CITY INTELLIGENCE

2019-based Trend Projections

Variant Projections Results

November 2020

Key Findings

- The 2019-based trend population projections comprise four variant projections:
  - Central projection upper bound
  - Central projection lower bound
  - High population variant
  - Low population variant

- London's current population is 8.96 million (2019 mid-year estimate). The Central Range projects a population of between 10.52 million and 10.92 million in 2050.

- The wider range given by the High population and Low population variants projects a population between 9.80 million and 11.64 million by 2050.

- In the very short-term (to mid-2022) London is projected to grow at rate of around 50,000 persons per annum. This is in the context of average growth of 88,200 over the last ten years. This growth comes from natural change – the balance of births over deaths; net migration during this period is negative. The initial projection phase uses different assumptions from those in the longer-term.

- In the Central projection variant London's population is projected to reach 10 million between 2036 and 2039. This is driven in large part by natural change which adds between 56,000 and 71,000 persons to London's population per year.

- In the Central Lower and Low population variants, total net migration is negative – meaning more people are projected to leave London than to arrive - for the entire projection period. In the Central Upper variant total net migration is positive in the first half of the projection before turning negative in 2042. Only the High population variant projects positive net migration for the entire projection.

- Both the Central Lower and the Low population variants see the working age population in London begin to decline towards the end of the projection period.

- Household projections use the ONS household projection model to convert population into households. Annualised household growth over the 25 years to 2044 is projected at between 33,600 and 37,700 households in the Central Range. The 2018-based central variant projected 34,700 households per year.

Introduction

This Update outlines the results of the GLA's 2019-based borough-level population and household projections. These were released in November 2020 and incorporate ONS population estimates and internal migration estimates up to and including mid-year 2019.

Four variant projections have been produced using different assumptions about future levels of domestic and international migration, they are:

- The Central projection upper bound
- The Central projection lower bound
- The High population variant
- The Low population variant

The projections move forward from a starting point of mid-2019. The first three years of the projection to mid-2022 are the same across all variants and reflect assumptions about short-term impacts of the pandemic. From 2022 the projections begin to diverge as the differing longer-term migration assumptions are applied. These assumptions have been developed with the assistance of an expert panel of academics and professional demographers.

Variant projections have been produced in order to assist users in understanding current uncertainty about future population growth. In addition to the four principal variants presented here, five additional variants were produced during the development of the 2019-based projections. An overview of all of the variants is available in a report published on the London Datastore.

Corresponding household projections have been produced for each population output. These projections use both the ONS 2018-based household model and the 2014-based DCLG household model to convert population into households.

Projection outputs and associated documentation are available on the London Datastore:
https://data.london.gov.uk/demography/population-and-household-projections/

Expert panel

In setting the assumptions for the 2019-based projection variants the GLA sought the guidance of an expert panel of academics and professional demographers. The panel were consulted on the economic and social drivers of population change over both the short-term and long-term as well as the specifics of component trajectories. Their input was key in shaping the assumptions which form the variant projections. A summary of the expert panel consultation is available on the London Datastore.

Interpreting variant projections

The 2019-based variant projections provide users with several population growth trajectories. The Central Range provides a conservative view on future change in which past trends largely hold into the future. The High and Low population variants are intended to provide a wider, but still plausible, range of possible trajectories based on significant shifts in future migration behaviour away from past trends.

Central Range

The Central Range takes an average of the last ten years' data for its assumptions about future international migration patterns. Net international migration to London over the past 20 years has remained relatively stable within a range of 69,200 and 126,400. The ten-year average for London is 95,500.

The last two decades have seen a number of shocks which might be expected to have significantly impacted international flows: EU expansion in 2004, 2007 and 2013; the credit crunch, housing crisis and great recession beginning in 2008; the EU referendum in 2016; and major changes to UK migration policy throughout the period. However, levels of international migration have been relatively stable lending weight to the idea of the resilience of long-term trends.

The difference in the upper and lower bounds of the Central Range is in the assumptions about future rates of domestic migration. The upper bound uses a ten-year average (2010-2019) while the lower bound uses a five-year average (2015-2019).

The ten-year average captures a wide range of behaviours across the economic cycle, including the lower levels of mobility observed following the financial crisis.

The five-year average provides a higher migration scenario - the last five years have been a period of relatively high migration with a peak in 2017 when net out migration reached 101,600 people. This represents an assumption that recent levels become the norm even after accounting for potential variation over the economic cycle.

High population variant

It seems likely that future population growth in London will not be as strong as it has been in recent decades. However, there remains good reason to include a High population variant in the 2019-based projections.

London receives a significant share of UK immigration and in particular a large share of incoming high-skilled workers. As a result, there exists the potential for the capital's level of in-migration to remain steady, or even grow, within a wider context of falling migration to the UK as a whole. In addition, during the most recent financial crisis London's relative global strength saw it become more attractive internationally leading to growth during a period of high economic uncertainty and recession. An important element of this is the international student market which remains strong and where growth is expected to continue.

The resilience of long-term trends across very different social and economic conditions has enabled London's population to grow consistently over the last two decades at an average of 88,000 persons per year. The Central Upper projection projects annualised growth of 63,000 over the period to 2050. A projection variant providing a trajectory above the Central Range is considered necessary to account for the possibility of sustained growth over the projection period in spite of current conditions. The High population variant projects average annual growth of 86,300 persons per year.

Domestic migration patterns in the High population variant are based on an average of the last ten years' rates. As domestic outflows from London have tended to rise in line with international inflows, these rates can be considered as relatively low in the context of the higher international migration flows assumed in this variant.

The High population variant is the only projection which has positive net migration (the sum of domestic and international flows) for the entire projection period. Total net migration peaks in 2028 at 38,700 persons before falling to 3,800 at the end of the projection.

Low population variant

The Low population variant provides an indication of how London's population might change in response to a sustained reduction in international migration while holding domestic net migration at relatively high levels.

This variant assumes a level of net international migration substantially below that observed over the last 20 years for the duration of the projection. Such a scenario might be consistent with a sustained recession or more general long-term economic uncertainty, the role of Brexit, and/or a changing policy approach to UK migration.

Domestic migration rates in the low population variant are held at the ten-year average. These domestic migration rates can be considered relatively high *in the context of lower levels of international migration*. Total net migration (the sum of international net and domestic net migration) in this variant ranges between -15,500 and -37,400 per year meaning growth in the population is a result of natural change only.

Annualised growth over the 31-year projection period to 2050 is 27,100 persons in the Low population variant.

Supplementary variants

Additional and supporting variant projections are reviewed in the variant analysis document which accompanies the release of the 2019-based projections.

Projections for areas outside of London

The detailed variant projections outputs include data for all local authorities in England and Wales as well as national-level data for Northern Ireland and Scotland. This report presents the results for London only. Data for areas beyond the Greater London boundary are primarily published for the purpose of transparency and do not necessarily reflect the organisation's view of future growth outside of the city.

Methodology

A paper on the model and methodology used to produce these projections is available to download from the London Datastore.

Mid-year estimate adjustment

The GLA has previously identified what we believe to be a systematic over-estimation in the level of net migration of young people resulting primarily from an imbalance in the way that international inflows and outflows are estimated. To mitigate this issue, we have adjusted the mid-year estimate series from 2011-2019 so that in 2019 there are 78,400 fewer children in the ages 0-10. This population has been redistributed to the ages 18-28 so that the total population for London and the boroughs remains the same, albeit with an amended age structure. More details on this can be found in the methodology documentation on the London Datastore.

Results

Covid Period

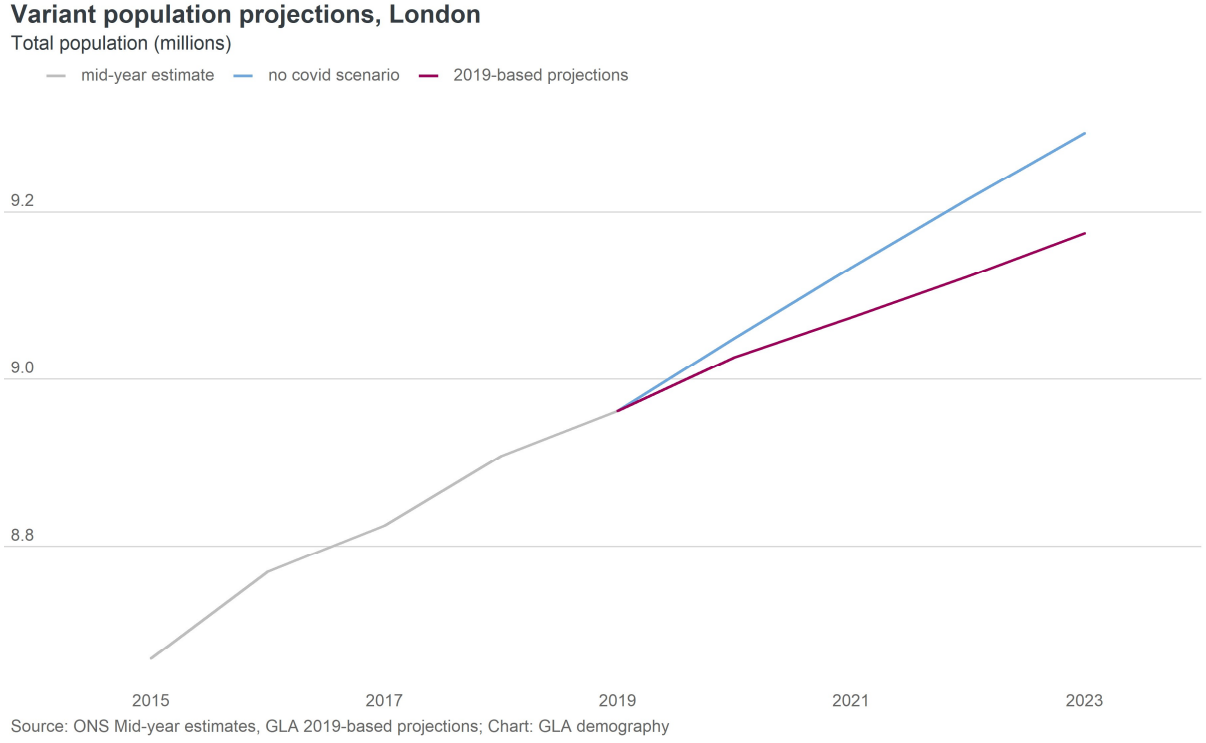
The initial years of the variant projections are characterised by the direct effects of the COVID-19 pandemic. The period mid-2019 to mid-2022 is herein termed the *covid period*. In addition to the increase in mortality from COVID-19 there are implications for other aspects of population change. Both international and domestic migration have been significantly supressed during periods of lockdown, and even under periods of looser restrictions it seems unlikely migration flows will return to recent levels in the short-term.

