GLAINTELLIGENCE UNIT

GLA Demographic Projections

London Plan Technical Seminar

6th November 2018

Content

- Background
- Overview of projection methodology
- Key results
- Comparison with official projections

Background

GLA 2016-based demographic projections

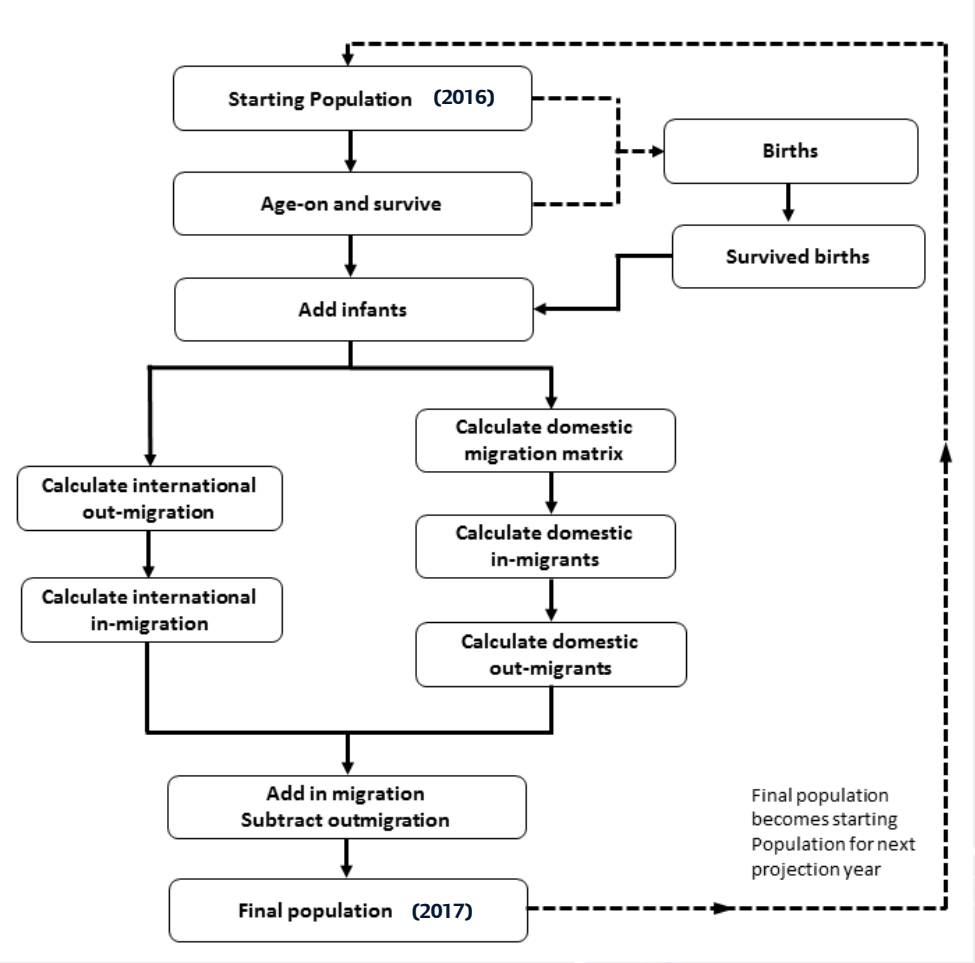
- Released July 2017
  - Includes a range of projections for different purposes
- **Trend-based** population and household projections discussed here
  - Form evidence base for SHMA and London Plan

Overview of methodology

- Population projections
  - Produced with in-house system
  - Comparable to ONS subnational projection model
- Household projections
  - Take GLA population projection as input
  - Population converted to HH
  - Model replicates DCLG approach for 2014-based projections

Structure of GLA population model

- Standard **cohort component** approach
- Begin with starting estimate
- Roll forward one year at a time, accounting for:
  - Fertility, Mortality, Migration



Population projections

- Past estimates of births, deaths, migration used to determine patterns projected forward
- Three variants based on different periods of past migration
  - 5, 10, and 15 years
  - Use common fertility and mortality assumptions

Population projections

- **10 year trend chosen for Central projection**
- Choice based on judgement
  - Approximates duration of last economic cycle
  - Longer periods provide more stable projections
- GLA demography team monitors population trends
  - Annual projection cycle

Structure of GLA population model

- Multi-regional model
- Includes representations of 329 areas in UK:
  - Each LAD in England
  - Scotland, Northern Ireland and Wales
- Explicitly accounts for migration flows between each model area
- Consistent projection produced for all areas

Independent review of GLA model

Conducted in 2016 by the Centre for Population Change at Southampton University:

"The GLA model is **robust, well-implemented and adequate for the purpose to which it has been put**. With regard to the model specification, in particular, **it follows the state of the art of demographic projections at a sub-national level**, that is, multi-regional models, which link different areas explicitly through origin-destination-specific migration flows, embedded within the cohort-component model of population renewal."

https://data.london.gov.uk/dataset/projection-methodology-independent-review

Household projections

- Model replicates that used for the 2014 DCLG household projections
  - This was the current official approach at the time of producing the projections and results given *National Statistics* status
- 2-stage approach:
  - Stage 1: **Project total households by LAD**
  - Stage 2: **Disaggregate to detailed household types**

https://www.gov.uk/government/statistics/2014-based-household-projections-methodology

Household projections
Stage 1

- Split population into those resident in:
  - Private households
  - Communal establishments
    - Assume constant number by group in CE for ages up to 75
    - For groups age 75+ assume constant proportion in CE
- Disaggregate population by relationship status
  - Couple, Single, Previously Married
  - Step based on ONS projections by marital status
    - Now discontinued – last outputs produced 2010

Household projections
Stage 1 continued

- Apply Household Representative Rates to population
  - Rates specific to age, LAD, relationship status
  - Represent likelihood of members of group heading a household
  - Rates projected forward from **1971 to 2011** census data
    - Minor adjustment of rates post-2011 based on Labour Force Survey data

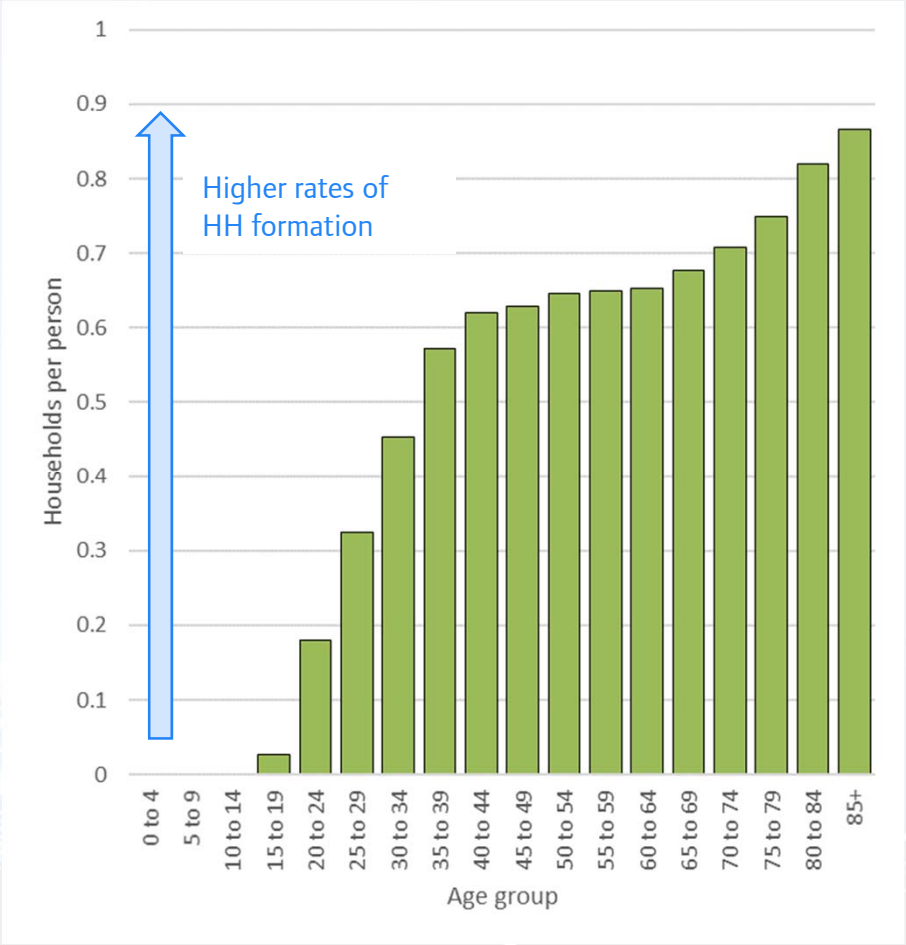
Doing so gives:

- Number of households by head* of household's:
  - Age, Sex, Relationship status

*Note that head of household is an old census definition no longer in general use

Household projections
Stage 1: Household Representative Rates

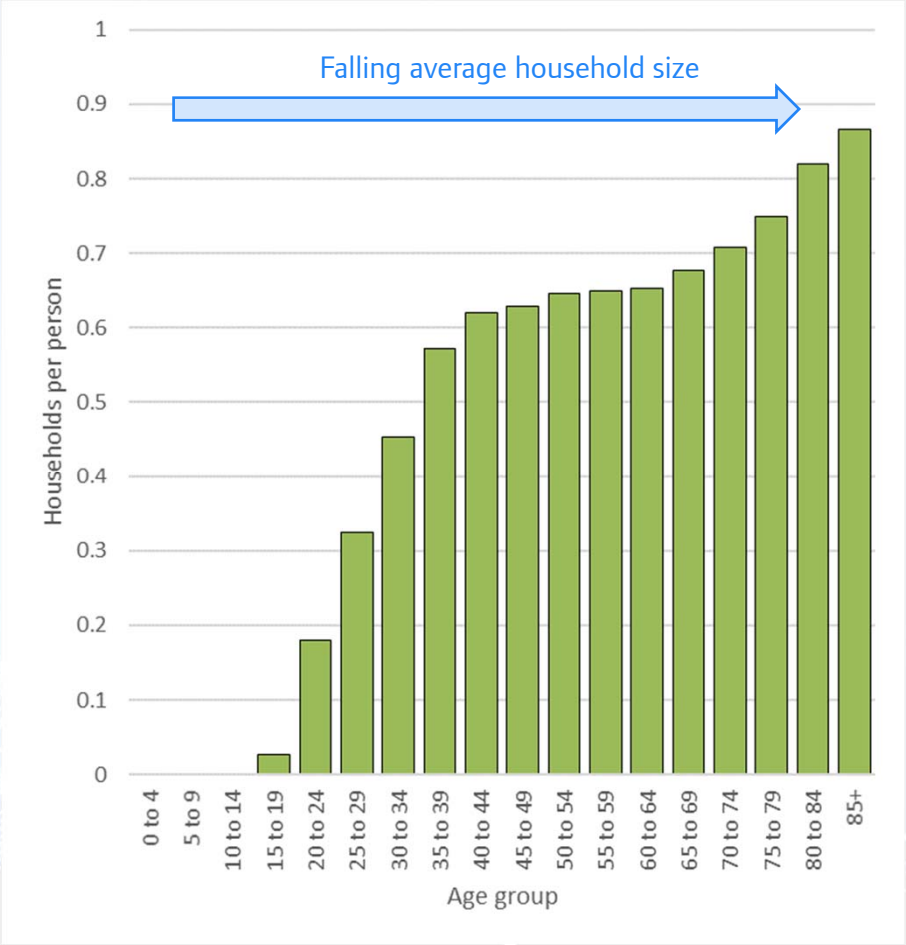
- Chart illustrates how household formation changes with age
  - Average number households headed per person, by age
- Rates increase with age
  - Rise from 65+ result of widowhood
- Lower rates for young people
  - Multi-person adult households
  - Living with parents



*Based on results of Stage 1. Excludes those in communal establishments

Household projections
Stage 1: Household Representative Rates

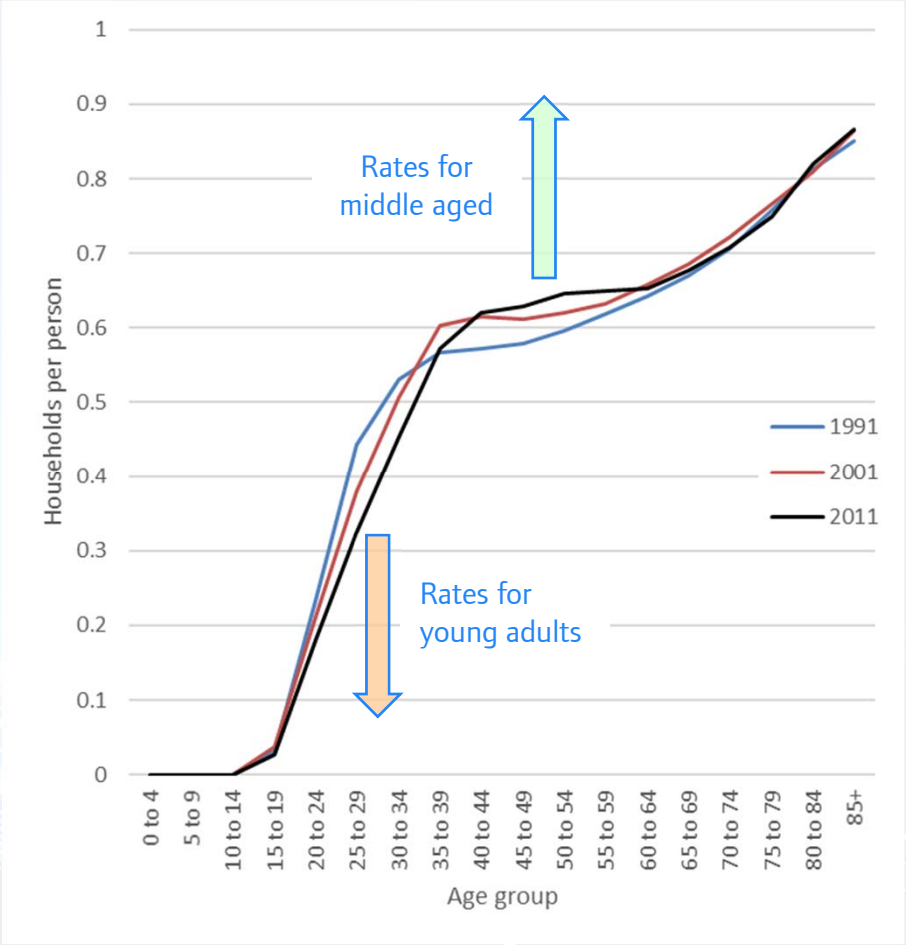
- Age structure of population affects results of projections
- Higher proportion of older people, leads to:
  - more households per person
  - falling household size



