sector study 10

The spatial distribution of general needs housing associations and their stock

Key points

The majority of HAs operate in just one local authority district but a few operate in over 100 districts throughout England.

The average number of HAs operating in any one district is 19. Seven inner city districts have 50 or more, with the highest number (66) in Birmingham.

Large scale voluntary transfer (LSVT) HAs still dominate their primary districts, (holding an average of 73% of all HA units in the district) and some have acquired units in secondary, usually contiguous, districts.

Other than in LSVT districts, HAs provide on average 20% of social housing in a district.

In the North of the country there tend to be fewer HAs operating in each district, suggesting that here HAs still follow the traditional pattern of ownership within their original district plus some ownership in neighbouring districts.

In the south the pattern is much more diverse, with more HAs operating in each district even though most of the LSVT HAs are located in the southern half of the country.

Most black and minority ethnic (BME) HAs are still located in inner urban and metropolitan districts but they are beginning to be found in less traditional areas.

HA stock accounts for less than one percent of total housing stock in almost 80% of districts, but in a few LSVT districts it can make up as much as 20% of total housing stock.

Nearly three quarters of all districts still have a reasonable mix of HA and local authority social housing, with HA stock comprising between 10% and 63% of the social housing stock. Only 24 districts (7%) have less than 10% of social housing as HA stock.

There are some districts where the fragmented distribution of HA stock between many HAs could inhibit efficient local provision.

Introduction

The 1987 White Paper 'Housing: the Government's' proposals outlined the Conservative government's push towards privatisation in housing. This involved encouraging local authorities to transfer their housing stock to housing associations (HAs) via large scale transfer arrangements (LSVT).

The recent 2000 Green Paper 'Quality and choice: a decent home for all' emphasises housing choice. One of the aims of the expansion and development of HAs is to extend tenant choice, especially where local authorities (LAs) had previously been the monopoly providers of social housing.

These developments have resulted in a challenge to some of the long-standing arrangements within the HA and LA sectors. Clearly in districts where LSVT has taken place the traditional distribution of social housing has changed. Even in the non-LSVT districts the growth in the number and size of HAs has meant changes in the proportion of social housing provided by HAs, although here they still do not typically provide a large proportion of the general needs social housing. Historically each HA would have had its own local area and there was tacit agreement between HAs not to compete for subsidies. One of the aims of changing the way the subsidy system worked, brought about by the 1988

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Housing Act, was to try to break away from this. HAs should compete for land and grants, and this should also lead to the instigation of development partnerships.

This spatial analysis of HAs assesses the present geographical spread of general needs HAs and HA units by district in England.[1] Knowing the distribution and concentration of HAs can give a clearer picture of the relative amount of choice for tenants in different districts and how the historical arrangements have been affected. It also has implications for rent setting policies and possible development potential for individual HAs.

The distributions of two very different types of HA are also examined. LSVT HAs are amongst the largest providers in districts where local authorities have transferred their social housing. However, some LSVT HAs now own units in secondary districts (i.e. districts other than the primary one where the LSVT was first set up), so the presence of an 'LSVT' HA in a district no longer always indicates a majority provider of HA housing. At the other end of the scale, black and minority ethnic (BME) HAs are typically small and have a special role to play in tenant choice. They provide not only better access to housing for black and minority ethnic households but also aim to draw a significant proportion of their

management and committee members from black and minority ethnic communities.[2] However they are rarely found outside metropolitan areas.

Findings

Section A concentrates on the number, type and location of HAs while Section B presents an analysis at LA district level. This includes the distribution of HAs by Housing Corporation region and classifies the districts by ONS socio-economic family.[3] The relative concentrations of HAs are examined in Section C.

A. Analysis by HA

Summary

- Over 1,600 general needs HAs in the dataset operate in the 354 local authority districts in England.
- Most operate in a single district or within two or three neighbouring districts, while some have units in other districts within their region and a few large HAs have units in many districts across the country.
- More LSVT HAs have been set up in the south than in the north of the country.
- BME HAs are slowly spreading beyond their traditional locations.