The *covid period* modelling assumes that domestic migration will be 70% of recent levels for all three years, while international migration is assumed to be 70% of recent levels in the first year and 50% in the following two years. Full details of the modelling approach and rationale are provided in the accompanying methodology document.

Mortality from COVID-19 is modelled from available official data sources[1]. Our modelling assumes 55,100 UK deaths from COVID-19 in the year to mid-2020 (of which 8,400 in London), and 27,500 in the year to mid-2021 (of which 4,200 in London).

For the *covid period* each of the variant projections uses the same trajectory. The chart shows this trajectory in comparison to a projection in which no account has been made of the impacts of the pandemic. In this *no covid* scenario migration rates based on the ten-year average are applied and deaths from COVID-19 are not included. Over the three-year period the *no covid* projection averages growth of 84,500 persons per annum while the 2019-based projections have growth of 53,600 per annum. By mid-2022 the population difference in London is 92,700.

Figure 1



[1] See the 2019-based projections methodology document for full details

Long-term projections

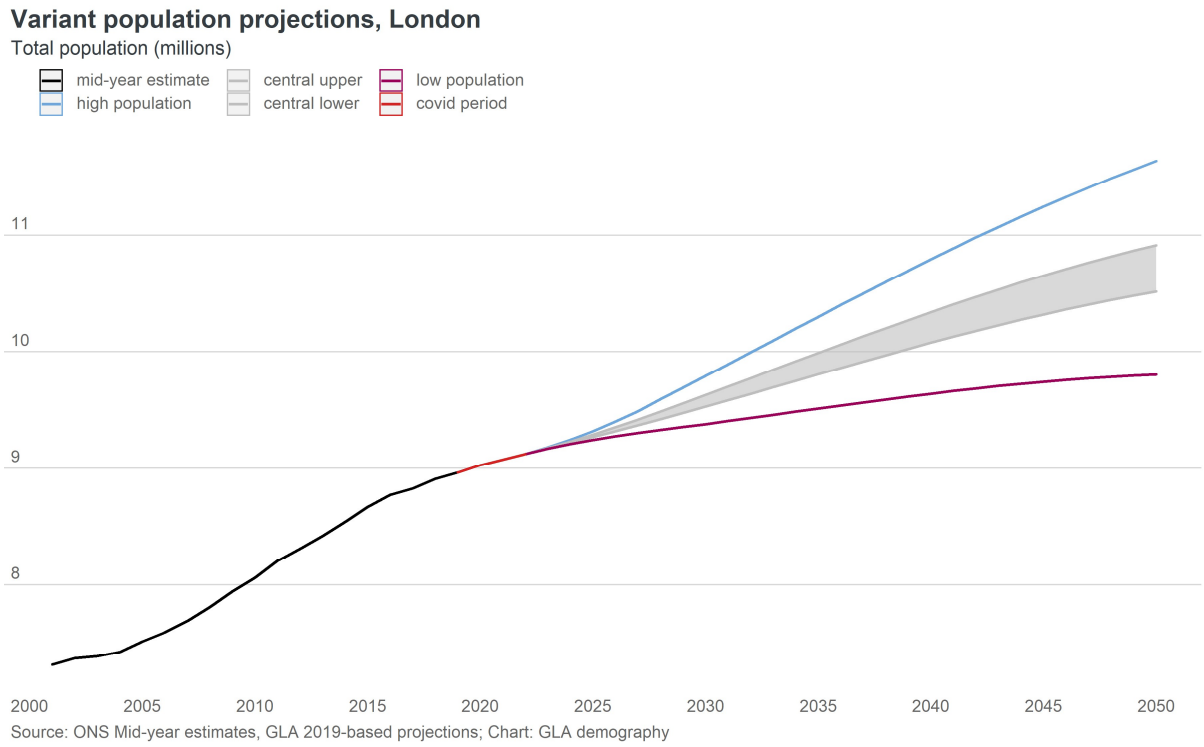
The variant trajectories begin to diverge from 2023 onwards as the differing long-term migration assumptions are applied. Between 2019 and 2050, the Central variant projects that London's population will grow by between 1.55 million (17%) and 1.95 million (21%). This level of growth would lead to a 2050 population of between 10.52 million and 10.92 million at an annualised rate of 50,100 to 63,000 persons per year. Growth over the last decade has averaged 88,200 persons per year. The High population variant projects growth of 2.67 million (30%), or 86,300 persons annually. The Low population variant by contrast projects growth of 841,000 (9%), or 27,100 persons annually.

Table 1: Total population, London (millions)

year	Central Upper	Central Lower	High population	Low population
2011	8.204			
2019	8.962			
2025	9.288	9.268	9.318	9.243
2030	9.629	9.528	9.791	9.379
2035	9.990	9.806	10.300	9.512
2040	10.339	10.078	10.793	9.639
2045	10.654	10.320	11.246	9.742
2050	10.915	10.516	11.637	9.803

Source: ONS mid-year estimates, GLA 2019-based projections

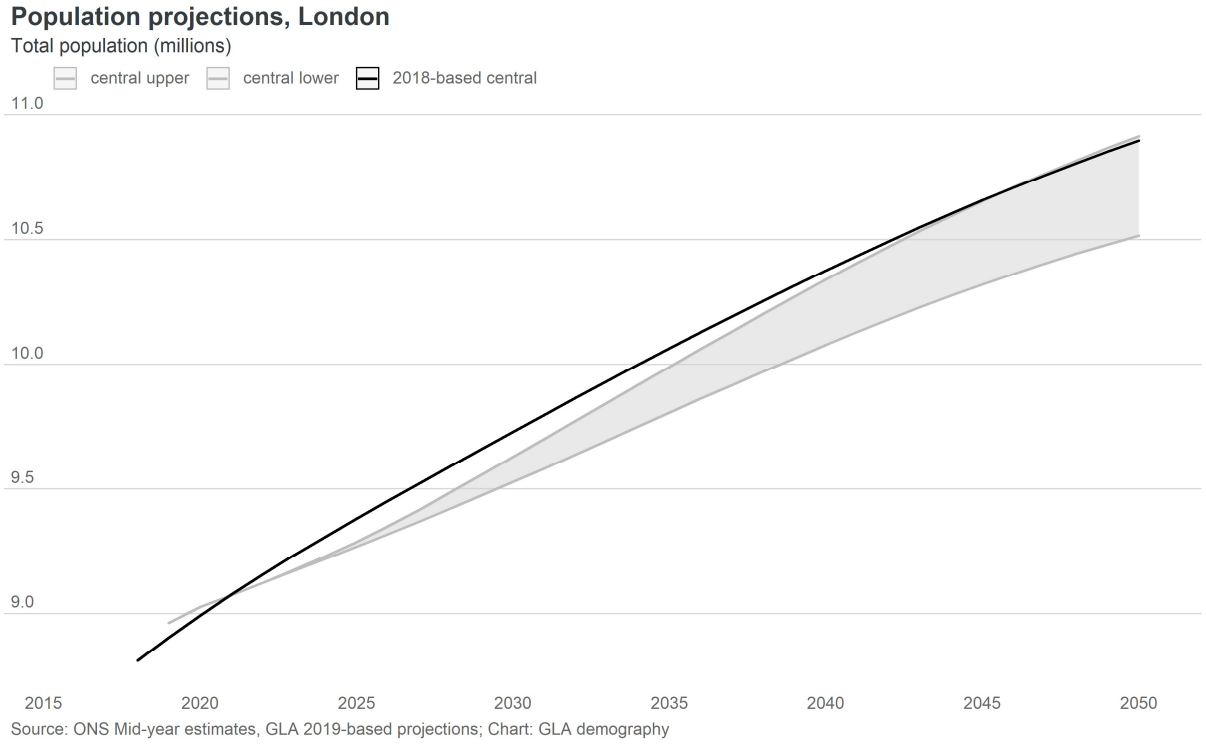
Figure 2



Comparison with 2018-based projections

In December 2019 the GLA published the 2018-based trend projections which included data up to mid-2018. The central variant in the 2018-based projections used a ten-year average of past migration flows for the entire projection period.

