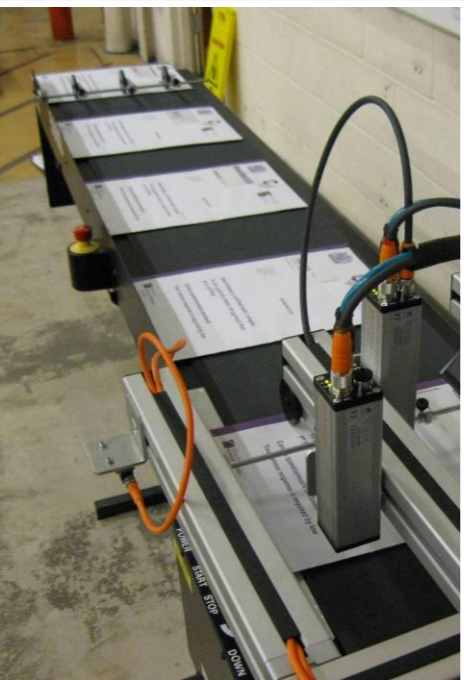
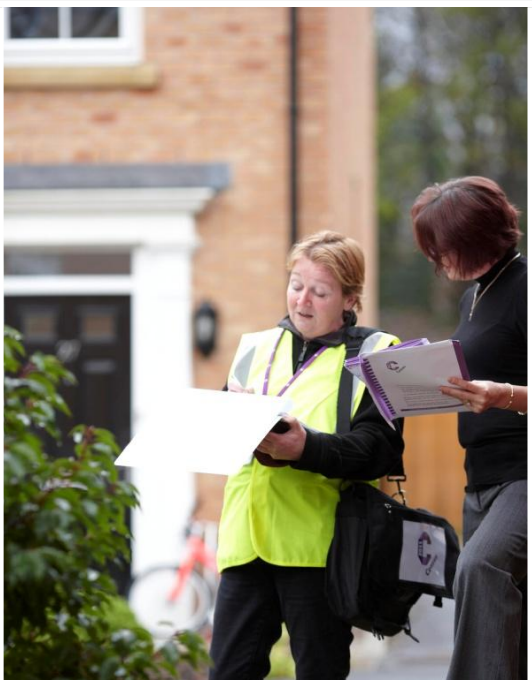
Office for National Statistics

2011 Census

2011 Census

General Report for England and Wales





2011 Census
England and Wales
General Report

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Office for National Statistics

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Foreword

By the National Statistician

Foreword by the National Statistician

Jil Matheson, National Statistician (1 September 2009 - 30 June 2014)

As the National Statistician at the time of the 2011 Census, it was a great honour to have my signature on every one of the 25.4 million questionnaires delivered. The decennial Census of Population and Housing is a vast and complex undertaking, often described as the largest peacetime operation carried out in the country. It is certainly the largest statistical exercise we can contemplate, touching, as it does, every individual and household in the land.

It provides us with the opportunity to get an accurate, comprehensive and consistent picture of the country's population. The results are invaluable for both national and local policy formation, planning and the effective targeting of resources. It provides the only source of directly comparable statistics both for small areas and different population groups, and which are generally consistent across England and Wales and the rest of the United Kingdom. It is used as a reference base for many statistical series such as population estimates and projections and sample surveys.

This General Report reviews the entire census operation from the early consultation and planning stages through to the production and dissemination of outputs and evaluation, and beyond. It provides a wealth of detail about how the census was carried out and what we have learned to take forward in our plans for the next census. I hope that both the experienced and occasional user of census data, as well as the wider public, may find it useful.

Every census has its unique features – new developments and innovations to meet changing user needs, to reflect evolving socio-demographic and economic circumstances, and to embrace new methodologies and technologies. The 2011 Census was no exception and here I would like to pick out just a few of them – the report describes these and others in detail.

Questionnaires were posted out to households around the country. This was a fundamental change in the field operation, breaking the 200-year-old tradition of an enumerator calling on every household to ensure hand-delivery of the questionnaire.

As with 2001, most completed questionnaires were posted back, allowing field staff to focus on following up those households that did not initially return the questionnaire. There were areas of the country which were known to be difficult to enumerate – these areas were targeted with the aim of minimising the differential undercount experienced in the 1991 and 2001 Censuses.

A pre-requisite for this approach was having a reliable and widely acceptable national address register – something which did not exist beforehand. The Office for National Statistics created, for the first time, one that was fit for purpose by identifying individual addresses and not just postal delivery points. The list, together with a unique bar code on each questionnaire, meant the status of individual questionnaires could be tracked in the field and monitored centrally, making subsequent follow-ups efficiently targeted.

Also for the first time, a secure online facility was made available for people to send in their responses. This not only reduced the volume of paper questionnaires to be processed, but speeded up the whole operation by embedding automatic quality checks into responses before they were submitted.

ONS extended the range of services provided by outsourced contractors to include the recruitment, training and pay of the field force. The supplier attracted a high quality of staff better reflecting their local community.

New questions on national identity, passport held (as a proxy for citizenship), month and year of entry into the UK and intended length of stay, language, and second address were all introduced for the first time. These new questions reflected the changing requirements for information from users and the need to be able to better understand the concept of usual residence. The long-standing question on marital status was expanded in order to collect information on civil partnerships. New questions on type of central heating used and number of bedrooms were also introduced in order to provide more relevant measures of housing standards.

An innovative national publicity campaign, backed by an engaging brand, an intensive local and community liaison programme, and a web-based self-help facility, helped to get the key messages to a wide audience. Supporting and explanatory material, including the text of the questions, was translated into 56 foreign languages. The fact that we not only maintained the overall level of response compared with 2001, but increased it in those local authorities recognised as being harder to enumerate, is a testimony to the success of the campaign.

Quality assurance was more extensive than before, giving users more confidence in the quality of the results. Census outputs have been produced earlier than was the case for the 2001 Census and have been accompanied by innovative data visualisation and have received extensive press coverage. Web technology has enabled much wider dissemination of, and access to, the largest volume of census data produced than ever before. Moreover, for the first time, we have attempted to assess the benefits that have accrued from the use of such data.

The confidentiality and security of the information collected in the census was, as has always been the case, a matter of the highest priority. The public can be reassured that the arrangements to protect their personal information were the most rigorous ever carried out. Sound planning and risk management meant there were no significant security incidents in the course of the Census.

Detailed planning was vital to the success of the whole census operation, and I am grateful to everyone who put in so much time and effort to make it such a success. With a programme of this size there will always be lessons to learn for the future – these are discussed further in the report.

The overall population coverage of the 2011 Census was again well up to, if not better than, the standards for the 2011 round of international censuses and, as noted, represented an improvement overall compared with 2001. For this I have to thank, as my predecessors have done in the past: the general public for filling in their questionnaires; the army of 35,000 temporary field staff employed throughout the length and breadth of the country to take the census; and the very dedicated staff at ONS in collaboration with their opposite numbers and colleagues in the Welsh Government and at National Records of Scotland and the Northern Ireland Statistics and Research Agency.

Jil Matheson
26 June 2014

Executive summary

Executive summary

The Census of Population and Housing is the most important single source of information about the size and characteristics of the country's most valuable resource - its people.

The 2011 Census programme conducted a census in England and Wales in March 2011 and the resulting outputs provide information on the number and characteristics of people and households. This information is invaluable for central and local government to develop policies and to plan and run public services, such as health and education. The outputs are also widely used by academics, businesses, voluntary organisations and the public. It is also used as a reference base for many statistical series such as population estimates and projections and sample surveys.

Running a census is a vast and complex undertaking. Years of planning and testing went into preparing for the field operation: questionnaires had to be designed, tested, printed and sent to over 25 million households in England and Wales; we ran the largest government marketing campaign that year; and 35,000 temporary field staff were employed to help people to complete their census questionnaire. Systems to process this data, quality assure it, carry out statistical analyses and produce and publish statistical data sets that users want, had to be designed and built.

The Office for National Statistics (ONS) started releasing data from the 2011 Census in July 2012 and since then has published over 600 data sets, with over 8 billion cells of data. By March 2014, ONS had 2.3 million page views for 2011 Census data online, over 500,000 page views of the census analyses and over 600,000 page views of the census data visualisations.

Online publishing has not only made the 2011 Census more accessible to the wider general public, technological developments have enabled ONS to present data in more innovative ways, including infographics and data visualisations.

This report contains a wealth of information to support the conclusion that the 2011 Census has been a success. The significant reasons for success were that the 2011 Census programme:

- was planned with the end user in mind and was clear about the benefits that had to be realised. The entire programme worked to a shared vision – the census helps tomorrow to take shape – which recognised how the statistical outputs are used. This vision underpinned our 2011 Census brand, our actions and how we communicated with our stakeholders and the general public
- started with agreed and shared success criteria which were used to design and drive decision making. Continuous monitoring of progress, evaluations from tests and rehearsals and lessons learned, as well as having sufficient people with the right skills and experience, all contributed to the success
- recognised the importance of stakeholder engagement and developed partnerships with local authorities and community organisations. Their understanding of their local areas and communities was a key contributor to the success of the census and they promoted it through their communication channels and ran over 6,000 events to help promote the importance of the census, and
- ensured that the confidentiality and security of the information collected in the census was a matter of the highest priority. There were no significant security incidents in the course of the census field operation and since,

which is a reflection of sound planning and risk management with good mitigations in place

In addition, given the recommendation by the National Statistician about the need for a 2021 Census (chapter 11), this will be an invaluable reference source when considering the design and development of that census.