1 This analysis is for self-contained general needs units only, excluding bedspaces and bedsits. These include sheltered units but exclude units defined as 'very sheltered with care'. The data originate from the valid returns from Part N of the RSR 2000. Guided by the materiality threshold of 5% recommended by the Housing Corporation, those HAs with less than 95% of general needs stock are excluded from the analysis.

2 The Housing Corporation definition of a BME HA is one that draws 80% of the governing body from BME communities, although in practice this is sometimes lower. Traditionally these BME HAs were located in those metropolitan and urban areas where there were concentrations of BME households.

3 For further information on ONS socio-economic families refer to the Technical Annexe of this report.

Table 1 HAs with units in more than 100 districts	HA name	No. of districts	(% of all districts)
	Housing 21	219	(62%)
	North British	210	(59%)
	Anchor Trust	190	(54%)
	English Churches	172	(49%)
	Hanover	148	(42%)
	Sanctuary	135	(38%)
	Guinness Trust	105	(30%)

Note: The data refer to general needs stock owned by individual HAs in each district and does not relate to group structures.

Table 2	Name	No. of general needs units	No. of districts	Regions of operation
Large HAs and their distribution throughout the country	North British	36,000	210	all
	Home	26,000	73	all but WM
	Sanctuary	23,000	135	all but NE
	Riverside	20,000	20	NW, EM
	Anchor	20,000	190	all
	London and Quadrant	18,000	60	L, SE, EE
	Guinness	18,000	105	all
	Peabody	16,000	25	London only
	William Sutton Trust	16,000	42	all
	Northern Counties	15,000	40	NW, Y&H, EM, WM
	Orbit	13,000	81	L, EE, SE, SW, EM, WM
	Wrekin (LSVT)	12,000	1	WM only
	Housing 21	12,000	219	all
	Broomleigh (LSVT)	12,000	4	London only
	Bradford and Northern	11,000	45	NE, NW, WM, Y&H, SE (3 districts)
	Hyde	11,000	47	L, SE
	Metropolitan	11,000	37	L, SE, EE, EM
	Focus	11,000	23	SE, SW, WM
	Samuel Lewis	11,000	45	L, SE
	Sovereign (LSVT)	10,000	50	SE, SW
	Notting Hill	10,000	11	London only

Note: The data refer to general needs stock owned by individual HAs in each district and does not relate to group structures.

The number of districts each HA operates in

There are 1,627 general needs HAs[4] in the dataset operating in the 354 local authority districts in England. Many of these (71%) have units in one district only, while even more (81%) have units in 3 districts or less. Thus the mode (most frequent value) for districts per HA is one while the mean (average) is 4.1. Where HAs operate in only two or three districts, these are usually contiguous or nearby, i.e. only separated by one district. The seven largest HAs have units in more than 100 districts. Amongst these, three HAs (Housing 21, North British and Anchor Trust) have units in over half of the districts in England (Table 1).

The number of general needs units held by each HA varies enormously, from the 36,000 held by North British to a handful held by the small Abbeyfield societies and almshouses. Of the largest HAs (those with over 10,000 units) some operate nationally,

some remain either in the south or north of the country and three operate solely in London (Table 2).

In general terms, the larger the HA, the more districts it operates in. However, as LSVT HAs have most of their units concentrated in their district of origin, the relationship between the LSVT HA's size and the number of districts in which it operates is much weaker.

This can be explained more concisely in statistical terms. The Pearson r correlation coefficient[5] shows there is a significant positive relationship (correlation) between HA size (based on the number of units) and the number of districts in which an HA operates. Results of the test suggest that for HAs overall the number of districts in which the HA operates can explain 48% of the variation in its size. For non-LSVT HAs the correlation is even stronger, with the percentage rising to 58%. However for LSVT HAs only, the correlation is much

4 This figure includes all HAs returning a valid RSR for 2000, excluding those with zero stock in Part N of the RSR and those with less than 95% general needs stock.

5 For further details of the Pearson r correlation coefficient refer to the Technical Annexe of this report.

weaker and the number of districts explains only 11% of the variation in size. This is because most LSVT HAs have far fewer units in any secondary districts.

