GLAINTELLIGENCE

Update 12-2015

2014 Round Ethnic Group Population Projections

November 2015

R2014 SHLAA CHS (Capped Household Size) and

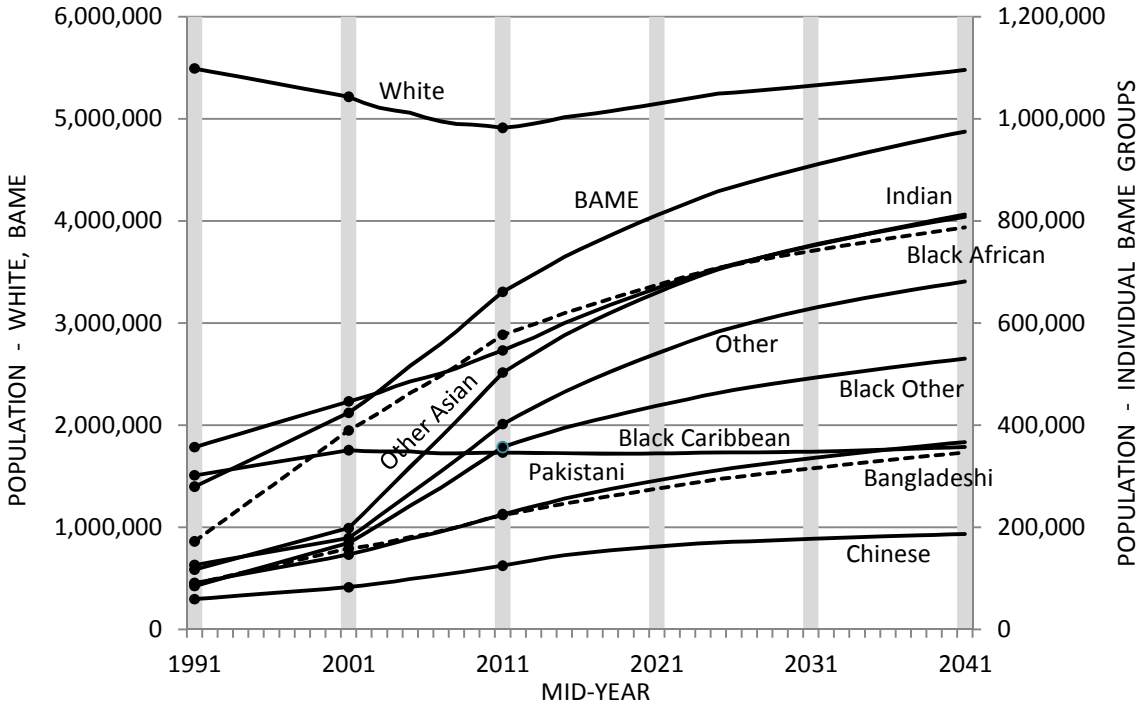
R2014 TREND LTM (Long-Term Migration scenario)

Key Findings

- The GLA publishes annual ethnic group population projections to assist planning and policy decision making. This 2014 Round is the first to incorporate newly available ethnic migration rates and probabilities derived from moves captured by the 2011 Census. This publication presents data for ten aggregated ethnic groups. The key findings presented here relate to the Capped Household Size, short-term migration scenario variant. At Greater London level the corresponding figures for the main trend-based projection variant (long-term migration scenario) do not differ greatly, and are shown in the main body of the report.
- The White population of Greater London is projected to increase from 4.91 million in 2011 to 5.48 million in 2041, an increase of 0.57 million (11.5 per cent) over the period. The 2041 projected White population is 0.38 million (7.6 per cent) higher than the preceding R2013 SHLAA CHS projection.
- The BAME (all ethnic groups except White) population of Greater London is projected to increase from 3.31 million in 2011 to 4.88 million in 2041, an increase of 1.57 million (47.5 per cent) over the period. The 2041 projected BAME population is 0.30 million (5.8 per cent) lower than the preceding R2013 SHLAA CHS projection.
- The Greater London BAME population is not projected to reach a majority at any time over the projection period (by 2041 the White proportion is projected to be 53 per cent and the BAME 47 per cent). However, by 2036 12 London boroughs are projected to have BAME majority populations, three in Inner London (Newham, Tower Hamlets, and Lewisham) and nine in Outer London (Brent, Harrow, Redbridge, Ealing, Hounslow, Barking and Dagenham, Croydon, Waltham Forest, and Hillingdon).
- Compared with the R2013 projections there is a reduction in the projected BAME population and an increase in the White projected population. This shift is mainly due to incorporation of 2011 Census ethnic migration information. This better captured White European Union (EU) migration patterns that would not have been as well accounted for in the adjusted 2001 Census ethnic migration information that was used to align the R2012 and R2013 ethnic projections with the 2011 Census ethnic populations.
- The incorporation of 2011 Census ethnic migration information in the R2014 projections has also resulted in noticeable changes in some projected individual BAME ethnic groups, compared to the R2013 projections. By 2041 the projected populations for the Black African, Black Other, and Other Asian groups are noticeably lower and the Indian population is noticeably higher.

- Over the projection period the greatest relative growth is projected to occur in the Other, Pakistani, and Other Asian ethnic groups, by over 60 per cent each.
- By the Census year 2011 the Black African population (577 thousand) had surpassed the Indian population (546 thousand) to become the biggest individual BAME ethnic group in Greater London. The ethnic projections indicate that from 2035 the Indian population will become the biggest individual BAME ethnic group, reaching 813 thousand in 2041. Practically, the trajectories of the Black African, Indian, and Other Asian ethnic groups are projected to converge by 2026 and remain close through to the end of the projection period, with the Black African trajectory falling away from the other two slightly.
- The R2014 SHLAA CHS ethnic projections are summarised graphically in Figure 1. Census-based populations in 1991, 2001 and 2011 are indicated by markers for clarity. The trajectories between 1991 and 2001 Census markers are linear interpolations to assist in clarifying each complete ethnic group trajectory. The BAME population is seen not to overtake the White population over the projection period. For the Black Other, Other Asian, and Other ethnic groups the trajectories between the 2001 and 2011 Censuses changed markedly compared to their trajectories between the 1991 and 2001 Censuses. These are the three groups whose projected trajectories and populations have reduced noticeably in the 2014 Round after updating ethnic migration with 2011 Census information. This suggests more variability inherent in these groups.
- The next update of the ethnic group population projections to be published in mid-2016 is planned to use the more detailed 17 ethnic group categorisation.

Figure 1: R2014 SHLAA CHS ethnic projections – Greater London



Background

Ethnic Group Population Projections for London boroughs are produced by the Greater London Authority (GLA) to support the authority, its functional bodies and London boroughs in planning and policy decision making. Ethnic projections were initially produced between 1995 and 2000 by the London Research Centre (LRC), in terms of the ten ethnic groups used by ONS in 1991 Census outputs. Publication of borough ethnic projections on the basis of these ten ethnic groups has continued, in most years, after the LRC was absorbed into the GLA at its formation in 2000.

At borough level, GLA have published four 2014 Round non-ethnic borough population projection variants in 2015, two housing development-based and two trend-based. The main housing development-based projection is the R2014 SHLAA CHS (Strategic Housing Land Availability Assessment Capped Household Size, short-term migration scenario) variant and the main trend-based projection is the R2014 TREND LTM (long-term migration scenario) variant. Corresponding 2014 Round borough-level ethnic population projections have been produced for these two variants only and the results are described in this *Update*.

The 2014 Round ethnic projection model uses the same basic methodology developed for the 2012 Final Round of ethnic projections as described in *Intelligence Update 13-2013: 2012 Round Final Ethnic Group Population Projections* and the 2013 Round of ethnic projections as described in *Intelligence Update 12-2014: 2013 Round Ethnic Group Population Projections*. However, for the 2014 Round four elements of the model inputs have been updated.

Firstly, the 2011 mid-year ethnic population datum has been updated to align with 2011 Census borough-level ethnic populations by sex and single-year of age published by ONS as Census Commissioned Tables CT0109 and CT0122 (both tables were commissioned for London boroughs only). In addition, with the availability of these commissioned single-year of age ethnic data, it was finally possible to incorporate GLA's adjustment of 0 to 3-year-olds to ONS 2011 Mid-Year Estimate (MYE) which form the base population at the start year of the projections. This GLA adjustment was first implemented in the R2013 borough non-ethnic projections in order to better reflect the pattern of births in each borough, but was not followed through in the R2013 ethnic projections. This adjustment added 13,068 0 to 3-year-olds to the Greater London ONS MYE, increasing it from 8,204,407 to 8,217,475. The ethnic base populations were updated by rolling-forward the Census ethnic populations by sex and single-year of age from Census Day to Mid-Year using the GLA-adjusted MYE populations by sex and single-year of age as constraints.

Secondly, ethnic migration rates and probabilities were updated to those pertaining at the 2011 Census. Commissioned Tables CT0404 and CT0405 (commissioned for London boroughs only) became available during the course of the year, providing borough ethnic moves by sex and 5-year age band, for domestic in-migration and out-migration, and international in-migration. These were used to derive 2011 Census-based borough inflow rate and outflow probability age structures by sex and ethnicity.

Thirdly, the ethnic model was modified to constrain borough ethnic male and female births separately, by inputting separate male and female total births from the main borough projection outputs.

Finally, sex and single-year-of-age specific survival rate inputs were updated. In previous projections these survival rates were based on borough groupings, i.e. Central Boroughs, Rest of Inner Boroughs, and Outer London, and were held constant over the projection period. Borough sex, single-year-of-age, and projection year-specific survival rates have recently become available as outputs from the main borough model, and these are now input into the ethnic model so that the "ethnic" mortality modelling process is fully in line with the main borough model. It should be noted, however, that there is no information in the UK on ethnic mortality, therefore the GLA ethnic projection model applies the same survival rates to each ethnic group. Drawbacks arising from this issue should be attenuated by moving away from using borough-grouped fixed survival rates to using borough-specific survival rates that are also projection-year specific.

One final ethnic element of the GLA ethnic projection model that has not yet been updated to the 2011 Census is transgenerational ethnicity of births, which will be updated in the next Round. In all other respects the 2014 Round ethnic model and ethnic outputs fully reflect the 2011 Census.

Both of the 2014 Round ethnic projection variants have been developed using the existing ethnic model which is based on the ten GLA Aggregated Ethnic Groups, which are broadly aligned with the ten ethnic groups used by ONS in 1991 Census outputs. Hence all 2014 Round ethnic projection outputs are also in terms of the ten GLA Aggregated Ethnic Groups (see Appendix 1 and 2 for definitions).

