

Briefing CIS2015-02

Comparing London and the Core Cities

Census Information Scheme

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Executive summary

This paper uses data from the 2001 and 2011 UK Censuses to make comparisons between London and nine English Core Cities; it identifies the current characteristics of these urban areas, across a range of indicators, and attempts to define the likely direction of future change. The objective is to identify how similar the ten areas are, where their differences lie, and whether changes over the last decade can give an indication of whether they are likely to become more or less similar in the future.

The nine Core Cities, as defined by the City Growth Commission, are:

- Bristol
- East Midlands
- Greater Manchester
- Merseyside
- South Hampshire
- South Yorkshire
- Tyne & Wear
- West Midlands
- West Yorkshire

Population Growth

At 8.17 million people in 2011 London was by far the largest of the city areas under consideration; the biggest Core Cities were West Midlands (2.74 million) and Greater Manchester (2.68 million). Growth in London over the decade 2001 to 2011 was faster than that in the Core Cities – 14 per cent compared to seven per cent in the combined Core Cities. Projected population change over the 23-year period 2014–2037 has London growing by 25 per cent, adding an additional 2.13 million people. Elsewhere, in the Core Cities, growth is slower, both proportionally and in real terms. Over the period London is expected to account for 27 per cent of population growth nationally while the Core Cities combined will account for 20 per cent.

Country of Birth

Over 37 per cent of Londoners were born outside the UK while in the Core Cities the proportion ranged from six to 23 per cent. The data suggest that different nationalities exhibit different patterns of settlement meaning that the composition of the Core Cities non-UK born populations vary significantly from place to place. As a result national changes in migration trends have very different impacts at the local level.

Socio-Economic Group

London has a younger age profile than the Core Cities, and as a result Londoners are more likely to be economically active than their counterparts elsewhere in the country. Over the coming decades the size of London's elderly population is projected to grow and this is likely to have an effect on the number of economically inactive residents. This trend may serve to make London more similar in structure to the Core Cities over time.

Historically, a high proportion of employment in London has been in the professional and managerial occupation groups. Over the last decade employment in these areas in the Core Cities increased significantly making them more like London. At the same time employment in the capital further consolidated into these groups making the economy increasingly dependent on higher-level occupations.

Commuting

There is no great variation between London and the Core Cities in the distances residents commute to work. London distinguishes itself in the magnitude of its commuter flows and its workforce. In 2011, the Core Cities combined had a commuter inflow of 1.02 million workers while London alone had 0.79 million. Overall, 4.52 million people worked in London while the largest Core City (Greater Manchester) had a working population of 1.25 million.

Qualifications

The period 2001-2011 saw significant increases in the proportion of Core City residents holding degrees (from 16 to 24 per cent), however growth was also seen in London (from 31 to 39 per cent) meaning that degree-level qualifications remain more common in London than elsewhere in the country.

London also saw growth in the number of residents with 'other' qualifications; these are commonly foreign qualifications which have no UK equivalent. The proportion of Londoners holding an 'other' qualification grew from five to 12 per cent, while in the Core Cities the proportion rose from seven to nine per cent. The higher level of 'other' qualifications in London is almost certainly a function of the larger non-UK born population in the capital.

Housing

Between 2001 and 2011 there was a national shift from owner occupation towards private renting. Historically, one of the defining characteristics of London's housing market has been the comparatively large size of its private rental sector. The trend seen in the Core Cities suggests they are becoming more like London in this regard. That said, private renting in London continues to grow (67 per cent between 2001 and 2011) and therefore the Core Cities are unlikely to achieve the same structure as the capital.

Primary Local Authority

The PLA is the main local authority within the Core City. Not all of the nine Core Cities have an easily identifiable PLA but among those that do Birmingham in the West Midlands, Leeds in West Yorkshire and Sheffield in South Yorkshire are the largest. There is evidence to suggest that these PLAs have a relationship to their wider Core City area which is similar to that which exists between London and England. For example, data on local authorities show that the PLA may attract younger, foreign-born individuals from the outer areas of the Core City in much the same way that internal and international migrants are drawn to London.

Introduction

Census data provide a detailed snapshot of the UK, its population, and their characteristics at ten-yearly intervals. The relative infrequency of the data is offset by its high level of detail, both in the characteristics measured and the geography at which statistics are reported, and its consistency over time. This report uses census data to compare London to nine Core Cities across England and to measure changes to the areas over the intercensal period (2001-2011).

The report uses diversity indices to compare the structures of Core City populations. A diversity index provides a measure of how well distributed a population is among different characteristics. Most often this is applied to personal characteristics such as ethnicity or religious belief however, the technique can also be used to determine diversity of household characteristics such as housing tenure. Details of how the indices are calculated can be found in Appendix B and the accompanying datasheet.

The Core City areas are defined by the City Growth Commission¹. This report only considers those Core Cities within England and so does not include data on Belfast, Cardiff, Edinburgh or Glasgow. The census populations of the English Core Cities were as follows:

Table 1: Core City populations, 2011

	2011 Population
Bristol	428,200
East Midlands	884,300
Greater Manchester	2,682,500
Merseyside	1,381,200
South Hampshire	441,900
South Yorkshire	1,343,600
Tyne & Wear	1,104,800
West Midlands	2,736,500
West Yorkshire	2,226,100
Core Cities Total	13,229,100
London	8,173,900
England	53,012,500

2011 Census, ONS

The number of local authorities within the Core Cities ranges from one (Bristol) to ten (Greater Manchester). There are 33 local authorities in London, including the City of London. For a list of the local authorities which comprise each Core City see Appendix A.

¹ <http://www.citygrowthcommission.com/evidence-for-evidence/>

Figure 1: Location of Core Cities

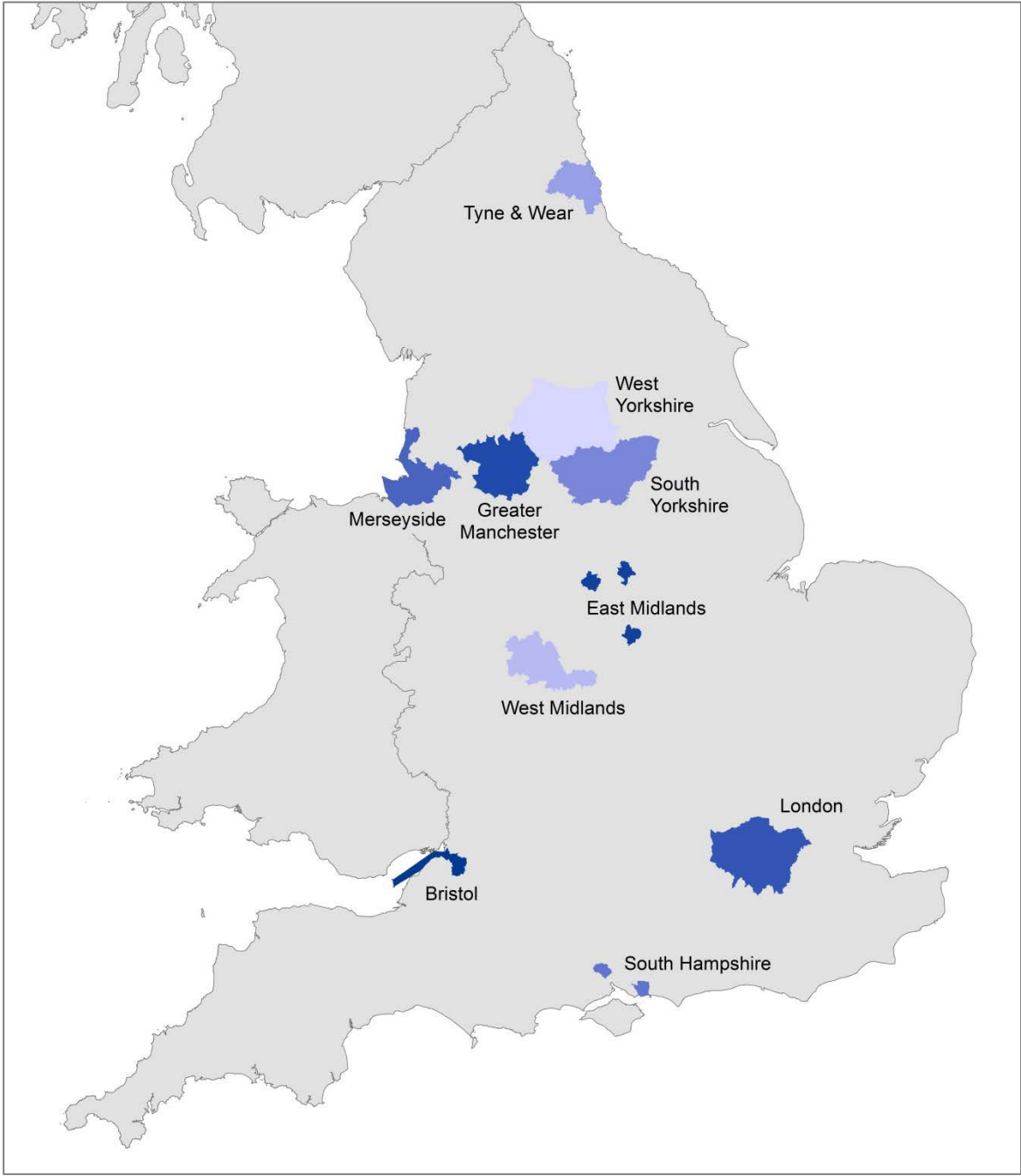
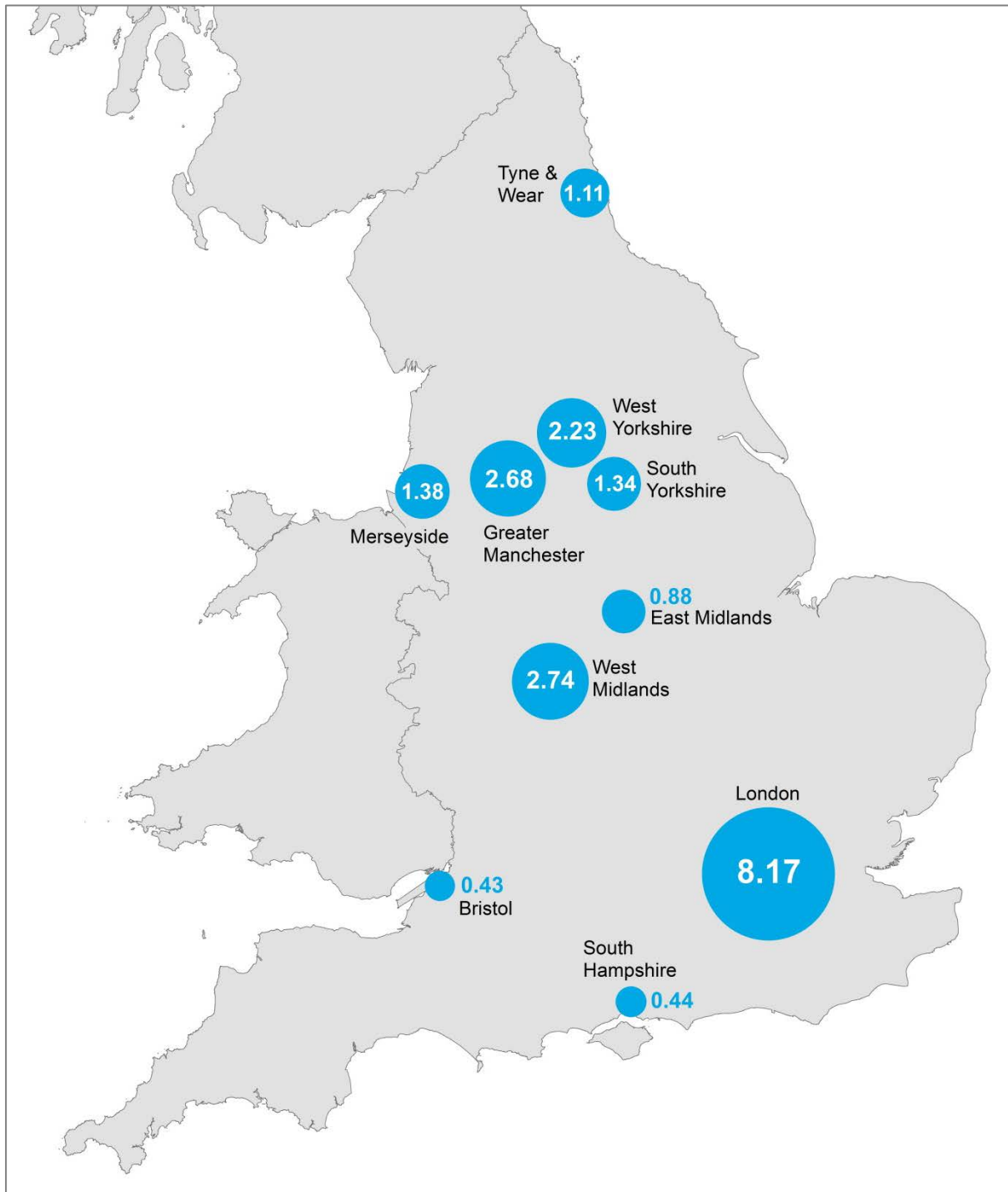


Figure 1 shows the location and extent of each of the nine Core City areas and London. Of note are the East Midlands and South Hampshire which are both comprised of non-contiguous local authorities.

