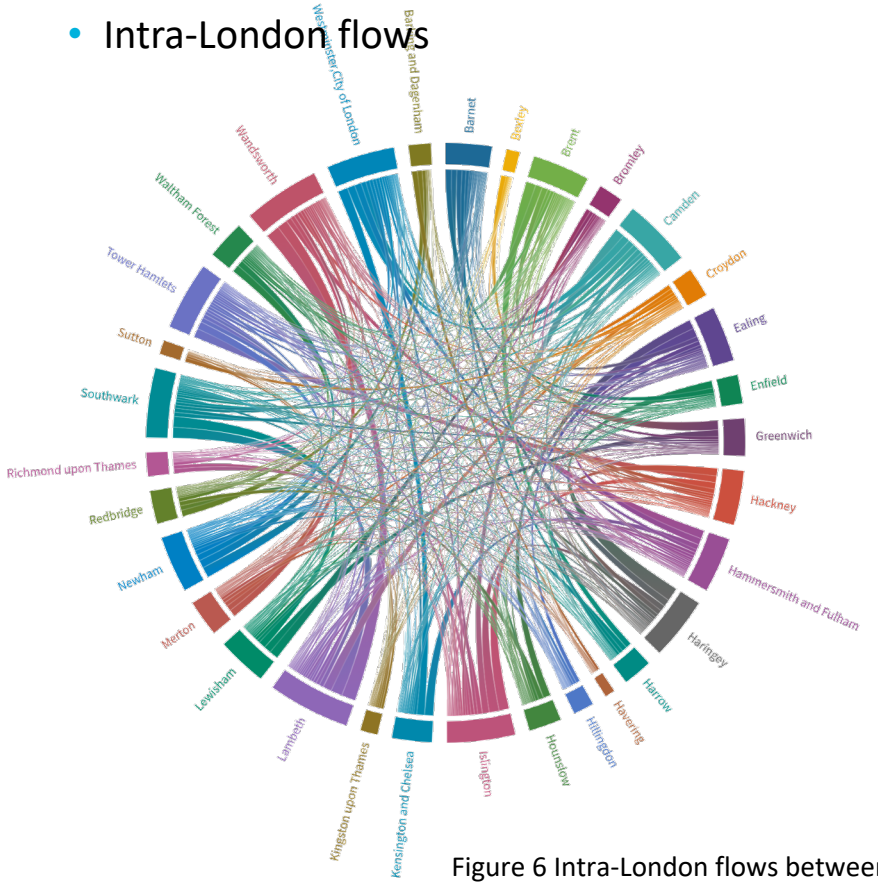


Figure 5 Inter-regional flows between London and other UK regions (Source: 2011 Census)

Characteristics of churning population

- Intra-London flows



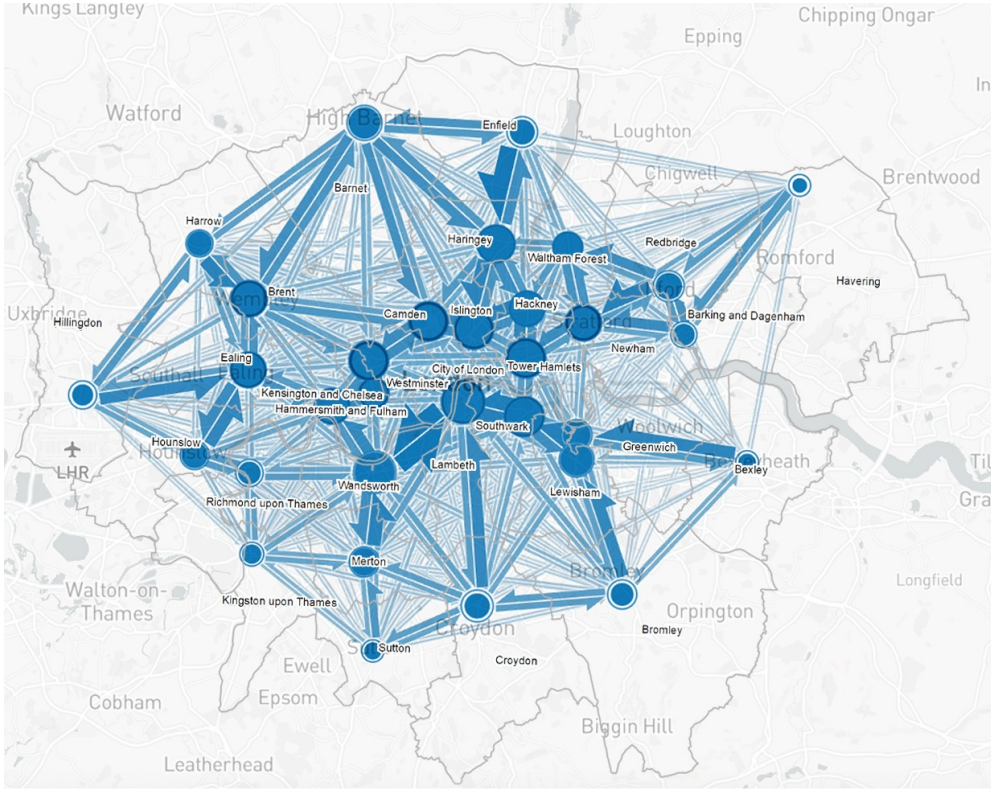
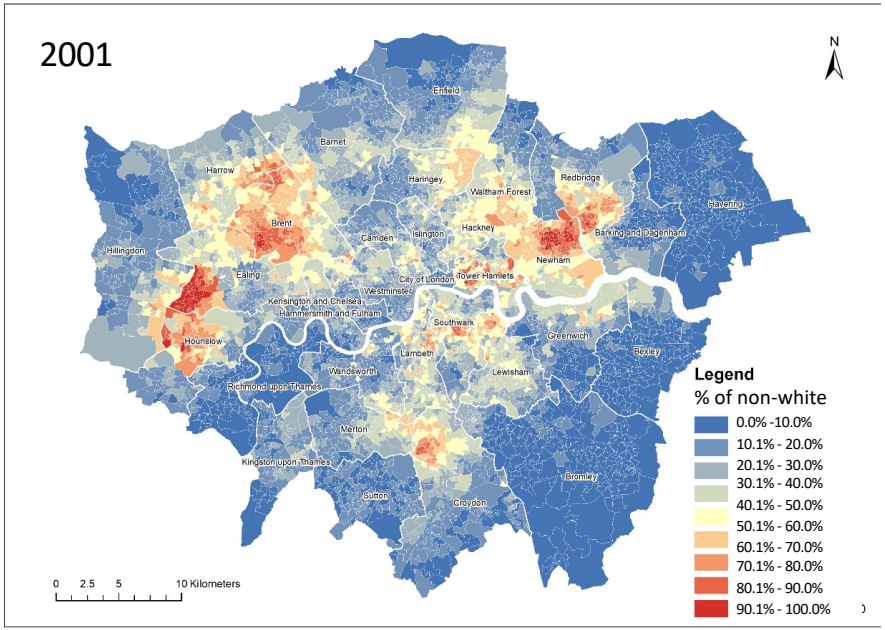


Figure 6 Intra-London flows between London boroughs (Source: 2011 Census)

Characteristics of churning population

- Ethnicity (white vs. other ethnic monitories)



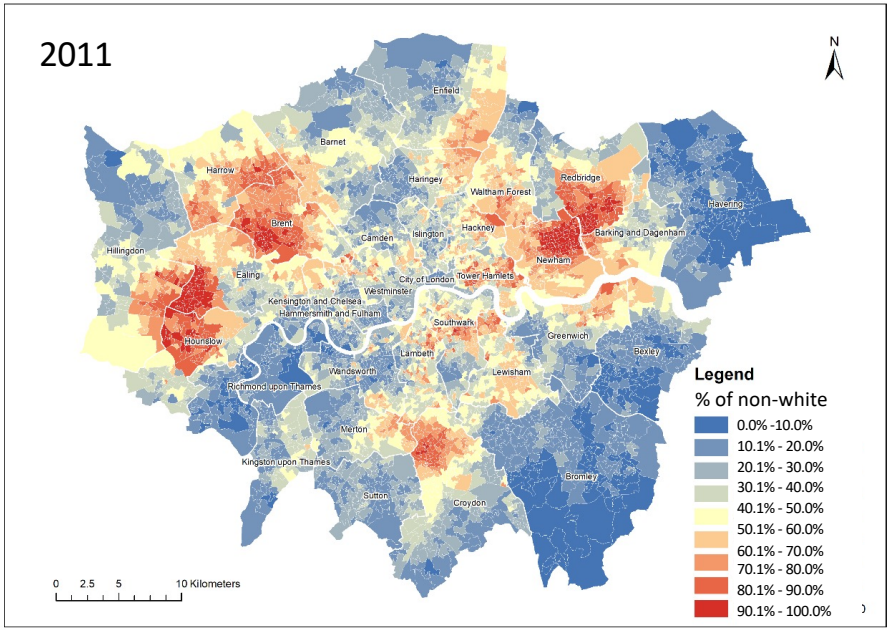


Figure 7 Distribution of other ethnic minority population in London (Source: 2001 and 2011 Census)

Characteristics of churning population

- Ethnicity (white vs. other ethnic monitories)

