Department for Levelling Up, Housing & Communities

English Housing Survey Methodology Paper

2019 Surveyor Quality Study

ENGLISH HOUSING SURVEY

Contents

Introduction and main findings

1. The English Housing Survey (EHS) is a national survey of people's housing circumstances and the condition and energy efficiency of housing in England. It consists of two main elements: an interview survey with an annual sample of approximately 13,300 households and a follow up physical survey of the dwelling of 6,000 of the participating households together with an inspection of around 200 vacant dwelling. The physical surveys are carried out by professional chartered surveyors, architects or environmental health officers.

2. Surveying dwellings is not an exact science and there will be variability in surveyors' assessments when faced with the same situation. There may be no "correct" answer in some cases, but a variety of legitimate judgements and approaches to dealing with problems. While such variability is accepted, the methodology of the EHS controls it in several ways, including:

    - Selecting a relatively large field force (approximately 150 professional surveyors) with varied qualifications and technical backgrounds to undertake the surveys each year;
    - Ensuring that each surveyor does not carry out a disproportionate number of surveys in any one region to avoid individual surveyors unduly influencing the data for that region;
    - Designing a data collection methodology which ensures that surveyors inspect a dwelling and record data in a standardised way;
    - Providing training, briefing manuals and supervision to ensure that surveyors' judgements are as consistent as possible in their survey completion;
    - Designing validation routines for surveyors to review potential errors and implausible results and to correct these, where appropriate;
    - Requiring surveyors to submit their completed surveys through a regional manager, who further validates the survey form by clarifying any outstanding issues through an iterative process with the surveyor and cross-checking submissions, with photos and in some cases third party information before 'accepting' the survey for inclusion in the survey dataset; and
    - Undertaking downstream validation and acceptance testing before the final dataset is confirmed for modelling, analysis and reporting purposes.

3. To further assess the level of variability, the EHS and its predecessor, the English House Condition Survey, have carried out three surveyor variability studies (SVS), in 2003, 2009 and 2013. Those were blind call back exercises in which around 300 dwellings were re-surveyed by a different surveyor and a selected number of responses from the initial and call back surveys were compared using a range of measures. There are limitations to the call back approach, namely:

    - While it can provide data to assess the extent to which the responses collected during the initial and call back visits match each other, it cannot provide information to judge whether the responses collected during the two visits were correct with respect to the dwelling surveyed.

- In cases where no "correct" answer exists, the call back approach does quantify the proportion of surveyors recording responses that falls outside the acceptable range of answers.

4. While the call back approach does assess the impact of variability on standard errors, previous surveyor variability studies on the EHS have found that the effect of variability on standard errors is generally small and unlikely to change much

5. Given these limitations, in 2019, the EHS contractors instead carried out a surveyor quality audit which focussed on comparing surveyors' responses to an ideal or 'model' answer. This report presents the findings of this study, referred to as the Surveyor Quality Study.

Main findings

- The great majority of English Housing Survey surveyors delivered good quality surveys.
- The survey methodology works and can be applied consistently, when due care is taken.
- There is no evidence that the EHS results are being compromised by any of the surveyor quality issues identified in this study.
- While some surveyors are exceptionally good at applying the EHS methodology, others require further help and guidance in applying the EHS methodology.
- The simpler and better condition the survey dwelling, the more likely it is that surveyors would agree with the model answers of the 2019 Surveyor Quality Study, and each other. Conversely, the more complex the survey dwelling the more likely it is that there will be variability.
- Even surveys of dwellings with an apparently simple form such as a house which has not been converted or extended can generate unforeseen errors. This is often because the surveyor has pre-judged the condition of the dwelling or has carried out the survey in a rush.
- Real errors, missing responses, inconsistencies and implausible responses are already dealt with through extensive validation checks, close supervision and acceptance testing. Nevertheless, the 2019 Surveyor Quality Study has highlighted areas where these can be improved.
- A spread of judgements will always be present where no 'right' answer exists. This spread of judgements can be seen in the findings of the 2019 study as it is throughout the main EHS. As in previous studies the spread follows an expected pattern and should not be of major concern. However, clearly some surveyors are

not always following the official guidance, such as with the HHSRS[1] and recording of repairs.

- Minor errors and misjudgements can be compounded in the most important derived variables. For example, an assumption that the kitchen and bathroom amenities are original, when they are not, can result in a perfectly good home being classified as non-decent. More training is required on the importance of such decisions to the integrity of the survey. Another example is the collection of the data required to calculate the SAP (Standard Assessment Procedure) rating used to assess the energy and environmental performance of dwellings. This is because the current data collection instruments cannot indicate the SAP outputs the input variables would produce so surveyors cannot judge whether they have supplied incorrect or implausible data or not.
- Carrying out background research on the dwelling beforehand and clarifying key judgements with households and owners are approaches conducive to collecting high quality data.
- Establishing a survey plan at dwelling level and staying with it is of utmost importance. While the methodology is designed to encourage the surveyor to carry out the components of the survey in a recommended order (make contact, survey interior, then exterior, etc.) it is essential when surveying dwellings with complex dwelling forms (for example, conversions, blocks of flats etc.) that the surveyor knows exactly what type of dwelling it is and how it relates to the building, block and wider environment before beginning the survey. The most difficult validation problems to resolve at the acceptance testing stage are the result of surveyors changing their mind about what they are inspecting part way into a survey. Different approaches to surveying are acceptable so long as they are consistent.

Acknowledgements and further queries

6. This report was produced by Simon Nicol, Molly Mackay and Matthew Custard at BRE in collaboration with NatCen Social Research, CADS Housing Surveys and MHCLG.

7. If you have any queries about this report, would like any further information or have suggestions for analyses you would like to see included in future EHS reports, please contact ehs@communities.gov.uk.

[1] The housing health and safety rating system (HHSRS) is a risk-based evaluation tool used to identify potential risks and hazards to health and safety from any deficiencies identified in dwellings.

Chapter 1

Design of the 2019 Surveyor Quality Study

1.1 The 2019 Surveyor Quality Study (SQS) was designed by the EHS contractors NatCen Social Research, Building Research Establishment (BRE) and CA Design Services (CADS). It was a fieldwork-based surveyor quality audit delivered during the 2019 surveyor refresher training. On the first day of their refresher training, the surveyors each visited and completed a full EHS physical survey on two test dwellings.

1.2 To ensure that all surveyors were exposed to issues of particular interest to the EHS, four dwellings were selected which enabled surveyors to make an assessment of the following:

Table 1: Aspects of dwelling conditions assessed in the Surveyor Quality Study

Stock profile	age, type, size and location of dwellings in England, including details on construction type and the materials used for key building components like roofs and windows
Amenities and services	the services and amenities present in dwellings, including kitchens, bathrooms, WCs, the accessibility of housing for people with mobility problems, security and smoke alarms
External environment	the size and type of plot and garden, the type of road and parking provision, and any significant problems in the local environment
Stock condition	the incidence, cost and nature of disrepair within the stock, and how these have changed over time. It also covers other aspects of dwelling condition: dampness, ventilation, electrical wiring and HHSRS (Housing Health and Safety Rating System) Category 1 hazards, highlighting which types of dwellings and households are most likely to have problems with these aspects
Energy performance	energy performance of the housing stock in terms of the energy efficiency and carbon dioxide emissions associated with its heating, lighting and ventilation characteristics

1.3 A study of surveyor quality would ultimately be of greater value in terms of driving improvements in data quality if it was able to look at surveyor variance and to be able to compare responses to an ideal or ‘model’ answer. To produce the ideal, or ‘model’, answer for each dwelling, technical staff from BRE and CADS surveyed each of the test dwellings in detail.

1.4 The surveyor field-force of about 150 usually attend the briefing in groups of around 25 at a time. Each group was split into four smaller groups of about 6 surveyors. Each of the small groups visited two of the four test dwellings to conduct a full survey, replicating as far as possible a standard visit. After carrying out their surveys, the surveyors returned to the venue of the briefing to download and validate their survey data online as they normally would. The surveyors also provided qualitative insights on their experience by completing an online questionnaire.

1.5 To provide the surveyors with some immediate feedback, members from BRE and CADS examined the validated input data and provided face-to-face feedback on the issues identified whilst the surveyors were still at the briefing

1.6 In total, the surveyors carried out about 300 physical surveys, 75 on each test dwelling. BRE then ran the data through the EHS derived variables models to produce a selection of derived variables matched to the aspects of dwelling condition of particular interest listed in Table 1. It was important for the study to create the complex derived outputs for analysis because that gave a fairer and more holistic reflection of the judgements made by the surveyors. This is because, very often, a number of combinations of different input data items can be used to record a particular dwelling condition.

1.7 BRE then analysed the data and derived variables to explore their variance in terms of the spread of their values and their divergence from the model answers.

1.8 Appendix B contains more details on the design of the study, including the selection of the test dwellings, the allocation of them to surveyors and the development of the model answers used to benchmark the surveys carried out by the surveyors.

Chapter 2

Data analysis and findings

2.1 The EHS physical survey form contains around 3,000 data items or variables and it would be neither practicable nor desirable to look at the variability of every one of those for all four test dwellings. The analysis therefore focused on the areas of greatest importance and greatest variability, including:

- descriptive factual information (which everyone should record the same as the model answer);
- general judgements and measurements (which should be close to the model answer);
- derived variables (which compile several, and sometimes hundreds of, variables into indicators, which should form a normal distribution); and
- additional case-specific judgements which the BRE/CADS team found to be of interest and was expecting to find variation between surveyors.

2.2 Appendix C lists the variables used to assess variability in each of the areas above.

2.3 In addition to the analysis of individual variables, an index was developed – the Surveyor Score Index or SSI – to score surveyors according to how their answers matched the model answers. This has been achieved by:

- Selecting 20 variables (from the list in Appendix C), for each of the four test dwellings, where the surveyor would be expected to be within acceptable agreement of the model answer and which covered the range of variables from the simplest (dwelling type) to the most complex (SAP score). For the most part the analysis on the four cases used the same variables, but these were varied for the two flats to include some flat/module-specific questions. The variables coloured purple in the list in Appendix C were included in the score for all four cases. The variables coloured blue were included for just the two houses and those coloured green were included for just the two flats. The list does not include any of the complex repair and environmental quality variables because surveyors could legitimately use strategies which differed from the model answers with these. The SSI allowed some deviation from the correct model answer in some cases. This was to reflect the fact that in some instances it would be unfair to deem that the surveyor was completely wrong. For instance, the actual construction may only have been out by a year or two but this may have been enough to move it into a different age band.
- Running an analysis on the four test cases to rank the surveyors according to how often their answers matched the model answers.

- Producing mean and median results with standard deviations for each of the four cases to see which dwellings had the best and worst agreement with the model answers.

2.4 It should be noted that the four test dwellings are by no means representative of the entire English housing stock. Nor does the study focus on the most complex or controversial variables. The purpose of the SQS was not to assess surveyors' performance but to gauge how the surveyors were applying the EHS guidance in the field, the sort of mistakes they were making, and how their judgements compared with those of their peers and managers.

2.5 While this exercise has made every effort to replicate 'real' fieldwork conditions, they cannot be regarded as truly typical for several reasons.

- The surveyors had to complete work on each test dwelling by a fixed time while, in a real life situation, surveyors work at their own pace.
- Surveyors may have been distracted while working among other surveyors, when they would normally work alone.
- They may have been expecting to find problems in the test houses, which was not always the case.
- All the test dwellings were vacant so the surveyors could not clarify some key judgements (such as tenure, age of refurbishment/s, presence of insulation, etc.) with the resident which they would normally be able to do in surveys of occupied dwellings.

2.6 The study does not assess quality of the final EHS physical survey dataset because a 'real' EHS physical survey goes through three additional layers of acceptance testing after the surveyor has completed the initial data validation, which were not undertaken for this study[2].

- First, the surveyors' Regional Managers (RM) check every form that is submitted. Observations and queries are fed back to the surveyors and discussions are held over judgements which require clarification. Only when the RM is happy with the form is it submitted via the EHS website.
- Second, BRE conduct further validation checks and acceptance testing before a full dataset is produced.
- Third, further errors and inconsistencies come to light during complex data-modelling and these are corrected by BRE before the final dataset is approved.

2.7 The remainder of this chapter presents the results for each of the test dwellings in turn.

[2] The additional stages are complex and time consuming. They were not carried out on the SQS because including them would introduce pressure to the downstream data production process of the EHS which in turn would put pressure on reporting schedules.

Dwelling 1

2.8 This dwelling was selected largely for its simplicity, as a typical survey of a small, relatively modern terraced house that had very little wrong with it. Nevertheless, surveyors needed to describe and measure all of the elements correctly and not overlook the few faults present.

Front view

Rear view

2.9 In summary, it was expected that the surveyors would agree on most key measures at this dwelling and for the most part this was the case. All surveyors agreed, for example, that they were looking at a mid-terraced house, with gas as the primary heating fuel, and with loft insulation present. The great majority agreed that this was a Decent Home, with modern amenities, no serious disrepair and no Category 1 HHSRS hazards. Where agreement was not complete, this would have been partly because the surveyors did not carry out the test surveys in ‘real’ fieldwork conditions.