Figure 2: Relative size of Core City populations (millions)



Source: 2011 Census, ONS

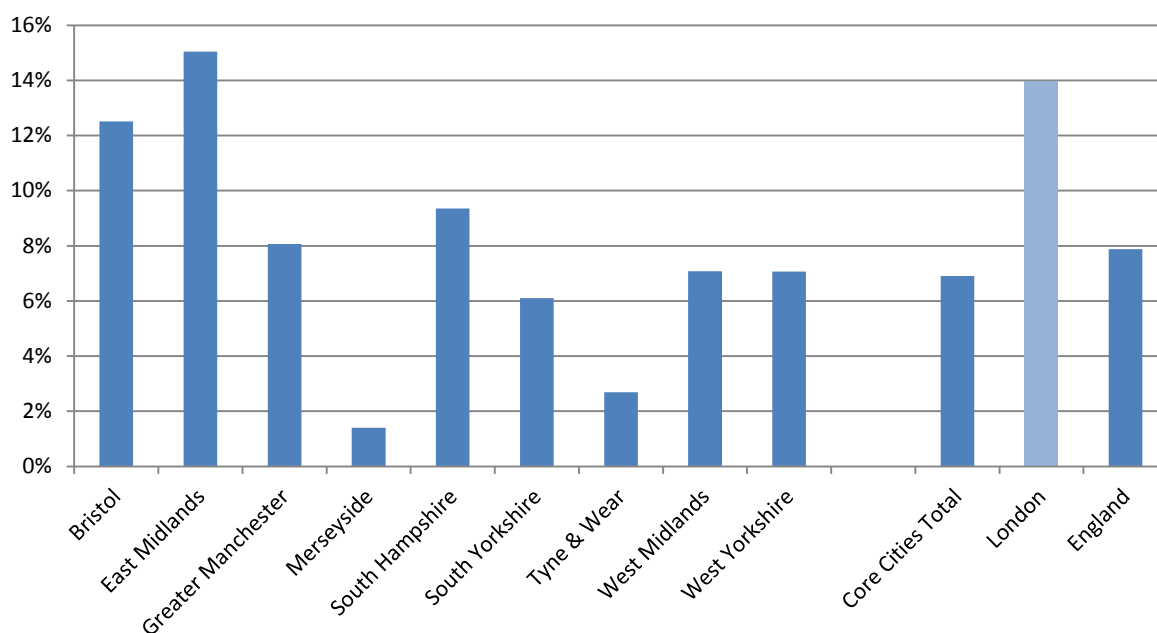
Figure 2 uses proportional symbols to demonstrate the relative size of the populations of each of the areas. The largest Core Cities, with populations over two million are West Midlands, Greater Manchester and West Yorkshire. The next order of size are those areas with a population of over one million: Merseyside, South Yorkshire and Tyne & Wear. Finally, the Core Cities with less than one million residents are East Midlands, South Hampshire and Bristol.

Population & Household Growth

London had by far the largest population of the ten cities – with 8.17 million people in 2011 it was almost three times the size of the largest Core City (West Midlands).

In addition to having the largest population London also saw the most growth between 2001 and 2011. An additional one million people were added to the capital's population over the decade (14 per cent growth) while in the Core Cities combined the population grew by 854,300 persons (seven per cent). In relative terms only the East Midlands (15 per cent) grew at a faster rate than London – see Figure 3.

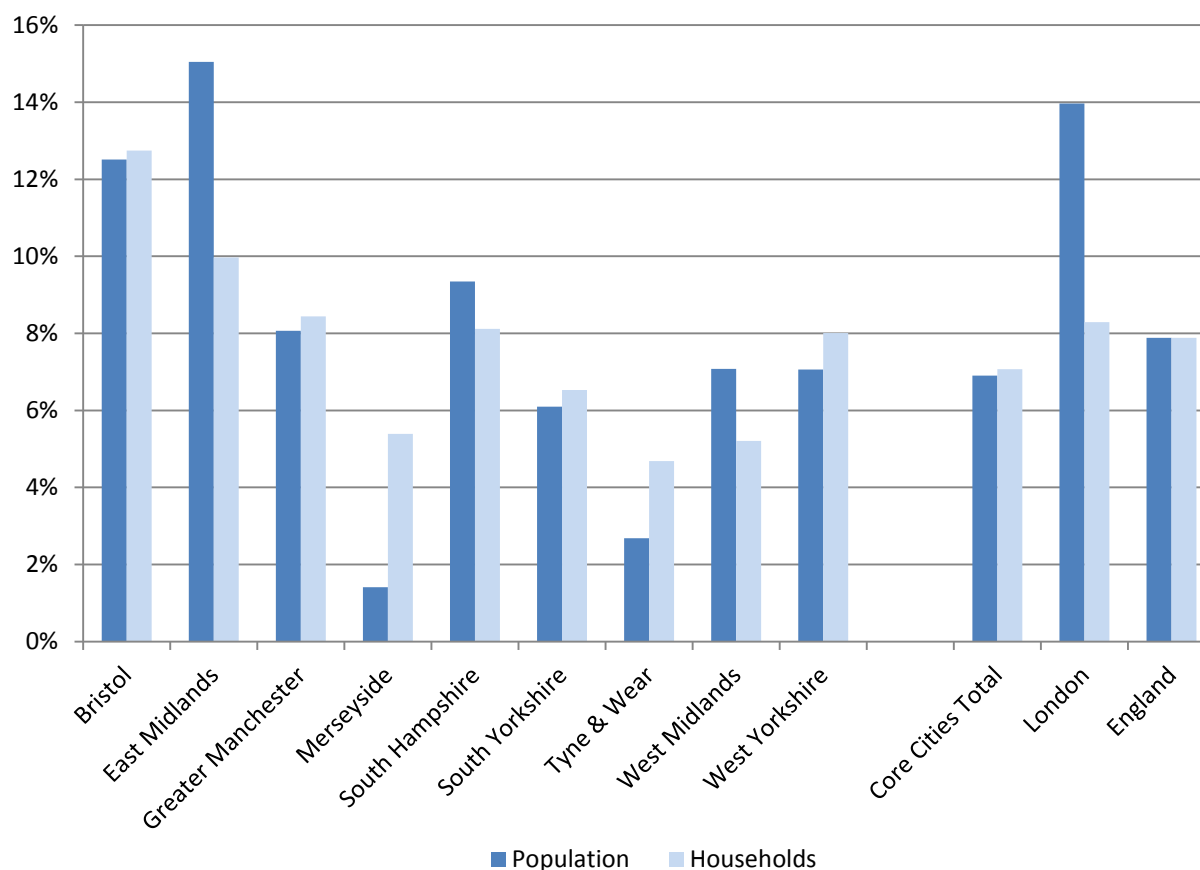
Figure 3: Proportional population increase 2001-2011



2001 Census, 2011 Census, ONS

Household Growth

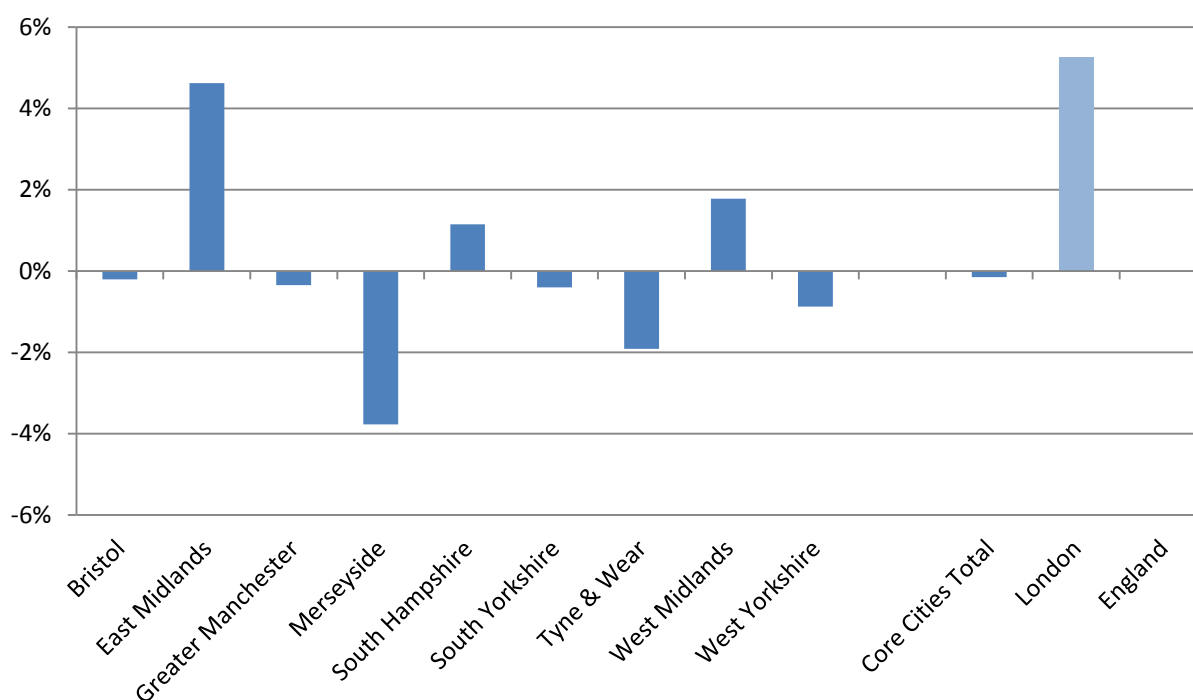
There were 3.27 million households in London in 2011, a rise of 250,000 since 2001 (8 per cent increase). Figure 4 shows the proportional increase in the number of households alongside population growth in London and the Core Cities over the decade.

Figure 4: Household & Population Growth, London and the Core Cities, 2001 & 2011

2001 Census, 2011 Census, ONS

Areas such as Merseyside and Tyne & Wear where household growth outstripped population growth saw a decrease in average household size (AHS)². The areas which saw population increases greater than household growth had a higher AHS in 2011 than 2001. London saw the most significant shift in AHS over the decade – an increase of 0.12 persons per household, or five per cent – as the population increased at a much greater rate than the number of households. The East Midlands and West Midlands were the only other areas where population growth exceeded household growth to any significant degree. In 2001 London had the second lowest AHS of the ten urban areas under discussion, in 2011 it had risen to third highest. No other area saw a higher shift over the period (see Figure 5).