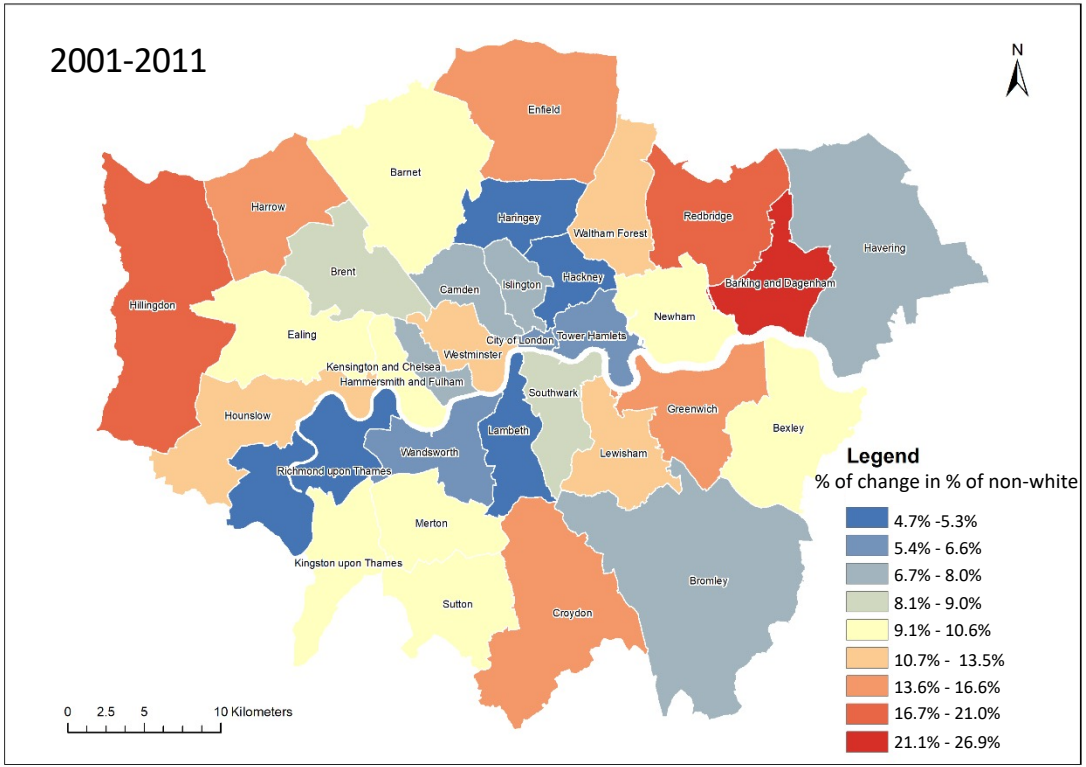


Figure 8 Change in the share of non-white population in London (Source: 2001 and 2011 Census)

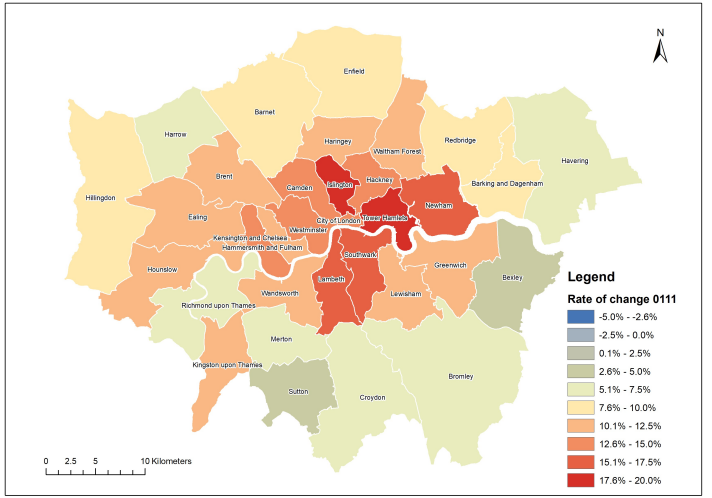
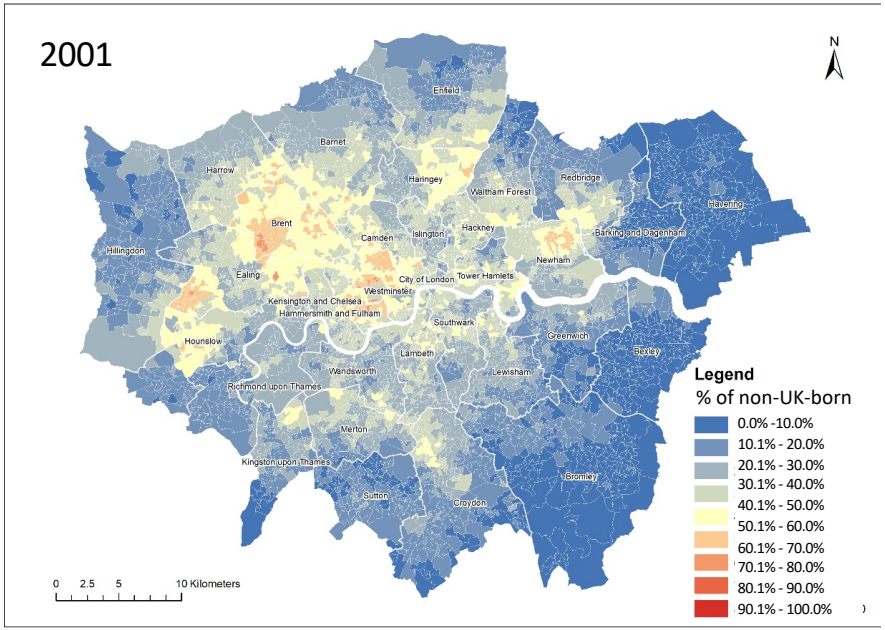


Figure 4-1 Distribution of change in churn rates by borough (Source: 2011 Census)

Characteristics of churning population

- Country of birth (UK vs. non-UK born)



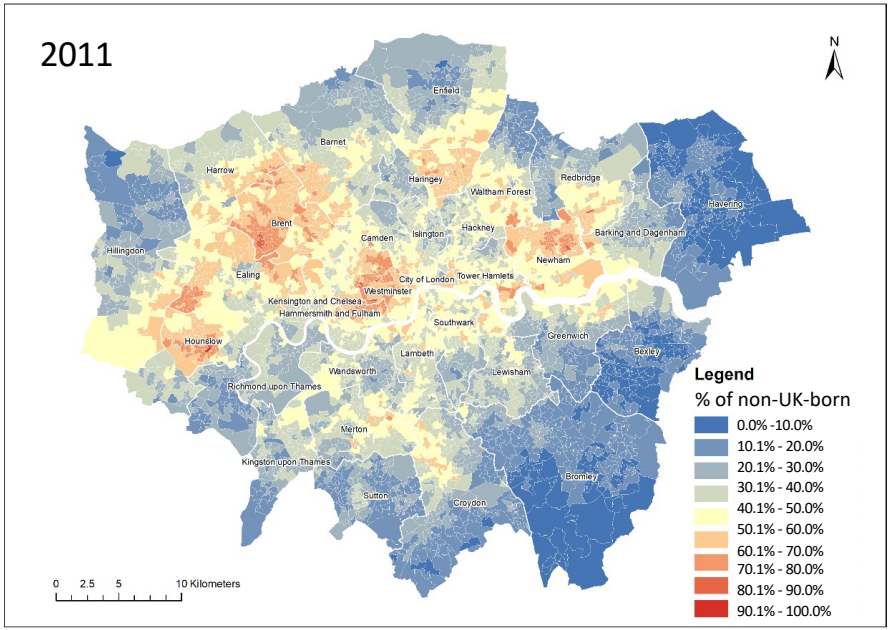
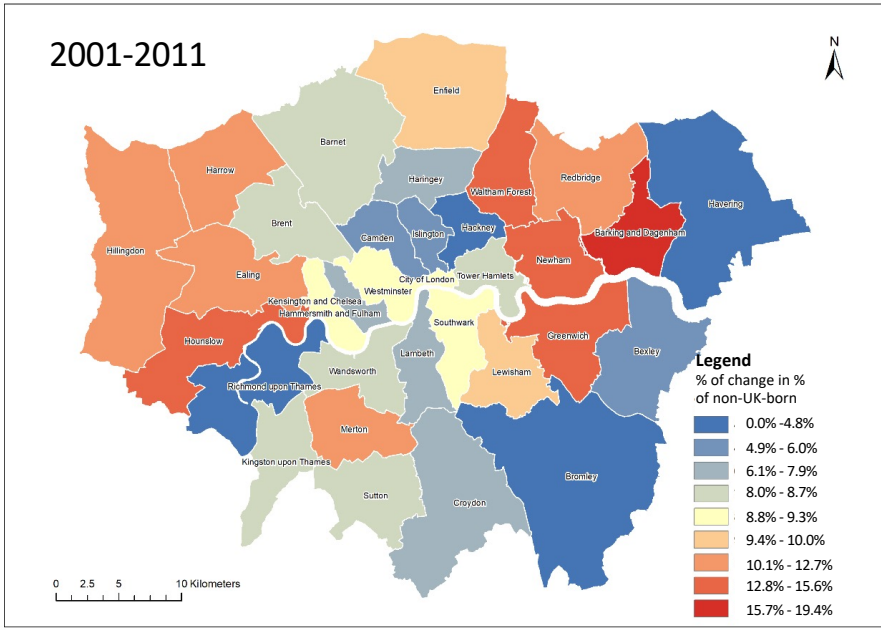


Figure 9 Distribution of non-UK-born population in London (Source: 2001 and 2011 Census)

Characteristics of churning population

- Country of birth (UK vs. non-UK-born)



