

Housing standards:
evidence and research

Dwelling size survey

A report prepared by Scott Wilson for
CABE in April 2010.



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1 Introduction

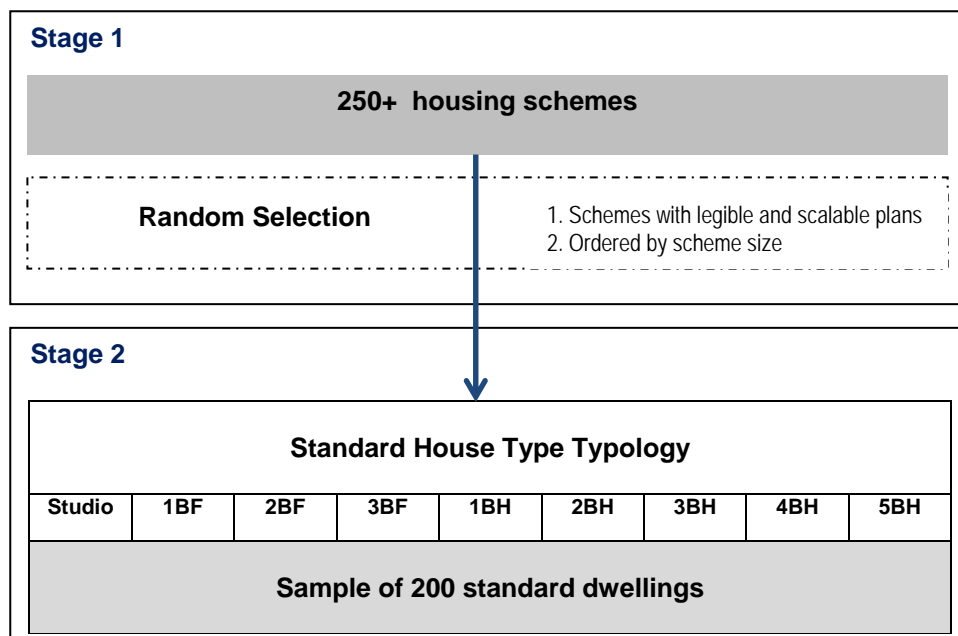
- 1.1.1 Scott Wilson was appointed by CUBE to carry out analysis on the provision and type of space being proposed in a range of standard or typical house and flat typologies in England.
- 1.1.2 This technical report explains the research methodology and presents a summary of the findings. It is CUBE's intention to further analyse the data from which this technical paper is derived and to publish updated versions of this technical report as new information is available.
- 1.1.3 It is noted that HACT Limited has published *Room to Swing a Cat? The Amount and Use of Space in New Dwellings in London & the South East*, March 2010. This research was conducted as part of a programme of research undertaken by the UK Space Standards Group, drawing on dwelling size information obtained in 2008. The HACT report compliments this technical paper and can be accessed via a link from the CUBE website.

2 Research Methodology

2.1.1 There were two stages to the project.

2.1.2 **Stage 1:** The first stage was to sift and select schemes and then identify standard dwelling typologies from a selection of housing schemes provided by CABE. This consisted of over 250 housing schemes submitted to CABE in 2009 and for which detailed information was available.

2.1.3 **Stage 2:** The second stage was the sampling and measurement of 200 different standard dwelling types.



2.1.4 Nine standard dwelling type typologies were identified:

- Studio Flat
- 1Bed Flat
- 2 Bed Flat
- 3 Bed Flat
- 1 Bed House
- 2 Bed House
- 3 Bed House
- 4 Bed House
- 5 Bed House

2.1.5 The target was 22 samples within each typology, although it was acknowledged that this may be difficult at the extremes, particularly, 1 and 5-bed houses. Where there was a shortfall, the sample size was increased in other typologies.

2.2 Criteria used for scheme selection

2.2.1 The database provided by CABE consisted of over 250 schemes. An initial sift of the database eliminated schemes without to-scale drawings, or plans that could not be transferred for measurement in CAD format.

2.2.2 The remaining schemes were then sorted by the overall number of units in the scheme: under 20, 21-40, 61-80, and over 100. The schemes within these size bands were then listed in a random order.

2.2.3 The first scheme from each size band was then analysed. This involved sorting the individual units into their respective typology category. Units were assessed to determine whether they represented 'typical' or 'standard' types. If deemed a standard dwelling type then the unit was selected for the sample.