Introduction and background (chapter 1)

The planning and design of the 2011 Census took account of lessons learned from the 2001 Census and the changes in society that were expected between 2001 and 2011. Societal changes included: an increasingly ageing population; a more mobile population with more complex living arrangements; increasing numbers of migrant communities; greater numbers of people generally, and more single-person households and dwellings with multiple household occupation.

Noting these and many other comments from users and stakeholders arising from the 2001 Census, the design of the 2011 Census was based on a number of broad strategic aims:

- to give the highest priority to getting the national and local population counts right
- to build effective partnerships with other organisations, particularly local authorities, in planning and executing the field operation
- to provide high quality, value-for-money, fit-for purpose statistics that meet both user needs and inspire user confidence, and which are as consistent, comparable and accessible across the UK as is possible
- to maximise overall response rates and minimise differences in response rates in specific areas and among particular population sub-groups, and
- to protect, and be seen to protect, confidential personal census information

Consultations and stakeholder management (chapter 2)

A census – which encompasses the whole population – has an exceptionally large number of stakeholders with varying degrees of influence and interest. For the 2011 Census, ONS took a more consistent approach to communicating with stakeholders than it had done in previous censuses. In particular, a programme of local authority liaison was initiated with the aims of:

- raising local authority awareness and understanding of the census and the role that local authorities can play in delivering a successful 2011 Census
- building confidence and trust in the census methodology and the resulting outputs, and
- encouraging their participation and support for the census, and in doing so contributing to maximising coverage of the 2011 Census

In addition, an intensive programme of community liaison built on the innovative community liaison activities undertaken for the 2001 Census.

ONS maintained regular contact with users through a variety of means including the long standing Census Advisory Groups. These represented the interests of users in central and local government, the health service, the academic community, the business sector, organisations with interests in diversity, religion, ethnicity and special needs, and users in Wales. Increased emphasis was given to particular requirements in Wales. In particular, a

Transfer of Functions Order, made in 2006, transferred the responsibility for making census Regulations in Wales from Westminster to Welsh Ministers, and provided the Welsh Assembly with the right to be consulted on the content of the census questionnaire.

A number of public consultations were carried out to determine user requirements for information to be collected from the census (particularly from those questions relating to ethnicity, identity, religion and language), and the geographic bases for presenting the census output.

As a result, new questions were included on national identity, passports held (as a proxy measure of citizenship), year of entry into the UK and length of intended stay, language, second address, number of bedrooms and type of central heating. Some of the regular questions were expanded to reflect both legislative and societal change since 2001, such as the extension of the question on marital status to include civil partnership, and the inclusion of tick-box response categories in the ethnic group question to identify Gypsy and Irish Travellers, and Arabs.

Post-out and address register development (chapter 2)

Following the successful trial of posting out census questionnaires in the 2007 Census Test, ONS adopted post-out as the prime means of questionnaire delivery for the 2011 Census. Consequently a comprehensive, high quality address register for all areas of England and Wales was a crucial pre-requisite, enabling questionnaires to be uniquely identified and linked to an address before the operation started.

However, none of the three national address products available at that time met ONS quality targets, so ONS had to construct its own address register specifically for the census. To build this the best parts of the national lists were pulled together: Royal Mail's Postcode Address File (PAF) and the National Land and Property Gazetteer (NLPG) maintained by local government. The address list used was extracted three months before census day, but included some properties under construction that were expected to be built by census day.

Publicity (chapter 2)

Every census presents a unique challenge to marketing communications as it necessitates engaging with every household in England and Wales and motivating them to fill in their census questionnaire. The success of the census depended on making contact with every household in England and Wales, and the target audience for the publicity campaign was, effectively, everyone. The increasing diversity of households, however, made such contact difficult for key population groups such as ethnic minorities, migrants and young adults – which are some of the very groups for which census information is critical.

A key finding from 2001 and subsequent research was that a large section of the population will willingly complete the census if they understand both what it is, and their obligations as a citizen. The recommendation for 2011 was to allocate resource where it was most required, communicating to some extent with the undecided, and to a much greater extent with the hard-to-reach groups.

The creative platform for the 2011 Census campaign was the *'Help tomorrow take shape'* concept. This simple call to action was literally an invitation for everyone to participate in shaping the future of their local environment, in everything from key services such as health and education to local parks and facilities.

Outsourcing (chapter 2)

As with the 2001 Census, ONS contracted out a number of services. The value of outsourcing some census activities and processes to external suppliers is that such organisations bring with them considerable technical experience and expertise. Given the 10-year cycle of the census, and the short timetable requiring a large temporary workforce, it would not have been appropriate for ONS to recruit and train such personnel itself.

The activities that were outsourced in 2011 covered:

- the recruitment, training and payment of field staff*
- the printing of the questionnaires
- the delivery of questionnaires*, and the collection of completed returns via a postal service
- the design of a questionnaire-tracking system*
- the provision of an online questionnaire completion system*
- a contact centre
- the translation, printing and distribution of non-questionnaire material and other field logistics services
- the publicity campaign
- the capture and coding of census data in electronic format
- the production of the archival records; and
- the development of a web data access system*

Activities marked with (*) were those newly outsourced for the 2011 Census.

Collection of completed returns (chapter 3)

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 the traditional paper questionnaire. Some 16.4 per cent of returns were completed through the secure online census; the majority of completed questionnaires were returned by post, as had been the case in 2001. The online service was regarded as a success, providing a number of benefits to the data collection operation:

- it met the expectations of both the public and census stakeholders for an online questionnaire
- it provided an environment in which the security of the census information could be better 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, data processing

There was an intensive programme of following-up households from which a completed questionnaire had not been received – an essential stage in ensuring the census met its overall quality targets. Posting out of questionnaires enabled the field operation to be designed around the follow-up activity and to focus more resources on non-responding addresses. To facilitate this, a questionnaire tracking system was developed that allowed accurate assessment of the enumeration progress in real time, which meant that field staff could be directed to the areas and addresses where they were most needed.

Special enumeration procedures were adopted to deliver and collect questionnaires from communal establishments and special accommodation sites such as caravan parks, marinas, Gypsy encampments and from special population groups such as rough sleepers.

ONS achieved its 2011 Census response rate targets. The overall response rate was 94 per cent with at least 80 per cent in all local authority areas. In addition, fewer than 5 per cent of local authority areas had a census response rate of less than 90 per cent.

Census Coverage Survey (chapter 4)

A Census Coverage Survey (CCS) is the main way to check the extent and distribution of any under (or over) count in a census. The 2011 CCS was a separate sample survey carried out over a three to four-week period after the field work for the census itself had been concluded. It took the form of a short interview to check on the coverage of households and people within households, and to collect some basic demographic characteristics (such as age, sex, marital status, ethnic group and economic activity). The information obtained from the survey was used, in conjunction with the census data, to produce a consistent set of census results fully adjusted for under (and over) coverage.

The design and implementation of the 2011 CCS closely followed the successful 2001 CCS, which had achieved a 90.8 per cent interview completion rate. Improvements were implemented for 2011 such as extended fieldwork for low response areas, and greater flexible working hours for interviewers to contact household members. This led to a 90.4 per cent interview completion rate in 2011, despite the sample being skewed much more towards harder-to-count areas than had been the case in 2001.

Data processing (chapter 5)

As was the case in 2001, the 2011 Census was processed in three main phases:

- *Input processing* – which comprised the main data capture and coding stages
- *Downstream processing* – the edit and imputation stage conducted in parallel with the coverage assessment and adjustment process, and concluding with statistical disclosure control measures
- *Output processing* –the creation of an outputs database, from which all of the census results were produced

Data processing began by scanning the questionnaires and automatically capturing their data. The data were validated to ensure that the values for each question were within the range specified in the relevant coding frame and that there were no duplicate responses. Coders assigned numerical values to written text and ticked boxes, applying coding rules and standardised national coding frames, such as SIC07 (Standard Industrial Classification 2007) and SOC2010 (Standard Occupational Classification 2010).

Respondents to any census sometimes make mistakes in their answers. This results in missing data or invalid responses which are inconsistent with other values on the questionnaire. An edit and imputation method was used to correct inconsistencies and estimate missing data while preserving the relationships between census characteristics.

The coverage assessment and adjustment operation helped ONS to adjust for the number of people and households not counted in the 2011 Census. The extent of this under counting was identified using the post-enumeration Census Coverage Survey (which covered

approximately 340,000 households). Standard statistical estimation techniques were then used to produce an adjusted database from which the final census results were produced. These results also formed the new 2011 base for the mid-year population estimates produced by ONS.

Quality assurance (QA) procedures were built into all stages of data processing and the 2011 Census estimates were subject to a rigorous QA process to ensure they were plausible and of the right overall magnitude.

Overall the methods and data sources used to capture, clean, validate and quality assure the census results were transparent and gave users confidence in the process and hence the census results.

Confidentiality and security (chapter 6)

ONS recognises that the public needs to be confident that personal information collected in the census will be held securely. As in previous censuses, assurances were given to the public that all the information provided would be treated in strictest confidence.

An independent information assurance review was carried out prior to and during the census operation, covering a wide range of planning, management and implementation activities. The review team noted that, from the outset, ensuring the protection of personal information provided by the public had been a core objective in planning the 2011 Census. They concluded:

"*As a result of our review, we are very satisfied that the three Census Offices are managing Information Assurance pragmatically, appropriately and cost-effectively. We are, therefore, confident that they are capable of delivering their IA objectives and that information will be held in secure environments and that it will be handled in line with best practice and Government standards. The public can be assured that the information they provide to the 2011 Censuses will be well protected.*"

The information collected in the 2011 Census is used solely for the production of statistics and statistical research. ONS applied a statistical disclosure control process that modified some of the data before the statistics were released. The method employed was record swapping, which always introduces some uncertainty as to whether the value of any given small count is the true value. These measures proved satisfactory for protecting statistical confidentiality within the published census outputs. The level of detail available was slightly less (in terms of number of rows and columns) in many tables compared with equivalent outputs in 2001 but it did have the advantage of providing considerably more detail through the inclusion of small counts.