² AHS is calculated by dividing the total population by the number of households to give the average number of people per household

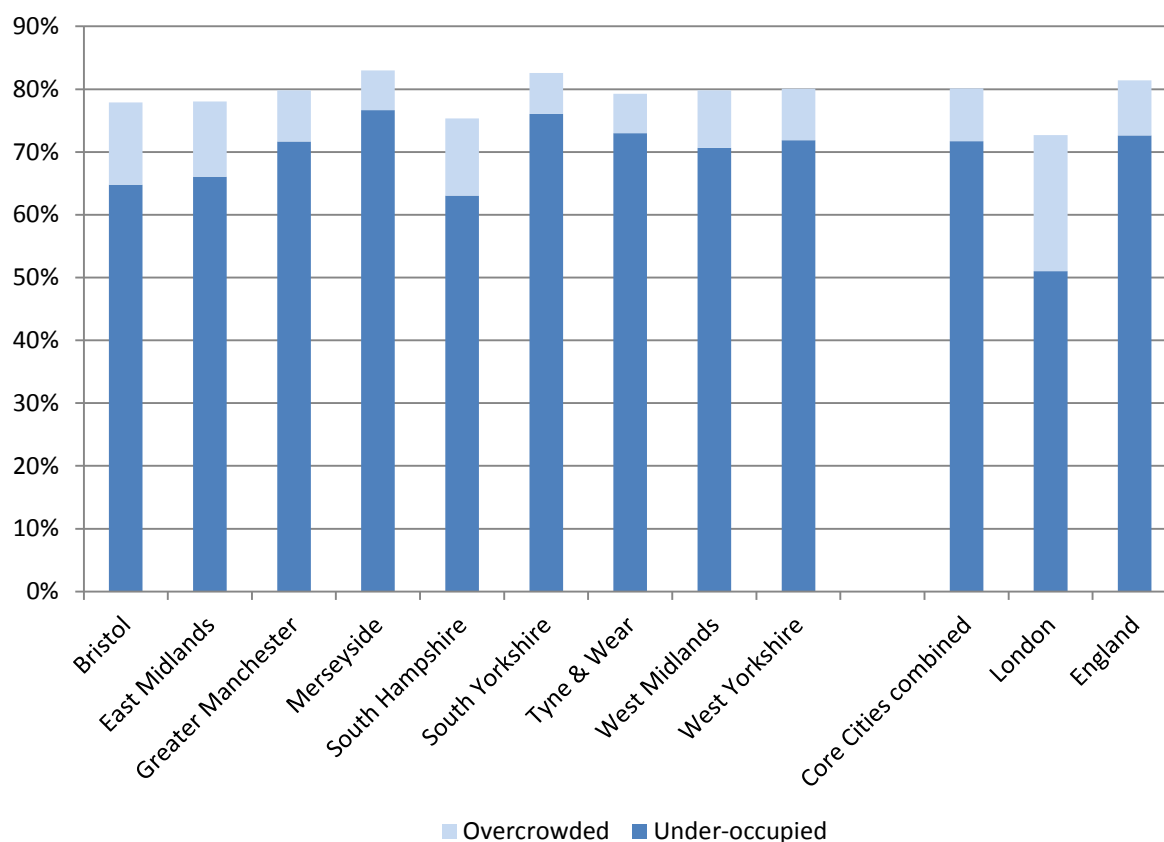
Figure 5: Proportional change in average number of people per household

2011 Census, 2001 Census

Overcrowding

Related to household growth is the issue of overcrowding – particularly in areas where population increases occurred at a rate faster than household growth. The census provides a number of measures of overcrowding, the most useful being occupancy rating. A rating is calculated by determining how many rooms a household needs for optimal occupancy and then subtracting from that the number of individuals in the household. A negative occupancy rating indicates the household had fewer rooms than it needed (and is therefore overcrowded) while a positive score indicates more rooms than were needed (under occupancy). In order to compare 2001 data with 2011 it is necessary to use an occupancy rating based on rooms rather than bedrooms.

Figure 6: Proportion of households under-occupied and overcrowded, Core Cities & London, 2011



2011 Census, ONS

Figure 6 shows the proportion of households which were either under-occupied or overcrowded. In the Core Cities an average of 72 per cent of households were under occupied meaning there were more rooms than the members of the household required. This is very close to the national average of 73 per cent. Overcrowding in the Core Cities was also at a similar level to that seen nationally with eight per cent of households having too few rooms, compared to an England average of nine per cent.

In London the situation was quite different. Just 51 per cent of households were under occupied in the capital while 21 per cent were overcrowded to some degree. Those households which were very overcrowded (occupancy level of -2 or lower) made up seven per cent of the total compared with just two per cent in the Core Cities.

Overcrowding increased and under-occupancy decreased in all areas over the decade to 2011. However, in London the shift was greatest; the larger number of households already in overcrowding in London in 2001 meant the proportional shift in London was more significant in real terms than in the smaller Core Cities. Over the decade London saw the number of overcrowded households rise by four percentage points (17 per cent to 21 per cent). This equates to an additional 155,600 overcrowded households in real terms. In the Core Cities combined overcrowding increased by two percentage points (an additional 115,400 households).

Population & Household Growth Summary

Between 2001 and 2011 London's population growth was substantial, both in proportional and absolute terms. London's population grew by 14 per cent compared with a national increase of eight per cent. However, the capital was not alone in seeing significant growth over the period; both Bristol (13 per cent) and East Midlands (15 per cent) saw similar levels of population increase. Other Core Cities saw much smaller growth and the overall increase for the nine cities combined, at seven per cent, was lower than the national average and the same as growth outside London and the Core Cities.

Proportional growth is only part of the story; in real terms the growth seen in London dwarfs that seen elsewhere in England. While Bristol and East Midlands saw similar proportional growth to London, in real terms they added 47,600 and 115,700 respectively to their populations over the decade. London's population grew by over one million residents in the same period.

There was less differentiation in household growth; the number of households in London increased by eight per cent, the same proportion as the combined Core Cities. As a result London saw a significant impact on average household size. While the national and Core City averages showed no change in AHS, in London the number of people per household grew by five per cent. This increased pressure on housing led to the proportion of overcrowded households in London to exceed one in five, while in the Core Cities the proportion remained below one in ten.

Age structure

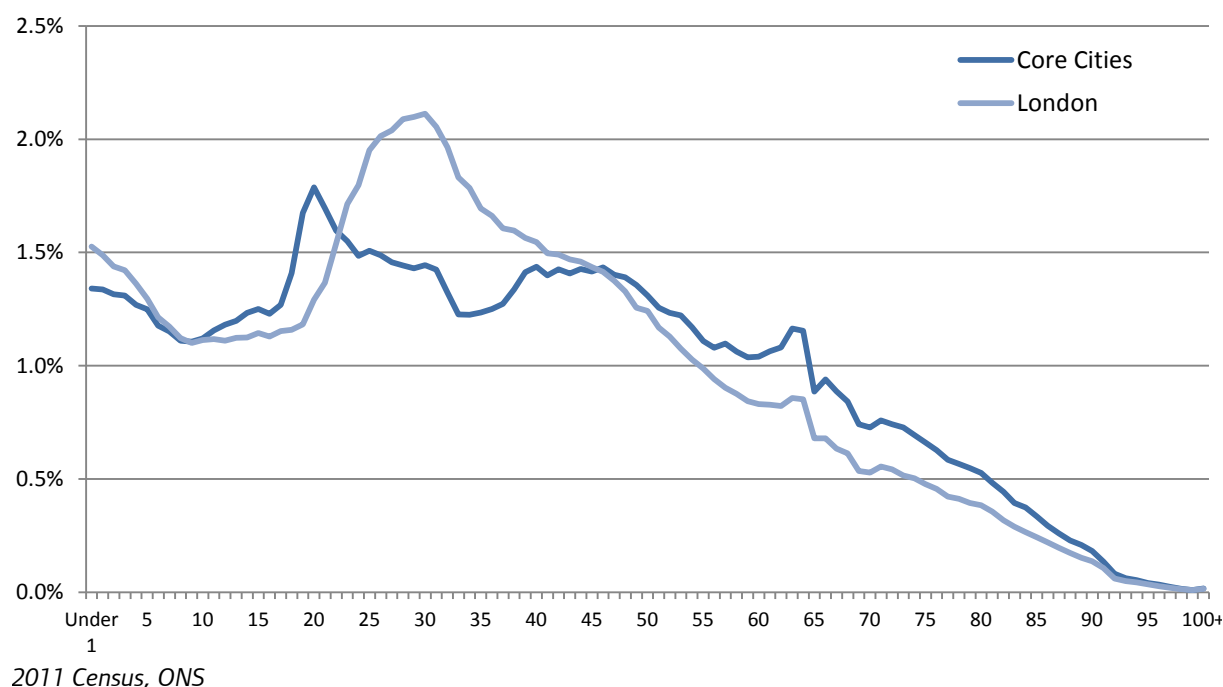
As an attribute in its own right, and as a driver for other characteristics, such as household composition, economic activity and occupation, the age structure of the population in London ensures that the capital remains distinct from the Core City areas and the wider country.

Of particular note in London's age structure are two trends: the first is a relatively high number of births meaning a high proportion of 0 to 1 year olds in the population. Out-migration of families with children means that subsequent ages (2 to 15) are increasingly less represented in the population. While not unique to London – the same trend is seen in the Core Cities also – in the capital this effect is more pronounced.

The second distinctive characteristic is the concentration of the population in the 20-35 age group. The population peak in the Core Cities occurs between the ages of 18 and 21 (which may be linked to university attendance) while in London the peak is later, more pronounced and lasts for much longer. The peak around 20-35 years old is suggestive of post-education young adults moving to the capital for work.

As a result of the high proportion of Londoners aged under 35, the share of the population in older ages, and particularly those over 50, was much lower than was seen elsewhere. In London 46 per cent of the population was aged over 35 while in the Core Cities an average of 52 per cent were aged over 35. The proportion aged over 50 was 24 per cent in London and 31 per cent in the Core Cities.

Figure 7: The age structure of London compared with Core Cities (combined), 2011



London's age structure points to a population driven by the migration of young people into the capital after leaving education. These individuals remain in the capital over the early part of their working life but begin to move away once they form families (as evidenced by the lower

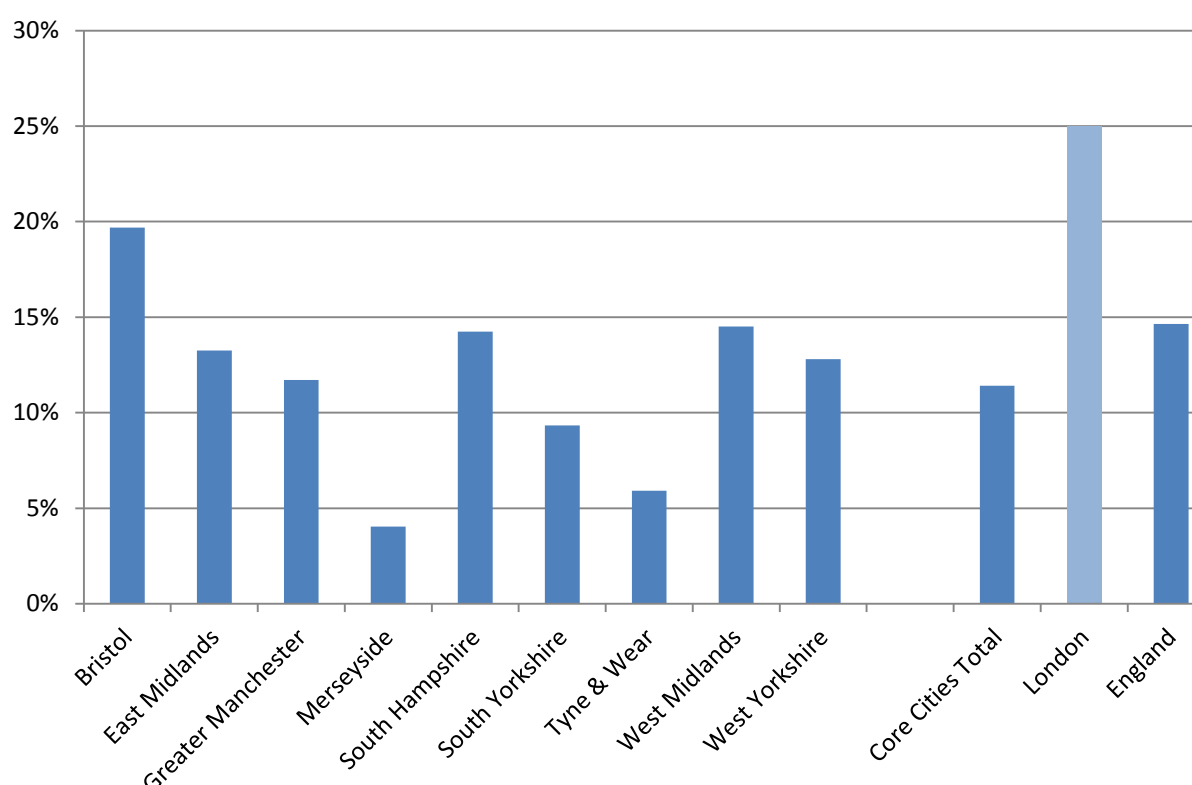
proportions of young children). These trends are not seen in the Core Cities where the population is more stable and the peak at 18-21 is more likely a result of university attendance than employment.