Almost inevitably, LSVT HAs dominate a district in terms of numbers of units, often having as many as ten times more units than the next biggest HA in a district. There are a few exceptions to this, however. In Allerdale, Derwent is the LSVT HA (3,600 units), but Home is the biggest HA (3,800 units). Similarly in Walsall, Beechdale is the LSVT HA (1,400 units) but Caldmore Area and Accord both have more units (1,700 and 1,600 respectively).

Given the range in HA size and spread it is unsurprising to find there is also a great variation in the proportion of the total district HA stock held by individual HAs. This ranges from 0.003% (held by 3 HAs in Birmingham — Black Star (BME), Bethany Guild Trust and St.Vincents) to 95% (Chiltern Hundreds (LSVT), in Chiltern). Clearly the LSVT programme has had an affect on individual HA proportions of stock in some districts.

Large Scale Voluntary Transfer HAs

Just under a quarter of all local authority districts (23%) have now transferred their stock. The majority of these are in the south of the country (Table 3).

There are 87 LSVT HAs in the dataset.[6] While LSVT HAs are clearly associated with

large proportions of HA stock in a district, there are also two non-LSVT HAs with over 80% of HA units in a district. These are Home in Teesdale and Guinness Trust in the City of London.

The spread of LSVT HAs to other districts

Since their establishment some LSVT HAs have acquired units in other, usually neighbouring, 'secondary' districts. For example, Wycombe is not an LSVT district but it has three LSVT HAs operating within it (Bedfordshire Pilgrims, Beacon and Chiltern Hundreds). The majority of the districts where this has occurred have only one or two of these secondary LSVT HAs operating within them, but six have five secondary LSVT HAs and three districts (West Dorset, Bracknell Forest, and Vale of White Horse) have six. There are 137 districts with no LSVT HA units. Map 1 shows the districts where LSVT HAs operate.

When LSVT HAs acquire units in other secondary districts, they usually spread first to contiguous or nearby (i.e. only one district separating the two) districts. Typically these units account for only a small proportion of the total HA units in the district. In the majority of cases (66%), the number of units held by a secondary LSVT HA is less than half of the average HA size for the district, and in just over a third of cases (35%) it is less than a tenth of the average HA size. This is so even when they have spread to many districts. Nine LSVT

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6 There is a difference between the number of LSVT districts and LSVT HAs as some districts have merged since transfers took place, or the transfer was split between more than one new association. Also, some districts have partial transfers in some areas, e.g. in Manchester; these districts are not included.

Table 3	HC region	No. of districts in region	No. of LSVT districts in region	% of LSVT districts in region
The distribution of LSVT districts by HC investment region	South West	45	19	42
	South East	67	27	40
	West Midlands	34	11	32
	North West	34	7	21
	East of England	48	9	19
	Yorks & Humber	21	3	14
	East Midlands	40	3	8
	London	33	2	6
	North Eastern	23	1	4
	Merseyside	9	0	0
	England	354	82	23

Table 4 LSVT HAs holding less than 10% of the district total HA stock in more than 10 districts	LSVT HA	No. of secondary districts in which HA has units	No. of districts where < 10% total district HA stock held
	Suffolk Heritage	17	11
	Yorkshire Community	18	12
	Peddars Way	16	15
	Bedfordshire Pilgrims	21	18
	Chiltern Hundreds	42	18
	Wherry	20	18
	Magna	24	23
	Mid Sussex	35	29
	Sovereign	49	47

HAs hold less than 10% of a district's total HA stock in more than 10 districts (Table 4). Here the secondary districts are usually in the same, or contiguous, county as the primary district. Magna, however, has spread from Dorset as far as Oxfordshire and Berkshire while Mid Sussex has units in Oxfordshire. Sovereign, which originated in Berkshire, now has small numbers of units in many districts throughout the south western counties and also in one district in Staffordshire. Most of these LSVT HAs were originally set up between 1988 and 1993, and have thus had time to acquire units in other districts. Magna (1998) was originally West Dorset HA and Yorkshire Community (1999) was formed from Yorkshire Metropolitan HA and Ryedale HA.