Figure 3

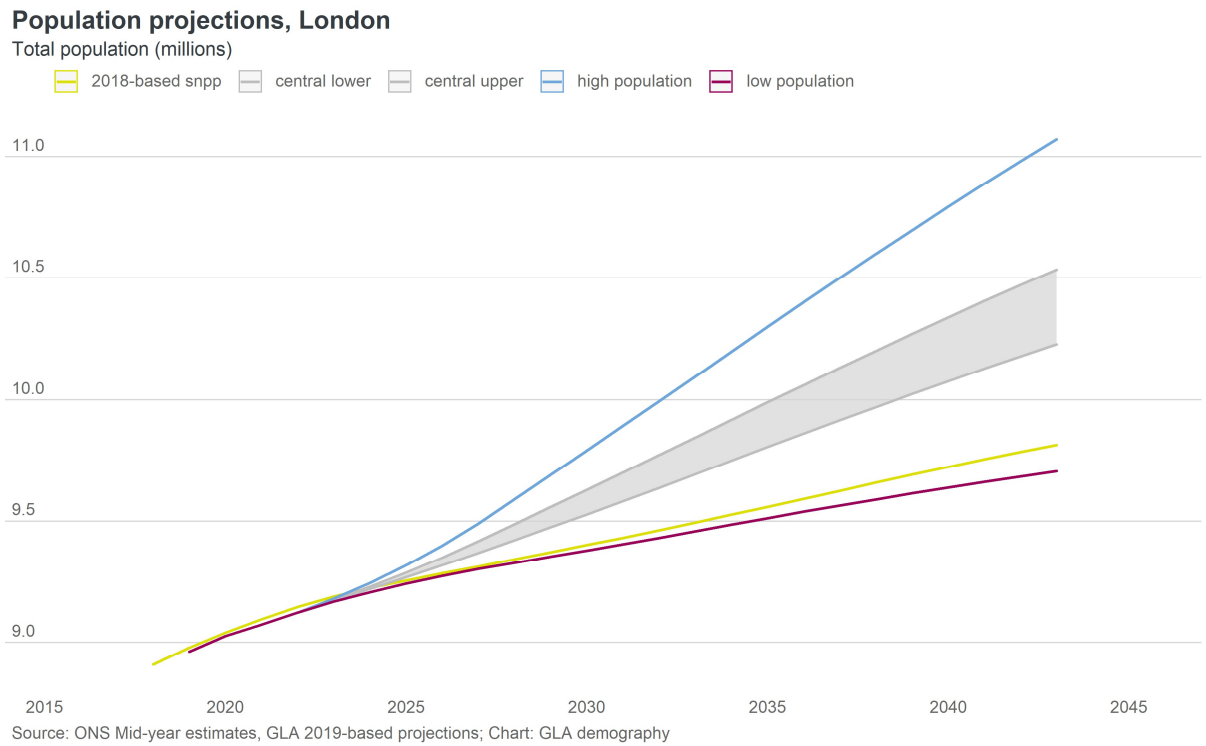


Comparison with ONS 2018-based SNPP

The most recent ONS subnational population projections (SNPP) were published in May 2020 and take the 2018 mid-year estimate as their starting point. These projections use two years of domestic migration data to set projected levels of future migration. This was a period of high domestic out migration and as such when projected forward will act to slow growth leading to a lower population trajectory. International migration in the ONS model is affected by the decision to constrain population the national population projections (NPP). International net migration to London in the 2018-based SNPP is 99,616 in 2019 falling to 75,781 in 2025 where it stays for the remainder of the projection.

Due to its timing, the SNPP makes no account of the impacts of the coronavirus pandemic.

Figure 4



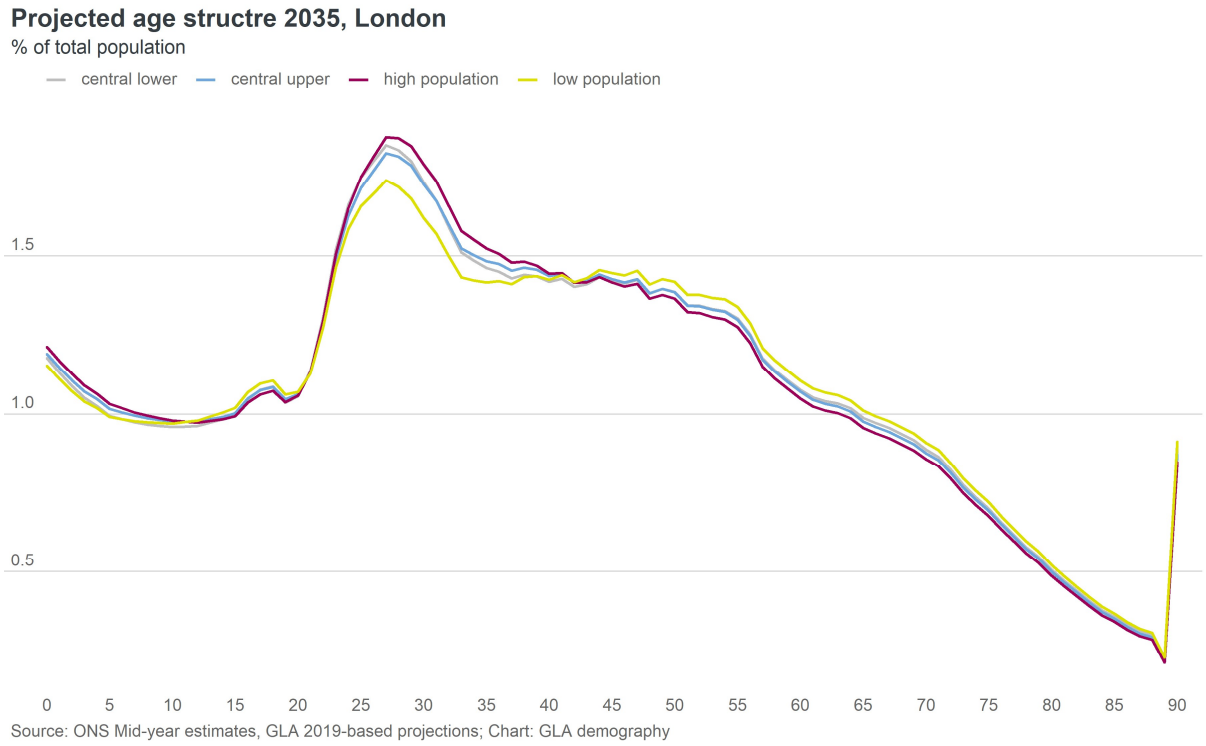
Age structure

The age structure in 2035, after 15 years of projection, is shown in the chart below. In the High variant a greater proportion of people are found in the youngest ages (0-10) and in the earlier adult ages (20-45). This contrasts with the Low population variant where there are comparatively fewer people in these ages but more in the population aged 45 and over.

This is due to the higher levels of migration in the High variant which adds the population in the younger working ages. This is also the population group in which we would expect to see higher levels of family formation explaining the higher proportion of children in this variant. In the Low variant fewer people out-migrate from London meaning the population begins to age and the proportion in the older age groups begins to increase.

The age structure has implications for household growth trajectories (see the section on households below) where household formation rates differ by age.

Figure 5

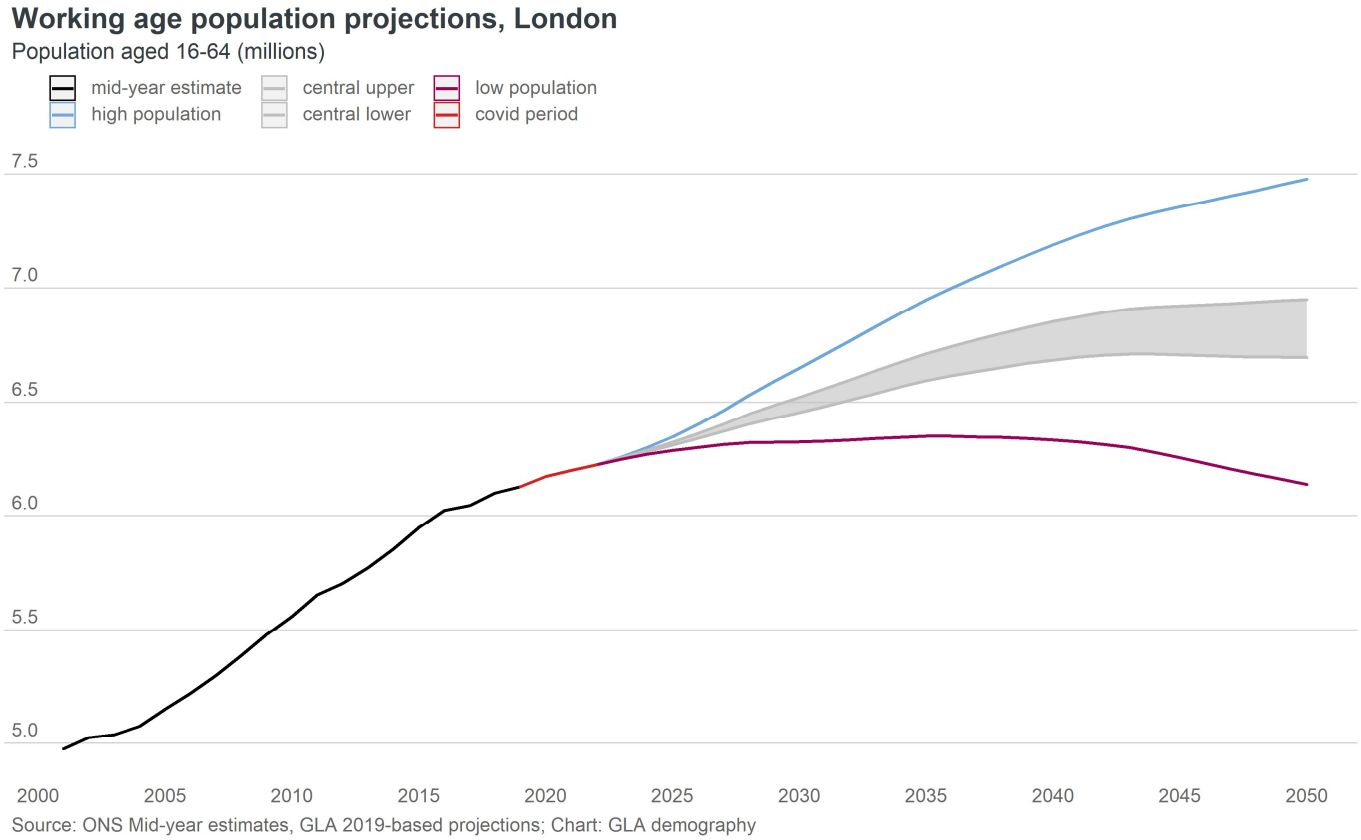


Source: ONS Mid-year estimates, GLA 2019-based projections; Chart: GLA demography

The working age population (those aged 16-64) comprised 68% of London's total population in 2019. The chart below shows the principal projections of the working age population. In the High variant the population increases by 1.348 million over the projection period to reach 7.48 million in 2050. In the Central variant growth is slower – between 567,000 and 816,000. In the final decade growth in the Central Upper is projected to be just 92,000 while in the Central Lower just 10,400. In the final seven years of the Central lower the working age population begins to decline.

In the Low population variant, the working population grows by 223,000 in the period 2035 to reach a peak of 6.351 million. Over the final 14 years of the projection the population falls by 212,000 persons reaching a final 2050 population of 6.139 million. The 2050 working age population is therefore similar in size to the 2019 working age population in this projection.

