

3 Data collection

Introduction

- 3.1 A census is a massive and complex undertaking; years of planning and testing go into preparing it. Yet most people are aware only of the delivery of the 2011 Census questionnaire and filling it in. Among many other activities the questions and questionnaire had to be designed, tested and printed. The systems to capture the data on the questionnaires, interpret it and code it had to be designed, tested and built. Systems to process data, quality assure it, carry out the necessary statistical analyses and produce the tables and other outputs that users want, also needed to be designed, tested and built. A rigorous legal process had to be followed to enable the census to be conducted while ensuring it was not overly intrusive or burdensome. And, for the first time in a national census, ONS built its own unique address list of households and communal establishments (the census address register), developed an innovative questionnaire tracking system, and enabled householders to return their census information online.
- 3.2 A major influence in shaping ONS's data collection plans for 2011 was the increasing difficulty of making contact with households – especially (but not exclusively) in inner cities. These difficulties could be attributed to: an ageing population; growing numbers of one-person households; a more mobile population; changing work patterns; increases in buildings with controlled access; increased numbers of migrants; a less co-operative society; and certain groups of the population feeling disengaged. Inclusiveness was therefore a key driver in the strategy and planning for data collection.
- 3.3 The 2011 Census programme had several high level objectives. Many of these were to ensure the quality of the census, protect people's personal data, and make sure that the benefits of the census were fully exploited. Others made sure that the census gave the tax payer value for money, delivered on time and came in on budget. To support these the field operation's objectives were to maximise the overall response rate and minimise any variation in response rates between, and within, local authority areas. To help achieve these ONS set several targets for parameters such as timing, security and confidentiality, cost, value for money, and quality.
- 3.4 For the field operation (which handled the delivery and collection of the census questionnaires) the critical targets were the response rates. ONS set these at a level that would give users confidence in the quality of the census outputs. The target response rates that the field operation aimed for were:
- an overall response rate for England and Wales of 94 per cent, and
 - that no local authority should have a response rate below 80 per cent

Both of these targets were achieved.

Lessons learned from the 2001 Census

- 3.5 Planning for the field operation of the 2011 Census began in 2003. Each census programme has built on lessons learned from previous censuses, as well as anticipating changes in society, technology and the environment. After the previous census, in 2001, there were reports published by the National Audit Office (NAO)⁸, Treasury Select Committee (TSC)⁷⁵, the House of Commons Committee on Public

Accounts⁹ and the then Statistics Commission as well as by ONS itself. ONS considered the lessons from these and previous censuses in the design and development of the 2011 Census. The issues encountered in 2001, in particular, informed some fundamental changes to the 2011 Census design and the structure and management of the large field force. These are described in more detail in this chapter.

- 3.6 ONS assessed all the proposed design changes through many tests covering a few hundred to a few thousand households, a large-scale field test of some 100,000 households in 2007, and a rehearsal of more than 130,000 households in 2009 (see chapter 2). This testing programme enabled processes and procedures to be refined and ensured that 2011 Census design decisions were evidence based.

Address register

- 3.7 In 2001, census questionnaires were hand delivered by field staff. However, the address list used then had become out of date. There were two main consequences of this. The first was that some field staff areas had either very large or very small workloads. The second was that, in areas of significant change, staff had to spend considerably more time updating their record books, which had not been allowed for.
- 3.8 For these and other reasons 2011 Census questionnaires were posted out to all households (but still hand delivered, as before, to communal establishments and some special population groups). This required an address register to ensure accurate posting and effective management of the data collection operation. However, as noted at paragraph 2.183, in the absence of a single national address register, ONS had to develop its own list using data from three national datasets: Ordnance Survey's Address Layer 2 (AL2) product; Royal Mail's Postcode Address File (PAF); and the National Land and Property Gazetteer (NLPG).
- 3.9 The address register used was 'cut' three months before census day, and included some properties under construction that were expected to be built by census day. The address register enabled questionnaires to be uniquely identified and linked to an address before the operation started.

Post back

- 3.10 In 2001 people were, for the first time, able to return their completed questionnaire through the post. Royal Mail then collected and sorted these, returning them to the appropriate local census manager. There were a number of issues with this approach that had significant consequences. There were sometimes long delays in the complex Royal Mail sorting process, because completed census questionnaires had to be sent from regional mail centres to the correct local delivery offices for collection by field staff. This resulted in other field staff spending time following up questionnaires that had already been returned.
- 3.11 For 2011, census questionnaires returned by post were receipted by Royal Mail and then delivered direct to the central processing centre. This receipting process ensured that ONS knew that a questionnaire had been returned while it was still in the postal system.

Recruitment and training

- 3.12 In 2001 the recruitment and training of field staff had been carried out internally. ONS recruited the top two tiers of field staff, who in turn recruited and trained the many enumerators. While effective in some areas, this cascade approach was considered unsuccessful. As noted at paragraph 2.336, there had been inconsistency in field staff training, poor communication and conflicts in the appointment process.
- 3.13 Another issue had been the appointment of insufficient numbers of staff in some areas. The lowest recruitment rates achieved had tended to be in large urban centres – which were also the hardest areas from which to get census returns. As a result, staff in the hardest areas also had the largest workloads.
- 3.14 Finally, all the frontline field staff in 2001 had been in one grade of job, known collectively by the traditional term ‘enumerator’. They had to be a ‘jack of all trades’, covering questionnaire delivery, collection from non-responding households, and special enumeration issues. For 2011 ONS created specific graded jobs for these different tasks, with specialised training provided for each job.
- 3.15 Also, for 2011, ONS recognised that its core skill was not in mass recruitment and training, nor in operating major short-term payroll systems. So the recruitment, pay and training of field staff was outsourced to one supplier – Capita Business Services (see paragraph 2.337). Training consisted of role-specific instructions and e-learning, which had to be passed before progression to role-specific classroom training. This meant that staff attending classroom training should all broadly have the same level of understanding. Field staff had specialised roles, with their own role-specific training. Collectors were employed to follow-up non-responding households, and special enumerators were employed to deliver and collect from communal establishments.

Payroll

- 3.16 The payroll system in 2001 had been outsourced as a single contract and did not deliver a robust, functioning service. Many field staff had been paid incorrectly or paid late, and some had been overpaid. Dozens of staff from elsewhere in ONS had to be transferred to support the payment of temporary field staff, and it took several months to resolve the issues. Evaluation had identified that the procurement had not been as robust as it could have been, and that the remuneration solution had been very complex.
- 3.17 For 2011 the census payroll was outsourced as part of one combined and far better managed contract, covering recruitment, pay and training.

Field management information

- 3.18 The system implemented to capture progress in the field in 2001 had not been robust enough for the scale of the operation. As a result HQ staff were not aware of some progress issues until the field operation had been completed.
- 3.19 For 2011 ONS developed a questionnaire tracking (QT) system. Each paper questionnaire was uniquely bar-coded and these bar codes were read either as they passed through the postal system or when a householder responded online. This information was captured on the QT system, providing an up-to-date report (usually within 24 hours) on whether a household had made a return or not.

Design of the field operation

3.20 ONS designed the field operation to maximise the likelihood of achieving the objectives and quality targets, to minimise the risks, and to identify operational problems promptly so that remedial action could be taken in time. The main field operation comprised four distinct activities: delivery, collection, follow-up of non-responders, and special enumeration.

Delivery phase

3.21 For the first time in a census ONS used the postal service to deliver questionnaires to households in all areas. For other types of accommodation, including communal establishments, special enumerators delivered questionnaires by hand (see below). Post-out was used for a number of reasons, but primarily because it reduced the costs of delivery and enabled ONS to re-design the field operation around the follow-up activity rather than, as previously, around the delivery workload. It also allowed ONS to focus more resources on non-responding addresses. Moreover, in 2001 many census enumerators had been unable to contact householders and had ended up simply posting the questionnaire through their letterboxes.

3.22 ONS thoroughly tested the posting out of questionnaires in the census test of 2007 (see paragraphs 2.243 to 2.251). This revealed a small drop in initial response rates in some of the harder-to-count areas – but this was offset by the additional follow-up resource that could be allocated. So ONS decided initially to post out to all but the five per cent of areas where the lowest response rates were anticipated. The extra effort needed to get responses was allowed for when estimating the number of field staff required.

3.23 By the time of the rehearsal in 2009, analysis of the returns suggested that the detrimental impact of post-out had disappeared. Additionally the hand delivery to just five per cent of the addresses proved to be costly, time consuming, and increased risk elsewhere because it made the operation more complex. As a result ONS decided to move to a fully postal delivery, other than for communal establishments and certain special population groups (see paragraphs 2.326 to 2.327).

Collection phase

3.24 The public could respond to the census in several ways, by:

- completing the paper questionnaire and posting it back in the prepaid envelope
- completing an online return (each paper questionnaire had a unique internet access code that let the householder enter the census website securely and complete their questionnaire online; this code linked their online return to their address – see paragraphs 3.154 to 3.180), and
- handing their completed paper questionnaire to census staff on the doorstep

3.25 A questionnaire tracking system (QT) was developed as a direct consequence of lessons learned from the 2001 Census. Each household/address was allocated a unique code that enabled every questionnaire to be tracked, in real time, through the several stages of the field operation.

- 3.26 Paper questionnaires were uniquely bar-coded, and the codes were read as they passed through the postal system, usually within 24 hours. This, and similar information relating to an online completion, generated receipt information that was captured on the QT providing up-to-date information about which households had made a return and which were still outstanding.

Following up non-responders

- 3.27 The use of post-out and post-back, and online completion was a very cost effective way to enable households to make a return with minimal effort. As a result ONS could target its field resources at those unwilling or unable to make a return without support and/or encouragement.
- 3.28 In effect the entire field operation was designed to focus effort and resources on non-responders by:
- changing the field staff roles (and training) to concentrate primarily on collection, and
 - having flexible workloads so that field staff were not assigned to one specific area
- 3.29 The follow-up of non-responders started 10 days after census day. Experience of the 2001 Census indicated that this was the time when the rate of unprompted returns started to reduce. Starting the follow-up earlier risked field staff chasing-up people who were going to respond anyway; starting later risked reducing the opportunity to make contact in time and persuade people to respond before the separate fieldwork for the Census Coverage Survey (CCS) started (see chapter 4).
- 3.30 Field staff were issued with lists of the non-responding households logged on the QT system. The objective was to obtain a return from each of these households. Field staff could help those willing to complete the questionnaire (explaining the questions, providing translation or advice), or persuade the unwilling to take part (by reminding them why the information is important to them and their community and, if necessary, mentioning the compulsory nature of the census). This activity continued for four and a half weeks, giving time to make repeated visits to households where no contact had been made.
- 3.31 The prompt receipting both of paper and online returns gave field staff up-to-date information on non-responders that enabled them to target their efforts. To meet the objective of minimising differential return rates between areas, field staff worked flexibly within their co-ordinator's area rather than in individual fixed areas, focusing on visiting non-responding households in areas with the lowest return rates.
- 3.32 In addition to field staff visits, 2.6 million reminder letters were sent between 5 April and 27 April 2011 to 1.6 million households that had not made a return. Other methods such as additional publicity and community liaison were also used to help obtain a response.
- 3.33 The non-response follow-up operation stopped on 6 May, six weeks after census day, and the CCS started on 9 May. The CCS was an independent survey to assess who the census had counted and who it had missed in a sample of one per cent of postcodes (around 340,000 households – see chapter 4). This information was used to help produce the final census population estimates. It was particularly important that the CCS did not overlap with the census because the underlying methodology relied on the two exercises being independent of each other.