Output production dissemination and analysis (chapter 7)

The 2011 Census provides the most complex and comprehensive set of information about the population ever produced. The recent growth in the demand for information, especially through the internet and social media, has encouraged a high user expectation regarding content and delivery that includes collaboration and user participation.

The ultimate benefits of the census are only realised when the users of census data make use of the published outputs. Therefore the investment of time and resources in a census can be justified only if the results are made accessible and the outputs produced meet users' needs.

The vision for 2011 was that the web would be the primary dissemination route, and would offer users easy navigation and functionality to customise outputs, charting and thematic mapping. To achieve this, existing ONS web services were enhanced and a Web Data Access programme initiated to provide new functionality in the ONS website. These channels were the primary vehicle for the publishing of the census standard products comprising over 600 data sets, with over 8 billion cells of data. Considerably more than the 360 data sets published from the 2001 Census at the same relative time 10 years ago.

Technological developments have enabled ONS to present data in more innovative ways, including infographics and data visualisations. Infographics in particular are an effective way to summarise census data and highlight key insights. Similarly, data visualisations allow users to explore different variables and have more control over what they want to see. As a result 2011 Census data is more relevant to a wider audience, as evidenced by the large numbers viewing the data and using the online tools.

ONS has aimed to meet users' requirements for statistics at varying levels of detail, for a number of geographies, subject to the overriding requirement to protect statistical confidentiality. These geographies have been created essentially from the same building bricks as in the 2001 Census – the output areas (OAs). These are the smallest area for which census statistics (other than simple head counts) can be released without being disclosive.

ONS has again produced more specialist products including samples of anonymised records (SARs) (often referred to as 'microdata files') and origin-destination statistics.

The 2011 Census analysis programme improved on previous censuses by publishing timely and informative analyses of census data. This programme was overseen by an ONS team responsible for the co-ordination, development, publication and timing of analytical outputs. To achieve this they worked closely with the team that was consulting users on their needs and helping to specify the outputs. Five main approaches were taken to producing analysis that showcased census data: stories, summaries, infographics, video podcasts, and interactive content. Chapter 9 includes selected analyses on census topics.

Data quality (chapter 8)

The success of any census hinges on producing relevant results to sufficient quality when they are required. Informing users about the quality of the data, and hence its limitations, is also crucial to aid user interpretation and understanding of the results.

Various indicators of data quality were used to guide the 2011 Census programme in its design and decision making. The overall aim of these indicators was to do at least as well as similar measures in 2001. In summary:

- the 95 per cent confidence interval achieved on the population estimate was +/- 0.15 per cent (83,000 people), much narrower than the confidence interval in 2001 of +/- 0.21 per cent (+/-109,300 people) indicating more accurate population estimates
- 97 per cent of local authorities had a 95 per cent confidence interval of +/- 3 per cent or better, compared with 94 per cent of local authorities in 2001
- the overall response rate for England and Wales in 2011 was 93.9 per cent, slightly better than the 2001 overall response rate of 93.7 per cent, and

- all LAs had a response rate above 80 per cent and only 13 had a response rate below 90 per cent, compared with 2001 where 13 local authorities were below 80 per cent and 38 were below 90 per cent

Based on these indicators the overall aim to maintain or improve data quality compared with 2001 has been very successful. Bearing in mind the trend of declining response to, and participation in, social surveys and previous censuses over the last three decades, these were challenging targets which the census has met.

Evaluating the 2011 Census (chapter 10)

This General Report contains information about the planning, conduct and results of the 2011 Census in England and Wales. It has noted that many aspects of this census were innovative and were successful, including:

- better engagement with users and stakeholders, particularly local authorities, which engendered higher levels of support and confidence in the census
- development of a purpose-built address register to facilitate mail-out of questionnaires and improve management of the field operation, including questionnaire tracking
- use of a reduced and more flexible and specialised field force, to enable more resource to be focused on achieving increased response rates in hard to enumerate areas
- introduction of a secure online census
- improvement in overall response and successfully reducing the variation of non-response across all local authorities, and
- more flexible dissemination of an increased range of census results and analysis across the suite of ONS websites

It also reports that there were, as is always the case in any census, a number of challenges and lessons to be learned for any similar census operation in the future. The main conclusions from the evaluations of several major and innovative elements of the 2011 Census Programme are summarised in themes, including:

- programme management and governance
- the development of an address register
- stakeholder management and the parliamentary process
- data collection and the field operation
- data processing and statistical methodology
- output, content production, and dissemination

Beyond 2011 (chapter 11)

Given the significant sums of public money spent on each census, ONS carries out regular investigations into the need for collecting such information, and the effectiveness of any alternative methods. Such reviews were, for example, carried out prior to both the 2001 and 2011 Censuses.

During the build-up to the 2011 Census, ONS set up another review programme to assess whether any of the alternative means of collecting census-type information were now viable. Together with National Records of Scotland (NRS) and the Northern Ireland Statistics Research Agency (NISRA), ONS initiated a ‘Beyond 2011 Project’ to test other models for

producing future population and socio-demographic statistics. Improvements in technology and in government data sources offered the opportunity either to modernise the census or to develop an alternative approach based on re-using administrative data which is already held within government.

Extensive consultation with users helped to inform assessment of the options, as well as the National Statistician's final recommendation that:

- an online census of all households and communal establishments in England and Wales should be carried out in 2021, as a modern successor to the traditional, paper-based decennial census, taking special care to support those who are unable to complete the census online, and
- there should be increased use of administrative data and surveys in order to enhance statistics after 2021 and improve statistics between censuses

Chapter 1

Introduction and background

1 Introduction and background

Historical background

1.1 There has been a census in England and Wales (and Scotland) every 10 years since 1801, with the exception of 1941 during the Second World War. Additionally there was a mid-term census in 1966. The Census of Population and Housing is the most important single source of information about the size and condition of the country's most valuable resource – its population. Broadly the same questions are asked, and the information is recorded in the same way, throughout the UK. This means that the census allows the comparison of different groups of people and small areas across the entire nation, and the opportunity to inter-relate various characteristics of the population. The high degree of consistency between one census and another also allows for changes over time to be measured.

Reasons for a census

1.2 Everyone in the country uses public services at various times, including schools, health services, roads and libraries. These services have to be planned to keep pace with changing patterns of life. For their work to be effective, government, local authorities, the health service, the education and academic community, commercial business, professional organisations and the public at large all need reliable information on the number and characteristics of people and households. This need is currently best met by conducting a census every 10 years covering the whole of the population, and by updating the population estimates each year benchmarked on the preceding census.

Shaping government policy

1.3 In particular, the UK Government and the Welsh Government need this kind of information to form policy, to plan services for specific groups of people and, especially, to enable local and health authorities to direct resources where they are needed. The information must be authoritative, accurate and comparable for all parts of the country. Currently only a census can provide the range of such information uniformly, both about the country as a whole and about individual small areas and sub-groups of the population.

1.4 The census counts the numbers of people living in each city, town and country area, distinguishing those who live in households and those who are resident in communal establishments. It provides information about each area and its population, including the balance of young and old, the healthy and sick, what jobs people do, the transport they use and the type of housing they live in.

1.5 An accurate count of the population in each local area is crucial for government to calculate the size of grants it allocates to local and health authorities. In turn, these authorities use census information when planning services in their areas.

1.6 As noted in the Government's 2008 White Paper '*Helping to shape tomorrow*'[1], basic information on the population size, age, sex and location are fundamental to many government policies including:

- ageing and pensions
- migration into and out of the country, and internally

- long-term sustainability of Gross Domestic Product (GDP) growth and long-term sustainability of government revenues
- labour supply and inflationary pressures

1.7 Information on housing, household size and family make-up is important for:

- redressing inadequate accommodation and over-crowding, and
- meeting local housing demand and planning

The range of other information collected in the census:

- provides a better understanding of pressures on transport systems and the planning of roads and public transport
- enables the identification of areas of deprivation for targeting initiatives such as Neighbourhood Renewal and Sure Start
- provides information on ethnicity, qualifications and labour market status, for example to identify the causes of deprivation and appropriate policy interventions
- shows how many people work in different occupations and industries, helping government and businesses to plan jobs and training policies and to make informed investment decisions

Benchmarking

1.8 The census provides the basis for deriving many social and economic indicators such as:

- population estimates
- employment and unemployment rates
- birth, death, mortality and fertility rates
- equalities monitoring (information on age, sex, ethnicity, religion, and disability help to identify disadvantage and measure the success of equal opportunities policies)
- grossing-up sample survey data (the census underpins socio-economic surveys carried out by government and the private sector because the survey results are grossed to census population counts. Without the census such surveys would be less reliable or would need to be larger and more costly)

1.9 Census benchmarks also underpin democratic engagement. The Boundary Commission, for example, takes account of population change to reshape constituency boundaries, and Member of European Parliament (MEP) representation is calculated using census population figures.

Allocation of resources

1.10 The Department for Communities and Local Government (DCLG) and the Department of Health (DH) allocate money to local authorities and clinical commissioning groups to ensure that access to services is based on relative need rather than the ability of a local area to fund those services. Between them DCLG and DH currently allocate about £110bn a year to local authorities and clinical commissioning groups in England**,** based on a whole range of factors including census-derived population estimates, projections and breakdowns. In Wales, census-derived indicators are used in the direct allocation of around £2.4bn out of the £5.5bn

available to councils in the Local Government Revenue settlement. Over £4bn of funds are also allocated to health areas in Wales based in part on census figures.