Household projections
Stage 1: Household Representative Rates

Projected rates continue past trends

- Falling formation rates among young adults
  - Increased participation in Higher Education
  - Increase in number migrant workers
  - Reductions in affordability
- Increasing rates age 35 to 74
  - Lower proportion of population in couples



Household projections
Stage 2

- Apply headship rates to private household population
  - Probability of person being 'representative person*' for specific household type
  - Rates by age, sex, local authority
  - Projected forward from **2001 and 2011** census data
    - Note: two points not five as used for Stage 1
- Results constrained to match total Stage 1 households
  - **Stage 2 does not affect total number of projected households**

* Household representative person is the current definition used in the census

Key results

Population

- Projected growth
- Age structure
- Components of change

Households

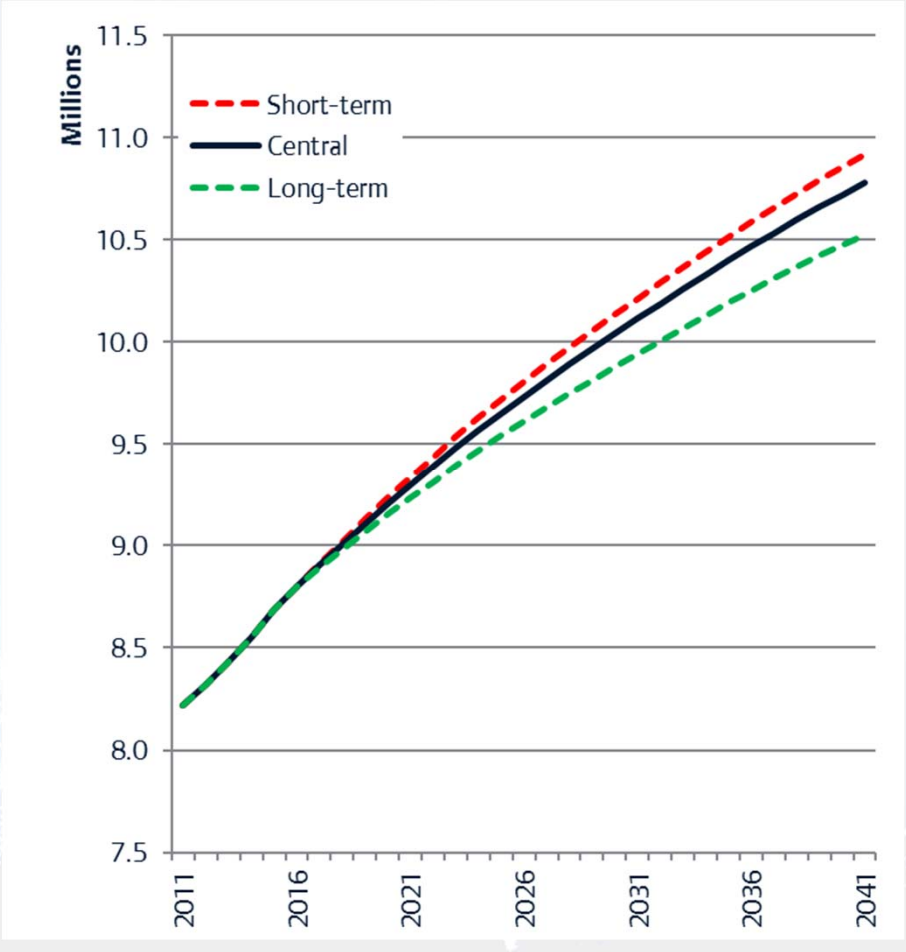
- Projected growth
- Components of change

Total population, London

- Annualised growth 2016-41
  - Central trend: 80k
  - Long-term: 69k
  - Short-term: 85k

Total population, millions

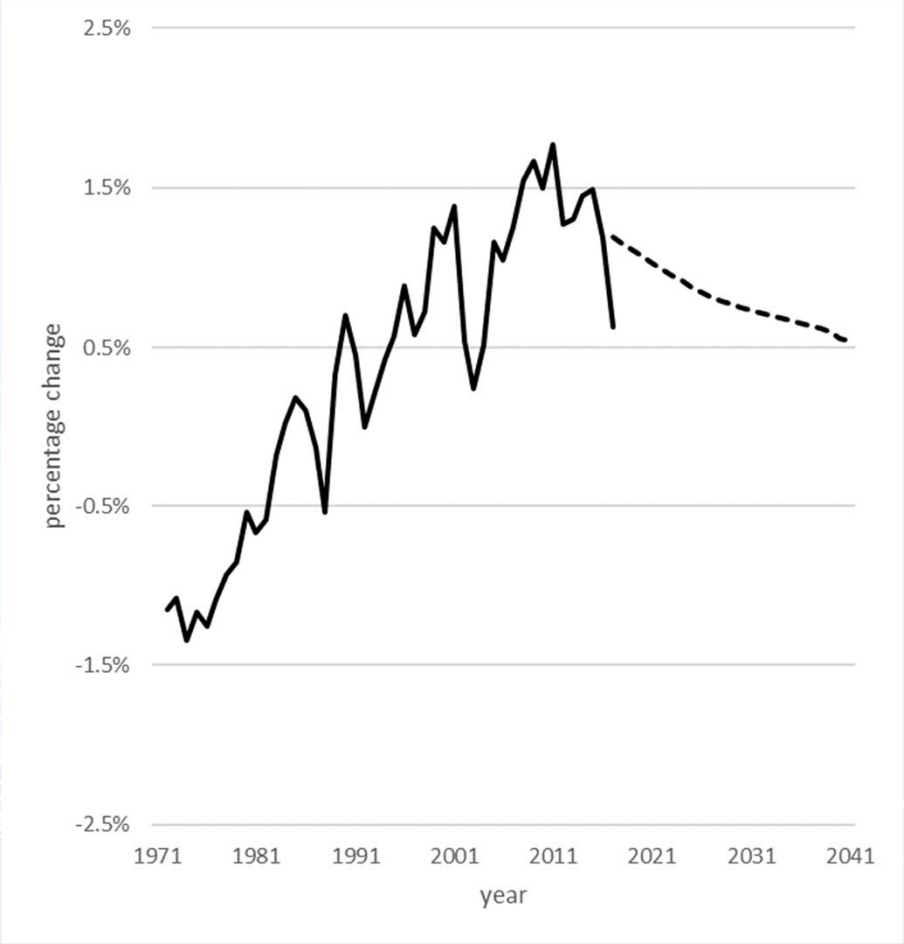
Year	Central	Long-term	Short-term
2011	8.22	8.22	8.22
2016	8.80	8.80	8.80
2021	9.30	9.23	9.34
2026	9.73	9.61	9.81
2031	10.11	9.94	10.21
2036	10.46	10.25	10.58
2041	10.78	10.52	10.92



Total population
Annual change

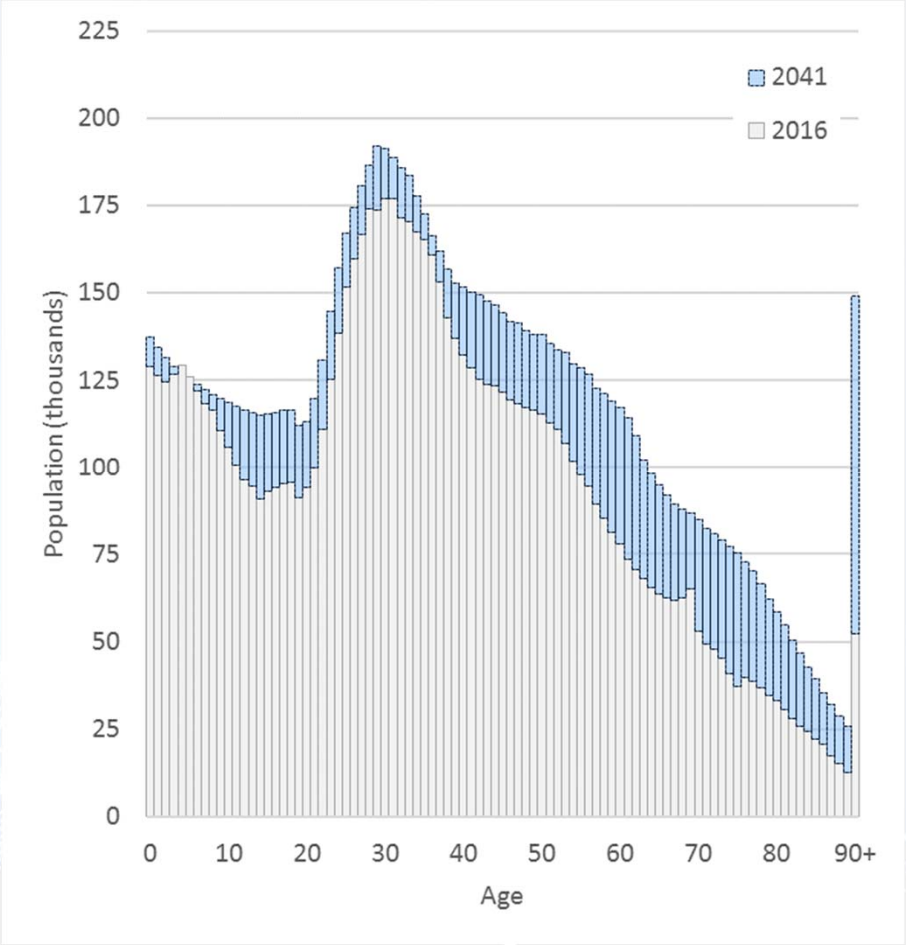
- Mean annual growth rate
  - Projected to 2041 ~0.8%
  - Since 1984 ~0.8%

London, estimated annual growth 1971-2017
Projected annual growth 2016-2041



Population age structure

- Greatest growth in age 40+ population
  - Large cohort of baby boomers
  - Falling mortality rates
- Additional children age 10+
  - Result of rise in births between 2002-2012

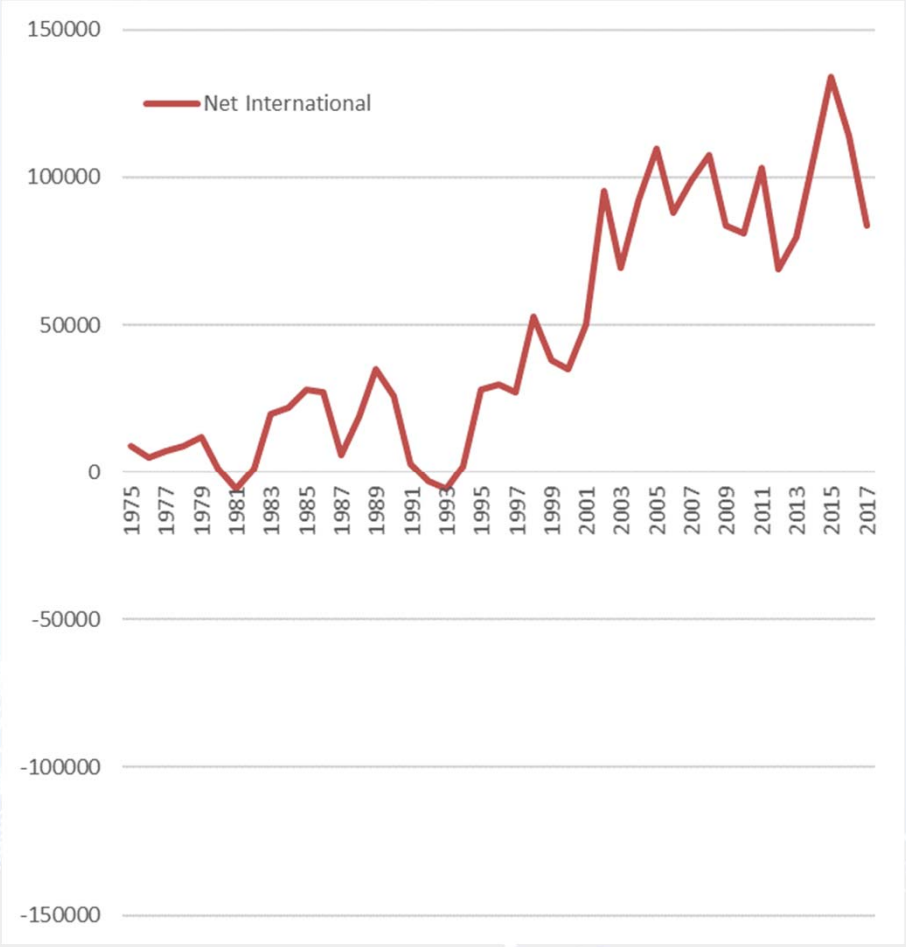


Components of change

- Migration
  - Past patterns of migration
  - Projected migration
- Natural change
  - Births and deaths