2.2.4 This step was repeated until all the first schemes in each band of each group had been examined, before moving onto the second scheme in the band, and so on. This process was repeated until 22 sample units were found for each typology. By moving through the size bands in this way, it was possible to ensure that the sample typologies were drawn from a range of scheme sizes. As mentioned above, where there was a shortfall of a particular typologies, the sample size was increased in other typologies

2.2.5 The assessment of what constitutes a 'standard' or 'typical' typology was based on our expertise and knowledge of housing design, and primarily discarded units with irregular or bespoke design features.

2.3 Measurement Definitions, Method & Validation

2.3.1 Internal areas were calculated by manually measuring the floor plans of the property in CAD. The following areas were measured:

- Gross Internal Area (GIA);
- Net Internal Area (NIA);
- Habitable areas
- Storage Space;
- Utility Space;
- Kitchen Area;
- 'Notional Corridor' areas

2.3.2 Note that the summary information provided in this Technical Paper is based on figures and floor space areas which are subject to a plus/minus 5% margin of error due to the inaccuracies of using imported PDFs or JPEGs in CAD.

2.3.3 Internal areas were calculated by manually measuring the floor plans of the property in CAD. A 10% repeat sample was also undertaken for quality control purposes, which confirmed all the original calculations and measurements.

2.3.4 Definitions¹

2.3.5 The GIA and the NIA were measured in accordance with the definitions set out in the Royal Institute of Chartered Surveyors (RICS) 'Code of Measuring Practice' 6th Ed. (2007).

2.3.6 **Gross Internal Area** is the internal area of the dwelling measured to the internal face of the perimeter walls.

2.3.7 **Net Internal Area** is the GIA, but excluding circulation areas, bathrooms, toilets, and internal structural walls.

- NB1: Internal non-structural walls were included in the NIA, but partitions between spaces that were excluded were not counted.
- NB2: Areas of reduced head height (under sloping ceilings) were included but one third of this area was assumed to be too low to be fully useable, and so was counted as storage space.

2.3.8 **Storage:** The space inside wardrobes, storage cupboards, under-stairs cupboards and 1/3 of the floor area under a sloping ceiling. If there was more than one linen/ airing cupboard in the dwelling, one was classified as Utility and other(s) as Storage (as detailed below).

2.3.9 **Utility:** The space inside utility rooms, airing cupboards, isolated washing machines spaces, boilers, cylinders or any combination. Linen/airing cupboards were included in the Utility category unless there was more than one, in which case one was classified as Utility and other(s) as Storage

2.3.10 The area of under-stairs cupboards was taken to be the measured width of the cupboard and depth of 1 metres, which was the assumed area that would actually be usable by residents.

2.3.11 **Kitchen:** The space inside the kitchen was measured from wall to wall. However, in cases where the exact size of the kitchen area was not clearly demarcated (most commonly in open plan flats) the area was calculated as the length of the kitchen units/spaces left for white goods multiplied by 1.6 metres (600mm for the depth of the kitchen units plus 1m clear working space in front of the kitchen units, as expected by the National Housing Federation's Guide to Standards and Quality in Development (2008).

¹ Definitions are taken from HACT *Room to Swing a Cat? The Amount and Use of Space in New Dwellings in London & the South East*, (2010) www.hatc.co.uk/room_to_swing_a_cat.pdf with simplified wording for clarification.

- 2.3.12 **Notional Corridors:** Areas in ‘primary’ rooms of units that must be kept clear for circulation and are therefore unusable by residents. Such areas cannot be used for furniture; storage etc and so are effectively corridors. For example, furniture could not be placed in front of the door leading from the living space to the kitchen, making this area a notional corridor.
- 2.3.13 ‘Primary’ areas are those that are used by all occupants frequently (for examples the kitchen or living areas).
- 2.3.14 The areas were calculated as the length of the notional corridor and an assumed width of 750mm as per guidance in the National Housing Federation’s Guide to Standards and Quality in Development (2008).
- 2.3.15 A cautious view was taken of Notional corridors. In a number of cases the notional corridor could have been assessed as significantly longer than was actually measured. This shorter length approach was used in the analysis, even though it under-states the space that has to be used for circulation within rooms.
- 2.3.16 **Habitable Area:** (HA) is the same statistic as developed by HTAC in their research. It draws from the frequently used term “habitable room” but reflects that fact that some of the dwellings in this sample were open-plan and so had “areas” rather than “rooms”. Furthermore, there is no generally agreed definition of the term “habitable room”. Although often used in planning applications, there is no definition of this term in planning law².
- 2.3.17 For the purpose of this research, therefore, Habitable Area is the Net Internal Area less Kitchen, Utility, Storage, and Notional Circulation areas. Habitable Area is therefore a measurement of the space that can be used by the furniture and activities in living areas, dining areas and bedrooms.
- 2.3.18 **Design Occupancy Level:** The intended number of people per dwelling. This is reflected in the number of bed spaces in each dwelling. For plans without illustrative furniture layouts, a benchmark of 8 square meters was used. Those at or below this figure were assumed to be for single occupancy while bedrooms above 8m were counted as double occupancy.