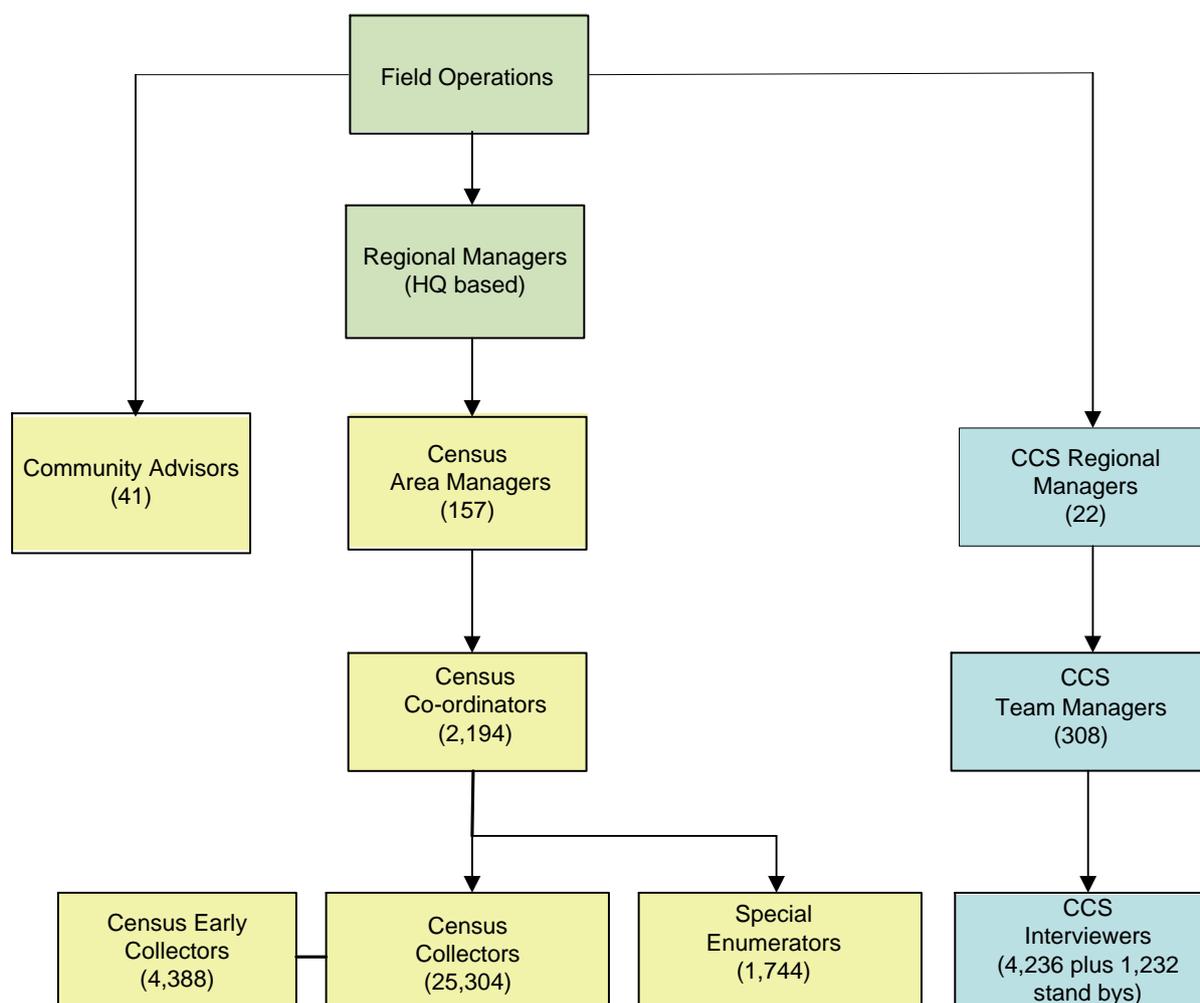
Special enumeration

- 3.34 Communal establishments (CEs) are places providing managed residential accommodation such as care homes, military barracks and student halls of residence. Each CE was given two types of questionnaires: an 'Individual' questionnaire for each person (with the same questions that individuals in households completed), and a second 'Communal establishment' questionnaire for the manager to complete (detailing the nature of the establishment and the number of residents).
- 3.35 ONS delivered these questionnaires by hand to all CEs. The majority were delivered by special enumerators – staff working solely on CEs and trained for the specific challenges of enumerating such establishments.
- 3.36 The CE delivery operation started on Monday 7 March, three weeks before census day, and continued up to census day itself. CE questionnaires were collected by census staff rather than being posted back. This was primarily to ensure good coverage (the special enumerator could check that the questionnaires collected matched those they expected to collect). The special enumerators obtained information about online returns from the QT system (via the census co-ordinator).
- 3.37 The CE collection phase continued until 16 April, three weeks after census day. Repeat collection visits were made as needed and extra assistance offered, along with persuasion to individual residents and managers as necessary. Post-back was used for any questionnaires still outstanding at the end of this phase of the operation.

Structure of the field force

- 3.38 As in previous censuses the structure of the field force was hierarchical, with the number of managers based primarily on ratios of field staff (collectors and special enumerators) to managers. Other factors influencing the numbers of managers included the geographic size of the area and the number of local authorities in it. Figure 3.1 illustrates the field staff structure (for both the 2011 Census and the CCS) along with the numbers of field staff required for each role.

Figure 3.1 Field staff structure and numbers for the 2011 Census and Census Coverage Survey



Regional management team

3.39 The field force were managed and supported by a regional management team (RMT) based at census HQ. This team was divided into 12 regions: 10 English regions plus Wales, but with the London region divided into three regions of its own. The RMT was a valuable interface between the area managers and the rest of census HQ, and the team regularly visited managers in their regions to exchange information and help focus local activities. The RMT also monitored return rates and ensured that each area manager was responding appropriately to their evolving local situation. They also helped area managers to resolve technical enumeration queries and operational issues.

Area managers

3.40 The field force was headed locally by 157 census area managers employed for eight months prior to census day and for approximately two months afterwards. From August to December 2010 the area manager's role was to:

- liaise with the local authorities to exchange knowledge

- build effective relationships with community groups and encourage their participation in the census, and to
- work with the local media

Although these tasks were quite separate from the field operation, they were important in ensuring that the follow-up operation went smoothly.

- 3.41 From January 2011 the area managers concentrated more on managing their local field force during the follow-up and special enumeration activities. This work included the direct line management of approximately 15 census co-ordinators. During the follow-up area managers used the QT system to monitor progress across their areas and target resources to those parts with the lowest rate of returns. They were also responsible for resolving any local operational problems, supported by the RMT.

Census co-ordinators

- 3.42 Some 2,194 census co-ordinators were employed from 7 February to 27 May 2011. The co-ordinator was the first-tier field manager, responsible for overseeing the operation in defined parts of their area manager's boundary. On average they managed a team of 17 collectors, directing their resources to achieve the highest possible return rate consistently across their area.
- 3.43 Co-ordinators made daily use of the QT system via laptop computers. They used the system to generate follow-up workloads for their teams, and carried out frequent activations and de-activations of questionnaires and addresses to ensure local information remained up to date. Around half of the co-ordinators also managed special enumeration activities in their areas.

Census collectors and early collectors

- 3.44 A total of 29,692 collectors were needed to carry out the follow-up work from 6 April to 6 May 2011. Of these 4,388 were assigned as 'early collectors' who started work on 21 March (two weeks before the main census collection phase) and then stayed on to work as census collectors. The early collectors' main task was to visit householders who had rung the census helpline in need of support. They were managed by the co-ordinators.
- 3.45 Collectors were responsible for making direct contact with those householders who had not returned their census questionnaires. On making contact, they needed to: establish the reason for the non return; answer queries; offer assistance; issue replacement or continuation questionnaires; confirm the number of households or usual residents; and, if necessary, persuade householders to take part. Where they encountered an outright refusal to return a completed questionnaire this was recorded and reported as the first stage of the non-compliance procedure.
- 3.46 To maximise the chances of finding people in, collectors were required to make visits at different times of the day and on different days of the week; 60 per cent of their hours had to be worked in the evenings or weekends – the times when more people are at home.

Community advisors

- 3.47 Community advisors were appointed to work in a liaison role with key ethnic minority and community groups (see paragraphs 2.224 to 2.226) from 9 August 2010 to 27 May 2011. ONS appointed 41, working part-time either 15 or 25 hours a week. Their language skills and understanding of specific local population groups were needed to help engage the public in the census (see chapter 2). They liaised directly with their specific community, and worked alongside the area managers, but reported directly to census HQ.

Size of the field staff

- 3.48 In the 2001 and previous censuses, enumerators were allocated a fixed geographical area (the enumeration district or ED) to deliver and collect questionnaires, and to follow-up households from which returns had not been received. The size of the EDs had been based mainly on the number of questionnaires to be delivered with, typically, fewer addresses allocated to staff in inner cities and sparse rural areas. Communal establishments (CEs) had been included with the exception of very large establishments which were designated EDs in their own right. The main driver for the numbers of field staff and their geographic allocation had been, therefore, the number of delivery addresses.

- 3.49 The design of the 2011 Census required a different approach, because of:

- the removal of the delivery task from the enumerator role (hence the renaming to ‘census collector’)
- the separation of special enumeration (the counting of CEs) from the general household enumeration
- the move to a team approach, with a team of collectors working across a larger census co-ordinator area, rather than each working individually in fixed areas, and
- the objective of achieving both a high overall return rate and a minimum rate in each local authority (easier to achieve in some areas than others)

- 3.50 The approach for 2011, therefore, was to work out what resources would be needed for the follow-up of non-responders within small geographic areas (the lower super output areas – LSOAs), which averaged around 750 households. These LSOAs were then combined to form 2,194 census co-ordinator areas that were expected to have roughly equal follow-up workloads and which required 15 or 16 collectors on average. Co-ordinator areas were then combined to form 157 area manager areas. When setting the co-ordinator and area manager area boundaries various rules were applied to ensure areas were aligned to administrative geographical boundaries (such as wards and local authorities). The main challenge was, therefore, to estimate the amount of effort required at the LSOA level. Accordingly ONS modelled the amount of follow-up resource required to achieve minimum return rate thresholds for each LSOA.

- 3.51 The model calculated the number of staff needed based on the interaction of three factors:

- an estimate of how many households would return a questionnaire without intervention (that is, the initial return rate at 6 April 2011)
- an estimate of how successful a collector would be in getting a questionnaire from each visit during follow-up, and

- an estimate of how long each visit would take given the type of area (for example, journey times between addresses in rural versus urban areas)

Estimation of return rate

- 3.52 To estimate workload size ONS had to estimate the number of households that would require follow-up in order to provide a response. Analysis of the 2001 Census revealed that the rate at which questionnaires were returned dropped sharply 10 days after census day, suggesting that this date would be optimal for deploying census collectors. So the field work to follow-up unreturned questionnaires was planned to start on 6 April 2011.
- 3.53 Estimating the proportion of households that would not have returned their census questionnaire by this date was carried out in three stages.
- 3.54 Stage 1 involved calculating an initial estimate of the final return rates for every LSOA based on the factors associated with low return rates in 2001, such as: ethnicity; unemployment rates; age; crime levels; house price change; and housing density. ONS published the methodology for predicting return rates in February 2010.
- 3.55 Stage 2 required adjusting these predicted final return rates to remove the effect of follow-up in 2001 (this was an estimate based on Royal Mail postal return rate data from 2001). This showed that, of all the questionnaires finally returned, around 82 per cent were returned by 10 days after census day – that is, without any intervention on the part of the field staff.
- 3.56 Stage 3 - making a final adjustment to take account of the impact of post-out, a design change since 2001. There were no data to allow the impact of this design change to be assessed under live census conditions. However, ONS did assess its impact during the 2007 Test, finding that, by day 10, postal delivery had achieved 87.5 per cent of the return rate achieved by hand delivery. Consequently this meant overall postal delivery further reduced the day-10 return rates estimated at stage 2 by a factor of 12.5 per cent.

