SCOTTISH HOUSE CONDITION SURVEY
TECHNICAL REPORT 2009

Chris Martin,
Ipsos MORI Scotland

Scottish Government Social Research

Table of Contents

1 SURVEY OVERVIEW

1.1 The Scottish House Condition Survey (SHCS), commissioned by the Scottish Government, is the largest single housing research project in Scotland, and the only national survey to link the physical condition of Scotland's homes to the experiences of householders. It does this by linking household information gathered during a social interview with details from a physical inspection of properties conducted by a building surveyor.

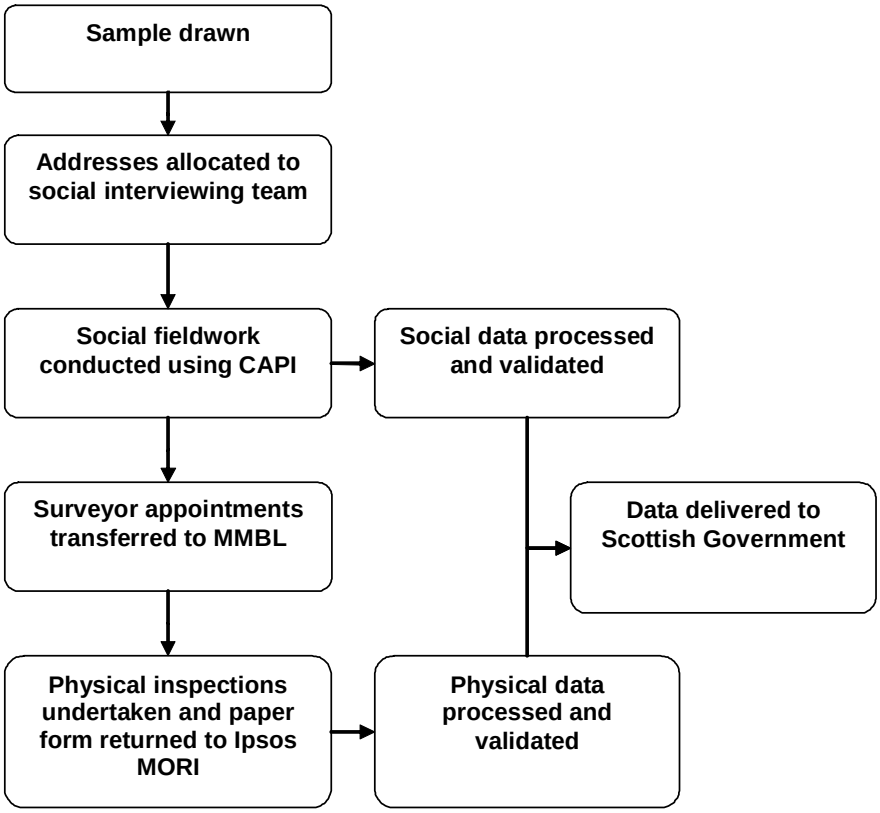
1.2 The key objectives of the survey are:

- To monitor the physical quality of Scotland's housing stock at a national level over time.
- To contribute to the understanding of the factors which influence the physical condition of the housing stock.
- To provide a benchmark against which outputs from local house condition surveys can be measured.
- To provide an information resource which can be drawn on for policy development in all areas of housing, such as fuel poverty and the Scottish Housing Quality Standard, which relate to individual households and dwellings and the relationship between them.
- To measure the energy efficiency, fuel use and green house gas emissions of Scotland’s domestic housing stock.

1.3 Originally, the SHCS was conducted roughly every 5 years. Ipsos MORI carried out the first SHCS in 1991, the second in 1996, and the third in 2002. In 2004, the Scottish House Condition Survey became a continuous survey, with fieldwork being conducted all year and every year. The contract for the 2003-2006 fieldwork was held by the Office of National Statistics. Following a competitive tendering exercise, the contract to undertake the survey between 2007 and 2009 was awarded to Ipsos MORI and MMBL. The nature of the survey remained unchanged with regard to the scope, coverage and methodology.

1.4 The primary target of the survey fieldwork was to achieve 3,000 paired interviews - a completed social survey interview with a full physical survey - a year nationally and 9,000 over the course of a 3-year period. The survey was based on a Scotland-wide random pre-selected unclustered sample. The process is summarised in Figure 1.1. An Ipsos MORI interviewer conducts a social interview with a householder. At the end of the interview, an appointment is made for a surveyor to call to conduct a visual inspection of the property. The physical survey form completed by a surveyor is then returned to Ipsos MORI for processing. Both the data from the social interviewing and the physical inspections are fully processed, cleaned and validated before being passed to the Scottish Government.

Figure 1.1: Summary of the SHCS process



1.5 This Technical Report covers fieldwork for the 2009 sample, and has the following structure. Chapter 2 outlines the sample structure and design. Chapter 3 outlines the social survey fieldwork, while Chapter 4 discusses the procedures for the physical survey fieldwork. Chapter 5 details the fieldwork outcomes to both the social and physical fieldwork. Chapter 6 summarises the data processing and validation routines. Finally, Chapter 7 details the weighting approach.

Acknowledgements

1.6 We are grateful for the support of the various people who helped to organise, manage and support the SHCS in 2009.

1.7 The project was overseen by a Project Management Group. We are grateful for their assistance. In particular, the research team would like to thank Ian Máté, Dave Cormack, and Pat Cairns at the Scottish Government for their support, guidance, and patience during the course of 2009.

1.8 The appointments for surveyor visits and the respondent helpline were organised by MMBL. We would like to express our gratitude to Steve Tidy,

Moray Leask and the rest of the team at MMBL in Edinburgh for their dedication and tenacity.

1.9 The fieldwork was undertaken by a team of around 60 interviewers and 50 surveyors, and managed by a number of Regional Managers. We would like to express our thanks for their commitment and determination.

1.10 Finally, without the goodwill and support of the householders who agree to fully participate in the survey, agreeing to both a 45 minute social interview and an inspection of their property, the SHCS would not be possible. Special thanks are due to 4,000 plus people who gave their time freely.

2 SAMPLING

2.1 The requirements of the sampling were as follows:

- That it should allow an achieved national sample of at least 3,000 paired interviews across Scotland annually.
- That it should provide at least 240 paired surveys over three years in any one local authority.
- That the sample should cover the whole of Scotland.
- That the sampling should not involve any element of clustering of addresses.

2.2 The SHCS differs from most other social surveys in that the primary unit of analysis is the dwelling. A dwelling is defined as, "... a unit of accommodation (usually a house or flat) where all the rooms and amenities (e.g. kitchen, bath/shower room and WC) are for the exclusive use of the household(s) occupying them. Amenities may be located outside the front door, but provided they are for the exclusive use of the occupants, the accommodation is still a dwelling." The following types of addresses are classed as ineligible:

- non-residential addresses
- residential accommodation not used by the household as their main address (e.g. a holiday home or second home)
- a caravan, houseboat or any temporary structure (any dwelling that does not have foundations)
- "Institutional" dwellings such as hospital staff quarters and student halls of residence, with the exception of dwellings that are totally self contained with kitchen and bathroom in an institutional building (for example, a self contained flat in a hotel for the hotel manager).

Sampling frame

2.3 The sample was selected from the Small User File of the Postcode Address File (PAF). This has been the most widely used sampling frame for general population surveys of this kind since the mid-1980s. It is compiled by Royal Mail from the list of all delivery points that receive fewer than fifty items of post each day. The principal advantages of the PAF, relative to alternatives such as the Electoral Register, are completeness (it is estimated to miss the addresses of only 2% of the adult population and is updated every three months) and lack of bias (those addresses which are missing from the PAF are not as likely to be concentrated among particular types of people).

2.4 Addresses that were sampled for the Scottish Household Survey were removed from the sample file in order to reduce respondent burden. Additionally, special Enumeration Districts (EDs) were excluded from the sampling frame. Such EDs account for just 0.5% of the population and primarily cover prisons, hospitals, and military bases.

2.5 The Small User File of the PAF is known to contain a number of addresses that are not residential (usually small shops and offices), that have been demolished, or that are unoccupied. The extent of this 'deadwood' in the PAF varies by area, but is usually estimated at between 9% and 13% in national samples of this kind.

Sample Design

2.6 In order to deliver a minimum number of responding paired cases (240 over three years), the SHCS over-samples in the smaller local authorities. As the annual sample size in each local authority is relatively small - with a target of 80 surveys annually in most local authorities - it is always likely that the achieved number of paired surveys will exceed target in some local authorities while there was a shortfall in others. As such, the targets set for 2009 in each local authority took account of the number achieved in 2007 and estimates of the number that would be achieved in 2008[1]. In local authorities where there was a shortfall in 2007 and 2008, targets for 2009 were initially set 5% higher than the required number to meet the three year target. This was done in order to reduce the risk that the three-year local authority targets would not be met. However, in local authorities where the targets were exceeded in 2007 and 2008, the initial targets for 2009 were *not* decreased in line with the surplus - this would have had a detrimental effect on the net effective sample size for Scotland as a whole. Instead, initial targets for these local authorities were set at a third of the three-year LA target. The initial targets for all local authority were then rounded to allow for four-day batches of addresses to be allocated to interviewers.