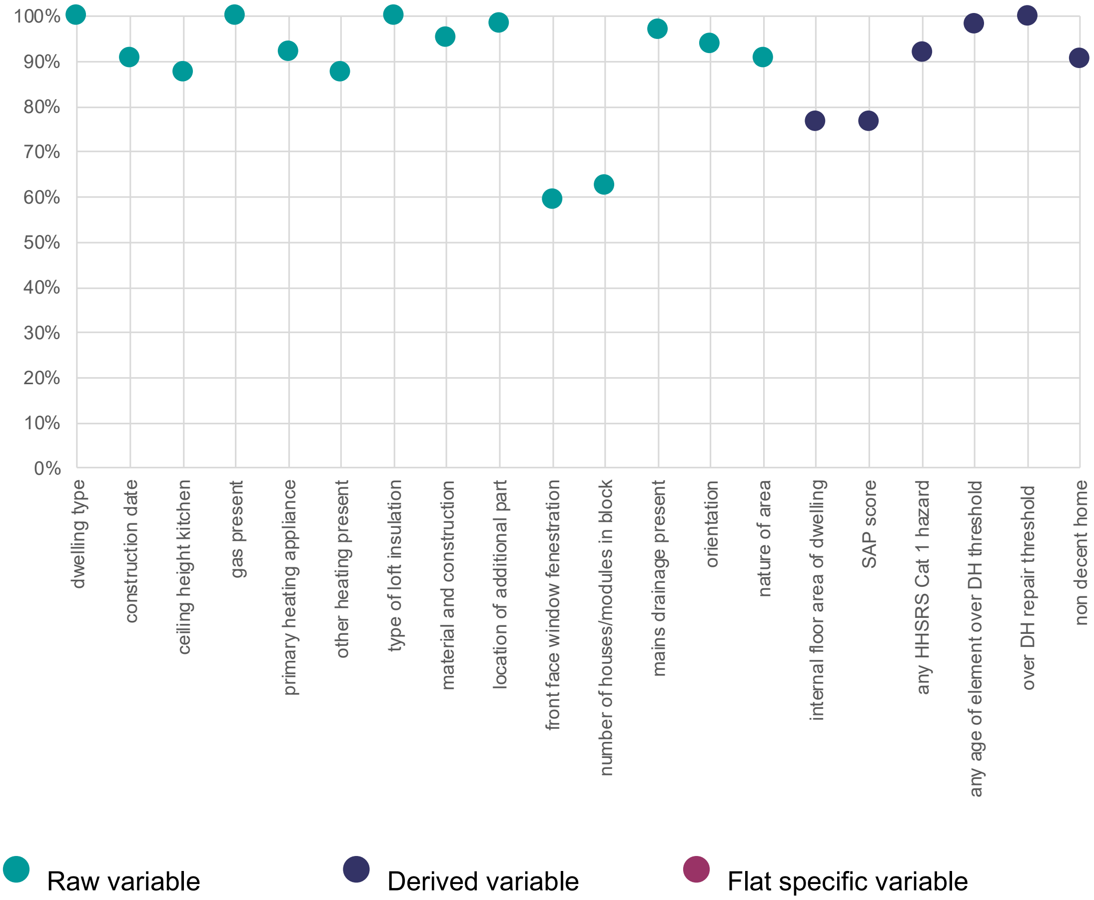
2.10 Looking at the surveyor score index (SSI) of the 20 indicative variables for Dwelling 1 together, the agreement with the model answers averages 18 (median), with 14% of surveyors recording data that are in total agreement with the model answers, Table 2.1. The mean score was 17.89 with a standard deviation of 1.45.

Table 2.1 Dwelling 1 surveyor score index

	surveyor count	*percentages*
14	1	1.6
15	3	4.7
16	6	9.4
17	15	23.4
18	15	23.4
19	15	23.4
20	9	14.1
total	**64**	**100.0**

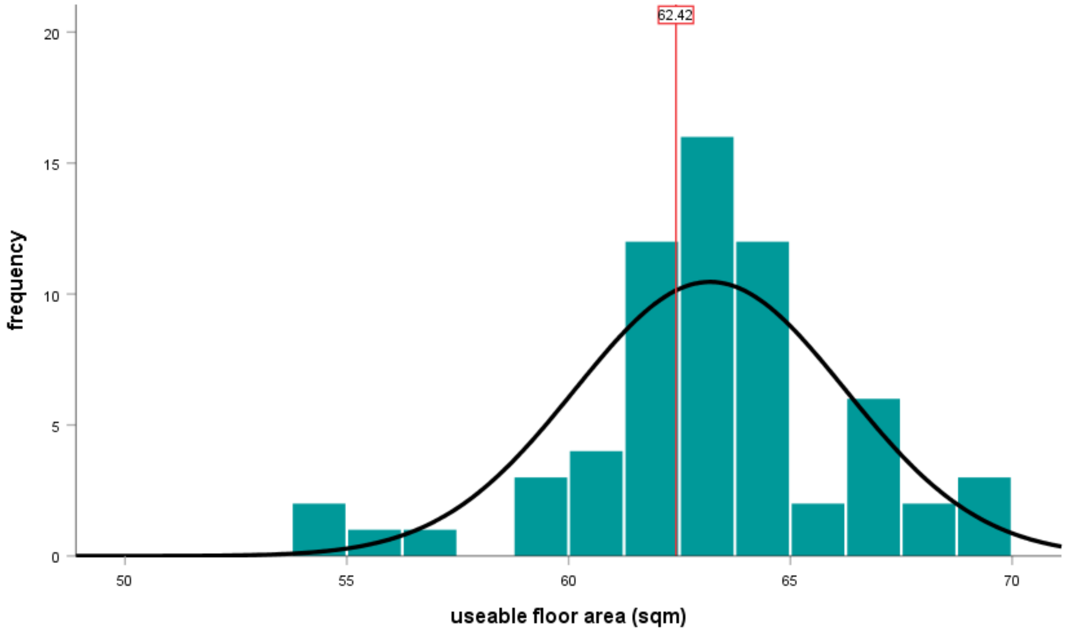
2.11 The surveyor score index are presented graphically, allowing surveyor performance for each variable to be observed and the different types of variables to be differentiated, Figure 2.1. It shows that performance for Dwelling 1 was generally good although identification of fenestration areas and the identification of the block were less good. Fenestration is the proportion of a face that is made up of windows and doors and is therefore important for correctly establishing wall and window areas which is important for disrepair and energy calculations.

Figure 2.1 Dwelling 1 surveyor score index



2.12 For variables where we would expect a spread of results around a mean, rather than total agreement with the model answer, these generally approximated to a normal distribution, as in the case of floor area. For Dwelling 1, 97% of cases were within +/-5% of the model answer, Figure 2.2.

Figure 2.2 Dwelling 1 floor area

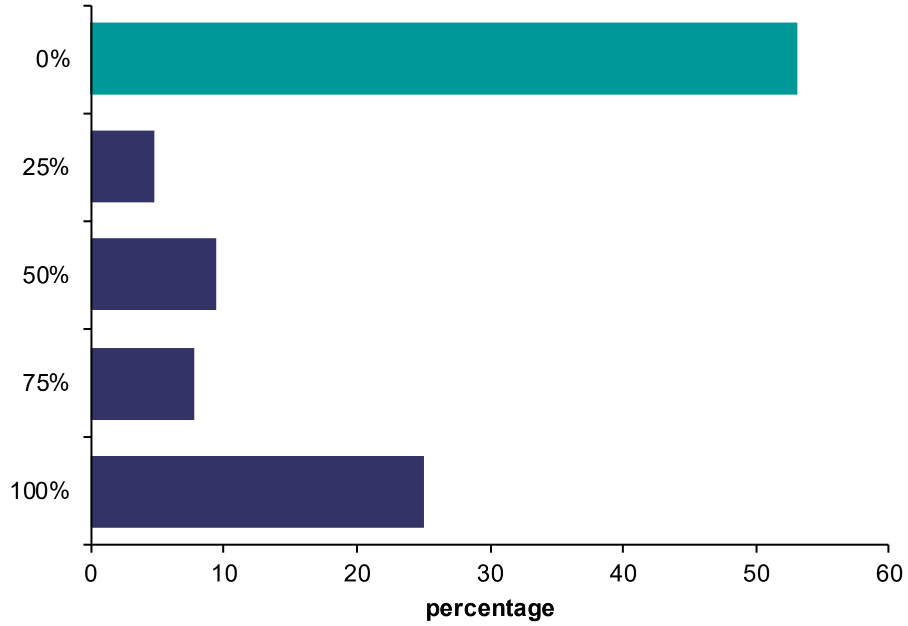


Note: Red line = surveyor's answer consistent with model answer.

2.13 Areas of disagreement with the model answer were typically around judgements over the severity of problems. This was to be expected. It is important to learn from the areas where there was disagreement because they can be used to improve briefing to surveyors.

2.14 In the case of Dwelling 1, Nearly half of surveyors assumed that this house had some cavity wall insulation, when there was no evidence for this. This has led to their SAP rating and EPC band being too high/good, Figure 2.3.

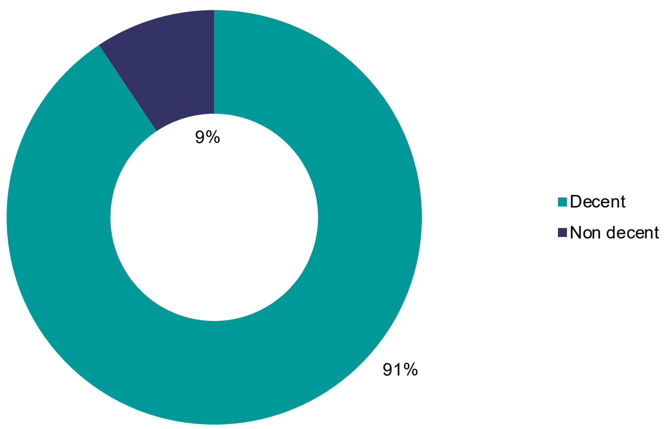
Figure 2.3 Cavity wall insulation extent



Note: Teal colour = surveyor's answer consistent with model answer.

2.15 Dwelling 1 had some minor issues with 'falls on the level', mainly around the access threshold (see picture below). This is a common problem, but two surveyors scored it as a Category 1 hazard, which in our opinion was too harsh. This had the knock-on effect of making the house 'non-decent', which we would not expect to see, Figure 2.4.

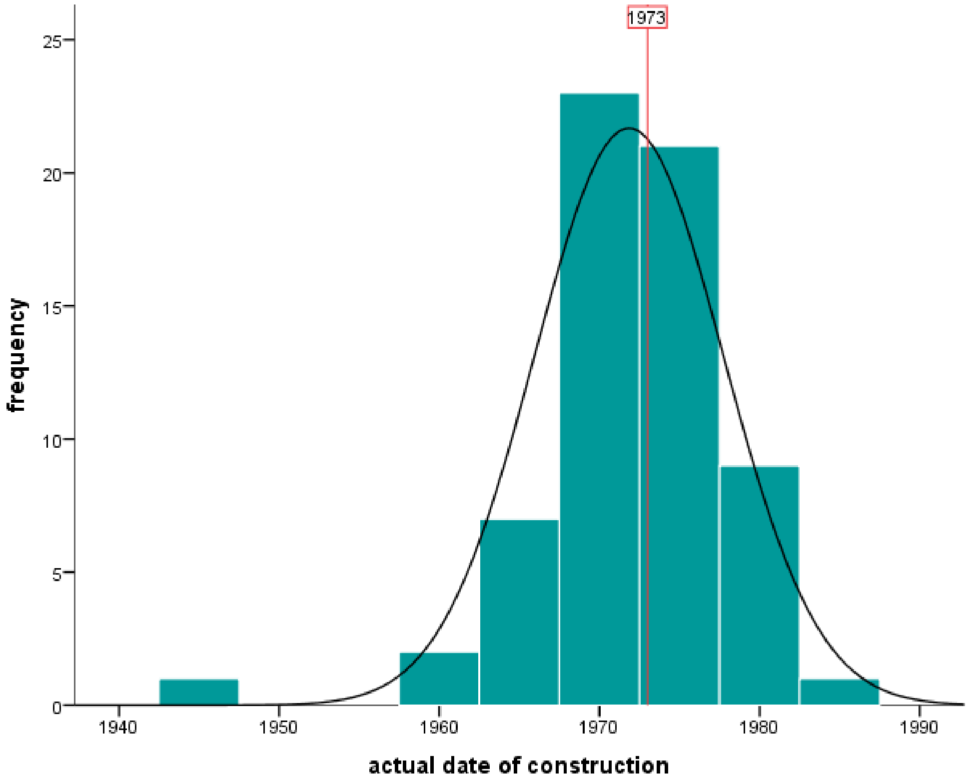
Figure 2.4: Dwelling 1 Decent Homes Standard



Note: Teal colour = surveyor's answer consistent with model answer

2.16 Surveyors were not always thinking through when the dwelling was built and at what time different elements, amenities and services had been renewed. Assessing the age of a dwelling or its elements is a very important judgement, which impacts on the Decent Homes Standard and is a key determinant of the assumptions made in RdSAP[3]. Dwelling 1 was constructed in 1973. RdSAP has an age band boundary at 1975. Dwellings built after this date are assumed to have better energy performance characteristics, Figure 2.5.