Estimating success at follow-up

- 3.57 Every LSOA was classified into a hard-to-count (HtC) category based on the estimate of the 2011 return rates described above.

HtC 1 – the easiest 40 per cent of LSOAs

HtC 2 – the next 40 per cent

HtC 3 – the next 10 per cent

HtC 4 – the next 8 per cent

HtC 5 – the hardest 2 per cent of LSOAs

For each HtC group ONS estimated the likelihood of a follow-up visit generating a return. These estimates were based on data and experience from other surveys that ONS conducts, which clearly show that the probability of getting a return reduces after each unsuccessful attempt.

- 3.58 From these estimates ONS calculated the number of visits likely to be required to reach any given return rate. Each area's target return rate was varied by its HtC category. The targets were then optimised by balancing the requirement to reach a high overall return rate (target of 94 per cent) with the minimum threshold rate in

each local authority (target of 80 per cent minimum). Finally an element of caution was added to the assumptions about the probability of getting a return from each contact attempt in the HtC 3 to 5 areas. This gave further assurance that this planning would meet the objective of a minimum 80 per cent return rate in each local authority area.

- 3.59 The number of estimated visits required increased greatly from HtC 1 to HtC 5 through a compound effect. In a HtC 5 LSOA, more first visits would be needed because of lower initial return rates. These were expected to be less successful than in HtC 4 LSOAs, so more second visits would be required (in total and proportionately), and so on for all HtC categories. This gave big differences in the total number of visits expected for the harder and the easier areas.

Estimating time per visit

- 3.60 ONS then estimated the hours of follow-up effort needed by taking the number of visits required in an LSOA, and dividing by the number of visits possible per hour. The number of visits possible per hour varied depending on the nature of the area: more visits would be possible in urban areas (less travel between addresses and typically lower contact rates) than in rural areas (where the opposite would apply).
- 3.61 These estimates were based on the 2007 Test and the 2009 Rehearsal, and were applied at LSOA level using the ONS supergroup classifications, which classify areas according to socio-demographic characteristics. This meant that the assumed number of visits per hour ranged from just six in LSOAs classified as 'Countryside' to 11 in LSOAs classified as 'Professional city life' and 'Multi-cultural city life' in London.

Determining the numbers of field staff required

- 3.62 Throughout its planning of the workforce ONS adopted a cautious approach. There were several changes to the staff structure and data collection processes to be implemented, and ONS needed to be confident that there would be sufficient staff in all areas. So when estimating the staff time needed for these factors ONS erred on the side of caution.

The impact of 100 per cent post-out

- 3.63 As already noted, the effectiveness of posting out the questionnaires was assessed during the 2007 Test. This had identified a difference of 4.9 percentage points in the return rates (before follow-up) between the sample receiving their questionnaires by post (30.3 per cent) and those receiving them by hand (35.2 per cent). However, for the 2011 Census, ONS cautiously assumed that the initial return rates would fall by 12.5 per cent from the levels experienced in 2001 as a result of the move from hand delivery to post-out. Although a significant fall in initial return rates was expected, the cost saving from post-out allowed a much bigger field operation that could be targeted to more difficult areas.

Cautious estimation of number of visits possible per hour

- 3.64 The estimate of the number of visits that a field worker could make was based on analysis of the 2001 enumerators' record books, evidence from various small scale tests, and the 2007 Test. While more recent evidence from the 2009 Rehearsal suggested more visits per hour were possible, ONS decided to keep to the more cautious, original estimates.

No allowance made for impact of media/advertising or community support

- 3.65 There were more new activities promoting the 2011 Census than in 2001, such as the community engagement programme. However, because ONS could not predict their impact on returns it had to be assumed that there would be no effect on the number of field staff needed.

Over-estimated number of staff needed

- 3.66 After the number of field staff hours required in an area had been estimated, ONS increased the hours to be allocated to the more difficult HtC areas 3, 4 and 5. This mitigated the risk of any shortfall in field staff numbers (such hard-to-count areas also tended to be the hardest areas in which to recruit field staff – especially when they were needed quickly for a short operation). The number of staff hours needed was therefore increased by 11 per cent in HtC 3 areas, 20 per cent in HtC 4 areas, and 33 per cent in HtC 5 areas. Table 3.1 shows the increase from the 2001 Census in the total number of planned man hours for each HtC area – overall nearly three times the effort put in to follow-up compared with 2001.
- 3.67 After the amount of hours needed had been calculated, the number of collectors required could be determined, based on 25 hours per person per week. Table 3.2 notes the planned staff numbers by HtC band, and shows that many more staff were allocated proportionately to HtC 5 areas than HtC 1 areas.
- 3.68 In London, the number of field staff managers was increased. In 2001, 26 area managers were appointed to London and Essex, all managed from census HQ by a single regional team. For 2011 this was increased to 42, and the number of London regional management teams was increased to three.
- 3.69 The numbers of special enumerators required were determined by the number and type of CE in each co-ordinator's area. Areas with large numbers of CEs and/or CEs housing large numbers of residents were allocated more staff. In total 1,744 special enumerators were needed.

Table 3.1 Planned person hours by HtC category

HtC category	Planned person hours		Increase Hours	2001-2011 Factor
	2001	2011		
1	390,684	964,596	573,912	2.5
2	443,289	1,174,098	730,809	2.6
3	178,920	531,110	352,190	3.0
4	207,585	634,839	427,254	3.1
5	53,403	210,569	157,166	3.9
All areas	1,273,881	3,515,212	2,241,331	2.8

Table 3.2 2011 Census planned numbers of field staff, by HtC category

HtC category	Per cent of country	Number of collectors	Per cent of collectors
1	40	8,100	27
2	40	9,900	33
3	10	4,500	18
4	8	5,300	18
5	2	1,800	6
Total	100	29,700	100

- 3.70 Follow-up was less successful than had been modelled: converting outstanding households was much harder and slower than expected. This was partly to do with over-estimating contact rates, and partly to do with the nature of follow-up. The higher than expected return rates at day 10 meant some of the more easily persuaded households had already completed a return; the remainder needed greater effort.
- 3.71 One factor that had not been modelled was the impact of vacant properties and holiday homes/second residences. These were difficult to identify in advance and were distributed unevenly across the country. These addresses were always likely to be hard to get a return from, so they deflated success rates and should have been taken into account in the planning.
- 3.72 More visits per hour were achieved than had been expected, especially in urban areas. This was a result of the cautious estimates and lower levels of contact, meaning that more addresses were visited per hour.
- 3.73 There were, however, higher than expected levels of duplication and over-coverage in the household address register, and duplication between the household and communal address register (for example, some university-owned houses were on both lists). This meant that some properties received two questionnaires (for example, addressed to 'Flat 1' and also to 'Bottom flat'). If one was returned, the second was still thought to be outstanding and generated follow-up visits. Field staff time was often spent on visiting households that had already returned a questionnaire or, on occasions, on dealing with concerned members of the public. It is hard to quantify this impact but field staff feedback suggested it occupied a sizeable proportion of their time.
- 3.74 It was difficult to forecast more than a year in advance the right number of field staff to allocate to nearly 2,200 co-ordinator areas; generally the right amount of resource was allocated to each area. There were compensating errors in the assumptions made, such as the initial return rate being higher than expected, and more visits being carried out per hour. The deliberate over-estimation of field staff numbers in some areas compensated for follow-up success being lower than expected, and for under-recruitment in some areas. ONS believes that generally the right amount of resource was allocated to each area. The flexible allocation of field staff helped the census field operation meet its objectives of high overall coverage, and all local authority areas exceeded the minimum target level of return rate. Table 3.3 shows the improvement in return rates at the start and end of follow-up, for the areas in each HtC category.

Table 3.3 Actual return rates at the start and end of follow-up, by hard to count category

HtC category	Return rates at start of follow-up to day 10 (%)	Return rates at end of follow-up (%)	Improvements from follow-up overall (% points)
1	84	95	11
2	78	92	14
3	69	88	19
4	62	84	22
5	58	80	22

Delivery of questionnaires to households

3.75 As noted at paragraph 3.21, there were two main methods of delivering 2011 Census questionnaires: the bulk were sent by post to households, and a small proportion were delivered by hand to communal establishments and some specific population groups. This latter process is described separately at paragraphs 3.105 to 3.125.

Post-out

3.76 The posting of household questionnaires was outsourced to Royal Mail, which was responsible for ensuring their accurate and timely delivery. The contract was awarded on 6 May 2009 and signed 1 October 2009 at an estimated cost of £7.25 million. Questionnaires were subsequently delivered to some 25.4 million households.

3.77 Royal Mail collected packs of blank census questionnaires from the print service provider between 5 January 2010 and 4 March 2011. These were delivered to households in a two week window (Monday 7 March to Saturday 19 March 2011), to ensure that the packs arrived one week before census day, 27 March.

Managing risks

3.78 The main potential risk to post-out was industrial action by Royal Mail staff (as had occurred in 2001), so ONS built robust contingency plans into the 2011 Census contract, including the delivery of post-out packs by Royal Mail's managers or agency workers. Royal Mail also guaranteed to keep ONS fully informed of any industrial ballot taken by its unions and about any potential impact that these could have on the post-out operation. In the event no such industrial action was threatened during the 2011 operational phase.

3.79 To mitigate the risk of fire or flood destroying census questionnaires before they could be delivered, two prospective warehouse sites were assessed by Royal Mail for any risks of flooding or fire/security breaches. All census packs were transferred to heavy duty trolleys on arrival from the printer, making them quick and easy to move if required in an emergency.

Operational performance

- 3.80 The post-out project successfully managed the logistics of collecting questionnaires from the printing contractor and distributing them to 25.4 million households in England and Wales. All this happened in the agreed timescales, including the main delivery of questionnaire packs. About 70 per cent of questionnaires were delivered within the first week and the remainder during the second.

'Undelivered as addressed' questionnaires

- 3.81 'Undelivered as addressed' (UAA) is the term Royal Mail uses for undelivered mail that is returned to the sender. There are several reasons why such mail may not be delivered: occupier gone away; address incomplete; address inaccessible; refused; not called for; no such address. Additionally, if an item of mail is marked 'Return to sender' or similar by the recipient and put back in a postbox, it is also treated as UAA.
- 3.82 For the 2011 Census the early collectors visited all the addresses from which UAAs were received. In the rehearsal of 2009 a sample of addresses from which questionnaires had been returned as UAAs had been checked and had concluded that a small proportion of them were addresses which should have received a census questionnaire. Therefore, to maximise coverage, early collectors were tasked with checking all UAA addresses.
- 3.83 This work was scheduled to be done between the end of post-out (one week before census day) and the start of follow-up (10 days afterwards). This timing enabled replacement questionnaires to be delivered close to census day if need be, and addresses to be de-activated where necessary before non-responders were followed up.
- 3.84 While it was difficult to estimate how many UAAs there would be, a best guess was around 1 per cent or 250,000. In the event, there were some 477,000 UAAs, representing 1.9 per cent of the questionnaires posted out. The proportions varied greatly, with more than 4 per cent of questionnaires being UAAs in eight local authorities (the highest, Great Yarmouth, had 4.8 per cent), and 34 local authorities having less than 1 per cent. It was notable that there were proportionately more UAAs in hard-to-count areas than in easier areas (3.6 per cent in HtC 5 areas compared with 1.6 per cent in HtC 1 areas), and proportionately more UAAs in rural areas than in urban areas.
- 3.85 Some 20 per cent of the 477,000 UAAs turned out to be valid addresses. While the UAA check did not significantly improve the overall coverage of the census, it was invaluable for added assurance that households were not being missed.