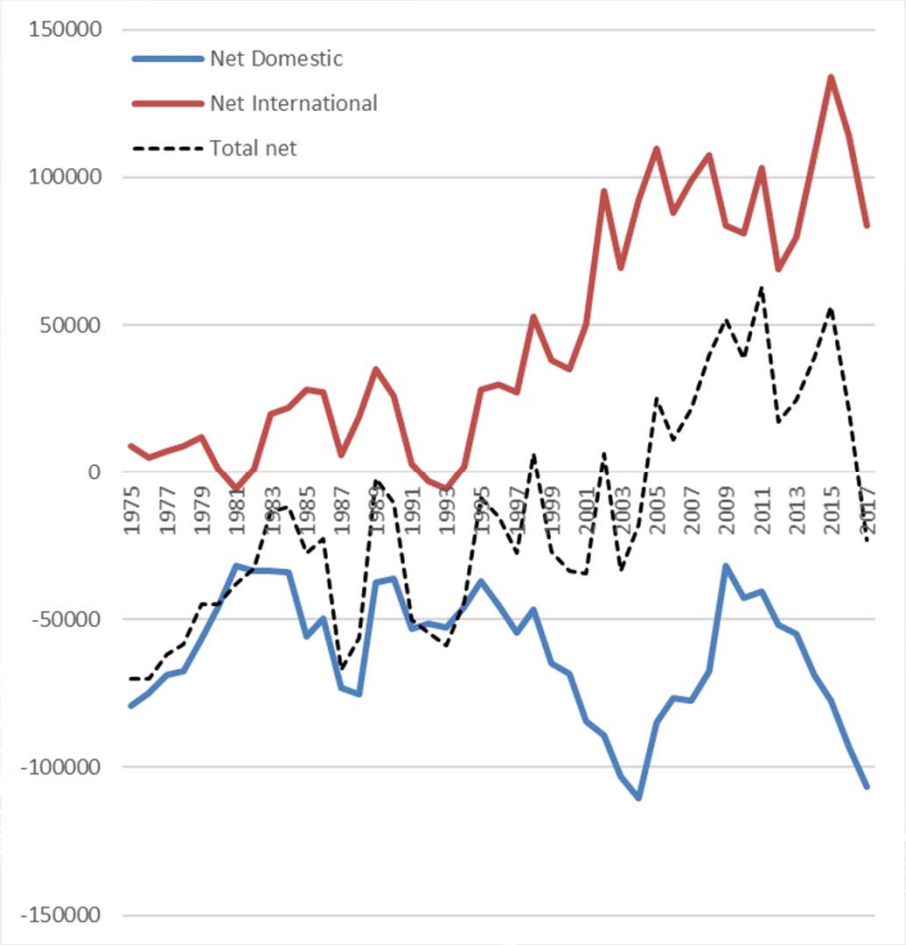
Historic migration patterns International

- Rise in international migration from mid-1990s
- Successive waves of migration since
  - EU8, EU2, Southern EU15
- 2017 saw fall relative to recent years
- Still high by historic levels



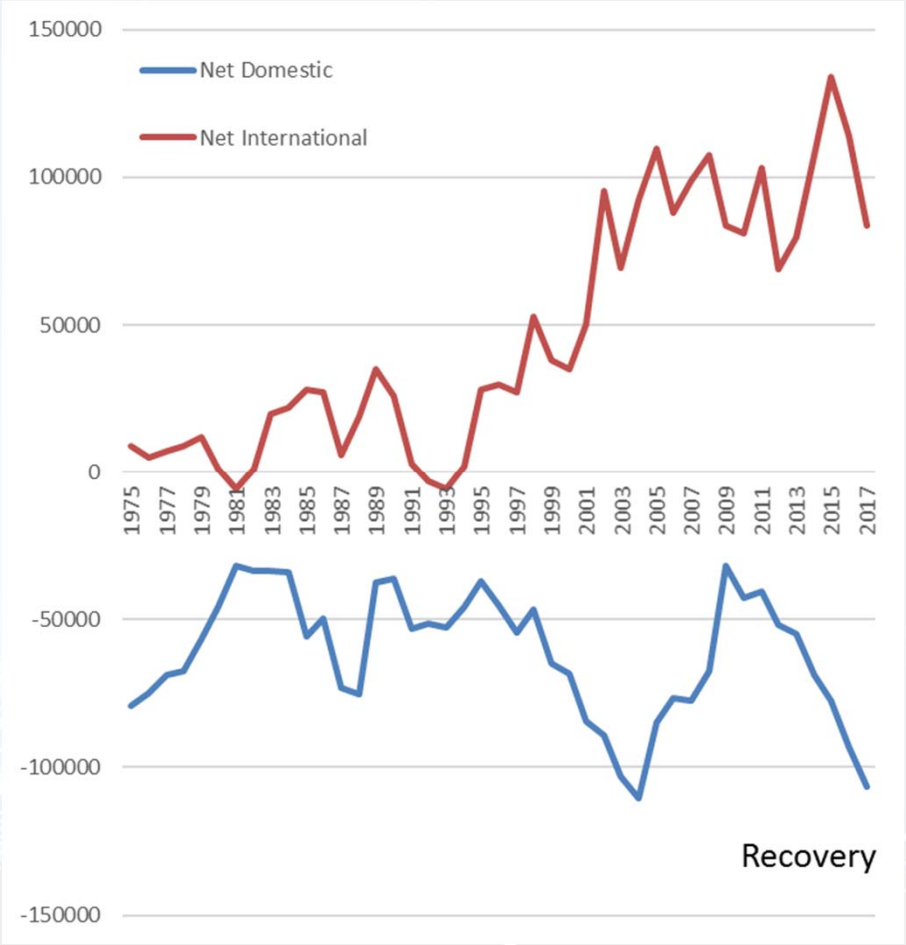
Historic migration patterns
Domestic

- Domestic migration mirrors international inflows
- Net domestic outflow from London is the norm
- Overall net migration small relative to size of gross flows
  - Sum gross flows ~1.5 million
  - Net flow ~ tens of thousands



Historic migration patterns
Domestic

- Domestic flows vary with economic/housing market cycles
- Domestic mobility fell following financial crisis
- Gradual recovery since
- Outmigration *rates* now back to pre-crisis levels



Historic migration patterns
Domestic

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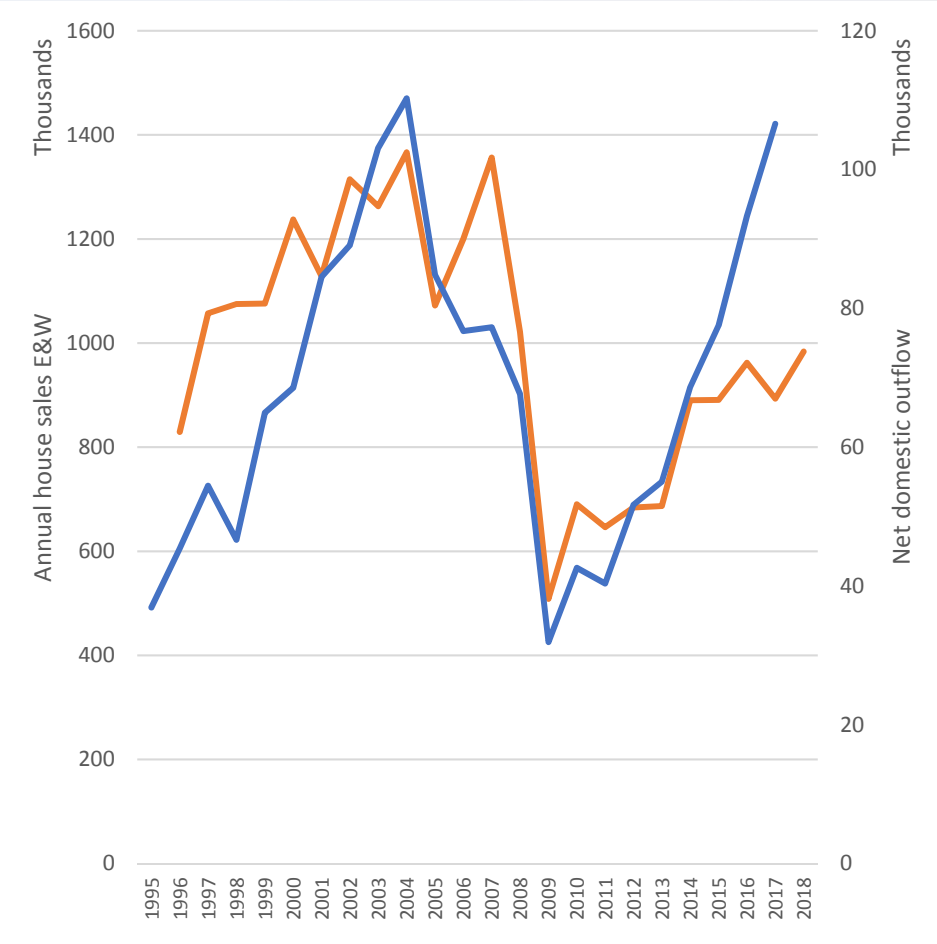
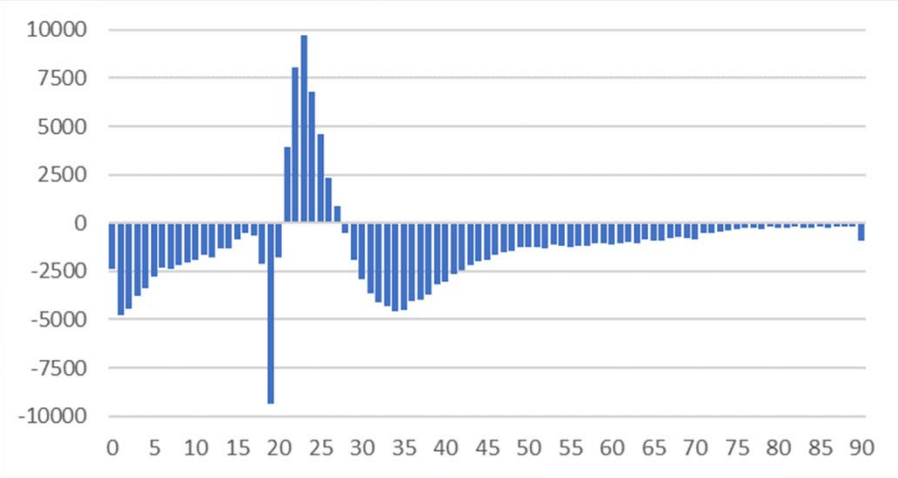
Net domestic outmigration from London and Annual house sales, England and Wales



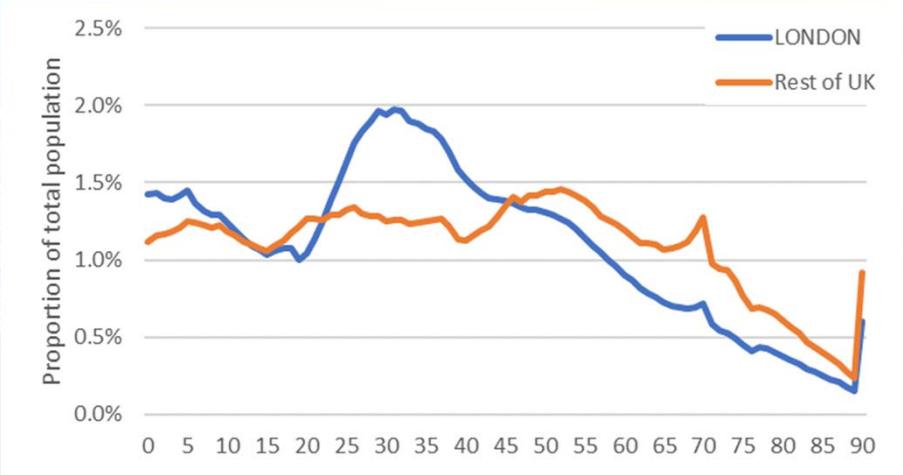
Migration age structure

- Net inflow age 20-30
  - For work and education
- Net outflow of all other ages
  - Students
  - Family formation
  - Retirement
- London has young age structure relative to UK