Figure 2.5: Dwelling 1 actual construction date

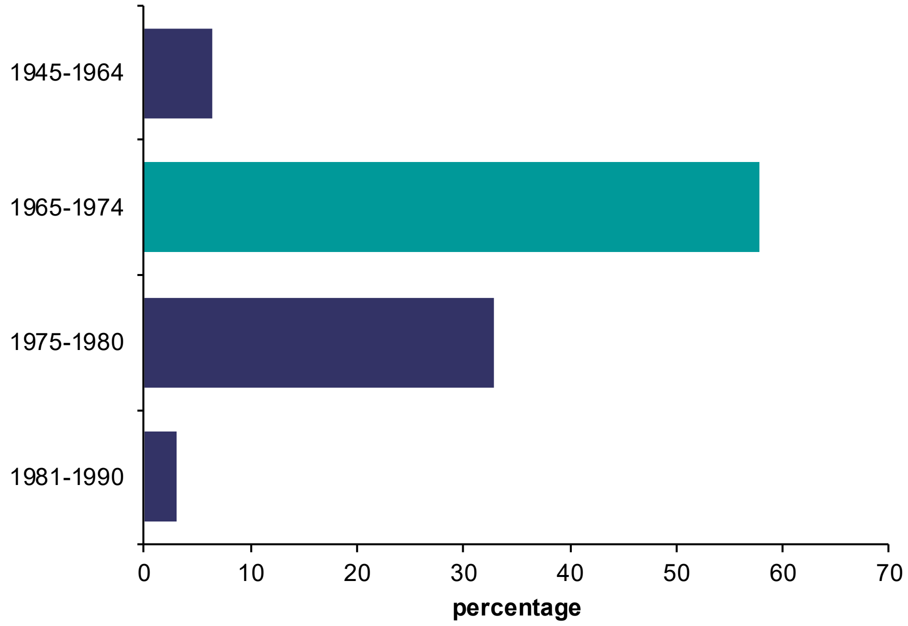


Note: Red line = surveyor's answer consistent with model answer.

2.17 The construction dates recorded by the surveyors for Dwelling 1 formed a normal distribution that was nicely centred around the true construction date, Figure 2.5. This was reassuring especially because boundaries such as the RdSAP age bands can be important in determining the final outcomes and seemingly small errors can have a large impact, Figure 2.6.

[3] The Standard Assessment Procedure (SAP) is the methodology used by the Government to assess and compare the energy and environmental performance of dwellings. Reduced Data SAP (RdSAP) was introduced in 2005 as a lower cost method of assessing the energy performance of existing dwellings.

Figure 2.6: Dwelling 1 construction date band



Note: Teal colour = surveyor's answer consistent with model answer.

2.18 The amenities were renewed recently in this house, but there was a range of views over when this was likely to have been.

Figure 2.7: Dwelling 1 kitchen amenities last refurbished

Note: Teal colour = surveyor's answer consistent with model answer.

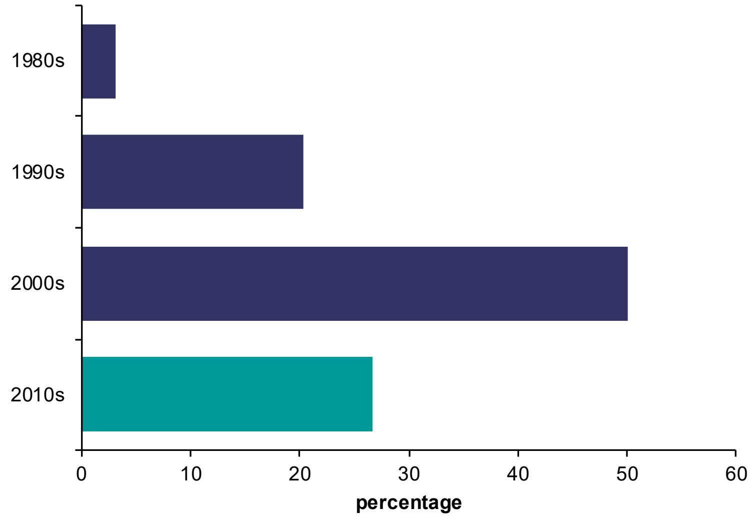
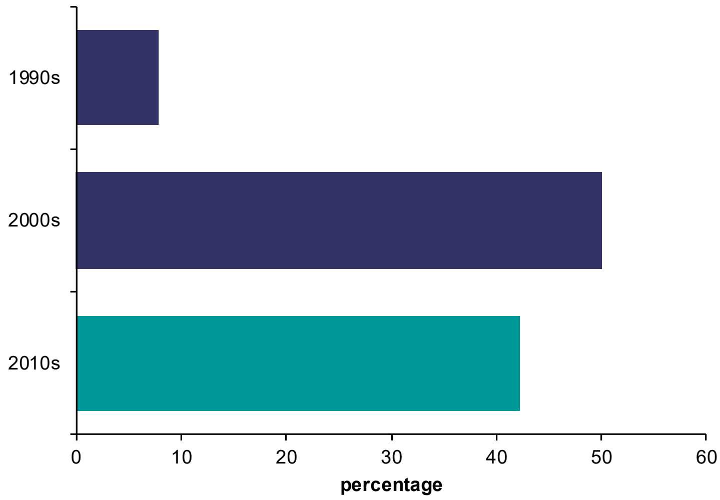


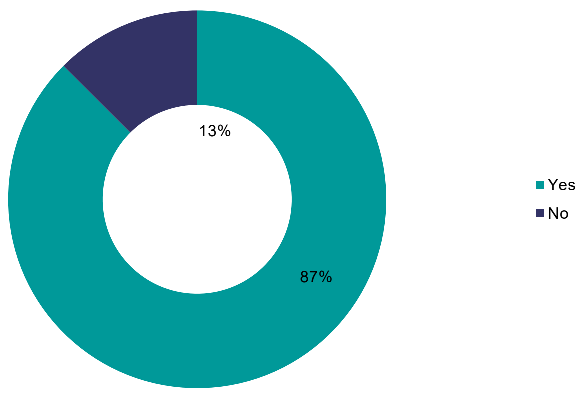
Figure 2.8: Dwelling 1 bathroom amenities last refurbished

Note: Teal colour = surveyor's answer consistent with model answer.



2.19 Some surveyors were confused around the relationship between porches/conservatories and the main dwelling structure. This had a knock-on effect on many areas of the form and highlighted the need for developing further briefing and training material, Figure 2.9.

Figure 2.9: Presence of secondary heating



Note: Teal colour = surveyor's answer consistent with model answer.

2.20 We might expect very basic measures, to be completed correctly all or most of the time however the SQS suggested that this was not the case. This included (in this case) counting the number of dwellings in the block, recording secondary heating, orientation, and mains drainage. Those errors were primarily related to some surveyors pre-judging their responses rather than approaching their surveys deliberately, carefully planning and thinking through the observations.

Dwelling 2

2.21 This home was selected because it was vacant awaiting sale and potential refurbishment. The last occupier was an elderly owner, who had acquired the property through the Right to Buy Scheme some years earlier. The dwelling was an unusual terrace design located on a social housing estate. It suffered from some disrepair, leading to health and safety hazards.

Front view

Rear view

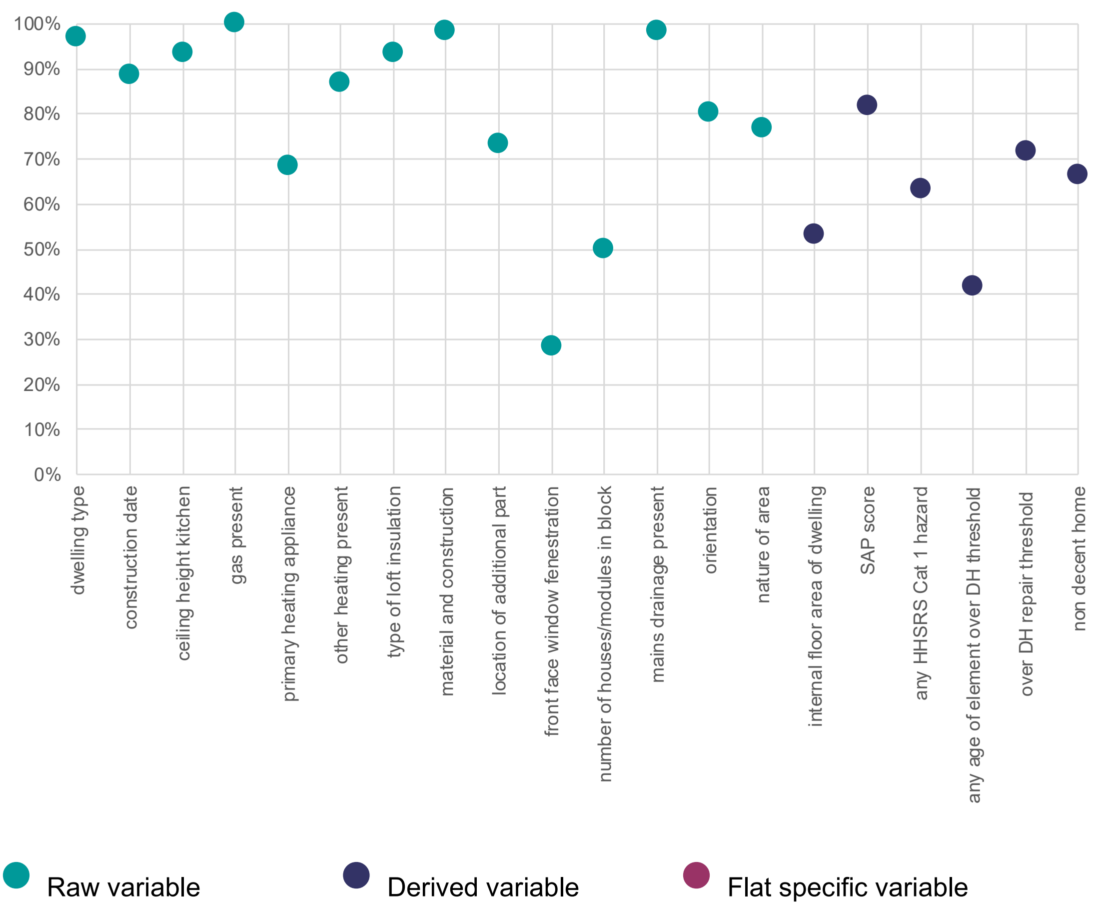
2.22 This property was selected for its complexity and condition. While there was complete agreement around many of the basics of the survey, the unusual design of the house, with its ‘flying first floor’ over a passageway caused definitional and measurement issues. The fact that it was vacant was a problem because there was no one with whom to clarify ownership; wall insulation; age of amenities and services; and whether recent repair problems had been fixed or not.

2.23 The surveyor score index has not included variables with definitional variations and complications which were not key to the overall results. However, this still proved to be the most complicated survey with the most disagreement with the model answers. The agreement over the 20 indicative variables averages 15 (median), with no surveyors in total agreement with the model answers, Table 2.2. The mean score was 14.17 with a standard deviation of 1.87.

Table 2.2 Dwelling 2 surveyor score index

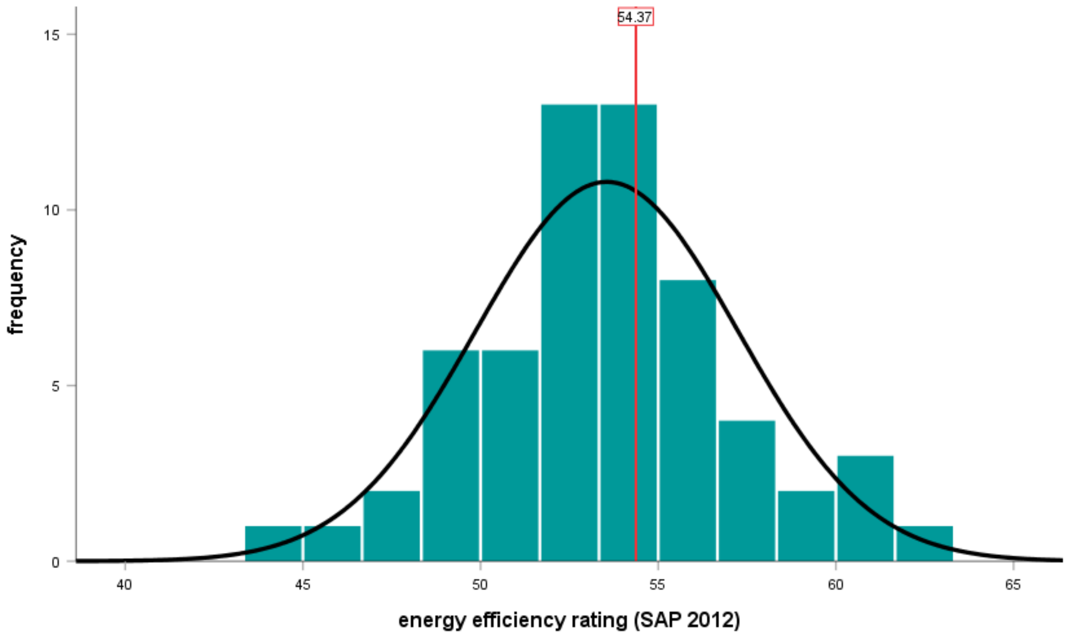
	surveyor count	*percentages*
9	2	3.3
10	0	0.0
11	3	5.0
12	7	11.7
13	7	11.7
14	9	15.0
15	18	30.0
16	11	18.3
17	2	3.3
18	1	1.7
total	**60**	**100.0**

Figure 2.10 Dwelling 2 surveyor score index



2.24 Even though this was a complex dwelling to survey, once the variables had been complied into the key derived variables, such as SAP, they tended to form the normal distributions that we would expect, while at the same time highlighting surveyors who were wider off the mark, Figure 2.11.