Collection of completed returns

- 3.86 ONS estimated that 69 per cent of the 25.4 million questionnaires delivered would be returned directly by the public within 10 days after census day, leaving the remainder to be followed up by field staff. It was expected that about 75 per cent would be sent back through the post and about 25 per cent through the internet. The majority of questionnaires collected by field staff as they visited households would also be returned by post, unless field staff collection had been specifically requested by a respondent.

Post back

- 3.87 The post-back operation was the main method of returning completed census questionnaires. Post-back was outsourced to Royal Mail, and it had been agreed that the post-back contract need not be tendered, because only Royal Mail had the postbox infrastructure to handle this service.
- 3.88 Although census day was 27 March 2011, ONS arranged to accept questionnaires that had been completed before then. This gave respondents more flexibility about when they could respond, by helping those, for example, who would be away from home around census day. So completed returns could be posted back from 8 March (the day after delivery), and transported to the data processing centre from 10 March. This also helped to spread the load on the postal services and at the census processing centre. Deliveries to the processing centre continued until 25 November 2011, after which they went direct to ONS census HQ in Hampshire.
- 3.89 Royal Mail was required to:
- securely collect, count, sort, receipt and deliver the mail in one seamless process to the UK Data Capture centre (UKDC) in dedicated rigid-sided vehicles
 - take account of the lessons learned from the 2001 Census post-back operation, such as the incidences of overflowing postboxes and the inability to track returned questionnaires; and
 - participate in the October 2009 Census Rehearsal and use this as an opportunity to test the new technology and processes before the main census
- 3.90 Ensuring the confidentiality of census data at all times was critical to the post-back process (as it was, indeed for the whole of the census operation). A bespoke solution provided by Royal Mail included:
- keeping census questionnaire returns separate from mainstream mail (made easier by the distinctive colour and markings on the return envelope)
 - reserving time on dedicated sorting machines in 23 mail centres to process census returns separately
 - using dedicated vehicles to take census mail to the data processing site in Manchester, and setting up a consolidation centre near the site to enable a steady flow of vehicle deliveries; and
 - using Royal Mail's flat-bed sorting machines (FSM). These could scan the census questionnaires' unique bar codes and then sort and count the returned questionnaires geographically. Royal Mail could then feed the resulting file of data promptly into the census QT system, while simultaneously forwarding the paper questionnaires to UKDC

Managing post-back risks

- 3.91 Several issues from the 2001 Census needed to be addressed, including the overflowing postboxes referred to above, as well as potential new risks for 2011. In the event of a major Royal Mail issue in which one or more FSMs became unavailable, all mail due to be sent to that FSM site would be re-directed to the next nearest site. Because there were 22 sites with this equipment Royal Mail did not consider this to

be a high risk. Indeed all mail could be consolidated to just one FSM site if any major collection difficulties arose.

- 3.92 To mitigate against the risk of overflowing postboxes, Royal Mail increased its collections from heavily used 'social' posting points during peak census activity. These included Sunday collections, and other additional collections to supplement the 220,000 daily posting points available. 'On demand' collections were also set up, using a response team established at each sorting office to react to reports from the public that a postbox was full. Approximately 50 such postboxes were reported and Royal Mail responded to each within one hour.

Post-back operational performance

- 3.93 There were some complex interfaces to manage in this part of the process, not least where and how the returned questionnaires were receipted. The contract with Royal Mail included the collection of mail from post offices and postboxes and its delivery to the processing site. As part of this operation Royal Mail also carried out the bar code scanning and receipting functions. Delivering large volumes of mail to the processing site in Manchester had to be carefully planned: there were just three loading bays at the processing site with more than 40 fully loaded trucks to unload every day during the height of the return period. In the event, the actual number of returns by post was greater than expected, significantly increasing both the volume of questionnaires that Royal Mail had to handle and the cost of the service. By the end of the follow-up Royal Mail delivered 19.8 million questionnaires in total to the processing centre (of which more than half a million were for Northern Ireland).
- 3.94 The profile of returns was different to that expected. Before census day there were almost 10 times more questionnaires returned than expected. The peak period was about the duration expected but peaked somewhat higher. However the later period, during the follow-up process, saw much lower volumes than planned.

Early enumeration and collection

- 3.95 The early enumeration and collection activity covered field work between 21 March and 5 April 2011, finishing just before the follow-up of non-responders started on 6 April. Activities during this early enumeration period were:
- handling requests for help received through the census helpline, as people began to receive their questionnaires
 - checking the status of any questionnaires returned as undelivered
 - visiting addresses in areas of complex housing to ensure households had sufficient questionnaires of the right kind; and
 - holding completion events as part of the community liaison programme (see chapter 2)
- 3.96 Achieving a high level of coverage in the census required both a high proportion of households to be counted and all people in the households to be included. One type of address at risk of not receiving a questionnaire was a multi-occupancy location. This is an address with more than one household behind the front door.
- 3.97 Multi-occupancy varies in its precise nature and in most instances the census address register should have included them. However, there was no definitive flag or indicator in the address register about whether or not an address was multi-occupied. Local authorities maintain registers of houses of multiple occupancy (HMO) but what

data is included on these varies between local authorities. Research on a sample of these showed that, for about 5 per cent of the HMOs identified, the census address register did not have all the separate sub-divisions defined. Consequently there was no reliable way of detecting where these missing households might be from the information available in the address register.

- 3.98 A different risk was posed by large households. The census questionnaire had space for six people, so where a household had seven or more people householders needed to request a continuation questionnaire.
- 3.99 ONS was confident that the presence of 'hidden' HMOs and large households needing extra questionnaires would not prevent the census from meeting its quality objectives. However, extra steps were taken to meet these objectives and thereby build or improve user confidence.
- 3.100 Early collectors were sent to areas that were thought to contain HMOs or large households after the completion of the postal delivery, but before non-response follow-up started, in order to check that the household had received the correct number and type of questionnaires. Extra questionnaires were delivered, and help in completing the questionnaire offered as necessary.
- 3.101 The areas selected for such visits were based on several data sources. ONS compiled the list of HMOs from data provided by local authorities. Of the 348 local authorities asked to supply a list, 197 did so. This resulted in a list of some 94,000 HMOs.
- 3.102 Several data sources were used to identify large households with more than six people. The best available data source was the 2001 Census. Output area data were used, which included every address in those output areas that, in 2001, had more than 7.5 per cent of households defined as 'large'. This resulted in 161,000 addresses, which were much more clustered than the HMO addresses. For example, more than 10 per cent of Bradford and Tower Hamlets were included in the early collection process.
- 3.103 Some of the output areas selected as large households also contained HMOs, so once these duplicates were removed the total listed was 252,000 addresses.
- 3.104 Feedback from field staff was that the process worked, but there were problems completing all of the fieldwork in the time allowed – primarily because of the lower than planned levels of recruitment of early collectors. The numbers required and their location were extremely difficult to estimate because the number and profile of requests for field visits were unpredictable. In addition, the decision to check HMOs and large households was a late one (February 2011) resulting in a change in the requirement for early collectors in many areas.

Special enumeration

- 3.105 In the 2011 Census the great majority of people in England and Wales were counted through the approaches described above. However, there were specific population groups for whom alternative arrangements were necessary in order to count them effectively. For these, special enumeration procedures were adopted.

Communal establishments

3.106 The majority of the population covered by these alternative arrangements lived in communal establishments (CEs). These comprise a range of managed accommodation units such as prisons, military bases, university halls of residence, care homes, hospitals and large hotels. The key factor determining who was included or excluded was that, if an individual had already spent, or was expected to spend, six months or more in a CE, then for census purposes this counted as their place of usual residence.

Special accommodation sites

3.107 Special accommodation sites (SASs) related to groups of non-permanent accommodation units, such as caravan parks and marinas. Where accommodation units in such sites contained usual residents, they were enumerated using a normal household census questionnaire. The special enumeration procedure was required to establish the number of usual residents at these sites, because the majority of these units are used only as temporary or holiday accommodation.

Special population groups

3.108 Special population groups (SPGs) are those who have an itinerant lifestyle such as Gypsies, Travellers and rough sleepers and so may need a different enumeration procedure.

3.109 Achieving a good census response from these groups was vital. Typically CEs accommodate higher numbers of harder-to-count populations, such as young adults, older people or more transient people. They also include a high proportion of vulnerable groups, who may find it particularly difficult to participate, but whose data are particularly valuable in informing social policy. In addition, there are many large CEs, such as university halls of residence and military bases, whose residents represent a significant proportion of a particular local community.

3.110 In the 2001 Census most CEs were counted (together with all other households) by the enumerator allocated to that area. Evaluation of the 2001 Census highlighted that a lack of knowledge and training about the relatively few CEs encountered by regular enumerators sometimes led to quality issues. These factors, together with the adoption of a post-out delivery model, resulted in the introduction of a new specific field role, the special enumerator, and new role-specific training and procedures that focused exclusively on the execution of the special enumeration.

Special enumeration procedures

3.111 Developing special enumeration procedures was a complex process, because different measures were needed for different types of establishment. In addition, the many diverse groups and establishments involved made it difficult to produce common procedures that could be applied consistently by a remote and temporary field force. Issues that required particular attention were:

- vulnerable individuals: CEs often accommodate vulnerable individuals, and the census required CE managers to assist with identifying usual residents and supporting them in completing their questionnaires. It was important that procedures were practical and supported managers as well as residents

- difficult identification: CEs did not always appear on address lists in a consistent way, which sometimes made them difficult to identify; and
- transient populations: some populations can be highly transient, making it difficult to provide the right number of census questionnaires

3.112 Field staff contact remained the preferred method for enumerating CEs (as opposed to posting out questionnaires). This allowed ONS to support CE managers who may be responsible for large numbers of residents. In addition, field staff were able to guide CE managers through the often complex definitions on who to include. The overall strategy was therefore to provide specialist staff for special enumeration who were responsible for hand delivering and collecting questionnaires and supporting the CE managers.

3.113 ONS identified almost 100 different types of special enumeration scenarios, and grouped these into five main models, each with their own enumeration methodology. These approaches are briefly described below, although it should be noted that there were subtle variations for certain establishments in each category.

General communal establishments

3.114 The majority of CEs fell into this group, which includes hotels, care homes, hospitals, hostels and religious establishments. The enumeration procedures were fairly straightforward. A special enumerator liaised with the CE manager and hand delivered and later collected the relevant number of questionnaires. They also provided the CE manager with any support they needed. The number of questionnaires used depended on the number of usual residents. Hand delivery started on 7 March 2011, three weeks before census day, and continued for up to three weeks after census day. During this stage the special enumerator made several visits to pick up completed questionnaires. The outcomes of their visits were recorded in special enumeration record books. Collected questionnaires were immediately returned to the central processing site by post.