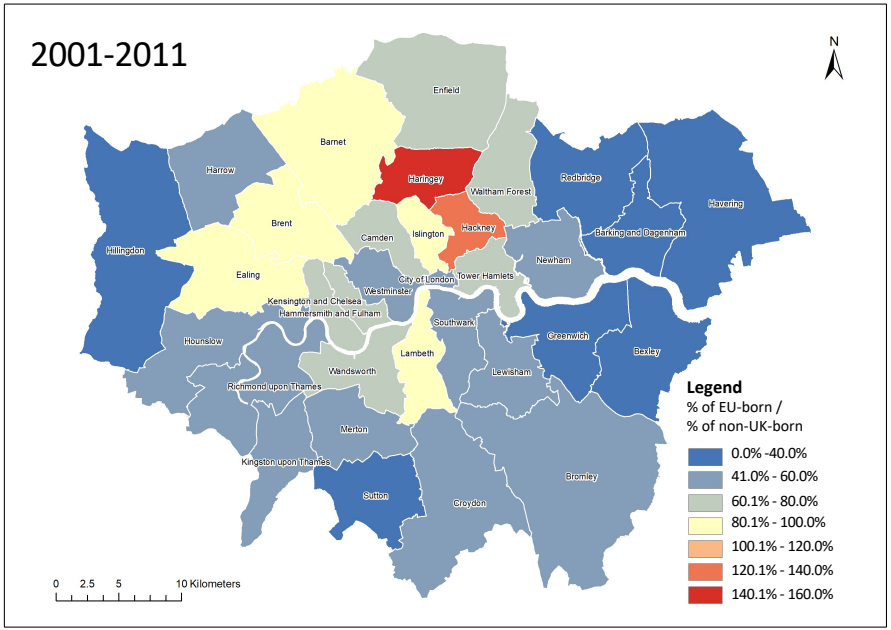
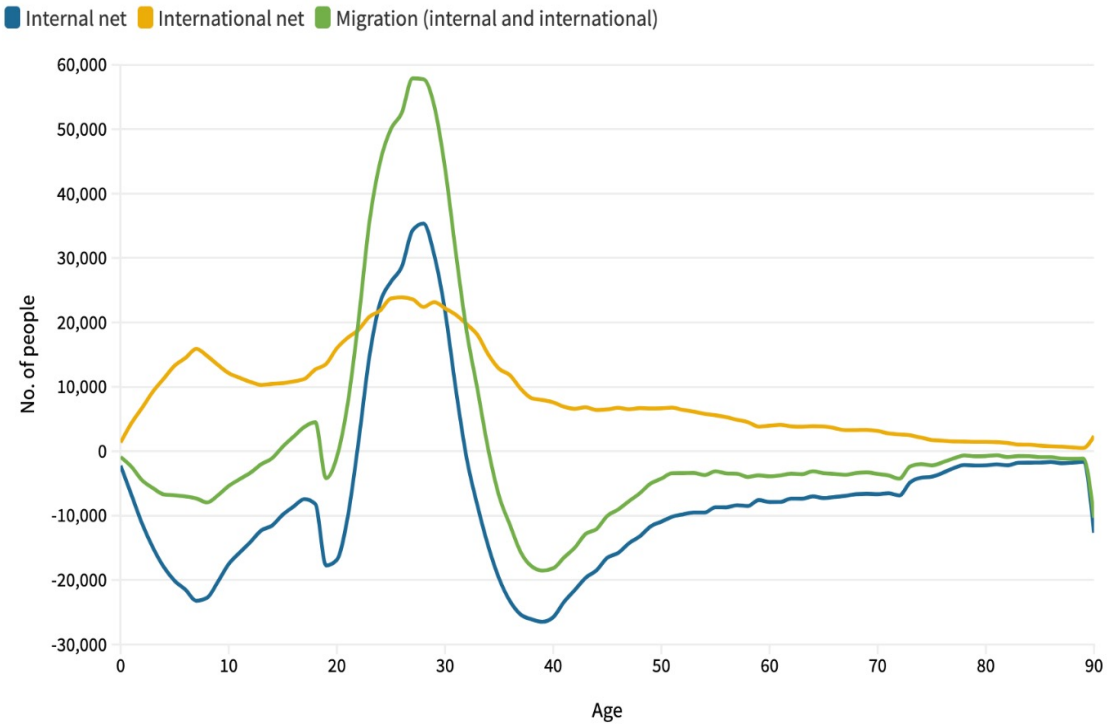


Figure 10 Change in the share of non-UK-born population (left) and EU-born population (right) in London (Source: 2001 and 2011 Census)

Characteristics of churning population

- Age



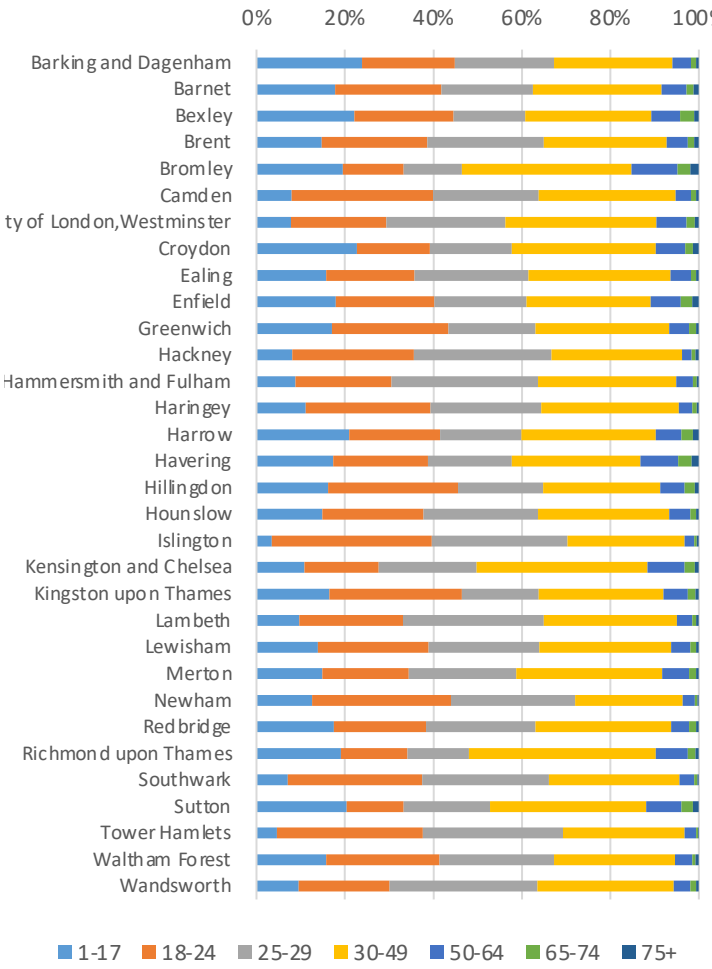


Figure 11 Churning population in London by age groups (Source: 2019 ONS population estimates and 2011 Census)

Characteristics of churning population

- Length of time in the UK (international migrants)

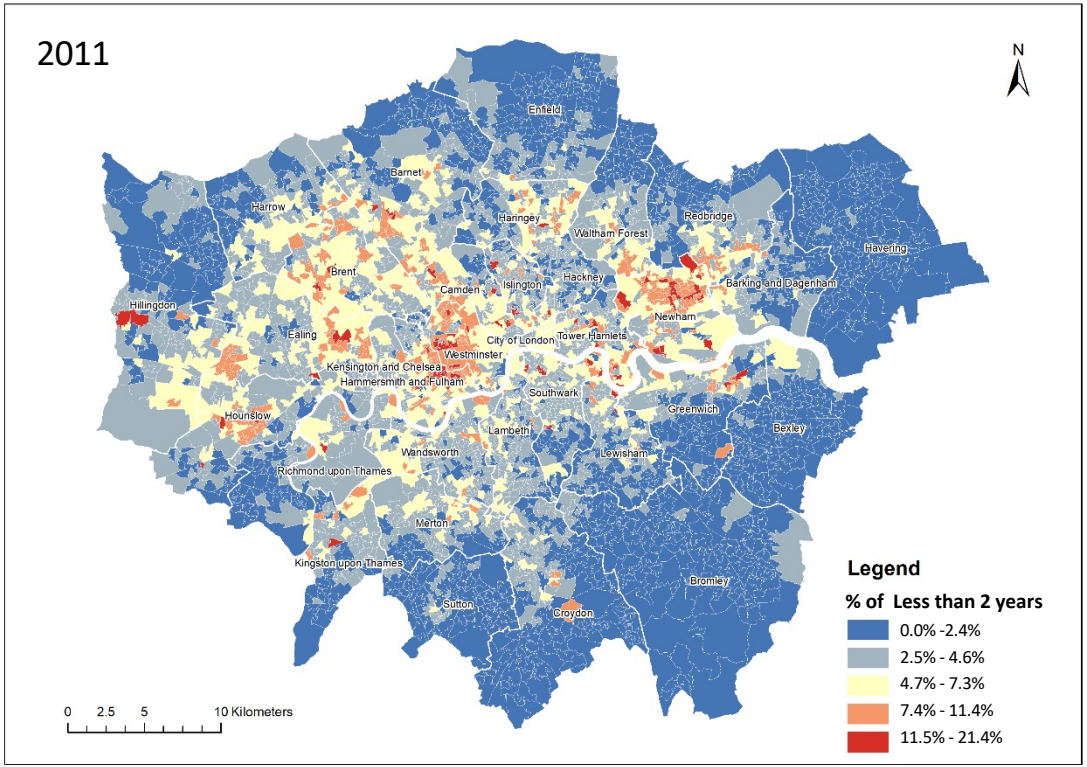


Figure 12 Distribution of new-comers (less than 2 years in the UK) in London (Source: 2011 Census)

Learning from Census trends

Multiple aspects to study, two striking features:

- Accelerated rates of change and churn across London; 2011 Census reports significantly higher rates of churn compared to 1981-2001
- Emerging new geographies of London; all parts of London see increases in churn, but the rates of increase are the greatest in newer areas of migration

Advantages of Census-based churn analysis

High spatial granularities

- Snapshots of residential moves, very accurate at the local level
- They help analyse long term trends of and differences in population churn and turnover between areas at a point in time.