Local investment and monitoring

1.11 The census drives targeting of local services such as:

- local health (census questions on long-term illness and general health are good predictors of demand on the NHS)
- local education needs (census informs where to site new schools)
- local transport planning and traffic modelling
- local authority development plans (to ensure that development happens at the right locations)
- community support services, including home help and home care

Use by businesses

1.12 The business community uses census data in a variety of ways, such as:

- in the creation of geodemographic packages such as Acorn and Mosaic
- in understanding small area characteristics for better market research
- in location analysis for determining sites for future stores and which products to stock in different parts of the country
- for selecting direct marketing strategies
- in financial product design

Academic research

1.13 The census is an excellent source of data for social science research. The ONS Longitudinal Study is a 1 per cent sample based on census records linked together from censuses since 1971 and combined with other sources such as cancer registrations, births and deaths. This provides, for example, an unrivalled source for examining change over time. Such studies increase our understanding of social conditions and can shed light on the impact of past policies.

1.14 In conducting all such research ONS takes its confidentiality pledge to the public extremely seriously. When data are published ONS takes great care to ensure that reports are anonymised so that no individual data can be identified.

Legal basis, the UK context and EU requirements

The UK context

1.15 The statutory authority for taking a census of population in England and Wales is the Census Act 1920 (this Act also provides for a separate devolved census in Scotland, and similar legislation covers the census in Northern Ireland). The Act gives powers for taking a census in any year that is at least five years from the year of the previous census.

1.16 The introduction of the Statistics and Registration Service Act 2007 (SRSA), which came into effect in April 2008, separated the function of the Registrar General (who had been responsible for the census since 1841) from the Office for National Statistics (ONS). The authority for carrying out the census in England and Wales under the Census Act 1920 now lies with the independent UK Statistics Board

(whose functions are carried out under the title of the UK Statistics Authority). ONS is the executive arm of the UK Statistics Authority.

1.17 The Statistics and Registration Service Act 2007 (SRSA) also transferred ministerial responsibility from the Treasury to the Cabinet Office. The scope and authority of the Census Act otherwise remains broadly unchanged (see chapter 6) as a result of SRSA, though the provisions concerned with protecting confidentiality have been extended.

1.18 Under the terms of the Census Act, the Registrar General for Scotland still has the authority for taking the census in Scotland. But since devolution the Scottish Parliament is entirely responsible for approving separate subordinate legislation relating to the census in Scotland and its funding. The Registrar General for Northern Ireland is similarly responsible to the Northern Ireland Assembly, under the provisions of the Census Act (Northern Ireland) 1969.

1.19 United Kingdom harmonisation has been achieved through close liaison and co-operation between the three census offices. The National Statistician and the Registrars General have a formal agreement[2] to work together to achieve consistent and comparable census outputs – both to meet domestic users' requirements and to fulfil the UK's international obligations.

1.20 The 2011 Census was compatible with the Human Rights Act (HRA), Data Protection Act (DPA), Disability Discrimination Act (DDA) and UK Equality legislation, and was carried out in a form and timeframe required by European Union regulations.

European Union requirements

1.21 The need for census information is shared by the European Union (EU). The European Commission needs sufficiently reliable and comparable data on population and housing in order to fulfil the tasks assigned to it, notably by Articles 2 and 3 of the Treaty establishing the European Community[3]. To this end a Council and European Parliament Regulation[4] requiring member states to provide the Statistical Office of the European Communities (Eurostat) with census-derived statistical information, or equivalent data, relating to the reference year 2011 came into force in July 2008. Aggregated statistics, agreed by the National Statistical Institutes of Member States, and prescribed by a subsequent Commission Regulation[5], have been supplied to Eurostat for use by the European Commission in support of the European Parliament.

1.22 The concepts and definitions adopted by the EU adhere to the Conference of European Statisticians' *Recommendations for the 2010 Censuses of Population and Housing*[7]. This was prepared by a joint Eurostat and UN Economic Commission for Europe working group, to which the UK made a significant contribution. Statistical disclosure controls protect the confidentiality of any statistical data made accessible to Eurostat under this obligation.

Separate arrangements in Wales

1.23 Statutory responsibility for the administration and conduct of the census is not fully devolved in Wales. However, there were concerns and strong feelings in Wales over the lack of a 'Welsh' tick box in the 2001 Census ethnic group question. This, together with a recommendation in the Treasury Select Committee's report on the 2001 Census,[6] resulted in a commitment to work with the Welsh Government and

give Welsh Ministers a more formal role in determining the conduct and content of any future census in Wales. Information on the legislative process necessary for taking the census in Wales is set out in chapter 2.

1.24 The 2011 Census field force was managed by a regional management team with a separate regional manager for Wales.

1.25 A census household questionnaire has been provided in Welsh since at least 1841. Prior to the 2011 Census this was produced by translating the finalised English questionnaire into Welsh. A new method was used for the 2011 Census, developing questions in the Welsh and English languages simultaneously. This approach gave both languages equal status throughout the development cycle, and allowed cognitive testing of questions in both languages at the same time. The new method enabled issues unique to each language to be considered at every stage of development, and ultimately both versions of the questionnaire met the same quality standard.

1.26 Recruitment campaigns in Wales were bilingual and application forms could be completed in Welsh. All interviews were available bilingually, and candidates applying for 'Welsh speaking essential' areas had a short interview in Welsh.

Recommendations from the 2001 Census and strategic aims

1.27 The design of the 2011 Census took into account the lessons learned from the 2001 Census, as assessed by ONS through its own evaluations, and also the changes in society that were expected between 2001 and 2011. ONS also took account of the recommendations made by external bodies, such as the Treasury Select Committee[6], the National Audit Office[8], the Statistics Commission, the Public Accounts Committee[9] and the Local Government Association[10] in their own independent reviews of the 2001 Census .

1.28 The key issues raised in these reviews covered the need to:

- select external suppliers of outsourced census operations early, using rigorous procurement procedures, and test their systems before the census
- increase the efficiency of census questionnaire delivery by developing a high quality and up-to-date address list
- enable better central control of field processes and activities by developing robust field management and questionnaire-tracking systems
- have earlier and more detailed engagement with stakeholders, particularly local authorities, and review consultation processes to ensure the disabled community's needs were taken into account
- ensure that the views of people in Wales and the Welsh Government are better reflected in census planning, by reviewing consultation processes
- review whether or not the coverage survey's design is sufficient to identify under-enumeration in the hardest-to-count areas
- review the need to collect information on income
- review the cost-benefit trade-offs in aiming to produce more timely outputs that are consistent and harmonised across the UK, and
- review the mechanisms to protect statistical confidentiality without eroding the utility of the data

Strategic aims

1.29 Taking account of these and many other comments arising from the 2001 Census, the design of the 2011 Census was based on a number of broad strategic aims:

- to give the highest priority to getting the national and local population counts right
- to build effective partnerships with other organisations, particularly local authorities, in planning and executing the field operation
- to provide high quality, value-for-money, fit-for-purpose statistics that meet user needs, inspire user confidence, and are as consistent, comparable and accessible across the UK as is possible
- to maximise overall response rates and minimise differences in response rates in specific areas and among particular population sub-groups, and
- to protect, and be seen to protect, confidential personal census information

Key elements and innovations of the 2011 Census design

1.30 To achieve these aims, and to respond to changes in society since 2001, the design of the 2011 Census was significantly different from its predecessors. The societal changes included:

- an increasing ageing population
- a more mobile population with more complex living arrangements
- increasing numbers of migrant communities, particularly from east European countries
- greater numbers of people in both single-person households and in dwellings with multiple household occupation

1.31 The key elements were that:

- the census would aim to cover everyone usually resident in England and Wales on census night, with a subset of information also collected from visitors present in households on census night
- questionnaires would primarily be delivered by post, using a purpose built address register
- field staff resources would be focused in areas which were particularly hard to enumerate, and from which initial response rates were low
- the public could return completed questionnaires either by post or online
- help would be available to anyone who had difficulty in completing the census questionnaire
- there would be a slight increase in the number of questions compared with the 2001 Census, but the questionnaire would be re-designed to make it easier to complete
- there would be some significant changes from 2001 in the questions asked, in particular:
    - questions on national identity and citizenship
    - additional response categories in the ethnicity question
    - questions on second residences
    - a question on language
    - the inclusion of a civil partnership category in the marital status question

  - questions on date of entry into the UK for immigrants and intention to stay
  - the omission of questions on access to toilet and bath/shower
  - some further differences compared with the censuses in Scotland and in Northern Ireland

- each question would meet a demonstrated need, would be publicly acceptable, and would be suitable for a self-completed questionnaire
- stringent confidentiality and security procedures would protect the information gathered in the census and would conform to the requirements of census confidentiality, data protection and freedom of information legislation, as well as to the provisions of the Statistics and Registration Service Act 2007
- to help achieve the public co-operation that a census relies on, there would be publicity to convey the purpose and value of the census, and to give assurances about the confidentiality with which information is treated
- initiatives would be put into place to maximise, and measure effectively, the quality of the information collected; in particular, census coverage and quality surveys would be carried out to measure the number of people not counted by the census and the quality of the responses given; quality assurance panels would review the outputs prior to publication to ensure differences with other sources can be explained (thereby increasing users' confidence in the estimates and realising the benefits of the census), and
- the statistical outputs from the census would be designed to meet user requirements, and dissemination would be to a timetable

1.32 This report describes how the aims and objectives of the 2011 Census were carried out, and documents (in chapter 10) the key lessons from the operational activities – both the successes and particular difficulties – so that the next census can be improved.