2.7 Table 2.1 shows the target number of interviews set for 2009. Overall, the target number of paired interviews was set at 3,384 across Scotland, ranging from 76 to 261 across local authorities.

2.8 The sampling assumptions underpinning the selection of addresses were set at local authority level and informed by data from previous years of the SHCS and the SHS. Across Scotland, the response rate target was set at 71%, and the conversion rate from social interview to paired interview at 80%. The expected level of deadwood across Scotland was estimated at 9%. Overall, based on these assumptions, a total of 6,732 addresses were drawn across Scotland.

2.9 In the autumn of 2009, close monitoring of fieldwork progress identified five areas where the 3-year targets were likely to be missed: Aberdeenshire, Fife, Moray, South Ayrshire and South Lanarkshire. As a counter measure, boost samples were drawn in these 5 local authorities. In total an additional 89 addresses were drawn.

[1] The sample for 2009 was drawn in the autumn of 2008, before the fieldwork for that year had been completed.

Table 2.1: Sampling assumptions by local authority area.

	Paired surveys achieved 2007	Paired surveys achieved 2008	Three year target	Paired surveys required to meet target	Target set for 2009	Initial addresses drawn	Boost addresses drawn
Aberdeen City	59	73	267	135	139	345	-
Aberdeenshire	89	78	261	94	98	170	19
Angus	71	69	240	100	103	190	-
Argyll & Bute	91	72	240	77	87	171	-
Clackmannanshire	97	88	240	55	79	126	-
Dumfries & Galloway	83	95	240	62	79	162	-
Dundee City	85	70	240	85	93	180	-
East Ayrshire	101	90	240	49	84	136	-
East Dunbartonshire	79	84	240	77	87	160	-
East Lothian	85	97	240	58	77	152	-
East Renfrewshire	82	81	240	77	82	168	-
Edinburgh, City of	148	176	570	246	261	624	-
Eilean Siar	63	84	240	93	98	220	-
Falkirk	80	82	240	78	85	152	-
Fife	120	113	420	187	192	361	13
Glasgow City	260	255	738	223	246	600	-
Highland	81	84	255	90	108	228	-
Inverclyde	89	89	240	62	77	133	-
Midlothian	72	79	240	89	93	189	-
Moray	72	63	240	105	106	198	28
North Ayrshire	95	94	240	51	85	168	-
North Lanarkshire	114	125	375	136	138	280	-
Orkney Islands	87	90	240	63	83	153	-
Perth & Kinross	85	81	240	74	82	160	-
Renfrewshire	97	95	240	48	78	140	-
Scottish Borders	81	89	240	70	82	144	-
Shetland Islands	104	83	240	53	82	128	-
South Ayrshire	96	73	240	71	80	133	7
South Lanarkshire	118	122	354	114	133	247	22
Stirling	92	83	240	65	76	126	-
West Dunbartonshire	88	85	240	67	84	168	-
West Lothian	69	73	240	98	107	220	-
Scotland	**3,033**	**3,015**	**9,000**	**2,952**	**3,384**	**6,732**	**89**

2.10 The sample was drawn as a stratified, one-stage, unequal probability sample of addresses. Addresses on the PAF were first sorted within local authorities by the Scottish Government's 6-fold rural/urban classification, and within this by postcode, giving implicit stratification by area. Addresses for each local authority were then sampled systematically using a fixed sampling interval from a random start point, both of which were proportional to the size of the LA. Therefore, within each LA, every eligible address had an equal chance of selection, but due to differences in LA size, there were differing probabilities of selection between LAs. The boost sample was drawn in exactly the same way as the initial sample, maintaining the geographical spread and the unclustered nature of the achieved sample.

2.11 Finally, addresses were grouped into batches for effective fieldwork. This was done by minimising the distance required to visit each address in a batch. Batches were then allocated to a particular fieldwork quarter. All quarters had, as far as possible, the same number of batches in each local authority to help ensure that the fieldwork was spread throughout the year.

3 SOCIAL SURVEY DATA COLLECTION

Use of CAPI

3.1 The SHCS social interview is carried out using Computer Assisted Personal Interviewing (CAPI). This offers a number of important advantages over traditional pen-and-paper interviewing for a survey of this kind, such as allowing greater complexity in questionnaire design and improved data quality.

3.2 In 2007, the SHCS script had been scripted using In2itive. In 2008, the interview was rescripted into Quancept, and provided the basis for the script used in 2009.

3.3 CAPI programming is integral to ensuring the quality of the data since it is in the programme that the main parameters of the data are defined. The CAPI programme defined:

- the acceptable range of responses at a question – if the respondent's age is recorded as less than 16 years either the age is wrong or the person is not eligible to be the respondent, the interviewer must either enter the correct age or return to respondent selection
- the acceptable relationships between questions – the routing – if response at A = 1, go to B, otherwise go to C.
- the acceptable relationships between response options at different questions - if person 3 is aged 4, the only permitted economic statuses are 'pre-school', 'at school', 'permanently sick or disabled' or 'other'.

3.4 The CAPI system also contained soft checks which highlight implausible but possible values for the interviewer to review and to either confirm that the value entered is correct or needs to be amended. Such examples included reports that a respondent smokes more than 100 cigarettes in a day. It is possible that they do but it is more likely that they smoke 10 and the interviewer has inadvertently added an extra zero.

Questionnaire structure and content

3.5 The interview was undertaken with a householder, or their spouse/partner, and collected information on households.

3.6 The social survey questionnaire covered the following topic areas:

- Household composition
- Tenure
- Neighbourhood environment
- Impact of noise
- Housing aspirations
- Repairs and work done
- Satisfaction with housing

- o Heating and fuel bills
- o Health, disability, and well-being
- o Existence and requirement for housing adaptations
- o Housing costs
- o Employment and education
- o Income from earnings, benefits and miscellaneous sources.

3.7 The original SHCS social questionnaire was developed for the 1991 survey, and has evolved slowly since then. No substantive changes were made to the questionnaire between 2008 and 2009[2].

3.8 At the end of the social interview, respondents were asked for their permission for a surveyor to visit and, where possible, a firm appointment was made. These details were then automatically passed on to MMBL's web-based surveyor appointment system for allocation to a surveyor.

Fieldwork

3.9 The fieldwork for the 2009 sample started in January 2009 and was completed in January 2010.

3.10 Fieldwork for the survey was organised on an on-going quarterly cycle. The fieldwork was scheduled to be carried out in the first two months of each quarter, in order to allow as much as possible of the physical survey fieldwork to be completed within the same quarter.

3.11 Before the first visit, addresses were sent an advance letter and leaflet outlining the purpose of the survey and the importance of participation. Interviewers were given the advance letters to post themselves in order that the letter would arrive a day or two before their first call. This helped to ensure that householders were likely to be aware of the letter and leaflet when the interviewer first visited.

3.12 Interviewers were required to make up to six calls at an address (an initial visit plus five 'call-backs'). They were required to make at least one call during an evening, and one at the weekend. In addition to the immediate reissue of contact sheets that had been wrongly completed or where the required number of call-backs had not been made, there was an on-going programme of reissuing 'non-contacts' in a bid to maximise the response rate.

3.13 On occasion, when an interviewer arrived at a sampled address, they would find that an address comprised more than one dwelling or household. In these cases, interviewers were required to select a household/dwelling at random using a Kish grid.

[2] The only changes to the script between 2008 and 2009 was the updating of soft and hard checks relating to the calendar year.

4 PHYSICAL SURVEY DATA COLLECTION

Physical survey team

4.1 The physical survey team comprised 51 surveyors and 6 Regional Managers The Regional Managers also acted as surveyors. The majority of surveyors and all of the Regional Managers had worked on the SHCS under the previous contract, and many had been with the team since the 2002 survey. Five surveyors joined the survey team in the course of 2009 and two surveyors left the team.

4.2 All surveyors were required to attend a two-day residential refresher briefing course. The training was led by representatives of the Scottish Government, with Ipsos MORI providing support. The briefing focused on visiting dwellings to practise conducting physical surveys in the field. Each surveyor undertook surveys of four test houses. The surveyors' results were then compared with model answers, and the results were passed back to the Regional Managers to help determine continuous training needs.

4.3 New recruits were required to attend a five-day residential training course, which incorporated fieldwork practice, so that all were fully proficient with the methodology used in the SHCS. The training was led by representatives of the Scottish Government, with Ipsos MORI providing support.

4.4 The role of the Regional Manager was to ensure the quality of the surveyor data. This included: the completion of the physical inspections; the use of the surveyor appointment system; return of all work and expense details to Ipsos MORI; and that the contractual obligations of the surveyors were being met. They oversaw the work of each of their surveyors, provided technical advice, attended surveyor briefings, and ensured that surveyors maintained quality and timeliness of output throughout the period of the survey.

4.5 Regional Managers accompanied surveyors on approximately 5% of surveys. The number of accompanied visits per surveyor was based on their assessment of individual surveyors. Programmes of accompaniments were designed so that the least experienced surveyors were accompanied first. Additionally, 5% of all full surveys (definition provided in section 4.13 below) were back-checked by Regional Managers.

