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PayCheck 2008
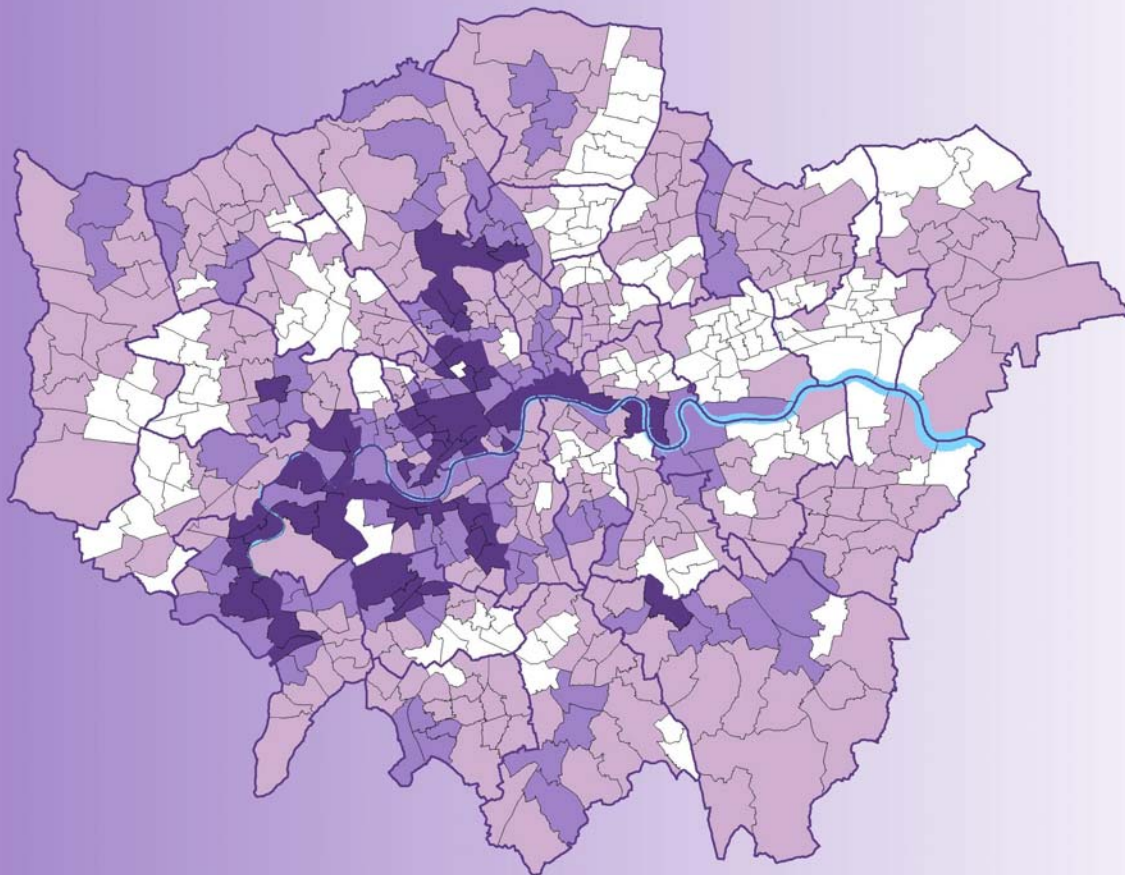
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DMAG Briefing 2008-33

November 2008

PayCheck 2008: Unequivalised and Equivalised Household Income

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Tables in this Briefing can be made available in other formats (e.g. Microsoft Excel) on request.

PayCheck 2008:
Unequivalised and Equivalised Household Income

Contents

Main Findings

- The mean or average unequivalised household income for London in 2008 was £38,892, this compares to £37,681 for the equivalised figure; the unequivalised average is just over £5,000 higher than the Great Britain average of £34,417.

- Median unequivalised household income falls by nearly ten per cent in London when equivalised.

- Barking & Dagenham has the lowest average household income in London compared to other London boroughs.

- The highest household income (outside the City of London) is in Richmond upon Thames when unequivalised and in Kensington and Chelsea when equivalised.

- The London boroughs of Harrow and Havering had the largest percentage drops in median household income when comparing unequivalised with equivalised.

- Both Barking & Dagenham and Newham had 19 per cent of households with an unequivalised household income below £15,000 a year – this rises to 24 and 26 per cent respectively when equivalised.

- A quarter of households in Richmond have an equivalised income of over £60,000 a year compared to only seven per cent in Barking & Dagenham.

- Fieldway ward in Croydon has the lowest median household income (unequivalised) in London with £23,126. This is under half the income in the highest ward, which is Thamesfield ward in Wandsworth that had a median household income of £49,677.

- Green Street East ward in Newham has the lowest median household income with £18,743 once equivalisation is taken into account.

- Southall Green ward in Ealing had the largest percentage difference between unequivalised and equivalised household income (minus 25 per cent).

Introduction

Now that the UK is on the verge of officially being in a recession people will be concerned about how the economic downturn will affect their own overall household income. Some forecasts suggest an economic decline similar to the one seen in the early 1990s. However, London has been much more volatile than the rest of the UK partly due to its high levels of private sector, as opposed to public sector, activity and it is affected more by events in the USA than is the rest of the UK, due to its reliance on the service sector. Other UK regions are more affected by manufacturing, which tends to be more Europe-driven[1].

There are likely to be pressures on real disposable income in both directions. Until recently there has been negative pressure on income. However, October 2008 saw the biggest fall in inflation for 16 years as oil and transport costs - as well as food prices fell. Mortgage rates may fall for those with variable rates after the latest rate cut by the Bank of England. Council Tax bills continue to rise but are predicted to rise by just four percent in 2008/09 - the lowest rise for 14 years[2].

Lower disposable incomes, lack of consumer confidence and a lower level of overseas visitors will have an effect on retail, hotels and restaurants - sectors that offer lower paid and part time opportunities. Job cuts in these sectors will affect the income of households already at the lower end of the income scale.

This *Briefing* presents figures from the 2008 PayCheck dataset. It shows unequivalised data, which provides modelled estimates of gross household income (including investment income and social security benefits) compared to equivalised data, which takes into account household size. The data are produced by CACI Information Solutions, a market analysis consultancy.

Equivalised income is an adjusted income scale, which takes into account the size of a household. It reflects the concept that a large household will need a larger income than a smaller household in order to achieve an equivalent standard of living.

The equivalisation scale used in PayCheck is the *McClements Scale*, which was widely used by the Office for National Statistics but has now been replaced by the OECD version. The McClements scale assumes the equivalised income of a cohabiting couple living on their own is equal to their actual income. The equivalised income of larger households is less than their actual household income, and the equivalised income of a single-person household is greater than the person's actual income. The scale takes into account both the greater income needs of larger families and economies of scale achieved when people live together.