GLA main borough and ethnic projection methodologies normally project forward from a census base year. Previously this was 2001, and 2011 is applicable for the 2012 Round and future rounds. In addition, a backfill series for the years 2002 to 2010 was produced for the main borough projections for the 2012 Round, reflecting the available 2011 Census information. A corresponding ethnic backfill series was also produced for the 2012 Round Final ethnic projections, and this was carried over to the 2013 Round and now the 2014 Round. This ethnic backfill series has not been updated in line with the commissioned ethnic sex and single-year of age 2011 Census information, nor with the GLA adjustment of 0 to 3-year-olds of the ONS MYE population. Therefore in the 2014 Round ethnic projection outputs there is a slight discontinuity between the backfill series and the base year for projections, 2011.

As outlined in the preceding Key Findings, the main outcome of fully updating the GLA ethnic projection model (2014 Round) to reflect the 2011 Census (except for transgenerational ethnicity of births) has been a shift from BAME to White populations and proportions, at Greater London level, compared to the previous 2013 Round of ethnic projections. When the two additional changes were made in the 2014 Round model, i.e. separate male and female constraining of borough ethnic births, and alignment of mortality processes with the main borough model, these were developed in separate steps. Evaluation of each change indicated that the change to constraining of ethnic births resulted in very little change in the ethnic composition of the population outputs. Updating the mortality processes resulted in more discernible differences in population ethnic composition but the differences were a fraction of a per cent for each ethnic group. This is at Greater London level. Therefore the differences in ethnic population composition resulting from the 2014 Round compared to the 2013 Round are mainly due to the new 2011 Census-based ethnic migration rates and probabilities.

Methodology Overview

The ethnic projections for the R2014 SHLAA CHS and R2014 TREND LTM variants each consist of four elements. The first element is the base 2001 Mid-Year Census-based ethnic populations derived for previous rounds. The other three elements are:

- Base 2011 Mid-Year Census-based ethnic populations reflecting sex and single-year-of-age structures published in ONS 2011 Census Commissioned Tables CT0109 and CT0122, and incorporating GLA-adjusted Mid-Year 0 to 3-year-olds. These are an update of the base 2011 ethnic populations used in the 2013 Round and the Final 2012 Round.

- Ethnic backfill populations for 2002 to 2010 based on sex and 5-year age ethnic population changes over the inter-censal period. These are the same as derived for the 2013 Round and the Final 2012 Round.

- Projected ethnic populations for the years 2012 to 2041 reflecting the updated base ethnic populations for 2011 and updated ethnic migration rates and probabilities derived from moves captured by the 2011 Census question "One year ago, what was your usual address?" (published by ONS in Commissioned Tables CT0404 and CT0405). These are consistent with the main borough-level projections for the R2014 SHLAA CHS and R2014 TREND LTM variants.

The methodology used to derive these four elements is described in Appendix 3.

Future Updates of Ethnic Group Population Projections

The next annual update of ethnic projections, the 2015 Round, is due to be published in mid-2016 and will be consistent with the 2015 Round main borough projections. It will incorporate the final alignment with the 2011 Census, that of transgenerational ethnicity of births. The outputs are planned to be in terms of 17 ethnic categories instead of the ten Aggregated Ethnic Groups that have been used to date.

Results

Change in Base Ethnic Populations between 2001 and 2011

Table 1 summarises mid-year ethnic populations in Greater London in the last two Census years.

Figures for 2001 are 2001 Census data scaled to the ONS 2001 Mid-Year Estimates incorporating GLA-adjusted Mid-Year 0 to 4-year-olds (implemented in order to better reflect the pattern of births in each borough) using Census ethnic proportions. These were used as base ethnic populations for previous rounds of GLA ethnic projections.

Figures for 2011 are derived from 2011 Census ethnic sex and single-year-of-age populations from Census Commissioned Tables CT0109 and CT0122 scaled to the ONS 2011 Mid-Year Estimates incorporating GLA-adjusted Mid-Year 0 to 3-year-olds (implemented in order to better reflect the pattern of births in each borough) using Census ethnic proportions. These are used as base ethnic populations for the 2014 Round of GLA ethnic projections.

The 2001 figures for each ethnic group are unchanged from the 2013 Round figures published in *Intelligence Update 12-2014: 2013 Round Ethnic Group Population Projections* and also the 2012 Round Final figures published in *Intelligence Update 13-2013: 2012 Round Final Ethnic Group Population Projections*. However, the 2011 figures for each ethnic group differ slightly from the previous two Rounds due to the re-basing to commissioned single-year of age data and the incorporation of GLA adjustments to 0 to 3-year-olds (the latter added 13,068 0 to 3-year-olds to the Greater London ONS Mid-Year Estimate, increasing it from 8,204,407 to 8,217,475).

Table 1: Summary of Change in Base Ethnic Populations between 2001 and 2011 – Greater London

R2014 SHLAA CHS and TREND LTM	2001	2011	2001-11 Change	2001-11 % Change
All Ethnicities	**7,336,900**	**8,217,500**	**880,600**	**12.0**
White	**5,216,100**	**4,912,100**	**-304,000**	**-5.8**
Black Caribbean	351,000	346,200	-4,800	-1.4
Black African	389,700	577,000	187,300	48.1
Black Other	169,200	357,000	187,800	111.0
Indian	446,600	546,300	99,800	22.3
Pakistani	146,400	225,500	79,100	54.0
Bangladeshi	158,200	223,900	65,600	41.5
Chinese	82,400	124,600	42,200	51.2
Other Asian	198,400	502,900	304,500	153.5
Other	178,900	402,000	223,100	124.7
BAME	**2,120,800**	**3,305,400**	**1,184,600**	**55.9**

Figures may not add due to rounding

Over the decade the population of Greater London increased by 881 thousand, an increase of 12 per cent. However, the White population declined by 304 thousand, 6 per cent, despite a significant arrival of European Union Accession citizens and other White people from the rest of the world. Therefore all of the population growth was in the BAME population which increased by 1.2 million, an increase of 56 per cent. By far the greatest relative increases were in the Other Asian, Other, and Black Other groups, which all increased by well over 100 per cent.

Previously the Indian population was the biggest of the individual BAME groups. By 2011 the Black African group was the biggest individual BAME group, with a population of 577 thousand compared to 546 thousand for the Indian group (in fact, although not shown in Table 1, the Black African population is estimated to have overtaken the Indian population in 2008, based on the ethnic backfill series described in Appendix 3). Following its 154 per cent increase since the 2001 Census, the Other Asian population was the third biggest individual BAME group with a population of 503 thousand.

Ethnic Projections

Table 2 summarises the 2014 Round projected ethnic populations for Greater London. For the SHLAA CHS variant, between 2011 and 2041 the overall population is projected to increase by 2.1 million, 26 per cent. A noticeable increase of 566 thousand, 12 per cent, in the White population is projected. The BAME (all ethnic groups except White) population is projected to increase by 1.6 million, 48 per cent.

For the TREND LTM variant, between 2011 and 2041 the overall population is projected to increase by 2.1 million, 25 per cent. A slightly lower increase of 525 thousand, 11 per cent, in the White population is projected. The BAME population is projected to increase by 1.5 million, 46 per cent.

For both variants the greatest projected relative increases in individual BAME populations are in the Other, Pakistani, and Other Asian groups, of about 60 to 70 per cent. The Other Asian, Other, and Indian groups will account for the greatest proportions of the projected increase, of about 13 to 15 per cent each.

Table 2: R2014 Ethnic Projections – Greater London

	2011	2015	2021	2031	2041	2011-41 Change	2011-41 % Change	2011-41 % of Change
R2014 SHLAA CHS								
All Ethnicities	**8,217,500**	**8,663,300**	**9,201,200**	**9,863,100**	**10,354,200**	**2,136,800**	**26.0**	**100.0**
White	**4,912,100**	**5,015,700**	**5,146,300**	**5,323,800**	**5,478,400**	**566,300**	**11.5**	**26.5**
Black Caribbean	346,200	345,200	344,400	348,000	357,300	11,100	3.2	0.5
Black African	577,000	619,500	674,700	740,900	787,200	210,200	36.4	9.8
Black Other	357,000	394,600	437,800	491,800	530,100	173,100	48.5	8.1
Indian	546,300	600,100	668,300	750,800	812,500	266,200	48.7	12.5
Pakistani	225,500	256,000	291,800	335,000	366,600	141,100	62.6	6.6
Bangladeshi	223,900	246,000	275,400	315,300	346,200	122,400	54.7	5.7
Chinese	124,600	145,100	162,200	177,200	186,800	62,200	49.9	2.9
Other Asian	502,900	576,000	659,600	751,900	807,800	304,900	60.6	14.3
Other	402,000	465,300	540,600	628,400	681,300	279,300	69.5	13.1
BAME	**3,305,400**	**3,647,600**	**4,054,800**	**4,539,200**	**4,875,900**	**1,570,500**	**47.5**	**73.5**
R2014 TREND LTM								
All Ethnicities	**8,217,500**	**8,608,400**	**9,111,300**	**9,762,800**	**10,276,400**	**2,058,900**	**25.1**	**100.0**
White	**4,912,100**	**4,978,400**	**5,085,700**	**5,263,400**	**5,437,400**	**525,300**	**10.7**	**25.5**
Black Caribbean	346,200	343,900	341,800	343,400	351,400	5,200	1.5	0.3
Black African	577,000	615,700	666,500	728,200	772,900	195,900	34.0	9.5
Black Other	357,000	392,700	433,700	485,100	522,800	165,700	46.4	8.1
Indian	546,300	598,200	669,800	757,000	823,000	276,700	50.6	13.4
Pakistani	225,500	255,700	293,800	340,000	373,500	148,000	65.7	7.2
Bangladeshi	223,900	244,600	270,200	304,800	331,900	108,100	48.3	5.2
Chinese	124,600	143,700	158,300	171,900	182,200	57,700	46.3	2.8
Other Asian	502,900	572,600	655,900	748,500	807,200	304,300	60.5	14.8
Other	402,000	462,800	535,500	620,500	674,000	272,000	67.7	13.2
BAME	**3,305,400**	**3,630,000**	**4,025,600**	**4,499,400**	**4,838,900**	**1,533,600**	**46.4**	**74.5**

Figures may not add due to rounding

The R2014 SHLAA CHS ethnic projections indicate that by 2026 the Indian population will reach 715 thousand to temporarily become the biggest individual BAME ethnic group until 2029, when the Other Asian group will temporarily become the biggest BAME group until 2034. From 2035 the Indian population will again be the biggest through to the end of the projection period (2041) when it will reach 813 thousand. Practically, the Black African, Indian, and Other Asian trajectories are projected to converge by 2026 and remain close through to the end of the projection period, with the Black African trajectory falling away from the other two slightly.