Physical survey form

4.6 The SHCS physical survey is a dwelling-based survey of the home and surrounding area and uses a 10 page paper form. The form used in 2009 was unchanged from 2008.

4.7 The survey form included sections relating to:

- type and age of the dwelling;
- types of defects;
- types of amenities;
- heating systems and insulation;

- dwelling measurements;
- external construction and materials used;
- external repairs required; and
- Statutory Action and Tolerable Standards.

4.8 The Scottish Government provided surveyors with detailed manuals providing full guidance on each section of the form.

Types of physical survey

4.9 There were four different types of physical survey:

- full surveys;
- external only surveys
- dwelling descriptions; and
- abbreviated dwelling descriptions.

4.10 The type of survey required by the surveyors was determined by the outcome to the social interview (see Figure 4.1).

4.11 All surveyor appointments made by interviewers were allocated for a full physical survey. Only a completed social survey interview with a full physical survey constituted a paired case.

4.12 A full physical survey is a visual inspection of both the inside and outside of a property. The surveyor is required to complete all parts of the physical survey form. Surveyors were required to take four photographs to accompany each full physical survey: of the front and the back of the property and two of the surrounding area. The photographs were used in the data validation process (see Chapter 6).

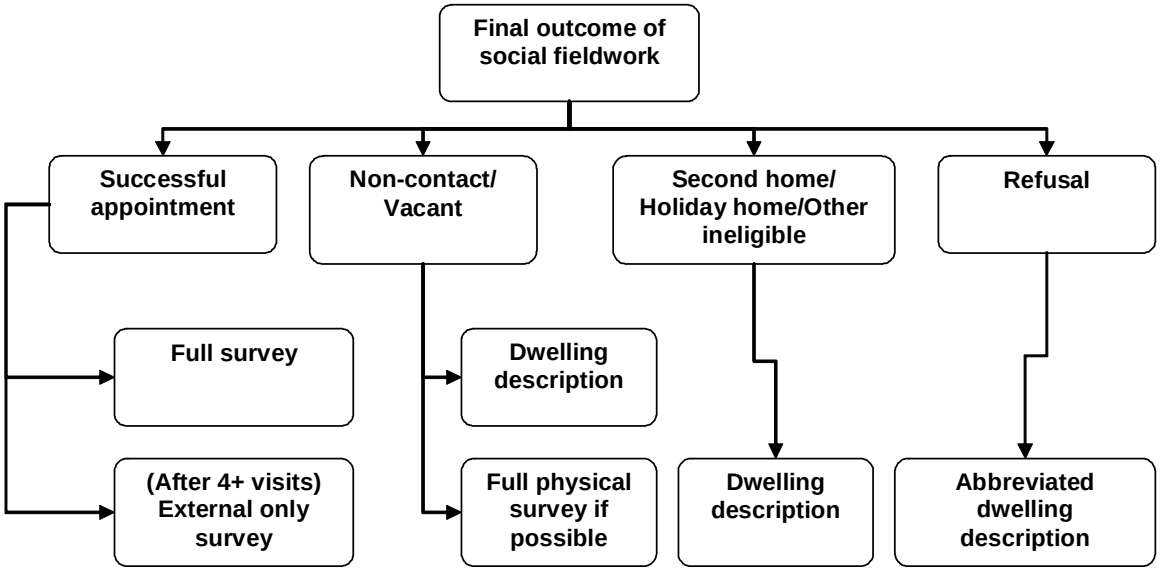
4.13 In a small percentage of cases, the appointment made for the surveyor visit was broken by a respondent. In these instances, surveyors were required to make a further 3 visits, with at least one visit during a weekend and one in the evening, in order to try to obtain a full survey. After 4 unsuccessful attempts to obtain a full survey, surveyors were required to complete a survey of the external elements of the dwelling only (an ‘external’ survey).

4.14 Vacant dwellings and dwellings where an interviewer had not made contact with a householder were allocated to surveyors for a dwelling description. This was a short physical survey that provides a summary of the property only. Surveyors were required to take one photograph of the property for a dwelling description and only required to make 1 visit to these addresses. On occasions, however, surveyors would make contact with a householder at these addresses. In these instances, they were asked to attempt to gain agreement for a full physical survey and pass contact information on to the fieldwork department for a social survey to be organised. An interviewer would then return and undertake the social survey, thereby completing a paired case.

4.15 Addresses out of scope of the survey, such as second homes and holiday homes, were also allocated for a dwelling description. For these addresses, surveyors were not required to attempt to try to obtain a full physical survey.

4.16 For addresses where a respondent had refused to undertake a social interview, surveyors were asked to undertake an abbreviated dwelling description. This type of survey only collected information on the age of the dwelling and the type of dwelling. If this information could not be collected from a public road, they were instructed not to complete any information at all and return a "non-survey".

Figure 4.1: Relationship between social outcomes and type of physical survey required.



Physical survey administration

4.17 The administration of the physical survey was as follows:

- At the end of the social interview, interviewers attempted to arrange a firm appointment for the surveyor inspection. Appointments were generally made for between 7 and 14 days after the interview date. Interviewers were asked to make appointments in batches, as far as possible, at intervals of one hour plus travel time between addresses. Interviewers left an appointment card with respondents that gave the appointment time and the telephone number of MMBL in case they wished to reschedule the appointment.
- When a respondent was unable to commit to a firm appointment time, interviewers were instructed to put in a dummy appointment time, collect the

respondent's contact details and indicate that this was not a firm appointment. MMBL would then attempt to arrange a surveyor appointment.

- Following download of the CAPI data, details of the appointments were automatically transferred to MMBL's secure web-based surveyor appointment system. Information sent included the date and time of the appointment, contact details, whether it was a firm appointment, and any other information that the interviewer deemed helpful to the surveyor (such as directions to the property)
- Details of addresses that did not result in a social interview were communicated to the MMBL website for allocation for an appropriate type of survey.
- MMBL staff then allocated appointments to surveyors. In advance of each of the fieldwork periods, surveyors were required to supply details of their general availability through MMBL's web-based surveyor appointment system to help with the allocation.

4.18 Staff at MMBL's Edinburgh office managed the day-to-day fieldwork process for the physical survey. Helpdesk staff managed communication between respondents and surveyors, booking or re-arranging appointments as necessary. Respondents, social survey interviewers and surveyors were able to contact MMBL using a dedicated telephone helpline and a SHCS survey email address.

4.19 The web-based surveyor appointment system was central to organising and monitoring the progress of the physical survey fieldwork. The website was used by surveyors, Regional Managers, MMBL staff and Ipsos MORI. All website users had their own password and were given access to different parts of the site, depending on their requirements.

4.20 Surveyors used the survey website to check the appointments that had been made for them, record outcomes of each appointment, record mileage, and to calculate payments due. The progress of individual cases could be viewed on the website by entering the unique case identification number. Additionally, the website system provided information on the progress of the fieldwork overall. Most appointments resulted in a full survey at the first surveyor visit.

Surveyor variability

4.21 In order to minimise the effect of variability between surveyors in completing the physical survey form, and to minimise the bias that this may have on estimates at local authority level, the physical survey fieldwork was subject to a set of allocation rules. These were developed by Communities Scotland originally and comprised the following rules relating to full surveys:

- Each surveyor must work in at least 2 local authorities in each year of fieldwork and at least 3 LAs over the three-year fieldwork period.
- No surveyor should complete more than 25% of the surveys issued in a local authority per year, with the exception of Highlands, Orkney, Shetland and Western Isles local authorities. Here the level was set at 33%.

- Each surveyor's allocation should contain a mixture of dwelling types approximate to the profile of the area they are working in, over each year of fieldwork.
- Each surveyor's allocation should contain a balance of urban/rural properties approximate to the profile of the area they are working in, over each year of the fieldwork.
- Each surveyor should conduct no more than a maximum number of surveys over each year of fieldwork. This maximum was set as 1.5 times the average number of full surveys issued each year i.e. about 90 surveys per annum.

4.22 In order to ensure consistency across surveyors, back-checks on 5% of responding households were conducted. Around 8% of all completed full surveys were selected, plus all properties that were found to be Below Tolerable Standard (BTS). This allowed for a failure to back-check at a proportion of addresses due to refusals and non-contact. The back-check sample was selected from all addresses where a full survey had been completed. These were sorted by surveyor and then by area and then sampled systematically using a fixed sampling interval. This helped to ensure that all surveyors' work was back-checked.

5 FIELDWORK OUTCOMES

Response to the social survey

5.1 Table 5.1 details the response to the social survey across Scotland. Overall, the response rate achieved was 67.2%. This was slightly lower than the target response rate[3].

5.2 Overall, 4,153 social interviews where achieved. The extent to which assumptions on ineligible addresses are accurate has an important bearing on the survey response rate and total number of interviews achieved. If there are more 'deadwood' addresses, the interviewers have a smaller pool of addresses from which to achieve the target number of interviews. Conversely, a smaller proportion of 'deadwood' addresses should make it easier to achieve the target number of interviews, but this target will be met with a lower response rate. The level of deadwood found in the 2009 sample was 9.4%, slightly higher than the estimated level of deadwood (9.0%).