Figure 2.11 Dwelling 2 SAP rating



Note: Red line = surveyor's answer consistent with model answer.

2.25 Specific areas of disagreement, which we can learn from, include:

- The treatment of dwellings with an usual design. The first floor attachment at the side, in terms of: whether the house was mid-terrace or end terrace; which view the side attachment went in; if the side attachment was in the front view, how to deal with the unseen window at the rear; how to deal with fenestration?

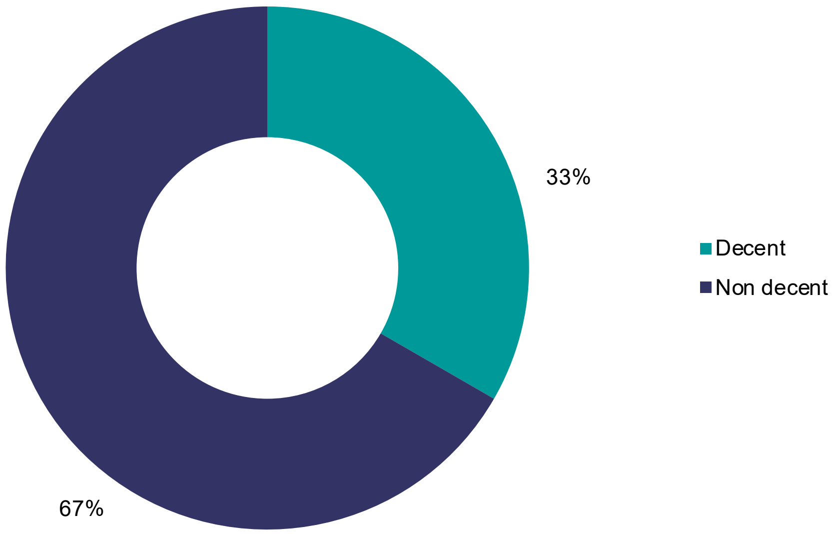
 

- The assessment of the Housing Health and Safety Rating System (HHSRS) Damp and Decent Homes Standard repair criterion. The roof of the dwelling had been leaking for some time and the ceilings, walls and floors had been soaked. But had that been repaired or not? As the roof was flat and had no loft, it was impossible to see whether the leak had been repaired from either the inside or the outside.


- Ageing amenities was, again, an issue. The house was built in 1973 and was then purchased by the tenant in the early 1980s. Shortly after this, the kitchen and bathroom amenities were refurbished but exactly when was key to the Decent Homes Standard modernisation modelling. Without asking someone, this was difficult to establish.


- Private plots and shared facilities; some surveyors missed the shared area at the rear and the small private plot at the front.
- Judging elements related to decent homes with limited information. The dwelling felt like a non-decent home and yet the model answer did not come to this conclusion, because BRE and CADS were aware that emergency repairs had been undertaken to the roof and considered that those had been effective even though residual damage remained to the ceilings. The surveyors did not have this information and had to make the assessment based on what they saw.

Figure 2.12 Dwelling 2 Decent Homes Standard



Note: Teal colour = surveyor's answer consistent with model answer.

- Defining the local area for assessing the extent and severity of environmental problems. The dwelling was on the edge of a small social housing estate but adjacent to large private housing estate. CADS/BRE selected the local area as just the social housing estate when they developed the model answers. That led to the assessment of the existence of some environmental problems. In contrast, some surveyors selected the wider mixed-tenure area which, as a whole, had fewer environmental problems.

Dwelling 3

2.26 Case 3 was a 2nd floor flat in a purpose-built private block, constructed in 1959. The flat is spacious and recently modernised, although the building itself requires some maintenance and improvement. It was rented privately, although the tenant was not present at the time of survey.

Front view

Rear view

2.27 In summary, this property was selected to test the surveyors' ability to understand and record the relationship between the individual flat and the block in which it is situated, its shared areas and facilities.

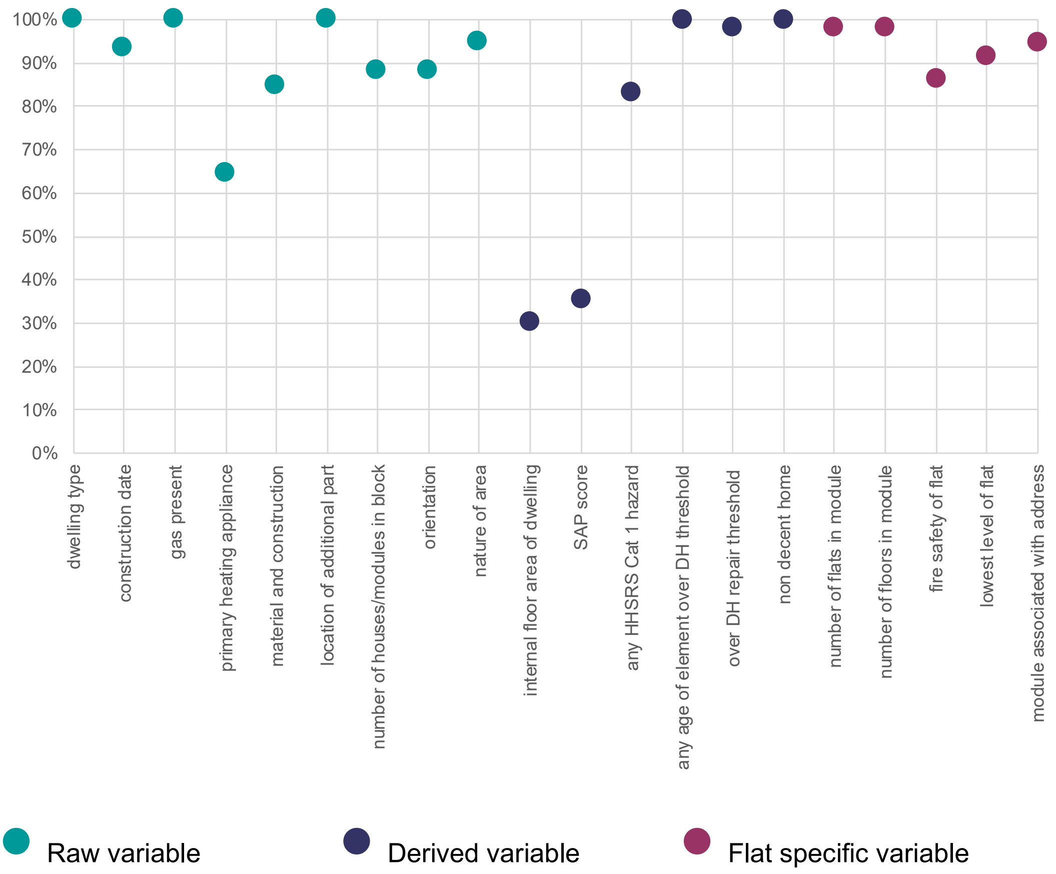
2.28 The dwelling was in a 'single module' block and the surveyors generally defined it correctly. They agreed that the flat itself was in good repair with modern amenities but was a Category 1 HHSRS hazard under excess cold, due to its expensive on-peak electric fuelled heating system.

2.29 For Dwelling 3, the SSI agreement with the model answers over the 20 indicative variables averages 17 out of 20 (median), with 7% of surveyors in total agreement. The mean value was 17.31 with a standard deviation of 1.6, Table 2.3.

Table 2.3 Dwelling 3 surveyor score index

	surveyor count	*percentages*
14	2	3.4
15	6	10.2
16	13	22.0
17	10	16.9
18	11	18.6
19	13	22.0
20	4	6.8
total	**59**	**100.0**

Figure 2.13 Dwelling 3 surveyor score index

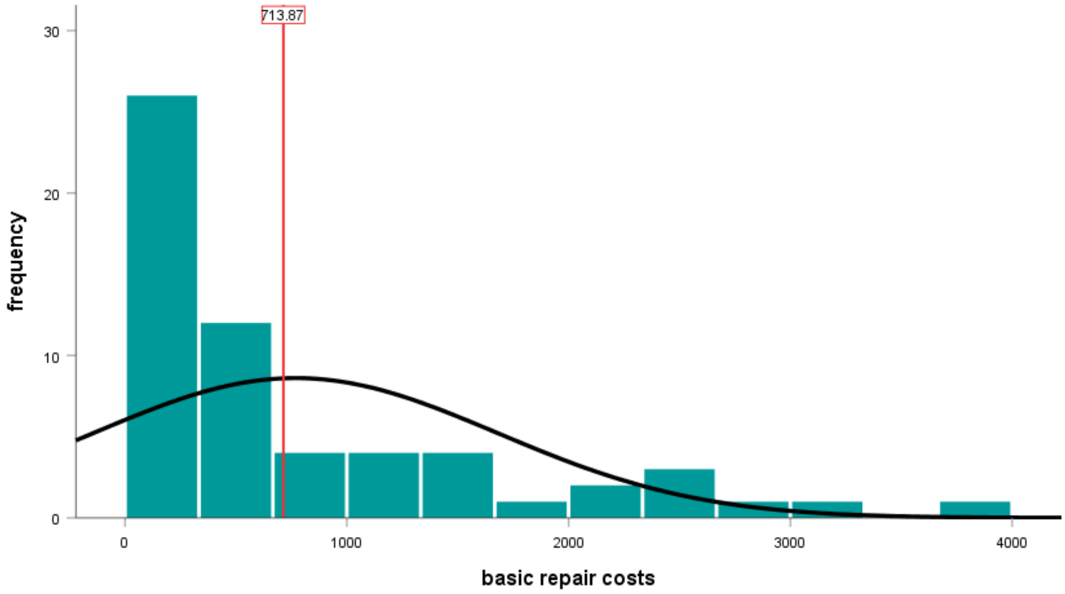


2.30 Individual variables from the SSI are generally well answered although the heating system was clearly a challenge. The derived variables for floor area and SAP score were the areas of lowest agreement. The SAP score requires many different parts of the form to be recorded correctly. Particular issues here related to the fenestration area, construction date and heating system type.

2.31 The figure below shows the distribution of the basic repair costs for Dwelling 3 generated from the surveyors' assessments. While the agreement with the model answer does not look strong, it should be re-iterated that the EHS methodology requires surveyors to apply a strategy to dealing with disrepair issues, which will depend on whether they see something as a problem, how urgent and extensive this is and what would be the timescale for undertaking remedial work. So complete agreement with the model answer was unlikely. In this case, the exterior of the block and common areas had a few scattered problems, which some surveyors felt were not significant enough to record or to require remedial action within five years.[4]

[4] 'Basic repairs' means all repair work that needs doing within five years.

Figure 2.14 Dwelling 3 basic repair costs

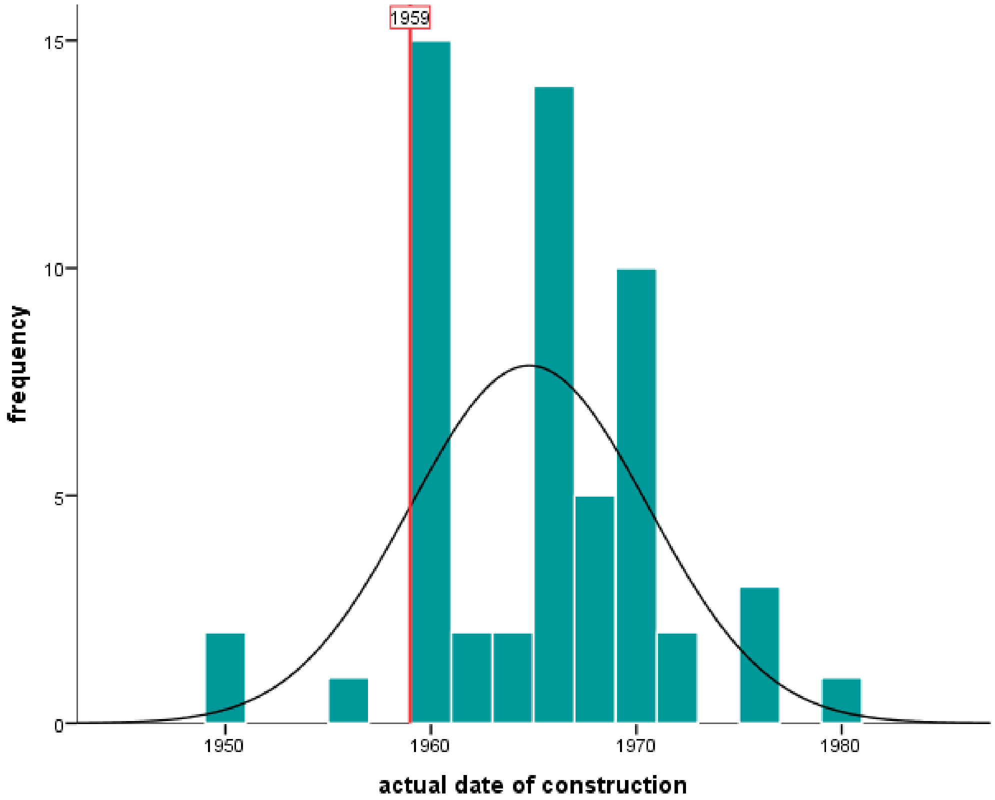


Note: Red line = surveyor's answer consistent with model answer.