The R2014 TREND LTM ethnic projections indicate that the Indian population will reach 659 thousand by 2020 to become the biggest individual BAME ethnic group and will remain so until the end of the projection period (2041), at which point it will reach 823 thousand. Although the Black African, Indian, and Other Asian trajectories are not projected to cross over after 2020 as is the case with the SHLAA projections, they are also projected to remain close through to the end of the projection period, with the Black African trajectory again falling away from the other two slightly.

Differences between R2014 SHLAA CHS and TREND LTM Ethnic Projections

Table 3 summarises the differences between the 2014 Round SHLAA CHS and TREND LTM ethnic projections at Greater London level (the 2011 base year ethnic populations are the same for both variants). The differences over the projection period are shown graphically in Figure 2 for the overall population and in Figure 3 for the ethnic populations. Census-based populations in 2001 and 2011 are indicated by markers for clarity.

The SHLAA CHS variant projects a higher overall population over the entire projection period, by between 0.6 and 1.4 per cent. The ethnic projections indicate that in 2015 the additional 54,900 of the SHLAA CHS population was two-thirds accounted for by the White group and one-third by the BAME groups, but by 2041 the additional 77,900 will be accounted for roughly equally by the White and BAME groups. Over the projection period the individual ethnic groups that generally account for the highest proportions of the additional SHLAA CHS population are the Black African and Bangladeshi groups, in 2041 each accounting for 18 per cent. However, the relative ethnic differences between the two variants are small over the projection period. In 2015 the percentage differences are within 0.7 per cent for each ethnic group, and by 2041 the greatest percentage differences increase only slightly, e.g. to about 4 per cent for the Bangladeshi group.

Table 3: Differences between R2014 SHLAA CHS and TREND LTM – Greater London

	2015	2016	2021	2026	2031	2036	2041	% of diff in 2041
diff SHLAA CHS - TREND LTM								
All Ethnicities	**54,900**	**55,900**	**89,900**	**128,500**	**100,300**	**78,600**	**77,900**	**100.0**
White	**37,300**	**38,400**	**60,600**	**80,300**	**60,400**	**43,800**	**41,000**	**52.6**
Black Caribbean	1,300	1,400	2,600	4,400	4,500	5,000	5,900	7.6
Black African	3,700	4,100	8,300	13,400	12,700	13,100	14,300	18.4
Black Other	1,900	2,000	4,100	6,700	6,700	6,700	7,400	9.5
Indian	1,900	1,100	-1,500	-2,400	-6,200	-9,100	-10,500	-13.5
Pakistani	300	-100	-2,000	-2,900	-4,900	-6,100	-6,900	-8.9
Bangladeshi	1,300	1,800	5,200	9,300	10,500	12,400	14,300	18.4
Chinese	1,400	1,700	3,900	5,700	5,200	4,600	4,500	5.8
Other Asian	3,300	3,000	3,700	5,600	3,400	1,200	600	0.8
Other	2,500	2,500	5,100	8,400	7,900	7,000	7,300	9.4
BAME	**17,600**	**17,400**	**29,300**	**48,200**	**39,800**	**34,700**	**36,900**	**47.4**
% diff SHLAA CHS - TREND LTM								
All Ethnicities	**0.6**	**0.6**	**1.0**	**1.4**	**1.0**	**0.8**	**0.8**	
White	**0.7**	**0.8**	**1.2**	**1.6**	**1.1**	**0.8**	**0.8**	
Black Caribbean	0.4	0.4	0.8	1.3	1.3	1.4	1.7	
Black African	0.6	0.7	1.2	1.9	1.7	1.7	1.9	
Black Other	0.5	0.5	0.9	1.5	1.4	1.3	1.4	
Indian	0.3	0.2	-0.2	-0.3	-0.8	-1.2	-1.3	
Pakistani	0.1	-0.1	-0.7	-0.9	-1.5	-1.7	-1.9	
Bangladeshi	0.5	0.7	1.9	3.2	3.5	3.9	4.3	
Chinese	1.0	1.1	2.5	3.4	3.0	2.6	2.5	
Other Asian	0.6	0.5	0.6	0.8	0.5	0.2	0.1	
Other	0.5	0.5	0.9	1.4	1.3	1.1	1.1	
BAME	**0.5**	**0.5**	**0.7**	**1.1**	**0.9**	**0.7**	**0.8**	

Figures may not add due to rounding

Figure 2: Difference between R2014 SHLAA CHS and TREND LTM overall population projections – Greater London

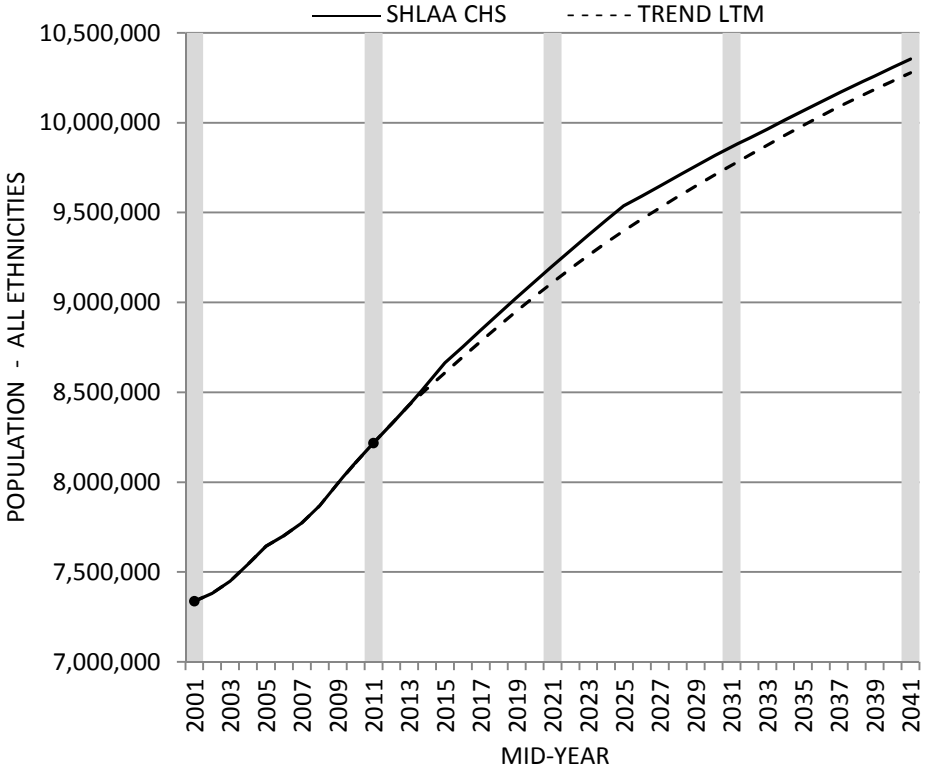
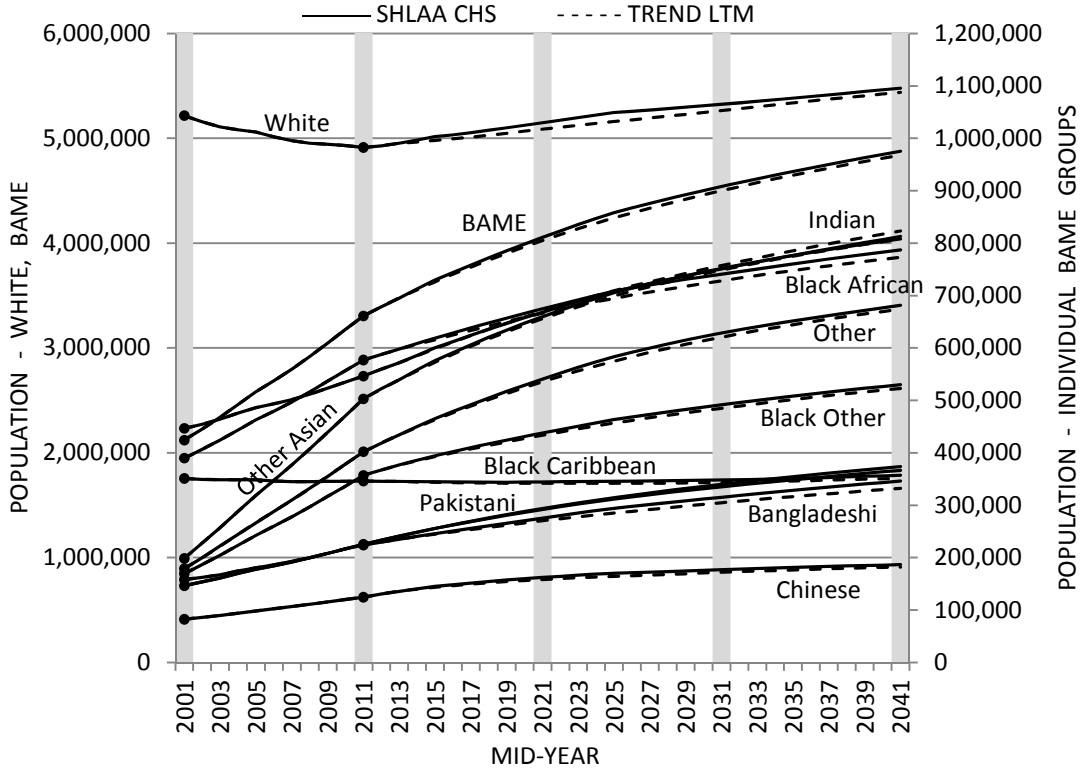


Figure 3: Differences between R2014 SHLAA CHS and TREND LTM ethnic population projections – Greater London



Although these differences between R2014 SHLAA CHS and TREND LTM ethnic projections at Greater London level are small, at borough level the differences can be greater due to the differing borough trend and household development trajectories underlying these two variants.

Distribution amongst Ethnic Groups

Table 4 shows Greater London ethnic compositions for the R2014 SHLAA CHS variant (for the R2014 TREND LTM variant the figures are very similar). The proportion of the White population is seen to have decreased over the inter-censal decade, from 71.1 per cent in 2001 to 59.8 per cent in 2011, and is projected to continue decreasing to 52.9 per cent in 2041. The proportion of the BAME population is seen to have increased over the inter-censal decade, from 28.9 per cent in 2001 to 40.2 per cent in 2011, and is projected to continue increasing to 47.1 per cent in 2041. Over the projection period 2011 to 2041 the proportions of most individual BAME groups are projected to increase by a greater or lesser extent, although the majority of increases will occur between 2021 and 2031. The Indian, Other Asian, and Black African groups are projected to increase their shares the most, in line with previous discussion. The exception individual BAME group is Black Caribbean whose proportion is projected to decline slightly over the projection period.