Table 5.1 SHCS social survey outcomes, 2009 sample

	Frequency	Per cent	Valid per cent
Complete social interview	4,153	60.9%	67.2%
Interview/partial interview but data withdrawn	5	0.1%	0.1%
Refused at household	823	12.1%	13.3%
Refused by phoning office	196	2.9%	3.2%
Refusal by proxy	11	0.2%	0.2%
Broken appointment, no recontact	64	0.9%	1.0%
Contact with household, respondent unavailable	197	2.9%	3.2%
Occupied, no contact with household	468	6.9%	7.6%
Unsure if occupied, no contact with household	144	2.1%	2.3%
Too ill to participate	55	0.8%	0.9%
Away during fieldwork	32	0.5%	0.5%
Other non-response	32	0.5%	0.5%
Total eligible for inclusion	**6,180**	**90.6%**	**100.0%**
Property vacant	339	5.0%	
Property derelict/demolished	46	0.7%	
Second home/holiday home	105	1.5%	
Non-residential property/Institution only	96	1.4%	
Insufficient address/no trace	51	0.7%	
Other ineligible property (e.g. caravan, houseboat)	4	0.1%	
Total ineligible	**641**	**9.4%**	
Total issued addresses	**6,821**	**100%**	

[3] The Scottish Government introduced a revised version of the physical survey form in January 2010. So that surveyors were not required to use two versions of the form concurrently, SG requested that the social fieldwork for the 2009 sample should be stopped in early January. This limited the number of addresses allocated to the Quarter 4 sample that could be reissued to maximise the response rate

5.3 Table 5.2 shows the assumed and actual response rates, and the assumed and actual levels of deadwood, by local authority. Response rates were highest in Scottish Borders (81%), Orkney Islands (80%), and Inverclyde (76%) and lowest in Glasgow City (60%) and Edinburgh (57%).

Table 5.2 SHCS social survey outcomes against assumptions by local authority.

	Assumed response rate	Actual response rate	Assumed deadwood	Actual deadwood
Aberdeen City	61%	62%	10%	10%
Aberdeenshire	73%	68%	5%	6%
Angus	73%	67%	9%	9%
Argyll and Bute	76%	74%	18%	21%
Clackmannanshire	74%	65%	3%	5%
Dumfries and Galloway	76%	65%	12%	14%
Dundee City	71%	73%	11%	8%
East Ayrshire	76%	68%	7%	5%
East Dunbartonshire	67%	68%	3%	5%
East Lothian	69%	62%	6%	7%
East Renfrewshire	65%	65%	3%	8%
City of Edinburgh	60%	57%	10%	8%
Eilean Siar	76%	83%	22%	15%
Falkirk	72%	69%	5%	6%
Fife	74%	73%	6%	8%
Glasgow City	60%	60%	10%	11%
Highland	77%	63%	17%	14%
Inverclyde	77%	76%	11%	11%
Midlothian	65%	72%	6%	4%
Moray	74%	70%	12%	15%
North Ayrshire	69%	75%	13%	13%
North Lanarkshire	67%	67%	5%	8%
Orkney Islands	85%	80%	16%	9%
Perth and Kinross	70%	73%	12%	9%
Renfrewshire	69%	70%	5%	6%
Scottish Borders	79%	81%	7%	13%
Shetland Islands	86%	70%	12%	11%
South Ayrshire	73%	65%	7%	7%
South Lanarkshire	70%	64%	4%	8%
Stirling	79%	73%	10%	12%
West Dunbartonshire	70%	66%	11%	10%
West Lothian	71%	63%	6%	6%
Scotland	71.6%	67.2%	9.0%	9.4%

5.4 It is worth noting that the response rate and the level of deadwood recorded by interviewers was close to that used as the basis for the survey sampling in most areas. There was, of course, some deviation from the assumptions, reflecting sampling variability in the data used for sampling and the sampled addresses. In spite of the deviation from assumptions, using different assumptions in individual local authorities rather than assuming uniform response rates and deadwood levels improves the structure of the sample and should contribute to meeting fieldwork targets.

Response to the physical survey

5.5 Table 5.3 shows the response to the physical survey by local authority. Overall, a full physical survey was completed at 80.6% of properties where a social survey interview was conducted. This resulted in 3,346 paired cases across Scotland, against the required number of 3,000.

Table 5.3 Conversion rates from social survey to physical survey by local authority

	Conversion from social to physical survey	Paired Surveys
Aberdeen City	80%	156
Aberdeenshire	76%	92
Angus	87%	100
Argyll and Bute	83%	83
Clackmannanshire	86%	67
Dumfries and Galloway	85%	77
Dundee City	84%	102
East Ayrshire	83%	73
East Dunbartonshire	81%	84
East Lothian	80%	70
East Renfrewshire	76%	76
City of Edinburgh	79%	258
Eilean Siar	83%	129
Falkirk	87%	85
Fife	75%	187
Glasgow City	77%	247
Highland	79%	96
Inverclyde	83%	75
Midlothian	77%	101
Moray	71%	96
North Ayrshire	79%	87
North Lanarkshire	82%	141
Orkney Islands	87%	97
Perth and Kinross	84%	89
Renfrewshire	85%	78
Scottish Borders	77%	79
Shetland Islands	85%	68
South Ayrshire	88%	74
South Lanarkshire	75%	119
Stirling	85%	69
West Dunbartonshire	88%	88
West Lothian	79%	103
Scotland	**80.6%**	**3,346**

5.6 The overall conversion rate was determined by two factors – the number of social interviews with a surveyor appointment, and the number of surveyor appointments that result in a full survey. The proportion of households agreeing to a surveyor appointment at the end of the social interview was 90.3% across

Scotland. The proportion of surveyor appointments that resulted in a full physical survey was 89.3%.

5.7 As noted in the previous chapter, all eligible dwellings, together with vacant properties and holiday homes, were allocated to some form of survey: a full survey, a dwelling description, or an abbreviated dwelling description. The rationale for this was two-fold. Firstly, it allows the characteristics of the non-occupied and holiday home stock to be analysed. Secondly, it means that any non-response bias at the social survey stage by property type can be controlled for in the weighting strategy (see Chapter 7).

5.8 The key information collected in the non-full surveys – external surveys, dwelling descriptions and abbreviated dwelling descriptions – is the property type and property age. Overall, some form of physical survey was undertaken at 6,586 addresses, 99.4% of eligible properties (see Table 5.4). For 19 of the remaining 38 addresses no survey was carried out because an abbreviated dwelling description could not be undertaken from a public road after a refusal to the social interview or a refusal to a surveyor visit.

Table 5.4: Physical survey outcomes by social survey outcomes

	Full survey	**Dwelling description/ External survey**	**Non-survey**	**Total**
Successful Interview	3,346	793	14	4,153
Data withdrawn	1	4	0	5
Refused at household	1	817	5	823
Refused by phoning office	0	196	0	196
Entry to block/scheme refused by warden etc.	0	11	0	11
Broken appointment	1	63	0	64
Contact with household, respondent unavailable	1	196	0	197
Occupied, no contact after 6+ calls	0	468	0	468
Unsure if occupied, no contact after 6+ calls	0	144	0	144
Too ill to participate	0	55	0	55
Away during fieldwork	0	32	0	32
Other non-response	0	32	0	32
Property vacant	13	314	12	339
Second home / holiday home	0	98	7	105
All social survey outcomes eligible for a full or partial physical survey	*3,363*	*3,223*	*38*	*6,624*
Property not found	1	38	12	51
Property derelict/demolished	0	0	46	46
Non-residential property/Institution only	0	0	96	96
Other ineligible property	0	0	4	4
Total	**3,364**	**3,261**	**196**	**6,821**

Compliance with surveyor allocation rules

5.9 With only minor exceptions, the physical survey fieldwork met the surveyor allocation rules.

5.10 ***Rule 1: Each surveyor must work in at least two Unitary Authorities in each year of fieldwork and in at least 3 Unitary Authorities over the three-year fieldwork period.*** Of the 57 surveyors employed, 56 worked in at least 3 local authorities, with the remaining surveyor having worked in 2 local authorities areas prior to resigning.

5.11 ***Rule 2: No surveyor should do more than 25% of the (full) surveys issued in any Unitary Authority in any one year, with the exception of the Highlands and the three island Unitary Authorities, where no one surveyor should exceed 33% of all (full) surveys.*** There were six breaches of this rule, although by only a small amount in most cases. (see Table 5.5). The scale of the largest breach of the rule (+4.7% in Stirling) was lower than in any of the previous five years of fieldwork.

Table 5.5: Instances of surveyors exceeding the 25% limit within a local authority

Local authority	Percentage of full surveys completed by a single surveyor
Stirling	29.7%
East Ayrshire	27.4%
South Ayrshire	27.0%
Scottish Borders	26.6%
Clackmannanshire	26.5%
Fife	25.1%

5.12 ***Rule 3 & 4: Each surveyor's allocation should contain a mixture of dwelling types and a balance of urban/rural properties that approximate the profile of the area in which they are working in over each year of fieldwork.*** Table 5.6 shows the proportion of full surveys conducted by surveyor and property type. It confirms that each surveyor undertook surveys in a mixture of different dwelling types.