² The 2010 Building Regulations use different definitions for “habitable room” in different parts:

- A room used, or intended to be used, for dwelling house purposes (including for the purposes of Part B, a kitchen but not a bathroom). (Part B);
- A room used for dwelling purposes but which is not solely a kitchen, utility room, bathroom, cellar or sanitary accommodation. (Part F);
- A room used, or intended to be used, for dwelling purposes including a kitchen but not a bathroom or utility room. (Part M)

3 Results

3.1 Description of sample set

3.1.1 Data and measurements for each sample were captured within a spreadsheet.

3.1.2 The final number of samples measured by typology is shown in Table 3.1 below.

Number of samples by housing type								
Studio	1BF	2BF	3BF	1BH	2BH	3BH	4BH	5BH
4	30	29	11	8	31	32	30	25

Table 3.1 Typology Count

3.1.3 There were a limited number of Standard typologies for Studio, 3-bed flats and 1-bed houses. The shortfall in these categories were made up by a larger sample of more prominent typologies – 1& 2 bed flats, and 2, 3 & 4 & 5 bed houses.

3.1.4 Within the 200 samples, only two were found to be of such a similar design to be considered a repeat of the same Standard house type. They were therefore both counted as one sample and two new samples were taken and measured.

3.1.5 Table 3.2 shows the median measured areas for all 200 samples. The median value has been used to mitigate the effects of outliers (very small or very large dwellings) found in some typologies. All values are in sq m unless otherwise stated.

Typology	GIA	NIA	Habitable	% of NIA relative to GIA	% of Habitable relative to NIA	Storage	Utility	Kitchen	Notional Corridor*
All Tenures									
Studio	31.94	25.05	19.44	77.93	77.38	0.43	0.46	3.81	1.84
1BF	46.32	36.54	26.27	78.30	73.60	0.69	0.49	6.06	1.49
2BF	59.11	46.58	35.61	77.55	77.60	0.70	0.53	6.45	1.69
3BF	89.62	71.12	57.53	79.53	79.79	0.92	0.36	8.27	1.70
1BH	69.06	36.01	23.74	58.24	73.25	1.21	0.50	5.27	2.31
2BH	69.16	50.86	36.96	72.84	75.95	1.15	0.60	6.85	3.20
3BH	92.05	67.55	51.23	72.10	77.98	1.70	0.83	7.84	2.54
4BH	116.96	81.71	67.07	69.45	81.55	1.59	0.95	8.69	1.79
5BH	158.65	111.66	90.78	69.54	82.37	4.12	3.54	10.25	1.88

Table 3.2 Median areas for all samples, % of NIA and Habitable areas

Values are in sq m unless otherwise stated as %

* figures represent samples with notional corridors, those samples without have not been included in the calculation of this statistic