Limitations of Census (and existing publicly available population statistics)

Census: low temporal granularities

- Census data cannot be relied upon to provide information on rapidly changing areas and/or population groups and do not give up-to-date information on population trends.
- How to track recent changes? Recent immigrants, potential effects of Brexit and Covid?

Other publicly available population statistics: low spatial granularities

- Local-level estimates often come with substantial margins of error
- Leaving a large proportion of short-distance moves under-documented

London’s churning population

New insights from the Residential Mobility Index (Consumer data based)

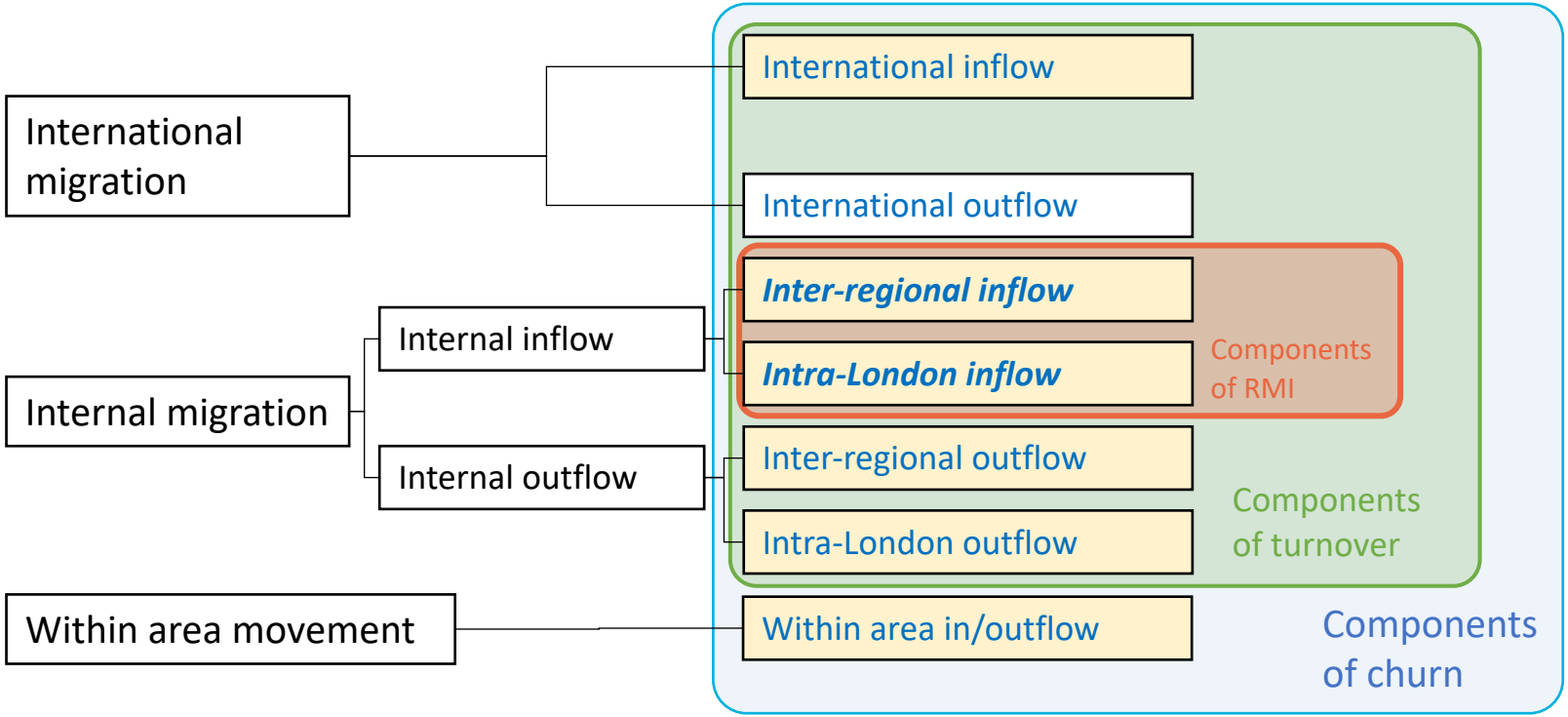
- Overview: what is Residential Mobility Index (RMI)?
- RMI and Census migration data
- RMI across London boroughs and neighbourhoods

Residential Mobility Index (CDRC)

- An experiment in new data gathering (big data)
  - Consumer registers, covering populations assenting to inclusion on the contact lists of services or goods
  - Public versions of UK electoral registers
  - Land registry house sale data (for validation)

- Estimation of **the first and last year** of which a household moved into and out of a property at a particular address
- A yearly estimate of **the proportion of households that are different** to those in the reference year (2020)

Comparisons across churn measures: Census v RMI



Census Migration data | Inflow | ONS Local Area Migration Indicator | ***Inflow*** | CDRC Residential Mobility Index

RMI and Census migration data: understanding the similarities

- **A strong and positive correlation between annual RMI and internal inflow rate**, (r=0.62, p<0.001).
- Absolute values: RMI underestimates population churn. The ratios between annual RMI and internal inflow rate are between 22.4% to 50.4%.
- Rankings: **for most London boroughs, their relative levels of annual RMIs correspond to their relative levels of internal inflow**.

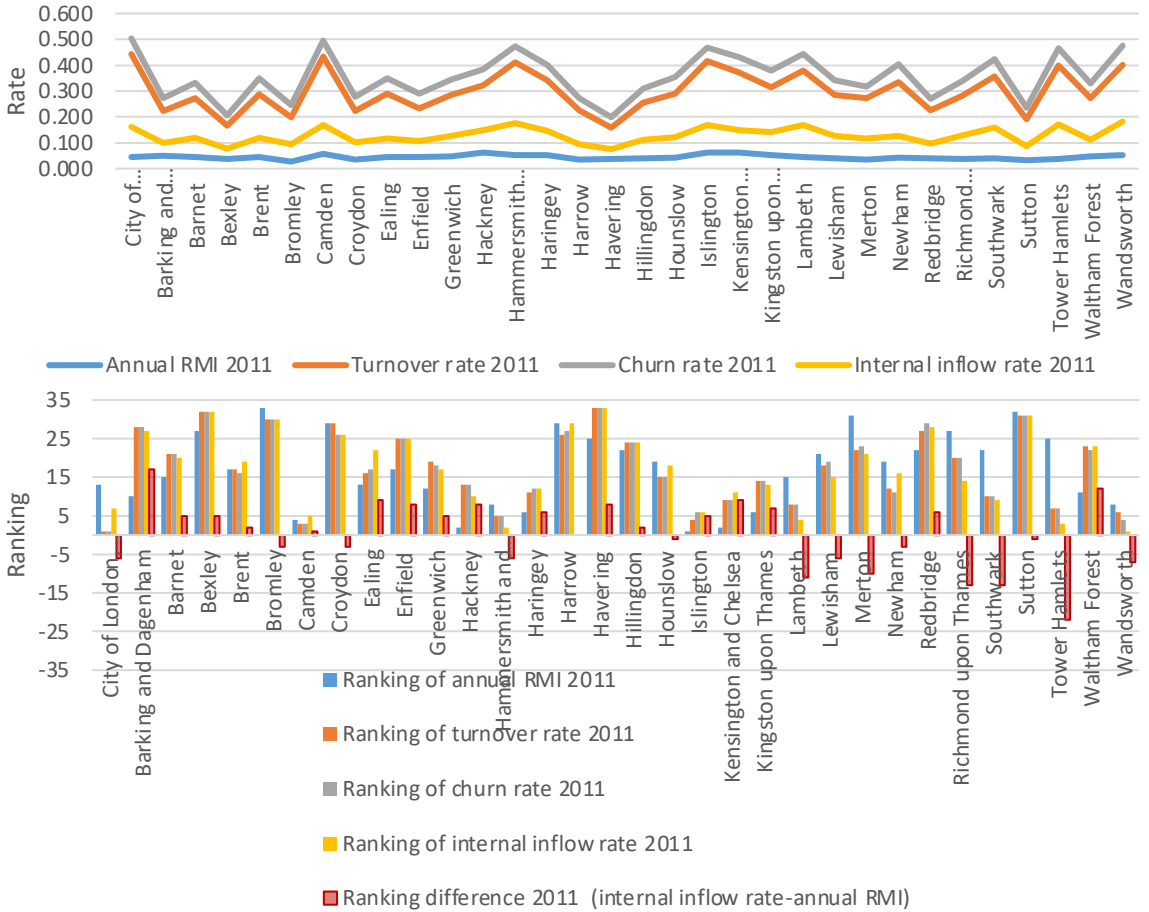


Figure 13 Comparison across scores (top) and rankings (bottom) of annual RMI and multiple mobility rate, London boroughs, 2011 (Source: RMI, 2011 Census)

RMI and Census migration data: understanding the differences

Strong correspondence between RMI 2011 and migration data from 2011 Census
The RMI has the potential to fill in some of the gaps left by currently publicly available data and supplement conventional population statistics

- The combination of multiple data sources at the address-level enables the RMI to capture changing patterns of residential mobility in London at a high spatial and temporal granularity (van Dijk & Longley, 2021).