The name 'PayCheck' is slightly misleading, since these data relate to household income from all sources, rather than just earnings, which might be assumed from the name. The data include most sources of income, such as benefits, but does not take account of outgoings such as tax payments and housing costs. Deductions for housing costs would make PayCheck a better measure of deprivation – especially in London.

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[1] London Economic Panel. London First, 12 February 2008
[2] Chartered Institute of Public Finance and Accountancy (CIPFA)

The results in this *Briefing* are mostly presented in map form for each geographical level: boroughs and wards. They show unequivalised and equivalised median household income, the difference between the two and a map showing the number of households with income below £15k per year.

Showing median household incomes instead of mean income is important when looking at income levels in London. A mean income would be skewed by a relatively small number of very high earners: for example only three per cent of households in London have an income above £100,000 (unequivalised), however, it is not known how much more they earn above this threshold. The median household income (unequivalised) for London is over £6,000 pounds below the mean figure of £39,892.

A further reason for highlighting the median figure is the importance that the Government places upon it in terms of defining poverty levels. The official poverty line is defined as households with less than 60 per cent of median income (equivalised). In Greater London 27 per cent of the population live in income poverty[3] (2005-07, after housing costs), this rises to 41 per cent for children – the highest for any region in the country. Child poverty is even higher in Inner London where just under half of all children (48 per cent) are living in income poverty – after housing costs. Poverty rates for some boroughs, especially those with high ethnic populations, would be even higher but sub-regional figures are not possible from the Family Resources Survey (FRS).

PayCheck data are produced at 2001 Census Output Areas and postcodes, however, PayCheck data at this level are confidential and the actual numbers cannot be published. The Greater London Authority has purchased this dataset and London Boroughs can buy into this to receive data for their own borough. Boroughs using PayCheck data at this level can do so for internal purposes only and must not pass the data on to anyone else, including to another London Borough.

To join the GLA scheme please contact Eileen Howes - email: eileen.howes@london.gov.uk
For further information regarding the background and methodology of PayCheck data visit the CACI website at: http://www.caci.co.uk/.

Results

The mean or average unequivalised household income for London in 2008 was £39,892, this compares to £37,687 for the equivalised figure; the unequivalised average is just over £5,000 higher than the Great Britain average of £34,417. The equivalised average for London is £2,205 lower than the unequivalised average (see Table 1), while for Great Britain average income decreases when equivalised by £3,032 – a percentage drop of nearly nine per cent compared to a 5.5 per cent drop in London. The difference between unequivalised and equivalised is more marked when looking at median household incomes in London. Median household income falls by nearly ten per cent in London when comparing unequivalised with equivalised – the percentage difference in Great Britain was 11 per cent.. According to the 2001 Census the average household size in London is 2.35, the same as Great Britain as a whole.

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[3] Household Below Average Income, 2005-07, DWP

This analysis shows that there are single person households in London with high incomes, which cancels out any difference when mean incomes are equivalised. These smaller but high earning households have less impact when looking at median income, hence the larger difference when median incomes are equivalised.

Barking & Dagenham has the lowest average household income in London compared to all other boroughs. This is true for both the unequivalised and equivalised data. Newham has the lowest median income in London with £27,458 unequivalised and £23,621 when equivalised (see Table 1). The highest household income is in the City of London when equivalised (see Chart 1).

The London boroughs of Harrow and Havering had the largest percentage falls in median household income when comparing unequivalised with equivalised. Household income falls by 15 per cent in each. The next largest difference was in Newham with a 14 per cent drop. Apart from the City of London, there were two other London boroughs (Kensington & Chelsea and Westminster) where average household income rose after equivalisation.

Map 3 shows that the largest changes in income occurred in outer London boroughs, particularly in the west and the east. Newham had the largest percentage change of any inner London borough.

Table 2 shows the distribution of earnings by income band for London and the boroughs – comparing unequivalised with equivalised. Both Barking & Dagenham and Newham had 19 per cent of households with unequivalised household income below £15,000 a year – this rises to 24 and 26 per cent respectively when equivalised. Overall, 16 per cent of households in London had equivalised incomes below £15,000. This translates to over half a million households.

Richmond upon Thames only had eight per cent of households with an equivalised income below £15,000 per year. This is the lowest percentage apart from the City. A quarter of households in Richmond have an equivalised income of over £60,000 a year compared to only seven per cent in Barking & Dagenham. Overall, 16 per cent of households in London had equivalised incomes above £60,000 a year.

The main advantage of the PayCheck dataset is that it can show household income levels for small areas. Figures for London wards can identify small pockets of low income and highlight polarization not only within London but also within individual boroughs.

According to PayCheck, Fieldway ward in Croydon has the lowest median household income (unequivalised) in London with £23,126. This is little more than half the income in the highest ward, Thamesfield ward in Wandsworth, which had a median household income of £49,677. The highest incomes by ward are mostly in three authorities: Richmond upon Thames, Kensington & Chelsea and Wandsworth.
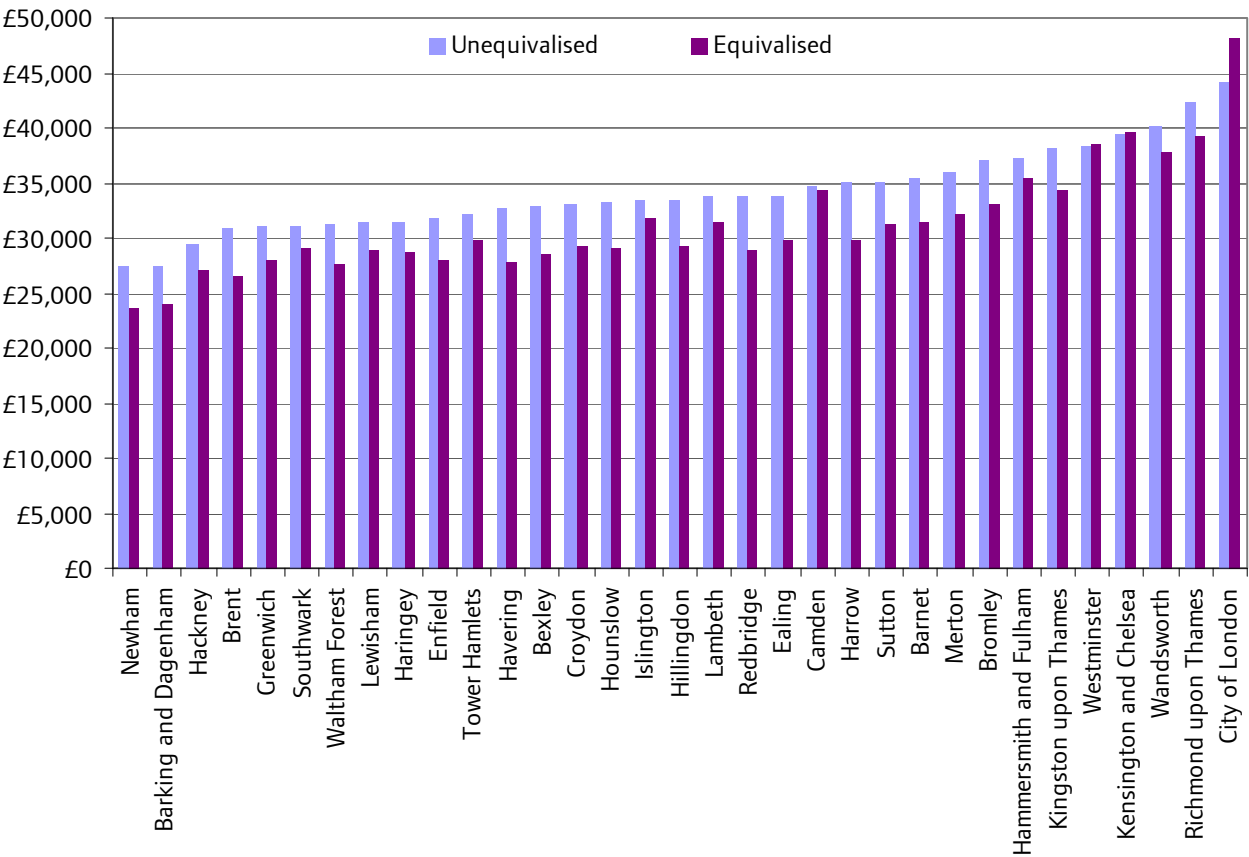
Table 1 Household Income by London borough, Unequivalised compared to Equivalised, 2008