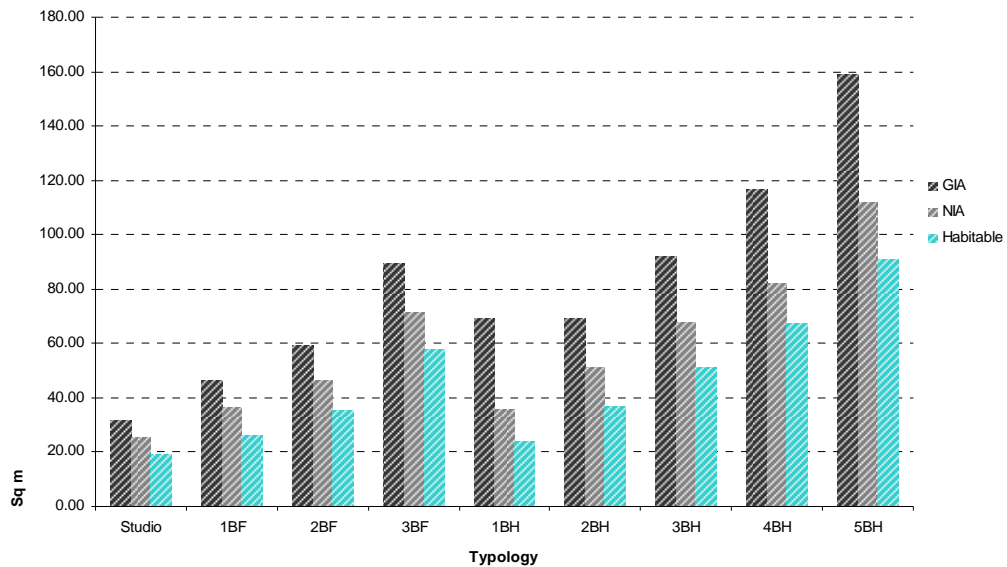


Figure 3.1 Median GIA, NIA & Habitable areas for all samples

3.1.6 Observations on the sample set

3.1.7 Only a handful of standard studio and 1-bed houses were identified in the database. Due to the limited number of samples the final statistics for these typologies may not be a true reflection of the market.

3.1.8 The % of NIA relative to GIA is low for 1-bed houses in comparison to other typologies because nearly all of these were coach house style dwellings – units with garages, storage and circulation space on the ground floor and the main living areas on the first floor.

3.1.9 General Observations

- 1-bed flats and 1-bed houses share similar areas for NIA and habitable area but the houses have substantially larger GIA. This is partly due to the fact that most the 1-bed houses are coach houses, meaning they have a ground floor area for parking / circulation / storage which has been captured in GIA but not NIA.
- 2-bed flats and 2-bed houses share similar areas for NIA and habitable area but the houses have larger GIAs.
- Despite having larger GIAs, 3-bed houses have smaller NIAs and habitable areas than 3-bed flats.

3.2 Frequency of distribution

- 3.2.1 The tables above present the median value for the dwellings. Other reports³ tend to refer to the mean value, and an analysis of the data by mean values, as well as by occupancy levels is to follow in the updated versions of this report.
- 3.2.2 However it is important to look at the frequency distribution of dwelling sizes found for each typology type. This (alongside the median and means) provides a more illuminating picture of the spread of dwelling sizes found. This analysis is useful in assessing the frequency and proportion of particularly small or large houses and flats (outliers to the median).
- 3.2.3 An understanding of the proportion of these outliers should inform consideration of the impact of any proposals for minimum space standards on the standard dwelling types described in this research.
- 3.2.4 Figure 3.2 shows the GIA range for all samples by typology. Table 3.3 compares the mean and median areas for each typology. Figure 3.3 focuses on the five typologies with the greatest sample to highlight the variance for each.