Projected Population Change

The analysis below uses Office for National Statistics Sub-national Population Projections (SNPP) projections to compare estimated population change over the 23-year period 2014-2037³.

Figure 8 shows projected population growth for London and the nine Core Cities. London is projected to grow at a much faster rate than all other areas adding an additional 25 per cent, or 2.13 million people, to its population by 2037. Growth in the Core Cities ranges between four per cent (Merseyside) and almost 20 per cent (Bristol).

Figure 8: Projected Population Growth (proportional) 2014-37, London & Core Cities



ONS 2012 SNPP

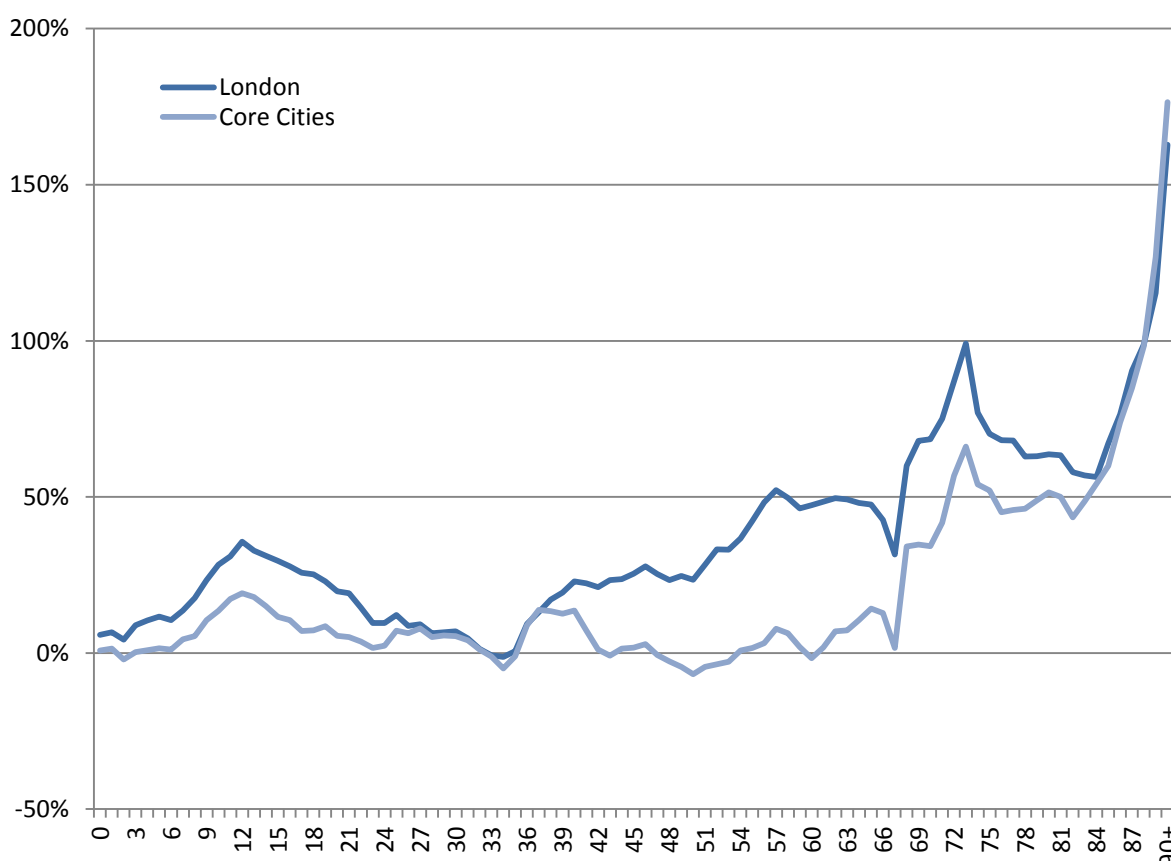
³ The GLA Intelligence Unit produce a range of variant population projections for use in strategic planning and policy impact assessment. These projections do not differ significantly from the Office for National Statistics projection in methodology but do benefit from the inclusion of housing development data and the modelling of London-specific trends to produce outputs which overcome some of the limitations of the national projections. In 2037 (23 years from 2014) the ONS 2012 Sub-national Population Projection (SNPP) projects London's population will be 10.66 million, the 2013 round GLA (SHLAA-based) projection estimates a population of 10.10 million (some 565,600 persons, or six per cent, lower). That being said, the central benefit of the SNPP is that the projections are produced for every local authority in England enabling a spatial comparison of population change.

It is important to note that London's baseline population in 2014 (8.53 million) is much higher than that of any other area. As a result, in absolute terms the difference between London's population growth and that in the Core Cities is even more stark: Bristol's growth of 20 per cent is an increase of 86,900 persons while the West Midlands' 15 per cent growth equates to an additional 406,100 people. Growth in all nine Core Cities combined is projected to be 1.54 million while over the same period growth in London is projected to be 2.13 million. London will account for 27 per cent of all growth nationally and London's share of the national population will grow from 16 per cent in 2014 to 17 per cent in 2037.

Against this backdrop of varying rates of increase are changes in the age structure of the populations. Here also we find differences between London and the Core Cities. The changes here will, to some extent, cause London and the Core Cities to become more similar in structure than they are currently.

Figure 9 shows growth by single year of age over the period 2014 to 2037 as projected by the 2012 ONS sub-national population projection. The figure shows London against an average of the nine Core Cities.

Figure 9: Proportional growth by single year of age 2014-2037



ONS 2012 SNPP

London shows a similar pattern to the Core Cities in the ages 0 to 40 with significant growth in the population aged 10-15. Historically, this age band has been associated with out-migration from London as families move away from the capital to raise their children, however the growth

in this area indicates this trend is projected to slow considerably over the next two decades. In fact, London's growth in this area exceeds that of all the Core Cities.

There is notable divergence between London and the Core City areas in the age band 40 to 65. Here the Core Cities all see low levels of growth between 40 and 50 year olds with most seeing a relative decline for some ages within the band. Populations begin to show more growth between 50 and 65 but in most cases this is below ten percent.

London on the other hand is projected to have some of its highest growth in these ages. Again, these are ages traditionally associated with out migration from London and the growth in this area may signify an assumed change in that behaviour. The numbers of those aged 65 and over are projected to increase in all cities with growth in London much higher than other parts of the country.

Population Projection Summary

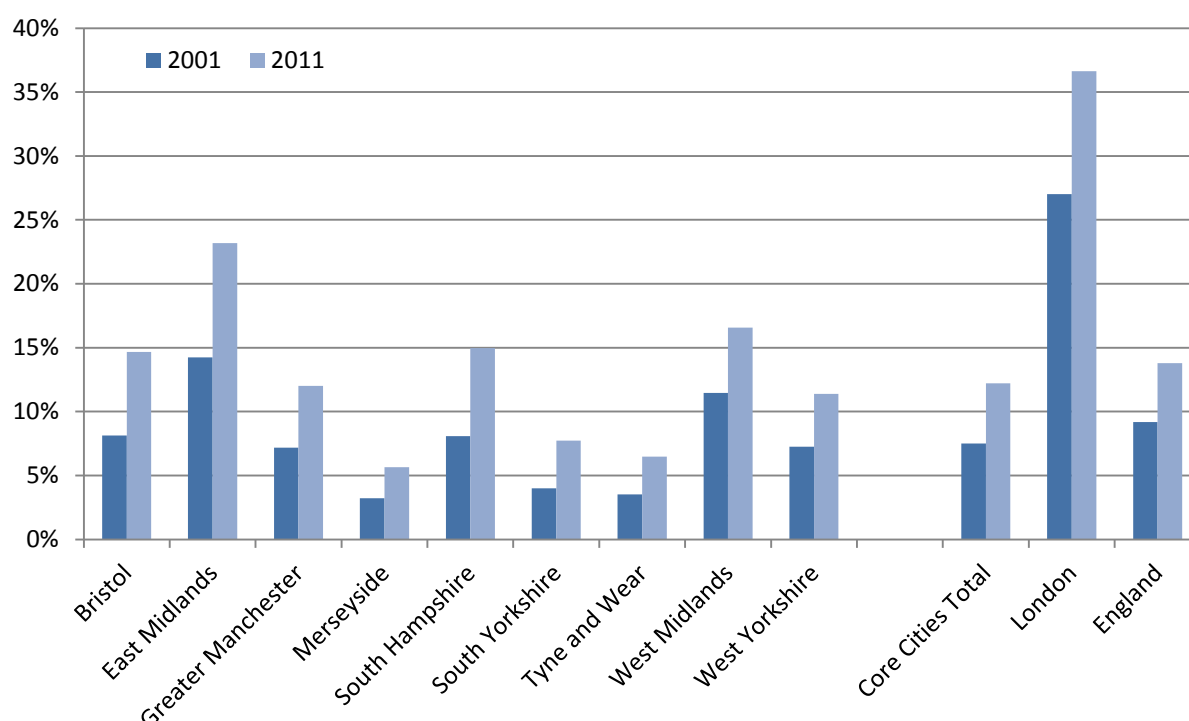
Overall the story of population change over the next two decades is one of growth in all city areas, however the growth is not uniform across age groups with some growing at a much faster rate than others. There is also a difference between the Core Cities on one hand and London on the other, with overall and proportional growth significantly higher in the capital. London is projected to see considerable growth in the age group 40 to 65 when all other areas are seeing lower growth or even declines. The compound result of all of this change is that over the period the age structures of the Core Cities and London will become more similar than they currently are. However, they will not converge entirely and London will continue to have a distinct and comparatively young age structure.

Country of Birth

Country of birth is often used as an indicator of international in-migration, however it is important to note that country of birth does not equate to nationality and that raw figures make no account for length of residence or intention to remain⁴. However, analysis of the distribution of different diaspora groups along with analysis of changes in the size of communities over time can be used to identify the evolving and projected needs of local populations.

In 2011, 37 per cent of Londoners were born outside the UK while among the Core Cities the proportion ranged from 6 per cent (Merseyside) to 23 per cent (East Midlands). The average for the combined Core Cities was 12 per cent.

Figure 10: Proportion of residents born outside the UK, London & Core Cities, 2001 & 2011



2001 Census, 2011 Census, ONS

The makeup of urban populations varied considerably across the UK, particularly in relation to the distribution of immigrant communities. Some established communities are found in cities right across the UK while others are concentrated in particular urban or regional centres. As a result the mix of nationalities varies from city to city. In 2011 in London a high number of countries of origin were represented, meaning a comparatively high diversity index score (2.39 out of 13). In the Core Cities diversity ranged from 1.12 (Merseyside) to 1.67 (East Midlands).