Source: PayCheck 2008, CACI

London borough	Mean Income (£)				Median Income (£)			
	Unequiv-alised	Equivalised	Difference	% difference	Unequiv-alised	Equivalised	Difference	% difference
City of London	£51,186	£57,526	£6,340	12.4	£44,215	£48,235	£4,019	9.1
Barking & Dagenham	£32,123	£28,804	-£3,320	-10.3	£27,530	£23,933	-£3,597	-13.1
Barnet	£41,477	£38,077	-£3,400	-8.2	£35,475	£31,454	-£4,020	-11.3
Bexley	£38,467	£34,170	-£4,296	-11.2	£32,999	£28,458	-£4,541	-13.8
Brent	£36,217	£32,316	-£3,901	-10.8	£30,891	£26,597	-£4,294	-13.9
Bromley	£43,082	£39,808	-£3,274	-7.6	£37,039	£33,121	-£3,918	-10.6
Camden	£41,093	£42,142	£1,049	2.6	£34,774	£34,319	-£456	-1.3
Croydon	£38,822	£35,569	-£3,253	-8.4	£33,142	£29,283	-£3,859	-11.6
Ealing	£39,737	£36,783	-£2,955	-7.4	£33,780	£29,776	-£4,004	-11.9
Enfield	£37,444	£34,040	-£3,404	-9.1	£31,780	£27,939	-£3,841	-12.1
Greenwich	£36,876	£34,497	-£2,379	-6.5	£31,032	£28,032	-£3,000	-9.7
Hackney	£35,246	£33,746	-£1,500	-4.3	£29,471	£27,110	-£2,361	-8.0
Hammersmith & Fulham	£43,718	£43,387	-£331	-0.8	£37,257	£35,468	-£1,789	-4.8
Haringey	£37,560	£35,739	-£1,821	-4.8	£31,495	£28,790	-£2,704	-8.6
Harrow	£40,963	£36,151	-£4,812	-11.7	£35,062	£29,844	-£5,218	-14.9
Havering	£38,297	£33,572	-£4,725	-12.3	£32,771	£27,900	-£4,871	-14.9
Hillingdon	£38,977	£35,346	-£3,631	-9.3	£33,431	£29,189	-£4,242	-12.7
Hounslow	£39,120	£36,045	-£3,074	-7.9	£33,194	£29,154	-£4,040	-12.2
Islington	£39,650	£39,281	-£369	-0.9	£33,430	£31,838	-£1,592	-4.8
Kensington & Chelsea	£46,158	£48,041	£1,884	4.1	£39,515	£39,579	£63	0.2
Kingston upon Thames	£44,330	£41,669	-£2,661	-6.0	£38,143	£34,309	-£3,834	-10.1
Lambeth	£39,905	£38,802	-£1,103	-2.8	£33,735	£31,453	-£2,283	-6.8
Lewisham	£37,052	£35,269	-£1,783	-4.8	£31,477	£28,865	-£2,611	-8.3
Merton	£42,262	£39,356	-£2,906	-6.9	£36,045	£32,150	-£3,895	-10.8
Newham	£32,349	£29,076	-£3,272	-10.1	£27,458	£23,621	-£3,837	-14.0
Redbridge	£39,457	£35,104	-£4,352	-11.0	£33,773	£28,970	-£4,803	-14.2
Richmond upon Thames	£48,862	£47,160	-£1,702	-3.5	£42,296	£39,234	-£3,062	-7.2
Southwark	£37,485	£36,806	-£680	-1.8	£31,174	£29,176	-£1,999	-6.4
Sutton	£40,954	£37,686	-£3,268	-8.0	£35,149	£31,254	-£3,895	-11.1
Tower Hamlets	£39,241	£38,867	-£374	-1.0	£32,219	£29,758	-£2,461	-7.6
Waltham Forest	£36,549	£33,432	-£3,117	-8.5	£31,303	£27,664	-£3,639	-11.6
Wandsworth	£46,972	£46,145	-£827	-1.8	£40,122	£37,781	-£2,341	-5.8
Westminster, City of	£45,003	£47,027	£2,024	4.5	£38,415	£38,631	£216	0.6
Inner London	£40,240	£39,723	-£517	-1.3	£33,784	£31,852	-£1,932	-5.7
Outer London	£39,646	£36,244	-£3,402	-8.6	£33,768	£29,665	-£4,103	-12.2
Greater London	**£39,892**	**£37,687**	**-£2,205**	**-5.5**	**£33,774**	**£30,509**	**-£3,265**	**-9.7**
Great Britain	£34,417	£31,386	-£3,032	-8.8	£28,698	£25,486	-£3,212	-11.2