Chapter 2

Planning, preparation and management

2 Planning, preparation and management

Date of the census

2.1 The choice of date for the census is central to its planning because it affects the quality of the data collected. The date of the census is set in secondary legislation but needs to be determined well in advance so that all aspects of the census can be planned accordingly. Although the census does not have to take place on a specific day of the week, a Sunday has traditionally been chosen as the most likely time that people will be at home. The date must also maximise the number of households present and ensure minimum interruptions to the delivery and collection of questionnaires. Other factors to be considered are:

- avoiding holiday periods (to maximise the number of people present at their usual residence and the recruitment/retention of field staff)
- maximising the number of students present at their term-time address
- avoiding local elections (when the publicity messages may get confused)
- allowing sufficient hours of daylight for field work; and
- harmonisation across the UK

2.2 The UK Census Offices jointly selected three potential dates for the 2011 Census: Sunday 20 March, Sunday 27 March or Sunday 15 May. This last date was eliminated because it would cause significant problems with the timing of UK local elections. The other dates were seriously considered and in February 2008 the UK Census Offices agreed to hold the 2011 Census on Sunday 27 March 2011, the date that British Summer Time began. This optimum date would provide longer daylight hours to assist in particular the field operation in Scotland and Northern Ireland (where questionnaires were to be hand delivered), and would also benefit follow-up activities across the UK.

Stakeholder management

Introduction

2.3 Because a census encompasses the whole population it has an exceptionally large number of stakeholders with varying degrees of influence and interest. Engagement with different sectors (such as users, partners, Parliament and the media) has traditionally been undertaken by various teams within the census organisation. For the 2011 Census it was decided that a more strategic approach was needed for communicating with stakeholders as a whole, and a stakeholder management and communications team was established. Engagement with stakeholders comprised four steps, providing a progressively higher level of engagement:

- awareness raising
- explanation
- consultation, and
- partnership working

2.4 ONS recognised that stakeholder groups would require different methods and degrees of approach, so different modes of engagement were developed to reflect this. It was also important that the mechanisms to be used for the census were tested at rehearsal, and that models of engagement for the rehearsal could be scaled up for the census itself.

2.5 Early in the planning ONS recognised that local authorities' knowledge and understanding of their areas and resident communities would be important to the success of the 2011 Census. The need for improved engagement with local authorities was one of the main lessons learned from the 2001 Census.

2.6 As part of the wider 2011 Census stakeholder management strategy, a programme of local authority liaison was initiated with the aims of:

- how raising local authority awareness and understanding of the census, local authorities helping to deliver a successful 2011 Census
- encouraging LA participation and support for the census, and so contributing to maximising its coverage; and
- building confidence and trust in the census methodology and the resulting outputs.

2.7 The 2011 Census stakeholder management strategy also included a programme of community liaison that built on the innovative community liaison activities of the 2001 Census, but at a much earlier stage. The main aim of the community liaison programme was to improve response, particularly among the key population groups. For 2011, community liaison started three years earlier than for 2001.

2.8 More information about the local and community programmes is given later in this chapter at paragraphs 2.199 to 2.232.

Parliamentary engagement

2.9 Engagement with Parliament, ministers and the National Assembly for Wales was seen as being an essential element of the wider 2011 Census stakeholder management strategy. The engagement approach was intended to be more pro-active than had been the case in the 2001 Census.

2.10 Each census requires secondary legislation to be approved by Parliament to allow the enumeration to take place: a Census Order, and Regulations under the provisions of the 1920 Census Act. The census also generates considerable public, political and media interest. So it was important that ONS engaged with nationally elected representatives to discuss census issues. Their advice would also ensure that relevant interests and issues were taken into account, so that there should be no surprises when the legislation was put before Parliament.

2.11 Parliament and ministers play an important role in the scrutiny and passage of census legislation to ensure that all relevant interest groups have their needs taken into account. Additionally ministers and MPs might wish to have a role in promoting the census to the many special interest or lobby groups, and to the general public nationally and in their respective constituencies.

2.12 The objectives of the parliamentary and ministerial engagement strategy were to:

- manage the legislation through Parliament and the National Assembly, and engage appropriate stakeholders at key stages of the legislative process
- lay the groundwork to ensure support in Parliament and the National Assembly for the White Paper (see paragraphs 2.343 to 2.347), the Census Order (paragraphs 2.355 to 2.365) and Census Regulations (paragraphs 2.366 to 2.374)
- demonstrate that lessons from the 2001 Census had been learned and incorporated, where appropriate, into the 2011 design
- show that ONS was addressing specific issues relating to: income, disability, local and community liaison, field operations, non-response, Welsh identity and language, and managing the procurement contracts
- assure the National Assembly that Welsh-specific issues and concerns were being considered and addressed
- ensure that MPs' individual and constituency interests and concerns were identified and addressed in advance, and to ensure cross-party support
- ensure ministers were aware of, and fully supported, proposals for the 2011 Census
- encourage MPs to be local advocates for the census, ensure they were aware of plans for the census, how to access the results and their value for research
- better equip MPs for dealing directly with lobbying by constituents and interest groups
- reduce the risk of the census becoming a political battleground (particularly if there were to be a change of government); and
- mitigate the risks from late surprises (such as requirements for new questions)

2.13 The 2001 Census showed that it was difficult to encourage Westminster MPs' interest and enthusiasm for the census more than a few months before the event. So, for engagement to be as effective as possible for the 2011 Census, ONS contacted several parliamentary stakeholder groups: MPs as individual constituency representatives; relevant Select Committees; All-Party Parliamentary Groups (APPGs) with a potential interest; the House of Commons Library and Journals Office; and ministers of key policy departments. There was a similar programme of engagement with Assembly Members (AMs) and committees in Wales, led by Welsh Government officials.

2.14 The engagement mechanisms included: the publication of the White Paper; briefings for MPs/AMs (or their researchers); presentations at Westminster and the Welsh Assembly; meetings with APPGs; giving evidence at Select Committee hearings and Welsh Subject Committee meetings; ministerial and Cabinet briefings; responses to Parliamentary and Assembly questions and (where they were required) Early Day Motions; ministerial statements; and Parliamentary/Assembly debates.

2.15 Success varied considerably across these forums: while it was still difficult to engage the attention of all MPs, Assembly Members were generally supportive.

2.16 All-Party Parliamentary Groups are groups formed by MPs, on a non-party basis, with a common interest in a particular topic or issue. Out of more than 300 APPGs, some 35 were originally identified as having an interest in, or some relevance to, the census; of these, 15 were prioritised and targeted for engagement. Letters were sent

to the chairs of these groups on 11 December 2008, offering meetings to update them on progress towards the 2011 Census, and to discuss any particular interests or concerns. An executive summary of the 2011 Census White Paper was sent with the letters. The key APPGs identified were:

- Ageing and Older People
- Carers
- Chinese in Britain
- Community and Voluntary
- Deafness
- Equalities
- Friends of Islam
- Gypsy and Traveller Law Reform
- Homelessness and Housing Need
- Inter-Faith
- Irish in Britain
- Kashmir
- Punjabis in Britain
- UK Sikhs, and
- Youth Affairs

2.17 Not all of these APPGs responded to the invitation and, in the event, meetings were held with the following:

- Carers
- Chinese in Britain
- Deafness
- Friends of Islam
- Gypsy and Traveller Law Reform, and
- UK Sikhs

In addition, a meeting was held with the Humanist APPG at their request.

2.18 Letters to MPs and AMs (either en masse or to selected constituencies) were sent out at key dates to raise awareness of some key activities:

- the 2007 Census Test
- the White Paper proposals
- the 2009 Census Rehearsal, and
- the 2011 Census itself

2.19 In addition, articles were written for the *House* Magazine, alerting MPs to the publication of the White Paper (in December 2008) and the subsequent laying of the Census Order before Parliament (in October 2009).

2.20 Other avenues of engagement included arranging open meetings and presentations for MPs and AMs at Portcullis House on 4 November 2009 and the Senedd building in Cardiff on 27 January 2010. It was difficult to assess how much the awareness of the census was raised by such activities because attendance at these events was low.

2.21 However, the Assembly Members were able to take a more active interest in the census through their membership of several Subject Committees, at which Welsh Government and ONS officials were invited to report progress and answer questions. Meetings were held with:

- Local Services and Public Services Committee (21 September 2005)
- Panel of Chairs (31 January 2006)
- Equality of Opportunities Committee (15 February 2006, 24 January 2007)
- Environment, Planning and Countryside Committee (13 December 2006)
- Social Justice and Regeneration Committee (31 January 2007)
- Health and Social Services Committee (1 February 2007)
- Education, Lifelong Learning and Skills Committee (8 March 2007)
- Culture, Welsh Language and Sport Committee (14 March 2007), and
- Enterprise, Innovations and Networks Committee (21 March 2007)

2.22 These provided an excellent opportunity for the majority of AMs to be directly involved in discussions on the census because most attended at least one of the committees.

2.23 In addition to matters relating to the Welsh language and Welsh identity, the range of issues covered were (in no particular order): second homes, the enumeration of transient populations, carers, general health, place of birth, students, hours worked, place of work, income, educational qualifications, sign language, sexual identity, migrants, measuring undercount, the role of the Assembly, the 2007 Test, online completion, and confidentiality.

2.24 All the committees (and hence most AMs) were encouraged by this close co-operation between ONS and Welsh Government officials on briefings and presentations, and by the joint working arrangements. They were satisfied that, at least as far as Welsh issues were concerned, the lessons from 2001 had been well learned.