Figure 6


Working age population projections, London
Population aged 16-64 (millions)
mid-year estimate
high population
central upper
central lower
low population
covid period
7.5
7.0
6.5
6.0
5.5
5.0
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Source: ONS Mid-year estimates, GLA 2019-based projections; Chart: GLA demography

Components of change

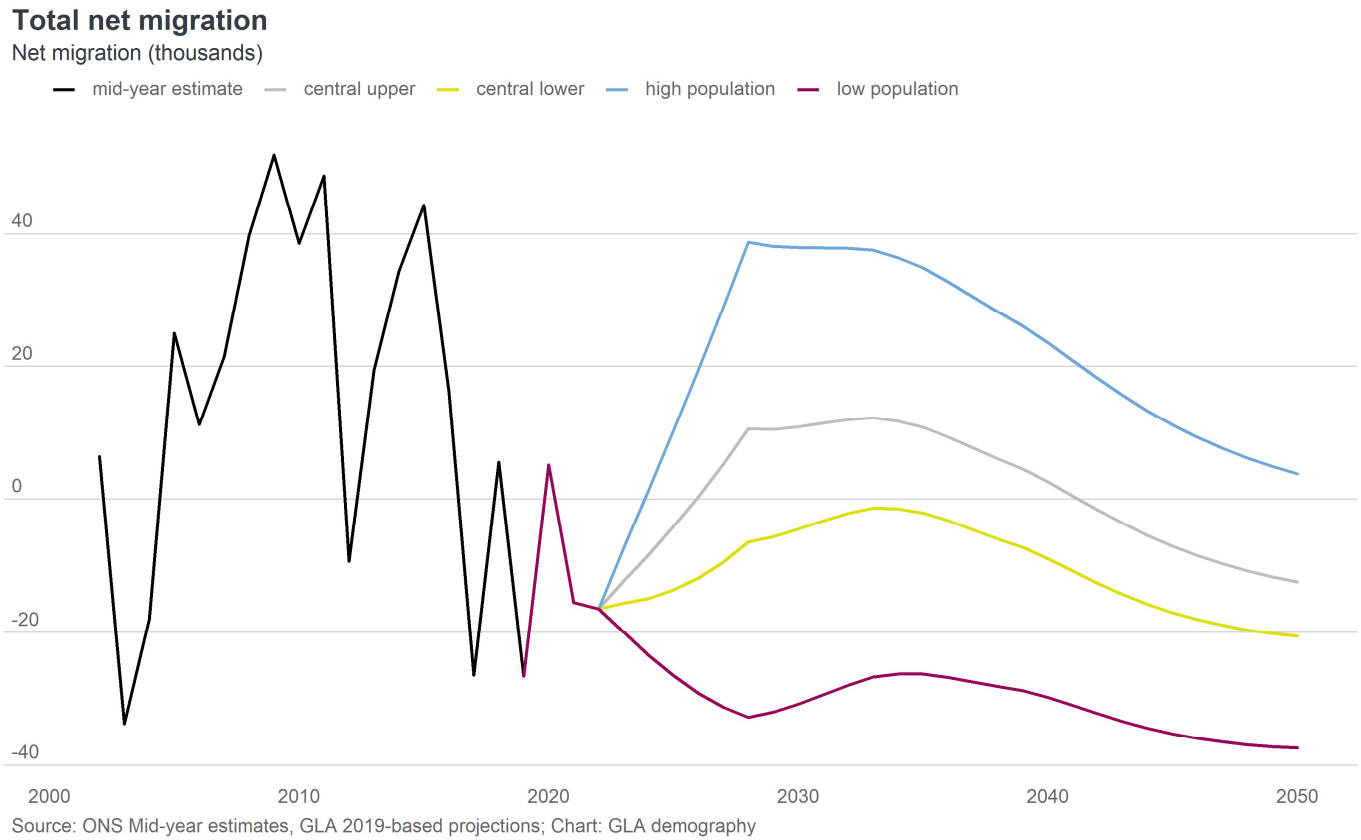
Births, deaths and migration all contribute to London's changing population. Natural change, which is the difference between the number of births and deaths, is the largest direct contributor to London's population growth. Natural change is high in London because its age structure is much younger than that of the rest of the UK.

As noted above, London's relatively youthful population is a result of established patterns of migration to and from the capital, which give rise to a net inflow of young adults and a net outflow of all other age groups.

Total net migration

Total net migration is the balance between domestic and international migration. In the Low population and Central Lower variants total net migration is negative for the entire projection period. In these variants population growth is a result of natural change only. The Central Upper variant has positive net migration for the first half of the projection period peaking at 12,000 persons in 2033 before passing into negative net migration in 2042. The High population variant is the only projection which has positive net migration for the entire projection period. It peaks in 2028 at 38,700 persons before falling to 3,800 at the end of the projection.

Figure 7



Source: ONS Mid-year estimates, GLA 2019-based projections; Chart: GLA demography

International migration

International migration assumptions provide the basis for much of the variation between the four projection variants. There are three international migration scenarios: a high, a central, and a low. In each case the level of net migration was agreed in consultation with the expert panel before gross in and out flows consistent with those net assumptions were derived.

Net international migration in the high scenario is 125,000 persons per annum, in the central scenario is 95,500 persons per annum and in the low scenario is 50,000 persons per annum. These levels are achieved in 2028 in the modelling. The period 2020-2022 has its own international migration profile which is consistent across all three scenarios. The period 2023-2028 is a transition period over which levels of migration move from the 2022 level to the 2028 level.

Figure 8

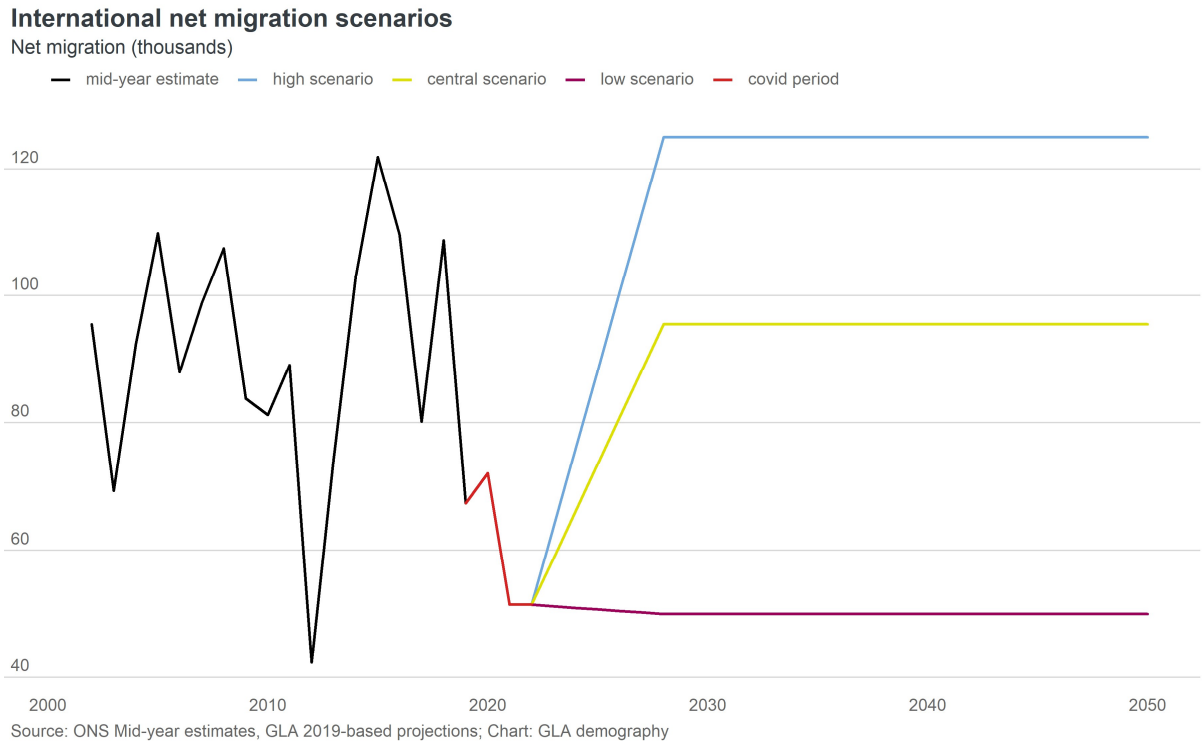
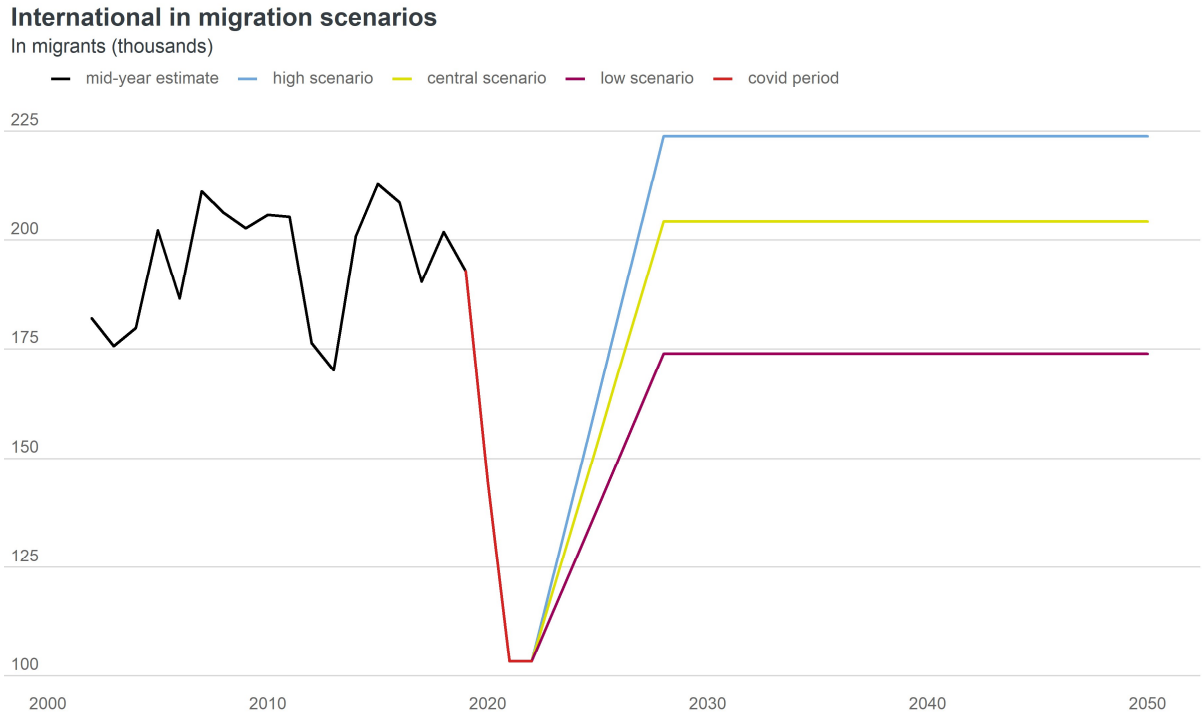
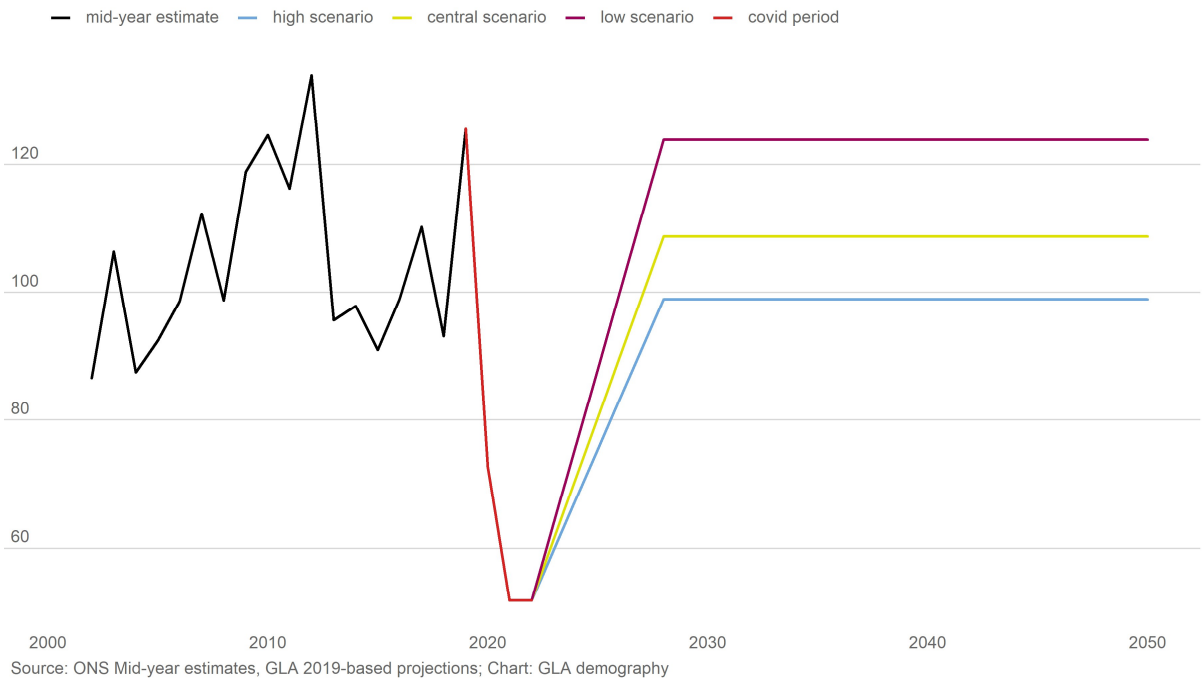