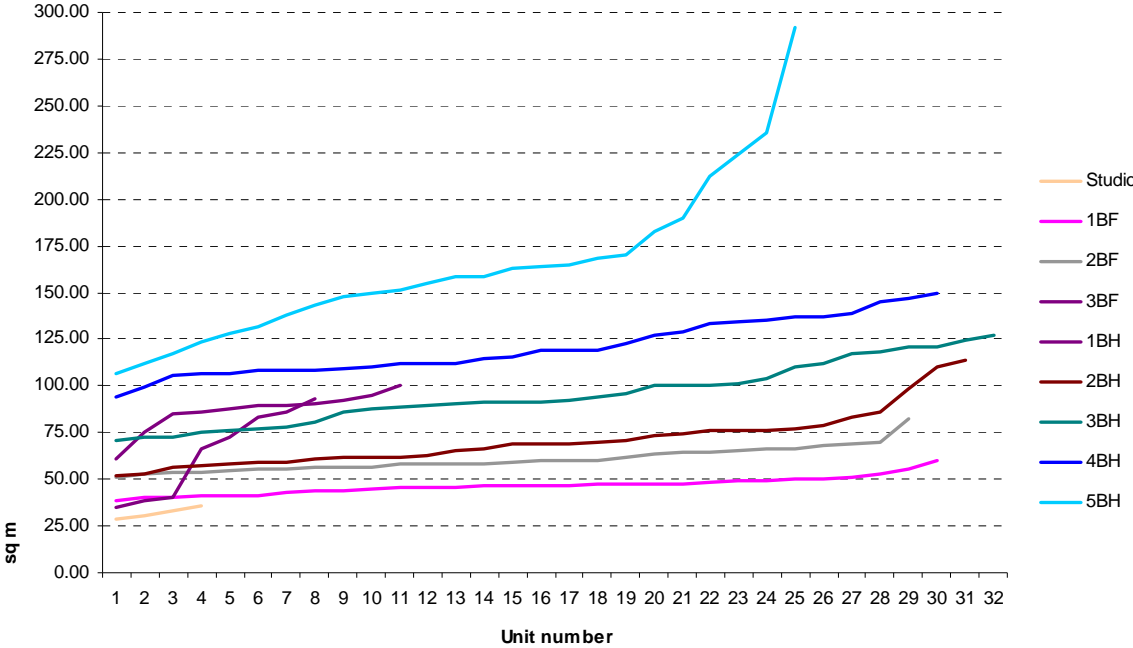


Fig 3.2 GIA in sq m range per typology

³ HACT *Room to Swing a Cat? The Amount and Use of Space in New Dwellings in London & the South East*, (2010) [/www.hatc.co.uk/room_to_swing_a_cat.pdf](http://www.hatc.co.uk/room_to_swing_a_cat.pdf)

<i>Typology</i>	<i>Mean</i>	<i>Median</i>
Studio	32.1	31.9
1 Bedroom flat	46.6	46.3
2 Bedroom flat	60.7	59.1
3 Bedroom flat	86.5	89.6
1 Bedroom house	64.3	69.1
2 Bedroom house	71.2	69.2
3 Bedroom house	95.6	92.1
4 bedroom house	120.6	117.0
5 bedroom house	163.5	158.7

Table 3.3 Mean and median areas for each typology

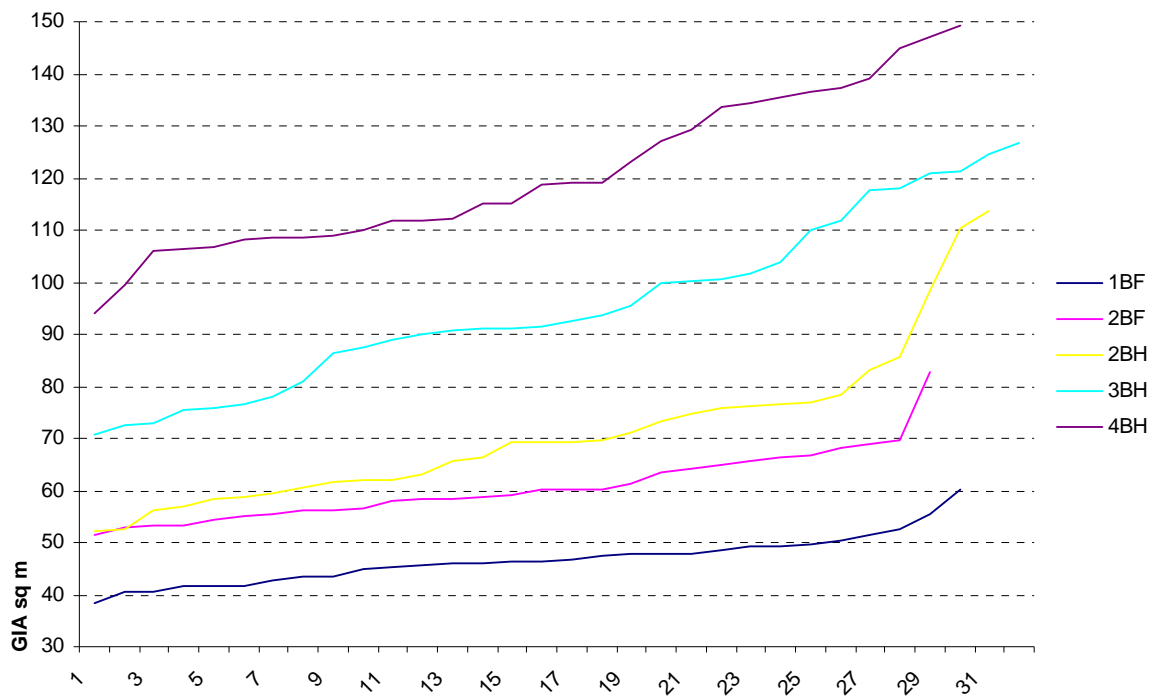


Figure 3.3 GIA range for five largest ranges

Analysis of data by tenure

3.2.5 To analyse differences between private and affordable dwellings the samples were sorted by tenure using the following four classifications:

- Private
- Affordable
- Private/Affordable (units which were identified as being either)
- Unknown (where information was not available)

3.2.6 To simplify the process the classifications were put into three groups:

- All Tenures (Private, Affordable, Private / Affordable, Unknown)
- Private (Private)
- Affordable (Affordable, Private / Affordable)

Table 3.4 shows the breakdown of measurement of areas by tenure

Typology	GIA			NIA			Habitable			% of NIA relative to GIA			% of Habitable relative to NIA		
	All	Pri	Aff	All	Pri	Aff	All	Pri	Aff	All	Pri	Aff	All	Pri	Aff
Studio	31.94	33.28	28.39	25.05	27.07	21.31	19.44	20.92	13.38	77.93	81.41	75.06	77.38	77.38	62.79
1BF	46.32	45.96	47.89	36.54	36.60	37.68	26.27	28.68	26.26	78.30	77.61	79.14	73.60	75.10	72.73
2BF	59.11	59.20	59.66	46.58	46.72	47.73	35.61	35.55	36.36	77.55	77.74	77.57	77.60	79.11	77.90
3BF*	89.62	88.69	0.00	71.12	69.09	0.00	57.53	55.25	0.00	79.53	79.26	0.00	79.79	79.46	0.00
1BH*	69.06	64.06	0.00	36.01	31.48	0.00	23.74	18.84	0.00	58.24	54.74	0.00	73.25	62.59	0.00
2BH	69.16	69.06	69.13	50.86	49.16	50.60	36.96	33.98	37.26	72.84	71.27	75.28	75.95	76.15	74.04
3BH	92.05	100.98	86.81	67.55	70.56	64.78	51.23	54.55	47.96	72.10	71.00	74.04	77.98	77.84	79.50
4BH	116.96	113.58	119.98	81.71	78.99	88.93	67.07	65.57	75.12	69.45	70.35	74.17	81.55	81.49	84.27
5BH	158.65	161.37	169.04	111.66	117.64	120.96	90.78	93.31	94.10	69.54	67.19	70.38	82.37	82.50	81.68

Typology	Storage			Utility			Kitchen			Notional Corridor*		
	All	Pri	Aff	All	Pri	Aff	All	Pri	Aff	All	Pri	Aff
Studio	0.43	0.75	0.86	0.46	0.22	0.48	3.81	3.06	4.39	1.84	1.68	1.96
1BF	0.69	0.81	1.15	0.49	0.98	0.87	6.06	5.91	6.34	1.49	1.60	1.82
2BF	0.70	0.57	0.74	0.53	0.69	0.96	6.45	6.15	6.49	1.69	1.76	1.69
3BF*	0.92	3.17	0.00	0.36	1.31	0.00	8.27	8.31	0.00	1.70	1.75	0.00
1BH*	1.21	3.14	0.00	0.50	1.82	0.00	5.27	5.35	0.00	2.31	4.55	0.00
2BH	1.15	2.02	1.89	0.60	0.43	0.99	6.85	6.85	7.46	3.20	3.13	2.86
3BH	1.70	2.05	1.68	0.83	3.26	0.82	7.84	7.94	8.10	2.54	3.62	2.33
4BH	1.59	1.42	2.38	0.95	3.57	1.25	8.69	8.69	8.60	1.79	3.29	1.15
5BH	4.12	3.88	3.67	3.54	3.87	4.45	10.25	9.65	11.44	1.88	2.39	2.29

Table 3.4 Median areas for all samples by tenure

Values are in sq m unless otherwise stated as %

*No affordable units were identified for 3BF & 1BH typologies – values are therefore counted as 0.