However

- We did not find statistically significant relationships between annual RMI 2001 and 2001 Census migration rates ($r=0.04$, $p>0.05$).
- For some boroughs, differences in ranking are significant

RMI and Census migration data: understanding the differences

- Compared to internal inflow rankings, lower annual RMI rankings (i.e. negative differences, coloured in blue) were mostly reported by boroughs in Central and South London
- Higher annual RMI rankings (i.e. positive differences, coloured in red or amber) were mostly reported by Outer London boroughs in East and North London

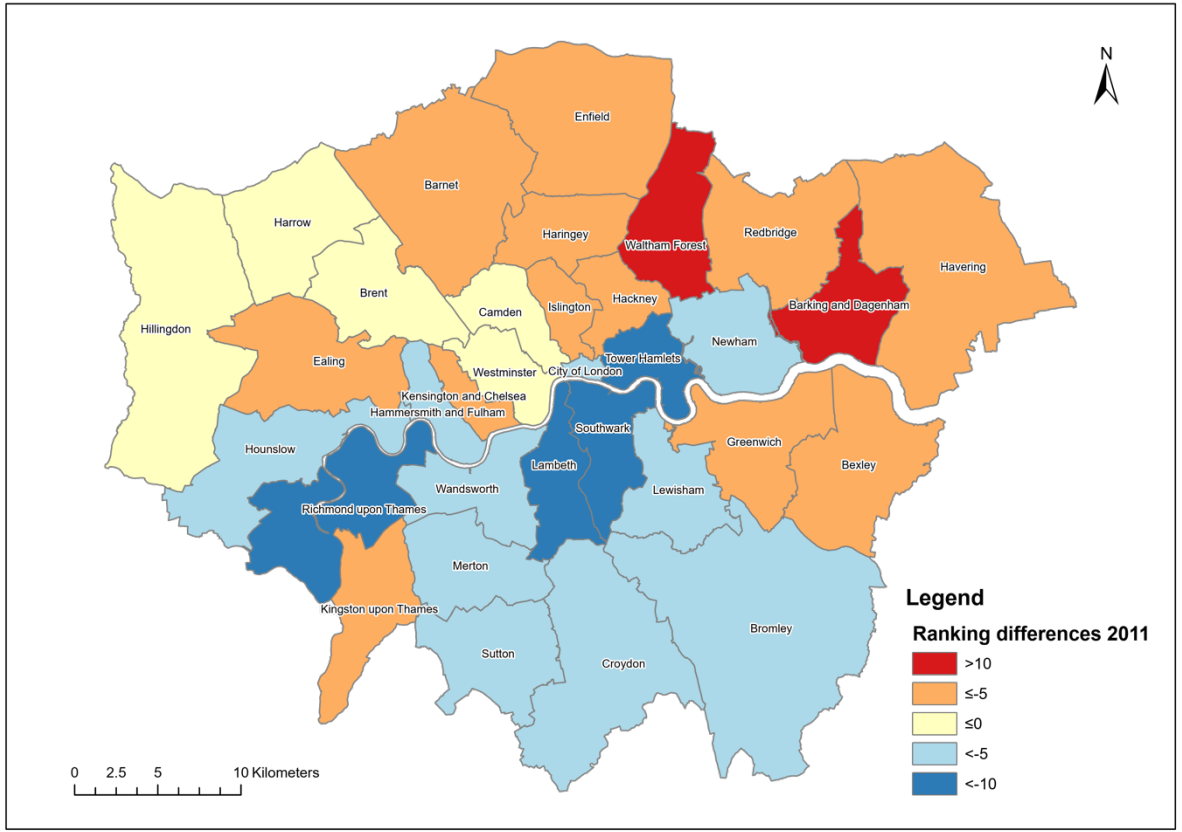


Figure 14 Distribution of ranking differences across London boroughs (Source: CDRC RMI, 2011 Census)

Residential Mobility Index (CDRC)

Pros

High temporal granularity: the RMI is able to reflect the annual (dis)continuity of residence, allowing us to monitor changes in patterns of internal migration over the past decades

High spatial granularity: the RMI provide 'highly granular inventories' of local populations and their movement at the address-level.

Cons

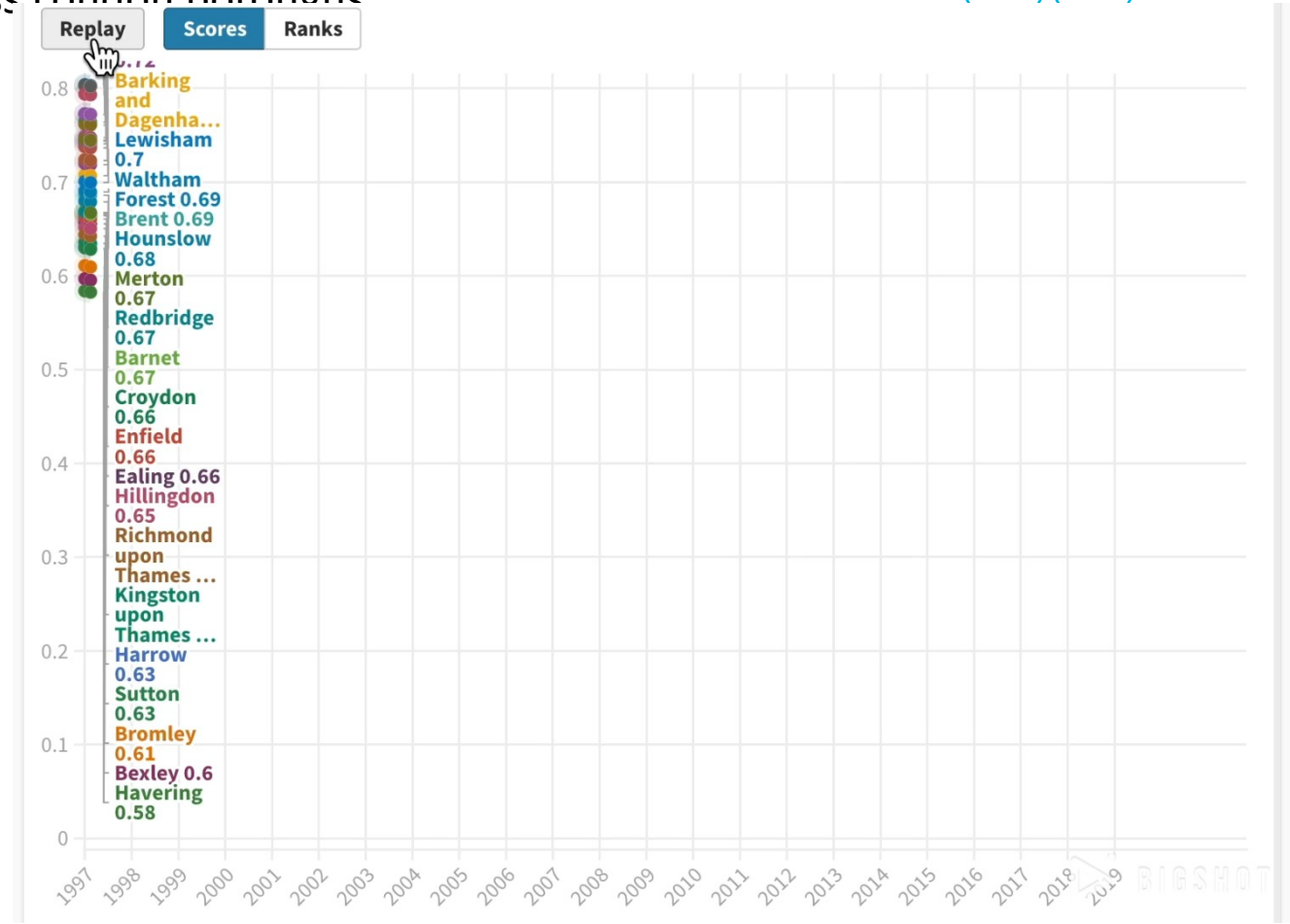
A limited measure of in-migration

Less accurate before 2011 (no statistically significant relationship found between 2001 RMI and 2011 Census churn rates)