Net domestic migration by age, London 2016-17

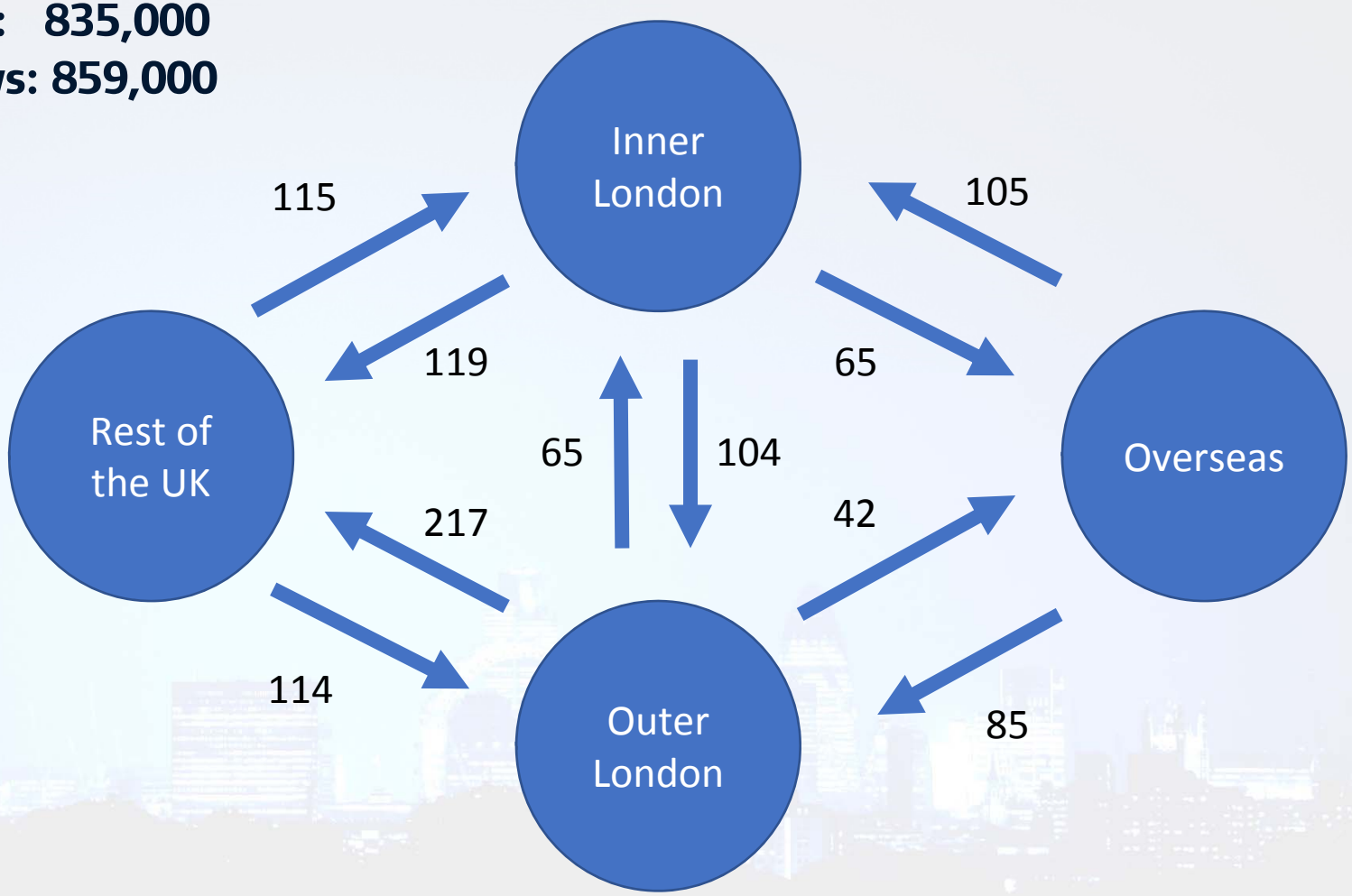


2017 age structure, London and rest of UK



Migration
Gross flows, London 2016-17

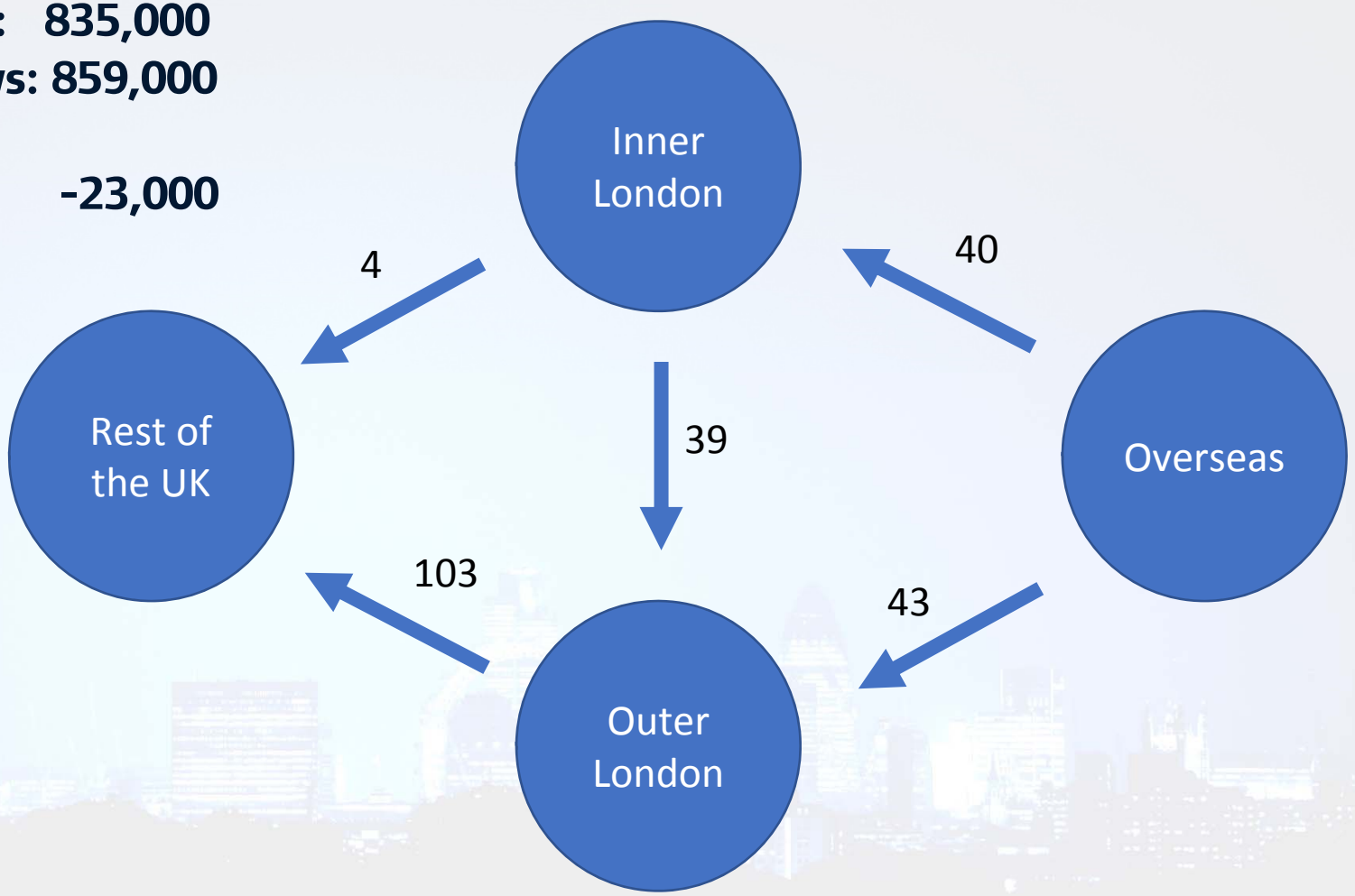
Gross inflows: 835,000
Gross outflows: 859,000