2.32 Specific areas of disagreement with the model answers, which we can learn from, include:

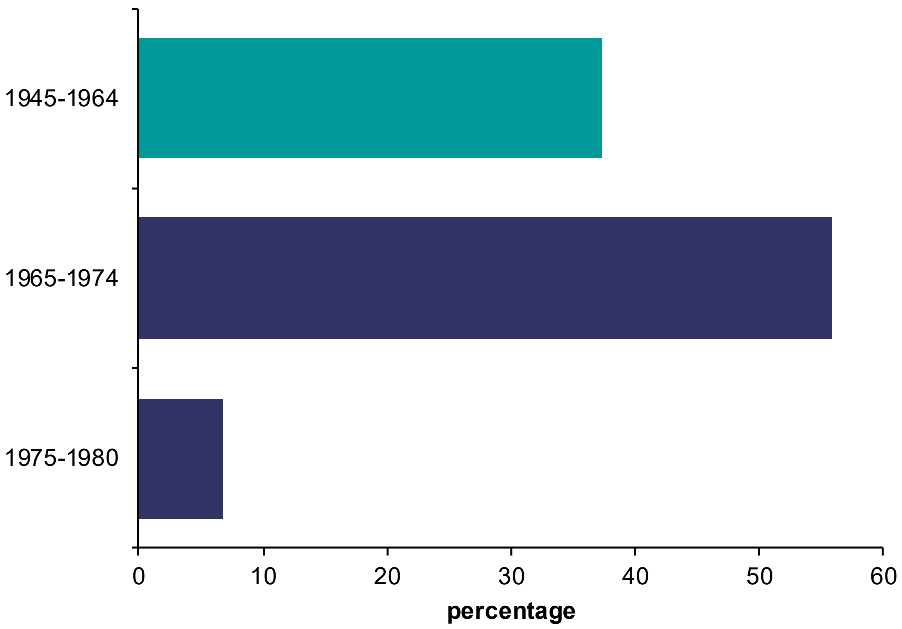
- Some surveyors had not had many purpose-built flats in their allocations so they made some basic errors, e.g. mixing up: 'dwellings and modules'; 'faces and views'; 'ground floor and basement'.
- Surveyors had not grasped the concept of 'fenestration of flat – area m2' and would need further briefing on this.
- Estimating the age and condition of a flat roof in a module was very difficult without clarifying with the freeholder.
- The age of construction was earlier than many surveyors recorded (although only five years before the threshold for the next age band), Figure 2.15, Figure 2.16. This impacted on their judgement of the age of elements, amenities and services.

Figure 2.15: Dwelling 3 actual construction date



Note: Red line = surveyor's answer consistent with model answer.

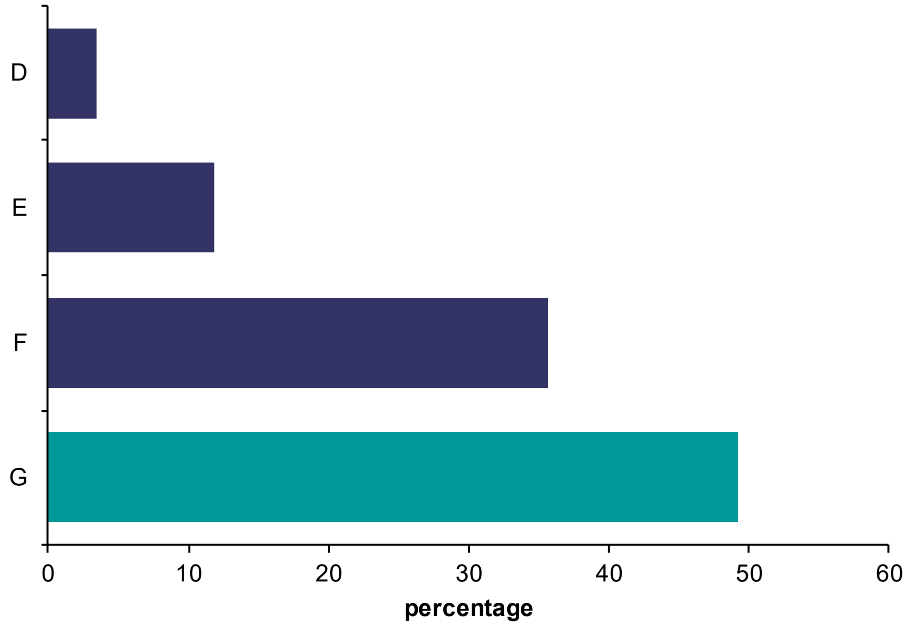
Figure 2.16: Dwelling 3 construction date band



Note: Teal colour = surveyor's answer consistent with model answer.

- The flat had no gas supply and was heated by individual electric radiators. Hot water was from an immersion heater only. The radiators were not storage units however the branding suggested that they were. This confused many surveyors who miscoded the primary heating system. This, along with the construction date, were the largest contributors to variation in the calculated SAP score and EPC band, Figure 2.17.

Figure 2.17: Dwelling 3 EPC band



Note: Teal colour = surveyor's answer consistent with model answer.

Dwelling 4

2.33 Dwelling 4 was a two-storey maisonette situated on the second and third floors of a historic terrace in the centre of a large town. On the ground floor was a large, extended high street shop. There was another flat on the first floor. Access was provided via a walkway and balcony over the rear of the shop and then up via a private enclosed entrance.

Front view

Rear view

2.34 This dwelling was selected to represent a converted flat, which number nearly one million in England. However, there is no such thing as a typical converted flat and by their nature they are often difficult to describe, survey and set in the context of the overall building of which they are a part. This was no exception.

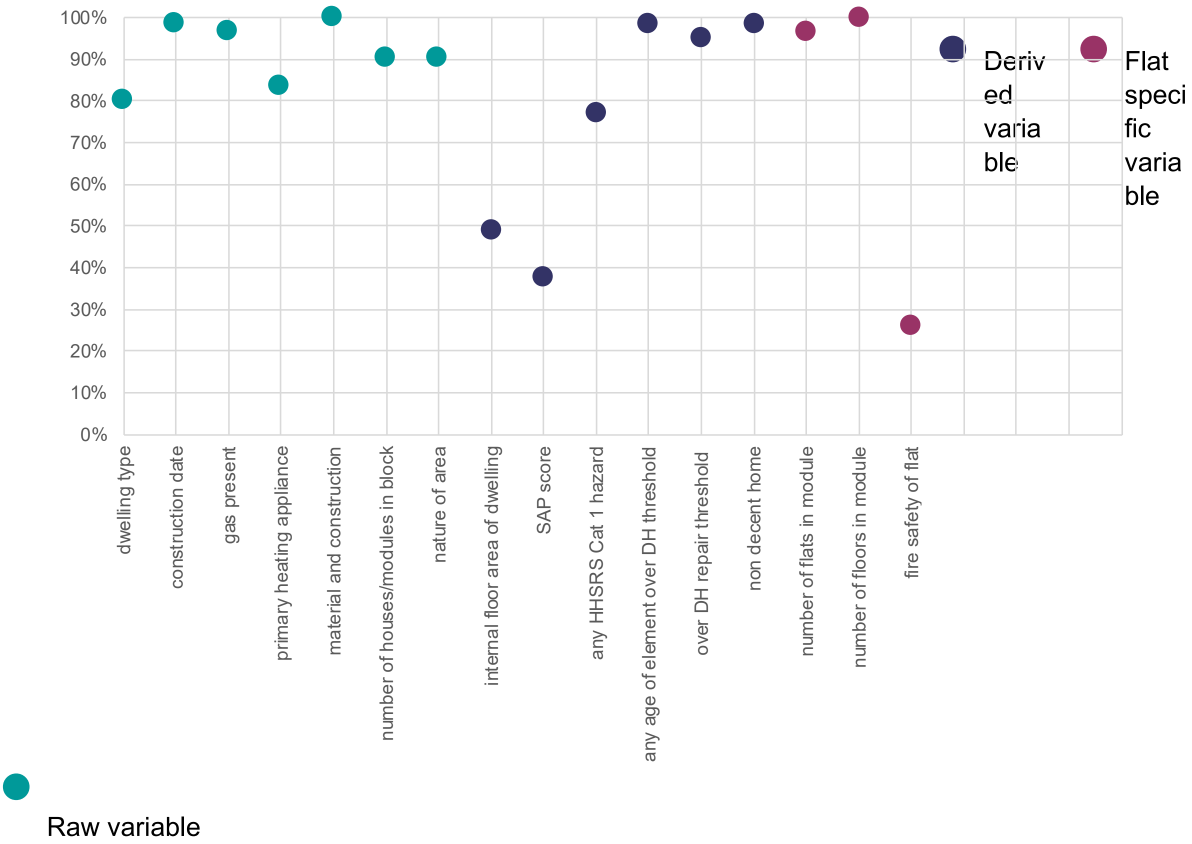
2.35 The great majority of surveyors agreed that it was of pre-1919 original construction, had recently been refurbished, and had no significant HHSRS or repair issues.

2.36 Looking at the surveyor score index for Dwelling 4, the agreement with the model answers over the 20 indicative variables averages 16 out of 20 (median), with no surveyors in total agreement, Table 2.4. The mean score was 16.26 with a standard deviation of 1.72.

Table 2.4 Dwelling 4 surveyor score index

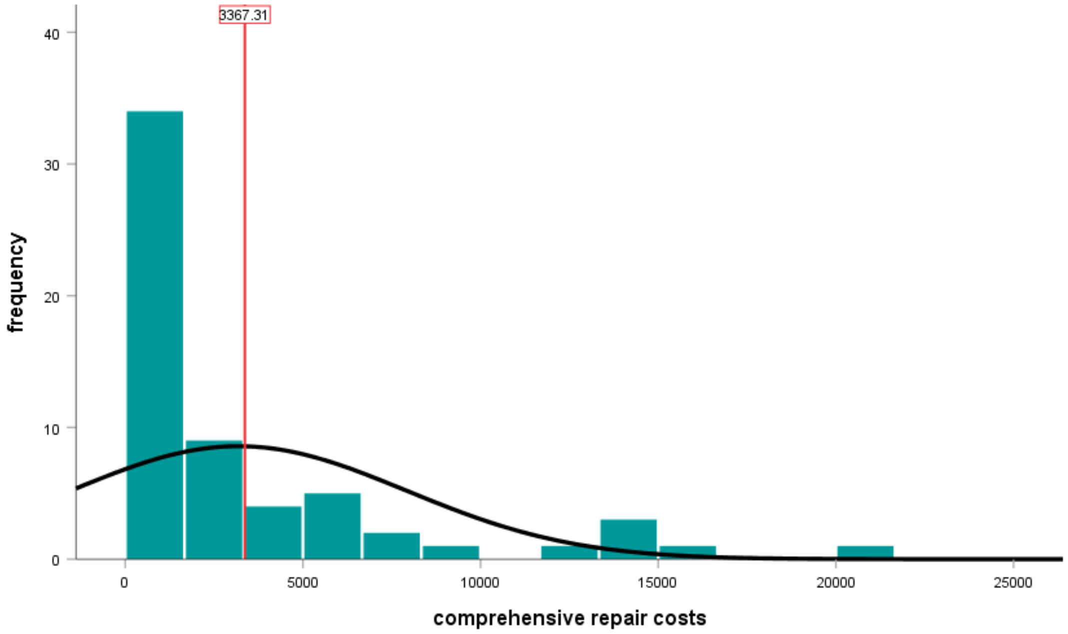
	surveyor count	*percentages*
12	1	1.6
13	3	4.9
14	6	9.8
15	10	16.4
16	12	19.7
17	12	19.7
18	12	19.7
19	5	8.2
total	**61**	**100.0**

Figure 2.17 Dwelling 4 surveyor score index



2.37 Figure 2.18, below, shows the distribution of comprehensive repair costs for Dwelling 4, generated by the surveyors' assessments. Agreement over comprehensive repairs should be stronger than basic repairs because this complex derived variable brings forward future non-urgent work, which may have been delayed until a later date. While the flat had recently been refurbished, there was a variety of (mostly non-urgent) repairs identified to the exterior of the building, including to the guttering, flashings, windows and entry door. Some surveyors did not identify any work, while some recorded major repairs. The data show that the big 'mistake' was not seeing any repairs which suggested that more care should be taken when considering these elements of the survey.