Systematic biases associated with the two registers underlying the RMI

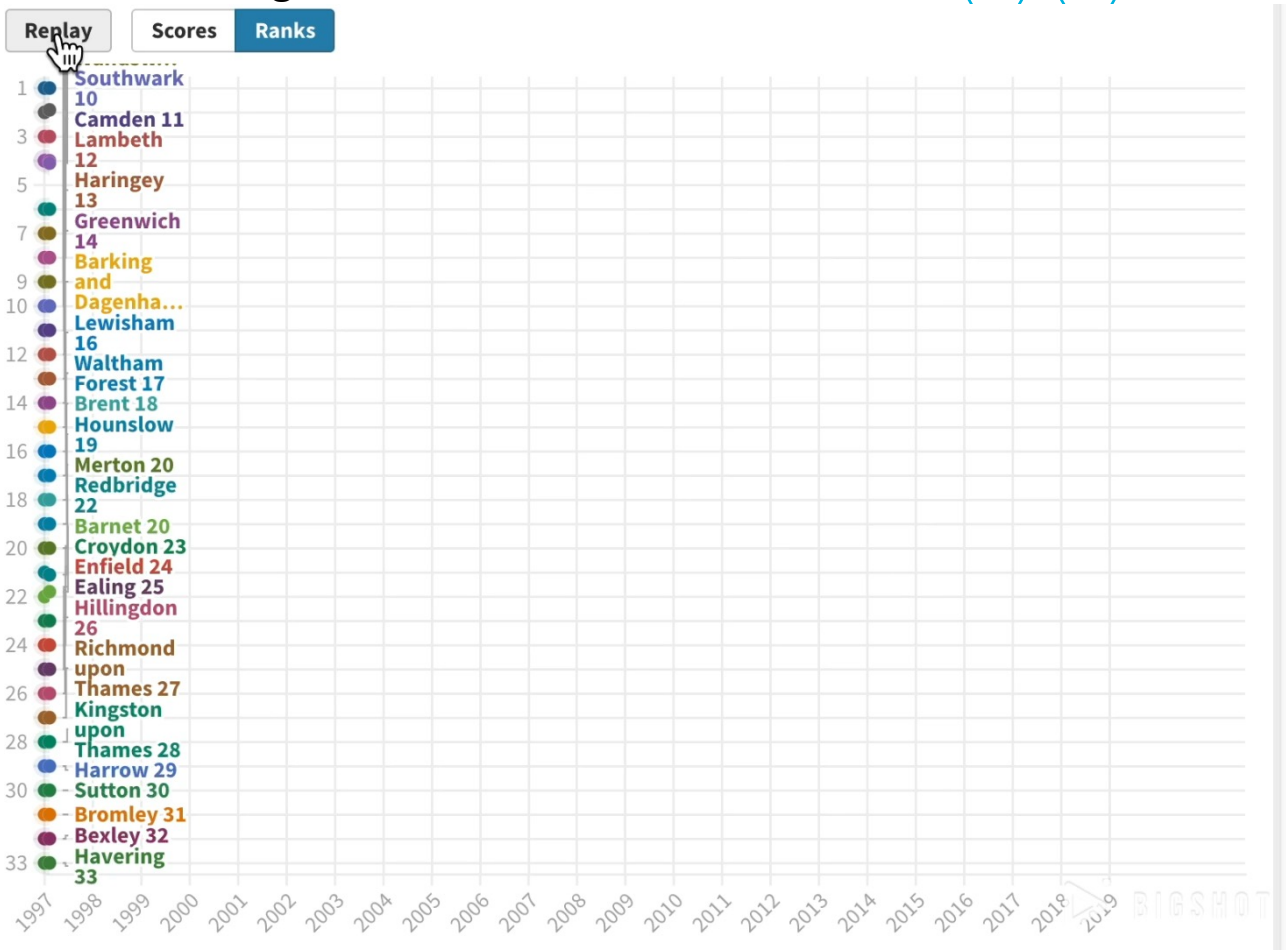
Trends of RMI across London boroughs

Overall trends



Trends of RMI across London boroughs

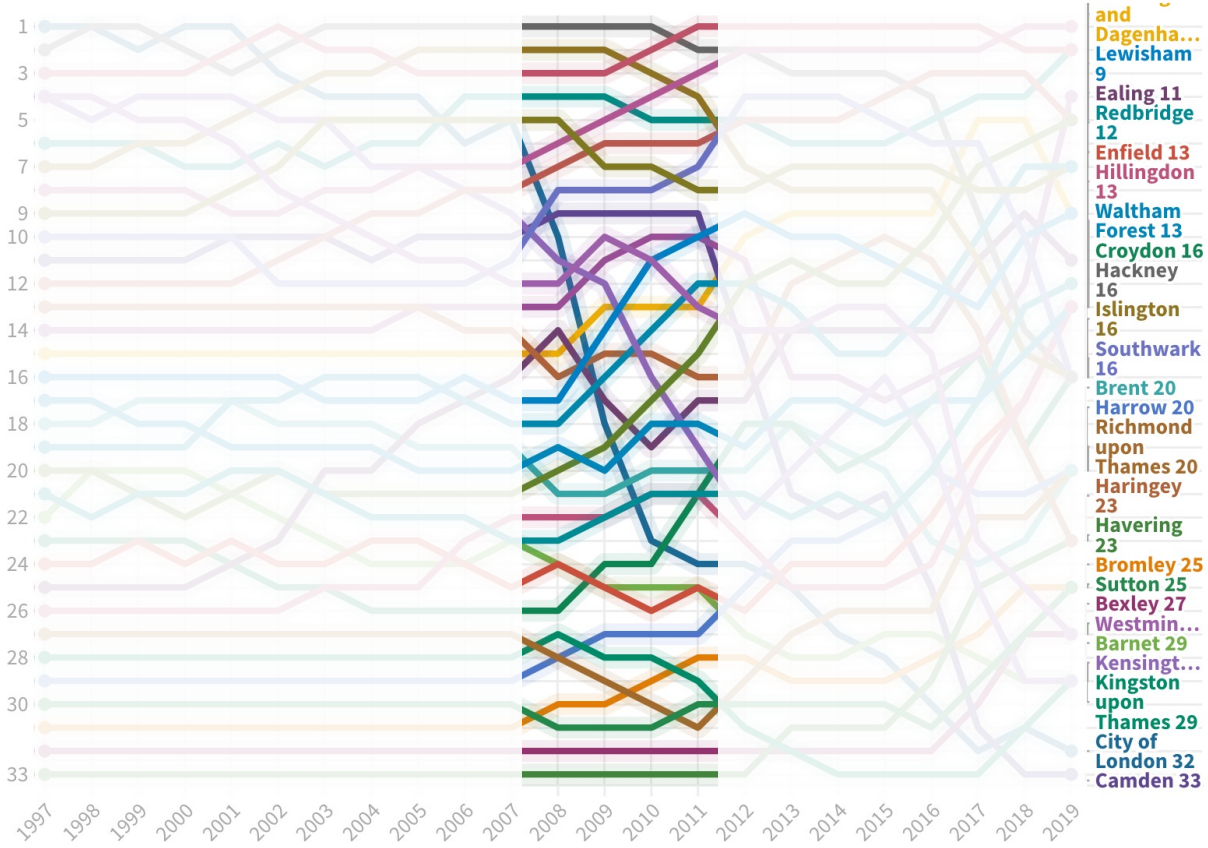
Overall rankings



Trends of RMI across London boroughs

Overall rankings

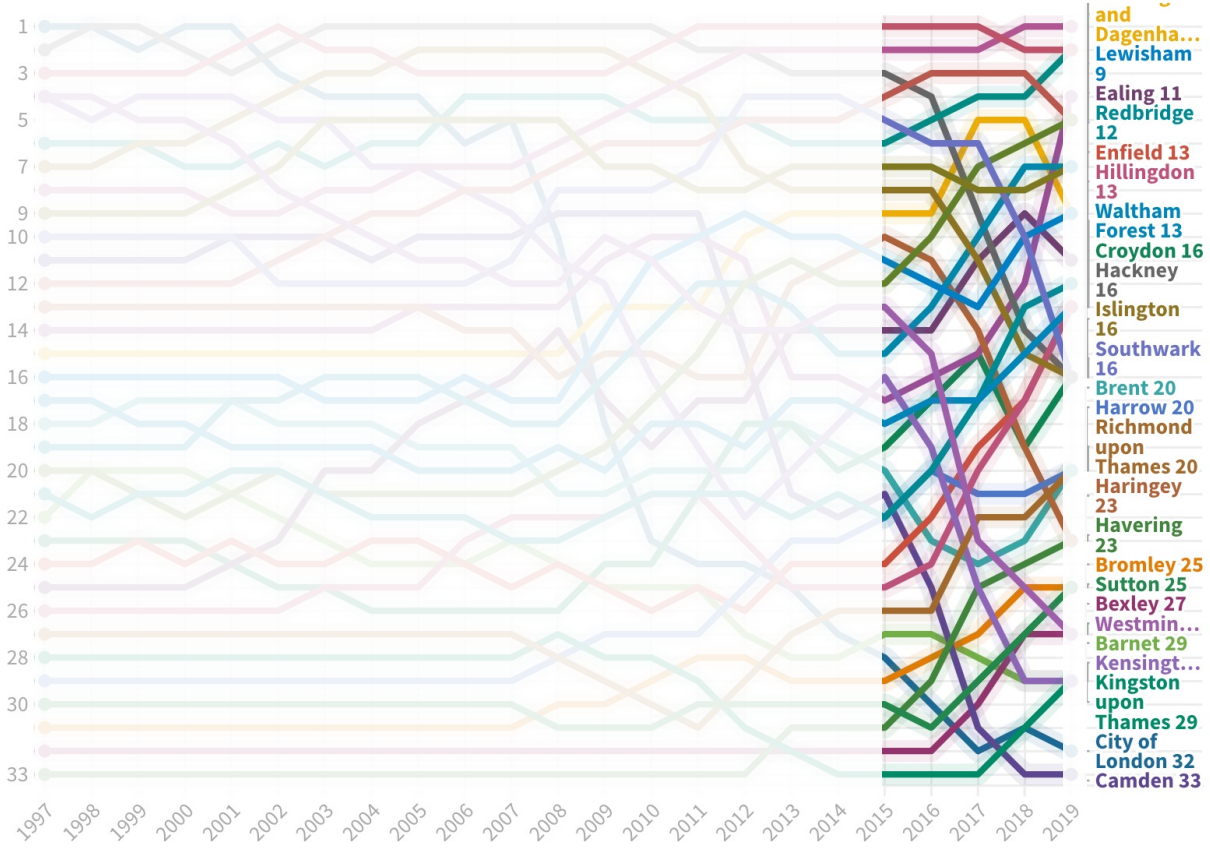
- Key moment 1: the 2008 financial crisis



Trends of RMI across London boroughs

Overall rankings

- Key moment 2: Brexit



Clustering London boroughs by mobility trajectories

We classified London boroughs into three groups according to their initial RMI rankings in 1997:

- Higher mobility: 1-10th
- Mediumish mobility: 11-25th
- Lower mobility: 26-33rd

We evaluated how RMI rankings changed over time, and identified four types of changes:

- Sharp increase (+10 change in avg. ranking)
- Sharp decrease (-10 change in avg. ranking),
- Slight increase (+5 - +9 change in avg. ranking), and
- Relative stability or fluctuation (change in avg. ranking between -5 and 5, or a mixture of positive and negative changes).