Table 4: Distribution amongst ethnic groups – R2014 SHLAA CHS 2001 to 2041

	2001	2006	2011	2016	2021	2026	2031	2036	2041
White	**71.1**	**65.1**	**59.8**	**57.5**	**55.9**	**54.8**	**54.0**	**53.4**	**52.9**
Black Caribbean	4.8	4.5	4.2	3.9	3.7	3.6	3.5	3.5	3.5
Black African	5.3	6.2	7.0	7.2	7.3	7.4	7.5	7.6	7.6
Black Other	2.3	3.4	4.3	4.6	4.8	4.9	5.0	5.1	5.1
Indian	6.1	6.4	6.6	7.0	7.3	7.5	7.6	7.7	7.8
Pakistani	2.0	2.4	2.7	3.0	3.2	3.3	3.4	3.5	3.5
Bangladeshi	2.2	2.4	2.7	2.9	3.0	3.1	3.2	3.3	3.3
Chinese	1.1	1.3	1.5	1.7	1.8	1.8	1.8	1.8	1.8
Other Asian	2.7	4.5	6.1	6.8	7.2	7.4	7.6	7.7	7.8
Other	2.4	3.7	4.9	5.5	5.9	6.2	6.4	6.5	6.6
BAME	**28.9**	**34.9**	**40.2**	**42.5**	**44.1**	**45.2**	**46.0**	**46.6**	**47.1**

Changes in Proportions of White and BAME Populations

Figure 4 shows the changes in proportions of Greater London White and BAME populations for the R2014 SHLAA CHS variant tabulated in Table 4.

The BAME population is not projected to reach a majority at any time over the projection period. This outcome differs from the R2012 and R2013 ethnic projections, which projected that the BAME population would just reach a majority in the final years of the projection period. Figure 4 also highlights the White and BAME proportions for the last three census years. These trends indicate that the proportional changes of the White and BAME populations occurred at similar rates over each of the two inter-censal decades.

Figure 5 is reproduced from *Intelligence Update 13-2013: 2012 Round Final Ethnic Group Population Projections (Figure 4)*. It shows the Greater London White and BAME proportions projected in the 2012 Round, the first post-2011 Census ethnic projections, and also the corresponding proportions projected in the last ethnic projections before the 2011 Census (R2011 SHLAA SF). The R2011 SHLAA SF projected White and BAME proportion trajectories that would not converge, flattening out by 2031 at 60 per cent White and 40 per cent BAME (Figure 5). These projections used 2001 Census ethnic migration information. Headline 2011 Census ethnic population data subsequently indicated that the ethnic projections needed to be re-aligned with the 2011 Census, and this was done by adjusting the 2001 Census ethnic migration rates using adjustment factors derived from estimated ethnic population change in the three years up to 2011. This was implemented in the 2012 Round and the outcome was the White and BAME proportion trajectories projected by R2012 SHLAA Final, which indicated convergence of the White and BAME proportions by 2036-2037, reaching 49.5 per cent White and 50.5 BAME in 2041, and hence a BAME majority (Figure 5). The R2013 ethnic projections produced a similar outcome regarding White and BAME proportions.

Commissioned 2011 Census ethnic migration information became available for the first time for the 2014 Round. Hence, updating the ethnic projections with actual 2011 Census ethnic migration data has produced the outcome shown in Figure 4. The projected White and BAME proportion trajectories have moved back apart slightly and do not converge over the projection period. This indicates that the ethnic migration adjustments used in the previous two Rounds slightly over-compensated the inter-censal shift from the White group and thus over-compensated the shift to the BAME groups. The use of 2011 Census ethnic migration data in the 2014 Round has fully updated ethnic migration data to the last census, including representative EU White migration at the time.

Figure 4: Changes in proportions of White and BAME populations – R2014 SHLAA CHS

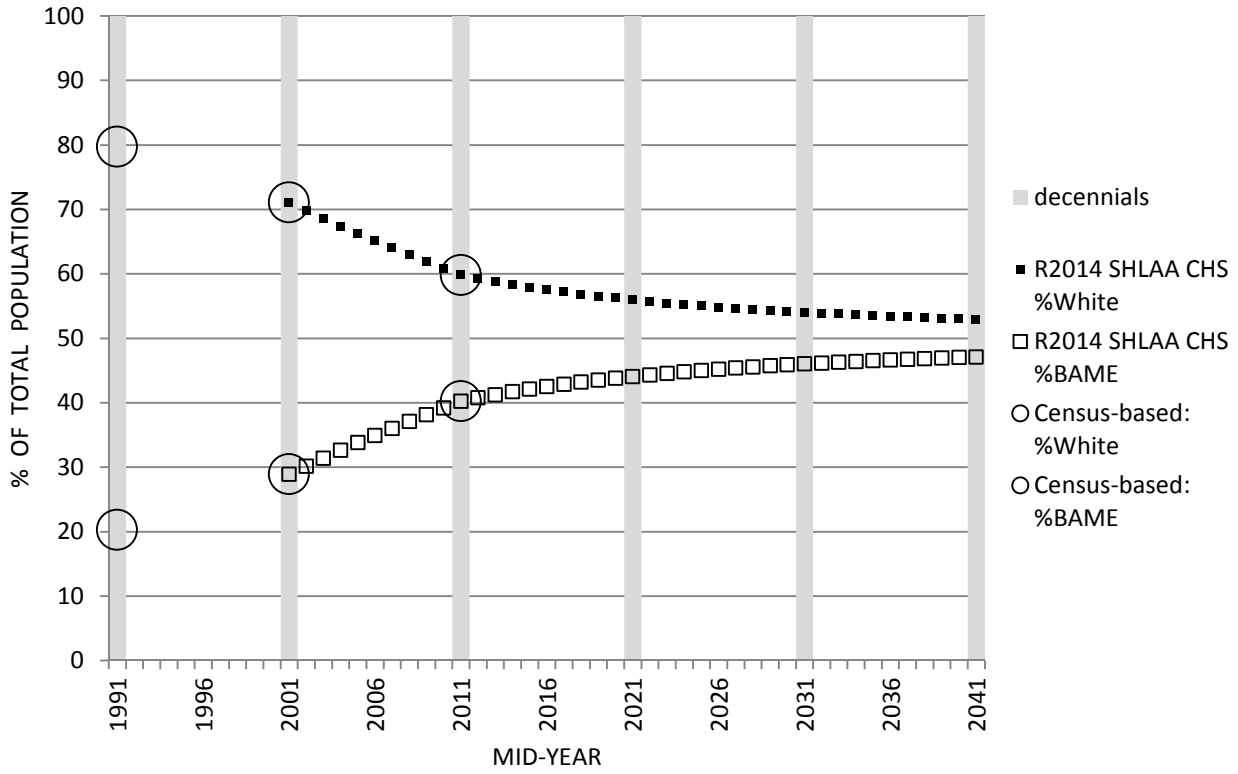
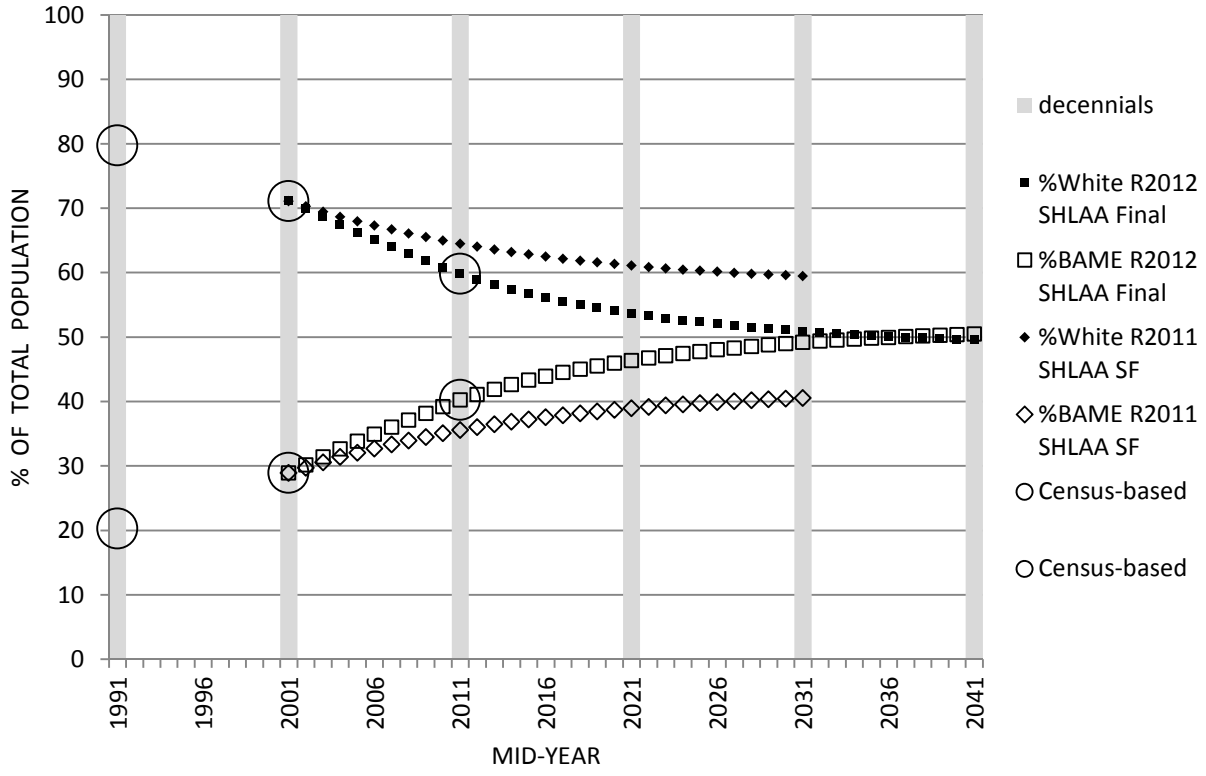


Figure 5: Changes in proportions of White and BAME populations – R2012 SHLAA Final