Figure 9



Source: ONS Mid-year estimates, GLA 2019-based projections; Chart: GLA demography

Figure 10



Source: ONS Mid-year estimates, GLA 2019-based projections; Chart: GLA demography

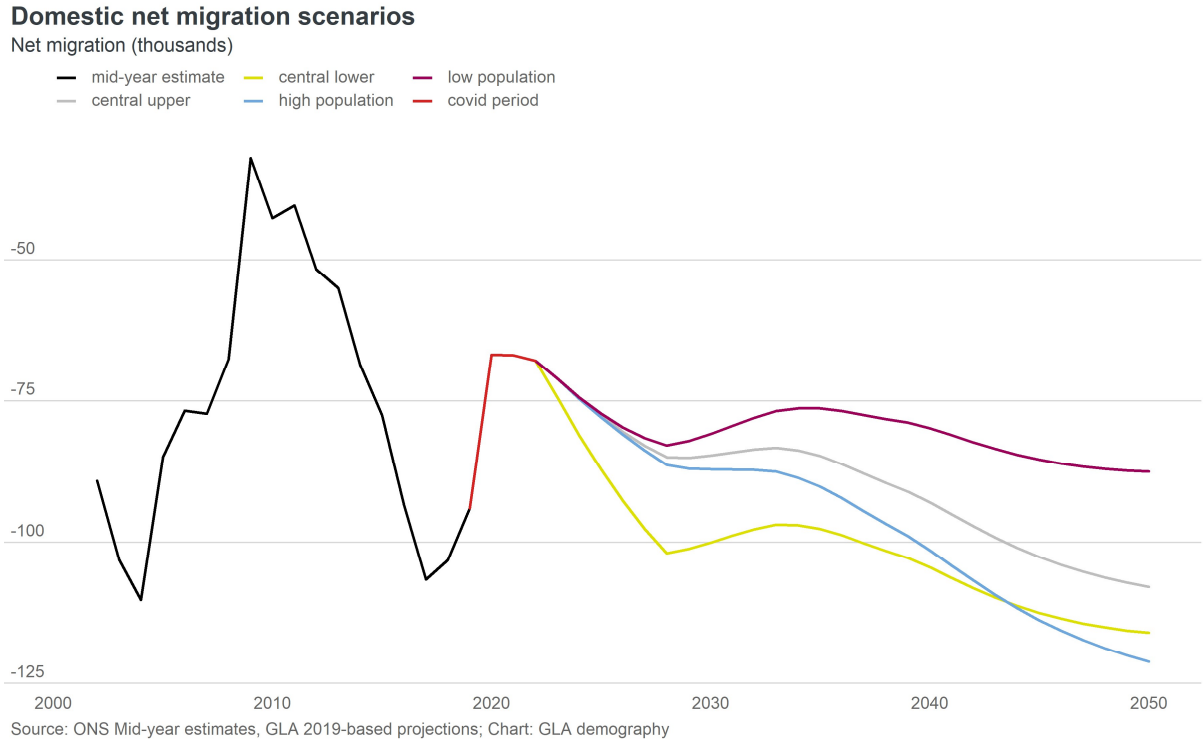
Domestic migration

The variant projections use a high migration scenario for the Central Lower projection and a central migration scenario for the other three projections. As domestic migration is projected using a rates-based approach, the number of people moving in any given projection is a function of the size and structure of the resident population as well as the rates.

The balance of domestic migration in London has been consistently negative for the last two decades. This means that more people leave the capital each year for other areas of the UK than move to London. Higher rates of domestic migration overall lead to a higher net outflow from London and correspondingly slower population growth.

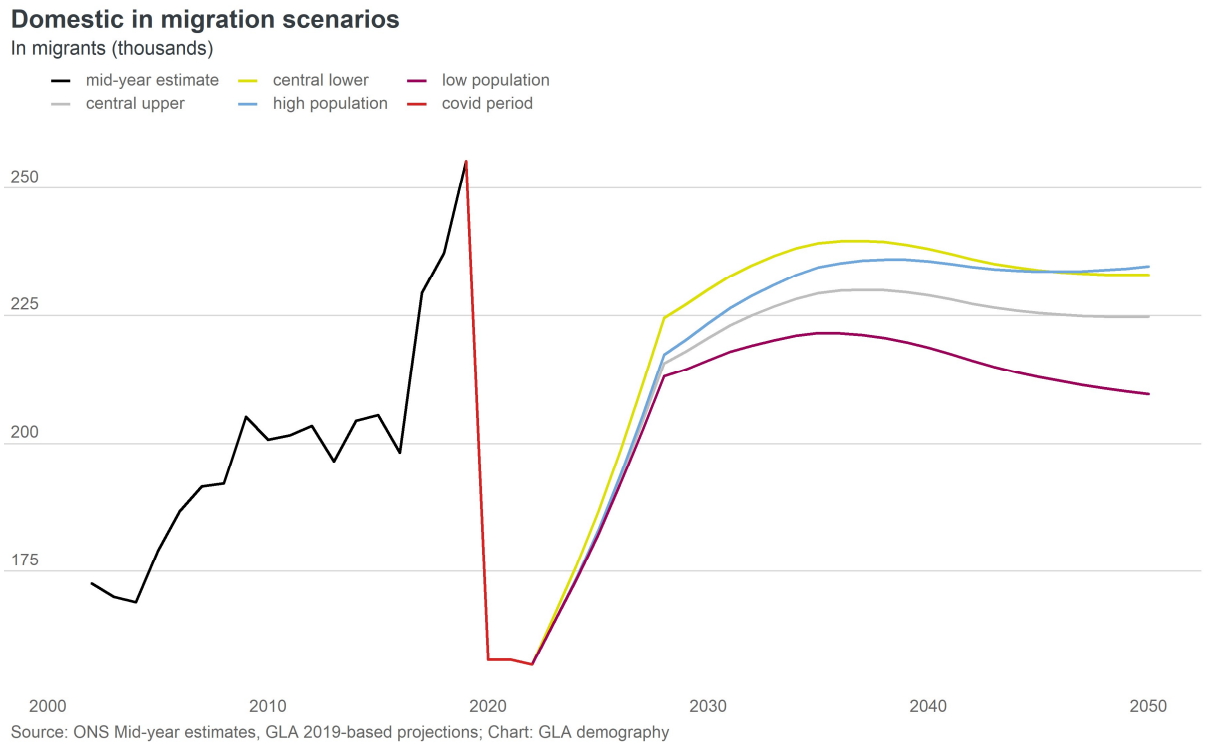
The Central Lower variant uses a high domestic migration average and as a result has the highest outflow of the four variants. The other three variants use the same central scenario migration rates – the differences in levels here are a result of the size of the resident population to which the rates are applied.