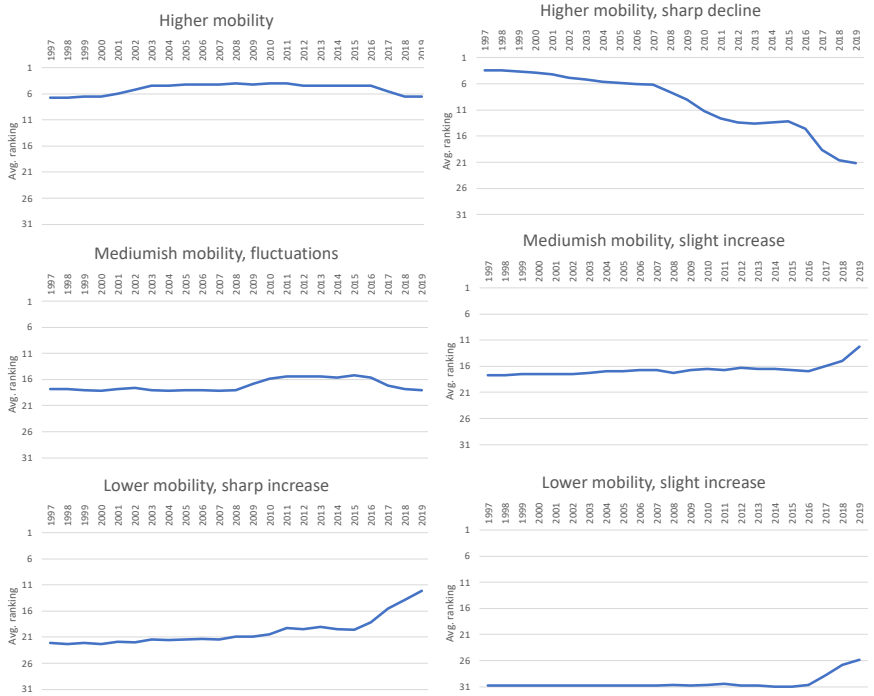


Figure 15 Six RMI clusters and their characteristics (Source: CDRC RMI)

Clustering London boroughs by mobility trajectories

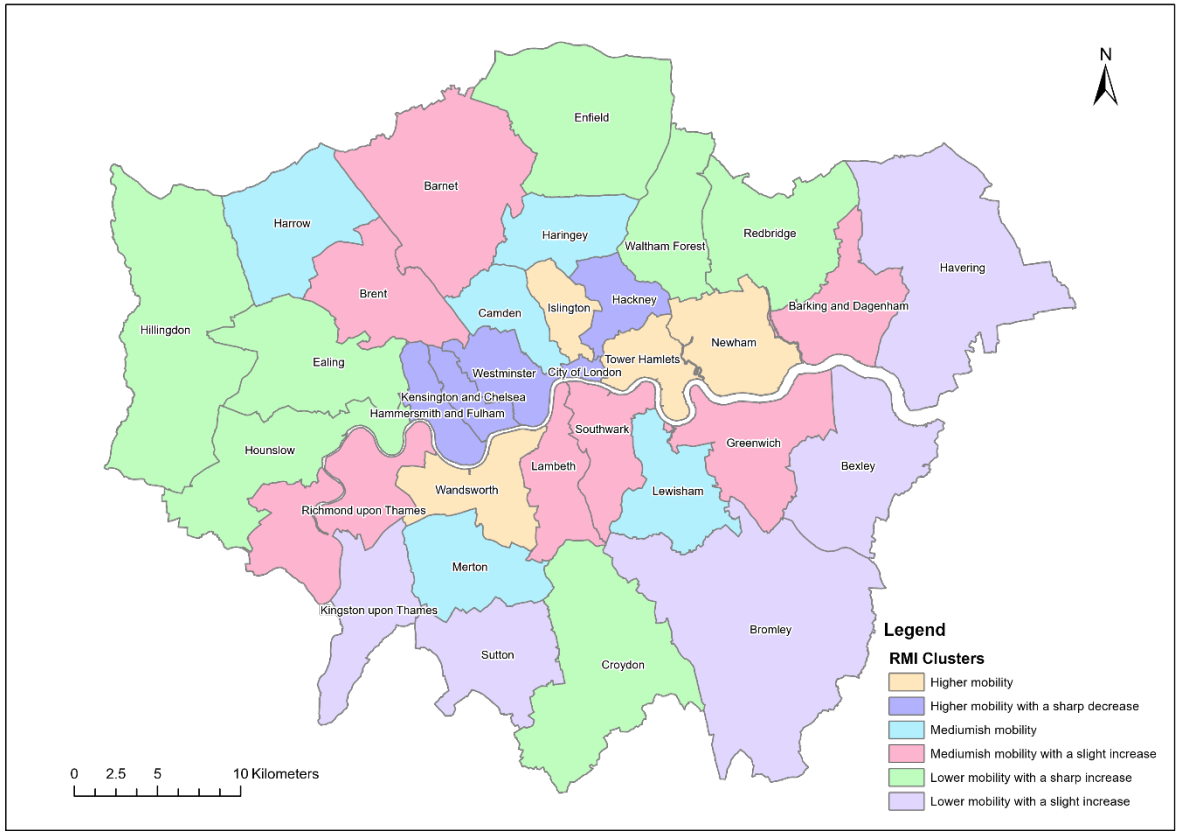
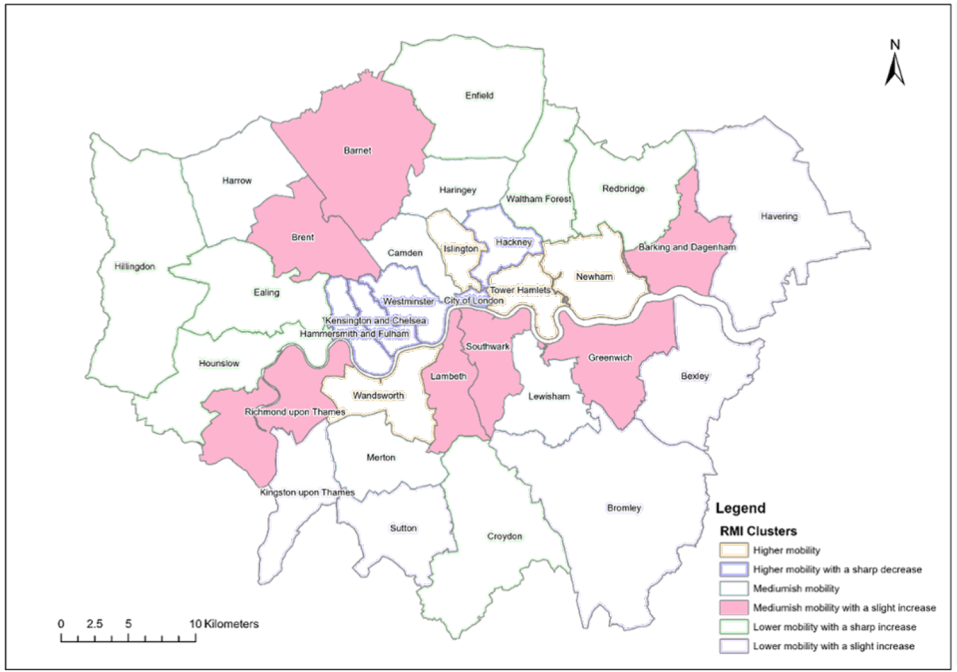


Figure 16 London boroughs coloured by RMI clusters (Source: CDRC RMI)

Clustering London boroughs by mobility trajectories: inflection at financial crisis