Black and minority ethnic HAs

While LSVT HAs are amongst some of the largest HAs, BME HAs are at the other end of the size spectrum. There are 52 BME HAs in the dataset (3% of the total) operating in 82 districts, which means 77% of districts have no BME HAs. The maximum number operating in one district is nine in Haringay and Islington. Over half operate in either one or two districts. Asra Greater London, Presentation and Ujima are most widely spread, operating in 25, 20 and 18 districts respectively. Map 2 shows the distribution of BME HAs by local authority district. Sixty percent of these districts are in metropolitan areas.

LSVT and BME HAs have very different distributions across the ONS district categories. LSVT HAs are more likely to be found in ONS Rural Area, Urban Fringe, Coast & Services and Prosperous England

districts. BME HAs, on the other hand, are more likely to be found in Mining Manufacturing & Industry, Education Centres and Outer London and Inner London districts. There are no BME HAs in Rural Area districts but three Coast & Services districts (Bristol, Southampton and Ipswich) now have BME HAs. The BME HAs with units in these non-traditional districts are Presentation (Ipswich and Southampton), Lien Viet (Southampton), and United (Bristol). Presentation is London-based and the longest established BME HA. Lien Viet's parent company is Ujima, the second-largest black-led association in the country and also London-based. United on the other hand is a local association based in Bristol.

B. Analysis by district

Summary

- The average number of general needs HAs operating in a district is 19.
- Most districts have little HA stock as a proportion of all housing.
- The average proportion of social housing that is HA housing in a district is 37%. This proportion is higher in the more prosperous parts of the country.
- For non-LSVT districts only this average is 20%.

The number of HAs per district

The number of HAs operating in any one district ranges from three in the City of London and the Isles of Scilly to 66 in Birmingham. The average (mean) value is 19 HAs per district and the most frequent value (mode) is 17 per district.

Map 3 shows the distribution of HAs by district. There are more HAs per district in a band across the south east and south west of England, although this trend does not extend to the far south west. Seven districts have 50 or more HAs operating within them, all inner city districts. These are Camden, Southwark, Manchester, Islington, Liverpool, Lambeth and Birmingham. Clearly greater population densities in the inner cities could be one reason for the greater numbers here, and historically more HAs have been established in districts in the south. London was the historic centre of housing association activity, and now around a third of National Housing Federation members are based there.[7]

HA stock per district

A higher number of HAs in a district does not mean that the district has a greater number of HA units. Birmingham and Liverpool have the greatest numbers of HA units, both having just under 32,000 units each. Apart from the Isles of Scilly, with less than 50 units, all districts have more than 200 units. The 5 districts with the lowest number of HA units are the Isles of Scilly, Richmondshire, Berwick upon Tweed, the City of London and Rutland UA. Overall the mean value is just over 3,500 units per district and the mode is just under 2,000.

HA stock as a proportion of total housing stock in each district [8]

There are six districts with more than 20% of total housing stock in HA units; Newcastle-under-Lyme, Hackney, Boston, Tameside, Allerdale and Telford & Wrekin. All are LSVT districts. There are 276 (78%) districts with less than 1% of their total housing stock in HA units. The lowest proportions are found in Great Yarmouth, South Northamptonshire, Castle Point, Rochford and Richmondshire. The mean percentage of HA stock in English districts is 6% and the mode is 2.5%.

Analysis of the district proportion of HA units by ONS family[9] suggests that the Inner

London and Education Centres & Outer London districts tend to have the highest proportions while Rural Areas tend to have the lowest. However rural areas such as Boston, that are also LSVT districts, have a high percentage of HA units similar to LSVT districts in Inner London areas like Hackney and Mining, Manufacturing & Industry areas like Tameside.

HA stock as a proportion of total social housing stock in each district [10]

For all HAs the mean value for the proportion of social housing is 37% and the median is 22%. For non-LSVT districts the average is 20%.

There are 24 districts where the proportion of HA stock is under 10%, ranging from 9% in Thurrock to 4% in Barking and Dagenham. There are 70 districts where all social housing is now in the hands of HAs. In a further six the proportion is between 98% and 99% and LA stock is therefore negligible, making a total of 76 (21%) districts where all or nearly all social housing is provided by HAs. All of these are LSVT districts.

Districts can be divided into three categories according to their proportion of HA stock:

- Minimum HA districts, with less than 10% HA stock (24 districts)
- Mixed HA/LA districts, with between 10% and 63% HA stock (254 districts)
- HA only districts, with 98% to 100% HA stock (76 districts).