2.25 Consequently it was considered unnecessary to engage further with the new committees created by the re-organisation of the Assembly structures following the Government of Wales Act in 2007. Nevertheless, Ieuan Wyn Jones (the AM for Ynys Môn Isle of Anglesey and Deputy First Minister at that time) attended the launch of the census rehearsal in Ynys Môn Isle of Anglesey in October 2009.

2.26 The local MP for Fareham, Mark Hoban (then in Opposition) was invited to the ONS offices in Titchfield on 24 July 2009 to be given a tour of the census HQ, where he made a prototype online census questionnaire response. He was impressed enough to write about his enthusiasm and support for the census in the local newsletter that week.

2.27 More support and interest in the census was shown by the House of Commons Journals Office, during several meetings to discuss the best means of making census results available to MPs and researchers. Initial discussions (in April and August 2006) had suggested that, without a significant change to House rules, any report formally laid before Parliament under the provisions of s4(1) of the Census Act would have to be, at least in part, printed and published in hard copy (as in 2001).

2.28 Other engagement included letters sent in January 2009 to the Chairs of the Public Administration Select Committee (PASC), the Treasury Sub-committee, the Public

Accounts Committee, and the Liaison Committee, offering informal meetings to update them on progress. In March 2009, letters and a census overview booklet were sent to all MPs, Lords and AMs updating them on progress towards the census.

2.29 A number of Parliamentary committees conducted hearings about the census including the Treasury Select Committee's 'Counting the Population'[75], and the first enquiry in February 2010 of the newly formed (but short lived) London Regional Committee which covered 'London's population and the 2011 Census'[11].

2.30 The Public Administration Select Committee took over responsibility for scrutiny of the work of the Office for National Statistics in April 2008 with the establishment of the independent UK Statistics Authority. In June 2009 PASC conducted a formal review on 'Progress towards the 2011 Census'[13] with a further review in November on 'Official Statistics 2011 Census Questions'[14]. Generally, the outcome of these hearings was very positive and several of their recommendations helped to cement the final plans and approaches for the census.

2.31 After the census, towards the end of 2011, the House of Commons Science and Technology Committee held an inquiry into 'The Census and Social Science'[12] , and in September 2012, PASC launched a programme of work on statistics and their use in government. The role of the census was included in this programme and was the subject of a specific enquiry in February 2014[15].

Engagement with the EU and international bodies

2.32 Census representatives continued to play a key part in co-ordinating the UK's input into liaison with the European Parliament, the Council of Ministers, the European Commission (through Eurostat) and the UN Economic Commission for Europe. They did this, both directly and through the ONS International Division, to ensure consistency of census content and quality across EU Member States, in line with European codes of practice and within the context of EU Census Regulations.

Consultations with users

2.33 The investment of time and resources in a national census can be justified only if the results are accessible to users and meet their needs. This involves wide consultation in accordance with the principles and practices set out in the Code of Practice for Official Statistics.

2.34 One of the long-standing ways in which ONS engages and consults with census users is through census advisory groups that represent the interests of the main user communities, such as:

- central government departments (Departmental Working Group – DWG)
- local authorities (the census sub-group of the Central and Local Government Information Partnership – CLIP)
- the health service (Health Service Advisory Group – HSAG)
- the business sector and professional interest groups (Business Advisory Group – BAPIAG)
- the academic community (Academic Advisory Group – AAG)
- organisations with interests in diversity, religion, ethnicity, special needs and minority populations (Diversity Advisory Group – DiAG)
- users in Wales (Census Advisory Group for Wales – CAGW)

2.35 The first five of these groups had been in existence since the planning of the 1991 Census. Retaining the input of knowledgeable and experienced census users had proved useful to ONS in previous censuses, and the users themselves had found it valuable to be involved in the census from the start of planning. In preparing for the 2011 Census two new groups were established. One of these (DiAG) addressed the concerns and requirements of organisations that represented special and minority population groups and communities, focusing on diversity and equality issues. The other (CAGW) provided a forum for communication between ONS, the Welsh Government, and users in Wales, to address issues of particular relevance in Wales.

2.36 Advisory groups usually met twice a year but received papers and reports as and when relevant issues arose between meetings. The groups provided a forum for discussion on a wide range of census components, including:

- the population base
- topic content and classifications
- test and rehearsal plans and outcomes
- data collection methodology
- quality assurance plans
- local authority and community liaison plans
- outputs, including geography and dissemination media
- disclosure control

2.37 In addition to these long-standing groups, others comprising specialist experts were established to cover topic, methodological, and other particular issues in more detail. These included:

- Population Definitions Working Group
- Output Working Group
- UK Census Design and Methodology Advisory Committee
- Operational Management Advisory Group

2.38 A public consultation on the content of the 2011 Census questionnaire for England and Wales was undertaken between May and August 2005. It began with a paper '*The 2011 Census: Initial view on content for England and Wales*'[16] published 13 May 2005 that provided an initial view on the content and invited comments on the proposals by August 2005. The consultation paper was supplemented by a series of public 'roadshow' meetings throughout England and Wales during June/July 2005 attended by more than 300 people. The paper gave users an initial idea of the information to be collected in the 2011 Census, and a view of the likely constraints and trade-offs. The paper also explained that the strength of the cases made for new data to be gathered would be evaluated against a number of criteria, in particular that:

- the data must carry a strong and clearly defined user need
- the data should be required for small population groups and/or at detailed geographical levels
- the census should seek to collect only that data which could not be collected in any other way
- the data collected must be of major national importance and allow high quality statistical outputs that are consistent across the UK
- only data used in multivariate analyses with other census data items should be collected; and

- questionnaire content should not differ drastically from previous censuses, to enable comparisons with previous censuses

2.39 ONS evaluated what information should be collected in the 2011 Census by considering the user requirements for it against a number of criteria. In particular census questions should not:

- be sensitive or potentially intrusive, not require lengthy explanations nor instructions to ensure an accurate answer
- impose an excessive burden on respondents, or seek information that is not readily known or is unlikely to be remembered accurately
- enquire about opinions or attitudes
- present major coding problems, or require extensive processing that would significantly add to the cost of the census

2.40 It is important that the census is seen to be carried out purely for statistical purposes. It should not therefore be used to collect data that would deliberately promote political or sectarian groups, or sponsor particular causes. The limited space available on the questionnaire meant that the design and size of a question was also an important factor in deciding whether or not certain data could be collected.

2.41 The public consultation generated a higher than anticipated response, with approximately 2,000 submissions from nearly 500 organisations or individuals across central and local government, academia, business, other groups and the general public. The consultation showed there was a continuing need for almost all the information that the 2001 Census asked for, and strong cases were also made for new topics:

- income – needed by central and local government to improve identification and understanding of areas of deprivation
- language – required to monitor equality legislation and to improve service provision to minority groups
- sexual identity – for use in monitoring equality legislation and improving service provision to the lesbian, gay, bisexual and transgender (LGBT) community, and
- second homes – needed to help housing and transport planning and to improve the accuracy of population estimation

2.42 Moreover, a clear requirement for additional information on ethnicity and national identity was also identified, with particular interest in Wales in the collection of information on Welsh identity.

2.43 The responses were evaluated using the criteria outlined in paragraphs 2.38 to 2.40 to provide an overall assessment of the strength of the user requirement.

2.44 The culmination of the first consultation was the publication 8 March 2006 of '*The 2011 Census: Assessment of initial user requirements on content for England and Wales*'[17]. This paper updated the '*ONS initial view on content of the 2011 Census*.' Summaries of user requirements for each topic and the individual responses to the consultation were also published on the ONS website.

2.45 Further consultation specific to the collection of information for each topic, and particularly on ethnicity, identity, language and religion was undertaken in 2006/2007 to:

- gain a better understanding of key data requirements
- gain an awareness of the range of views held on these topics, and
- identify the relative priorities for this information given the constraints of space on the census questionnaire

A report on the responses was published on the ONS website in October 2007.[18]

2.46 One-day open meetings were held during March 2007 in Sheffield, London and Cardiff to present the ONS view of the likely content of the 2011 Census.

Consultation on output geographies

2.47 In parallel to the programme of consultation on census topics and questions, ONS also engaged with users on a proposed National Statistics small area geography policy for England and Wales. This was first put to census advisory groups in the autumn of 2005. Its main thrust was to seek to maintain a high degree of geographic stability with the innovative output areas (OAs) and super output areas (SOAs) developed for the 2001 Census.

2.48 A National Statistics consultation on small area geographies for England and Wales subsequently ran for three months, from 15 November 2006 to 21 February 2007. Its aim was to inform thinking on the future policy for small area geographies for National Statistics, and specifically the way forward on the use of OAs and SOAs in the 2011 Census. More than 240 completed responses were received, as well as 40 comments on specific aspects of the proposed policy, and a further 65 comments from an online blog.

2.49 There was strong and clear demand for stability at the SOA level, although this was less clear at the OA level. While some users asked that OAs should reflect 'reality' at the time of the 2011 Census, just as many argued for no change. Overall the case was not made for any significant change to OAs.

2.50 There was strong support for: OA and SOA boundaries to continue to be freely available; keeping the licensing arrangements for sharing and distribution as simple as possible; and a common boundary between England and Scotland.

2.51 The outcome was that the National Statistics small area geography policy was to retain a high degree of stability – both at the OA and SOA level – and that no major change would be made to the existing OAs and SOAs before the 2011 Census (see paragraphs 7.19 to 7.22).