Table 5.6: Full physical surveys by surveyor and dwelling type.

Surveyor ID	Terraced /corner house	Detached house	Semi-detached house	Tenement flat	Other flat	Total
1	34%	21%	32%	4%	9%	100%
2	13%	19%	29%	30%	9%	100%
3	19%	19%	14%	34%	14%	100%
4	32%	22%	21%	12%	13%	100%
5	25%	24%	27%	13%	11%	100%
6	16%	22%	24%	26%	12%	100%
7	29%	24%	20%	20%	8%	100%
13	17%	19%	29%	31%	5%	100%
14	27%	15%	32%	16%	9%	100%
15	20%	30%	20%	18%	12%	100%
16	22%	19%	43%	5%	11%	100%
17	14%	17%	25%	22%	22%	100%
21	19%	26%	38%	15%	2%	100%
22	27%	21%	24%	11%	17%	100%
23	6%	29%	19%	38%	9%	100%
24	19%	28%	12%	26%	15%	100%
25	20%	22%	14%	26%	18%	100%
27	16%	18%	8%	39%	18%	100%
28	17%	10%	9%	50%	15%	100%
31	29%	18%	11%	23%	20%	100%
32	16%	19%	14%	46%	5%	100%
33	15%	25%	22%	18%	20%	100%
34	12%	12%	6%	49%	19%	100%
41	21%	15%	14%	43%	7%	100%
42	30%	14%	12%	32%	12%	100%
43	31%	19%	21%	18%	11%	100%
44	29%	31%	19%	8%	13%	100%
47	15%	23%	35%	19%	8%	100%
48	10%	7%	12%	57%	13%	100%
51	30%	16%	22%	19%	13%	100%
53	23%	16%	20%	27%	14%	100%
54	23%	19%	23%	23%	13%	100%
55	23%	10%	19%	31%	17%	100%
56	19%	15%	30%	27%	8%	100%
57	18%	18%	18%	39%	8%	100%
61	14%	21%	23%	28%	14%	100%
63	30%	22%	18%	16%	14%	100%
64	20%	20%	18%	24%	18%	100%
65	27%	22%	22%	16%	13%	100%
66	31%	17%	34%	6%	12%	100%
67	20%	27%	36%	11%	6%	100%
71	23%	24%	29%	10%	15%	100%
72	28%	21%	17%	22%	12%	100%
73	11%	22%	44%	11%	11%	100%
74	15%	19%	28%	27%	12%	100%
75	19%	18%	12%	35%	16%	100%
81	17%	25%	33%	21%	4%	100%
82	26%	21%	33%	9%	12%	100%
83	30%	22%	30%	13%	4%	100%

Surveyor ID	Terraced /corner house	Detached house	Semi-detached house	Tenement flat	Other flat	Total
87	22%	23%	23%	16%	16%	100%
88	28%	25%	10%	25%	11%	100%
89	12%	29%	17%	29%	12%	100%
91	11%	16%	31%	26%	16%	100%
92	16%	25%	33%	11%	14%	100%
93	22%	22%	39%	6%	11%	100%
97	28%	19%	18%	20%	14%	100%
98	33%	14%	13%	22%	18%	100%
Total	22%	20%	21%	24%	13%	100%

5.13 **Rule 5: Each surveyor should conduct no more than a maximum number of 1.5 times the average number of full surveys issued to each surveyor? each year.** The maximum of 89 surveys was not exceeded by any surveyor.

Three year local authority targets

5.14 The main three year survey targets were 3000 paired surveys in any one year (9000 over three years) and a minimum of 240 in any one UA over three years. As can be seen from Table 5.7, the target of 9000 paired surveys was exceeded by 394. The target number of paired surveys was met in all but three local authorities: Moray (shortfall of 9); Aberdeenshire (shortfall of 2)[4]; and East Renfrewshire (shortfall of 1).

Table 5.7: Full physical surveys by surveyor and dwelling type.

	Three year target	Paired surveys achieved 2007	Paired surveys achieved 2008	Paired surveys achieved 2009	Total paired surveys	Shortfall
Aberdeen City	267	59	73	156	288	
Aberdeenshire	261	89	78	92	259	*2*
Angus	240	71	69	100	240	
Argyll & Bute	240	91	72	83	246	
Clackmannanshire	240	97	88	67	252	
Dumfries & Galloway	240	83	95	77	255	
Dundee City	240	85	70	102	257	
East Ayrshire	240	101	90	73	264	
East Dunbartonshire	240	79	84	84	247	
East Lothian	240	85	97	70	252	
East Renfrewshire	240	82	81	76	239	*1*
Edinburgh, City of	570	148	176	258	582	
Eilean Siar	240	63	84	129	276	
Falkirk	240	80	82	85	247	
Fife	420	120	113	187	420	
Glasgow City	738	260	255	247	762	
Highland	255	81	84	96	261	
Inverclyde	240	89	89	75	253	
Midlothian	240	72	79	101	252	
Moray	240	72	63	96	231	*9*
North Ayrshire	240	95	94	87	276	
North Lanarkshire	375	114	125	141	380	
Orkney Islands	240	87	90	97	274	
Perth & Kinross	240	85	81	89	255	
Renfrewshire	240	97	95	78	270	
Scottish Borders	240	81	89	79	249	
Shetland Islands	240	104	83	68	255	
South Ayrshire	240	96	73	74	243	
South Lanarkshire	354	118	122	119	359	
Stirling	240	92	83	69	244	
West Dunbartonshire	240	88	85	88	261	
West Lothian	240	69	73	103	245	
Scotland	**9,000**	**3,033**	**3,015**	**3,346**	**9,394**	**12**

[4] Both Aberdeenshire and Moray were affected by severe weather in December 2009 and January 2010 and so final follow-up fieldwork was called off by the SG.

5.15 Table 5.8 shows the response rate to the social survey for each local authority over the period 2007 to 2009. Overall, the response rate across the three year period was 67.9%. The highest response rates were achieved in island and largely rural authorities: 81% in Orkney and Shetland, 79% in Eilean Siar, and 78% in Stirling. The lowest response rates were achieved in urban authorities; 60% in Edinburgh, 59% in Aberdeen City, and 58% in Glasgow. Comparing local authorities, there is no clear trend, with wave-on-wave fluctuations but no obvious pattern of improvement or decline.

Table 5.8: Social survey response rates 2007-2009

	Response rate 2007	**Response rate 2008**	**Response rate 2009**	**Response rate 2007-2009**
Aberdeen City	55%	59%	62%	59%
Aberdeenshire	71%	68%	68%	69%
Angus	69%	66%	67%	67%
Argyll and Bute	74%	67%	74%	72%
Clackmannanshire	73%	75%	65%	71%
Dumfries and Galloway	80%	74%	65%	73%
Dundee City	71%	66%	73%	70%
East Ayrshire	75%	69%	68%	71%
East Dunbartonshire	64%	73%	68%	68%
East Lothian	68%	66%	62%	65%
East Renfrewshire	63%	64%	65%	64%
City of Edinburgh	57%	67%	57%	60%
Eilean Siar	70%	84%	83%	79%
Falkirk	70%	71%	69%	70%
Fife	71%	67%	73%	71%
Glasgow City	58%	55%	60%	58%
Highland	79%	68%	63%	69%
Inverclyde	76%	78%	76%	77%
Midlothian	62%	72%	72%	69%
Moray	71%	69%	70%	70%
North Ayrshire	67%	67%	75%	70%
North Lanarkshire	65%	66%	67%	66%
Orkney Islands	87%	76%	80%	81%
Perth and Kinross	68%	65%	73%	69%
Renfrewshire	70%	68%	70%	69%
Scottish Borders	77%	74%	81%	77%
Shetland Islands	89%	82%	70%	81%
South Ayrshire	72%	64%	65%	67%
South Lanarkshire	70%	68%	64%	67%
Stirling	81%	78%	73%	78%
West Dunbartonshire	71%	68%	66%	68%
West Lothian	69%	64%	63%	65%
Scotland	68.9%	67.8%	67.2%	67.9%

5.16 Table 5.9 shows the conversion rate – the proportion of completed social surveys that resulted in a paired survey - for each local authority over the period 2007 to 2009. Overall, the conversion rate across the three year period was 79.7%. The highest conversion rates were achieved Clackmannanshire (87%), East Ayrshire (86%) South Ayrshire (86%) and Renfrewshire (85%), while the lowest were in Moray (73%), Highland (74%) and Fife and West Lothian (both 75%). Again, comparing local authorities, there is no clear trend, with wave-on-wave fluctuations but no obvious pattern of improvement or decline.