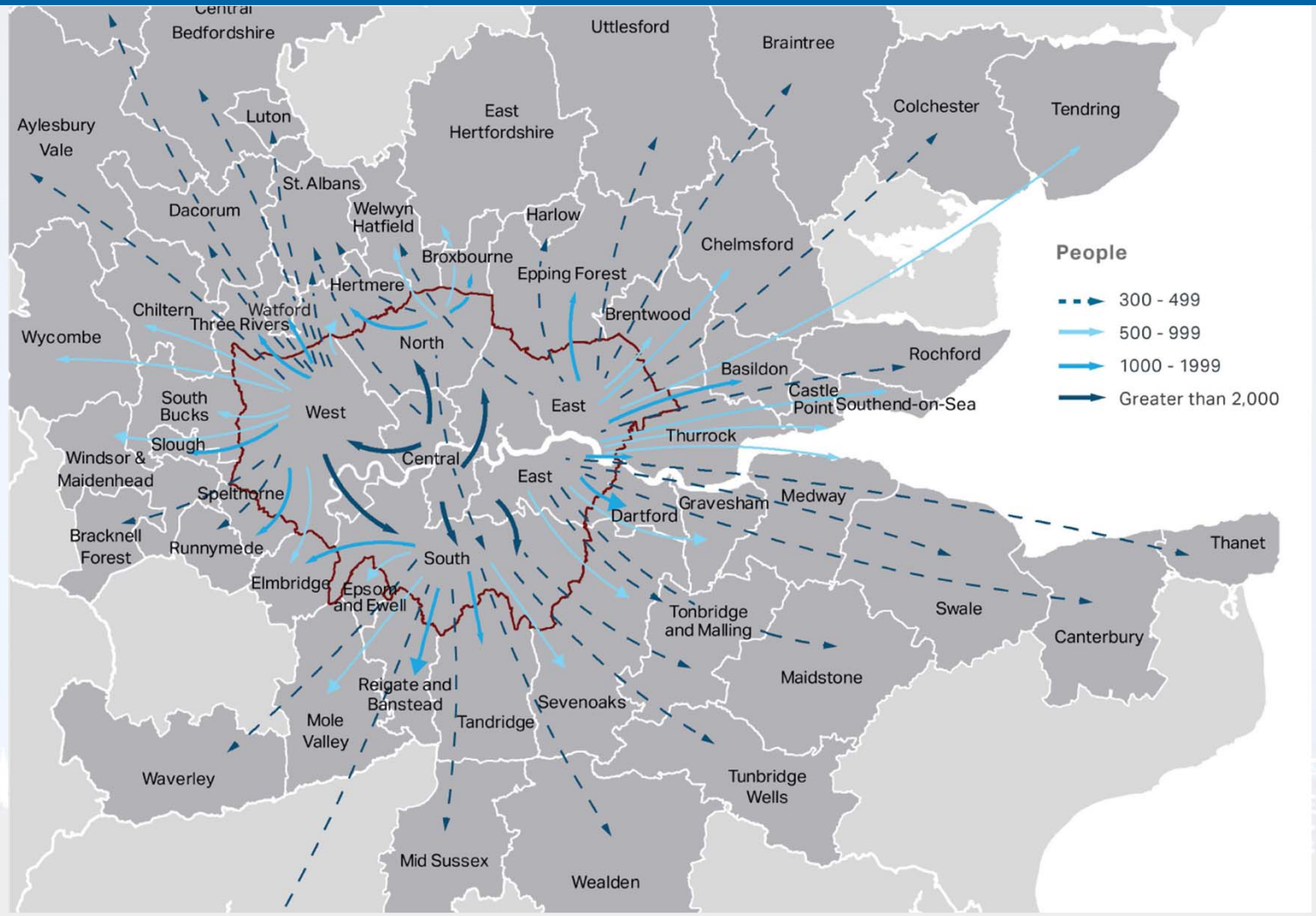
Migration
Net flows, London 2016-17

Gross inflows: 835,000
Gross outflows: 859,000

Net flow: -23,000

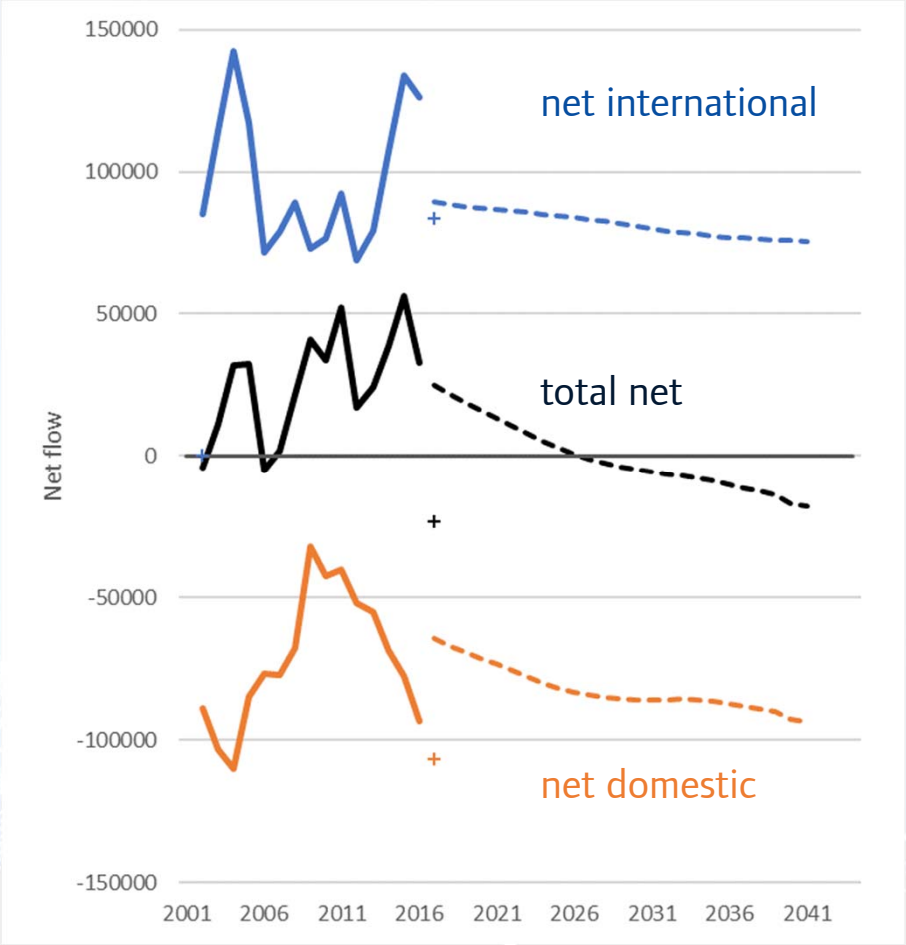


Spatial patterns of domestic migration
Net flows



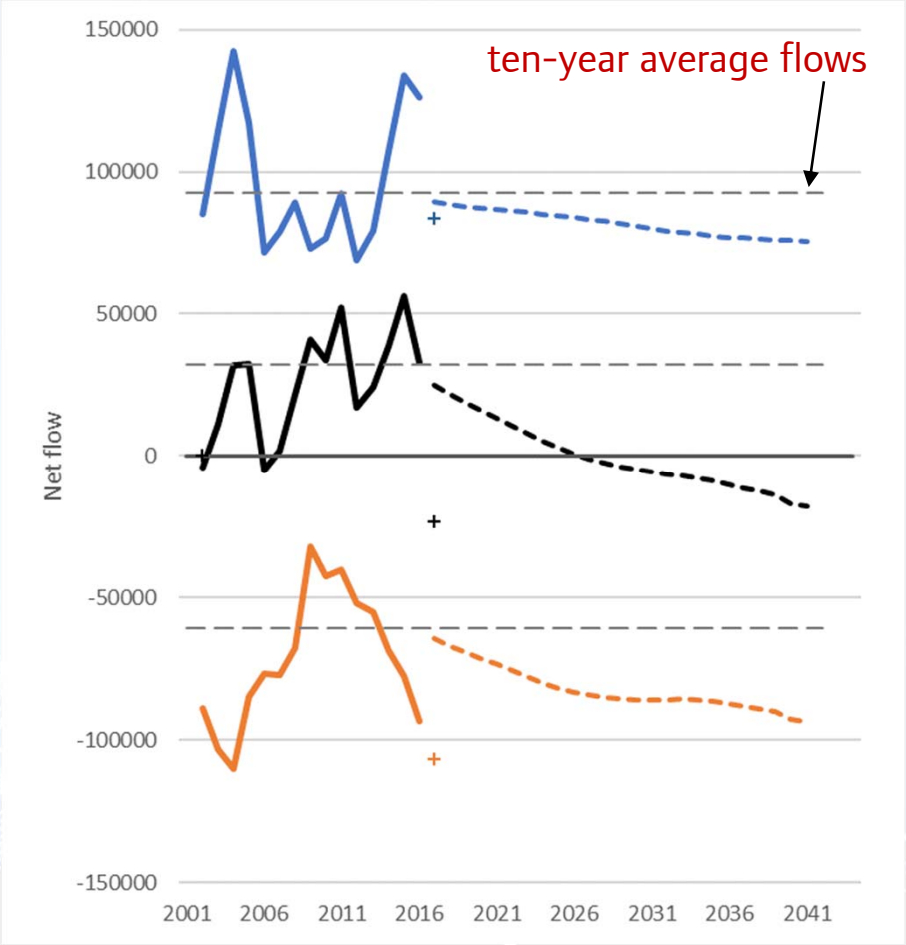
Components of change
Migration

- Large net international inflow
- Offset by comparable net domestic outflow
- Modest total net migration over projection period



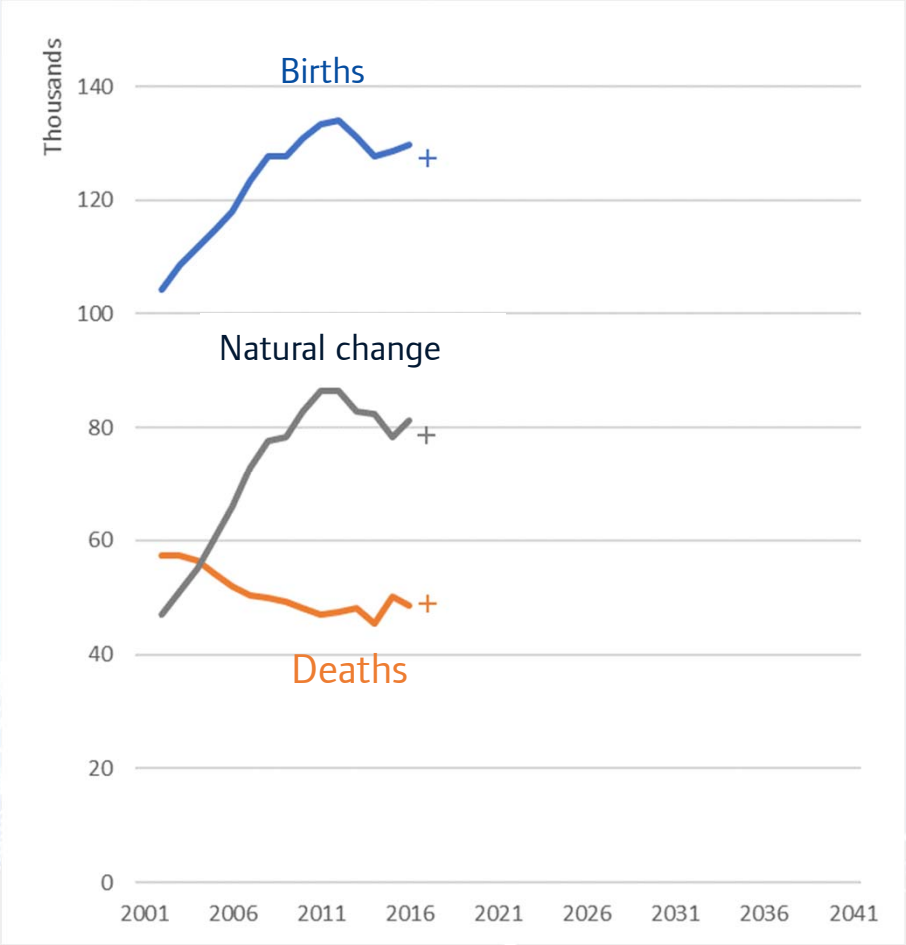
Components of change
Migration

- Net outmigration **increases** over projection period
- Result of using **rates** to project outflows
- Larger London population -> larger migration outflows
- Inflows increase from UK
  - But at slower rate than outflows



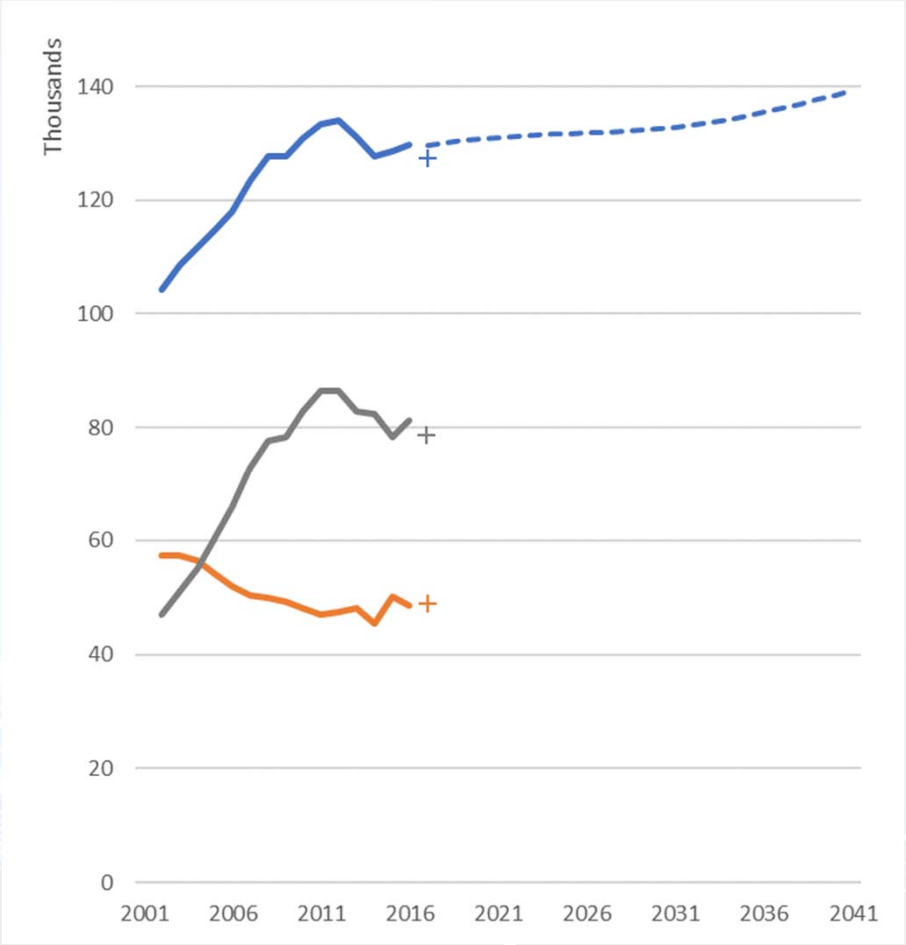
Natural change

- London has a high level of natural change ~80k pa
  - c130k births
  - c50k deaths
- Fertility and mortality highly age dependent
- Young age structure:
  - High births
  - Low deaths



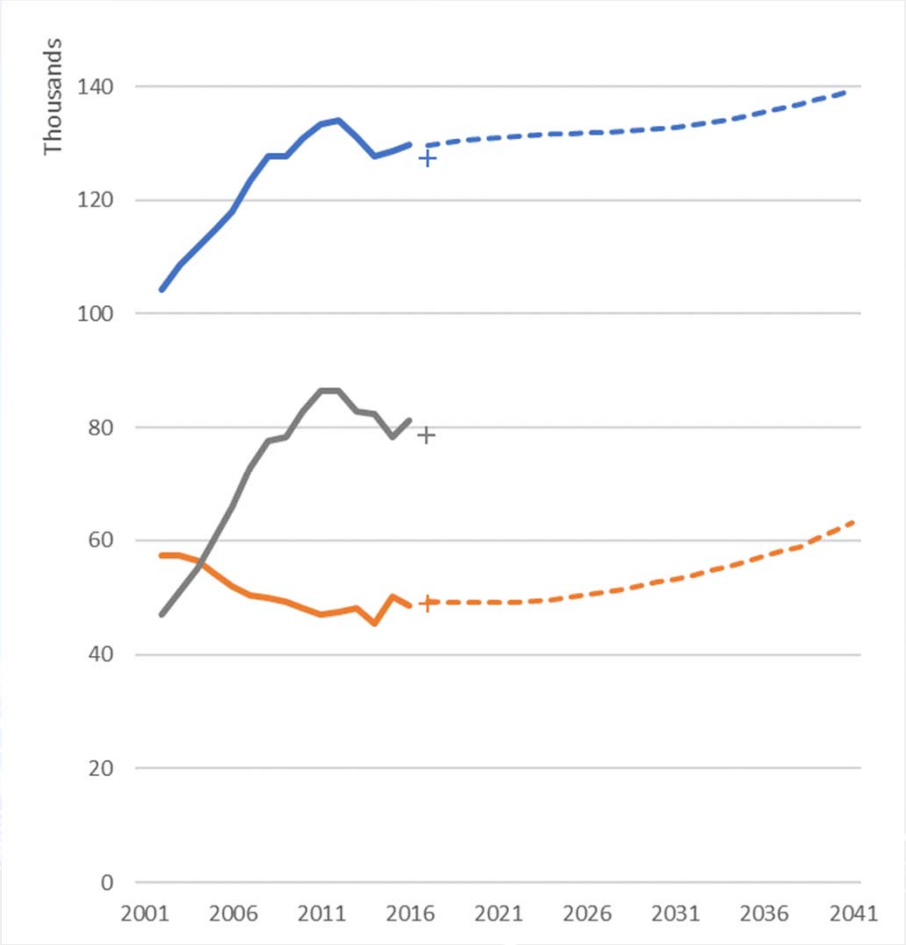
Natural change

- Births increased by ~30% over period 2001 to 2012
- Due to combination of:
  - High international inflows
  - Changes to timing of family formation
- Assume fertility rates relatively stable
- Births increase in line with population of childbearing age