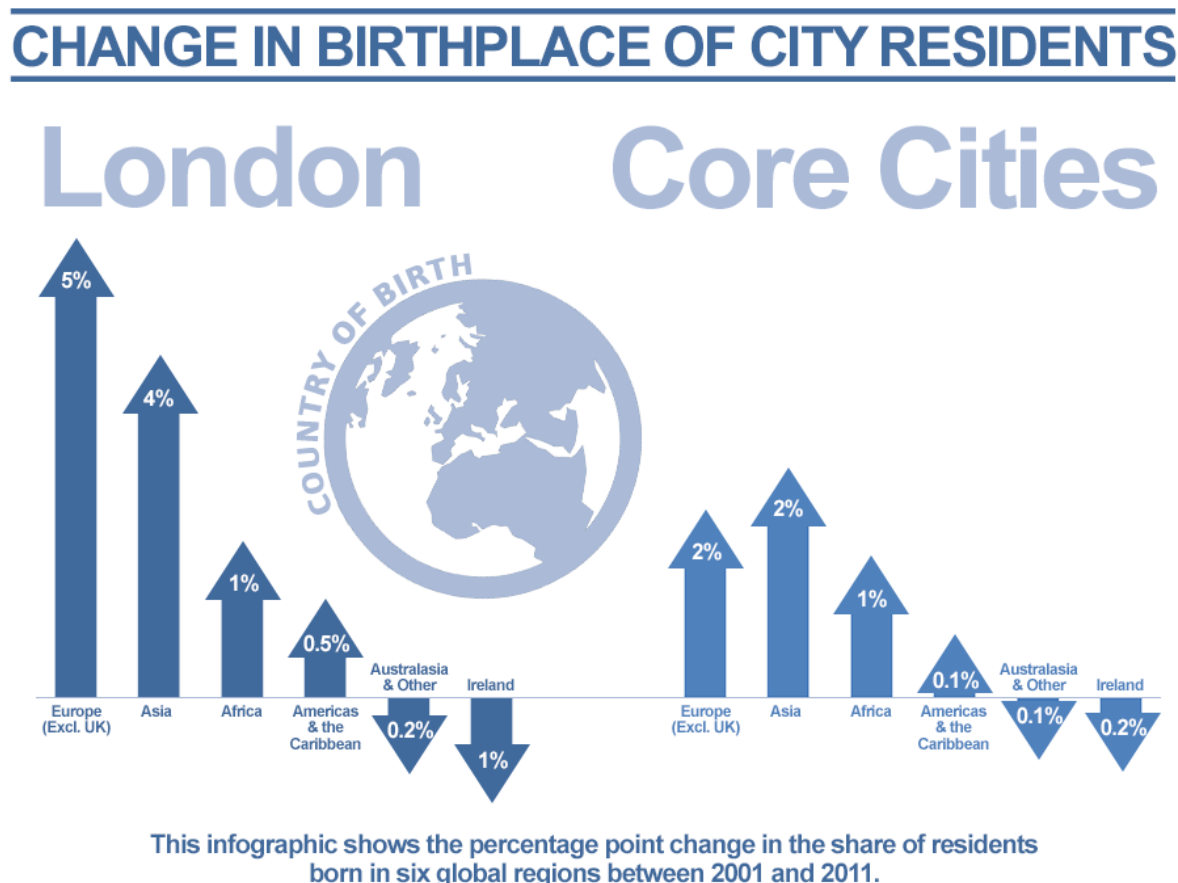
⁴ Census data only record those people who have lived, or intend to live, in the UK for 12 months or more.

The diversity index scores suggest that London not only contains a larger non-UK born population than the Core Cities but that its population is more evenly distributed among a number of country-of-birth groups. In the Core Cities the smaller non-UK born population is more likely to be concentrated into a smaller number of groups.

The nature of diversity index scores is such that low scores are more likely to increase than high scores. This is because a low score indicates a significant proportion of the population is concentrated in a small number of dominant groups. An increase in the proportion of one of the minor groups can therefore have a significant effect on the balance of the overall population, making it more equal. However, the more diverse, or balanced, a community becomes the harder it becomes for the score to increase.

Therefore, when looking at changes to diversity index scores over time one might expect to see the greatest changes in the areas with the lowest baseline scores, and vice versa. However, between 2001 and 2011 London (which had the highest index score in 2001) saw the largest increase (0.54 points compared to a Core City average of 0.16). This suggests a growing divergence, and that while diversity is increasing in the Core Cities it is not occurring at a rate fast enough to make those areas more like London.

Figure 11: Change in size of non-UK-born populations



2001 Census, 2011 Census, ONS

The infographic in Figure 11 shows changes in the relative size of six global regions. For instance, in 2001, 394,700 residents in London were born in Europe (excluding UK & Ireland). This accounted for six per cent of the total London population of 7.17 million. By 2011 the European-born population had grown to 865,700 people, or 11 per cent of London's 8.17 million residents. This, as seen in Figure 11, was a five percentage point increase.

The advantage to presenting the data in this way is that it removes the impact on analysis of the differing overall rates of population growth in London and the Core Cities. In 2011, the Core Cities as a combined entity had a population of 13.23 million compared to London's 8.17 million. However, the non-UK born section of the population was larger in London (3.0 million compared to 1.62 million). As a result of these variations, and the differing rates of growth in the two areas, comparative measures can be misleading.

Figure 11 demonstrates relative growth within the non-UK born population. This means that the different sizes of the non-UK born population are accounted for, as too are the differing rates of population change over the decade.

Case Study: Africa

In 2001, 57 per cent of all African-born residents in England lived in London. In comparison, the Core Cities contained just 14 per cent of England's African-born population. The decade to 2011 saw the number of African-born residents increase by 62 per cent nationally with a third of that growth seen in London and a quarter in the Core Cities. Numerically, at 149,600 people, the increase seen in the Core Cities was smaller than that seen in London (167,100). However, proportionally growth was higher in the Core Cities – 134 per cent compared to 37 per cent in London. Therefore, while the balance of settlement did shift towards the Core Cities to some extent, the African-born population in London remained, by some margin, the largest in the country.

Case Study: Pakistan

Over half of the Pakistan-born population resident in England in 2011 were living in one of the Core Cities, while just under a quarter (24 per cent) lived in London. While there was minimal change in the relative distribution of the population over the intercensal period there was significant growth in number of Pakistan-born residents in all areas. In England as a whole the population increased by 56 per cent. In the Core Cities growth ranged from 38 per cent (West Midlands) to 118 per cent (Merseyside) while in London the Pakistan-born population grew by 69 per cent, a real terms increase of 45,800 residents. The Core Cities saw growth in real terms of between 700 people (South Hampshire) and 26,700 people (Greater Manchester).

Table 2: Residents born in Pakistan, 2001 & 2011

	2001	2011	Change	% Change
Bristol	1,828	2,770	942	52%
East Midlands	9,602	16,493	6,891	72%
Greater Manchester	29,350	56,094	26,744	91%
Merseyside	616	1,342	726	118%
South Hampshire	858	1,569	711	83%
South Yorkshire	9,308	12,915	3,607	39%
Tyne and Wear	2,461	3,735	1,274	52%
West Midlands	56,211	77,581	21,370	38%
West Yorkshire	49,728	72,082	22,354	45%
London	66,700	112,500	45,800	69%

2001 Census, 2011 Census, ONS

In 2011 the Pakistan-born population accounted for just four per cent of London's total foreign-born resident population. In West Yorkshire 28 per cent of foreign-born residents were from Pakistan while in the West Midlands the proportion was 17 per cent. Changes to this population over the period 2001-2011 were not uniform across the country. The smallest community was in Bristol where just four per cent of the total foreign-born population were from Pakistan. Where similar changes did occur the impacts on the size of the populations were not necessarily the same, being dependent on the size of the existing population and the comparative growth or decline of other populations in the area.

Case Study: EU Accession Countries

All areas saw increases over the decade in the number of residents from EU accession countries⁵. In most areas the increase was above the average population increase meaning that by 2011 a larger proportion of the population were EU-accession-born than was the case in 2001.

In London the proportion of the non-UK-born population born in one of the EU accession states trebled from 4 to 12 per cent, similar changes were seen in the Core Cities. The largest change was seen in South Hampshire where, in 2011, 24 per cent of all non-UK-born residents were from EU accession states. However, while the size of the accession state population relative to the foreign-born population was similar in London and the Core Cities, in real terms there was significant difference. The differing sizes of the non-UK-born populations mean that while residents born in EU accession states accounted for 12 per cent of the foreign-born population in both London and Tyne & Wear, in real terms this translates into 369,200 people in London but just 8,300 in Tyne & Wear.

All areas saw significant growth at a rate three to four times faster than the overall population growth in the area. Table 3 shows the change in the EU Accession State populations in London and the Core Cities between 2001 and 2011. London's growth from a base of 84,700 people to

⁵ 2004 EU Accession States: Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia

369,200 was an increase of 336 per cent. The Core Cities started from much lower bases in 2001; between 1,200 (Bristol) and 5,900 (Greater Manchester) and so while in absolute terms numbers did not rise as quickly, in proportional terms the increases far outstripped those seen in London.

Table 3: Residents born in an EU Accession State, 2001 & 2011

	2001	2011	Change	% Change
Bristol	1,200	10,500	9,300	757%
East Midlands	2,900	26,900	24,000	820%
Greater Manchester	5,900	35,900	30,000	507%
Merseyside	1,500	12,100	10,600	706%
South Hampshire	1,700	15,900	14,200	833%
South Yorkshire	2,300	18,700	16,400	711%
Tyne & Wear	1,300	8,300	7,000	530%
West Midlands	5,400	45,600	40,200	741%
West Yorkshire	4,900	37,500	32,500	660%
London	84,700	369,200	284,500	336%

2001 Census, 2011 Census, ONS

*Data from the 2001 Census are taken from CT0413 which suppresses counts under 10.

Future Migration

The ONS 2012 SNPP include estimated international in- and out-migration over the projection period.

Table 4: Net International Migration 2014-2037

	SNPP 2014 Population	Average net migration 2014-2037	Net migration as % of 2014 population
Bristol	44,1300	21,100	5%
East Midlands	902,200	113,600	13%
Greater Manchester	2,732,500	139,300	5%
Merseyside	1,388,100	33,000	2%
South Hampshire	453,500	62,800	14%
South Yorkshire	1,363,700	99,700	7%
Tyne & Wear	1,114,000	85,800	8%
West Midlands	2,800,300	259,200	9%
West Yorkshire	2,270,800	145,800	6%
Core Cities Total	13,466,400	960,300	7%
London	8,530,400	1,600,600	19%
England	54,227,900	3,485,900	6%

ONS 2012 SNPP

Table 4 shows annualised migration as a proportion of the 2014 (projected) population. Providing the data in this format allows like-for-like comparison. Average annual migration from overseas to London is expected to be equivalent to 19 per cent of the 2014 population for each year of the 23-year period. The combined Core Cities are projected to see annual growth of around seven per cent of the 2014 population with a range of 2 per cent (Merseyside) to 14 per cent (South Hampshire). This would suggest that international migration will play a more significant role in population growth in London than elsewhere, continuing the trend observed over the last decade.

It is important to note that when international migrants leave an area they can either leave the UK or they can move to another area within the UK. In this second scenario the individual is a domestic migrant. There is evidence to suggest that London may act as a staging point for migration. Under this hypothesis London's international in-migration is high as a disproportionate number of migrants head to the capital. However, subsequently many of these individuals relocate within the UK meaning that they leave London as domestic migrants. When the individual leaves the UK they are recorded as being a domestic out-migrant from the area they leave. For London this means that in-migration numbers are high, out-migration numbers are low and net migration as a measure is undermined.

Country of Birth Summary

The case study examples provided serve to illustrate the complexities of evolving urban populations. Populations such as the African-born community are well established within London but have a much smaller presence elsewhere. The last decade has seen growth in the African-born population in the Core Cities but the community in London remains the most populous. Changes over the coming decades may see a more even national distribution emerge, however based on current trajectories it would take significant time before the Core Cities reached populations on a par with London.

The example of the Pakistani-born population is one of much greater equity of distribution, although naturally certain areas see greater concentrations than others. The total number of Pakistani-born residents in England did rise between 2001 and 2011, however, other nationalities increases at a greater rate meaning as a proportion of the total foreign-born population Pakistan shrank.