Figure 2.18 Dwelling 4 comprehensive repair costs

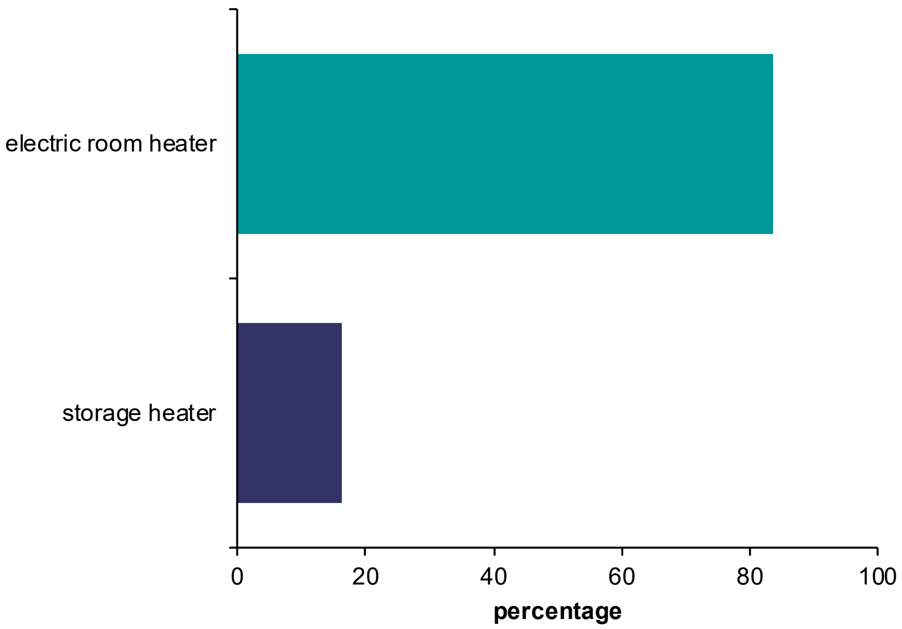


Note: Red line = surveyor's answer consistent with model answer.

2.38 Areas of disagreement, which we can learn from, include:

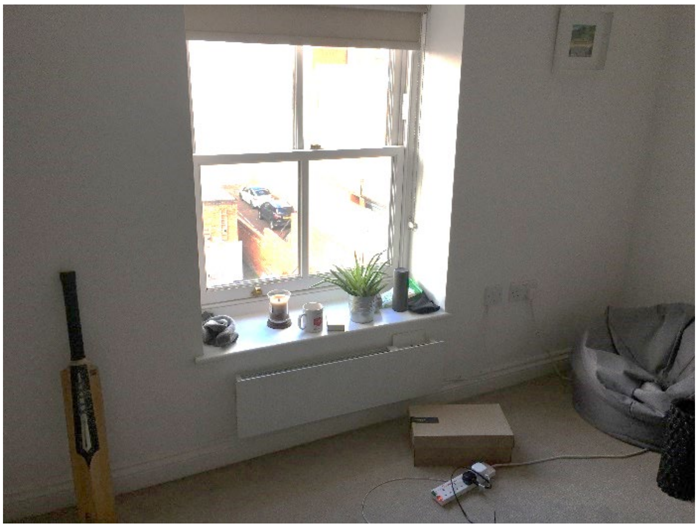
- As with Test Dwelling 3, this had no gas supply and used fixed electric appliances for space heating and an immersion heater for hot water. Miscoding of this system caused variability around the SAP rating.

Figure 2.19 Dwelling 4 primary heating type



Note: Teal colour = surveyor's answer consistent with model answer.

- Again, the basics around defining this as a converted flat, ageing the original building and not the conversion and counting the number of modules in the block, were not always completed correctly.
- Some defined the balcony access system as a deck, which would only work if measurements were taken in the shop extension below (a strategy which would have caused considerable unnecessary work).
- Some surveyors were not happy with the low window sills to the flat and generated a high HHSRS score for 'falls between levels'. But mitigation works had already been undertaken, with a window locking system and extensive guarding to the balcony access.



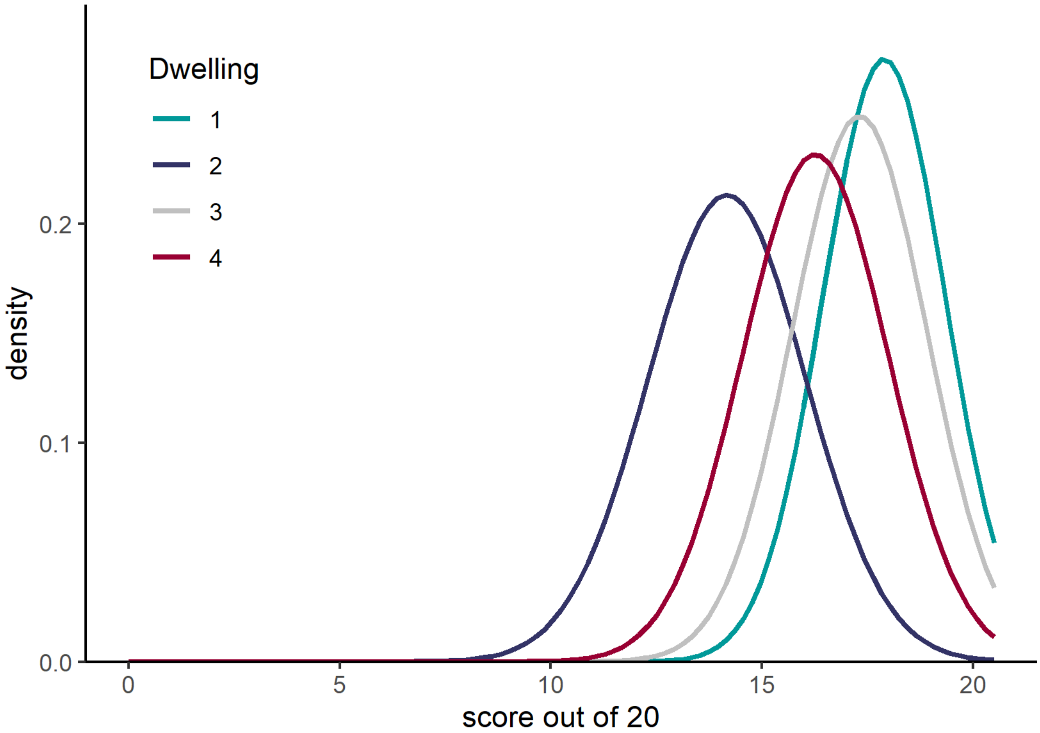
2.39 There was disagreement over what the front of the module was in this conversion – as the original house was accessed from the front and the flats were accessed from a street at the rear. While this would not impact unduly on the survey results, it made the comparisons of some variables difficult. This was because the front of the module faced a busy shopping street while the rear was quiet but less well kept. This suggests the need to strengthen the guidance on what constitutes the front of a module and dwelling.

2.40 While we accept different strategies to deal with repairs, more briefing is required on when repairs are significant enough to record at all.

Comparison of the surveyor score index across the four test dwellings

2.41 An overall comparison between the surveyor score index for the four test dwellings is shown below. The y-axis shows the density of scores at a particular value. A density of 0.2 indicates that 20% of surveyors attained that score out of 20. The area under each of the curves is equal to 1. This confirms that the simplest survey (Dwelling 1) has the most agreement and the most complex survey (Dwelling 2) has the least agreement. Similarly, the more straightforward purpose built flat (Dwelling 3) was surveyed better than the more complex converted flat (Dwelling 4) but flats are generally more difficult to get right than straightforward houses, Figure 2.20.

Figure 2.20: Overall surveyor score index for all dwellings



2.42 A number of minor errors, inconsistencies and professional disagreements may not significantly affect the survey outputs if found in individual survey cases, however, if they impact on the main compound modelled (or 'derived') variables that are used for reporting and measuring change in the housing stock, these seemingly minor errors can have a major impact, especially as several individual errors can combine to create a larger effect. A summary of the results for these key variables for the four test dwellings is presented in the table below, Table 3.5. The cells in red are those where agreement with the model answer fell below 50% of surveyors. While 50% is an arbitrary threshold, it highlights the most relevant findings.

Table 2.5: Agreement with the model answer over key summary variables

variable	dwelling 1 model answer	dwelling 1 % agree with model answer	dwelling 2 model answer	dwelling 2 % agree with model answer	dwelling 3 model answer	dwelling 3 % agree with model answer	dwelling 4 model answer	dwelling 4 % agree with model answer
dwelling age *	1965-1980	91%	1965-1980	88%	1945-1964	37%	pre 1919	98%
dwelling type	terrace	100%	terrace	97%	PB flat	100%	conv. flat	80%
floor area, m^2 (±5%) **	62	97%	61	77%	68	76%	98	67%
EPC band	D	27%	E	67%	G	49%	E	72%
SAP (±5 points) ***	66	61%	54	87%	18	44%	48	39%
HHSRS cat 1	pass	92%	pass	63%	fail	100%	pass	77%
Decent Homes age failure	pass	98%	pass	58%	pass	100%	pass	98%
Decent Homes repair failure	pass	100%	pass	72%	pass	100%	pass	95%
Decent Home	pass	91%	pass	33%	fail	100%	fail	98%
Major environmental problems	pass	94%	fail	27%	pass	93%	pass	69%

*** Dwelling age category in agreement if within the correct or nearest adjacent age band.**
**** Floor area agreement occurred when derived sqm was plus or minus 5% of the model answer.**
***** SAP agreement occurred when derived score was plus or minus 5 points of the model answer.**

2.43 A range of factors have caused the areas of disagreement highlighted in Table 2.5.

- Dwelling 1, EPC Band. The high level of disagreement was caused by many surveyors assuming that this dwelling had cavity wall insulation, while the model answer did not record cavity wall insulation because the dwelling showed no evidence of it.
- Dwelling 2, Decent Homes Standard. As the dwelling was vacant the surveyors could not get information from the household to resolve the ambiguities over the age of the amenities, whether the HHSRS dampness was ongoing and whether repairs had been adequate.

- Dwelling 2, major environmental problems. Some surveyors did not apply the definition correctly to identify the local area.
- Dwelling 3, EPC Band/SAP. The electric heating system caught many surveyors out. The system was not unusual but surveyors needed to take some care to identify it correctly because it was marketed as one type of system but treated as another type according to SAP definition.
- Dwelling 3, dwelling age. The block containing the dwelling was ahead of its time in design. Some surveyors recorded an incorrect age because they had pre-judged the age using established assumptions. They would be less likely to record dwelling age incorrectly in a real life survey because they would be able to check the age with the household.
- Dwelling 4, SAP. The electric heating system caught many surveyors out highlighting the need for more care in their approach.
- None of the issues above were systematic problems and many would be picked up in the regional manager checks and BRE acceptance testing, but they do suggest that further briefing and validation checks along the lines set out below should be applied going forward to ensure that they do not become systematic problems.
- Identifying evidence of cavity wall insulation (or lack of it) is a concern, particularly when the household cannot confirm this. This needs to be addressed with further briefing on identifying the signs of cavity wall insulation and its importance.
- Assessing the HHSRS for vacant dwellings can be difficult, as surveyors have to imagine them to be occupied by a vulnerable person over a one-year period.
- Better briefing is required on defining local areas and applying the definition consistently.
- More briefing is required on identifying and recording different heating systems, particularly storage versus on-peak electric heating.
- More briefing is required on the importance of ageing dwellings, services and amenities, and the importance of taking active steps to clarify information with the household especially at the points in the survey form bearing the prompt ‘clarify with household’.
- More consideration needs to be given to how apparently small decisions impact on some of the most important measures in the survey: SAP; EPC; HHSRS; and Decent Homes. This may involve more briefing for surveyors, but also perhaps having more flexible thresholds in the models.

Surveyors’ feedback on the study

2.44 Surveyors completed a feedback questionnaire as part of the study. Surveyors seemed to have enjoyed the carrying out fieldwork on the test dwellings and the few comments that were supplied revolved around the request to see the model answers of each property.

2.45 Specific responses relating to the SQS are summarised below:

- 13% of surveyors felt there were some aspects of the housing stock that were not represented by the SQS fieldwork dwellings. This is to be expected as it was not possible to cover all aspects of the housing stock. The four dwellings were selected based on the individual characteristics of each and were intended to represent the common types of property surveyors see on the ‘average’ survey while at the same time testing their judgements.
- 95% of surveyors felt they had enough time at each property and 97% felt they had enough time to upload and validate their surveys.
- The issues that had arisen on more than one occasion were surveying a large block of flats and non-traditional forms of construction. These can be more complicated to survey though they are rare in the housing stock. These issues have been addressed in previous refresher briefings and they can be revisited in the future.

Chapter 3
Conclusions and recommendations

3.1 In a survey with nearly 3,000 variables to consider, there are bound to be a range of judgements from surveyors when faced with the same dwellings to inspect. The SQS has demonstrated that the great majority of surveyors delivered good quality surveys. The EHS methodology for carrying out the physical surveys works and can be applied consistently, when due care is taken. Some surveyors are exceptionally good at applying the methodology while others require further help and guidance.

3.2 The simpler and better condition the survey dwelling, the more likely it is that surveyors will agree with the model answers, and with each other. Conversely, the more complex the survey the more likely it is that there will be variability.

3.3 There is no evidence that the EHS results are being compromised by any of the surveyor quality issues identified in this study.

3.4 Real errors, missing responses, inconsistencies and implausibilities are already dealt with through extensive validation checks, close supervision and acceptance testing. However, this exercise has highlighted areas where these can be improved.

3.5 A spread of judgements will always be present in the assessment of aspects of the EHS physical survey where no ‘right’ answer exists. This spread of judgements is present in the four case studies as it is throughout all the physical surveys carried out on the EHS. As in previous studies on surveyor variability, the spread follows an expected pattern and should not be of major concern. However, clearly some surveyors are not always following the EHS guidance, including the guidance on carrying out HHSRS assessments and recording repairs. Minor errors and misjudgements can be compounded in the most important derived variables. An assumption that the kitchen and bathroom amenities are original, when they are not, can mark a perfectly good home down as non-decent due to the lack of ‘modern’ amenities, for example. More briefing is required on the importance of such decisions to the integrity of the survey. Another example is the collection of the data required to calculate the SAP (Standard Assessment Procedure) Rating used to assess the energy and environmental performance of dwellings. This is because the current data collection instruments cannot indicate the SAP outputs that will be derived from the input variables so surveyors cannot judge whether they have supplied incorrect or implausible data or not.