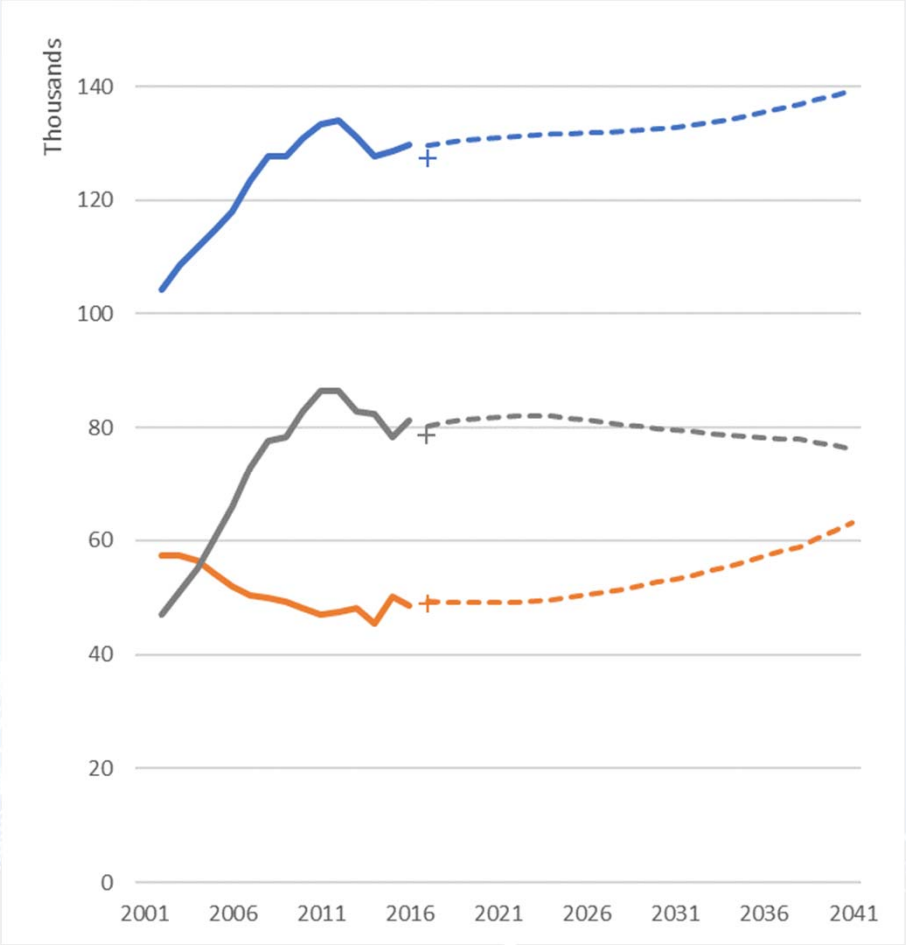
Natural change

- Deaths have been falling with improvements to mortality rates
- Project continued improvements in mortality rates
  - Assumptions taken from ONS National Projections
- Annual deaths increase over projection period
  - Result of more old people in the population



Natural change

- Projected natural change relatively steady
- Increases in births and deaths largely offset one another



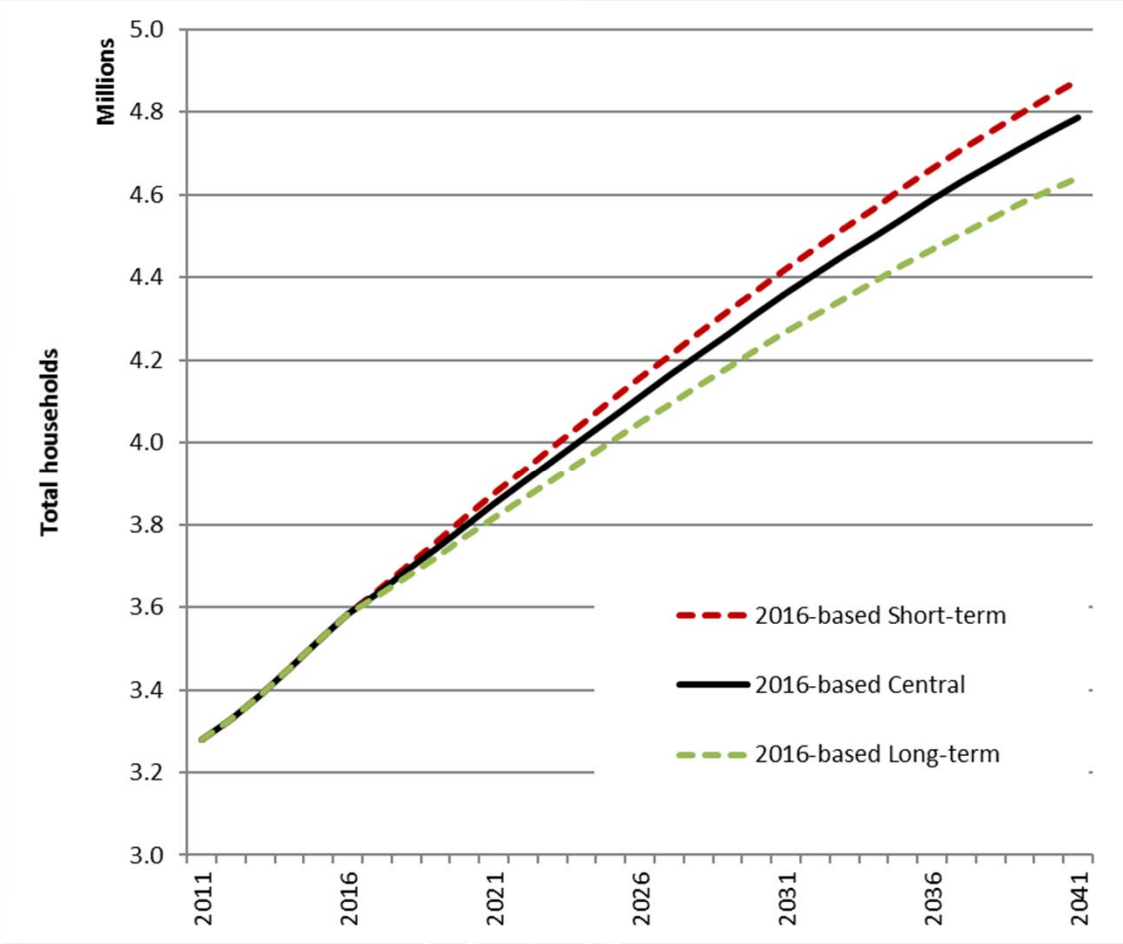
Household projections

25yr annualised:

- Short-term 52k
- **Central 48k**
- Long-term 42k

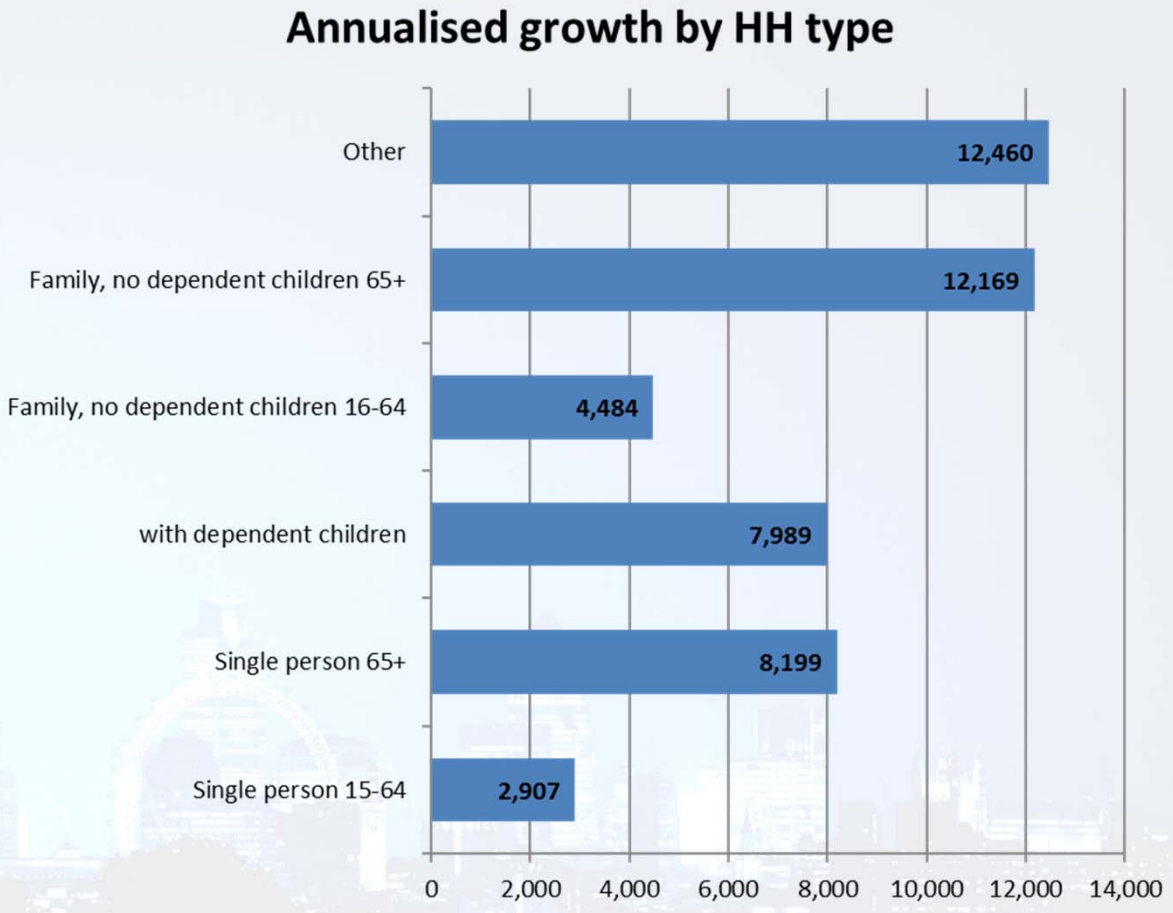
10yr annualised:

- Short-term 57k
- **Central 53k**
- Long-term 47k



Households by type

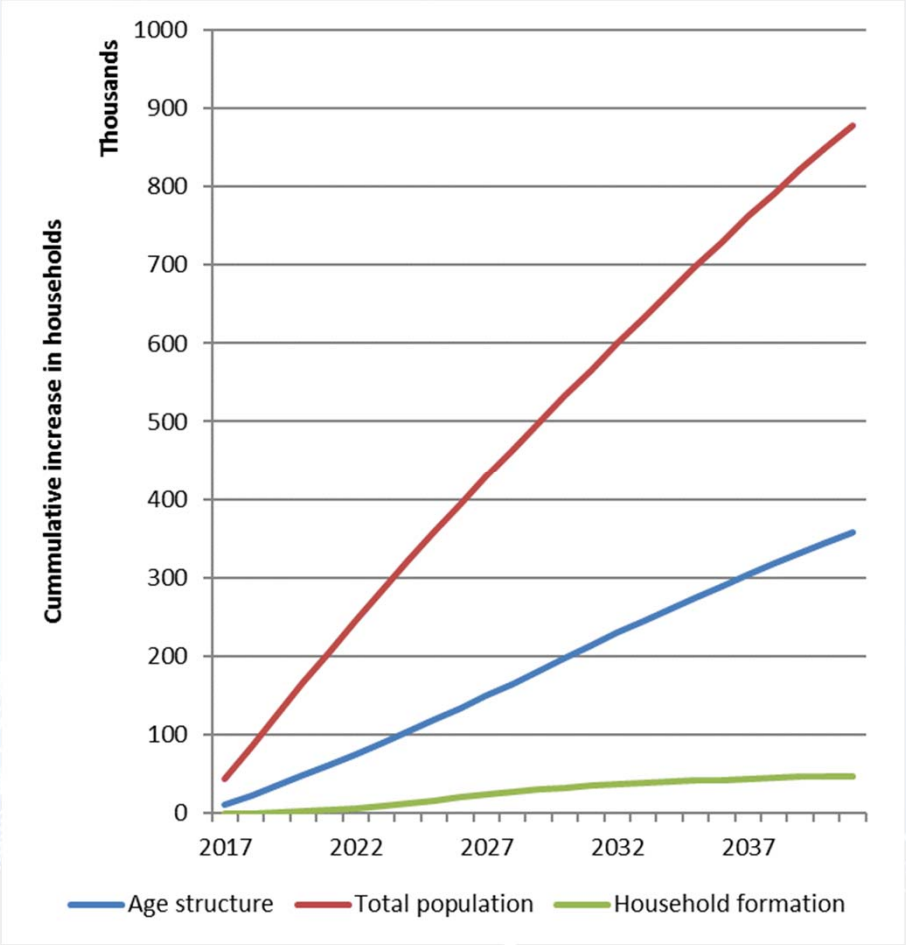
- 40% of growth in age 65+ households
- 26% in 'other'
- 17% in families with dependent children



Components of household growth

- Decompose projected HH growth by changes in:
  - Age structure of population
  - Total population
  - Household formation
- Estimate contribution* to overall growth (25yr):
  - 68% <- total population
  - 28% <- age structure
  - 4% <- household formation

*approximate due to interaction effects



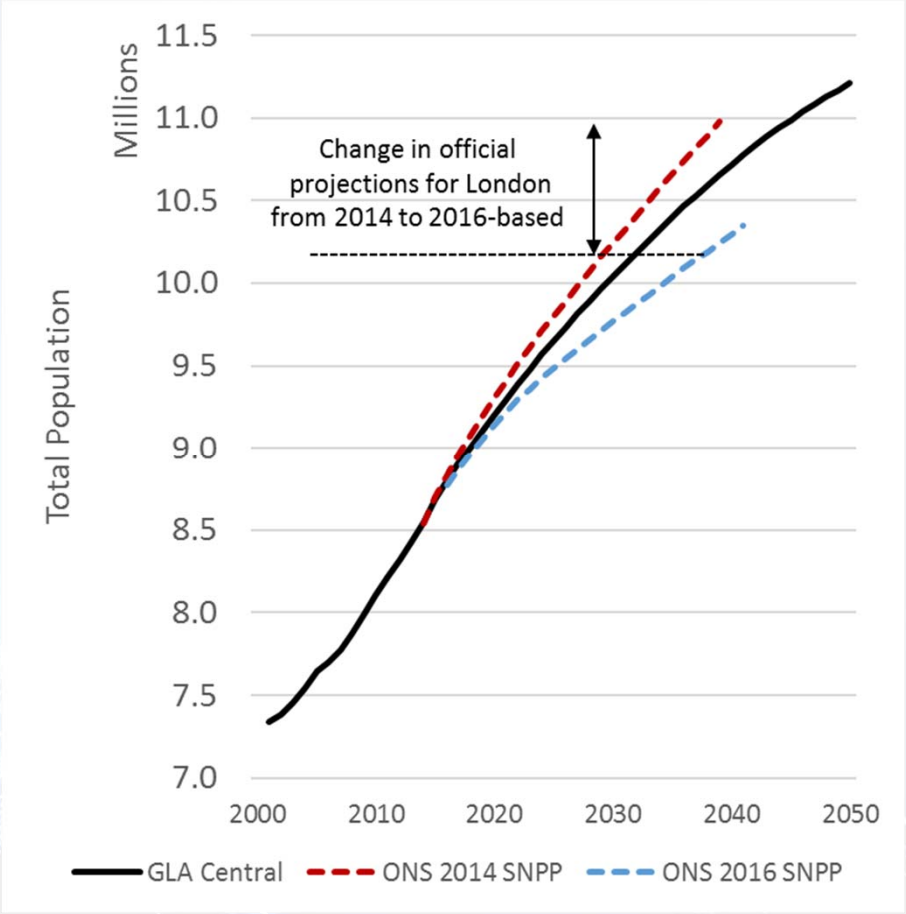
Comparison with official projections

- Population Projections
  - ONS 2016-based SNPP
- Household Projections
  - ONS 2016-based