The induction of the accession states into the EU in 2004 triggered a period of high migration. The pattern of settlement however was not focused on the larger urban areas but rather was well distributed across the country. This serves to highlight how varied different migrations can be with economic factors and the location of existing diaspora, to name just two, influencing where populations grow and decline. As a result predicting the next wave of migration and its characteristics is particularly challenging.

Overall the data suggest that changes in the constitution of non-UK-born populations have different impacts depending on location. As a result even uniform changes across the country will have very different impacts at the local level. Therefore the make-up of the different Core Cities and of London is likely to remain unique to each area and while there may be some common trends and characteristics, overall they will remain distinct.

Socio-Economic Grouping: Residents of London

Socio-economic grouping is a classification of residents aged 16 to 74 into one of 13 groups: those who were employed are classified based on their occupation (nine groups) while those not employed are classified as either unemployed, retired, full-time student or other economically inactive⁶.

Diversity of socio-economic grouping was relatively high for both London and the Core Cities. In 2001 London's diversity score was 10.6 (out of 13), this was lower than the Core Cities average (11.3) and was the result of 41 per cent of employment being in one of four occupation types and relatively low proportions of the population being retired or otherwise economically inactive. Elsewhere, Core Cities with similar diversity scores to London had very different structures. Merseyside, which had a score of 9.6, had a concentration in the economically inactive categories while employment was relatively evenly distributed among all nine categories.

The intercensal period saw increased diversity in both London and the Core Cities. However London had the smallest change with an increase of just 0.6 points. Elsewhere, diversity in Merseyside increased by 1.7 points and in Bristol by 2.6 points.

These variable increases in diversity were in large part driven by a universal fall in the proportion of the population which was economically inactive. This national trend had a greater impact on diversity in those areas where the economic inactivity made up a larger proportion of the total population. Therefore, London which had comparatively low levels of inactivity saw less of an impact while Merseyside saw significant change.

Over the period 2001-2011 there was growth in both the number and proportion of people employed in professional occupations in all of the Core Cities and London. London's existing structure, where professional occupations were already a significant group, meant that further growth in these occupations had a negative impact on diversity, diminishing the effect of positive changes such as increases in Sales and Services occupations. In areas where professional occupations did not figure as significantly in 2001 (again, e.g. Merseyside) the shift towards these occupations had a positive effect on diversity of employment and therefore socio-economic group.

In 2001, nine per cent of Londoners aged 16-74 worked in a professional occupation and a further 11 per cent worked as a manager or senior official (20 per cent combined). In the Core Cities the proportion of workers in these two combined occupation groups averaged 13 per cent. In 2011 the Core Cities average had risen to 15 per cent of the working-age population while in London the increase was to 22 per cent. Within the combined total there was a shift away from managers and senior official positions to the lower professional occupations category.

⁶ Other economically inactive includes those looking after the home or family and those inactive by reason of disability or long-term illness

Figure 12: Proportion of workers employed in Professional occupations, 2011

2011 Census ONS

Socio-Economic Group Summary

There are two sets of factors which impact on the structure of socio-economic grouping in London and the Core Cities. The first is the age structure of the population: as discussed above London has a younger age structure than the Core Cities and, although socio-economic grouping only classifies residents aged 16-74, this age structure will have an impact on the propensity of the population to cluster into certain socio-economic groups. For instance, London's population is more likely to be found in one of the employment categories rather than the economically inactive categories. As the capital's population ages over the coming decades it may be that this characteristic will begin to change.

The second factor is the changes that have been observed within the economically active groups. This includes trends between employment and unemployment as well as shifts in the type of occupations residents have. All of the urban economies analysed here became increasingly reliant on professional occupations over the last decade. However, jobs in London were already clustered in the higher occupation groups and so this national trend served to decrease diversity in the capital while elsewhere there was an increase.

If the trends seen over the last decade continue the Core Cities are set become more like London as it is today. However, London is not a static economy and it will also continue to evolve taking it away from its current position and developing into something new. As a result it is unlikely that the Core Cities and London will converge in character.

Commuter Flows

Table 5 shows the size of the resident population in employment, the location of their employment and the workplace population. London had both the largest employed resident population (4.02 million employed residents) and the largest workplace population (4.53 million).

Table 5: Commuter flows, 2011

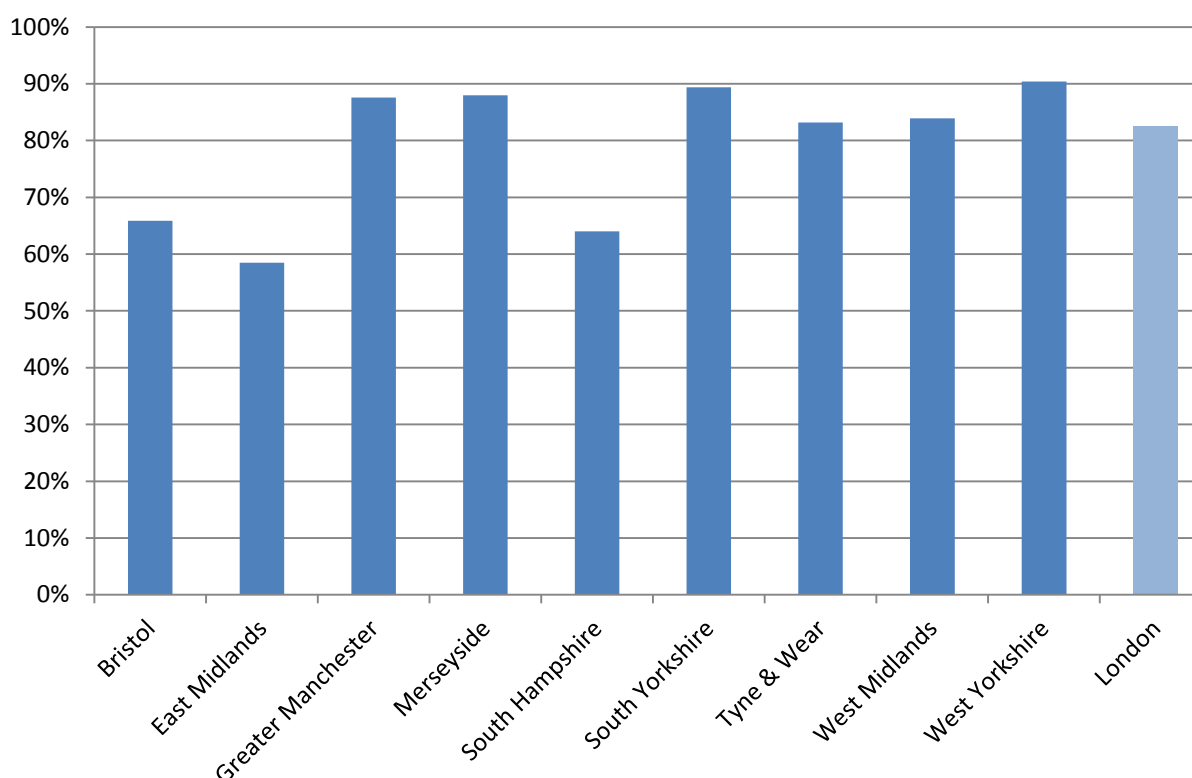
	Employed Residents	In-commuters	Out-commuters	Intra flow ⁷	Workers
Bristol	210,900	81,000	54,700	156,300	237,300
East Midlands	374,600	192,300	103,600	271,000	463,300
Greater Manchester	1,223,900	155,400	130,200	1,093,700	1,249,000
Merseyside	601,600	69,300	94,800	506,900	576,100
South Hampshire	210,000	80,400	66,900	143,100	223,600
South Yorkshire	599,100	61,900	78,800	520,300	582,200
Tyne & Wear	495,300	88,200	58,700	436,500	524,700
West Midlands	1,151,700	193,600	141,400	1,010,300	1,204,000
West Yorkshire	1,019,200	100,300	78,700	940,500	1,040,800
London	4,021,800	795,100	286,900	3,734,800	4,529,900

2011 Census, ONS

All areas, with the exception of Merseyside and South Yorkshire, had working populations which were larger than their resident populations making them net importers of commuters. London's working population was 13 per cent larger than its employed resident population making it second only to the East Midlands (24 per cent) in the ratio between workers and residents. The East Midlands is a special case – due to the fact that it is comprised of three non-contiguous local authorities there is a higher likelihood that residents and workers will move across the border of the Core City when commuting. If the local authorities between the three cities of Leicester, Derby and Nottingham were included in the Core City definition the flows in and out would be much smaller and the intra flow much larger.

Workers in West Yorkshire were more likely than any other Core City to be resident in their city of work (90 per cent). The proportion of London's workforce that lived in the capital was slightly above average at 82 per cent (Figure 13).

⁷ Intra-flow is people who live and work in the same area, includes home workers and those with no fixed place of work

Figure 13: Proportion of workers in area who live in same area

2011 Census, ONS

Distance Travelled to Work

Table 6 shows the average distance residents travelled to their place of work. This table does not distinguish whether or not the place of work was within or outside the area of residence. It shows that Londoners had, on average, the shortest commute travelling 9.0km (5.6 miles). Those commuting furthest lived in Tyne & Wear (13.0km/8.1 miles) while the Core City average was 11.1km (6.9 miles).

Conversely, those who worked in London had the longest travel to work distance of any of the areas under consideration. At 14.6km (9.1 miles) London's average was over 4km more than the Core City average of 10.0 (6.2 miles). Among the Core Cities, those working in South Hampshire travelled the furthest to their jobs (11.4km/7.1 miles).

Table 6: Average distance travelled to work, 2011

	Average distance travelled by Residents (Km)	Average distance travelled by Workers (Km)
Bristol	10.0	10.3
East Midlands	10.6	9.7
Greater Manchester	10.6	10.4
Merseyside	12.1	8.2
South Hampshire	10.9	11.4
South Yorkshire	12.3	9.0
Tyne & Wear	13.0	9.8
West Midlands	10.4	10.1
West Yorkshire	10.9	10.7
Combined Core Cities	11.2	10.0
London	9.0	14.6
England	12.1	11.9

2011 Census, ONS

Travel to Work Summary

There are certainly variations in the patterns of commuting, however London does not stand out as being particularly different in character. In fact the data for London are around the mean for all indicators. The only area in which London distinguishes itself is in the magnitude of the commuter flows. The Core Cities combined had commuter inflows of 1.02 million people while London alone had 789,800. Similarly, the outflows for the Core Cities together totalled 1.69 million while 1.10 million Londoners commuted out of the capital for work.

Qualifications

The census outputs take the Qualifications and Credit Framework (QCF), the national credit transfer system for qualifications in England & Wales, as the basis for reporting. Details of the qualifications included in each level can be found in the Census Information Scheme report Key Findings: Qualifications⁸.

At the national level residents aged 16-74 were educated to a higher level in 2011 than was the case in 2001; a trend also observed in London and the Core Cities (Figure 14). Overall in England the proportion of the population with low or no qualifications⁹ fell from 45 per cent in 2001 to 33 per cent in 2011. Similarly, in London and the Core Cities the proportion with no or low qualifications fell by 14 and 16 percentage points respectively (see Figure 14).

Overall, in England, the proportions of 16-74 year olds holding high qualifications¹⁰ rose from 20 per cent in 2001 to 29 per cent in 2011. The Core Cities saw a similar increase, rising from 16 per cent in 2001 to 24 per cent. In London in 2001 it was already the case that 31 per cent of the population were educated to at least degree standard. Over the decade this rose to 39 per cent. Therefore, while the populations of the Core Cities were moving towards a higher average level of qualification the same trend was apparent in London meaning that the distance between the capital and the Core Cities remained.