GIA and NIA

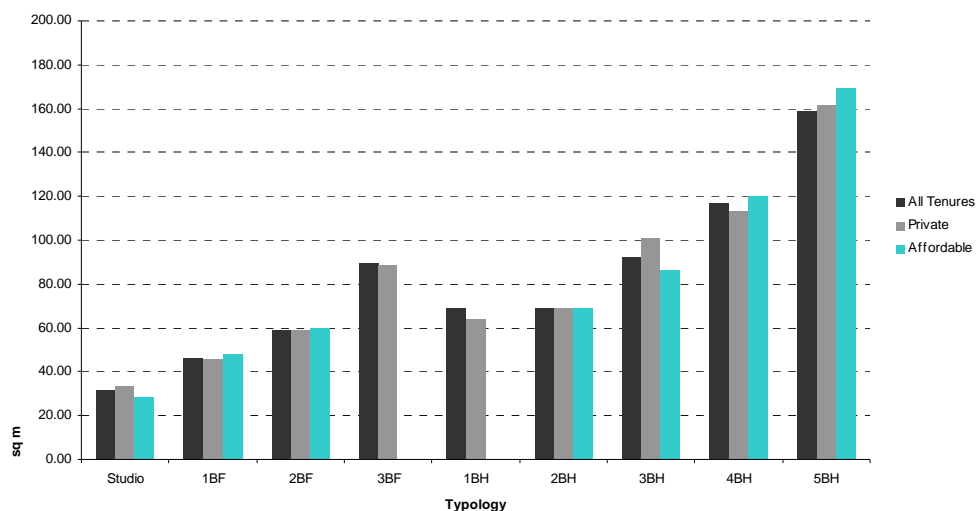


Figure 3.4 Gross Internal Area, by tenure

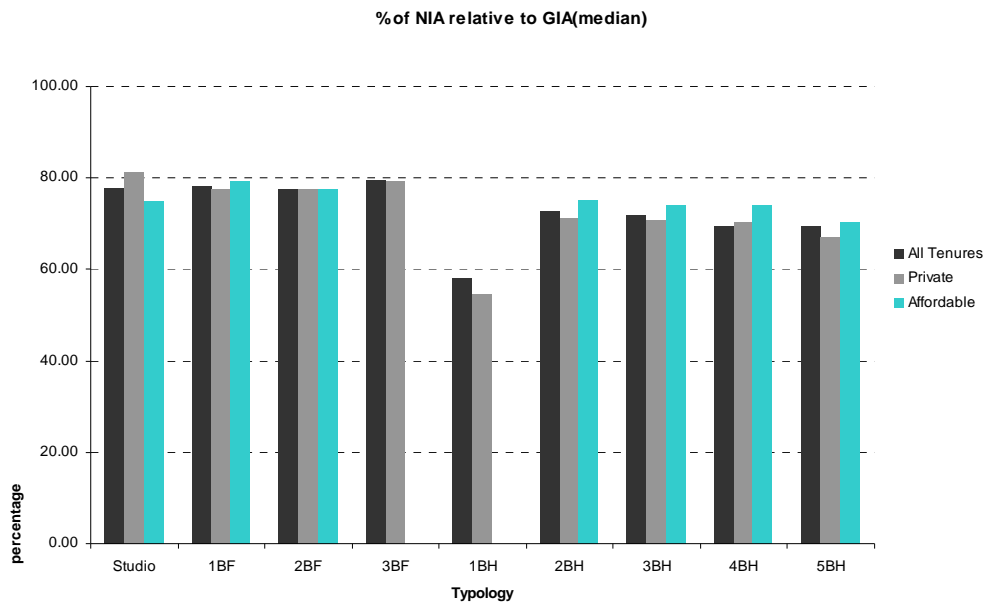


Figure 3.5 Percentage of NIA relative to GIA by tenure

3.2.7 General GIA and NIA Observations:

- There is evidence indicating affordable house types having a higher percentage of NIA relative to GIA than private houses.
- GIA & NIA increases as dwelling type by bedroom count increases. However, comparing percentage of NIA relative to GIA between flats and houses there is a marginal difference. The NIA in flats form a higher percentage of GIA than in houses.
- % of NIA relative to GIA for 1-bed houses was low in comparison to other typologies. This was because most of this typology comprised of coach house style dwellings – garages, storage and circulation space on the ground floor and the main living areas on the first floor.