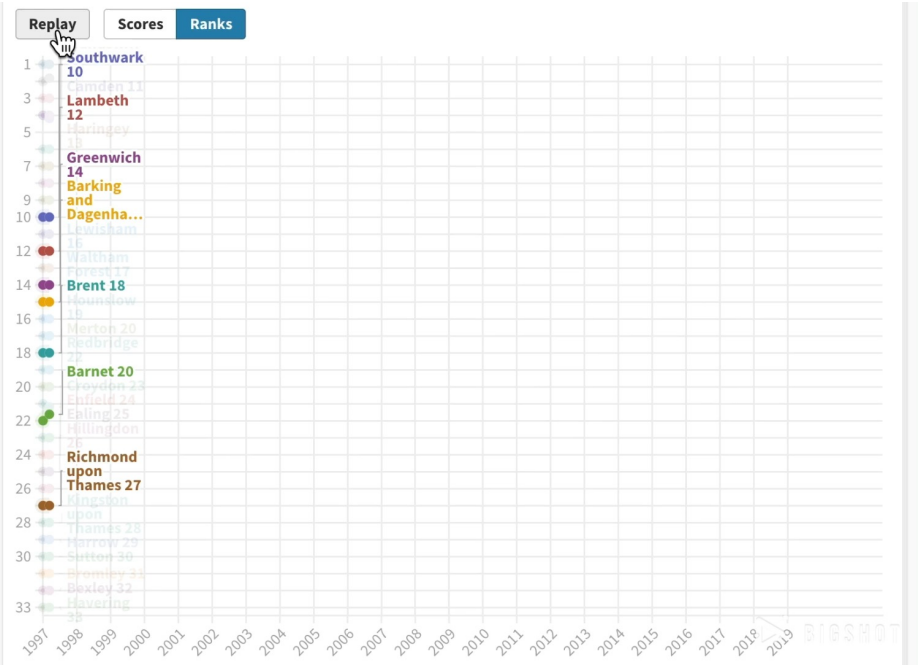
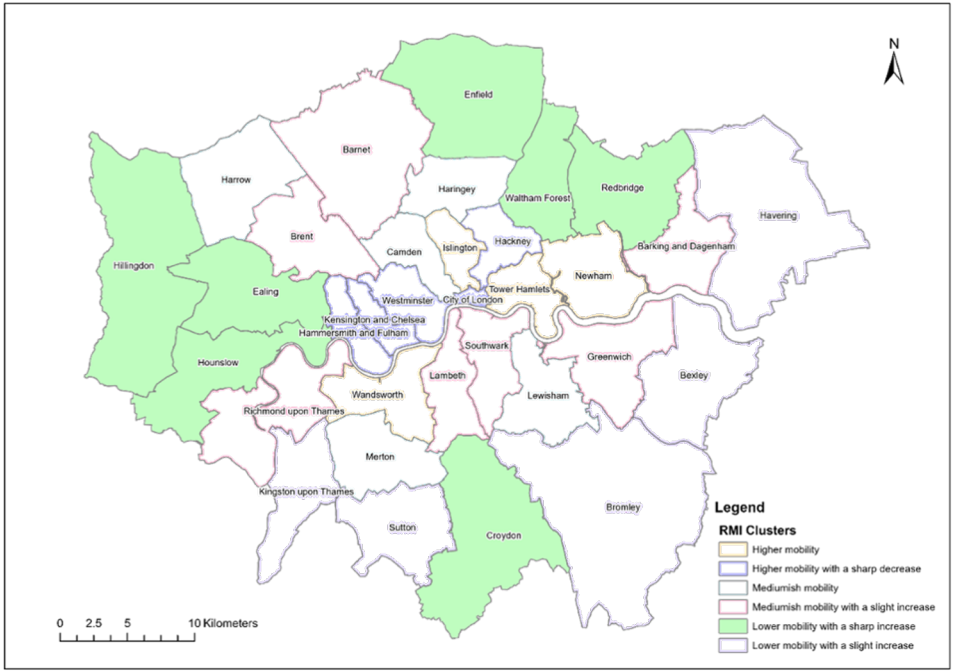


Figure 17 RMI cluster four (Source: CDRC RMI)

Clustering London boroughs by mobility trajectories: inflection at Brexit



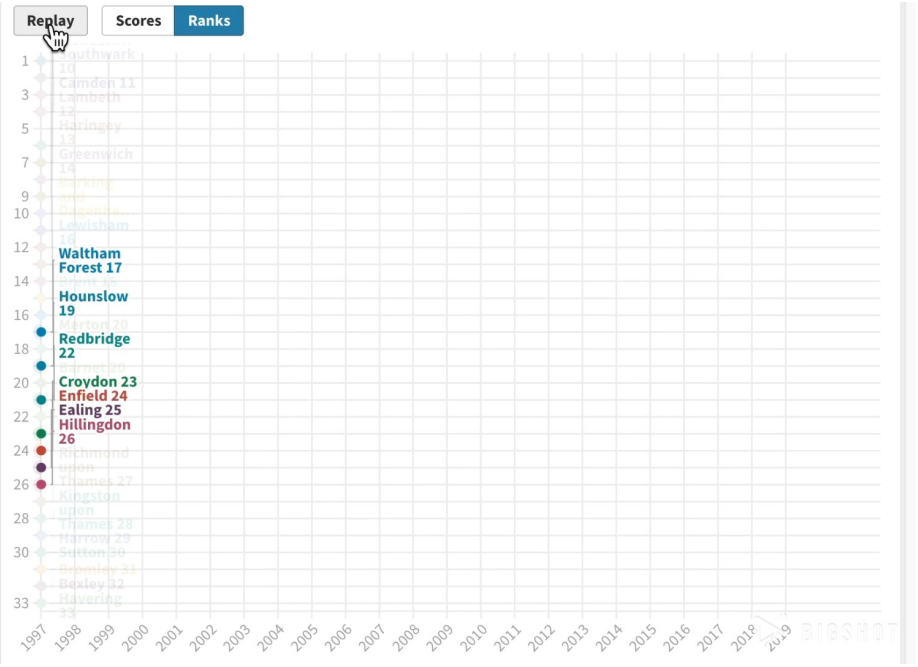


Figure 18 RMI cluster five (Source: CDRC RMI)

RMI at the Lower Super Output Area level (2011-2019)

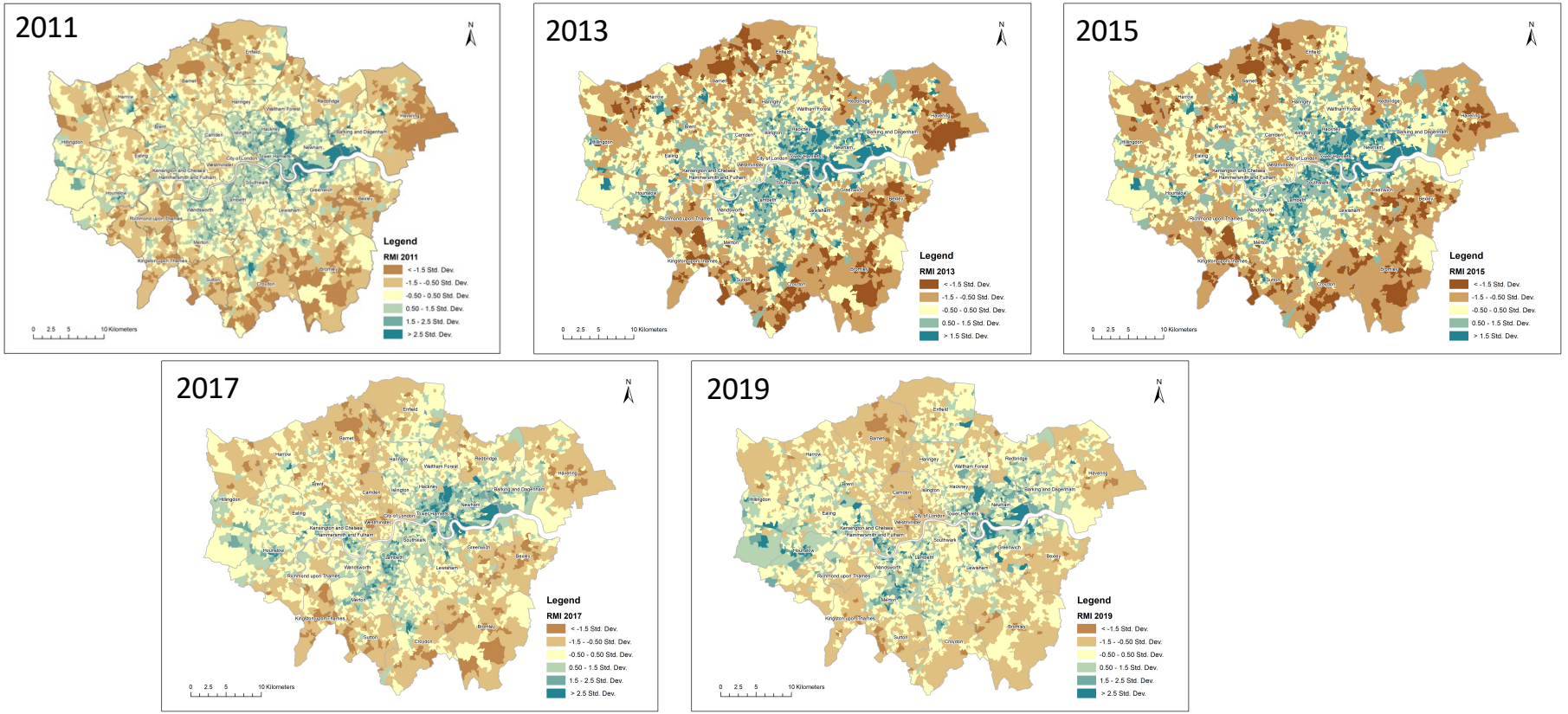


Figure 19 RMI at the LSOA level, by standard deviation (Source: CDRC RMI, top left: 2011, top middle: 2013, top right: 2015, bottom left: 2017, bottom right: 2019)

Conclusion and discussion

What does the new data show us

- Trends and hints – a starting point rather than an end point
- New geographies of London, new trends
- Key moments in time
- Demographics of young London
- Importance of scale

Thank you !

Do these patterns surprise you? Do they confirm what you thought already?

What differences might these changes make to your area of policy formation?

How should we share this information most effectively?

Michael Keith (University of Oxford) and Ying Wang (University of Warwick)

https://warwick.ac.uk/fac/soc/sociology/research/projects/isc/opencity/

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