University halls of residence

3.115 Students are one of the most hard-to-count groups and must be enumerated at their term-time address. Developing the procedures for this group needed extensive liaison between census HQ staff and many of the university accommodation managers and private hall providers. The overall approach was again to hand deliver and collect questionnaires using special enumerators, this time with the help of university staff. However, the complex nature of universities (their varying term-time dates, hall layout and accessibility, and use of private halls of residence), required a bespoke enumeration plan for each university.

3.116 In late 2010 area managers contacted the accommodation managers of the university in their area and agreed the process to deliver, collect and follow-up the students' individual questionnaires. Questionnaires could either be delivered to rooms by census field staff or university staff, or collected from a central point such as the porter's desk. Individual questionnaires could either be collected from rooms or left at a central point by the students. A method of tracking the questionnaires to each room was developed using a university enumeration record book, but universities could also use their own system if it was more suitable.

3.117 Research into Easter term-times showed that almost 50 per cent of universities (and 60 per cent of students) would be on vacation on census day. As a result, some of these would need delivery to commence before the planned date of 7 March (which

allowed the usual 30 days between delivery and the start of follow-up). For 54 of the universities affected a decision was made to reduce this period to as little as 18 days and carry out the work more intensively. For eight universities (including Oxford and Cambridge) vacation timings meant that even this approach was not possible. The whole enumeration needed to take place earlier, using a combination of area managers, co-ordinators, special enumerators and census HQ staff. (Census legislation allowed for the early delivery and collection of questionnaires, although ONS could not insist that a student completed the questionnaire before census day).

Secure accommodation

- 3.118 From a census perspective, secure accommodation is classed as having either an element of security in getting access to residents, or the addresses are of a sensitive nature, or both. Included in this group are all military bases (UK and US), detention accommodation, immigration centres, royal households and embassies. In terms of military bases, only residential accommodation inside ‘the wire’ was classed as secure accommodation. Any military accommodation outside ‘the wire’ was enumerated the same way as other households.
- 3.119 ONS began negotiations with the Ministry of Defence (MoD) and Ministry of Justice (MoJ) early in 2008 to develop the partnerships needed to make the enumeration of military bases and detention accommodation successful. Because of the secure and/or sensitive nature of these establishments it was agreed that hand delivery and hand collection of the questionnaires would be carried out by field staff of manager grade, namely the co-ordinator. This approach was particularly important for military bases, as they wanted to deal with only one point of contact throughout the operation. Secure accommodation is also associated with a range of highly complex definitions as to who should be included as a usual resident, so it was also thought appropriate to allocate this work to co-ordinators. For example, military personnel away on operations with no family address needed to have questionnaires completed for them by proxy at their home base.
- 3.120 ONS worked with the MoD and MoJ to produce written census instructions for base commanders and prison governors. Once agreed, these organisations arranged for distribution of questionnaires in their establishments. Special arrangements were made to protect the completed questionnaires of UK military personnel, with pick-ups done by a secure courier service direct from military bases.

Special accommodation sites

- 3.121 Special accommodation sites (SAS) were enumerated by special enumerators to the same timescales as general CEs. The key difference was that the special enumerator was attempting to identify all of the usual residents on a SAS, before delivering and collecting household questionnaires. The census address check in 2010 had already gone some way to identifying sites and accommodation units that contained usual residents, rather than just holiday makers. Special enumerators needed to verify this information by talking to site and marina managers, and by looking for further visual evidence of usual residency.
- 3.122 For Gypsy, Roma and Traveller sites, census HQ liaised with representative groups and with local authorities to develop suitable procedures. Co-ordinators were required to make prior contact with local authority Gypsy liaison managers, who often helped establish contact points on site.

Rough sleepers

3.123 In 2001 rough sleepers had been enumerated by getting field staff to conduct a count on census night where there were known pockets of rough sleepers. There were concerns over the difficulty of getting temporary field staff who were not used to working with such a vulnerable group to conduct such a specialist count. It was also costly and highly impractical to instigate night working on a large scale for such a short period. Discussions with many organisations working with this target group concluded that, for the 2011 Census, it would be feasible to identify and count genuine rough sleepers at day centres for the homeless; other homeless people could be enumerated at homeless hostels and similar accommodation. Co-ordinators were instructed to make prior contact with day centres for the homeless to build relationships and make arrangements for the enumeration.

The outcome

3.124 The special enumeration work was found to be achievable in the timescales given. Creating a specialist field grade for special enumeration meant staff could receive more concentrated and role-specific training, and so were much more aware of what to do at different establishments. The calibre of special enumerators, co-ordinators and area managers was high. The field staff involved in special enumeration were often highly enthusiastic and pro-active in their roles. HQ procedures could not always fit every circumstance encountered, but special enumerators used a good deal of common sense and initiative to achieve the overall aim of getting questionnaires out and back again.

3.125 The planning of special enumeration workloads was difficult because the dispersal of CEs across the country did not always follow the pattern of high concentrations of households. For example, some coastal towns had a high number of hotels and relatively little housing. This led to a few co-ordinators having a lot of special enumeration activity to manage, while many had none at all. Attempts were made to balance this out by giving some co-ordinators fewer collectors to manage, but this was difficult to achieve.

Non-response follow-up

3.126 The follow-up of non-responding households by field staff was an essential stage in ensuring the census met its overall quality targets. Success at follow-up hinged on the ability to identify the non-responding households, to make contact with them, and to offer the appropriate support to get a response.

3.127 As noted in paragraph 3.2, experience has shown that it is increasingly difficult to make contact with, and secure a response from, some households. The high level strategy for the 2011 Census placed considerable emphasis on the effective targeting of hard-to-count populations and this applied particularly to the follow-up stage.

3.128 ONS adapted the follow-up 2001 Census methodology to account for the following:

- collectors needed to visit only those addresses from which a completed questionnaire had not been received
- the deployment of staff needed to be more flexible, to enable allocation of collectors to areas where they were most needed
- a (QT) system was developed to guide the effective deployment of staff (see below); and

- increased numbers of field staff were recruited for areas where response rates were expected to be lower, and, generally, covered a much larger area than had been the case in 2001, working across several different neighbourhoods

3.129 The objective of following up non-responders was to improve return rates. The broad strategy and tactics used were to:

- develop clear field staff procedures and role-specific instructions
- draw up detailed follow-up lists that were regularly updated and could be printed from the QT by co-ordinators as needed
- arrange additional publicity and further local engagement with census liaison managers and communities
- develop clear calling strategies, focusing most contact attempts on the late afternoon, evening or weekend
- have collectors leave reminder cards where they had been unable to make contact
- send reminder letters to non-responding addresses; and
- use a 'dummy' form for collectors to capture basic information on unoccupied addresses, addresses that were second residences, or where contact could not be made

Follow-up procedures

3.130 The follow-up operation was divided into two phases covering four and a half weeks, during which collectors visited non-responding households to encourage them to complete their questionnaire, deal with any concerns, explain the value of the census, or issue a replacement questionnaire if the original had been lost or damaged. Collectors could, if needed, provide help and assistance, which might include completing the questionnaire on behalf of the householder (for example, if they had physical, reading or other difficulties).

3.131 Phase 1 lasted for two weeks from 6 April to 19 April. Follow-up was targeted on poorly performing areas where the return rate was below the expected level. This was managed locally by co-ordinators who printed follow-up lists of non-responding households from the QT system. These lists were provided to collectors with instructions on the amount of hours to spend in each area. Priority was given to those areas with low return rates.

3.132 If a collector discovered some addresses that were not occupied (for example a newly-built block of flats, or houses due for demolition) the co-ordinator could contact the local authority to confirm that the properties would not be occupied during the follow-up period. In these circumstances field staff filled in dummy forms, linked them to the addresses, and de-activated the original questionnaire on the QT. This ensured that the address did not appear on future follow-up lists, but was still captured as a non-return in the QT reports.

3.133 Phase 2 took place over two weeks from 20 April to 6 May, during which all non-responding households were visited at least once and, if no contact was made, a dummy form was completed. Once all addresses had been visited, the area managers had the option to target certain areas further using the intelligence from their QT reports.

Making contact

3.134 The best times to contact householders are generally late afternoons, evenings and at weekends, so ONS expected collectors to carry out 60 per cent of their duties between 2pm and 9pm Monday to Friday, and 10am to 9pm Saturday and Sunday. A reasonable time was left between visits to the same address, with subsequent attempts being made on different days of the week and at different times of day.

Multiple occupancy and access to properties

3.135 Many urban areas have a concentration of houses of multiple occupancy (HMO). Some of the early enumeration focused on these types of properties. For the main follow-up, field staff were provided with full instructions on how to generate new addresses and questionnaires if a household they visited was an unrecognised HMO.

3.136 Strategies were also devised for 'difficult to access' properties such as gated communities, flats with controlled access, residential accommodation above or behind non-residential accommodation, and back garden developments or conversions of garden sheds and garages into accommodation units. London, in particular, has a significant proportion of properties with access-controlled security gates managed by gate keepers or concierges.

3.137 Leading up to the 2011 Census ONS worked with a large number of local authorities and carried out many field tests to ensure a clear understanding of potential accessibility issues. Detailed procedures were developed to cover what field staff needed to look out for, and possible methods of gaining entry. Area managers were also tasked to work closely with their local authorities on these issues so that information could be shared. ONS prepared a letter for concierges to help facilitate access by field staff, and field staff made great efforts to make contact, including early morning visits to catch people in, and obtaining assistance from Royal Mail staff.

Language issues

3.138 Some residents' inability to speak or write English or Welsh was potentially a major barrier to completing census questionnaires. A range of language aids was set up through the public support facilities. In addition, field staff were equipped with a language identification card. This was shown to householders to help identify their language. It provided the householder with details of the individual 'language line' telephone numbers they could contact for assistance or to order translation leaflets. Managers were provided with a list of their field staff who spoke a foreign language, and some areas also had community advisors who spoke the language of the community they were representing.

Vacant properties, holiday and second homes

3.139 Any holiday or second home is generally less likely to be contacted successfully in the census, so areas with many of these properties risk having lower return rates. For these addresses field staff filled in dummy forms. This ensured that basic address information was captured for any property unlikely to be occupied during the follow-up period, or where no contact was made. Even if a dummy form had been used, field staff continued to try further visits in case the property was occupied before follow-up ended. In addition, special reminder cards were printed for field staff to post in areas with a particularly high density of second homes. These highlighted the need for residents to complete a questionnaire, even if it was not their primary residence. If

no contact had been made by the end of follow-up a questionnaire and return envelope were posted through the door.

Reminder letters

3.140 During the course of follow-up, between 5 April and 27 April 2011, 2.6 million reminder letters were sent in several phases to 1.6 million households that had not made a return. The letters were sent to those non-responding households in areas where return rates were lower than expected. They provided an alternative and more cost effective way to reach householders and persuade them to complete their questionnaire, particularly in areas where it was difficult to make doorstep contact.

Questionnaire tracking

3.141 The introduction of post-back in the 2001 Census had led to difficulties for the enumerators and census HQ in knowing which addresses had or had not responded. ONS developed a questionnaire tracking system (QT) for the 2011 Census to solve this problem. The QT allowed accurate assessment of enumeration progress and could be used to direct collectors to the areas and addresses where they were most needed.