Timeline of London Boroughs reaching a BAME majority

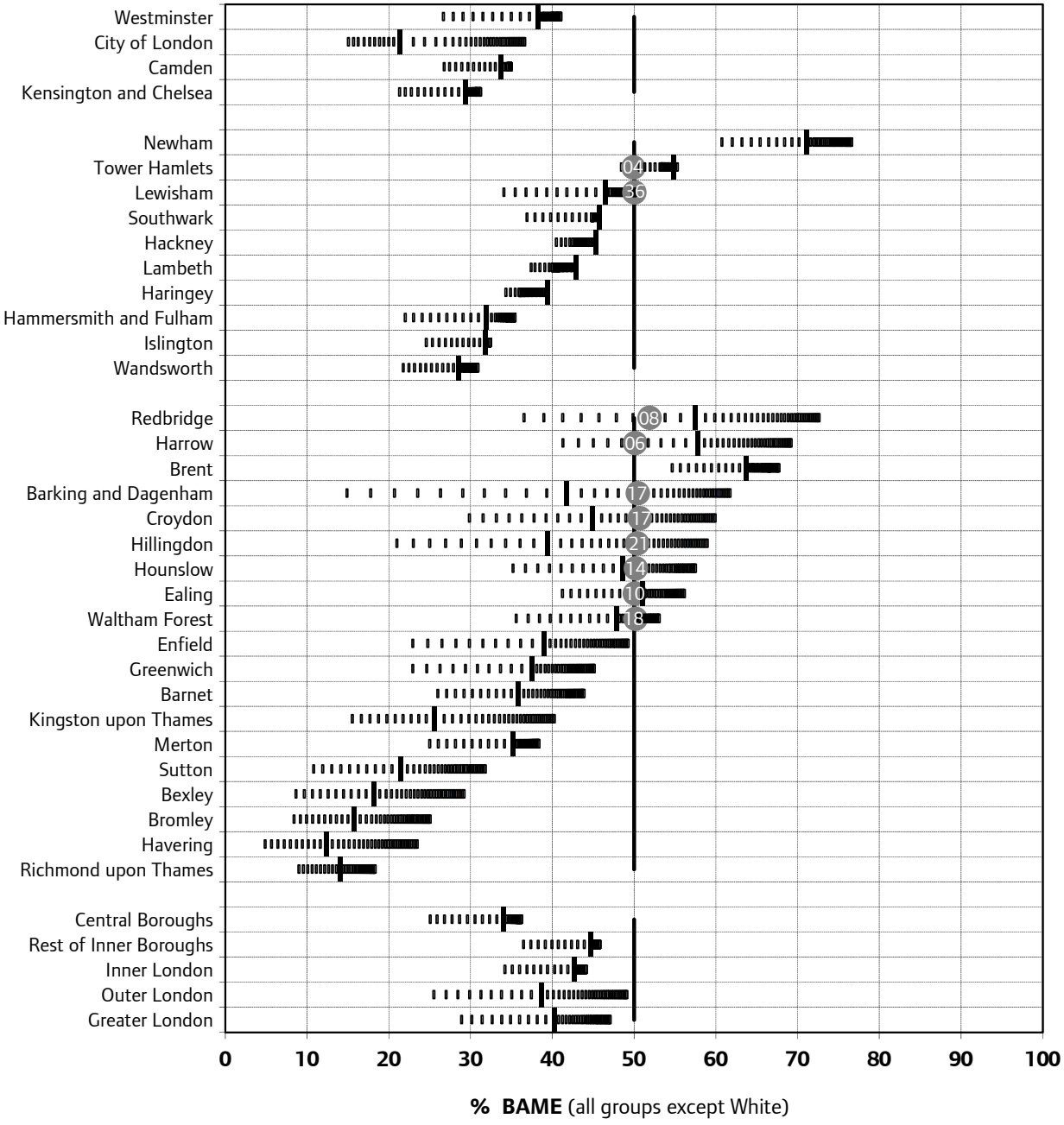
Figure 6 shows the timeline of the changing proportion of the projected BAME population in each borough over the period 2001 to 2041, for the R2014 SHLAA CHS variant (for the R2014 TREND LTM variant the timelines are similar). In most boroughs the BAME proportion (%BAME) generally increases progressively over the period 2001 to 2041. Hence, each mid-year value is plotted as sequential bars from left to right, the 2001 (left-most) value being Census-based, and the tall bar indicating the Census-based 2011 value. Where the bars are closer together this indicates that the gradient of the increase in %BAME is flattening out. Within each London area (Central Boroughs, Rest of Inner Boroughs and Outer London) the boroughs

Figure 6: Timeline of London Boroughs reaching a BAME majority – R2014 SHLAA CHS

▮ (short bar) denotes %BAME values for 2001 to 2041(left to right), excluding 2011

▌ (tall bar) denotes %BAME values for 2011 (Census-based)

04 denotes year by which BAME majority (> 50%) is reached (e.g. 04 = 2004, 36 = 2036)



are ranked by the maximum projected BAME percentage over the period (usually the last short bar to the right).

In Census year 2001 only Newham and Brent had a BAME majority of over 50 per cent. Newham's BAME proportion was 60.7 per cent in 2001, reached 71.0 per cent in Census year 2011, and is projected to reach 76.5 per cent in 2041. Brent's BAME proportion was 54.7 per cent in 2001, reached 63.7 per cent in 2011, and is projected to reach 67.7 per cent in 2041.

From the ethnic backfill series created between Census years 2001 and 2011 it is estimated that another four boroughs reached a BAME majority over that period, one in Inner London and three in Outer London:

- Tower Hamlets: reached 50.6 per cent BAME in 2004, projected to increase to 55.3 per cent in 2041
- Harrow: reached 50.1 per cent BAME in 2006, projected to increase to 69.2 per cent in 2041
- Redbridge: reached 51.9 per cent BAME in 2008, projected to increase to 72.7 per cent in 2041
- Ealing: reached 50.1 per cent BAME in 2010, projected to increase to 56.1 per cent in 2041

Between 2011 and 2041 another borough in Inner London is projected to reach a BAME majority, and another five boroughs in Outer London:

- Lewisham: will reach 50.0 per cent BAME in 2036, flattening out to 50.2 per cent in 2041
- Hounslow: reached 50.2 per cent BAME in 2014, projected to increase to 57.5 per cent in 2041
- Barking and Dagenham: will reach 50.4 per cent BAME in 2017, projected to increase to 61.7 per cent in 2041
- Croydon: will reach 50.7 per cent BAME in 2017, projected to increase to 59.9 per cent in 2041
- Waltham Forest: will reach 50.2 per cent BAME in 2018, projected to increase to 53.1 per cent in 2041
- Hillingdon: will reach 50.4 per cent BAME in 2021, projected to increase to 58.9 per cent in 2041

Hence it is projected that by 2036 a total of 12 London boroughs will have majority BAME populations. This is three less than projected in the previous 2013 Round, where Southwark, Enfield and Greenwich had been additionally projected to reach a BAME majority. This change is due to the updating of ethnic migration rates to 2011 Census data which reflects a greater influence of White EU populations on borough White/BAME proportions. Greater London as a whole is not projected to reach a BAME majority, reaching 47.1 per cent BAME in 2041.

Figure 6 clearly indicates the difference in change in BAME proportion between Inner and Outer London boroughs. For Inner London boroughs the spread of the projected data points is generally tighter than for Outer London boroughs. Barking and Dagenham is projected to have the widest spread, from 14.9 per cent BAME in 2001 to 61.7 per cent in 2041, a spread or increase of 46.7 percentage points. The BAME proportions of the outer boroughs of Redbridge, Hillingdon, and Croydon, are each projected to increase by more than 30 percentage points between 2001 and 2041.

Consequently, the Inner London BAME proportion is projected to increase from 42.7 per cent in 2011 to 44.2 per cent in 2041, whereas the Outer London BAME proportion is projected to increase from 38.6 per cent in 2011 to 49.1 per cent in 2041. Hence, the BAME proportion in Outer London is projected to see a greater increase than in Inner London over the projection period, and is also projected to surpass the Inner London proportion in 2019, when both proportions will be over 43 per cent. The projected growth in the BAME proportion in Central London will lag the growth in the Rest of Inner Boroughs and Outer London, although all four Central London boroughs are projected to continue their growth in BAME proportion, and Westminster is projected to reach 41.0 per cent BAME in 2041.

Differences between R2014 and R2013 Ethnic Projections

Table 5 shows the differences between R2014 and R2013 ethnic projections for the final projection year, 2041, for Greater London. This provides an overview of the impact of fully updating the R2014 model to all required 2011 Census ethnic information (except transgenerational ethnicity of births), in particular the effect of 2011 Census-based ethnic migration rates and probabilities, on each Aggregated Ethnic Group.

The main outcome of updating the R2014 model has been a shift from the BAME population to the White population. Taking the SHLAA variant, by the end of the projection period the annual shift to the White group is 385 thousand people, and 299 thousand people away from the BAME group as a whole. These shifts are not identical in magnitude because the overall Greater London population in the 2014 Round is greater than in the 2013 Round by the balance, 86 thousand people.

The shift has mainly affected four of the individual BAME groups. For 2041 projection year the greatest

Table 5: Differences between R2014 and R2013 – Greater London

	R2014 SHLAA CHS 2041	R2013 SHLAA CHS 2041	R2014-R2013 diff	R2014-R2013 %diff
All Ethnicities	**10,354,200**	**10,268,600**	**85,700**	**0.8**
White	**5,478,400**	**5,093,500**	**384,800**	**7.6**
Black Caribbean	357,300	367,300	-10,000	-2.7
Black African	787,200	873,300	-86,100	-9.9
Black Other	530,100	689,000	-158,800	-23.1
Indian	812,500	731,200	81,300	11.1
Pakistani	366,600	342,900	23,700	6.9
Bangladeshi	346,200	344,700	1,600	0.5
Chinese	186,800	201,900	-15,100	-7.5
Other Asian	807,800	929,400	-121,600	-13.1
Other	681,300	695,200	-14,000	-2.0
BAME	**4,875,900**	**5,175,000**	**-299,100**	**-5.8**

	R2014 TREND LTM 2041	R2013 TREND Central 2041	R2014-R2013 diff	R2014-R2013 %diff
All Ethnicities	**10,276,400**	**10,354,800**	**-78,400**	**-0.8**
White	**5,437,400**	**5,120,700**	**316,700**	**6.2**
Black Caribbean	351,400	370,600	-19,200	-5.2
Black African	772,900	877,400	-104,500	-11.9
Black Other	522,800	690,900	-168,100	-24.3
Indian	823,000	755,200	67,800	9.0
Pakistani	373,500	353,700	19,900	5.6
Bangladeshi	331,900	345,200	-13,300	-3.9
Chinese	182,200	199,000	-16,800	-8.4
Other Asian	807,200	942,700	-135,500	-14.4
Other	674,000	699,400	-25,400	-3.6
BAME	**4,838,900**	**5,234,100**	**-395,100**	**-7.5**

Figures may not add due to rounding

reduction in population is 159 thousand (23 per cent) in the Black Other group, followed by 122 thousand (13 per cent) reduction in the Other Asian group, and 86 thousand (10 per cent) reduction in the Black African group. However, although the shift is away from the BAME group as a whole, some individual BAME groups have gained as well as the White group, the main gainer being the Indian group with an increase of 81 thousand people (11 per cent). For the individual BAME groups the relative (percentage) changes follow a similar pattern as the actual population changes.