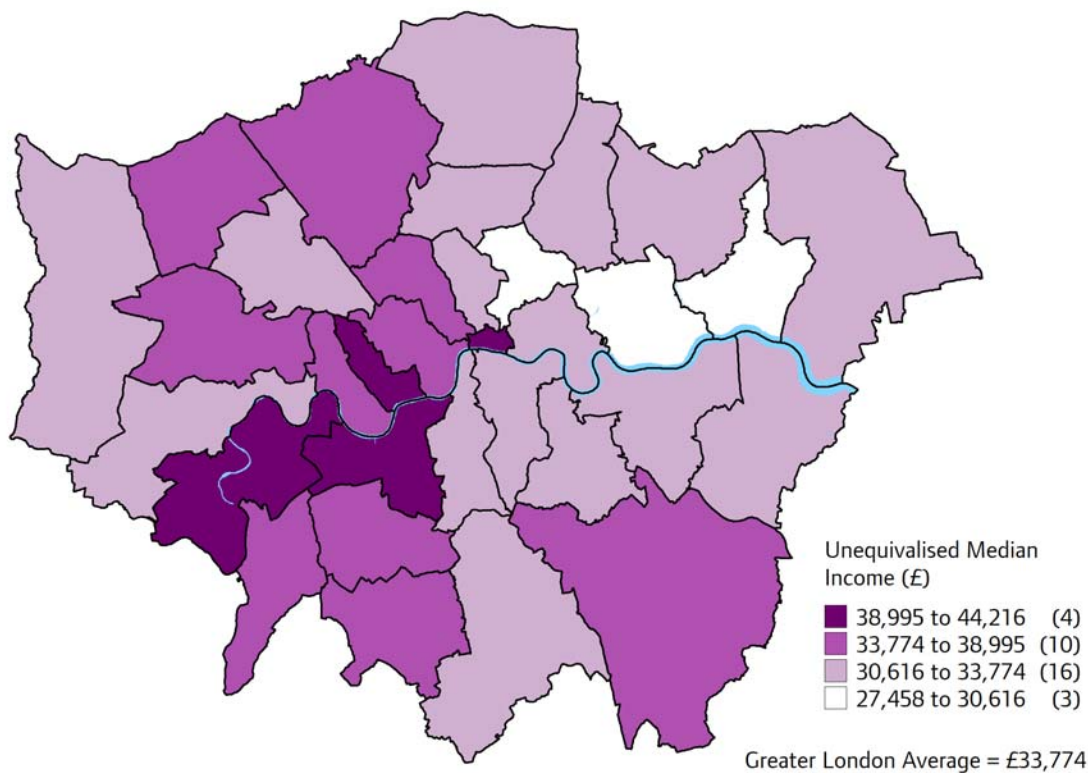**Chart 1 Household Median Income by London borough, Unequivalised compared to Equivalised, 2008**

Source: PayCheck 2008, CACI

Map 1 Household Median Income by London borough, <u>Unequivalised</u>, 2008

Source: PayCheck 2008, CACI

Unequivalised Median Income (£)

■ 38,995 to 44,216 (4)
■ 33,774 to 38,995 (10)
■ 30,616 to 33,774 (16)
□ 27,458 to 30,616 (3)

Greater London Average = £33,774

Map 2 Household Median Income by London borough, <u>Equivalised</u>, 2008

Source: PayCheck 2008, CACI

Equivalised Median Income (£)

■ 41,005 to 48,235	(1)
33,774 to 41,005	(7)
28,698 to 33,774	(16)
□ 23,621 to 28,698	(9)

Greater London Average = £30,509

Map 3 Household Median Income by London borough, percentage difference between Unequivalised and Equivalised, 2008

Source: PayCheck 2008, CACI

% Difference

■ 3 to 10	(1)
-3 to 3	(3)
-9 to -3	(10)
□ -15 to -9	(19)

Greater London Average = -10%

Map 4 Households with Median Income under £15k per year by London borough, <u>unequivalised</u>, 2008

Source: PayCheck 2008, CACI

Household Unequivalised
Income Under 15k (%)

■ 16 to 20   (3)
■ 13 to 16 (16)
  10 to 13   (8)
□ 7 to 10   (6)

Greater London Average = 13%

Map 5 Households with Median Income under £15k per year by London borough, <u>Equivalised</u>, 2008

Source: PayCheck 2008, CACI

Household Equivalised
Income Under 15k (%)