3.142 The QT was developed as part of the procurement that also included the customised printing of questionnaires, the online data collection system, data capture and coding, and the provision of the census public helpline. The QT's core data were simple and comprised:

- the address register
- an inventory of questionnaires
- an inventory of 'fulfilments' (the term used to include the issuing of replacements or additional questionnaires and a record of calls to the public helpline); and
- the expected return rate for each area

3.143 The QT system tracked the unique bar code printed on every census questionnaire. It provided census HQ and the census field managers with an up-to-date, daily picture of the status of the operation in their individual areas. This information was used to allocate field staff promptly and accurately to follow-up non-responders and to improve return rates.

3.144 The QT went live on 28 February 2011 and was available throughout the field operation. It provided three types of reports for field managers: operational reports, management reports and reference reports. QT reports were produced each morning before 8 am during field operations, showing new information and updates to existing addresses. The reports reflected the transactions carried out by all users on the previous day, providing a wealth of almost real-time management information that was available to field managers and HQ alike. The system proved invaluable for a number of operations, as follows.

Underpinning the follow-up operation

3.145 Each address on the address register was allocated a pre-addressed questionnaire with an individual bar code printed on the front. The addresses and bar codes were loaded into the QT system and used to identify and track each individual questionnaire.

Enabling census helpline staff to direct calls for help

3.146 The QT supported requests for field staff to contact or visit householders needing help with their return.

Monitoring daily progress

3.147 HQ and area managers could access a range of field reports for an up to date picture of an area. The QT held the expected return rate, so managers could monitor progress towards a target rate and move field staff around to improve the return rate where needed.

Generating weekly lists of non-responding households

3.148 These lists helped to optimise the follow-up visits.

Recording outcome codes

3.149 The results of follow-up visits to non-responding households were coded for rapid analysis and decision making.

Receipting forms in the field using hand-held scanners

3.150 This was used where a householder handed their completed questionnaire to a collector and requested that it was not returned via the postal service. The questionnaire could be quickly receipted by the co-ordinator to prevent it from appearing on the follow-up worksheets.

Updating the QT weekly

3.151 Co-ordinators could, for example, deactivate a questionnaire for a derelict or demolished building, add new addresses, link questionnaire IDs to an address when new or additional ones were issued.

3.152 Once a questionnaire from an address had been receipted or deactivated, that address would not appear on any future follow-up worksheet and no more follow-up visits took place.

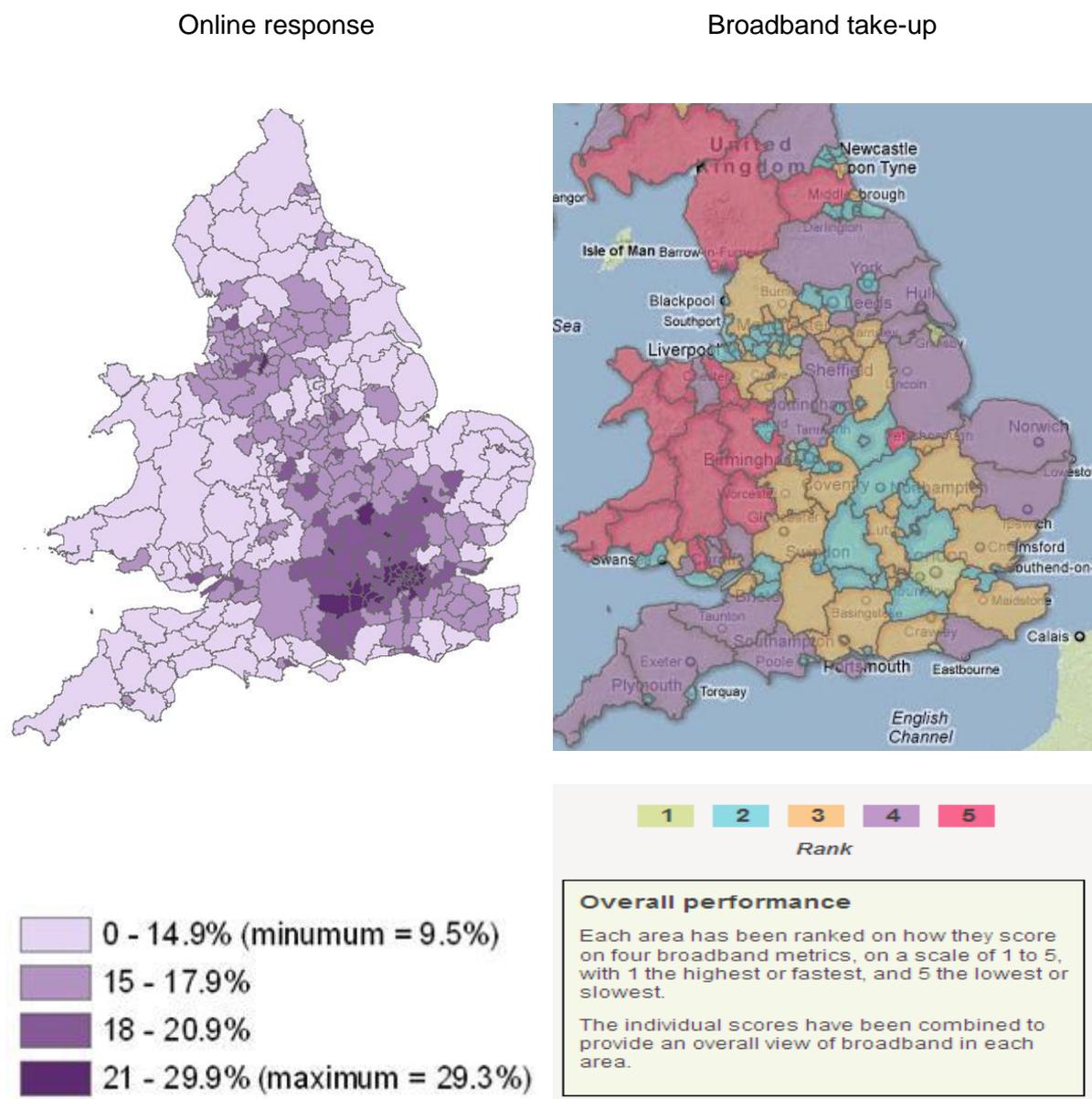
3.153 The QT was also used in a number of other census processes, notably:

- fulfilment centre staff recorded replacement and additional questionnaires or other materials (such as translation booklets) sent out at householders' request
- the data capture team accessed reports on the processing of questionnaires
- recorded numbers of paper questionnaires receipted by Royal Mail; and
- to record numbers using the online census

Online completion

- 3.154 For the first time in England and Wales the 2011 Census offered households and individuals the opportunity to complete their return online, as an alternative to completing the traditional paper questionnaire (with an optional Welsh language online questionnaire available in Wales). Using other countries' experience of online censuses, ONS set a target of around 25 per cent of all returns being made online and planned for around 40 per cent, with the capability of handling around 170,000 concurrent responses. The system was designed so that if the number of simultaneous respondents exceeded this capacity then new users would be 'gracefully deferred' to a holding page that asked them to try again later. In the event, however, take-up was less than anticipated, with only 16.4 per cent of returns being completed in this way, so there was no need to instigate deferral arrangements.
- 3.155 This less than expected level of online response was probably due to several factors. Responding on paper may have seemed easier to many people than going online, because a paper questionnaire had been delivered to every household and was readily to hand (some countries such as Canada had achieved significantly higher online response rates because they had not universally delivered paper questionnaires). The 2011 Census marketing strategy had been designed to maximise overall response, rather than responses via a particular channel. It encouraged responses generally by highlighting the benefits to the population of a successful census; only later in the campaign did it begin to specifically encourage online responses. Furthermore, the online questionnaire was more easily completed using a broadband connection, and at the time of the census only half to three-quarters of households were estimated to have had a broadband connection. The effect can be seen in the correlation between the two maps in figure 3.2, which show the level of online responses and the level of broadband take-up respectively.

Figure 3.2 The levels of online responses to 2011 Census and broadband take-up



3.156 Nevertheless, the online service has been regarded as a great success, providing a number of benefits to the data collection operation:

- it met both the public's and census stakeholders' expectations for an online questionnaire
- it provided an environment in which the security of the census information could be robustly protected
- it improved overall responses by offering an alternative to householders who may have been less inclined to complete a paper questionnaire
- it delivered a more accessible census for the disabled community; and
- it avoided the need to scan and capture a significant proportion of the returns thereby speeding up, and reducing the cost of, the data processing operation

Most importantly it was easy to use, improved data quality by prompting for missing responses, and limited the scope for incorrect responses. It did not fail at any time during the process, and there were no security breaches.

- 3.157 Indeed, security was the highest priority requirement in developing the online system. Confidentiality of personal information is a cornerstone of ONS's assurance to the public, and any breach of data security would not be tolerated. The service was hosted in a secure environment with multiple layers of security built into the design. Firewalls, intrusion detection systems and distributed denial of service protection ensured that the responses were kept confidential throughout capture, storage and processing.

Paper questionnaire or pre-registration

- 3.158 In 2007 ONS commissioned Digital Public to provide recommendations for developing and implementing a strategy for online census responses. The research concluded that the online completion rate could exceed 40 per cent, but that this was very much dependent on the overall design. A key issue was how best to ensure everyone was able to take part in the census, and could complete online if they wished. So the decision had to be made whether every household should receive a questionnaire, or whether to allow people to pre-register for online completion. Three options were considered.

Option 1: initial paper-based questionnaire

- 3.159 This model was closest to many other countries' online censuses. In this option all households would receive a paper questionnaire, with an internet access code printed on it, and the online service would be promoted through advertising. This would allow respondents a choice, and the option to change their mind if they wished. It was acknowledged that their choice might be affected by provision of the paper questionnaire, and it was anticipated in 2007 that 20-30 per cent of all returns would be online by adopting this option.

Option 2: paper-based questionnaire with an option to register to complete online

- 3.160 In this option households would have to decide initially if they wanted to complete online, and pre-register to do so. Paper questionnaires would be sent only to those households wishing to complete on paper. Estimates were that 30-40 per cent of all returns might be made online using this option.

Option 3: online census

- 3.161 In this model, households wishing to complete on paper would have to pre-register, and paper questionnaires would be sent only to households that had done so. It was estimated 40-60 per cent of all returns might be completed online using this option.

Weighing the risks

- 3.162 The census offices considered the risks, potential scenarios and benefits of each option. Option 3 was ruled out almost immediately due to a number of factors. Although it was tempting to assume that a larger online return would provide many benefits – especially the cost savings of printing and scanning fewer questionnaires and the associated environmental factors – these were outweighed by the cost of

providing an online system which might need to accommodate up to 15 million households.

- 3.163 There was a risk with both options 2 and 3 that respondents' circumstances could change so that they no longer wished to complete online. A potential scenario could have been respondents losing confidence in online census completion after hearing about another organisation losing personal data.
- 3.164 Also, the challenge of providing a print-on-demand service for options 2 and 3 was considerable; there would be only a short time frame available to print large numbers of pre-addressed questionnaires.
- 3.165 Although the respondents' chosen method of completion could be influenced by receiving a paper questionnaire at the outset, option 1 was selected. This provided respondents with an option to complete online if they wished, and had the least impact on the ability to provide paper questionnaires. Accordingly every household was sent a paper questionnaire. Each paper questionnaire contained a unique internet access code (IAC) which was the key to the online questionnaire. The respondent opened the website and entered their 20-character IAC on the login page to sign in to their own secure questionnaire.