For the TREND variant the overall 2041 population in the 2014 Round is 78 thousand less than the 2013 Round population, a reversed direction of change compared to the SHLAA variant. However, the shift to White and Indian groups and away from most other BAME groups follows the same pattern as the SHLAA variant.

Figures 7, 8 and 9 illustrate the shift to the White group and changes in the individual BAME groups in the 2014 Round for the whole projection period. The projection trajectories of the Bangladeshi group in both the 2014 Round and 2013 Round, and the trajectory of the Pakistani group in the 2013 Round, are very similar, hence it is not possible to distinguish them in Figure 9. The trajectory of the Pakistani group in the 2014 Round is sufficiently higher than in the 2013 Round and so it is distinguishable in Figure 9.

The projected ethnic group population outcomes for the 2014 Round have been described for Greater London. At borough level the variation in outcomes by aggregated ethnic group may be greater.

Figure 7: Difference between R2014 SHLAA CHS and R2013 SHLAA CHS overall population projections – Greater London

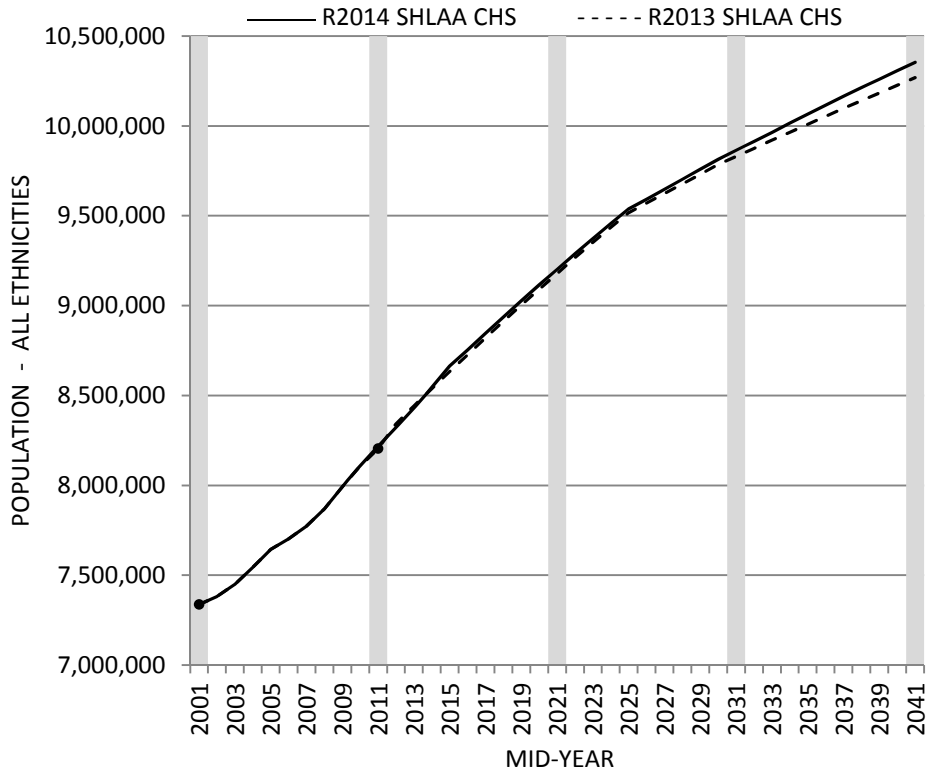


Figure 8: Differences between R2014 SHLAA CHS and R2013 SHLAA CHS ethnic population projections – Greater London: White, BAME, Black Caribbean, Black African, and Black Other groups

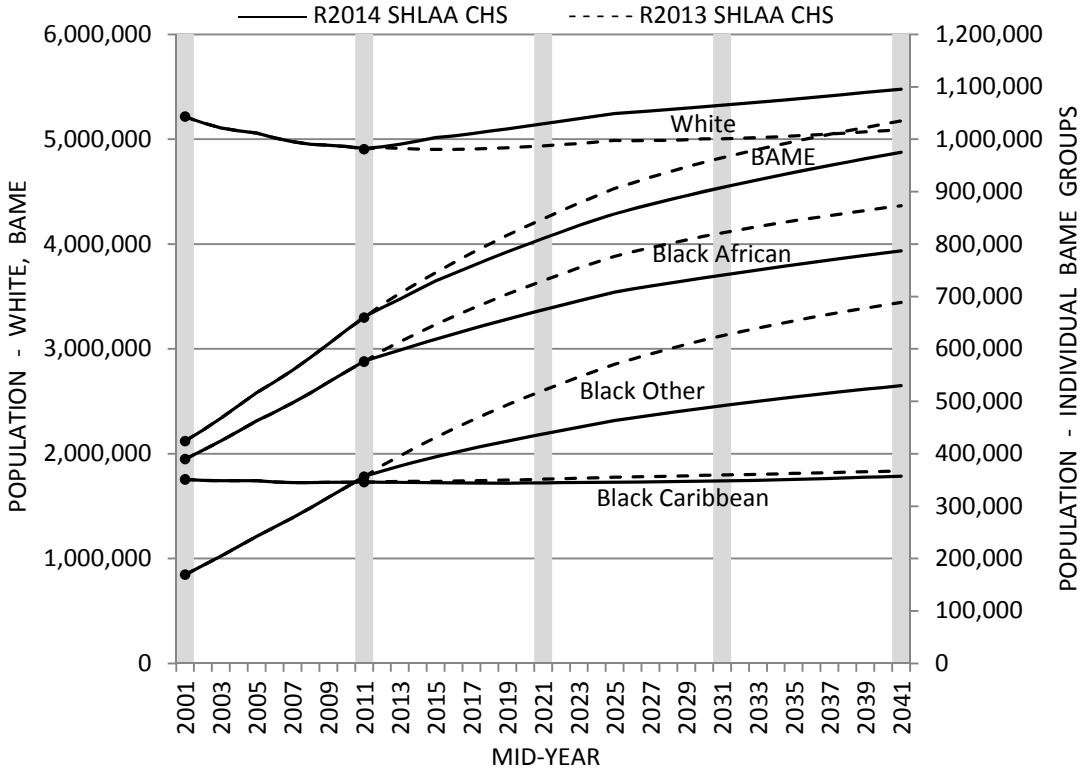
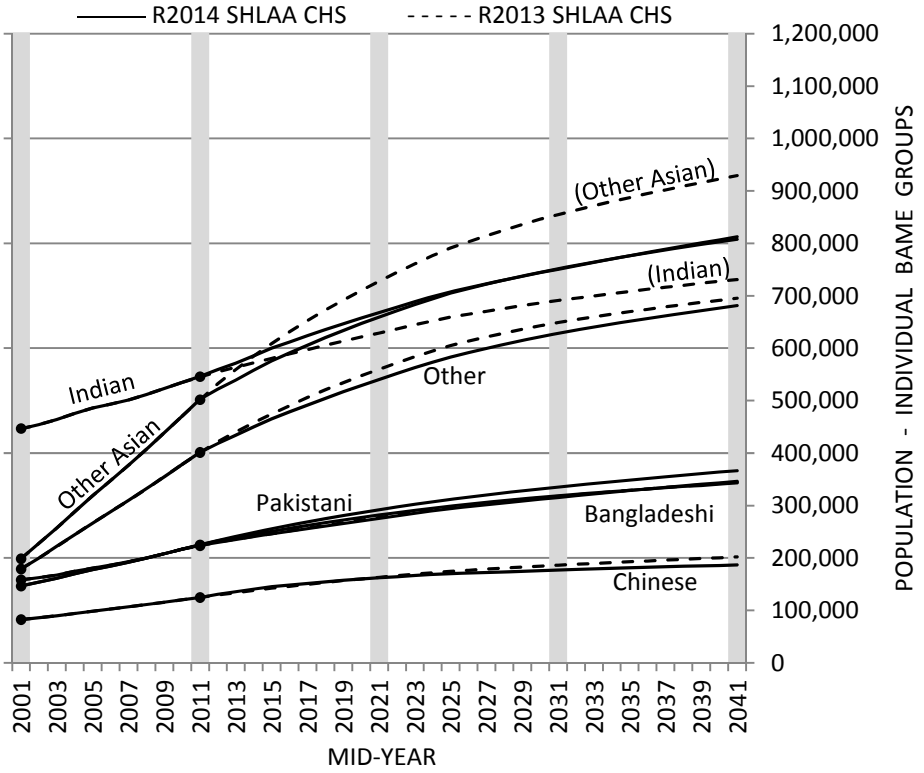


Figure 9: Differences between R2014 SHLAA CHS and R2013 SHLAA CHS ethnic population projections – Greater London: Indian, Pakistani, Bangladeshi, Chinese, Other Asian, and Other groups



Appendix 1: GLA projection aggregated ethnic groups and how they relate to the 2001 Census categories

ONS 2001 Census Ethnic Category	GLA Aggregated Ethnic Group (AEG) [1]	GLA White or BAME [2]
White: British White: Irish White: Other White	White	White
Black or Black British: Caribbean	Black Caribbean	BAME
Black or Black British: African	Black African	
Black or Black British: Other Black Mixed: White & Black Caribbean Mixed: White & Black African	Black Other	
Asian or Asian British: Indian	Indian	
Asian or Asian British: Pakistani	Pakistani	
Asian or Asian British: Bangladeshi	Bangladeshi	
Chinese or Other: Chinese	Chinese	
Mixed: White & Asian Asian or Asian British: Other Asian	Other Asian	
Mixed: Other Mixed Chinese or Other: Other	Other	

[1] approximate to the ten Ethnic Groups used in the 1991 Census, using best fit comparison described in DMAG Briefing 2003/9, 2001 Census Key Statistics: Ethnicity, religion and country of birth.