Table 5.9: Conversion rates from achieved social survey to paired surveys 2007-2009

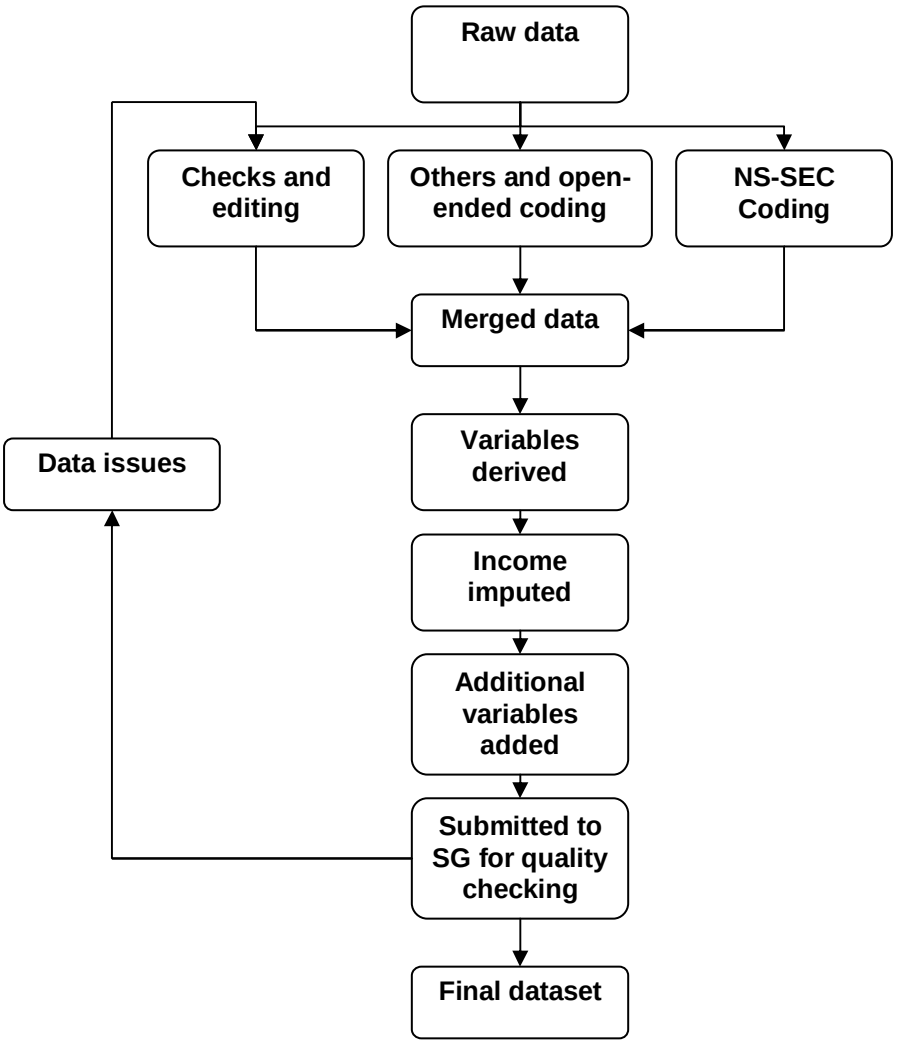
	Conversion rate 2007	**Conversion rate 2008**	**Conversion rate 2009**	**Conversion rate 2007-2009**
Aberdeen City	67%	77%	80%	76%
Aberdeenshire	82%	79%	76%	79%
Angus	77%	81%	87%	82%
Argyll and Bute	82%	74%	83%	80%
Clackmannanshire	91%	83%	86%	87%
Dumfries and Galloway	69%	81%	85%	78%
Dundee City	80%	73%	84%	79%
East Ayrshire	89%	87%	83%	87%
East Dunbartonshire	84%	83%	81%	83%
East Lothian	77%	91%	80%	83%
East Renfrewshire	77%	76%	76%	76%
City of Edinburgh	76%	77%	79%	78%
Eilean Siar	71%	82%	83%	80%
Falkirk	79%	83%	87%	83%
Fife	74%	75%	75%	75%
Glasgow City	77%	83%	77%	79%
Highland	68%	76%	79%	74%
Inverclyde	82%	78%	83%	81%
Midlothian	77%	74%	77%	76%
Moray	79%	70%	71%	73%
North Ayrshire	86%	85%	79%	83%
North Lanarkshire	75%	80%	82%	79%
Orkney Islands	73%	86%	87%	82%
Perth and Kinross	83%	84%	84%	84%
Renfrewshire	84%	85%	85%	85%
Scottish Borders	74%	86%	77%	79%
Shetland Islands	85%	75%	85%	81%
South Ayrshire	90%	80%	88%	86%
South Lanarkshire	77%	83%	75%	78%
Stirling	84%	79%	85%	82%
West Dunbartonshire	79%	79%	88%	82%
West Lothian	67%	78%	79%	75%
Scotland	**78.4%**	**80.1%**	**80.6%**	**79.7%**

6 DATA PROCESSING

Social data processing

6.1 The social data processing routines are summarised in Figure 6.1

Figure 6.1 SHCS social survey data processing procedures.



6.2 The raw data was initially split into 3 files. Data from the 'other (write in)' variables and open-ended data was extracted for coding separately. Additionally, the variables used to produce NS-SEC variables were extracted into a separate file for coding[5].

6.3 The main data file was subject to checks and editing involving:

[5] NS-SEC can also be automatically assigned to SEG codes, which allow a degree of backward compatibility with Socio-economic Group.

- Range checks, confirming that all variables were within the acceptable limits established for the question concerned

- Simple logic checks ensuring the relationships between questions were logical. For example, that the number of people answering a filtered question is equal to the number of people giving the appropriate response at the filtering question e.g. if 500 people say they smoke then the number of people giving a response to the number of cigarettes they smoke needs to be 500.

- Complex logic checks. These involved examining the relationships between variables and assessing the logic of combinations of responses. Combinations of age and working status, age and relationships to other household members, for example, were checked to assess the logic of someone being aged over 60 years and coded as the child of another household member.

6.4 The data then underwent 3 additional processes – calculation of derived variables (such as the age and sex of the Highest Income Householder) the merging of external variables (such as Scottish Index of Multiple Deprivation (SIMD) indicators and the 6-fold Scottish Government Urban/Rural Classification) and the imputation of income.

6.5 The edited data was delivered to the Scottish Government in June 2010, who ran further checks on the data. Any data issues identified by Scottish Government were discussed and, where necessary, corrected and the data processing routines were amended.

Imputation of income in social data

6.6 Within the SHCS, total net household income remains the main indicator of household income. This was defined as the total income from earnings, benefits and a variety of miscellaneous sources of the Highest Income Householder and their spouse, where applicable, with each component of income collected separately.

6.7 A proportion of respondents either did not know how much they received or refused to say how much they received. In order to rectify this non-response, and produce an accurate measure of total net household income, missing values were imputed. The process used was based on the imputation process developed by Scottish Homes for the 1996 Scottish House Condition Survey, and similar to the method employed on the Scottish Household Survey.

6.8 Missing income data was imputed for each component of income separately:

- 4 components of earnings (earnings from main jobs and all other jobs of Highest Income Householder and Spouse).
- 26 different benefit components
- 13 different components of miscellaneous income.

6.9 Before starting the imputation process, the raw data was fully cleaned. For income from benefits, the upper limit of entitlement for each benefit was calculated. Any cases which were above these thresholds were examined, and edited if necessary. It is possible that respondents over-estimate income from one source of benefit and under-estimate income from another. Therefore, in cases where the benefit level was marginally above the threshold, the amount was not edited, but the case was excluded from use as a donor case in the imputation process.

6.10 Unlike benefits, clear rules do not exist regarding upper and lower limits of earnings and sources of miscellaneous income. These were examined against key indicators - such as tenure, NS-SEC, and description of employment - and were either edited or excluded from the imputation process.

6.11 Imputation of earnings has the largest effect on total net household income because of the proportion of cases with missing earnings data and the fact that earnings are commonly the main source of household income. For main jobs, imputed values were calculated from a regression model that related earnings to a set of explanatory variables, such as age and sex, full-time or part-time employment, car ownership, tenure, receipt of means tested benefits, and NS-SEC. For imputation of second and subsequent jobs, Hot Deck imputation was used. In Hot Deck imputation, respondents were sorted into imputation groups according to likely determinants. Cases with missing data were donated values from cases with data which were in their imputation groups, according to the characteristics chosen.

6.12 Imputation of income from benefits was undertaken for each benefit separately. For benefits which were received by only a few people, no modelling could be undertaken and the median value of receipt for these benefits was imputed. For non-means tested benefits which are received by a significant number of respondents, entitlement levels were approximated using variables collected in the rest of the social survey interview. For example, Child Benefit is dependent on the number of children, and whether the recipient is a lone parent. For these benefits, Hot Deck imputation was used, with the imputation classes reflecting the entitlement rules as closely as possible. For means tested benefits which are received by a significant number of respondents, Hot Deck imputation was used, with the imputation classes reflecting entitlement rules as closely as possible. These were undertaken after imputation of earnings and other sources of income, as they were dependent on the income of the household.

6.13 Imputation of income from miscellaneous income was undertaken separately. Most miscellaneous sources of income were received by a small number of respondents and no modelling could be undertaken. The median value of receipt was imputed for these components. For components where modelling could be undertaken – investment income, and income from non-state pensions - Hot Deck imputation was used, with the imputation classes based on the variables in the models that had the most explanatory power.