■ 19 to 26   (4)
■ 13 to 19 (20)
  9 to 13   (7)
□ 5 to 9   (2)
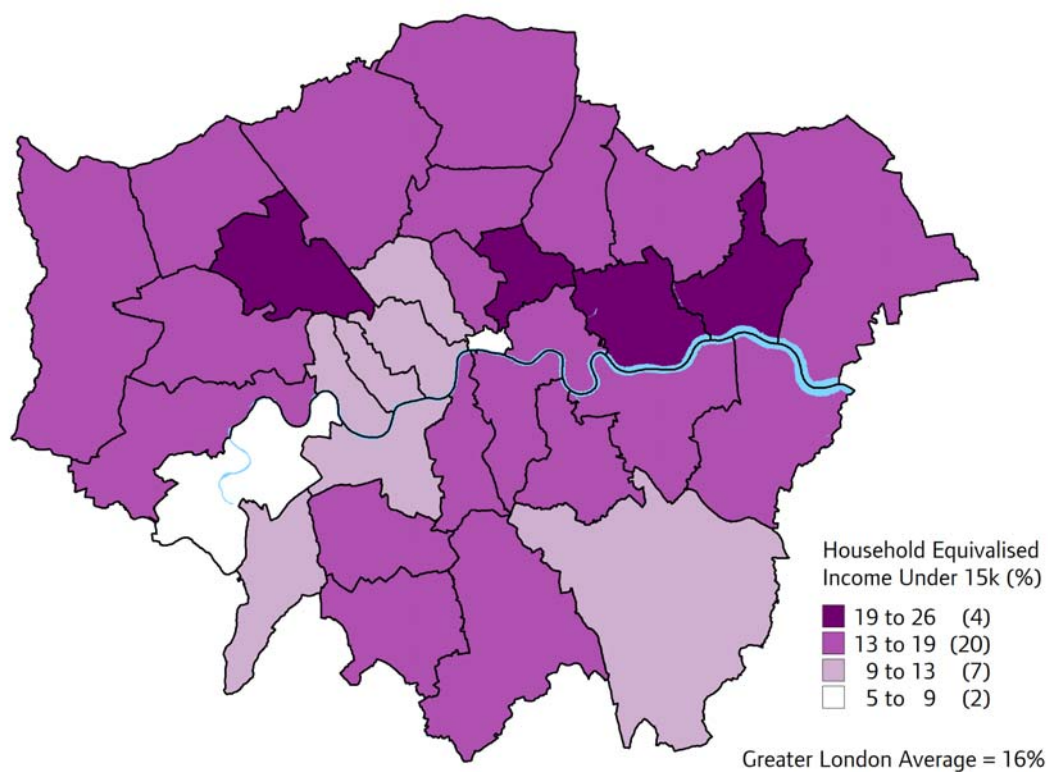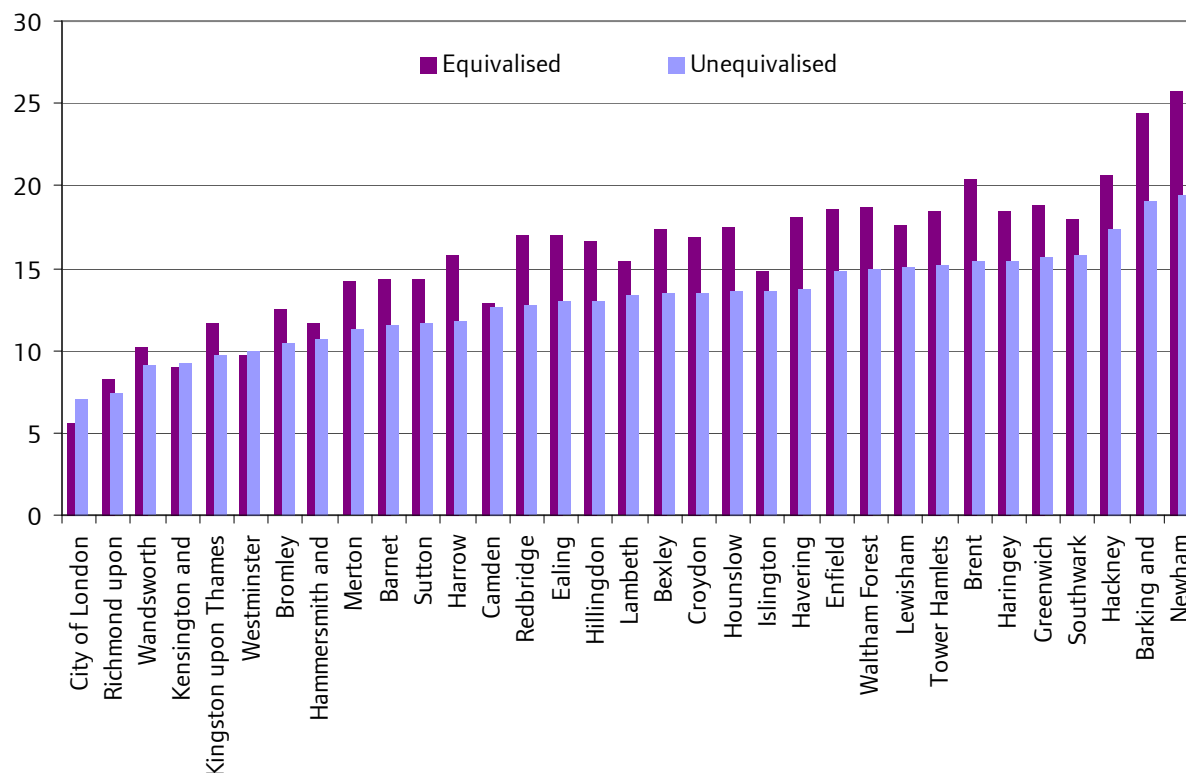
Greater London Average = 16%
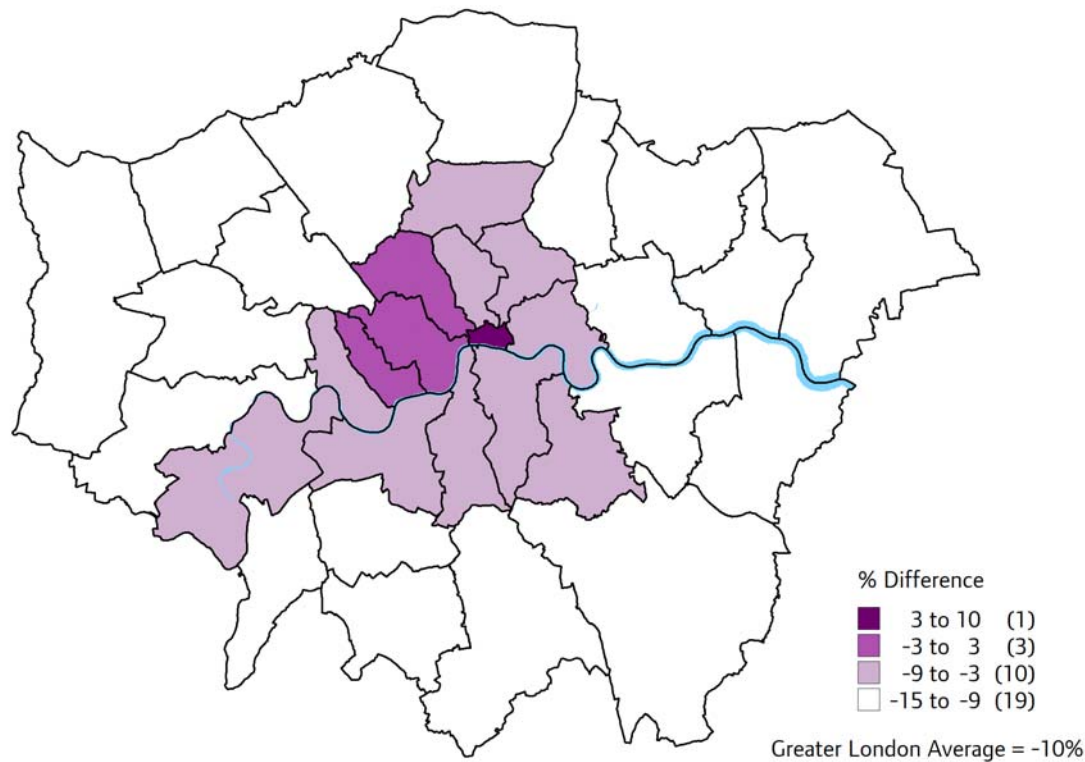
Chart 2 Percentage of households with income below £15,000 per year by London borough, Unequivalised compared to Equivalised, 2008

Source: PayCheck 2008, CACI

Map 6 shows that the lowest unequivalised household incomes are mostly situated in the east of London and along the Lea Valley, with pockets also in the south of Brent, south Lewisham and across the middle of Southwark (around the Peckham and Faraday area). There are also wards in the west of Hounslow and Ealing with low incomes.

The rankings change once equivalisation is taken into account. Green Street East ward in Newham has the lowest median household income with £18,743. This is followed by another ward in Newham: East Ham North. Also appearing amongst the lowest in London is Southall Broadway in Ealing.

The number of wards in the lowest two bands used in Maps 6 and 7 increases from 319 when income is unequivalised to 454 once income is equivalised.