Map 4 shows the location of districts in each of these categories. These are then analysed to see how the distribution varies in the Housing Corporation regions and ONS district types.

Distribution by HC region

Minimum HA

A third of these districts are situated in the East Midlands, whereas there is only one

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7 *See Malpass (2000) 'Housing Associations and Housing Policy', Macmillan.*

8 *The denominator here is the district total housing stock (from Housing Investment Programme data, April 2000).*

9 *See Technical Annexe for more details of the ONS classifications.*

10 *Here the denominator is the sum of HA general needs units and LA housing stock (HIP data, April 2000).*

such district in each of London, the North West, South East and West Midlands and none in the South West.

Mixed HA/LA

These are more evenly distributed between the regions, with the highest percentage in the South East (16%) and the lowest in Merseyside (3%).

HA only

Most of these districts are found in the South East (16%) and South West (24%).

Distribution by ONS family

Minimum HA

Most of these districts are either Urban Fringe (38%) or Mining Manufacturing & Industry (33%) districts. There are no Minimum HA districts in either Education Centres & Outer London or Inner London districts and only four percent are in Prosperous England districts.

Mixed HA/LA

These are the only type to appear in Education Centres & Outer London and Inner London districts but these areas only account for 11% of the Mixed HA/LA districts in all. Most are found in Urban Fringe (26%), Prosperous England (20%) and Mining Manufacturing & Industry districts.

HA only

Here most (40%) are Prosperous England districts. Again none of these is found in Education Centres & Outer London and Inner London districts and only 4% are in Mining Manufacturing & Industry districts.

C. The concentration of HAs and their stock

Summary

- A large scale transfer within a district may often constrain choice for households in need of social housing
- There is a significant number of districts where the large numbers of HAs may inhibit the efficient provision of social housing.

Tenant choice can be evaluated simply by comparing each HA's proportion of the total district stock, but this does not permit national comparisons as there are different numbers of HAs and units in each district. An alternative is to use a concentration ratio (C_r).[11] This is the proportion of HA housing accounted for by the r largest HAs, where r is an arbitrary number. A more comprehensive measure, which takes account of the numbers and share of *all* HAs is the Herfindahl index (HI).[12] It gives a slightly different district ranking than the C_r (whose value can vary according to the value of r). However, as it is not as intuitive as the C_r, both are used in this analysis.

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11 For further details of a concentration ratio (C_r) refer to the Technical Annexe of this report.

12 For further details of the Herfindahl index (HI) refer to the Technical Annexe of this report.

Table 5 **The 10 districts with the highest HA concentrations**	District	Dominant HA	**% of HA units owned by dominant HA**	LSVT?	C_3	**No. of HAs in district**	**HNI for district**
	Chiltern	Chiltern Hundreds	95%	Y	0.98	11	0.8958
	Newcastle-under-Lyme	Newcastle-under-Lyme	94%	Y	0.98	7	0.8807
	Ryedale	Yorkshire Community	93%	Y	0.97	9	0.8721
	Hambleton	Broadacres	92%	Y	0.96	14	0.8549
	Congleton	Dane	91%	Y	0.97	11	0.8374
	Boston	Boston Mayflower	91%	Y	0.97	9	0.8346
	East Cambridgeshire	Hereward	91%	Y	0.95	11	0.8340
	Surrey Heath	Surrey Heath	91%	Y	0.96	10	0.8268
	West Lindsey	West Links	90%	Y	0.94	8	0.8051
	Tonbridge & Malling	Tonbrige & Malling	90%	Y	0.95	15	0.8046