6.14 Following imputation, income from all components were summed to create a total net household income variable. All households with a net total household income were set to ‘missing’ if the computed figure was less than £25 a week.

Although a small proportion of households will have had a lower income than this – and be living off savings or loans – it is likely that some households will have either under-reported receipt of benefits or earnings, or the imputation process has resulted in a low value being given.

6.15 Overall, imputation was undertaken for one or more component in 50% of households. After imputation, household income was missing for 1.8% of households.

6.16 With imputation, there is a danger that the donor groups may differ from those with missing information. While this factor can be minimised with careful specification, it can never be totally excluded. In order to guard against analyses that might be sensitive to the imputation procedures, a set of flag variables were created in order than analysts could identify cases and components where income had been imputed.

Physical survey data validation

6.17 The physical survey forms were returned to Ipsos MORI's Edinburgh office. All returns were checked for completeness and that they included the required number of photographs. Any form that failed these checks was returned to the surveyor for amendments.

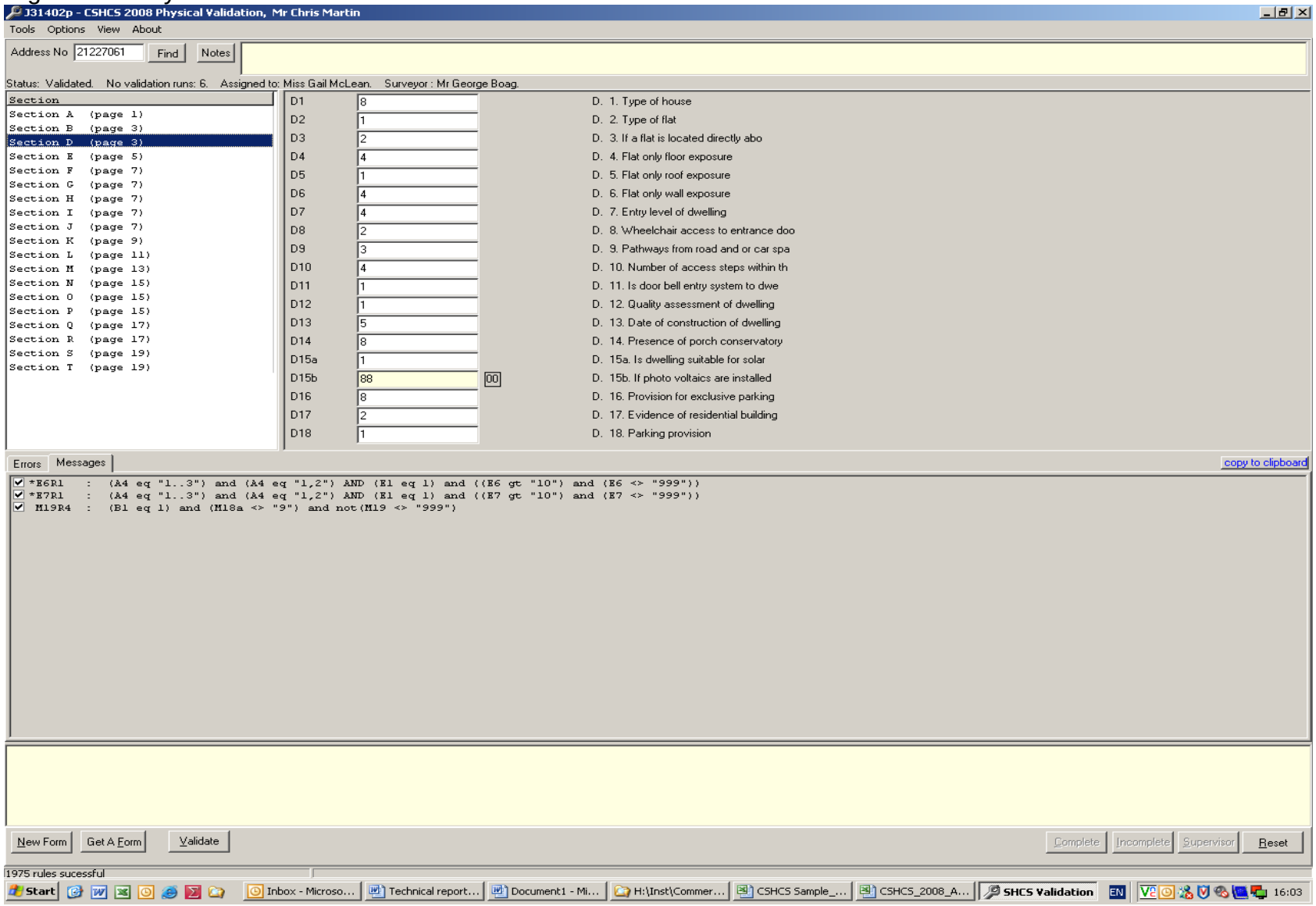
6.18 All forms were then scanned and filed in the Ipsos MORI office in Edinburgh. The scanned images were electronically transferred securely for data processing. Filed copies were stored until the data was signed off, and then securely destroyed.

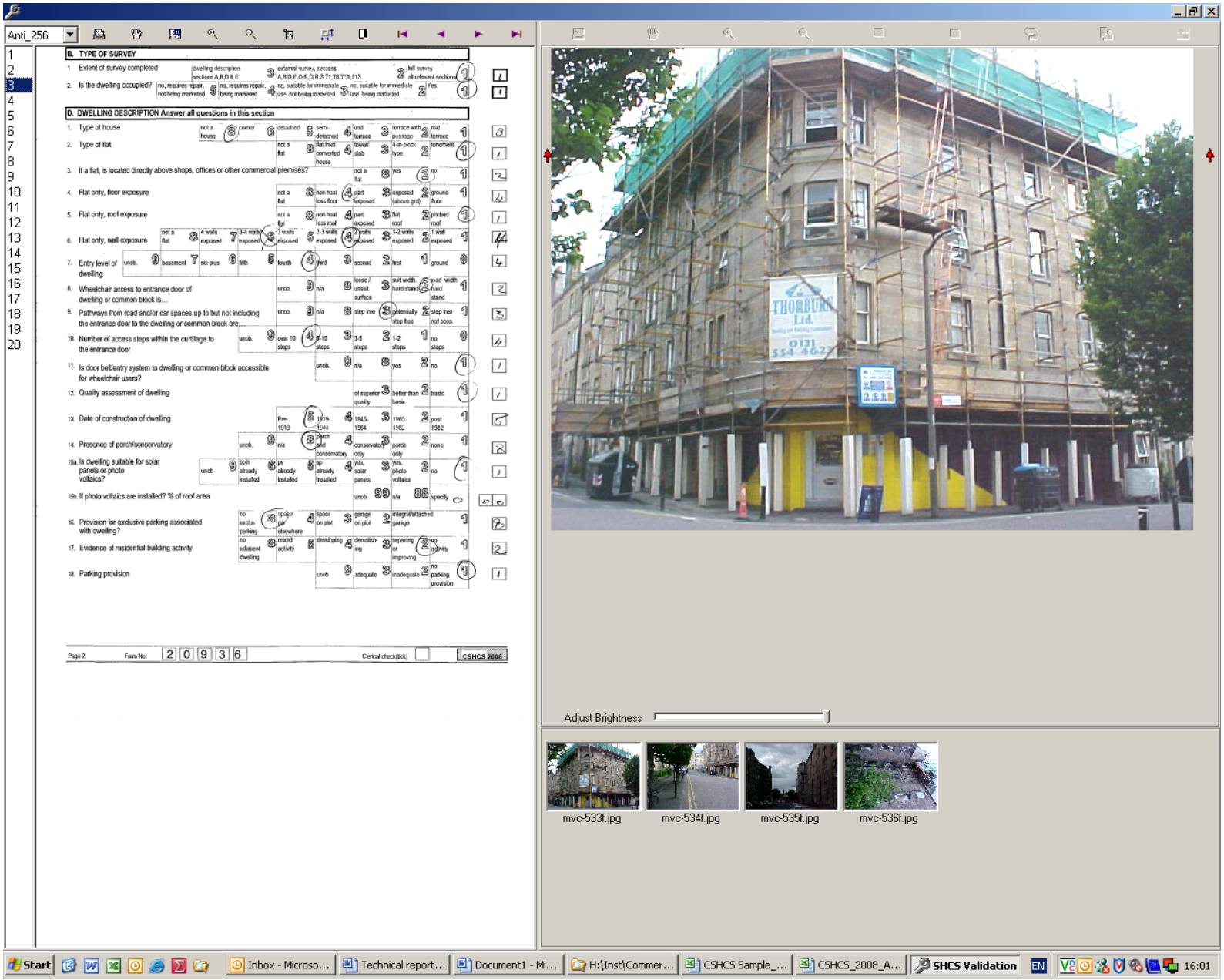
6.19 The data from the scanned forms, images of the completed forms, and photographs of the dwelling were all linked in the physical data validation system.