3.6 The importance of carrying out background research on the dwelling beforehand and clarifying key judgements with households and owners is highlighted by the comparison of the surveyors' data (which were all based on observation alone) with the model answers (which were developed with the help of research and sources like maps, plans available online and Google Streetview). Some additional briefing is required on this, and on the problem of inspecting vacant dwellings where the household is not available to provide additional background information.

3.7 Establishing a survey plan at dwelling level and staying with it is of utmost importance. While the methodology is designed to encourage the survey to be completed in a standard way (make contact, survey interior, then exterior, etc.), it is essential with complex dwelling forms, conversions, blocks of flats etc., that the surveyor knows exactly what the survey dwelling is and how it relates to the building, block and wider environment before beginning the survey. For example deciding before beginning the survey:

- whether Dwelling 2 was mid-terrace or end terrace given the side attachment and in which view should the side attachment go; or
- whether the front of Dwelling 4 was the front of the original house before the conversion or was it the rear of the original house because, after the conversion, access to the dwelling was from a street at the rear.

3.8 The most difficult validation problems to resolve at the acceptance testing stage are the result of surveyors changing their mind about what they are inspecting part way into a survey. Different approaches to surveying a dwelling are acceptable as long as they are consistent throughout the survey of that dwelling.

3.9 Finally, even apparently simple surveys throw up unforeseen errors, often because they are being pre-judged or rushed. These might be addressed by additional briefing and validation but there is no substitute for ensuring that care is taken and that surveyors check their own surveys thoroughly.

Recommendations

3.10 While this study is, essentially, about surveyor performance, it has been very useful in highlighting areas of the EHS that can be improved in general.

Surveyor guidance

3.11 Surveyors are provided with comprehensive guidance on how the survey should be completed and the standards that should be applied. This includes hard-copy manuals and on-line briefing. This exercise has demonstrated that the guidance can be improved in some areas. We recommend that:

- The guidance includes clearer instructions on how to survey vacant dwellings, and how to define the local area in a consistent way.
- Additional briefing is provided on how key derived variables are constructed from the many parts of the form and the importance of completing these correctly. This might include the SAP, dimensions, repair costs and Decent Homes variables. This is actually covered in the new surveyor briefing under the title of "how we use your data" however it has been 18 years since some of the established surveyors received such a briefing and this needs to be formalised in the available training materials (e.g. manual or online learning materials).

Surveyor training

3.12 The SQS has shown how important it is to bring existing surveyors to a face-to-face briefing and undertake calibration exercises at real survey dwellings. In addition, training for existing surveyors typically focuses on new parts of the form or complex details. Surveyors have in some cases been working on the survey for many years and have not received a refresher on the basic training that a new surveyor receives. We recommend that:

- A face-to-face refresher briefing, with real surveys and feedback is undertaken every year.
- Surveyors are re-briefed on some of the basic principles as some may not have received training on since 2002.

Survey fieldwork

3.13 Regional managers and many surveyors are very good at planning their fieldwork, both in advance through studying maps, plans, Google Streetview, etc, and on-site prior to completing the form. We recommend that this good practise is passed on to others and that additional guidance is provided on planning and undertaking fieldwork in a consistent way to minimise the frequency of surveyors changing their mind about what they are inspecting part way into a survey.

3.14 Even simple surveys throw up unforeseen errors, often because the surveyor has pre-judged an assessment or has rushed the inspection. Ensuring that care is taken in completing the survey is important. This should include advice on getting information about the dwelling in advance using map, plans, Google Streetview etc.; clarifying key judgements with households and owners; and more guidance on surveying flats, which some surveyors do not see many of in their allocations and are liable to make mistakes with.

Survey validation

3.15 The survey validation system has been honed over a number of years. However, the SQS has shown that this can still be improved - to pick up errors that may previously have slipped through unnoticed.

3.16 The most complex compound variables are those which lead to the SAP calculation. The problem here is that the calculation is not fed back to the surveyor as a validation check, so they are not aware of the SAP score they are generating or the EPC band that results. We should consider building the SAP score into the validation feedback so that surveyors can check the source of any implausibilities and change them if necessary. If possible, this approach might also be extended to the dimensions model. This is a major undertaking but could lead to improvements in data quality and potentially accelerate the data production process at the end of the survey year.

3.17 We also recommend that additional checks are introduced, including plausibility checks for Yes/No boxes for simple decisions, such as whether a dwelling is on mains drainage, has a gas supply, or has other heating.

Surveyor supervision

3.18 Regional managers currently check every survey form that is passed to them before allowing them to be accepted onto the system for data processing. This is a laborious process and much time is spent correcting errors that should never have been submitted. A disproportionate amount of time is spent correcting the forms of a few surveyors. We recommend that the SQS is used to inform regional managers of surveyors in their teams who may not be applying the methodology consistently and would benefit from closer supervision. This should include providing feedback from the SQS results and, perhaps, targeted field accompaniments.

Acceptance testing and modelling at BRE

3.19 Undertaking the post-validation of surveys that do not produce plausible findings when run through the complex models is a time consuming process which elongates the time from survey closedown to results being produced. This includes looking at outliers on the distributions of dimensions, repair costs and SAP. It would be hoped that this could be reduced with the application of the recommendations above. A specific recommendation would be to look to automate BRE acceptance testing, where possible, to impute corrected data, which will enable the models to be run more quickly and consistently.

Reporting

3.20 Some of the apparent disagreements observed in this report are negated because the variables are re-coded or combined for reporting purposes. For example: for reporting purposes we tend to use seven (or fewer) dwelling age bands rather than the full list of 11 for most analyses; the 1 -100 SAP score will be recoded into seven EPC Bands for reporting. While this approach masks survey variability it also introduces 'cliff edges' (thresholds), which are useful for presentation purposes but often misleading when individual dwellings (and surveyors) are being judged against them. For example, the surveyors have the opportunity to use one of nine age bands for the age of kitchen amenities. But there is a key threshold applied at 20 years old to define those kitchens that fail to meet the Decent Homes modernisation standard. We recommend that:

- Surveyors are informed of where key 'threshold' judgements are in the survey, so they take more care of these assessments;
- Consideration is given to how these thresholds become embedded in policy, when we know there is variability around them (for example, targeting policies against EPC bands or Decent Homes thresholds).

Data collection tools

3.21 There are many advantages with the current EHS digital pen system, which is ideal for the purposes of the survey. However, errors inevitably occur where the surveyor's pen stroke is not picked up correctly by the system. These errors are, for the most part, corrected through the validation, checking and acceptance testing process but some still slip through where they are within range and not inconsistent with the rest of the form. Some of the errors in the SQS surveys clearly come from this source, including from the many Yes/No boxes and from misread numbers that the surveyor validation has not picked up. We recommend that:

- The survey form is reviewed and where possible, re-designed to reduce the risk of pen-stroke errors occurring and being overlooked. This might include separating Yes and No boxes where possible and reducing the requirement to enter hand-written numbers.
- Looking, longer-term, to move towards a system which does not rely on pen-stroke recognition, such as tablet PCs. This is a complex decision with many advantages and disadvantages to weight against each other.

The next steps

3.22 Some of these recommendations are relatively straight forward to implement and have already been embedded into the data collection methodology. They include:

- updating the validation system that underpins the website by adding new checks and altering some existing checks;
- improving data acceptance checking processes for 2019-20 data by including automated checks written in SPSS syntax which will work alongside more traditional methods of validation;
- feeding back to regional managers which of their surveyors are routinely sending through surveys where their responses have been misinterpreted by the digital pen character recognition software; and
- Including extra briefing on topics such as surveying flats in the 2020-21 surveyor distance learning material.

Appendices

Appendix A: Assessments of surveyor variability on the English Housing Survey

1. The EHS and its predecessor, the English House Condition Survey, have incorporated three surveyor variability studies (SVS) prior to the 2019 Survey Quality Study, in 2003, 2009 and 2013. Those studies were blind call-back exercises in which around 300 dwellings were re-surveyed by a different surveyor. The objectives of the studies were to:

   - look at the effects of surveyor variability on the precision of estimates from the EHS physical survey;
   - assess impact of surveyor variability on complex standard errors (and confidence intervals);
   - compare variability between surveyors;
   - highlight key survey measures on the EHS which were subject to high variability (low levels of agreement), or low variability (high levels of agreement);
   - produce evidence to improve training of surveyors and to improve form design; and
   - compare the levels of variability in the EHS across time.

2. The 2013 study focussed on 73 key survey measures (variables) covering the five chapters in the EHS housing stock report. Variability between surveyors was measured using a series of approaches, in order to give a holistic view of surveyor variability. The measures were:

   - **Level of observed agreement** – a percentage of cases where both the parent survey and child survey were in agreement with one another. This measure does not take account of agreement that could be expected by chance (i.e. if both surveyors guessed their assessment, it is possible they would both agree by chance), but it was useful to get a general view of the level of observed agreement for each survey measure. In addition, it took no account of where different responses were legitimate and expected.
   - **Kappa score** – calculated as a ratio of the difference between the observed and the expected agreement, to the maximum possible agreement. The ratio allows us to identify the level of agreement which takes into account chance agreement. However, it has been observed that Kappa score was not a reliable measure of agreement when most of surveyors in both ‘parent’ and ‘child’ surveys chose one answer. In such situations, measures based on chi-square statistics (incl. Kappa score) are not reliable measures of agreement.

For some variables it could not be computed at all. For this reason, the report included an appendix with cross-tabulations for all 73 measures. It was recommended that interpretation of variability for each measure should make reference to cross-tabulations, to see where agreement or disagreement can be found between observations.

- **Correlated Surveyor Variance (CSV)** scores offer an alternative assessment of the level of agreement between surveyors and help in the final judgment. It refers to the tendency of an individual surveyor to make assessments that are consistent to other assessments of that surveyor but different from the average assessment of all surveyors. Multi-level (ML) modelling was used to calculate CSV for each individual category of the key survey measures investigated in this study (192 estimates). ML modelling allowed the analysis to disentangle the variance of each estimate due to households having different properties and variance due to surveyors' individual manner of responding. The correlated surveyor variance is calculated by dividing the estimate of the variance due to the surveyor by the total variance. Any CSV greater than or equal to 0.1 was considered as having substantial levels of variability (low agreement).

3. In order to aid interpretation of the statistics produced in the variability studies (Kappa and CSV scores), a RAG (Red-Amber-Green) scoring system was developed. CSV scores have also been used to revise the complex standard errors and confidence intervals around estimates that were found particularly prone to surveyor error and a few not affected by it to provide a benchmark. It was based on the assumption that some correlation between individual observations from the same surveyor exists (which would be an effect of their tendency to respond in a way specific to them), and without accounting for it the complex standard errors produced would be underestimated. Among estimates prone to high surveyor variability, six were found to have increased the confidence interval by 1 percentage point. The biggest adjustment was calculated for assessment of secure windows and doors: the adjusted confidence intervals surrounding the estimate would increase to ±2.76% if surveyor variability would have been taken into account. However, we need to remember that this revised estimate is subject to a degree of variance itself, as well as other confounding factors which may not have been captured in this analysis. Therefore, it was advised that the analysis should treat these revised confidence intervals with the appropriate level of caution.

4. The EHS contractors consortium identified a number of limitation with the blind call-back approach when developing the 2019 study.

   - It was recognised that it would not be feasible to achieve an absolute match between surveyors, rather, a distribution of responses was to be expected[5]. In instances where there was a clear correct answer then it would be reasonable

[5] This is a reason why level of agreement and Kappa scores may not be the best measures for this study – the calculation uses number of exact matches between parent and child interviews. However, CSV measures something different: variance in the estimates due to the fact that various surveyors have given responses.

to expect surveyors to choose the correct answer (see third bullet point for discussion about correct answers in the context of the previous SVS). Where a range of responses was possible, a distribution would be expected and the aim should be to minimise the variance as far as possible.

- Where a range of responses was possible, two data items (i.e. the initial surveyor visit and then the call-back by a different surveyor) for each question answered in a dwelling would not allow for a distribution of responses to be analysed[6].
- Two data items for each question answered in a dwelling could be compared with each other but it would be not possible to judge how far either of them were from the correct answer. In the consortium's opinion, this should be an important element of a study exploring surveyor quality. The objective of the previous study was to look at the impact of surveyor variability on precision of survey estimates but it was not possible to measure the accuracy of surveyor estimates because the 'correct' values for those estimates in the main sample was unknown.
- The previous design could potentially have an impact on surveyor response rates on the main EHS physical survey as SVS fieldwork was carried out alongside the main survey, using the same surveyors. That could create pressure on the availability of surveyors and could negatively affect the number of physical surveys achieved.
- The previous design involved considerable management overhead for surveyor managers and added complexity to the survey process at a time when the focus should be on maximising response for the main survey. The previous methodology meant that a surveyor working on a 'child' quota could have several extra cases which could stretch the availability of that surveyor, which may limit time to give sufficient attempts at difficult to access cases.
- The reporting of variability observed in previous studies lacked the context of the survey process and methodology. Differences had been highlighted where it was quite valid to have differences; for example visual quality and different methods for specifying roof repairs that would result in the same cost. Within the 2009 SVS, four items came out as red on the RAG score. Of these three were subjective measures on the form that were sliding scales from 1-5, agreement might in reality be considered when the scores were within adjacent boxes on the scale. These issue exist regardless of the data collection methodology selected, nevertheless, a study of surveyor variability needs to address it to maximise the value of the exercise.