Table 6

Characteristics of districts with low H indices

District	No. of secondary LSVT HAs	No. of HAs in district	C_3	H index
Waverley	3	25	0.47	0.1049
Medway	2	27	0.48	0.1042
Wandsworth	0	48	0.43	0.1030
Brighton and Hove	1	34	0.46	0.1026
Reigate and Banstead	0	19	0.45	0.1026
Bournemouth	5	24	0.48	0.1024
Redditch	2	19	0.45	0.1017
Lambeth	0	64	0.45	0.1017
Reading	2	28	0.47	0.1013
Stevenage	1	18	0.42	0.1007
Mole Valley	0	20	0.42	0.0991
Milton Keynes	1	34	0.45	0.0990
Leeds	1	38	0.42	0.0979
Hounslow	2	44	0.47	0.0973
Kingston upon Thames	0	29	0.41	0.0900
Sutton	0	27	0.42	0.0871
Birmingham	0	66	0.40	0.0846
Hackney	0	45	0.39	0.0833
Croydon	1	43	0.40	0.0807
Southwark	0	51	0.34	0.0742
Barnet	0	49	0.28	0.0552

Ranking each HA's proportion of total HA stock in each district shows that for most districts there are two or three HAs that dominate. Thus a 3-HA concentration ratio (C_3) is calculated by summing the three largest proportions in each district. Birmingham, with a C_3 of 40% (0.4) and 66 HAs has fewest units concentrated in its three largest HAs, potentially giving tenants plenty of choice. On the other hand, there are only 3 HAs operating in the City of London and the Isles of Scilly, so all units are concentrated into these giving a C_3 of 100% (0.1) and consequently very little choice for tenants.

The three districts with the highest HI values are Chiltern, Newcastle-under-Lyme and Ryedale. These districts are dominated by large LSVT HAs and have few other HAs operating within them (Table 5). The table is ranked by the HI value and shows how the rankings differ between the HI and the C_3 ratio.

In contrast, those districts with low HI values have many HAs operating within them and although there may be LSVT HAs present, they are in secondary districts (Table 6). In economic terms, firms with an HI this low would be at risk in the presence of so many competitors. This suggests that housing provision by HAs in these districts may be too fragmented for optimum efficiency. In the case of Waverley, for example, there are 25 different HAs operating in the district and nearly half of the units are concentrated into just three of these. Prompted by an HI value as low as 0.1, a closer look at the district data reveals that there are eight HAs operating in the district with fewer than 10 general needs units each.

Conclusion

The HA sector has a long and varied history and the impact of large scale transfers together with the overall increase in the sector since 1988 has affected the traditional arrangements of HAs. In nearly a quarter of the districts in England local authorities have now relinquished social housing to the HA sector and in many of the remaining districts HAs have increased

their share of social housing provision. One of the consequences is that there are now two distinct groups of large HAs, the traditional HAs that have large numbers with a regional or national distribution and the LSVT HAs with large numbers in one location. At the other end of the size scale the small BME HAs are now beginning to locate beyond their traditional neighbourhoods.

The increasing spread of HAs outside their district and region of origin can also be problematic in terms of development. The presence of the HA's head office in a district may mean it is more able to attract 'local' money even though the majority of its stock may be located elsewhere in the country. Conversely, they may also find it difficult to attract funds for development in another part of the country. This is likely to be more of a problem now that many local authorities have preferred development partners. Where a district has many HAs, this may also lead to the locally available funds being thinly allocated between them.

This analysis looks at the provision of general needs units from two perspectives. The results suggest it is time to review the local provision of general needs housing. The national analysis of HA size and distribution enables them to be ranked on both of these attributes. This could be an increasingly important consideration with the present rent restructuring regime.

The district analysis throws a different light on HA distribution that may not be so apparent to individual HAs. It can give a

picture of both tenant choice and the potential efficiency of social housing provision in a locality. So while an individual HA may want to expand into another locality, one has to ask if it really makes sense, either in terms of tenant choice or efficiency, for yet another player to be operating in that particular area? Careful analysis of the pattern of local provision could be useful in informing any potential partnerships between existing and incoming HAs. The aim then would be to find a suitable balance between having enough HAs in a locality to provide an acceptable level of tenant choice while trying to avoid the fragmented and potentially uneconomic provision that can occur when too many HAs appear to crowd into one district.

Additional information

This report was researched and written for the Housing Corporation by Dataspring. Further information on Dataspring can be obtained from Cambridge Centre for Housing and Planning Research, Department of Land Economy, Cambridge University, 19 Silver Street, Cambridge CB3 9EP. Tel. 01223 337124/337119, e-mail Landecon-dataspring@lists.cam.ac.uk. Or visit the Dataspring website at www.landecon.cam.ac.uk/dataspring.