6.20 The validation system worked by applying a set of rules, provided by the Scottish Government, to the raw data, to ensure the accuracy and validity of each item of data entered. This included range checks on all fields, detailed consistency checks making use of the redundancy built into the survey schedule and plausibility checks on all appropriate items. Rules cross-reference different parts of the survey form (e.g. if the dwelling is a house, then aspects of common dwelling section should not be completed; if the house is a flat, then details for common parts should be present).

6.21 Validators were shown a list of all the errors picked up by the validation program. Additionally, they were shown a list of all the entered data, with a description of the variable next to each bit of data, and with the data split into representations of each page of the form. Validators had two monitors; one to show the data and the failed edits and the other to show the scanned images of the form and also the photographs of the property. Any page of the form can be selected and any section of the form can be enlarged by highlighting it. Photos can be enlarged to full screen by clicking on them.

Figure 6.2: Physical data validation screens




Anti_256
B. TYPE OF SURVEY
D. DWELLING DESCRIPTION Answer all questions in this section
Page 2
Form No: 2 0 9 3 6
Clerical check(tick)
CSHCS 2008
Adjust Brightness
mvc-533f.jpg
mvc-534f.jpg
mvc-535f.jpg
mvc-536f.jpg
Start
Inbox - Microso...
Technical report...
Document1 - Mi...
H:\Inst\Commer...
CSHCS Sample_...
CSHCS_2008_A...
SHCS Validation
EN
16:01

6.22 Corrections were then made and each form rechecked until it passed all edits. Changes to the data were made simply by overtyping the incorrect data where it was displayed. Validation of each form was completed when all errors had been eliminated or a supervisor from the Scottish Government determined that the dwelling genuinely falls outside the validation criteria. An audit trail of changes made to the data was kept.

6.23 The system is shown in more detail in Figure 6.2. The first screen shows the data and any errors. It shows the address number, the list of sections of the form, the variable names, data from the survey, any error messages, and has the buttons for saving the validated form and obtaining the next form for validation.

6.24 Each validation error can be set to allow an override by the validator by ticking the box next to the error message. However, only a few common errors are usually allowed to be cleared in this way by validators – most require the approval of a supervisor.

7 WEIGHTING PROCEDURES

7.1 This chapter describes the process used for deriving the weights for analysis. The weighting approach used in 2009 was consistent with that used in 2008.

7.2 The primary objective of the SHCS is to provide data that is representative of the eligible stock across Scotland, that is, dwellings that are used as a main residence. Two types of analysis are most commonly undertaken using SHCS: analysis using only the social survey data and analysis using both the social and physical data. Therefore, weights were required to provide estimates based on all social survey cases and to provide estimates based on all cases with paired surveys.

7.3 In sample surveys, two types of weighting are potentially necessary: weighting to compensate for unequal probability of selection (design weights) and weighting to counteract the effects of non-response bias (non-response weights). Accordingly, the weighting strategy employed adjusts for both the sample design and for patterns of non-response. The first stage was to calculate a non-grossing weight to adjust for disproportionality between local authorities. This then allowed patterns of non-response to be examined, and estimates for the use in the weighting calculations to be calculated. Finally, these were then used to create the weights using a rim weighting method.

7.4 As detailed in Chapter 2, in order to deliver a minimum number of responding paired cases, the SHCS over-samples in many of the smaller local authorities and under-samples in the larger local authorities. Additionally, because the drawn sample contains non-eligible addresses, the distribution of eligible dwellings across Scotland is also affected by differential levels of deadwood. Table 7.1 shows the estimated household distribution across Scotland[6], compared with the number of eligible dwellings in the 2009 SHCS sample (as detailed previously in Table 5.1). A non-grossing weight was calculated using these figures so that data on all eligible dwellings in the sample would be nationally representative.

[6] www.gro-scotland.gov.uk/statistics/publications-and-data/household-estimates-statistics/household-estimates-2009/index.html

Table 7.1: Household distribution across Scotland compared with number of eligible dwellings in 2009 SHCS sample

Local authority	Number of households	%age	Number of eligible dwellings	%age	Non-grossing weight for proportionality
Aberdeen City	103,438	4.4%	311	5.0%	0.88
Aberdeenshire	102,626	4.4%	177	2.9%	1.53
Angus	50,343	2.1%	172	2.8%	0.77
Argyll & Bute	41,422	1.8%	136	2.2%	0.80
Clackmannanshire	22,967	1.0%	120	1.9%	0.50
Dumfries & Galloway	68,161	2.9%	140	2.3%	1.28
Dundee City	69,228	3.0%	165	2.7%	1.11
East Ayrshire	53,459	2.3%	130	2.1%	1.08
East Dunbartonshire	42,915	1.8%	152	2.5%	0.74
East Lothian	42,385	1.8%	141	2.3%	0.79
East Renfrewshire	35,799	1.5%	154	2.5%	0.61
Edinburgh, City of	218,774	9.3%	572	9.3%	1.01
Eilean Siar	11,893	0.5%	187	3.0%	0.17
Falkirk	68,223	2.9%	143	2.3%	1.26
Fife	160,372	6.8%	343	5.6%	1.23
Glasgow City	281,743	12.0%	535	8.7%	1.39
Highland	100,906	4.3%	196	3.2%	1.36
Inverclyde	36,595	1.6%	119	1.9%	0.81
Midlothian	34,820	1.5%	181	2.9%	0.51
Moray	38,954	1.7%	195	3.2%	0.53
North Ayrshire	61,814	2.6%	147	2.4%	1.11
North Lanarkshire	143,896	6.1%	260	4.2%	1.46
Orkney Isles	9,206	0.4%	139	2.25	0.17
Perth & Kinross	64,654	2.8%	146	2.4%	1.17
Renfrewshire	79,026	3.4%	132	2.1%	1.58
Scottish Borders	51,640	2.2%	126	2.0%	1.08
Shetland	9,704	0.4%	114	1.8%	0.22
South Ayrshire	51,255	2.2%	130	2.1%	1.04
South Lanarkshire	136,389	5.8%	248	4.0%	1.45
Stirling	37,789	1.6%	111	1.8%	0.90
West Dunbartonshire	41,471	1.8%	152	2.5%	0.72
West Lothian	72,569	3.1%	206	3.3%	0.93
Scotland	**2,344,436**	100%	6180	100%	

7.5 Table 7.2 details the distribution among eligible dwellings of dwelling type, dwelling age and urban/rural classification by whether a social survey was achieved. These figures were based on the data weighted to account for disproportionality in the sample design and are therefore representative of Scotland as a whole. As can be seen, social surveys were more likely to be achieved with people living in houses, and people living outside of large urban areas. The final column in Table 7.2 shows the distribution of these three variables among all eligible dwellings, in other words, the distribution that would be found if there was no non-response bias.

Table 7.2 Response to social survey by dwelling type, dwelling age and urban/rural indicator among all eligible dwellings.

	Social survey Achieved	Social survey not achieved	All eligible dwellings
Dwelling type			
Missing	0.3%	0.2%	0.3%
Terrace/corner	22.6%	21.5%	22.2%
Semi	20.6%	19.4%	20.2%
Detached	22.1%	19.6%	21.2%
Tenement	21.8%	26.4%	23.3%
Other flat	12.7%	12.9%	12.8%
Total	100%	100%	100%
Dwelling age			
Missing	0.3%	0.2%	0.3%
Post 1982	21.7%	21.7%	21.7%
1965-1982	23.0%	23.1%	23.0%
1945-1964	23.1%	20.1%	22.1%
1919-1944	14.1%	13.4%	13.8%
Pre-1919	17.9%	21.4%	19.1%
Total	100.0%	100.0%	100.0%
Urban/rural indicator			
Large urban areas	37.5%	44.5%	39.9%
Other urban	31.2%	28.3%	30.2%
Accessible small towns	9.2%	8.1%	8.9%
Small remote towns	3.9%	3.7%	3.8%
Accessible rural	11.8%	10.4%	11.3%
Remote rural	6.4%	5.0%	5.9%
Total	100%	100%	100%

7.6 Rim weighting calculates weights by specifying known distributions of particular factors and, using an iterative process, adjusting the values of the weights until the weighted sample matches these targets. Rim weighting was undertaken using the distributions of dwelling type, dwelling age and urban/rural indicator among all eligible dwellings (detailed in the table above), together with the distribution of households across Scotland. This approach, therefore, produced weights that adjusted both for the disproportionality of the sample design and for patterns of non-response.

7.7 As a small proportion of cases with social survey data were missing information on dwelling type and dwelling age, for the production of the social survey only weights, the calibration targets included a “missing” category. The target distributions for the social weights are shown in the final column of Table 7.2 (together with the household counts shown in the second column of Table 7.1). As all cases with both a social survey and physical survey included data on dwelling type and dwelling age, the calibration targets were set excluding the missing values of dwelling type and age.

7.8 Both a grossing weight and a non-grossing weight were calculated for the social survey data, and for the social and physical paired data. The grossing weights give estimates totalling the number of households across Scotland, while the non-grossing weights give estimates that total the number of cases. It should be noted that, as the non-grossing weights adjust for the disproportionality in the sample design, weighted counts by local authority will be different from non-weighted counts. For calculating confidence intervals of estimates, non-weighted counts should always be used.