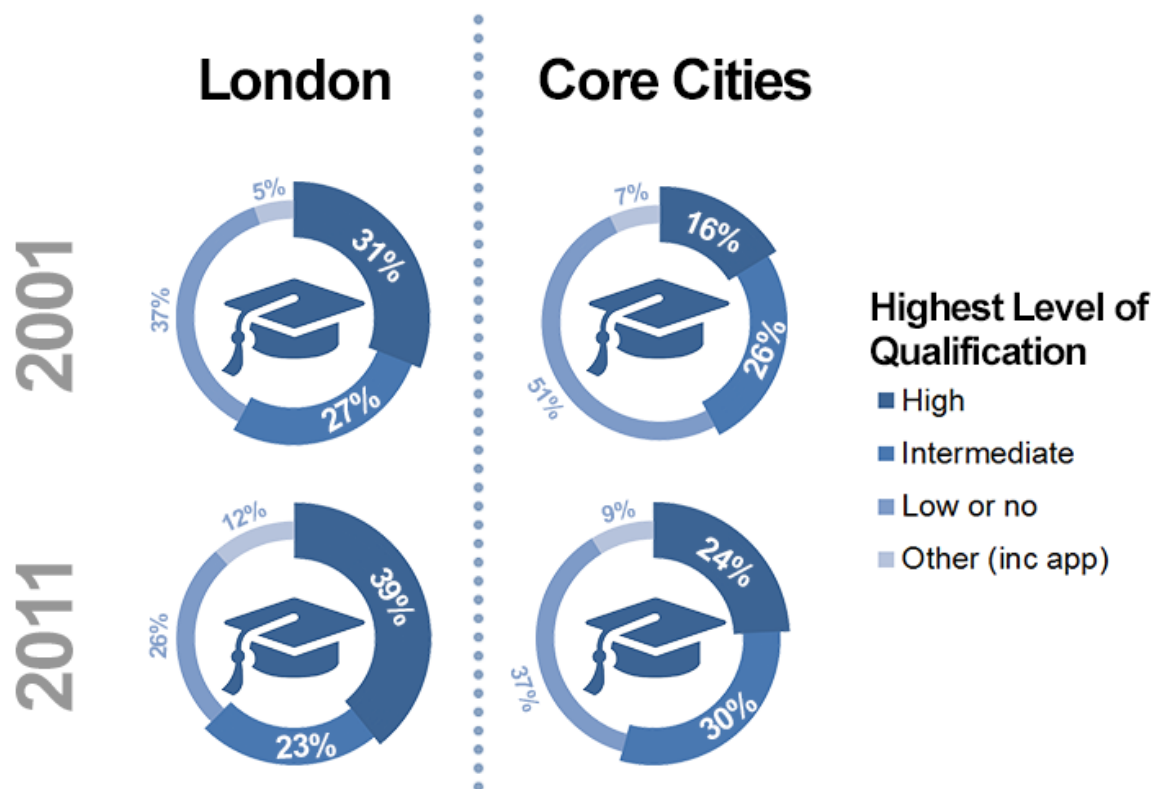
The number of residents holding an 'other' qualification also saw growth. In the Core Cities the proportion grew from seven per cent to nine per cent while in London the increase was more substantial – five to 12 per cent. Other qualifications are those which cannot be matched to the QCF, and therefore are commonly foreign qualifications. Over the decade 38 per cent of the national increase in these qualifications was seen in London. This is almost certainly a function of the higher proportion of non-UK born individuals in the population in London bringing non-comparable qualifications when they migrate.

⁸ <http://data.london.gov.uk/dataset/2011-census-key-findings-summaries>

⁹ No or Low qualifications = no qualifications or NQF level 1 = e.g. GCSE grade D-G

¹⁰ High qualifications = NQF level 4 or higher = degree or equivalent, or higher

Figure 14: Highest level of qualification achieved by residents of London & the Core Cities, 2001 & 2011

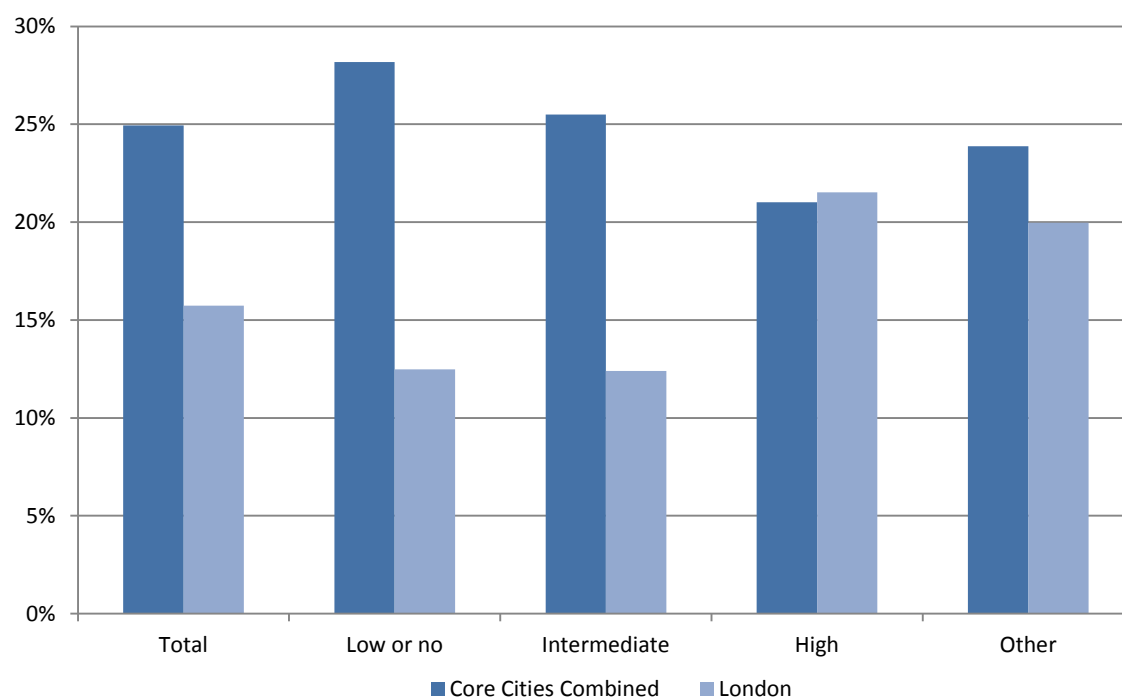


2001 Census, 2011 Census, ONS

Location of residents by highest qualification held

In 2011, 16 per cent of 16-74 year olds in England lived in London, while 25 per cent lived in one of the Core Cities. However, just 12 per cent of those with low or no qualifications lived in London while 28 per cent lived in a Core City. At the other end of the spectrum 22 per cent of those educated to degree level or higher (level 4) lived in London compared with 21 per cent in Core Cities.

This illustrates the imbalance in the distribution of the highly educated as those educated to the highest level favouring the capital over the Core Cities.

Figure 15: Place of residence by qualification held

2011 Census, ONS

Qualifications Summary

Historically, the higher education level of the population in London has helped to distinguish the capital from other areas of the country. However, increases in the proportion of those attaining degree-level qualifications nationally may change this. That being said high qualifications remain more common in the capital than elsewhere. London is also distinguished by the high numbers of residents holding non-classifiable 'other' qualifications. Again, the decade to 2011 saw national increases in this type of qualification but London is clearly the focal point for residents with these qualifications.

Household Composition

Household composition is a classification of the relationship between the individuals living in a household.

A lack of diversity in household composition could indicate a number of different things. At a small geographic level diversity is likely to be low. This is because the type of housing available in an area will naturally lend itself towards particular household types. For instance, a block of one bedroom flats is less likely to be occupied by couples with children than a development of 3-bedroom homes. Other factors, such as the presence of a university, which will lead a high proportion of residents being students, will also affect diversity at the small level.

At higher geographic levels, for instance when looking at the Core Cities and London, higher diversity would be expected, as theoretically there is greater opportunity for a range of communities, households and housing types to co-exist. Lower diversity scores in large areas are therefore more likely to be driven by external factors such as economic pressures or population structure.

London was among the areas with the lowest household composition diversity in both 2001 and 2011 – 7.1 in 2011 out of ten, compared with 7.4 for the combined Core Cities. The largest proportion of households in London in 2011 were one-person households where the occupant was under 65 years of age. This was also the largest group in six of the nine Core City areas. In the remaining three Core Cities couples with children formed the most common household type.

The category where London really distinguishes itself from the Core Cities is the ‘All others’ group. In London in 2011 this group accounted for 14 per cent of households while in the Core Cities it averaged just seven per cent of households. A variety of household types fit into the ‘All others’ group, including:

- Any household with a lodger
- Two families living together in one property, including extended family (i.e. Grandparents living with their children and their grandchildren) or two non-related families
- Adult siblings
- People living together that are ‘not in a couple’

While this catch-all group does contain a wide range of different households it is accepted that a significant proportion are households comprised of young adults living together (not students which are included in a separate group).

All areas saw growth in this household type between 2001 and 2011 and London’s 33 per cent increase was typical (average 31 per cent). However, London started from a larger base – in 2001, 11 per cent of households were of this type – and also has almost three times as many households as the largest Core City (Greater Manchester 1.13 million, London 3.27 million). As a result the number of households of this type in London (455,700) was greater than the total in all of the Core Cities combined (386,600).

This apparent trend was driven by social factors, such as individuals delaying family formation, as well as economic factors linked to the cost-sharing advantages of living in multi-person

households. The growth in these types of households is likely to be a significant factor influencing the increased average household size seen in 2011 over 2001.

The only household types where London saw a relative decline were one-person households where the resident was aged over 65 and multiple-person households where all residents were aged over 65. The same was true in the Core Cities. In addition, some Core Cities saw a decline in the proportion of couple households with children, however this trend was not observed in London.

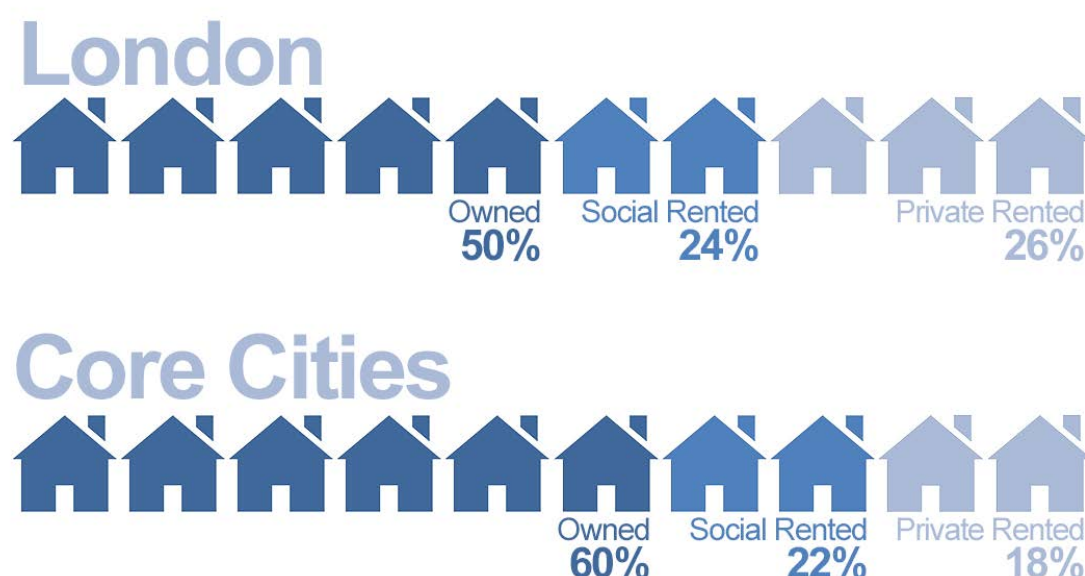
Household Composition Summary

In summary, London's low diversity of household composition can be attributed to the younger age structure found in the city. London held smaller shares of households types with persons aged 65 and over than other areas, and larger shares households types where one would expect to find younger residents. There was not much variation across city areas for couple households with or without children.

Tenure

There was greater diversity of housing tenure in London in both 2001 and 2011 than in any of the Core Cities. This was primarily driven by the lower levels of home ownership seen in London compared with other parts of the country. In London in 2011 half of households lived in a home that they either owned outright or owned with a mortgage. Among the Core Cities the average was 60 per cent (range 52 to 63 per cent). Many more households in London rented through the private market (26 per cent in 2011, compared to 18 per cent in the Core Cities) meaning a much more balanced distribution and therefore higher diversity score – London 4.6, Core Cities 4.2. Changes to the diversity of tenure were largely driven by changes in the proportion of households in owner occupation. Owner occupation remains the dominant form of housing in all areas (although less so in London) and therefore falling levels over the decade have acted to increase diversity.