Figure 11



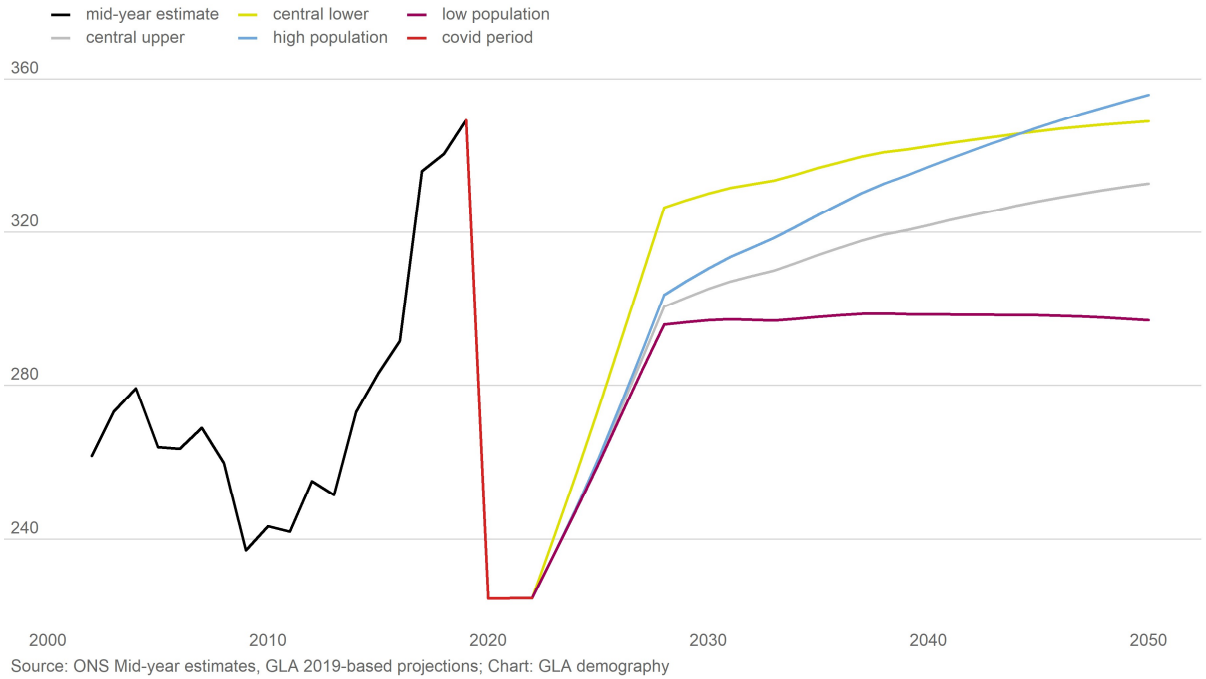
Source: ONS Mid-year estimates, GLA 2019-based projections; Chart: GLA demography

Figure 12



Source: ONS Mid-year estimates, GLA 2019-based projections; Chart: GLA demography

Figure 13



Source: ONS Mid-year estimates, GLA 2019-based projections; Chart: GLA demography

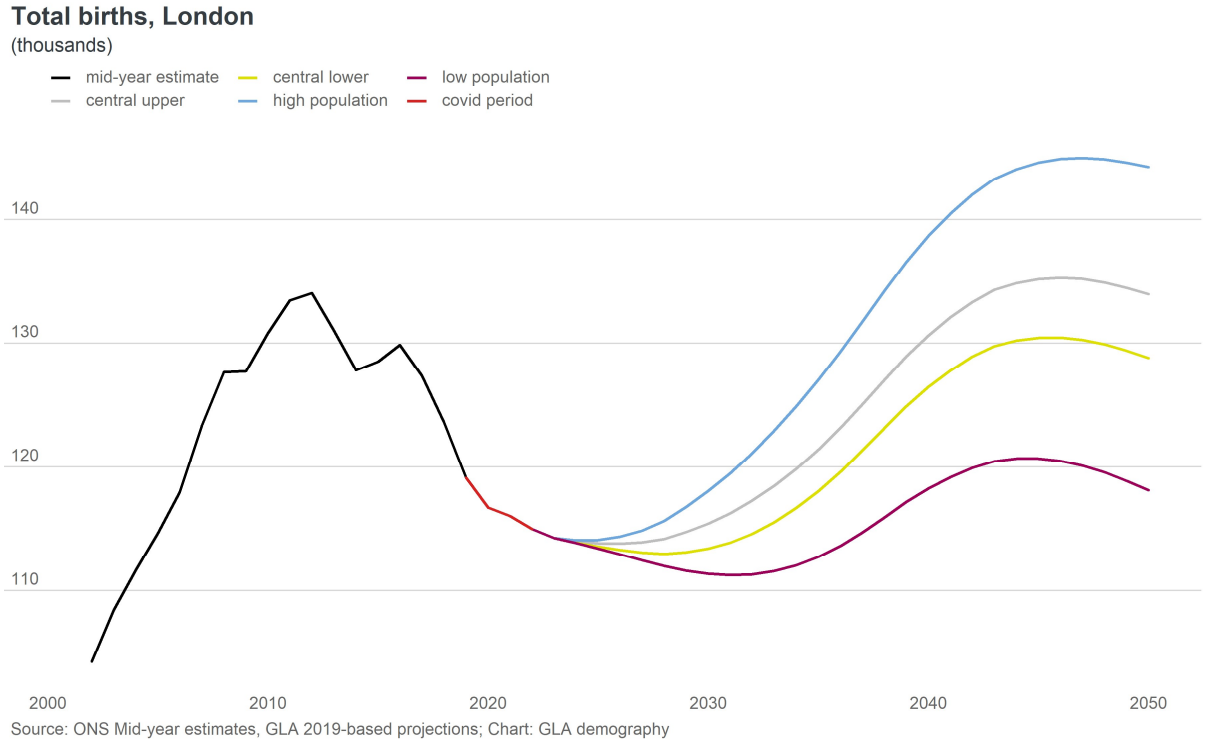
Births, Deaths & Natural Change

Births and deaths are calculated in the variant projections using the same set of fertility and mortality rates. Differences in the number of births and deaths in the variants are a result of the differing resident populations.

Annual births in London rose by approximately 30 per cent over the decade from 2002 to 2012. Since then the number of births has fallen back to the level seen in 2006. Birth projections vary according to the variant but in all cases an initial period of falling births is followed by steady increase. The number of births peaks and stabilises at the end of the projection as the number of women of child-bearing age in the population reaches an equilibrium.

The Low population variant doesn't begin to increase until 2032 but births do not fall below 111,000 (2004 level). The rise in births over the later part of the projection period in all variants is primarily as a result of increasing numbers of women of childbearing age, rather than significant changes in overall fertility rates. The difference in the range of births in 2050 is 26,200: 118,000 in the Low variant and 144,000 in the High variant.

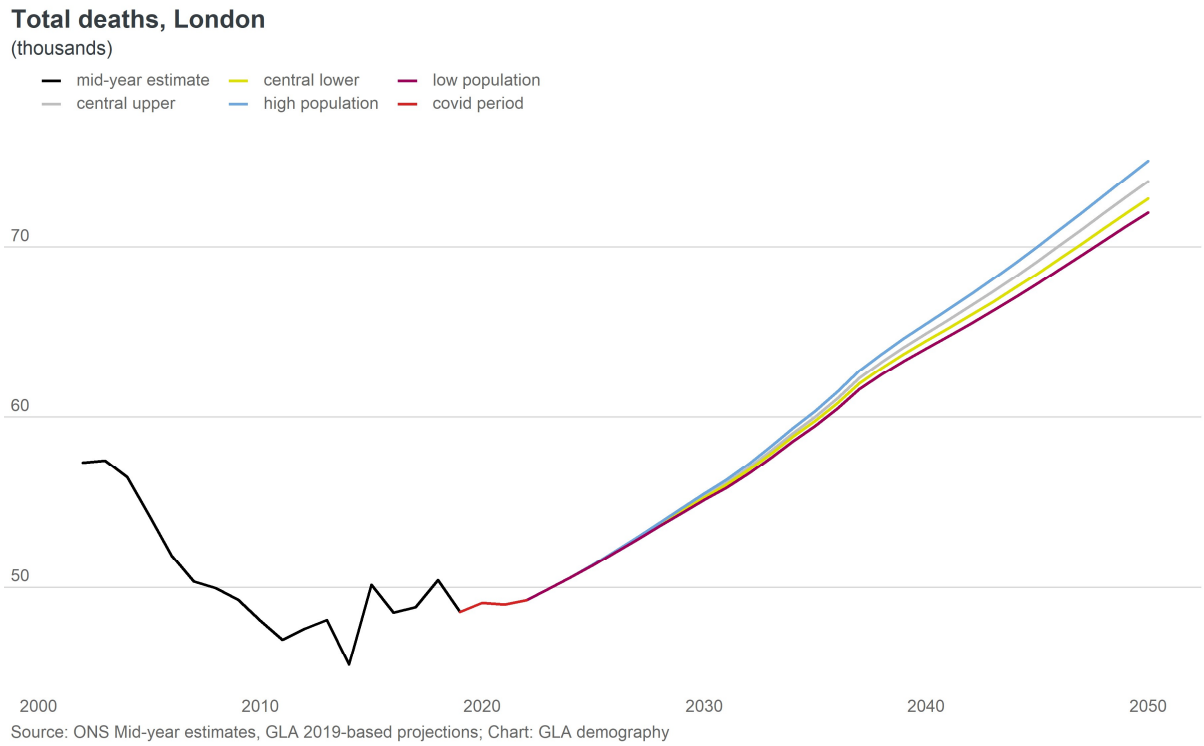
Figure 14



Source: ONS Mid-year estimates, GLA 2019-based projections; Chart: GLA demography

Deaths are also projected to rise, up approximately 50% over the period from 2019 to 2050 in the Central Upper variant. This rise comes despite an assumption that mortality rates will continue to fall over the period and is a result of increasing numbers of elderly people in the population.