Usability

- 3.166 Designing the online questionnaire's 'usability' – how easy the system was to use – was a very important requirement. It would affect the experience of using the system, and therefore a person's willingness to take part and give accurate answers. The online questionnaire was thus designed to maximise usability, but of course the question content had to be the same as the paper questionnaire. Therefore, to avoid responses being biased by the chosen completion method, the question text was not changed; respondents had to interpret the questions in the same way whether online or on paper. Furthermore, to avoid confusion, and to reinforce the census brand, the online questionnaire was designed to look like the paper questionnaire.
- 3.167 However, although the question text could not be changed, the accompanying instructions had to be amended. For example, instructions to 'write in' or 'tick all that apply' were not necessarily appropriate to online completion. If the respondent had not provided the information that allowed the service to route them to the next relevant question automatically, the routing instruction was phrased as a question. Additional instructions were also provided where the respondent was required to review all available answers.
- 3.168 Furthermore, the questionnaire needed to be intuitive. It needed to make the online experience as painless as possible. If it did not there was a risk that people would abandon the attempt, and that their commitment to engaging with the census – whether online or on paper – would be affected.
- 3.169 Respondents online needed to be:
- able to move to the next question, and review previous answers easily
 - able to see, at a glance, how far through the questionnaire they had progressed, and be able to stop and resume at any time
 - told if their response was not as expected, and what the problem might be; and
 - routed past questions that were not relevant

3.170 The screen layout was designed so that any question could be seen, answered and saved without scrolling. For this reason, most pages displayed only one or two questions.

Types of online questionnaire

3.171 All households were required to return a household questionnaire. Additionally, respondents who were resident in communal establishments (for example, retirement homes), and individuals wishing to make a return separately from the main household return (for reasons of privacy), could complete an individual questionnaire. The questionnaires available for completion online were:

- England household
- England individual
- Wales household
- Wales household (in Welsh)
- Wales individual; and
- Wales individual (in Welsh)

3.172 Household continuation questionnaires were not required for online completion, because the system accepted up to 30 residents and up to nine visitors in each household. Households exceeding 30 persons required a field visit to determine whether or not it was a communal establishment.

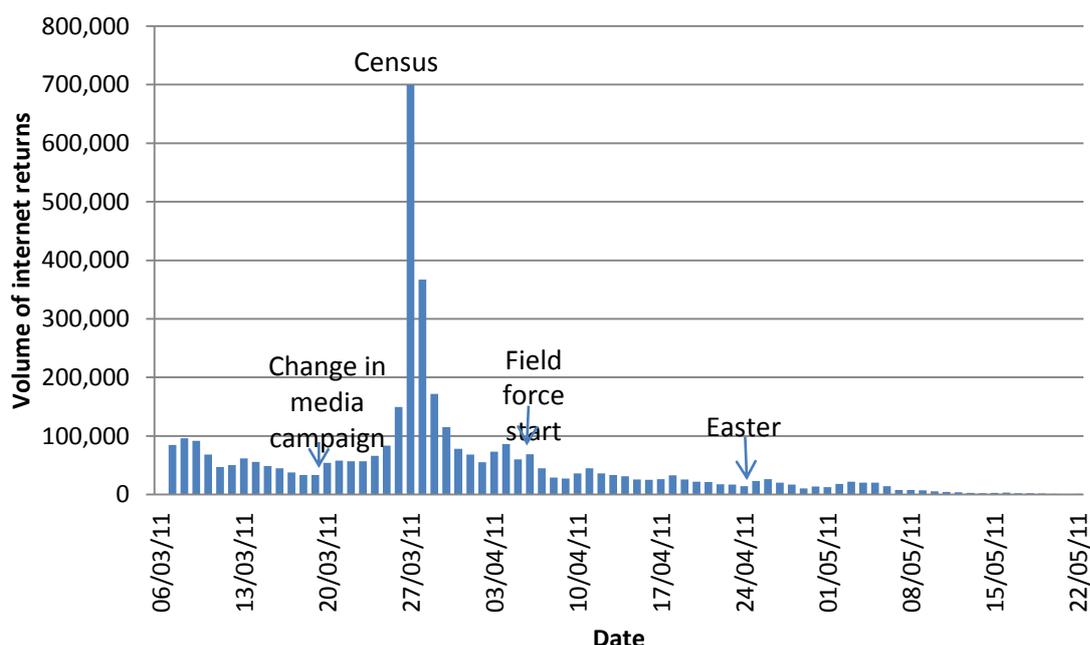
3.173 Communal establishment managers could not complete the communal establishment questionnaire online; however residents of communal establishments could complete their individual questionnaires online if they wished.

Validation

3.174 To help respondents avoid making mistakes their responses were validated to ensure they were within the required parameters (for example that a letter had not been entered where a number was expected). ONS decided to use 'hard' validation (which prevents the respondent moving to the next question until a valid answer had been provided) only on those questions that referred to the number of residents and/or visitors. The majority of questions were 'soft' validated (where an error message was displayed if the respondent did not provide an answer; but did not stop the respondent from continuing). Finally, when the respondent clicked 'submit' a check was run that alerted them to any questions that had not been answered.

The online response

3.175 The online questionnaire went live on 4 March 2011 and was available until 22 May 2011. The first response was received 38 minutes after the system went live. As expected, census day itself (27 March) had the highest volume of daily returns with 680,000 household returns submitted on that day (19 per cent of the total online household returns – see figure 3.3).

Figure 3.3 Daily volume of online census returns

3.176 Apart from census day, the daily volumes of returns throughout each week (from 21 March to 22 May) always peaked on a Monday but there was a notable influence on the volume from a number of external activities:

- there was an increase from Saturday 19 March to census day which coincided with the change of media campaign message to 'Fill it in now'
- there was an increase on Wednesday 6 April, which coincided with the start of collectors visiting the homes of non-responders
- there was a rise on Tuesday 26 April – after the Easter weekend – which probably reflected people returning from the weekend and finding reminder cards left by a collector; and
- there were rises during the week of 2 May which reflected the last week of collectors' visits before the non-compliance process started

3.177 Figure 3.4 shows the time of day when people completed their online questionnaire on census day, while figure 3.5 shows the time of day when people completed their online questionnaire, by day of the week. There was little significant variation from the pattern shown on census day itself, other than for Saturday.

3.178 The great majority of respondents took between 10 and 20 minutes to complete the online questionnaire (figure 3.6). This varied of course depending on the number of people in the household. The average time taken to complete the questionnaire was 22 minutes. This was consistent with the rehearsal in 2009, which showed that the average time for completion was about 30 minutes for a four-person household, with questions for adults taking about 10 minutes and children's questions taking about 6 minutes each.

Figure 3.4 Volume of online census returns by time – census day

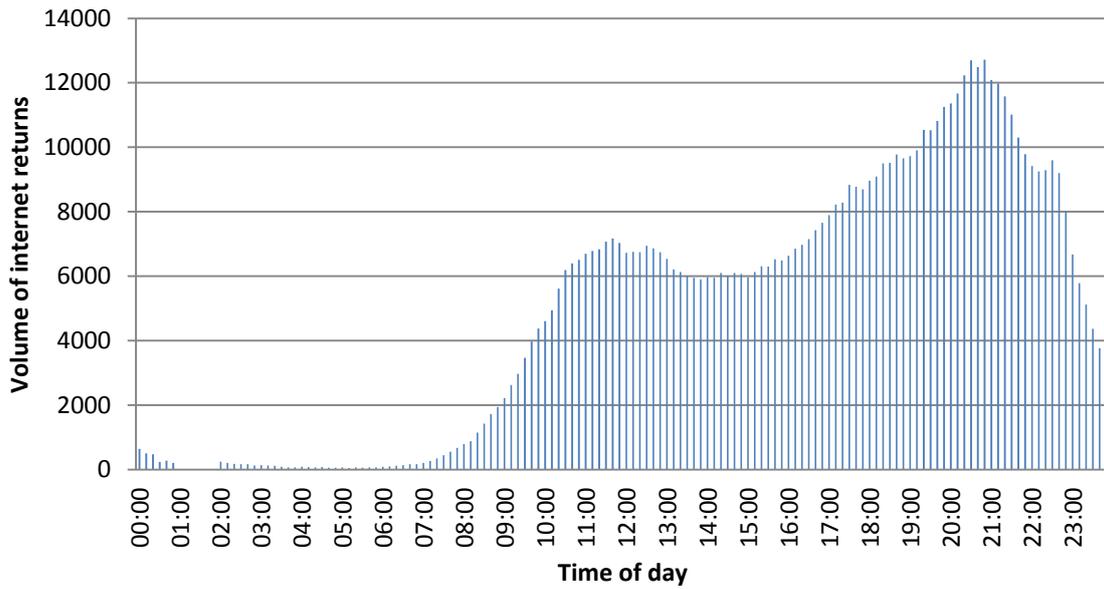


Figure 3.5 Percentage of online census returns by time and day of the week

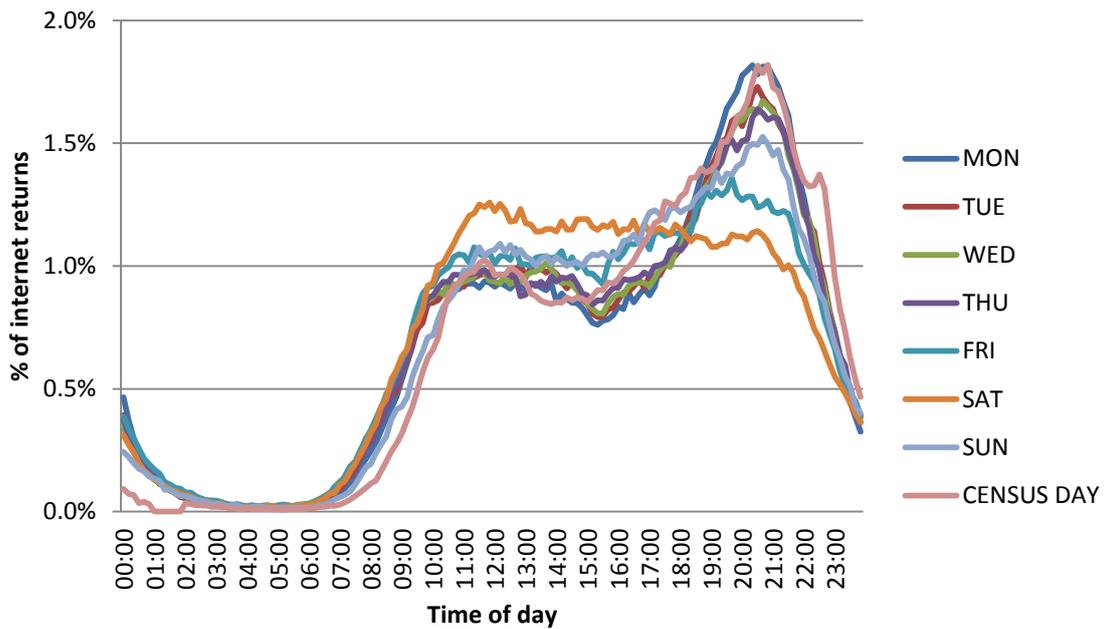
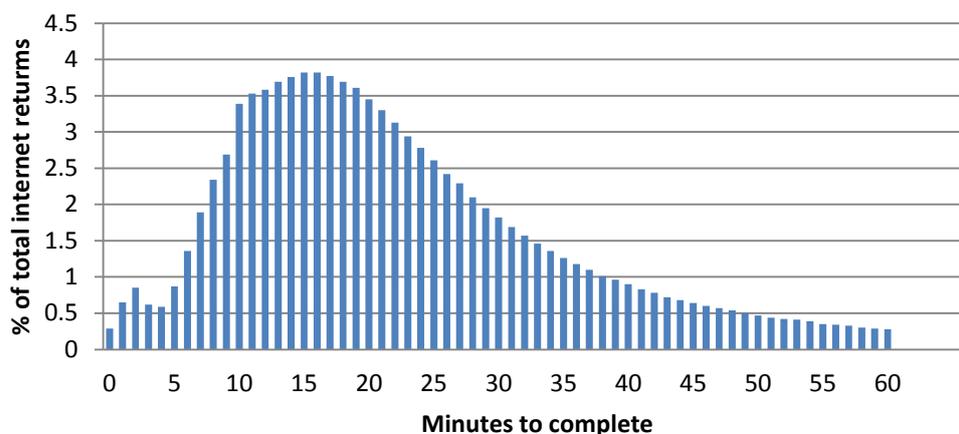


Figure 3.6 Volume of online census returns by minutes taken to complete questionnaire



3.179 Overall 16.4 per cent of census returns were completed online in England and Wales, but certain groups were more likely to respond online than others, including young people. In particular, large households were more likely to respond online than smaller ones: over half of households with more than six people responded online compared with 15 per cent of one and two-person households (figure 3.7). This indicates that they found it easier or more appealing to use the online questionnaire rather than request a paper continuation questionnaire.