Southall Green ward in Ealing had the largest percentage difference between unequivalised and equivalised income. Its household income fell by 25 per cent when comparing the two median measures. Along with Southall Broadway and Lady Margaret ward, Ealing had three of the 10 largest differences. Others included the aforementioned wards in Newham and wards in Harrow and Brent.
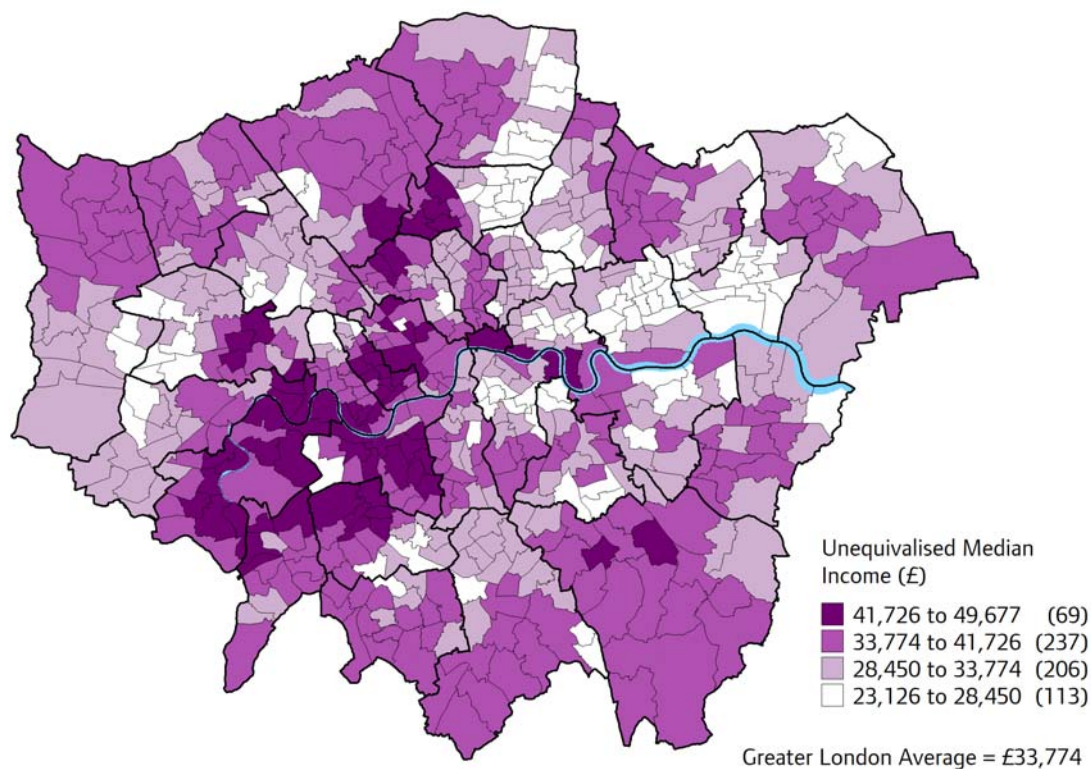
Table 2 Household Income distribution by London borough, Unequivalised compared to Equivalised, 2008

Source: PayCheck 2008, CACI

London borough	Unequivalised Percentage of households earning:			Equivalised Percentage of households earning:		
	Under 15k	Under 30k	Under 60k	Under 15k	Under 30k	Under 60k
City of London	7	28	69	6	24	63
Barking and Dagenham	19	56	91	24	64	93
Barnet	12	40	81	14	47	84
Bexley	13	44	84	17	53	88
Brent	15	48	86	20	57	90
Bromley	10	37	79	12	44	83
Camden	13	41	81	13	42	80
Croydon	13	44	83	17	52	87
Ealing	13	43	82	17	50	85
Enfield	15	47	85	19	54	88
Greenwich	16	48	85	19	54	87
Hackney	17	51	87	21	56	88
Hammersmith and Fulham	11	37	78	12	40	79
Haringey	15	47	84	18	52	86
Harrow	12	41	81	16	50	86
Havering	14	45	84	18	55	89
Hillingdon	13	43	83	17	52	87
Hounslow	14	44	83	17	52	86
Islington	14	44	82	15	47	83
Kensington and Chelsea	9	34	75	9	34	74
Kingston upon Thames	10	36	77	12	42	81
Lambeth	13	43	82	15	47	83
Lewisham	15	47	85	18	52	87
Merton	11	39	80	14	46	83
Newham	19	56	90	26	64	92
Redbridge	13	43	83	17	52	87
Richmond upon Thames	7	30	72	8	34	75
Southwark	16	48	84	18	52	85
Sutton	12	40	81	14	48	85
Tower Hamlets	15	46	82	18	50	82
Waltham Forest	15	47	86	19	55	89
Wandsworth	9	33	74	10	37	76
Westminster	10	36	76	10	36	75
Inner London	14	43	82	15	47	82
Outer London	13	43	83	16	51	86
London	**13**	**43**	**82**	**16**	**49**	**84**
Great Britain	18	53	88	23	60	90

Map 6 Household Median Income by London wards, <u>Unequivalised</u>, 2008

Source: PayCheck 2008, CACI

Unequivalised Median
Income (£)

- 41,726 to 49,677 (69)
- 33,774 to 41,726 (237)
- 28,450 to 33,774 (206)
- 23,126 to 28,450 (113)

Greater London Average = £33,774

Map 7 Household Median Income by London wards, <u>Equivalised</u>, 2008
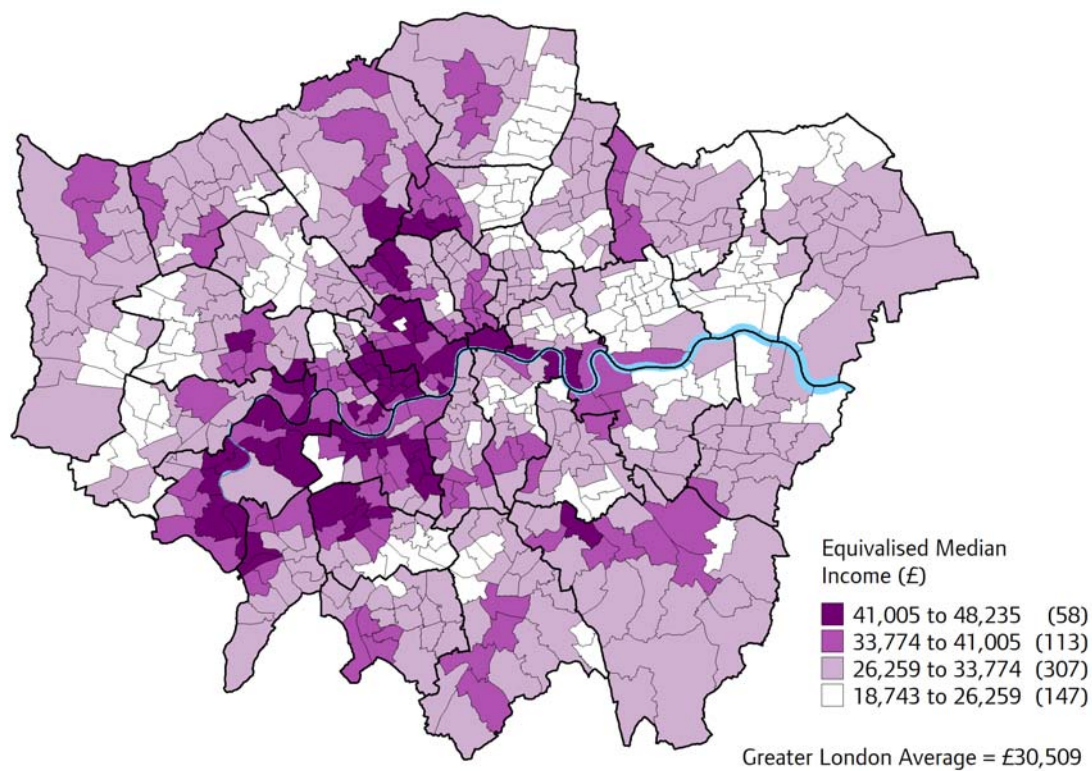
Source: PayCheck 2008, CACI