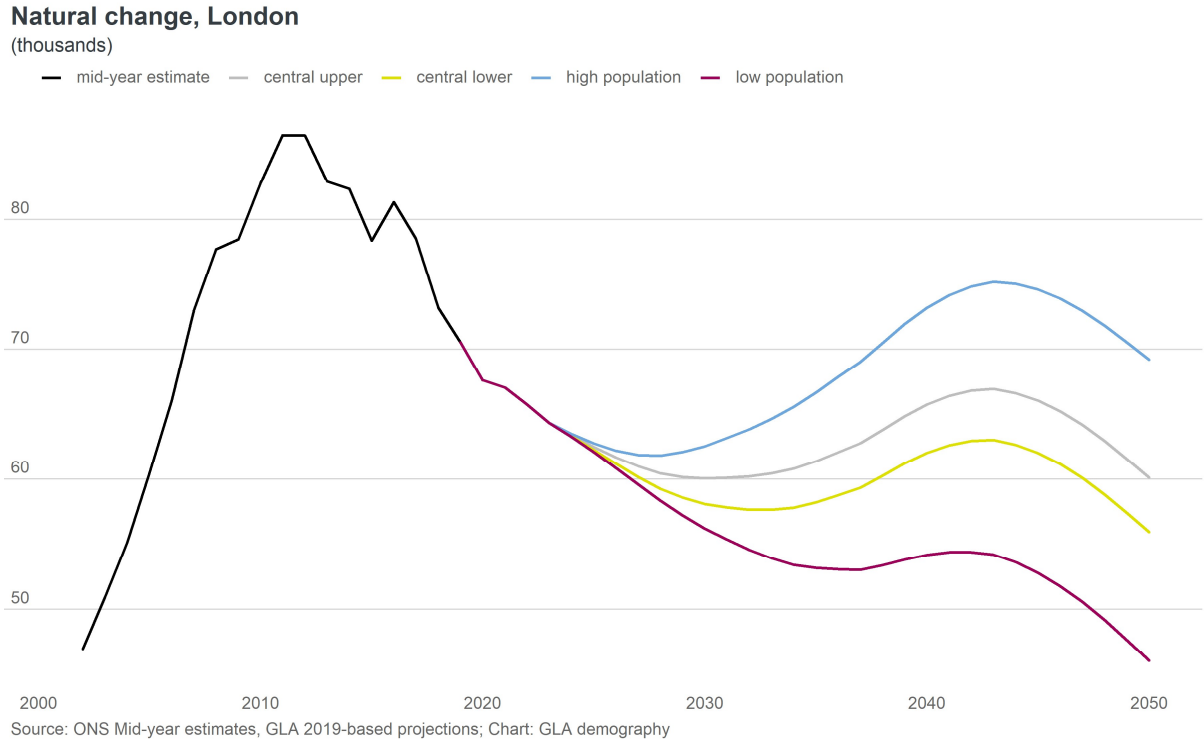
Figure 15



Source: ONS Mid-year estimates, GLA 2019-based projections; Chart: GLA demography

In the Central Range projections, the projected increases in both births and deaths largely balance one another out and therefore natural change remains relatively stable over the period. In the High population variant, the higher number of births means natural change adds more to the population while in the Low population variant the lower number of births causes the level of natural change fall over time.

Figure 16



Source: ONS Mid-year estimates, GLA 2019-based projections; Chart: GLA demography

Household projections

Household projections use household formation rates to convert population into households. The 2019-based projections have been run using both the ONS 2018-based household projection model and the 2014-based DCLG household model.

ONS Household model

The ONS model is the official household model for England and was used by ONS in the preparation of the 2018-based household projections.

Table 2: Variant household projections, ONS household model (millions)

Year	Central Upper	Central Lower	High population	Low population
2011	3.288			
2019	3.570			
2025	3.795	3.788	3.804	3.780
2030	4.000	3.964	4.054	3.917
2035	4.204	4.137	4.312	4.037
2040	4.402	4.305	4.567	4.146
2045	4.577	4.451	4.800	4.233
2050	4.717	4.564	4.997	4.285

Source: ONS 2018-based household model, GLA 2019-based projections

Figure 17

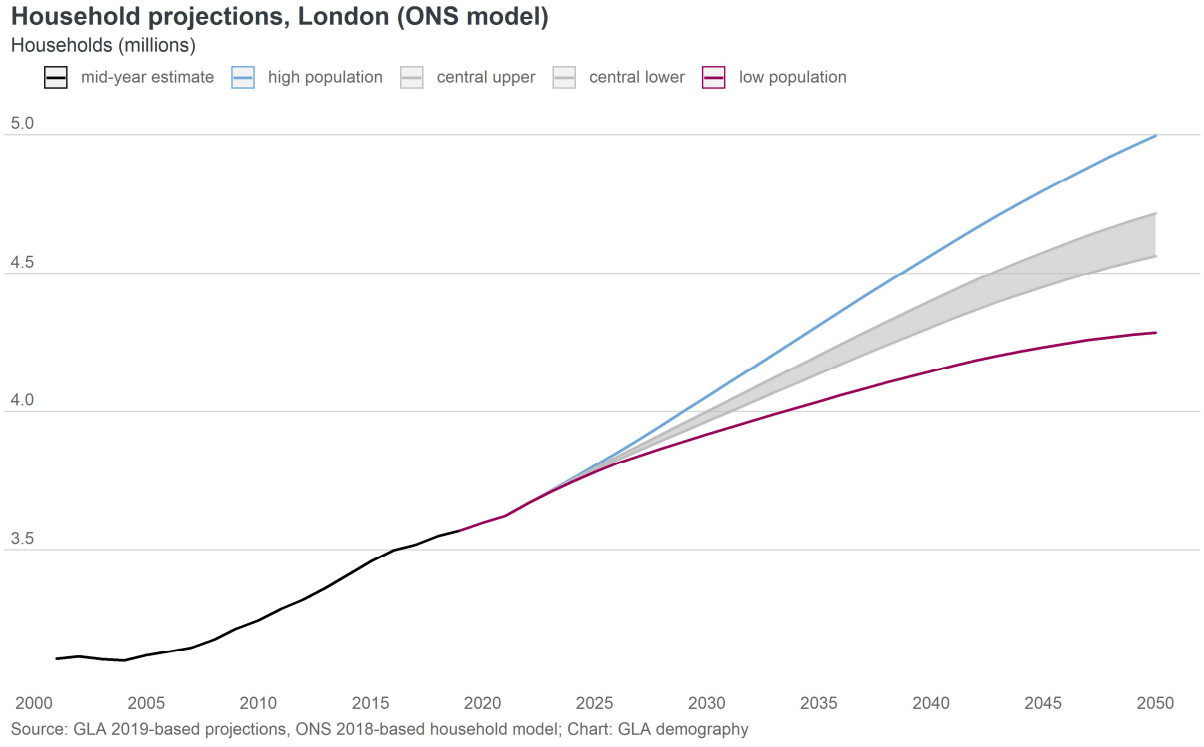
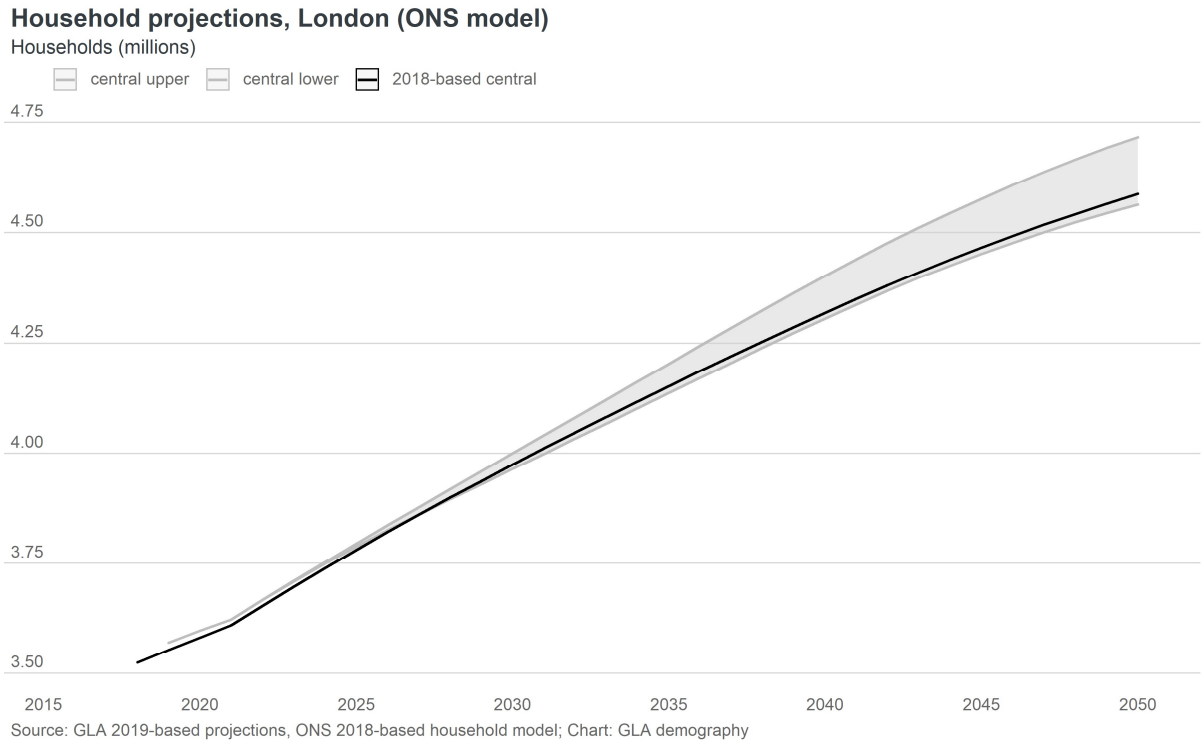


Table 3: Annualised household change (ONS household model)

Variant	Households 2041	Change 2016-2041	Annualised Change
Central Upper	4,440,000	941,900	37,680
Central Lower	4,337,000	839,600	33,580
High population	4,617,000	1,119,200	44,770
Low population	4,166,000	668,800	26,750
2018-based central	4,350,000	868,300	34,730
2016-based central	4,559,000	977,410	39,096
ONS 2018-based SNPP	4,086,000	638,900	25,550

Note: The table uses 2041 as this is the maximum common year across all of the projections

Figure 18



The 2018-based central household projection tracks the 2019-based Central Lower variant. This is somewhat in contrast to the population projection where the 2018-based projection is closer to the 2019-based Central Upper trajectory. This is a result of the age structure of the populations in the different projections – the household formation rates used in the 2018-based and 2019-based projections are the same[2] and changes to the communal establishment population assumptions are not significant.

The 2019-based Central Range variants have higher proportions of their population in ages where household formation rates are higher meaning the 2019-based projections yield more households. For example, in 2035 18% of the population in the 2018-based projection is aged 0-15 where household formation rates are zero compared with 16% in the 2019-based Central Upper projection.

[2] The 2018-based projections used the 2016-based ONS household model while the 2019-based projections used the 2018-based ONS household model. However, the methodology and household formation rates did not change between the two models.