3.180 Figure 3.8 shows the age of respondent by mode, using the age of person 1 on the questionnaire as a proxy for the person who completed the questionnaire for the household. The chart shows that nearly 30 per cent of respondents aged 26-35 chose to complete online, very similar to the proportions aged 17-25 and 36-45; compared with less than 10 per cent for those aged over 65.

Figure 3.7 Percentage of census returns submitted on paper/by internet, by household size

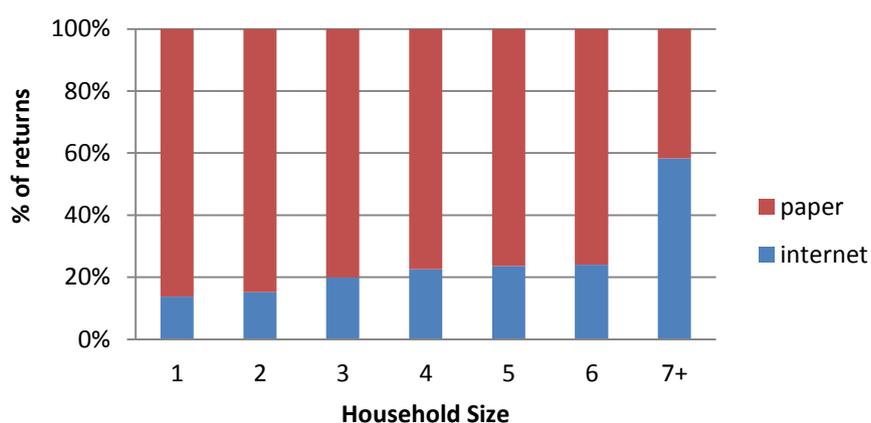
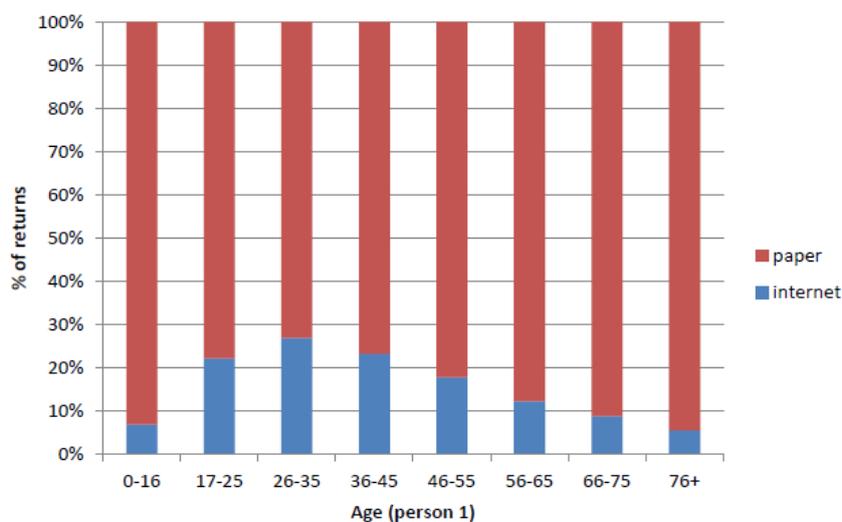


Figure 3.8 Percentage of census returns submitted on paper/by internet, by age of respondent



Online help and support

- 3.181 In addition to the online completion facility an online self-help system was available in English and Welsh. ‘My Census’ proved to be the most popular area of the website. It provided general information about the census, information about census questions, and answers to questions that the public might have. Answers to specific questions such as who to include on the questionnaire, how to obtain replacements, additional questionnaires or large print versions of questions and translation leaflets proved very popular.
- 3.182 A version of the online help system was also used by ONS contact centre staff when responding to queries from the public, thereby maintaining consistency in the information provided.
- 3.183 The help website received some 3.7 million visits and is estimated to have reduced the potential volume of calls to the contact centre (the high number of calls received during the 2001 Census, particularly on the Monday after census day, had created particular problems). The system was especially effective at helping people decide how to complete certain parts of the questionnaire. The online help was also a popular method for requesting materials such as audio cassettes, Braille booklets or British Sign Language DVDs.
- 3.184 The contact centre itself was outsourced to bss, a specialist contact centre provider. It handled almost a million telephone calls between 4 March and 15 May. A large number of queries related to address register ‘anomalies’, most of which related to:
- houses that had been split into flats had received only one questionnaire
 - houses that used to be flats and were no longer sub-divided received multiple questionnaires
 - properties were incorrectly addressed (such as ‘Basement flat’ instead of ‘Lower flat’, or ‘Flat A’ instead of ‘Flat 1’); and
 - Welsh road names were more commonly known in their English form, and vice versa

- 3.185 The contact centre was live from 8am to 8pm each week day and over the census weekend, and 9am to 4pm during all other weekends. It was supported by an interactive voice response system (provided by Cable and Wireless) which was available 24 hours each day for the same period.
- 3.186 In addition, at census HQ, the census customer services team helped to answer email queries and the more difficult queries that could not be handled by the contact centre. The sending of reminder letters to households who had not returned a questionnaire also generated a large amount of correspondence. Those who had returned their questionnaire but had since been sent a reminder were either worried that their questionnaire had not been received, or annoyed at being followed-up. No email response address had been provided on the initial reminder letter, but a dedicated email address was quoted on subsequent reminder letters.
- 3.187 Over the course of the census field operation (between 5 March and 11 May) census customer services dealt with more than 29,000 emails, letter and phone calls, and then dealt with a further 27,000 census-related enquiries between 12 May and the end of July.

Logistical support

- 3.188 A field operation the size of the 2011 Census required a very large logistical operation to procure, deliver and replenish the range of supplies used by field staff throughout England and Wales, and to collect supplies and equipment (but not completed questionnaires) from field staff at the end of the field operation.
- 3.189 ONS published two statements of requirement for the delivery of the field logistics and public fulfilment operations in the *Official Journal of the European Union* (OJEU). A preferred supplier was selected (the same supplier for both projects), but in October 2009, during the final stages of agreeing the contract, the negotiations broke down and the procurement stopped.
- 3.190 ONS started a second procurement, this time combining the two elements into one joint contract covering both field logistics (for England, Wales and Northern Ireland) and public fulfilment (for England and Wales only). The contract was awarded to 3M SPSL in March 2010, some six months later than planned, and was active between 1 June 2010 and 30 November 2011.
- 3.191 The procurement of supplies went well and, as a result, the field force was well equipped to do the job. Supplies required by the field staff included: replacement questionnaires, continuation questionnaires for larger households; translation leaflets and other accessibility materials; maps, pens and carrying bags. Additionally there were health and safety materials such as personal alarms and high-visibility vests.
- 3.192 Delivering the range of supplies to some 35,000 field staff in the short window available resulted in some issues. Supplies were delivered to the co-ordinators, for subsequent distribution to their teams of collectors when they started work. However, large numbers of field staff had to be recruited a short time before they were due to start work, which made it difficult to plan the large volume of deliveries required, so logistical and operational arrangements had to be revised.
- 3.193 Despite these challenges supplies were successfully delivered in time for following-up the non-responders, and equipment and materials were subsequently collected from field staff across England and Wales in a short period of time.

Non-compliance

- 3.194 For every census since 1801 there has been a legal obligation for people to be included in the census. Since 1921 censuses have been taken under the Census Act 1920, which makes it an offence to refuse or neglect to comply with the provisions of the Act or any Order in Council or Regulations made under the Act.
- 3.195 The main objective of the non-compliance process was to persuade the few people who refused to complete a questionnaire to do so. If this was not possible, the objective was to gather robust evidence to ensure a successful prosecution. At any point during the non-compliance process, if a person changed their mind and satisfactorily completed a census questionnaire, no further legal action was taken, and the case was withdrawn and closed. In the case of a successful prosecution, individuals were liable to receive a criminal record and a fine of up to £1,000. The actual amount of the fine imposed was at the discretion of the magistrate or judge within the scales set out in the Criminal Justice Act.
- 3.196 A key change in the 2011 Census process was the introduction of specialist non-compliance staff working in teams. These teams received specific training in gathering sufficient evidence to enable prosecution. A requirement under the Police and Criminal Evidence Act (PACE) is that interviews under caution have to be conducted, and the ability to perform such interviews effectively was an important element of the role. The lack of sufficient training had been recognised as a shortcoming in the 2001 Census, in which enumerators had undertaken this role as part of the regular duties. Several reports of refusal could not be pursued to prosecution because of the failure of enumerators to gather adequate evidence required under PACE regulations.
- 3.197 The design of the non-compliance strategy for 2011 was influenced by the return of questionnaires to a single data capture centre and the introduction of the questionnaire tracking system, which made it possible to monitor accurately the progress of each questionnaire (or in these cases the lack of such progress).
- 3.198 Another significant change was the use of the Crown Prosecution Service (CPS) to decide on, and undertake, prosecutions. ONS had initially approached a number of government departments with legal teams to see if they would consider taking on the work (the legal team from the Department for Work and Pensions had done this in 2001) but none was able to help. The CPS was approached and agreed in principle to undertake the work. They contributed significantly to the development of the non-compliance processes by providing detailed guidance and advice on the preparation of robust prosecution cases.
- 3.199 The census non-compliance team also worked closely with the Ministry of Justice in London, and regional offices, from May 2010 regarding the court process and the location of dedicated courts across England and Wales in which prosecutions would be heard.
- 3.200 Of the 20,000 refusal reports generated by follow-up staff and taken forward for further action, a third were converted into returns by the non compliance process. Some 12,000 visits by non-compliance field staff took place and, where contact was made over a third of these resulted in a completed questionnaire. Outstanding cases of non compliance were then selected for referral to the Crown Prosecution Service based on the availability of robust evidence of a persistent refusal. However, if the

householder chose to make a return at any stage during the prosecution proceedings prior to a conviction the proceedings were dropped.

3.201 There were eventually 270 successful prosecutions for refusal to complete census questionnaires – a level that was in line with the average number recorded for the previous decennial censuses:

1951	57
1961	87
1971	424
1981	692
1991	342
2001	38
2011	270