Further information on the Sector Studies series can be obtained from Siobhan McHugh, Sector Analyst, Regulation Division, on 020 7394 2024 or e-mail siobhan.mchugh@housingcorp.gsx.gov.uk.

1. The ONS classification of districts

This is a classification of local and health authority areas that was produced to give a straightforward indication of the socio-economic similarity and difference between areas. Originally published in 1996, it uses a cluster analysis technique on a set of variables drawn from the 1991 Census. This groups districts according to similarity. The initial clusters are then arranged into larger groups and again into fewer, larger families. Each Cluster, Family and Group is then given a short distinctive title.

An update was published in 1999, still using 1991 data and the same methodology but taking into account the boundary changes that have taken place since then. The revision resulted in a different hierarchical structure, with different numbers of Families, Groups and Clusters, so there is little direct comparison with the earlier results. Where appropriate, the same names were used for the new classes with the new nomenclature reflecting any changes.

The 1999 Families referred to in this analysis are 1: Rural Areas, 2: Urban Fringe, 3: Coast & Services, 4: Prosperous England, 5: Mining, Manufacturing & Industry, 6: Education Centres & Outer London, 7: Inner London.

Further details of the methodology can be found in Bailey, S. et al. (1999) *The ONS classification of local and health authorities of Great Britain: revised for authorities in 1999* London: ONS.

2. Pearson *r* Correlation Coefficient

The Pearson *r* Correlation Coefficient (r) expresses quantitatively the magnitude and direction of the relationship between two variables, in this case the size of HA (in units) and the number of districts in which it operates. The correlation coefficient varies from +1 to −1. A correlation of 1 (either positive or negative) indicates a perfect correlation while 0 indicates there is no relationship between the variables. Squaring r gives the coefficient of determination (r^2) which is the proportion of the variability of Y (RSL size in units) accounted for by X (the number of districts in which the HA operates). Adjusted r^2 attempts to correct r^2 to reflect more closely the 'fit' of the model from which the statistic is obtained in the whole population, rather than in the sample from which r^2 is calculated. The amount of variation in Y that is explained by X is expressed more simply by converting r^2 into a percentage (multiplying r^2 by 100). (Table 7.)

3. Concentration ratios and the Herfindahl Index

The simplest way to measure concentration is by comparing the proportions of each HA's units in each district. However, this does not permit national comparisons, as there are different numbers of HAs and HA units in each district. A summary representation of concentration can be given by using a concentration index. The simplest of these is the reciprocal of the number of HAs, but this assumes that HAs are of equal size.

An alternative approach is to use a concentration ratio (C_r). This is defined as the proportion of HA housing accounted for by the *r* largest HAs, where *r* is an arbitrary

Table 7 Correlation coefficients for HA size and number of districts where operating	Type of HA	Correlation coefficient (*r*)	Coefficient of determination (*r²*)	Adjusted *r²*	% variation in Y explained by X
	All	0.695	0.483	0.483	48%
	Non-LSVT only	0.764	0.584	0.584	58%
	LSVT only	0.352	0.124	0.114	11%

number. However, concentration ratios can be criticised for the arbitrary selection of *r*, and the measure will give different rankings for different values of *r*.

A more comprehensive measure, the Herfindahl Index (HI), takes into account the number and share of all the HAs in a district. The HI is a commonly accepted measure of market concentration. It is calculated by squaring the market share (proportion) of each organisation competing in the market area and then summing the resulting numbers (for this analysis, market share and the HI are expressed as decimal). For example, if only 4 HAs have stock in a district, with shares of 30, 30, 20 and 20 each, this would give an HI of 0.26, calculated as $0.3^2 + 0.3^2 + 0.2^2 + 0.2^2$. The index varies between zero (indicating a large number of equally sized HAs in a district) and one (where there is just one HA). The HI increases as both the number of HAs in the district decreases and the disparity in size between the HAs increases, thus giving rise to a slightly different district ranking to the concentration ratio. A market where the HI is between 0.1 and 0.18 is moderately concentrated and a value in excess of 0.18 is considered to be concentrated.