DCLG Household model

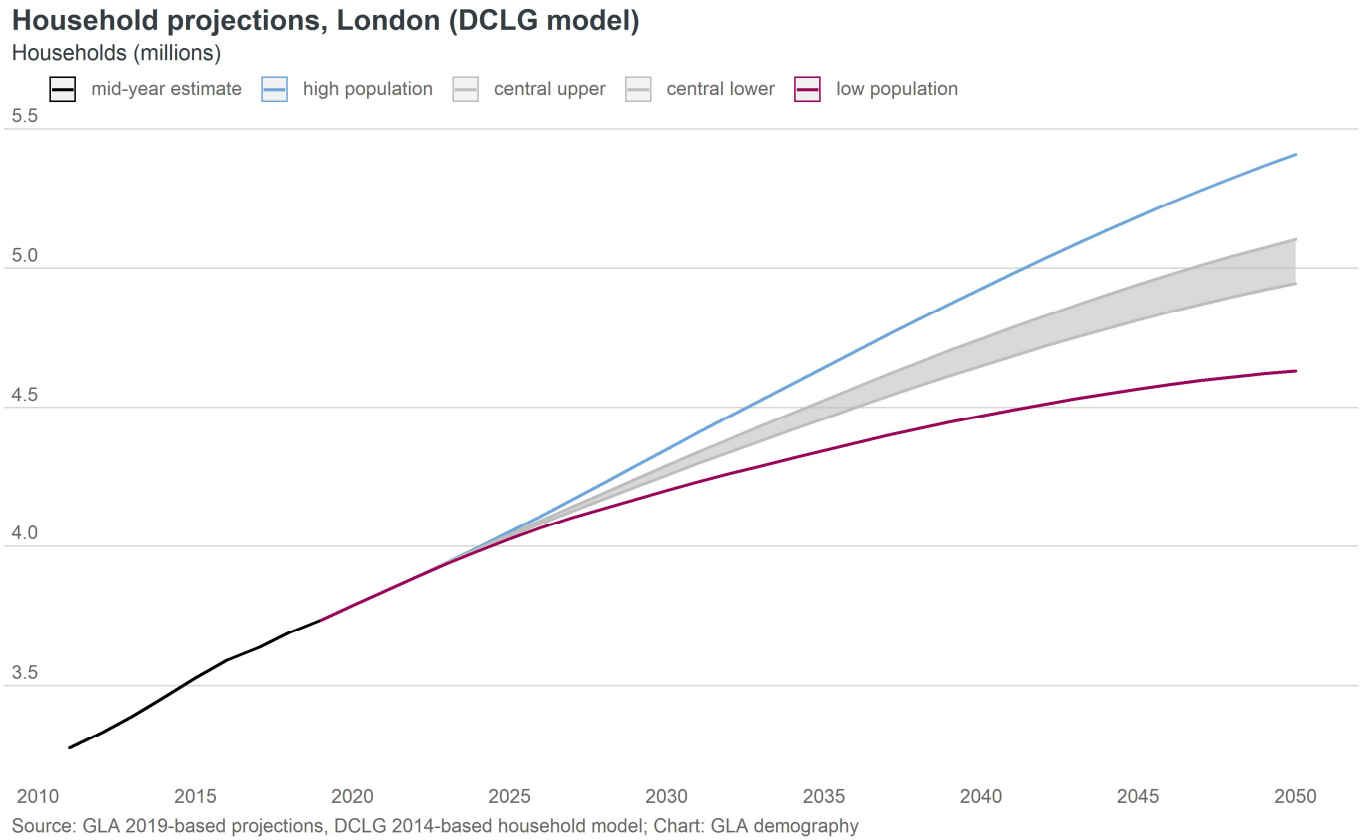
The 2014-based DCLG household model is the model favoured by MHCLG in the calculation of housing requirements. It is also the model used to determine need in the 2017 London Strategic Housing Market Assessment (SHMA) and the London Plan[3]. The DCLG model uses higher household formation rates than the ONS model and so projects a higher number of households from the same population.

Table 4: Variant household projections, DCLG household model (millions)

Year	Central Upper	Central Lower	High population	Low population
2011	3.276			
2019	3.737	3.737	3.737	3.737
2025	4.041	4.035	4.051	4.026
2030	4.290	4.255	4.349	4.200
2035	4.526	4.460	4.644	4.345
2040	4.747	4.650	4.927	4.469
2045	4.942	4.814	5.185	4.566
2050	5.103	4.947	5.409	4.632

Source: DCLG 2014-based household model, GLA 2019-based projections

Figure 19



[3] Intend to Publish 2019 version. The 2019-based variant projections have no impact on London Plan housing targets.

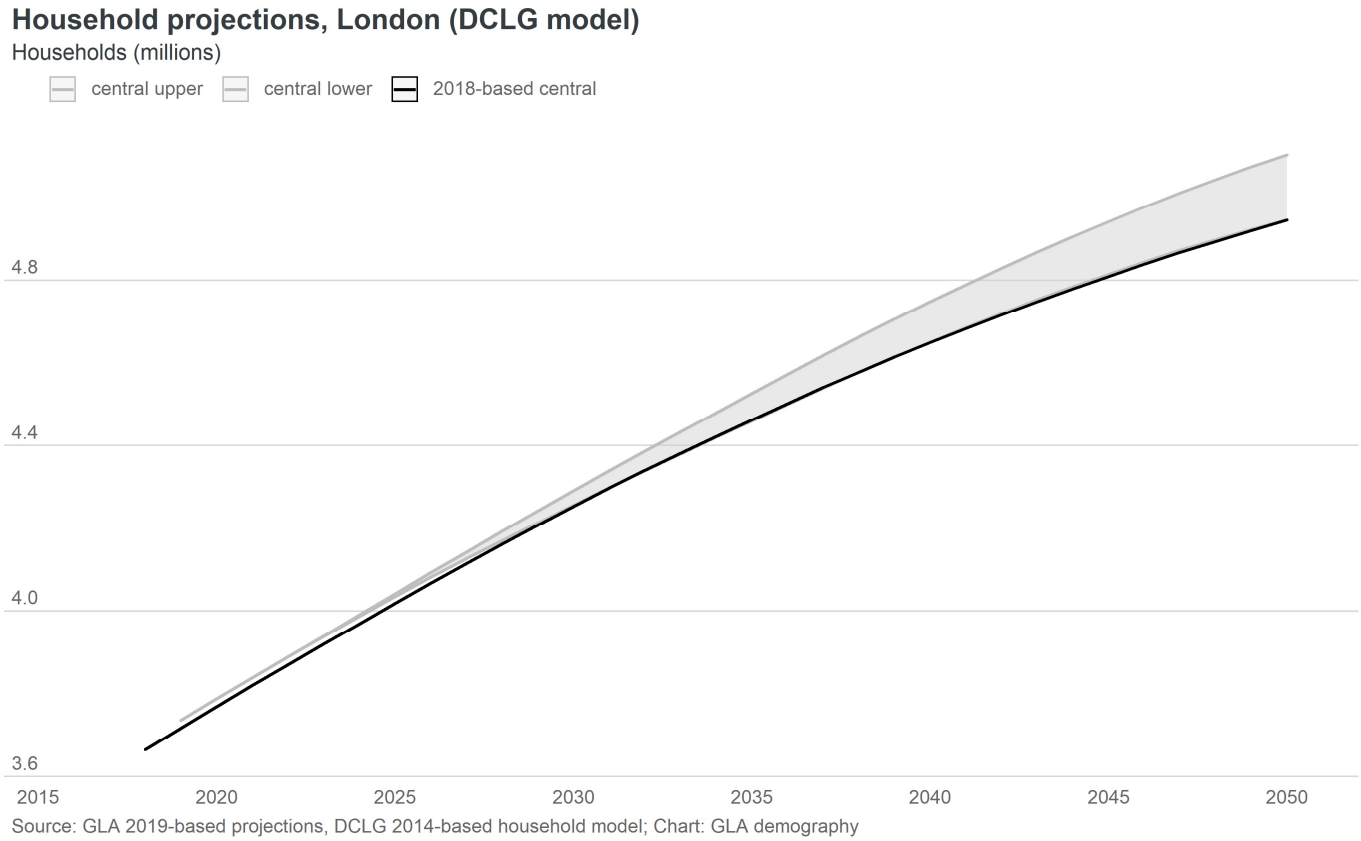
Table 5: Annualised household change (DCLG household model)

Variant	Households 2041	Change 2016-2041	Annualised Change
Central Upper	4,788,000	1,196,200	47,850
Central Lower	4,685,000	1,092,900	43,720
High population	4,981,000	1,389,300	55,570
Low population	4,491,000	898,500	35,940
2018-based central	4,683,000	1,090,400	43,620
2016-based central*	4,786,000	1,205,200	48,210

**London Plan projection (Intend to Publish 2019 version)*

Note: The table uses 2041 as this is the maximum common year across all of the projections

Figure 20



The table brings together the annualised change over the 25-year period 2016-2041from both the ONS and the DCLG models for comparison.

Table 6: Annualised change ONS and DCLG models

	Annualised change 2016-2041	
Variant	**ONS 2018-based model**	**DCLG 2014-based model**
Central Upper	37,680	47,850
Central Lower	33,580	43,720
High population	44,770	55,570
Low population	26,750	35,940
2018-based central	34,080	43,620
2016-based central	39,096	48,210
ONS 2018-based SNPP	25,550	NA

Note: These data are also contained in tables 3 & 5

Further information

The following are all available from the London Datastore:
https://data.london.gov.uk/demography/population-and-household-projections/

Data downloads

- Excel workbook books containing population and components of change data for each of the four variant projections.
- Household model outputs for both 2018-based ONS household model and 2014-based DCLG household model for each variant projection.
- Detailed outputs for the variant projections including detailed components of change csv files, and population data for areas outside the Greater London boundary.
- Population files for each of the nine variant projections.

Methodology documentation

A methodology document detailing the operation of the GLA cohort component model and the setup for the 2019-based variant projections. Includes appendices detailing the GLA adjustment to the mid-year estimate series, the modelling of COVID-19 deaths and fertility curve smoothing.

Supporting documentation

In addition to the standard results and methodology documentation there are two additional pieces of supporting analysis for the 2019-based projections: A report on the operation and outcomes of the 2019-based projections expert panel and an analysis of the full range of nine variant projections. This latter document also includes sensitivity analysis of differing levels of international and domestic migration, fertility scenarios and population change trajectories.

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