Consultation on the population base

2.52 Following earlier user consultation in 2004/05 through a Population Definitions Working Group, a decision was reached jointly by ONS and the census offices in Scotland and Northern Ireland to enumerate the 2011 UK Census on a usual residence basis (as had been done in 2001), but at the same time to collect some information on each visitor present at an address on census night (which had not been done in 2001). It was also decided that ONS would consider the need for including any additional questions necessary to record address information for the

purposes of obtaining accurate counts of other population bases, such as workplace and daytime populations.

Question testing

2.53 Following user consultation in 2005, ONS launched a programme of question development and testing, to ensure the 2011 Census met as many user requirements as possible. New questions were developed for topics where there was a new demand for information, and existing questions were redeveloped to accommodate changing user requirements and to improve the accuracy of response.

2.54 A range of qualitative and quantitative tests were used to develop questions that met users' requirements. This testing was supported by further, targeted, consultations to ensure understanding of detailed requirements and to assess where compromises could be made if testing highlighted any difficulties.

2.55 Several UK-wide working groups were established to manage the development of topic-specific questions that met user requirements, and these included data users who were topic experts drawn from across the UK and ONS. These working groups reported to a UK Census Questionnaire Design Working Group, which had responsibility for overall questionnaire development, ensuring that the needs of different topics were balanced appropriately.

2.56 The ONS data collection methodology team carried out a large programme of qualitative and cognitive testing of census questions, in both English and Welsh, between February 2005 and July 2009. The purpose of this testing was to explore, understand and explain the ways in which respondents answer questions, to ascertain whether or not a question was acceptable and worked as intended. Cognitive testing usually took place as a one-to-one interview to maximise effectiveness. This testing helped develop questions designed to collect accurate and meaningful information that met user requirements, were readily understood and easy to answer, and conformed as closely as possible to international best practice of questionnaire design.

2007 Census Test

2.57 A large scale census test covering 100,000 households was carried out in England and Wales 13 May 2007. A 24-page questionnaire was used that included four pages of individual questions per person for five respondents. The opportunity was taken to test a number of new and revised questions.

2.58 As a result of this test, and further consultation and re-evaluation of user requirements, not all of these questions were included in the final set proposed for the 2011 Census. The detailed evaluation of the 2007 Test and the questionnaire can be found on the ONS website.[19] More information on the aims and scope of the 2007 Census Test is given in paragraphs 2.233 to 2.241, including an assessment of the impact that a question about income would have had on response.

Small-scale testing

2.59 A number of small-scale postal tests were also conducted to collect sufficient quantitative information about questionnaire design and content, and to collect further information on the success of all new questions. In April 2007 a split-sample postal

test of 10,400 households was carried out in order to inform the decision on the length of the 2011 Census questionnaire. There was sufficient user demand for the questionnaire to be expanded to four pages of questions per person, requiring a questionnaire of 32 pages in total. This was considerably longer than the 2001 Census questionnaire (20 pages with 3 pages per person), and there were serious concerns that the longer questionnaire would affect response.

2.60 This test concluded, however, that the length of the questionnaire would not significantly affect response rates if the questionnaire was well designed. This was a contributing factor in the ONS decision to increase the length of the questionnaire to 32 pages in order to accommodate six respondents.

2.61 In July 2008, two postal tests were carried out, one across England, and the other in Northampton - an area with a high concentration of international migrants. These tests would inform the decision on whether to include 'short-term UK residents' (sometimes referred to as 'short-term migrants') in the 2011 Census. The conclusion was that people resident in the UK for less than 12 months would complete a census questionnaire if asked to do so. Consequently the 2011 Census was the first to gather information on such short-term UK residents, providing a new population base while at the same time allowing comparison with the enumeration base used in the 2001 Census.

2.62 Then in March 2009, ONS carried out two further postal tests, each with a sample of 10,000 households, one across England and one targeting areas of Durham and Norwich. Their main purpose was to explore issues around the enumeration of students. ONS concluded that it was possible to collect information about students' term-time address at their family home, and vice versa. Collecting this information in 2011 would help to ensure a more accurate enumeration, and estimation, of the student population.

2.63 Later, in July 2009, a postal test of 27,000 households was carried out in areas known to have a high concentration of Pakistanis. The main purpose here was to explore the issues surrounding the inclusion of a 'Kashmiri' tick box in the ethnic group question. This testing showed that respondents would be significantly more likely to record their ethnicity as Kashmiri if a specific tick box was available, rather than a write-in space, but that the user requirement for this additional tick box was insufficient to expand the ethnicity question in this way. This work is discussed in more detail in a separate paper, available on the ONS website[20]. In addition, in July 2009 ONS commissioned some focus groups and in-depth interviews to explore issues around the potential effect of a Kashmiri tick box in the ethnic group question, to help inform the final decision on whether or not to include one.

2.64 The ONS Opinions (formerly Omnibus) Survey was used in 2007, 2008 and 2009 to test new migration questions (year of arrival in UK, citizenship and intended length of stay in the UK); questions on language, national identity and religion; and attitudes towards colour terminology within the ethnicity question. This testing informed the decision to include a range of new questions on migration, and to retain the basic wording of the ethnic group question, as most respondents were happy to answer them and were able to do so accurately.

2.65 In April and May 2007, ONS held focus groups in England to discuss the acceptability of colour terminology within the ethnic group question and to seek to reconcile conflicting views on the issue. The outcome of the focus groups, which had

expressed strong views both for, and against, the use of colour terminology, led to a compromise on the descriptions used in the ethnic group question.

2.66 The Welsh Government also conducted a series of six focus groups in November 2007, in Cardiff, Carmarthen and Wrexham, specifically among people identifying themselves as 'White Welsh/British' to discuss national identity and ethnicity issues. The conclusion was that it would be acceptable to include a 'Welsh' tick-box in the new national identity question rather than as a specific ethnic group in the ethnicity question.

2.67 In August 2008, the National Centre for Social Research held focus groups and in-depth interviews with migrants and the general population to explore the acceptability of collecting information from short-term UK residents in the census. This supported the findings from the July 2008 postal tests, that it would be possible to enumerate this non-resident population.

Agreement to harmonise census design with Scotland and Northern Ireland

2.68 In 2005, the Registrars General for each of the UK countries signed an agreement to work towards a harmonised set of questions, questionnaires and outputs where possible. The agreement is reviewed and updated periodically and published on the ONS website[2].

2.69 Officials from each of the census offices met regularly to discuss progress through quarterly meetings of the UK Census Committee (UKCC) at the most senior executive level, and monthly meetings of the UK Census Questionnaire Design Working Group (UKCQDWG) at the working level. The results of all consultations, research and question testing was shared across the UK.

2.70 Eight UK-wide topic groups were set up that usually met monthly. These were responsible for establishing and prioritising user requirements for information, researching alternative sources of data, commissioning small-scale question testing, and making recommendations on the final set of questions. Each topic group included people with a range of skills and expertise from the following areas:

- ONS census division – to co-ordinate the work and provide census expertise for England and Wales
- other ONS business areas – to provide expertise on each topic
- ONS data collection methodology – to develop and test questions to meet user requirements and provide expertise in questionnaire design
- ONS harmonisation – to ensure questions developed for the census were comparable with those from other surveys where possible
- General Register Office for Scotland (GROS) now National Records of Scotland (NRS), and the Northern Ireland Statistics and Research Agency (NISRA) – to provide census expertise for Scotland and Northern Ireland respectively and ensure UK consistency where possible; and
- the Welsh Government – to ensure Welsh requirements were met and that questions developed would be acceptable in Wales

These groups also included representatives from other government departments (most notably the Department for Education), where ONS did not have a recognised topic expert.

2.71 The work of these topic groups culminated in the production of question recommendations which were then reviewed by the UKCQDWG.

The final content and design of the census questionnaires

The enumeration base

2.72 Traditionally each decennial census covers all people in England and Wales. For censuses prior to 2001 the enumeration base had been those persons who were present at an address on census night**,** and counts of residents were estimated by transferring visitors back to the area of their usual residence. But following consultation in the lead-up to the 2001 Census, users had expressed a strong preference for the census to count persons at their place of residence whether or not they were actually present there on census night and this change was made**.** A decision was also made at that time not to collect any information about visitors in order to reduce the burden on the public.

2.73 However, this lack of any attempt to capture information about visitors, and the resulting loss of clarity as to where visitors should be recorded, may have been factors that led to some under-coverage in the 2001 Census. Consequently, although ONS again enumerated persons where they were usually resident, in 2011 two important additions to the enumeration base were made:

- information was collected on short-term UK residents (persons intending to stay in the UK for more than three months but less than 12 months), and
- the householder also recorded the number of visitors present at the address on census night and certain basic demographic characteristics such as age, sex and usual address. However, any such visitors who were usually resident elsewhere in the United Kingdom were also required to supply full information at their usual residence

2.74 As in previous censuses, students and children at boarding school were regarded as being resident at their term-time address irrespective of where they were present on census day, making the census consistent with the base for the mid-year population estimates.

Revised definition of a 'household'

2.75 For the 2011 Census ONS adopted a revised definition of what constituted a household, with the aim of improving response rates, particularly at addresses with multi-occupancy where the previous definition was likely to be misunderstood.

2.76 In the 2001 Census (and the 1991 Census), enumerators had been instructed to deliver a census questionnaire to each individual household, which was defined as: either 'one person living alone' or 'a group of people (not necessarily related) living at the same address with common housekeeping'. For this purpose 'common housekeeping' had been defined as: 'sharing at least one meal a day or sharing a living room or sitting room'. However, householders had difficulty interpreting this definition, and with the proposed move to a predominantly post-out methodology in 2011 (see chapter 3) with its resulting loss of door-step contact, it was felt that a more intuitive definition of a household was required for the 2011 Census.