[2] BAME (Black, Asian and Minority Ethnic) denotes a grouping of all GLA Aggregated Ethnic Groups except the GLA White group.

Appendix 2: GLA projection aggregated ethnic groups and how they relate to the 2011 Census categories

ONS 2011 Census Ethnic Category	GLA Aggregated Ethnic Group (AEG)	GLA White or BAME
White: English/Welsh/Scottish/Northern Irish/British White: Irish White: Gypsy or Irish Traveller White: Other White	White	White
Black/African/Caribbean/Black British: Caribbean	Black Caribbean	BAME
Black/African/Caribbean/Black British: African	Black African	
Black/African/Caribbean/Black British: Other Black Mixed/multiple ethnic group: White and Black Caribbean Mixed/multiple ethnic group: White and Black African	Black Other	
Asian/Asian British: Indian	Indian	
Asian/Asian British: Pakistani	Pakistani	
Asian/Asian British: Bangladeshi	Bangladeshi	
Asian/Asian British: Chinese	Chinese	
Mixed/multiple ethnic group: White and Asian Asian/Asian British: Other Asian	Other Asian	
Mixed/multiple ethnic group: Other Mixed Other ethnic group: Arab Other ethnic group: Any other ethnic group	Other	

Two additional ethnic categories were introduced in the 2011 Census for England & Wales, "White: Gypsy or Irish Traveller", and "Other ethnic group: Arab". To date there is no detailed Census data or ONS studies thereof available that establish linkage between the 2011 categories and higher-level ethnic group aggregations used in relation to data from previous Censuses. To allow comparison with previous GLA ethnic projections and permit use of the existing GLA ethnic model the two new categories were allocated to the White and Other GLA Aggregated Ethnic Groups respectively, as shown in the table above.

Note the different terminology used by ONS for "White: British" in the 2001 Census and "White: English/Welsh/Scottish/Northern Irish/British" in the 2011 Census. It has been assumed that this is the same ethnic category reflecting people who consider themselves of White background relating to the United Kingdom of Great Britain and Northern Ireland (this excludes White people from the Republic of Ireland, who are defined as a separate category, White Irish, in both Censuses). Technically this group would be defined as "White UK", but is referred to as "White British" for consistency and continuity.

Appendix 3: Methodology

Step 1 – 2011 single-year of age by sex base ethnic populations

Base ethnic populations used in 2012 Round:
The key inputs used were:

- ONS 2011 Mid-Year Estimates (Census-based), published 25th September 2012.
- ONS 2011 Census Table DC2101EW – Ethnic Group (sex by 5-year age), published 16th May 2013.
- GLA R2012 TREND main borough projections, single-year of age and sex (including backfill series for 2002 to 2010), published December 2012.

Both the TREND and SHLAA 2012 round main borough projections are described in *Intelligence Update 05 2013: GLA 2012 Round Population Projections*.

A version of the existing 2001–base ethnic model was updated as normal with constraints from the R2012 TREND main borough outputs. These were single-year of age by sex borough populations, borough births and deaths, and borough migration moves by sex, in separately from the UK and Overseas, and out separately to the UK and Overseas, respectively. This model was run from 2001 to 2011. The 2011 ethnic populations by sex and single-year of age then needed to be brought into line with borough ethnic populations by sex and 5-year age band based on the 2011 Census.

Mid-year borough ethnic populations by sex and 5-year age band based on the 2011 Census were derived by scaling the figures in each ethnic group by sex and 5-year age band in Census Table DC2101EW to the borough figures (all ethnicities) in the corresponding sex and 5-year age band in the 2011 Mid-Year Estimates (Census-based). The scaled 2011 Census ethnic group populations by sex and 5-year age band were then aggregated to the ten GLA Aggregated Ethnic Groups (see Appendix 1 and 2 for definitions). The resulting borough mid-year ethnic group populations by sex and 5-year age band were then used as additional constraints for 2011 in the ethnic model. By constraining the model 2011 ethnic sex by single-year of age populations to the corresponding derived Census-based mid-year ethnic populations by sex and 5-year age band, as well as the single-year of age by sex populations from the R2012 TREND main borough outputs, it was possible to arrive at 2011 ethnic group sex and single-year of age structures that were aligned with the 2011 Census ethnic sex and 5-year age structures. These 2011 ethnic group population structures were used as the base for projecting forward to 2041.

Base ethnic populations used in 2013 Round:
The above process describes creation of single-year of age by sex base ethnic mid-year populations for the Census year 2011 for the 2012 Round of GLA ethnic population projections, *as reported in Intelligence Update 13-2013: 2012 Round Final Ethnic Group Population Projections*. For the 2013 Round of GLA main borough projections the overall 2011 borough mid-year populations were adjusted to account for 0 to 3-year olds that were considered to be under-represented in the published 2011 Census data, as described in *Intelligence Update 03-2014: GLA 2013 round of trend-based population projections - Methodology* (the adjusted 2011 mid-year populations also being applicable to SHLAA housing development-based main borough projections). For Greater London this comprised an increase of 13,068 people aged 0 to 3 relative to the ONS 2011 Census-based Mid-Year Estimate. This represents an increase in GLA 2011 mid-year population of 2.71 per cent in 0 to 3-year olds to 495,382, and an increase of 0.16 per cent in the overall population to 8,217,475. However, additional data required to incorporate these adjustments into the 2013 Round of GLA ethnic projections was not available in time, hence the 2013 Round has the same 2011 mid-year ethnic populations as the 2012 Round, described above.

Base ethnic populations used in 2014 Round:

For the 2014 Round of GLA ethnic population projections the required 2011 Census information was available to enable single-year-of-age base 2011 ethnic populations to be established.

The inputs used were:

- ONS 2011 Census Commissioned Table CT0109 - Sex by age by ethnic group (18 groups), published 26th September 2013. The data in this table was by single-years-of-age from 0 to 74, then 75+. Data for City of London and Westminster was given separately.
- ONS 2011 Census Commissioned Table CT0122 – Age by ethnic group by sex, published 9th January 2014. The data in this table was by single-years-of-age from 0 to 84, then 5-year age bands 85-89 90-94 and 95-99, then 100+. Data for City of London and Westminster was combined so that the White Gypsy or Irish Traveller ethnic group could be retained consistently over the specified ages/age bands for all boroughs or borough combinations.
- 2011 Mid-Year populations by sex and single-years-of-age from the GLA 2013 Round of borough demographic projections (same for R2013 SHLAA CHS and R2013 TREND Central). These GLA borough populations are ONS 2011 Mid-Year Estimates (Census-based), published 25th September 2012, with GLA-adjusted 0 to 3-year olds, and form the base populations at the start year of the projections. This GLA adjustment was first implemented in the R2013 borough non-ethnic projections in order to better reflect the pattern of births in each borough (described in *Intelligence Update 03-2014: GLA 2013 round of trend-based population projections - Methodology*), but was not followed through in the R2013 ethnic projections. The adjustment added 13,068 0 to 3-year-olds to the Greater London ONS 2011 MYE, increasing it from 8,204,407 to 8,217,475.

It was first necessary to create a 2011 Census set of ethnic populations by sex and single-year-of-age from 0 to 90+, using commissioned tables CT0109 and CT0122. Ethnic populations by sex and single-year-of-age 0 to 74 were the same in each table. City of London and Westminster data for ages over 74 in table CT0122 were split using CT0109 75+ ethnic proportions CoL/CoL+Westminster for each sya/5ya over 74 in CT0122. CT0122 and separated City of London Westminster data for age band 85-89 were then separated into single-years-of-age 85 …. 89 using the borough distributions for these ages in the base GLA-adjusted 2011 Census-based MYE. 90+ populations were aggregated from the 90-94, 95-99, and 100+ age bands in CT0122, including the separated City of London and Westminster data.

The 2011 ethnic base populations were then created by scaling the Census ethnic populations by sex and single-year of age from Census Day to Mid-Year using the GLA-adjusted 2011 MYE populations by sex and single-year of age as constraints.

Step 2 – Ethnic backfill series for 2002 to 2010

Ethnic backfill series used in 2012 Round:

From the 2001 sex by single-year of age base ethnic group populations, borough sex by 5-year age band ethnic populations were derived. These corresponded with the scaled 2011 Census-based borough sex by 5-year age band ethnic group populations used as the additional constraints in Step 1 above.

Initially the ethnic population by sex and 5-year age band for each borough for each year from 2002 to 2010 was linearly interpolated from the 2001 and 2011 ethnic sex by 5-year age band base values. These were then constrained to the corresponding total populations by sex and 5-year age band from the backfill series in the R2012 TREND main borough projections. Hence the resulting ethnic sex by 5-year age band populations did not necessarily follow a linear path between 2001 and 2011, but were governed by the historical information underlying the main borough projections as described in *Intelligence Update 05-2013*, and provided ethnic sex by 5-year age band backfill constraints for the years 2002 to 2010.

The process used for deriving the 2011 sex by single-year of age base ethnic populations was then repeated for each of the years 2002 to 2010 for each borough, the ethnic sex by 5-year age band backfill constraints being used to bring the model ethnic sex by single-year of age outputs into line with what may be regarded as estimated ethnic sex by 5-year age band intra-censal population changes.

The resulting sex by single-year of age ethnic populations for each year 2002 to 2010 constitute the ethnic backfill series. This ethnic backfill series is the same for the TREND and SHLAA ethnic projections since the main borough projection backfill series for 2002 to 2010 is also the same for the TREND and SHLAA in the 2012 Round (both being based on the same historical information). The census years 2001 and 2011 main borough and ethnic populations and structures are the same for the TREND and SHLAA by definition.

Ethnic backfill series used in 2013 Round:

The above process describes creation of the ethnic backfill series for 2002 to 2010 for the 2012 Round of GLA ethnic population projections, *as reported in Intelligence Update 13-2013: 2012 Round Final Ethnic Group Population Projections*. For the reasons stated in Step 1 above, this ethnic backfill series was not revised in line with the 0 to 3-year olds adjustments made for the 2013 Round of main borough projections, hence the 2013 Round of ethnic projections has the same ethnic backfill series as the 2012 Round, described above.

Ethnic backfill series used in 2014 Round:

The 2014 Round of ethnic projections has the same ethnic backfill series for 2002 to 2010 as the 2013 Round and 2012 Round, described above. Hence, there is a slight discontinuity from 2010 to 2011 as 2011 figures now include the GLA adjustments to 0 to 3-year olds.