Habitable area

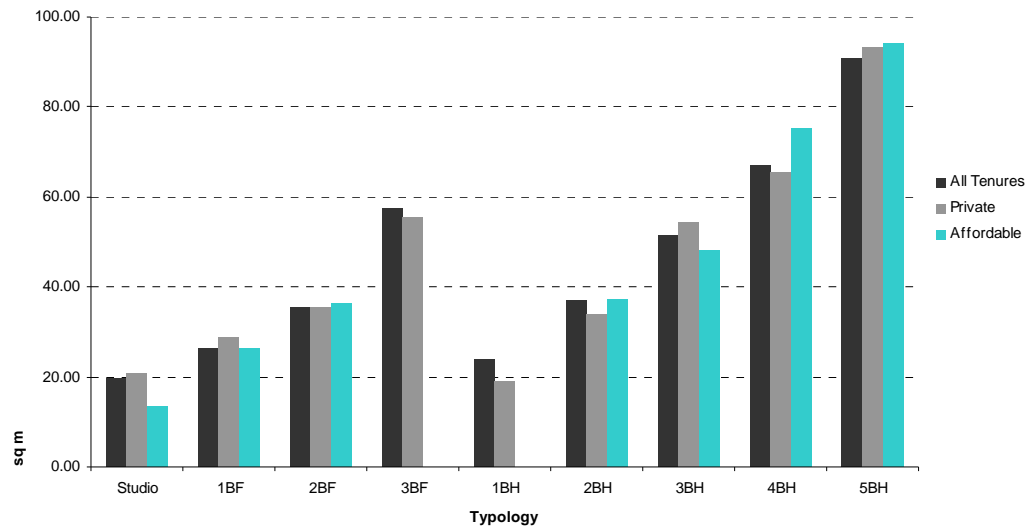


Figure 3.6 Habitable area in sq m by tenure

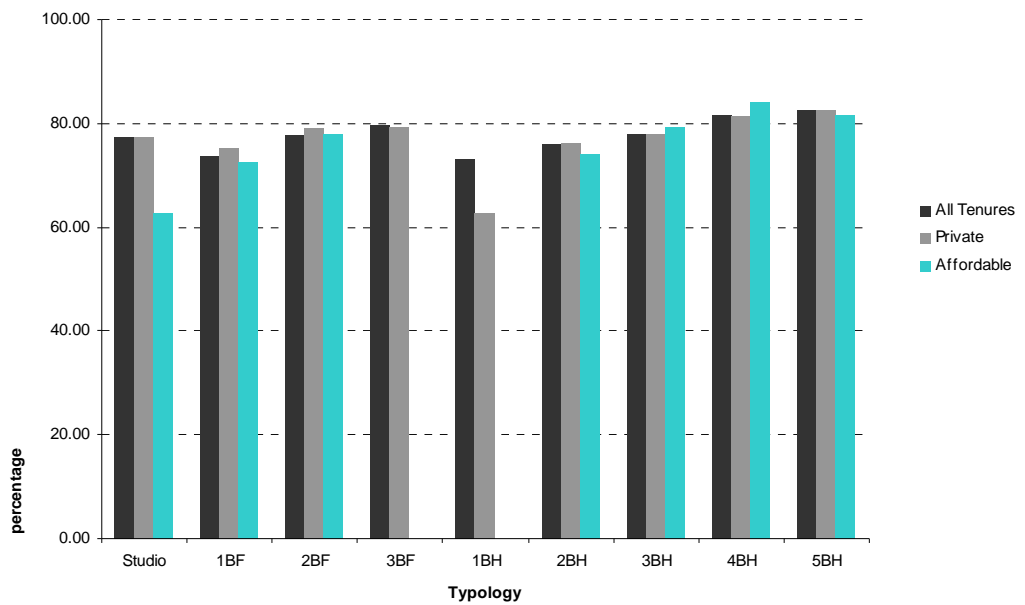


Figure 3.7 Habitable area as % of NIA in sq m by tenure

3.2.8 General Habitable area observations

- Habitable area increases as dwelling type by bedroom count increases.
- However, habitable area as a percentage of NIA is marginally higher in houses than in flats.

3.2.9 Observations on the sample set

3.2.10 There was insufficient information to identify the tenure for all 200 samples; this left more than a quarter of the samples classified as “unknown”. If the tenure of these samples were available this may have had an impact on the final statistics particularly when analysing differences between private and affordable units, there inclusion would have given a more conclusive evidence based result.