5. Repeating the SVS would allow a comparison of surveyor variability over time but the EHS contractor consortium did not consider that as a central reason for

[6] This concerns level of observed agreement and Kappa score. The CSV method assumed aggregating responses from multiple dwellings and separating the variance due to different households being observed from the variance due to different surveyors.

repeating the methodology. This was because the drift in surveyor judgements had always been assessed through the calibration workbooks exercise which was conducted regularly over a similar timeframe. Repeating the SVS in 2019 would also give an assessment of the impact of variability on standard errors. However, given that the effect of variability on standard errors is generally small as well as limited to a small number of variables and that it is unlikely to change much, there was limited value in repeating the previous approach. The consortium's view was that a study of surveyor quality would ultimately be of greater value in terms of driving improvements in data quality if it was able to look at surveyor variance and to be able to compare responses to an ideal or 'model' answer. Therefore, it proposed and MHCLG accepted an alternative design which was akin to a surveyor quality audit. The design of the quality audit is outlined in Appendix B.

Appendix B: Detailed description of the design of the 2019 Surveyor Quality Study

1. Contrary to the previous surveyor variations studies (SVS) which used a blind call-back methodology involving a proportion of the field force, the 2019 Survey Quality Study was a quality audit of all the EHS surveyors who attended the surveyor refresher training in March 2019[7].

2. The approach involved identifying four test dwellings which, together, had all the attributes and issues listed in Table 1 of Chapter 1. Each surveyor undertook a survey of two of the dwellings under controlled time-limited conditions and the data they collected were compared to 'model answers' compiled especially for the study. One of the limitations of the previous blind call-back SVS model was that surveyors were unlikely to encounter the full range of housing issues of interest in a 300-survey random sample. This is because most homes do not present those issues. One advantage of the approach of the 2019 study was that it could guarantee that surveyors would encounter the issues of interest.

3. It was recognised that surveyors would be aware that they were being tested. (An advantage of the blind call-back method was that surveyors did not know that they were carrying out a call-back and therefore would not alter their behaviour. In reality, it was difficult to avoid revealing the call-back cases despite the extensive efforts of the consortium. The most common cause of this is respondents talking about a previous visit.)

4. The surveyors were divided into six groups which varied in size from 18-24 surveyors. The table below shows how a typical group of surveyors would be divided between the four dwellings being surveyed. It assumes 24 surveyors for ease of explanation.

[7] Some surveyors left the survey and were replaced by new surveyors, who were briefed in May 2019 and therefore did not participate in this exercise. Some were unable to attend the briefing.

Table 2.1 Survey and dwelling split

	Survey 1	Survey 2
Surveyor 1	1	4
Surveyor 2	1	4
Surveyor 3	1	4
Surveyor 4	1	4
Surveyor 5	1	4
Surveyor 6	1	4
Surveyor 7	2	1
Surveyor 8	2	1
Surveyor 9	2	1
Surveyor 10	2	1
Surveyor 11	2	1
Surveyor 12	2	1

	Survey 1	Survey 2
Surveyor 13	3	2
Surveyor 14	3	2
Surveyor 15	3	2
Surveyor 16	3	2
Surveyor 17	3	2
Surveyor 18	3	2
Surveyor 19	4	3
Surveyor 20	4	3
Surveyor 21	4	3
Surveyor 22	4	3
Surveyor 23	4	3
Surveyor 24	4	3

Putting the proposal into practice

Selection of the fieldwork houses

5. Four dwellings could not represent the whole of the English housing stock. Apart from the multitude of house types, ages, construction materials and tenures in the stock, most dwellings actually have few disrepair or health and safety problems, but it is surveyors' judgements around these areas that are critical and of considerable interest. So, it was agreed to seek out a range of dwellings that between them would collect a variety of judgements around:

- simple, or typical, surveys;
- more complex surveys;
- houses and flats;
- different ages of dwellings and building elements;
- different building materials;
- different tenures;
- different heating and energy arrangements;
- disrepair;
- health and safety problems;
- different types of area; and
- occupied and vacant.

6. BRE and CADS managed to obtain four suitable dwellings for the duration of the fieldwork. These were all either privately rented or vacant awaiting refurbishment and a new occupier at the time of the study.

- **Dwelling 1.** Selected largely for its simplicity, as a typical survey of a small, cavity wall construction, terraced house that had very little wrong with it. Nevertheless, all of the elements needed to be correctly described and measured and the few faults present not overlooked.
- **Dwelling 2.** Selected because it was vacant awaiting sale and potential refurbishment. The last occupier was an elderly owner who had acquired the property through right-to-buy some years earlier. The dwelling was an unusual mid-terrace design located on a social housing estate. It suffered from disrepair and health and safety hazards.
- **Dwelling 3.** A second-floor flat in a purpose-built private block, constructed in 1959. The flat was spacious and recently modernised, although the building required some improvement works. It was rented privately at the time of the fieldwork.
- **Dwelling 4.** A two-storey maisonette situated on the second and third floors of a historic terrace in the centre of a town. On the ground floor was a large, extended high street shop. There was another flat on the first floor.

Data entry

7. The surveyors completed their surveys using the BRE digital pen system and downloaded them immediately on their return to the briefing room at the training centre. The surveys were undertaken independently, with no support from CADS regional managers (RMs) other than time control. Surveyors were not to discuss their findings, although once the data had been entered on the system and validated, there was a general discussion with BRE and the RMs in the briefing room and an ‘exit survey’ on their experience of the exercise.

Number of surveys achieved

8. In total, the six groups of surveys achieved 256 surveys (64 surveys on each test dwelling). The surveys were collated into the four cases and analysed.

Model answers

9. To provide a benchmark for assessing the quality of the surveys on the test dwellings, a complete ‘model answer’ was produced for each of the four test dwellings entered into the BRE system to aid analysis.

10. The model answers were compiled by technical staff from BRE and CADS and were quality assured and moderated by the CADS Regional Managers. The quality assurance and moderation process took place both at the test dwellings and back at the training centre.

Surveyor feedback

11. Because the surveyors submitted their forms, as normal, through the EHS on-line system, we were able to feedback results to them before they left the briefing (programme at Appendix C). This was based purely on a visual inspection of the responses and included positive re-enforcement around where they were doing well and more detailed discussions over where there was disagreement with the model answers and the reasons for this.

12. The face-to-face feedback session proved very useful, providing the following immediate benefits:

    - It gave the surveyors more briefing over aspects of the survey that some of them were getting wrong, prior to going out into the field for another year.
    - It demonstrated our preferred approach to dealing with some complex issues.
    - It prepared the regional managers to make additional checks (on aspects of the survey and on individual surveyors) during the forthcoming fieldwork.

13. It has enabled BRE to introduce additional validation checks, so that more of the errors would be corrected by the surveyors themselves, rather than CADS or BRE at a later stage.

14. The image below is an example of a feedback slide from the briefing. The slide shows how CADS/BRE worked out the fenestration ratio for the front view of Dwelling 1 to produce a model answer of three tenths. The fenestration ratio is the proportion of a face that is made up of windows and doors.

Figure 2.1: Example feedback slide from the surveyor briefing

Appendix C: List of variables analysed

The surveyor score index is made up of 20 variables which vary slightly depending on the type of dwelling. The variables coloured purple in the list below are included in the score for all four cases. The variables coloured blue are included for just the two houses. The variables coloured green are included for just the two flats.

A. For all four survey dwellings

1.Descriptive information

Type of occupancy (FODISHMO)

Dwelling type (FODDTYPE)

Construction date (FODCONST)

Occupancy (FODOCCUP)

Module associated with address surveyed (FMODULE)

Gas present (FINGASPR)

Electricity present (FINELEPR)

Primary heating present (FINCHEAT)

Primary heating fuel (FINMHFUE)

Primary heating type (FINMHBOI)

Primary heating appliance (FINCHBCD)

Other heating present (FINOHEAT)

Hot water system present (FINWHEAT)

Cylinder present (FINWHCYL)

Loft inspection (FINLOPOS)

Type of loft insulation (FININTYP)

Number of floors in main structure (FDHMFLRS)

Number of floors in additional part (FDHAFLRS)

Material and construction (FMTCONST)

Plot of survey dwelling (FEXPLTYP)

Mains drainage present (FCUDRAIN)

Number of houses/modules in block (FBLBLOCK)

2.General judgements

Ceiling height kitchen (FINKITCL)

Kitchen amenities last refurbished (FINKITLR)

Bath/shower last refurbished (FINBATLR)

Age of primary heating (FINCHBAG)

Front face window fenestration (FELFENFW)

Roof pitch (FELROOFP)

Orientation (FELORIEN)

Age of front roof covering (FEXRC1AG)

Wall thickness front (FEXWS1WT)

Age of front window frames (FEXWN1AG)

Accessibility (FEXDSTEP)

Street parking (FCUSTR)

Off-plot parking for disabled (FCUOPP)

CWI summary (FCWIPROP)

Exposure of dwelling (FCUEXPOS)

Over-shading (FCUOSMR)

Houses in disrepair in block (FBLDEFEC)

Structural defects present (FSTPRES)

Any HHSRS hazards worse than average (FHSAHWA)

Nature of area (FARNATUR)

Number of dwellings in area (FARDWELL)

Predominant age of area (FARPRAGE)

Visual quality of area (FARQUALI)

3.Derived variables

Internal floor area of dwelling

SAP score

EPC Band

Any HHSRS Cat 1 hazard

Any age of element over DH threshold

Over DH repair threshold (dwelling fails the Decent Homes Standard because of it does not meet the Standard's criterion on disrepair)

Non decent home

General repair cost

Comprehensive repair cost

Cost to make healthy and safe

Major problems in local area

B. Additional case-specific variables to compare (problem spotting)

Case 1.

Overload protection (FINELEOP)

No. fireplaces (FINNOFIR)

Do shared facilities exist (FFCSHARE)

Location of additional part (FSHADDIT)

Main structure width (FDHMWID1)

Main structure depth (FDHMDEP2)

Left face attached (FVWSPELF)

Front view roof covering age (FEXRS1AG)

Rear view conservatory faults (FEXDB2FL)

Falling on level surfaces likelihood (FHSLVLIK)

Case 2.

Renew living room ceiling (FINCLGRNLIV)

Bedroom 1 Floor (FINFLRRPBED)

Bedroom 1 walls (FINWLSPLBED)

Penetrating damp (FINDFXPDBED)

Structural collapse HHSRS (FSTHSSLO)

Falling between levels (FHSBTLEV)

Case 3.

Fire safety of flat (FCPESCAP)

No. flats in module (FNOFLATS)

Lowest level of flat (FNOLOWES)

Module associated with address (FMODULE)

Number of floors in module (FDHMFLRS)

Fenestration M2 area front wall (FDFFROFA)

Entry floor to dwelling proper (FDFENTYN)

No. floors in flat (FDFFLOOR)

Type of access (FCPACCES)

Use of ground floor (FNOGRUSE)

Use of basement (FNOBSUSE)

Roof covering front (FEXRC1TE)

Falling between levels likelihood (FHSBTLIK)

Case 4.

Fire safety of flat (FCPESCAP)

No. flats in module (FNOFLATS)

Lowest level of flat (FNOLOWES)

Module associated with address (FMODULE)

Number of floors in module (FDHMFLRS)

Fenestration M2 area front wall (FDFFROFA)

Entry floor to dwelling proper (FDFENTYN)

No. floors in flat (FDFFLOOR)

Balcony/Deck/Corridor/Lobby (FCPTYPES)

Type of access (FCPACCES)

Fire safety of flat (FCPESCAP)

Use of ground floor (FNOGRUSE)

% floor area non-res (FNORESAR)

Evidence of rats (FCUVERAT)

Falling between levels HHSRS (FHSBTLEV)

Appendix D: English Housing Survey surveyor briefing programme

EHS SQS AND REFRESHER BRIEFING MARCH 2019		
	Day 1 - SQS	
9.15-9.30	Welcome - SQS introdution	CB / RMS
9.30-12.00	Fieldwork of 1st property	RMs / CJ / IW
12.30-13.00	Uploading and validation of survey	CB / AS
13.00-14.00	Lunch	
14.00-16.30	Fieldwork of 2nd property	RMs / CJ / IW
17.00-19.00	Uploading and Validation of surveys	KD/ CB / JW / AS
19.00-20.00	Dinner	
20.00	Further validation and submission of data	KD/ CB / JW/ AS
	Day 2 - refrehser briefing	
09.00-10.30	SQS feedback	SN / RMS
10.30-10.45	Coffee	
10.45-11.20	EHS results, UK statistics	SN
11.20-12.00	Form / System changes	MC / JW
12.00-13.00	Lunch	
13.00-14.00	Form filling and SAP	JW / FT
14.00-15.00	The retrofit challenge	MC
15.00-15.30	Survey admin for 2018	RMs
15.30	Computer workshop (optional)/ leave	KD

Key:

Felden (blue)
Fieldwork (yellow)
Free (white)

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