Step 3 – Ethnic projected populations from 2012 to 2041

Ethnic projected populations derived in 2012 Round:

Since all 2011 Census ethnic outputs required for ethnic projections other than borough ethnic sex by 5-year age band populations were not available for the 2012 Round it was necessary to not only continue using the existing ethnic model, but also to compensate for the fact that its projection parameters based on the 2001 Census may have no longer been representative of population change at the time of the 2011 Census.

The estimated 2011 single-year of age by sex base ethnic populations described in Step 1 were used as the projection starting point. For each borough and each projection year 2012 to 2041 the ethnic model was updated with constraints for births, single-year of age by sex, and separate male and female in-migration and out-migration from and to the UK and Overseas from the main borough TREND projections.

The most straightforward way of adjusting overall population change parameters from those experienced at the time of the 2001 Census to those experienced at the time of the 2011 Census was to adjust ethnic in-migration rates. This was done using the ethnic by sex and 5-year age band backfill constraints (derived in the first stage of Step 2, aggregated to all ages), and the ethnic by sex and single-year of age population changes output by the model for the first projection year, 2012 (aggregated to all ages). For each borough, the average constrained ethnic by sex overall population change of the last three backfill years (2008-09, 2009-10 and 2010-11) was taken, and compared with the ethnic by sex overall population change output by the model for 2011-12. The ratios of these two ethnic by sex population changes were used to adjust the 2001 Census-based borough ethnic by sex in-migration rates from the UK and from Overseas.

A final adjustment was also made to align projected 0-year olds with the 2011 0-year olds in the base ethnic populations derived in Step 1. It was assumed that borough projected ethnic 0-year olds for 2012 should be similar to the borough 2011 0-year olds derived in the base populations. Hence, the adjustment was done by adjusting borough ethnic fertility rates, on the basis that births account for the majority of 0-year olds. Borough total ethnic 0-year olds output by the model for 2012 were re-distributed into the ethnic groups using the borough ethnic distribution of 0-year olds from the 2011 base populations derived in Step 1, to produce expected ethnic 0-year olds. The actual borough ethnic 0-year olds output by the model for 2012 were then compared with the expected ethnic 0-year olds to produce borough ethnic fertility rate scaling factors, which were then incorporated into a final version of the model. The model was then run for the whole projection period 2011 to 2041 using the adjusted borough ethnic by sex in-migration rates and adjusted borough ethnic fertility rates.

This produced ethnic projections consistent with the TREND main borough projections. The model was then modified to replace the borough and each projection year variant-specific constraints (for births, single-year of age by sex, and separate male and female in-migration and out-migration from and to the UK and Overseas) for the TREND main borough projections with those for the SHLAA projections. The estimated 2011 single-year of age by sex base ethnic populations described in Step 1 and used in the TREND model were retained, as were the adjusted borough ethnic by sex in-migration rates and adjusted borough ethnic fertility rates. This model version constituted the SHLAA ethnic model and was run for the whole projection period 2011 to 2041.

Ethnic projected populations derived in 2013 Round:

The above process describes the development of GLA 2012 Round ethnic projection models. These models, incorporating the overall population change parameters estimated for 2011 and the alignment of 2011 0-year olds, were used as the basis for the 2013 Round of ethnic projections. The R2012 models were converted to R2013 SHLAA CHS and TREND Central models by replacing the borough and each projection year variant-specific constraints (for births, single-year of age by sex, and separate male and female in-migration and out-migration from and to the UK and Overseas) with constraints from the SHLAA CHS and

TREND Central main borough projections. For both variants projected ethnic outputs for 2012 to 2041 are fully consistent with the main borough projections.

Ethnic projected populations derived in 2014 Round:

The models used to derive projected ethnic populations in the 2014 Round were 2013 Round models that were updated with further 2011 Census information and also modified to better align births and mortality with outputs now available from the main borough model. These changes were:

Updated 2011 base ethnic populations:

Updated 2011 base ethnic populations based on single-year-of-age ethnic populations in Commissioned Tables CT0109 and CT0122, described above. The update of base ethnic populations with the 2011Census is now complete, and they are also fully consistent with the main borough projections.

Updated ethnic in-migration rates and out-migration probabilities based on 2011 Census:

Updated ethnic in-migration rates and out-migration probabilities were derived from moves captured by the 2011 Census question "One year ago, what was your usual address?", available as Commissioned Tables CT0404 - Origin and destination of migrants in to London by age by sex by ethnic groups, published 28th January 2015, and CT0405 - Origin and destination of migrants out of London by age by sex by ethnic groups, published 28th January 2015. This supersedes the adjusted 2001 Census-based ethnic migration rates and probabilities used in the 2013 Round and 2012 Round.

Using the commissioned tables in-migration moves FromUK and FromOV (Overseas) by aggregated ethnic group, sex, and 5-year age band were derived for each borough. Where the total number of male or female moves in any aggregated ethnic group in any borough was less than 250, Greater London-level ethnic group structures were applied to re-distribute the corresponding total male or female moves on a smoother basis. This was necessary because in these cases the numbers of moves within the older age bands of many aggregated ethnic groups were very low or zero, and this would have resulted in unrealistic in-migration rate structures for projection. Using the in-migration moves (re-distributed where applicable), separate male and female in-migration rates FromUK and FromOV for each 5-year age band, aggregated ethnic group, and borough were derived. For a given borough the rate denominator was the total number of male or female moves in all aggregated ethnic groups in the borough. Single-year-of-age in-migration rates were then derived from the 5-year age band rates by uniform division. The resulting 2011 Census-based single-year-of-age rates were kept constant for each projection year. They were multiplied by the corresponding number of total male and total female borough FromUK and FromOV in-moves output by the main borough demographic model for each projection year, to give the number of FromUK and FromOV in-migrants for each projection year, for each sya of males, females, aggregated ethnic group, and borough.

The commissioned tables were also used to derive out-migration moves by aggregated ethnic group, sex, and 5-year age band ToEW (England & Wales, including other London boroughs) for each borough. Probabilities of out-migration ToEW were derived for each 5-year age band (and hence each sya within it) by dividing the ToEW out-moves for each sex, aggregated ethnic group, and borough by the corresponding Census population adjusted for 0 to 3-year olds by scaling-back from the GLA-adjusted 2011 MYE. However, for most of the aggregated ethnic groups the numbers of out-moves and/or corresponding populations in older age bands was very low or zero and this would have resulted in unrealistic out-migration probability structures for projection. Therefore Inner London and Outer London ethnic probability structures, which were much smoother, were applied to corresponding borough-level moves for all aggregated ethnic groups except White. In the case of the White group the numbers of out-moves in each age band were always sufficiently large to result in acceptably smooth probability structures for projection. The resulting 2011 Census-based single-year-of-age probabilities were kept constant for each projection year. For the White aggregated ethnic group the unconstrained number of out-migrants ToEW (for each sya) was derived by multiplying the unadjusted sya probabilities by the corresponding number of survivors for the projection year. For all other aggregated ethnic groups except White the unconstrained number of

out-migrants ToEW (for each sya) was derived by multiplying the adjusted sya probabilities by the corresponding number of survivors for the projection year. Finally, for each aggregated ethnic group, the numbers of out-migrants ToEW were constrained to the main borough demographic model. This was done separately for males and for females, at borough level, the constraining factor being the total borough male or female out-moves from the main model divided by the corresponding unconstrained total borough male or female out-moves from the ethnic projection model. The constrained number (for each sya) was then derived by multiplying the unconstrained number by the constraining factor, for males and females respectively.

The 2011Census commissioned tables did not include moves to Scotland and Northern Ireland due to differences in the ethnic groups used in the Census question in those countries. As out-migration moves from London to Scotland and Northern Ireland are very low in comparison to moves out to England & Wales, the ToEW probabilities were assumed to approximate probabilities of moves out to the UK so that they could be applied in conjunction with the constraining out-moves from the main borough model described above, which are constraints for out-moves to the UK, i.e. the ToEW probabilities were used to approximate out-migration to the UK. Census data does not capture information relating to overseas destinations. Hence out-migration ToOV (Overseas) is approximated in the ethnic projection model by applying the ToEW probabilities to ToOV constraining outflows from the main borough model using the same processes as for out-migration to England & Wales.

The underlying methodology of deriving and applying ethnic migration structures using the updated 2011 Census information described above was the same as used in all preceding ethnic projection Rounds, except that the adjustments applied to 2001 Census structures in the 2012 and 2013 Rounds were not applicable.

Constraining of borough transgenerational ethnic births by sex:
Projected borough births from the main borough models are now available by sex. The 2014 Round ethnic models were modified to constrain borough transgenerational ethnic births by sex instead of by persons as before.

Alignment of mortality with main borough model:
The main borough models now also output borough (non-ethnic) survival rates by sex and single-year-of-age for each projection year. The 2014 Round ethnic models were modified to incorporate these survival rates in deriving aged-on survivors. This means that mortality in the ethnic models is now better aligned with the main borough models and is updated for each Round. Previously, survival rates used in the ethnic models were based on borough groupings (Central Boroughs, Rest of Inner Boroughs, and Outer Boroughs), were fixed for each projection year, and were not updated each Round. However, as ethnicity is not recorded at death registration in the UK it remains the case that information on ethnic mortality differentials does not exist and hence the ethnic models apply the same borough-specific survival rates to each ethnic group.

The alignment of 2011 0-year olds using adjusted borough ethnic fertility rates was retained as for the 2013 Round and 2012 Round (described above).

The R2014 SHLAA CHS and R2014 TREND LTM models were completed by updating the borough and each projection year variant-specific constraints (for births by sex, deaths, single-year of age populations by sex, and separate male and female in-migration and out-migration flows from and to the UK and Overseas) with constraints from the R2014 SHLAA CHS and R2014 TREND LTM main borough projections. For both variants projected ethnic outputs for 2012 to 2041 are fully consistent with the main borough projections.

Availability of Data

The R2014 SHLAA CHS (Capped Household Size) and R2014 TREND LTM (Long-term migration scenario) ethnic group population projections are available on the GLA London DataStore, which is the depository for all current and recent GLA projections and related reports:
http://data.london.gov.uk/demography/

ONS Census Commissioned tables are available on the ONS website:
http://www.ons.gov.uk/ons/about-ons/business-transparency/freedom-of-information/what-can-i-request/published-ad-hoc-data/census/index.html

Routine ONS Census outputs are available on NOMIS:
https://www.nomisweb.co.uk/

ONS 2011 Mid-Year Estimates are available on the ONS website:
http://www.ons.gov.uk/ons/rel/pop-estimate/population-estimates-for-uk--england-and-wales--scotland-and-northern-ireland/mid-2011-and-mid-2012/stb---mid-2011---mid-2012-uk-population-estimates.html

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