ONS Subnational Population Projections Key differences

Length of past migration trends used to project forward

- ONS use 5-years of past migration trends
- GLA Central uses 10 years
- ONS outputs inevitably more variable



ONS Subnational Population Projections Key differences

ONS constrains up to totals from National Projections

- Leads to inconsistency between international and domestic migration methods
- NPP reverts to **25-year average** for international migration over first ten years of projection
- Subnational projections follow suit, but
- Domestic migration still based on previous **5 year period**

ONS Subnational Population Projections Key differences

ONS constrains up to totals from National Projections

- Literature shows the **direct relationship** between international inflows and domestic outflows
- Models used by both GLA and ONS only account for **indirect relationship**

  More international migration -> more population -> more outmigration
- Both are valid when consistent period used to determine each component
- But not when international and domestic migration assumptions differ significantly

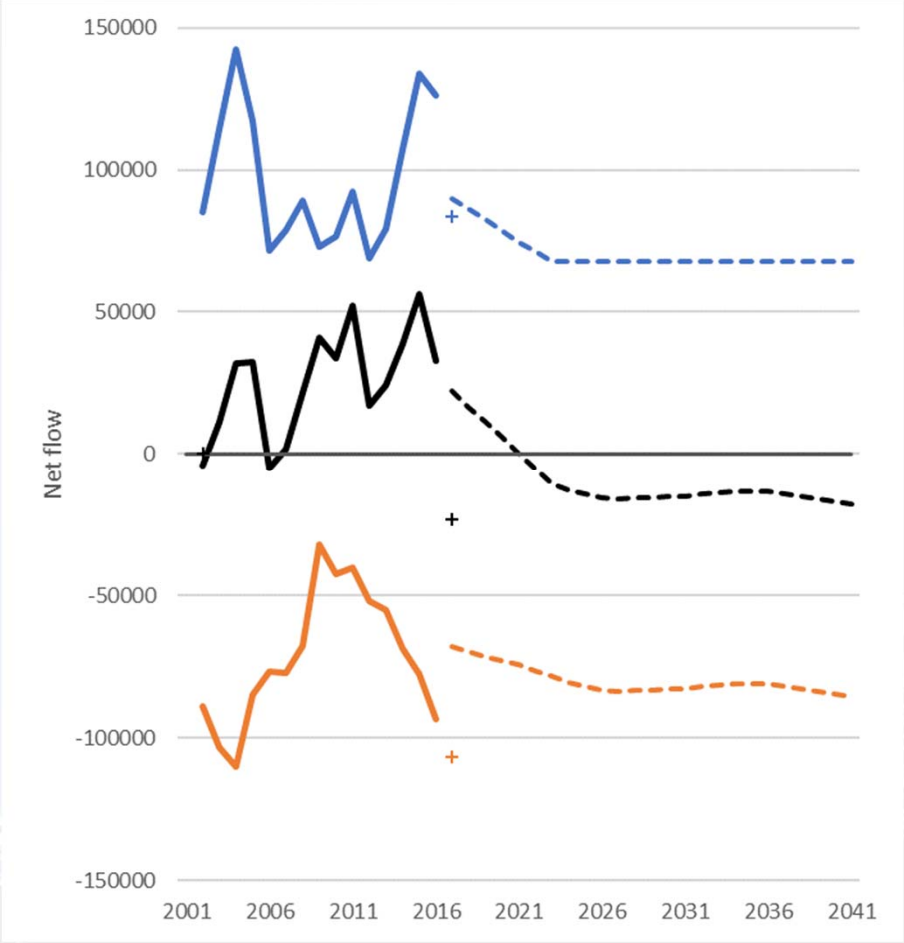
ONS Subnational Population Projections Key differences

ONS constrains up to totals from National Projections

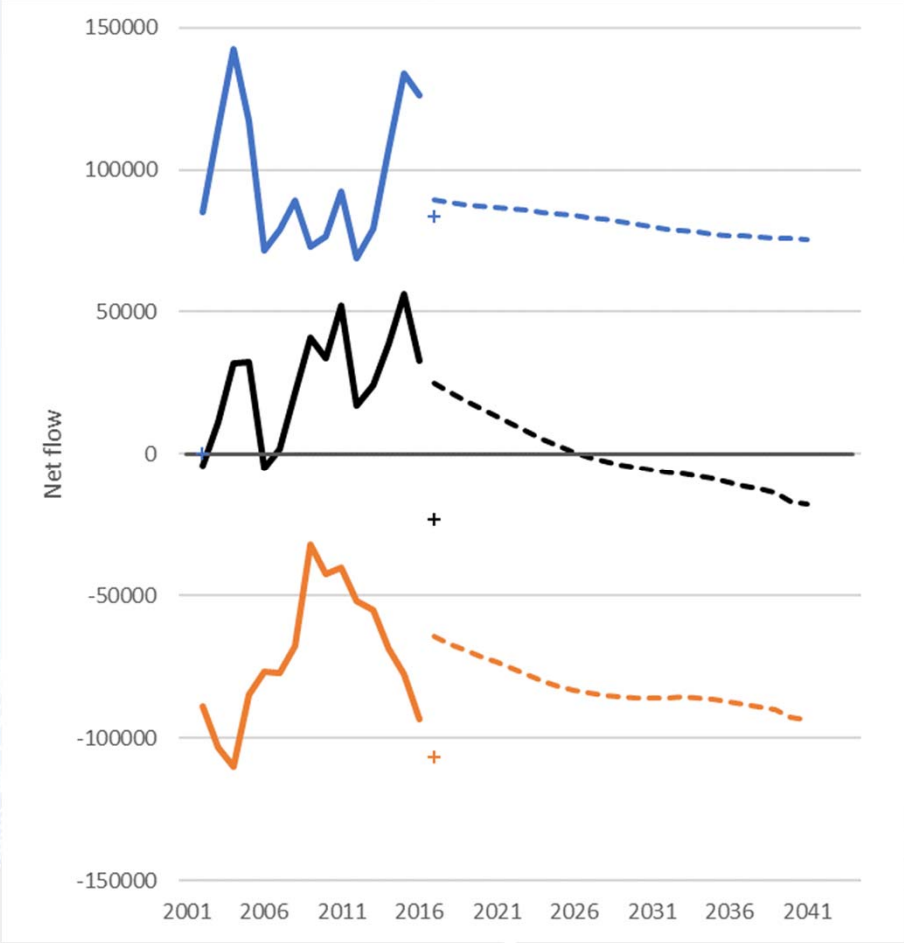
- This issue has greatest impact for areas where large international inflows are offset by large domestic outflows
- London affected most
- Assumed fall in international migration doesn't lead to comparable direct reduction in domestic outmigration

Comparison of projected migration flows

ONS 2016-based SNPP

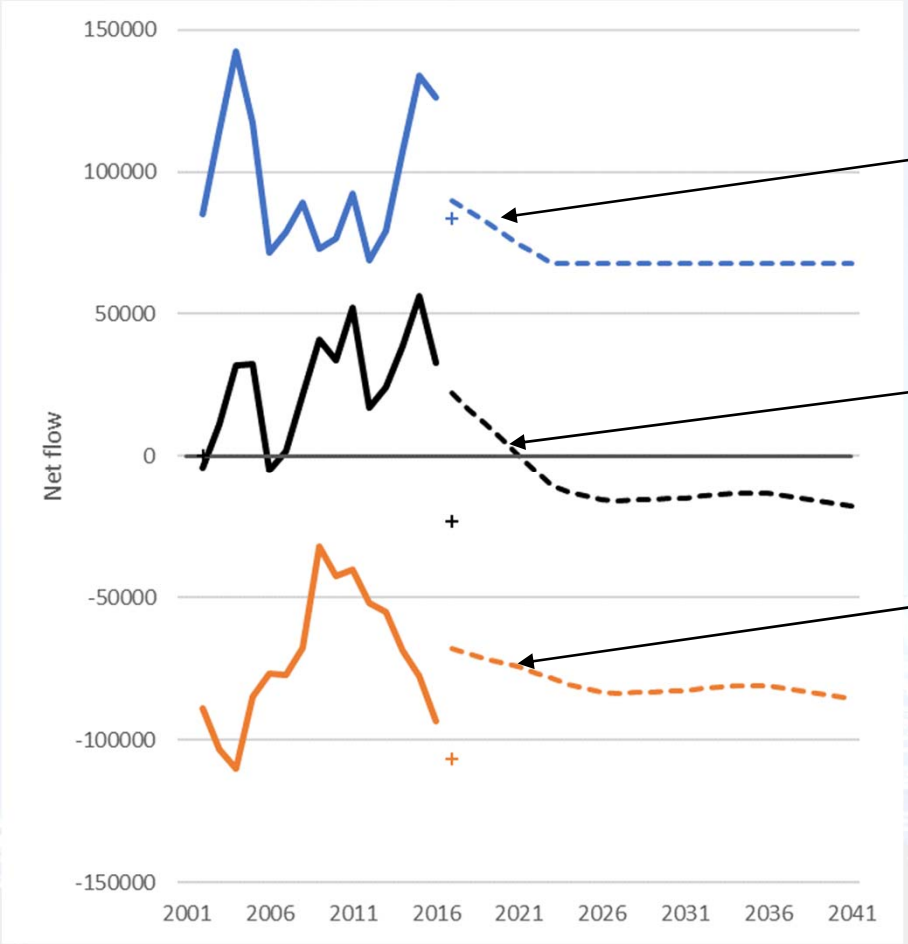


GLA 2016-based Central



Comparison of projected migration flows

ONS 2016-based SNPP



Drop in international migration level
- to point lower than any in preceding 15 years

Sharp fall in overall net migration

Gradual fall in domestic outflow
- result of indirect relationship in model

2016-based ONS household model
Key differences

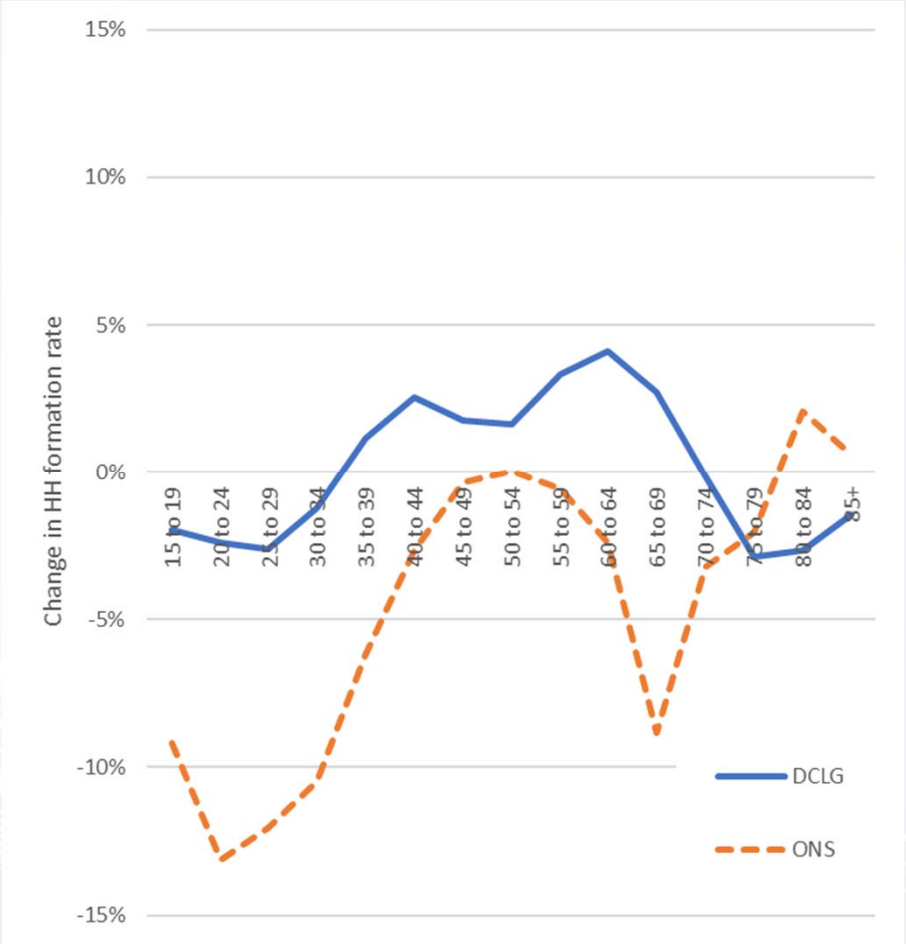
- No longer
  - uses data based on old 'head of household' definition
  - disaggregates population by relationship status
  - uses LFS data to update rates after 2011
- Representative rates
  - projected forward **10 years** based on **two data points** – then constant
    - DCLG uses **5 points, project forward 25 years**
- No household type breakdown available yet
  - Scheduled for 3rd December release