Equivalised Median
Income (£)

- 41,005 to 48,235 (58)
- 33,774 to 41,005 (113)
- 26,259 to 33,774 (307)
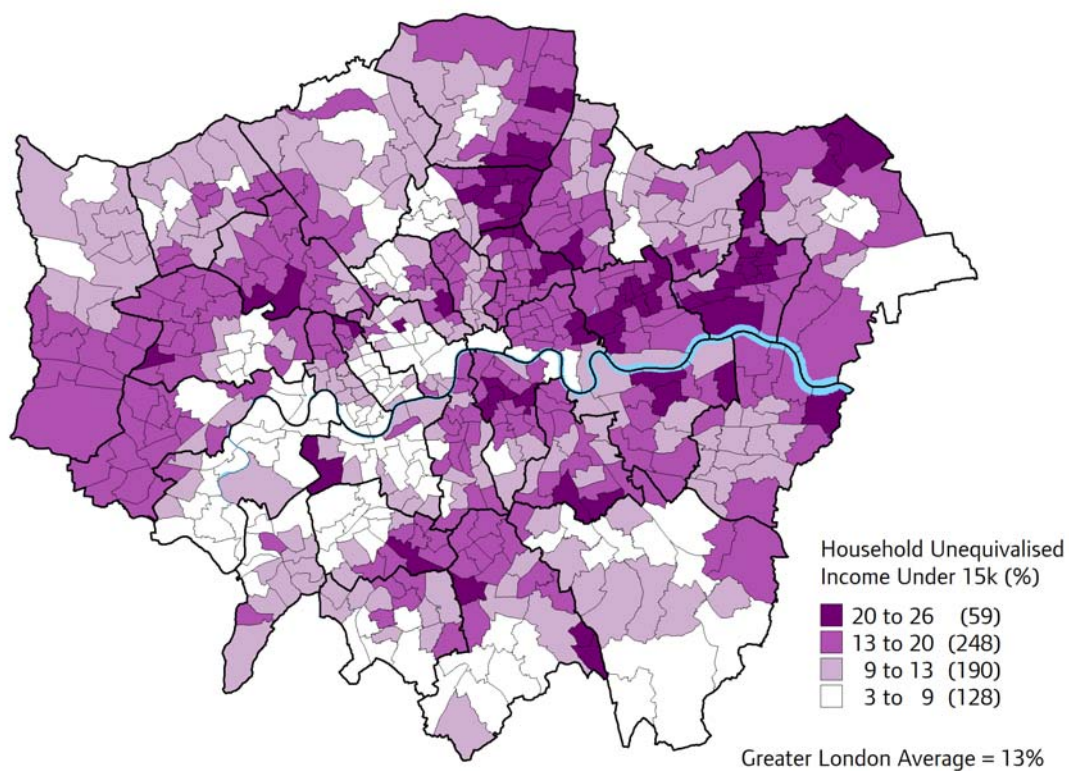- 18,743 to 26,259 (147)

Greater London Average = £30,509

Map 8 Household Median Income by London borough, percentage difference between Unequivalised and Equivalised, 2008

Source: PayCheck 2008, CACI

% Difference
- 1 to 10 (30)
- -8 to 1 (193)
- -16 to -8 (326)
- -25 to -16 (76)

Greater London Average = -10%
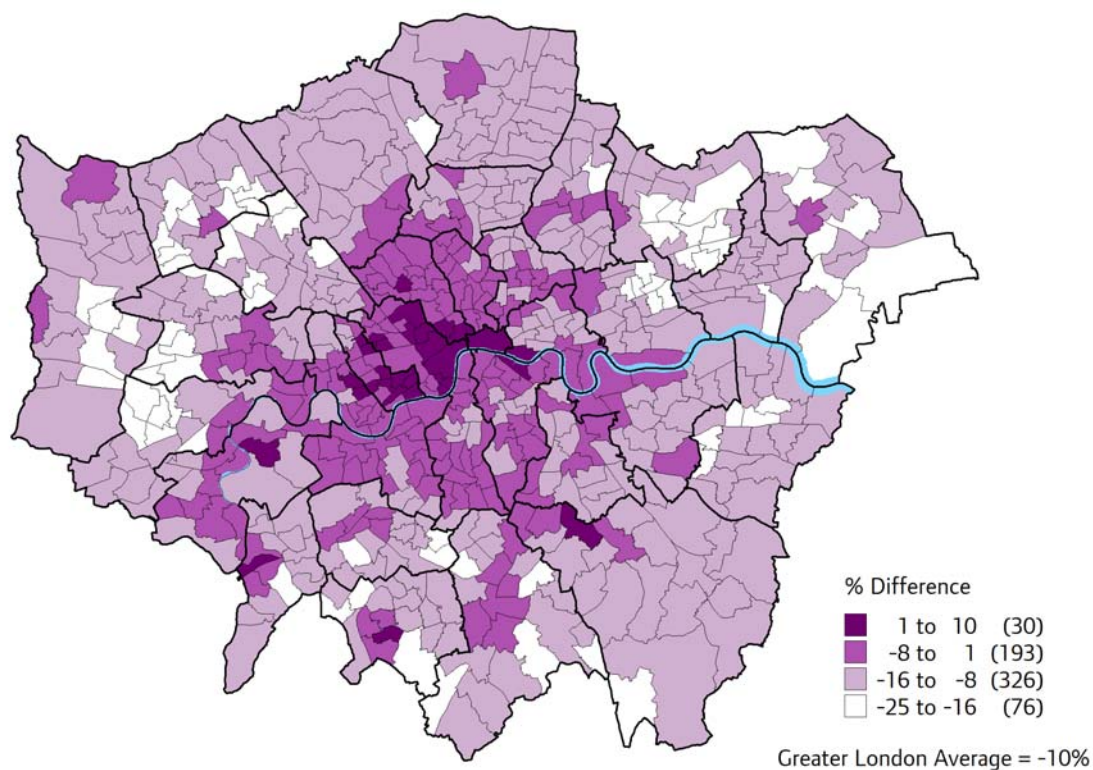
Map 9 Households with Median Income under £15k per year by London wards, <u>unequivalised</u>, 2008