Figure 16: Tenure of households, 2011



2011 Census, ONS

Owner Occupation

The differences between London and the Core City areas in the proportion of households which were owned outright by their occupiers were significant (21 per cent in London, 28 per cent in the combined Core Cities). Among households with a mortgage the gap between London and the Core Cities was also notable (28 per cent in London and 32 per cent in the combined Core Cities).

Social Rent

London was above average for the proportion of households in social rented accommodation. In the capital 24 per cent of households were social rented in 2011 while in the Core Cities the share ranged from 19 per cent (West Yorkshire) to 27 per cent (Tyne & Wear) with 22 per cent overall for the combined nine cities. As with most of the Core Cities, Londoners were more likely to rent from a local authority than a Registered Social Landlord or Housing Association. The

ratio was more pronounced in 2001 suggesting a move away from local authority renting to other forms of social rent as councils sell their housing stock. This shift was less pronounced in London than elsewhere.

Private Rent

In London in 2011, 26 per cent of households were privately rented from a landlord or letting agency. South Hampshire and Bristol also showed high proportions in private rent (26 and 25 per cent respectively) while other Core Cities reported much lower levels, 15 per cent in both South Yorkshire and Tyne & Wear being the lowest. The intercensal period saw massive growth in private renting right across the country but particularly in urban areas. In London the number of households in private rent increased by 67 per cent while in the West Midlands and Greater Manchester the sector grew at a faster rate (121 per cent and 108 per cent respectively). Numerically, London's increase in private renting was in the order of 313,200 households. This means that London saw 69 per cent as much growth as all of the nine Core Cities combined.

Tenure Summary

Over the decade there was a shift away from owner occupying towards private renting in London and all of the Core City areas. London already had a much larger private rented sector at the beginning of the period meaning that in proportional terms its growth was lower than the other city regions, however in numbers the number of new households in private rent in London dwarfed that elsewhere. In proportional terms the Core Cities appear to be moving closer to the tenure structure of London. However, the continued growth of renting in London means that renting in the capital is more prevalent than most other areas. It is worth noting that within the rental sector, social renting is still more common than private renting in the Core Cities while the opposite is true in London.

Primary Local Authority

Table 7 identifies the largest local authority (by resident population) in each of the nine Core Cities. For the purposes of this report, this is termed the Primary Local Authority (PLA).

In some Core Cities the identity of the PLA is obvious; in the case of Greater Manchester, Manchester contains 19 per cent of the Core City population and is the economic centre of the region. Similarly, in the West Midlands (Birmingham), Merseyside (Liverpool), Tyne & Wear (Newcastle), South Yorkshire (Sheffield) and West Yorkshire (Leeds) there is a dominant PLA at centre of the Core City.

However, for three of the Core Cities the PLA is more problematic, or less clearly defined. The first of these is Bristol which is a Core City comprised of a single local authority making the identification of a PLA unnecessary.

The Second example is South Hampshire. Here the Core City is comprised of two local authorities with similar sized populations; Southampton contains just 31,800 more people than Portsmouth. As neither city is dominant identifying a PLA for South Hampshire is not possible.

Finally, unlike the other Core Cities, the East Midlands is a group of three non-contiguous cities. The three cities are located at a distance of between eight and 14 miles from each other and are separated by semi-urban and rural areas (see Figure 1). No one city is obviously dominant with each city having a similar share of the total population: Derby 28 per cent, Leicester 37 per cent, Nottingham 35 per cent. As a result identifying a PLA is not possible.

Table 7: Core cities primary local authority

Core City	Primary Local Authority (PLA)	Population of PLA	% of Core City in PLA
Bristol	Bristol	428,200	100%
Greater Manchester	Manchester	503,100	19%
Merseyside	Liverpool	466,400	17%
South Yorkshire	Sheffield	552,700	41%
Tyne & Wear	Newcastle upon Tyne	280,200	25%
West Midlands	Birmingham	1,073,000	39%
West Yorkshire	Leeds	751,500	34%

Source: 2011 Census, ONS

NB: Table excludes East Midlands and South Hampshire Core Cities

Relationship between PLA and rest of Core City

A key difference between London and the nine Core Cities is the age structure of their respective populations. The age structure is a characteristic in its own right but also a driver of many of the other characteristics of these urban areas; for example, younger people are more likely to rent than own, more likely to be migrants, and are more likely to be educated to a higher level. Therefore, the characteristics which set London apart from the Core Cities are to some degree a function of its younger population.

However, as has been shown, the Core Cities themselves are not uniform and some are much closer to London in character than others. In particular Bristol, South Hampshire and East Midlands repeatedly display profiles more like the capital than the Core Cities. As was noted above, these areas are also differentiated from the other Core Cities by their size and their organisation. While the other six Core Cities are large conurbations built around a central PLA these three are much smaller and have no discernible PLA.

Also of note are the characteristics of the PLAs themselves. Tables 8 to 10 show age structure, tenure and migration characteristics for the Core Cities and their PLAs. The PLAs tend to exhibit characteristics more similar to those seen in London suggesting the differences between the Core Cities and the capital are the result of the populations living in the outlying areas of the Core Cities. It is in these areas where the older, UK-born, owner occupiers reside.

Table 8: Proportion of population aged 20-30, Core Cities & PLA

Core City	Primary Local Authority (PLA)	% CC aged 20-30	% PLA aged 20-30
Bristol	-	15.0	
East Midlands	-	14.3	
Greater Manchester	Manchester	14.4	24.6
Merseyside	Liverpool	19.5	19.4
South Hampshire	-	19.9	
South Yorkshire	Sheffield	15.1	17.2
Tyne & Wear	Newcastle upon Tyne	20.6	21.0
West Midlands	Birmingham	14.7	16.7
West Yorkshire	Leeds	14.8	17.5
London	-	17.9	
Core City Average	PLA Average	16.5	19.4

Source: 2011 Census, ONS

Table 9: Proportion of households in private rent, Core Cities & PLA

Core City	Primary Local Authority (PLA)	% CC private renting	% PLA private renting
Bristol	-	16.5	
East Midlands	-	17.8	
Greater Manchester	Manchester	15.5	30.0
Merseyside	Liverpool	22.6	24.7
South Hampshire	-	24.9	
South Yorkshire	Sheffield	17.4	16.5
Tyne & Wear	Newcastle upon Tyne	25.9	20.4
West Midlands	Birmingham	17.8	19.6
West Yorkshire	Leeds	14.6	19.4
London	-	26.4	
Core City Average	PLA Average	19.2	21.8

Source: 2011 Census, ONS

Table 10: Proportion of population born outside the UK, Core Cities & PLA

Core City	Primary Local Authority (PLA)	% CC non-UK born	% PLA non-UK born
Bristol	-	16.6	
East Midlands	-	5.7	
Greater Manchester	Manchester	7.8	25.3
Merseyside	Liverpool	23.2	9.9
South Hampshire	-	14.8	
South Yorkshire	Sheffield	12.1	11.7
Tyne & Wear	Newcastle upon Tyne	15.1	13.4
West Midlands	Birmingham	11.4	22.2
West Yorkshire	Leeds	6.5	11.5
London	-	36.7	
Core City Average	PLA Average	12.6	15.6

Source: 2011 Census, ONS

Conclusion

The conclusion drawn is that the relationship between a Core City and its PLA is similar to the relationship between London and England. The central area (PLA or London) draws in the young highly educated population from the wider area which has implications across a range of metrics from tenure to economic activity. The same drivers at play nationally that shape London's demography repeat themselves at the regional level on a smaller scale. The reason that Bristol, South Hampshire and the East Midland Core Cities are closest to London in their character is that these three Core Cities are functioning as a PLA to their wider areas.

Appendix A: Composition of Core Cities

Local Authority	Population	LA pop as % of Core City pop
Bristol	428,234	
City of Bristol	428,234	100%
East Midlands	884,271	
Derby	248,752	28%
Leicester	329,839	37%
Nottingham	305,680	35%
Greater Manchester	2,682,528	
Bolton	276,786	10%
Bury	185,060	7%
Manchester	503,127	19%
Oldham	224,897	8%
Rochdale	211,699	8%
Salford	233,933	9%
Stockport	283,275	11%
Tameside	219,324	8%
Trafford	226,578	8%
Wigan	317,849	12%
Merseyside	1,381,189	
Knowsley	145,893	11%
Liverpool	466,415	34%
St. Helens	175,308	13%
Sefton	273,790	20%
Wirral	319,783	23%
South Hampshire	441,938	
Portsmouth	205,056	46%
Southampton	236,882	54%
South Yorkshire	1,343,601	
Barnsley	231,221	17%
Doncaster	302,402	23%
Rotherham	257,280	19%
Sheffield	552,698	41%

Tyne & Wear	1,104,825	
Gateshead	200,214	18%
Newcastle upon Tyne	280,177	25%
North Tyneside	200,801	18%
South Tyneside	148,127	13%
Sunderland	275,506	25%
West Midlands	2,736,460	
Birmingham	1,073,045	39%
Coventry	316,960	12%
Dudley	312,925	11%
Sandwell	308,063	11%
Solihull	206,674	8%
Walsall	269,323	10%
Wolverhampton	249,470	9%
West Yorkshire	2,226,058	
Bradford	522,452	23%
Calderdale	203,826	9%
Kirklees	422,458	19%
Leeds	751,485	34%
Wakefield	325,837	15%
London	8,173,941	
City of London	7,375	0%
Camden	220,338	3%
Hackney	246,270	3%
Hammersmith and Fulham	182,493	2%
Haringey	254,926	3%
Islington	206,125	3%
Kensington and Chelsea	158,649	2%
Lambeth	303,086	4%
Lewisham	275,885	3%
Newham	307,984	4%
Southwark	288,283	4%
Tower Hamlets	254,096	3%
Wandsworth	306,995	4%
Westminster	219,396	3%
Barking and Dagenham	185,911	2%
Barnet	356,386	4%
Bexley	231,997	3%
Brent	311,215	4%
Bromley	309,392	4%
Croydon	363,378	4%
Ealing	338,449	4%
Enfield	312,466	4%
Greenwich	254,557	3%
Harrow	239,056	3%
Havering	237,232	3%
Hillingdon	273,936	3%

Hounslow	253,957	3%
Kingston upon Thames	160,060	2%
Merton	199,693	2%
Redbridge	278,970	3%
Richmond upon Thames	186,990	2%
Sutton	190,146	2%
Waltham Forest	258,249	3%

Source: 2011 Census, ONS

Appendix B: Simpson's Diversity Index

The Simpson's diversity index provides a measure of the equality of distribution in a population across a range of characteristics. An index score of 1 signifies a complete lack of diversity with every member of the population having the same characteristic. As diversity increases so too does the index score. Perfect diversity is achieved when every characteristic has an equal share of the population. The highest score achievable in an index is the number of characteristics being measured and so it varies from index to index.

Example: Diversity of Housing Tenure

This report considers six housing tenure types:

- Owned outright
- Owned with a mortgage or loan
- Shared Ownership
- Rented from local authority
- Rented from housing association or other social rent
- Private rent

Diversity of housing tenure is therefore measured on a scale from one to six. In an area with 120 households a diversity index score of 1 would be achieved if all 120 were of the same tenure type. A diversity index score of 6 would be achieved if there were 20 households in each tenure type.

Formula

To calculate Simpson's Diversity Index the proportion of people in each group relative to the total population of that area is calculated and squared. The squared proportions for all groups are then summed, and the reciprocal is taken:

$$SDI = \frac{1}{\sum_1^n [P(i)]^2}$$

- *SDI* is Simpson's Diversity Index
- *P(i)* is the size of a given group as a proportion of the total population
- The sum is across the groups

Details of the diversity index scores for each of the characteristics analysed in this report can be found the accompanying datasheet (Excel).

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