2016-based ONS household model
Comparison of representative rates

London change 2011 to 2021:

- ONS model
  - projects large fall in household formation
  - biggest reduction for young adults
- DCLG model
  - smaller reduction in rates for young adults
  - offset by rises at other ages

Proportional change 2011 to 2021

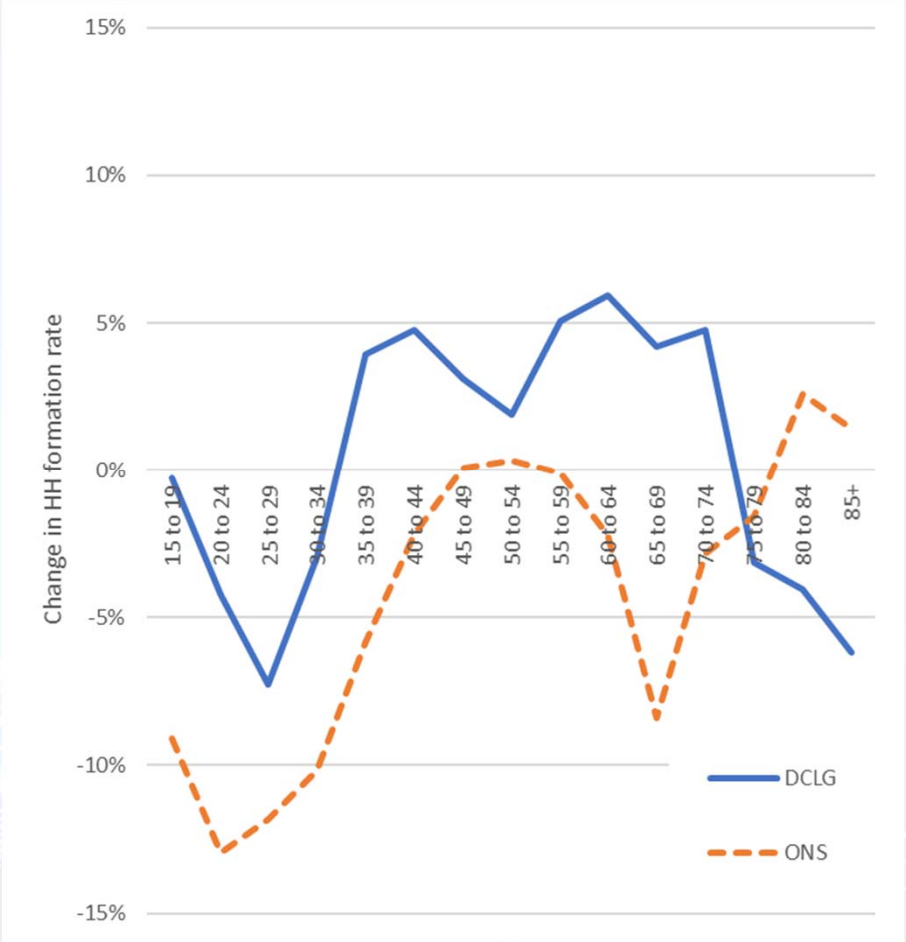


ONS: Households by age of HRP/private HH population by age
DCLG: Stage 1 households by age of head of household / private HH population by age

2016-based ONS household model
Comparison of representative rates

- Beyond 2021
  - ONS rates held constant
  - DCLG rates continue to change

Proportional change 2011 to 2041

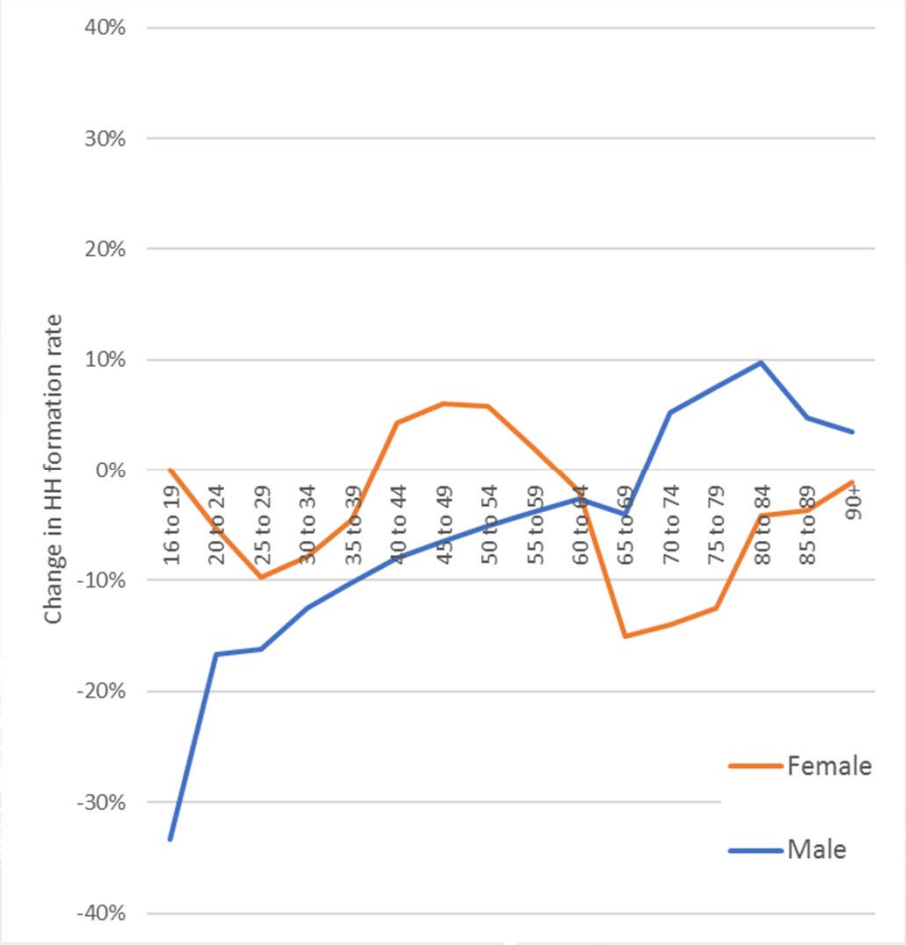


ONS: Households by age of HRP/private HH population by age
DCLG: Stage 1 households by age of head of household / private HH population by age

2016-based ONS household model
Comparison of representative rates

- For some areas, ONS and DCLG methods give similar results
- Not the case for London
  - Large changes over last decade
- Close examination of results raises concerns
  - Diverging trends by age and gender

Proportional change 2011 to 2021



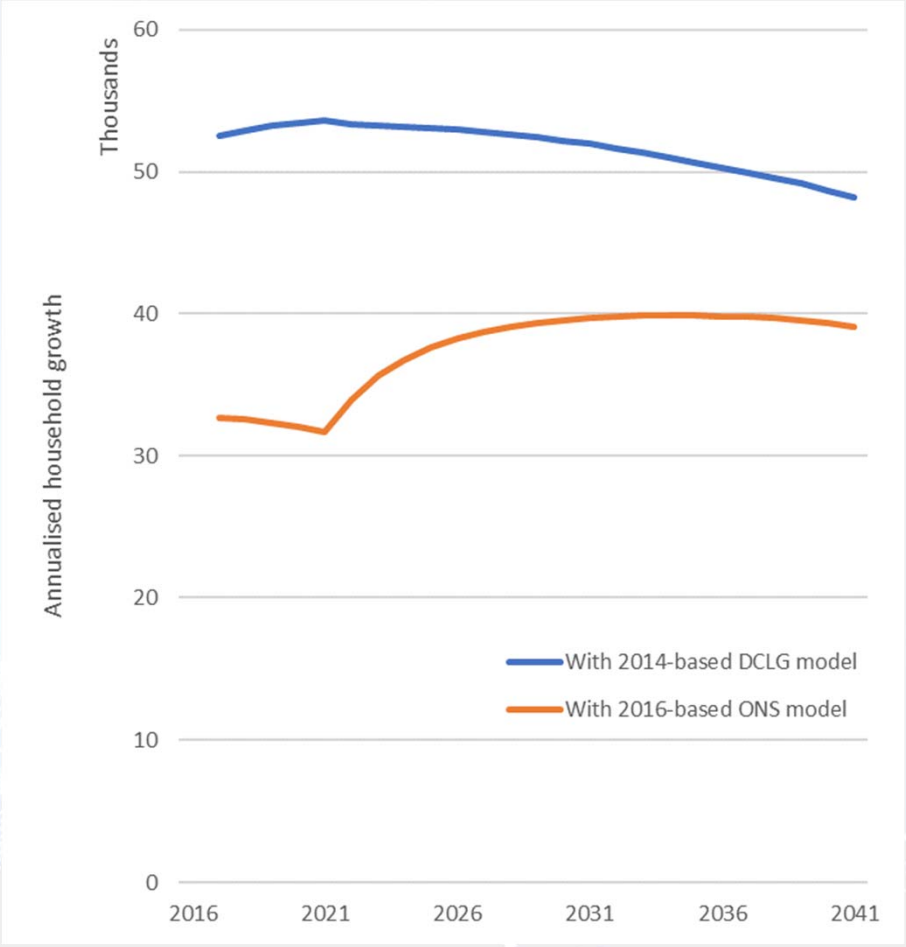
2016-based ONS household model

Comparison of models applied to GLA population projection

- Compare result of each model applied to GLA population projection

Annualised growth – ONS vs DCLG:

- 10-year: 38k vs 53k
- 25-year: 39k vs 48k

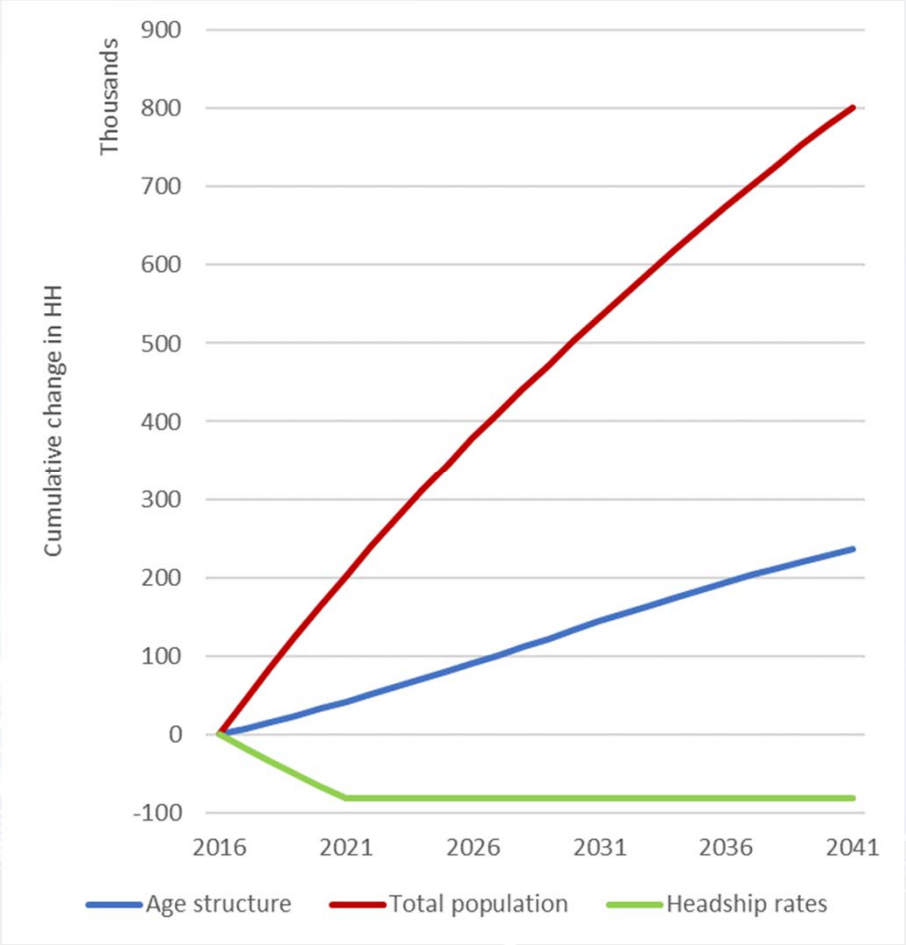


Outputs based on 2016 ONS model available at:
https://data.london.gov.uk/dataset/household-projection-research-outputs

Components of household growth

2016 ONS model applied to GLA Central population projection

- Estimate contribution to annualised growth (25yr):
  - 33k <- total population
  - 10k <- age structure
  - -3k <- household formation



Summary

- GLA population projections provide robust basis for planning
  - Use of long-term trend provides stability for strategic planning
  - More consistent methodology than ONS approach
  - Uncertainty in future migration impossible to quantify at this time
  - Continue to monitor and review
- Use of 2014-based DCLG household model best current option
  - Concerns about new ONS approach when applied to London
  - Government has indicated that it should continue to be used to determine housing need

Contact

demography@london.gov.uk