Source: PayCheck 2008, CACI

Household Unequivalised Income Under 15k (%)
- 20 to 26 (59)
- 13 to 20 (248)
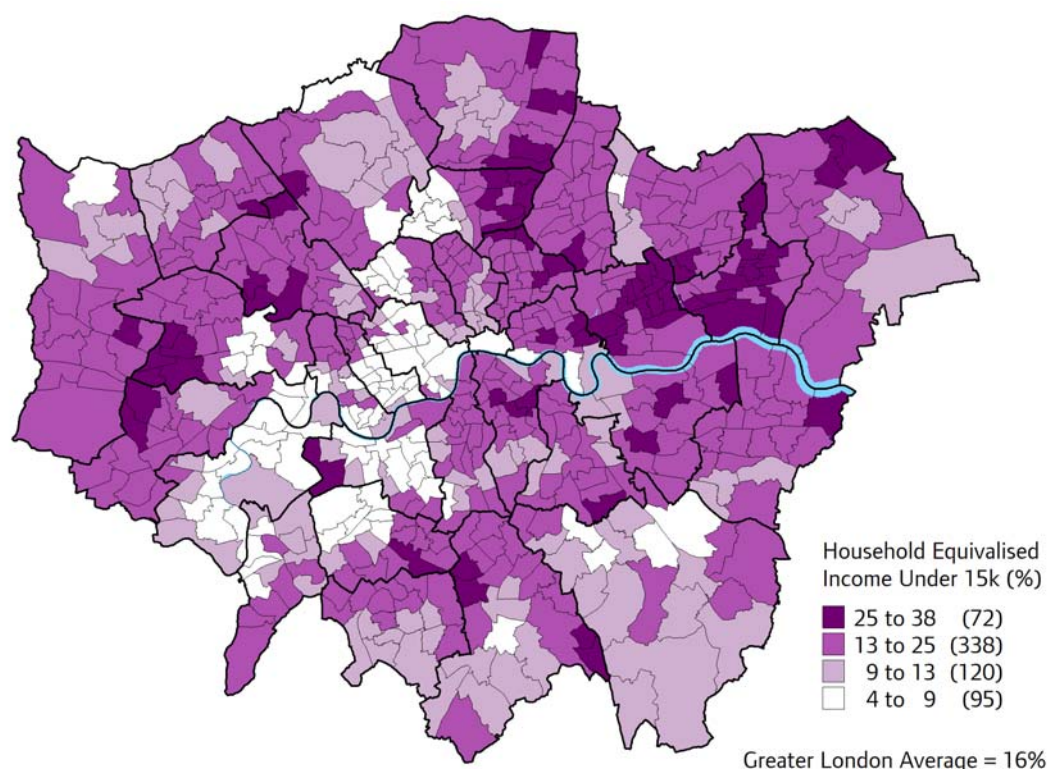- 9 to 13 (190)
- 3 to 9 (128)

Greater London Average = 13%

Map 10 Households with Median Income under £15k per year by London wards, <u>Equivalised</u>, 2008

Source: PayCheck 2008, CACI

Household Equivalised
Income Under 15k (%)

■ 25 to 38   (72)
■ 13 to 25 (338)
□ 9 to 13 (120)
□ 4 to 9   (95)

Greater London Average = 16%

There are wards where median household income actually increases once equivalised. These wards are situated mostly in Westminster, Kensington & Chelsea and a few in Camden. These boroughs have very low average household size.

Newham has five wards (Green Street West, Green Street East, East Ham North, Little Ilford and East Ham Central) that have over 30 per cent of households with an annual household income (equivalised) below £15,000 – the highest percentages of all wards. Three quarters of those households have an overall income below £30,000 per year.

Overview of methodology

Equivalised PayCheck is derived from the core PayCheck product. The methodology for core PayCheck is described in *DMAG Briefing 2005/29*.

Distributional assumptions

The basic distributional assumption of PayCheck is that log(Income+C) is normally distributed among households within each postcode. (More precisely, the actual distribution of household incomes in a postcode can be considered to be a sample from such a distribution.) The value of C (constant across all postcodes) is determined as part of the model calibration, as are the values of the mean and standard deviation of the normal distributions. These latter two values differ between different postcodes.

Equivalised PayCheck calculates a mean equivalisation score for a postcode and applies this to the aggregate distribution of incomes to provide an estimate of the distribution of equivalised incomes.

The basics of the model are that, if

log(income+C) is distributed $N(\mu_{pc}, \sigma_{pc})$,

and the calculated mean equivalence score for a postcode is q_{pc}, then

log(equivincome + C/ q_{pc}) is distributed $N(\mu_{pc} - \log(q_{pc}), \sigma_{pc})$

Calculation of equivalence scores

The mean equivalised score is based upon:

a) Estimates of the number of households with 1 adult, with 2 adults, and so on up to 7 adults in the postcode.
b) An estimate of the number of households containing a married couple.
c) Estimates of the number of children in the postcode, by age.

(a) and (b) are based upon CACI's Lifestyles UK propensity estimates, and (c) is based upon CACI's population updates and projections.

With these statistics, it is possible to calculate an aggregate equivalisation score for the postcode. The mean is derived by dividing this by the number of households in the postcode, and this mean is then assumed to act on the distribution of incomes as described above.

Within this calculation, an adjustment was made for those few postcodes where there is a high population compared to the number of households. It can be difficult to distinguish between those that have considerable communal population, and those that have large (adult) households, and a general pragmatic approach has been adopted of effectively limiting the size of the mean equivalence score that can be used.

Regular Briefings from the GLA Data Management and Analysis Group (DMAG)

Recent DMAG Briefings 2008:

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2008-03	GLA 2007 Round Ethnic Group Projections	Baljit Bains
2008-04	Council Tax Analysis	Elizabeth Williams
2008-05	A Profile of Londoners by Country of Birth	Lorna Spence
2008-06	Claimant Count Model 2008: Technical Note	Lorna Spence
2008-07	GLA 2007 Round Demographic Projections	John Hollis
2008-08	Greater London Authority Constituency Profiles	Elizabeth Williams & Caroline Hall
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