2.77 ONS consulted data users, and did research and testing with the public, to produce a more readily understood definition that reflected social change and modern living

conditions, while also being consistent with the harmonised definition that was recommended for government surveys. The following definition was adopted in the 2007 Census Test:
'A household is: one person living alone; or a group of people (not necessarily related) living at the same address, who share cooking facilities and share a living room, sitting room, dining room or kitchen.'

2.78 Cognitive research and post-test evaluation showed that respondents did not have difficulty in understanding the definition of a household. The new definition was entirely consistent with the Conference of European Statisticians' *Recommendations for the 2010 Censuses of Population and Housing*[7]. However, to avoid any ambiguity about what elements of living accommodation are 'shared', the following revised definition was adopted in the 2011 Census:

'A household is: one person living alone; or a group of people (not necessarily related) living at the same address and sharing cooking facilities and who also share a living room or sitting room or dining area.'

2.79 This change also made it easier for respondents to understand, because the definition was based on a physical concept (shared facilities) rather than a social concept (shared housekeeping).

The census topics

2.80 The topics included in the census were those most needed by the major users, and for which questions could be expected to produce reliable and accurate data. In each case no other comparable and or accessible source of the information was available in combination with other items in the census.

2.81 As noted in paragraph 2.38 above, an initial view of the 2011 Census's content was published in May 2005 to promote discussion and encourage the development of strong cases for topics to be included in the questionnaire. The consultation resulted in a demand for many more questions than could be accommodated on a census questionnaire.

2.82 Users initially indicated a need for all the topics covered in the 2001 Census and a range of additional topics covering national identity, income, language, nature of disability, second residences, year of entry into the UK and sexual identity. Subsequently cases were made for further topics such as number of bedrooms and intention to stay in the UK. In making the final selection of questions some difficult decisions had to be made, assessing the different requirements for information and balancing the needs for change against continuity. So ONS used a number of criteria to help evaluate the strength of each topic's case for inclusion. If a robust case could not be made for gathering particular information, a topic would not be included.

2.83 Topics had to meet a significant and clearly demonstrated user need. Users' needs could be justified in terms of, for example, assisting the allocation of significant resources, improving service provision, and developing or monitoring policies. It was essential, therefore, that every question included had a specific purpose, and that the data collected were of major national importance.

2.84 The census is particularly appropriate for topics yielding detailed information for small geographic areas and/or information about small population sub-groups that cannot be sufficiently identified by other means, such as administrative records. Information

required for broad geographic areas only (such as at local authority or regional level), may be better obtained by other means, such as sample surveys. Equally, if the need is restricted to information about a few specific small areas, other methods of data collection might be more appropriate.

2.85 A key benefit of census data is the ability to analyse particular variables against one another, so a proven need for multivariate analysis strengthened the case for a topic's inclusion in the census. Census topics are mutually supporting - each one provides information that makes the other topics more useful. This is particularly valuable where information on a range of topics is collected simultaneously for the whole population to form a single source from which important inter-relationships between topics can be analysed. Answers from individuals forming households and families can be combined to provide valuable information on the number and characteristics of households and families of different types, such as the number of single-parent families where the parent is employed and the children are under school age.

2.86 Statistical comparability with previous censuses is an important requirement for new census topics. Wherever possible, careful consideration was given to the comparability of new questions with the content of earlier censuses.

2.87 Other factors which ONS considered in evaluating priorities for topics included:

- new questions, which had to be tested to show they had no significantly adverse effect on the census as a whole – particularly the level of public response
- new questions, which needed to be capable of collecting data of sufficient and measurable statistical quality to meet users' requirements

2.88 Because the census requires each householder to complete all relevant questions (excepting religion), the questions it asks have to be designed to encourage high quality and accurate answers. So in general the census should not:

- ask sensitive or potentially intrusive questions that could result in an unacceptable level of non-response
- ask questions that require a lengthy explanation or instruction to ensure an accurate answer (people often do not read such instructions) and
- seek information that a householder will not readily know or is unlikely to remember accurately (their answers are unlikely to be reliable)

2.89 It is also important that the census collects only information for which there is no other viable source. So ONS had to consider whether the new data being requested were available from other sources. For example, similar data may have already been collected by another government department, or by ONS surveys, or the data may be available from existing administrative records. The National Statistics Code of Practice Protocol on Managing Respondent Load[21] states that 'National Statistics will, where appropriate, be derived from information supplied for the administration of government business and public services'.

2.90 To minimise the burden on census respondents the length of the questionnaire also has to be limited. Although the 2011 Census questionnaire was one page-per-person longer than the 2001 questionnaire, test results suggested that this increase would not affect response because the extra space was used to improve the questionnaire design.

2.91 In addition to these factors, the census should be seen to be an exercise carried out purely for statistical purposes, and should not be perceived as collecting data that would promote political or sectarian groups, or sponsor particular causes.

2.92 Finally, ONS had to consider legal and statutory requirements. The Census Act 1920 (as amended by the Census (Amendment) Act 2000) restricts, to some degree, what information can be collected. ONS also had to consider the potential requirements of the EU's recently adopted Regulation on censuses of population and housing and current international guidelines relating to census content, which are made to facilitate international comparisons of statistical outputs. Recommendations made by the United Nations, the UN Economic Commission for Europe, and Eurostat were also taken into account in shaping the content of the 2011 Census questionnaire.

2.93 In the event the 2011 Census collected information on the following topics. Those marked * were included in the census in England and Wales for the first time.

At all properties occupied by households and for all unoccupied household accommodation

- address, including the postcode

For households

- number and names of all residents whether present or temporarily absent on census night
- tenure of accommodation
- type of accommodation and whether or not it is self-contained
- type of landlord (for households in rented accommodation)
- number of rooms and bedrooms*
- type of central heating*, and
- number of cars and vans owned or available

For all residents in households

- name, sex, and date of birth
- marital status (including civil partnership status*)
- relationship to others within the household
- student status
- whether or not students live at enumerated address during term-time
- usual address one year ago
- country of birth
- passports held (as a proxy for country of citizenship)*
- year of entry into the UK* and intended length of stay* (for non-UK born)
- national identity* and ethnic group
- religion
- language*
- Welsh language proficiency (in Wales only)
- general health
- long-standing illness or disability
- provision of unpaid personal care
- educational and vocational qualifications
- second address*
- economic activity in the week before the census

- time since last employment
- employment status
- supervisor status
- hours worked
- job title and description of occupation
- name of employer and nature of employer's business at place of work (industry)
- workplace address, and
- means of travel to work

For visitors in households

- name, sex, and date of birth, and
- usual address (or country of usual residence if a non-UK resident)

For residents in communal establishments

- as for residents in households except for the relationship to others within the household, and
- status within the establishment

For communal establishments

- type of establishment (including age group and population catered for, and management responsibility)

2.94 Topics marked* were in the England and Wales census for the first time. All other topics had been included in the 2001 Census, in one form or another. The format of the question on ethnic group in England and Wales was more detailed than the question asked in 2001, to reflect the changing needs and dynamic profile of the ethnic minority population. Details of all the questions and the reasons for their inclusion are given below. A copy of the household questionnaires showing all the questions are in Annex A and B.

Questions asked at all addresses

Name and address

2.95 All census questionnaires were pre-printed with the full address of each household to aid delivery and tracking through the postal system (see chapter 3). The householder (or manager of the communal establishment) was asked to check that the address information was correct and to amend it if necessary.

2.96 Recording the name of each household resident to be included on the questionnaire helped to ensure that the enumeration was complete and enabled a measurement of under-coverage to be made (see chapter 5), and also ensured that queries were directed to the right people if it was necessary to check for missing information.

Questions asked of each household

2.97 Some questions were asked about each household as a whole. Information on the number of households is used in the planning, funding and management of services. In addition, a wider range of census statistics about people, households and housing, aids decisions on rural development, urban and inner city policies, in particular the development of brown field sites. Statistics derived from the census also help to define areas of deprivation and enable policies and resources to be directed to areas with special needs.

2.98 Where accommodation was unoccupied on census night and no questionnaire returned, a few basic facts about the property were recorded by field staff and were used to complement the information collected from occupied accommodation. Households which were entirely absent from their usual address on census night were, however, required to complete a census questionnaire on their return, if this was within six months of census night.

Questions about housing

2.99 The census provides information about the accommodation occupied by each household. It also provides a count of dwellings, including vacant dwellings, and of dwellings shared by two or more households. This shows the extent to which the housing stock is being used and provides a firm basis for assessing current and future requirements as the number and type of households change. No other data source gives such comprehensive information on housing stock at both national and local level.

2.100 At the local area level the census is the only source of nationally comparable information on housing, and so is used widely in calculations of grant entitlements to local authorities. Measures of inadequate housing and overcrowding are used in deciding on levels of housing investment and in targeting programmes which address social and economic needs in urban and rural areas. The following questions were included.

Type of accommodation and self-contained accommodation

2.101 Information was collected from questions on the type of accommodation occupied by the household and whether or not that accommodation was self-contained. This is used to identify separate dwellings and the characteristics of the accommodation in dwellings shared by two or more households. Households living in caravans and other temporary structures were also identified. Central government, local authorities and other users had confirmed the ongoing importance of collecting data to help analyse changes in housing supply and demand, to understand variations in multi-occupancy, and to identify deprived areas. The availability of such information provides a sound basis for comparing household and dwelling counts and establishing the distribution of vacant dwellings in small areas.

Tenure of accommodation and type of landlord

2.102 Questions on the tenure of accommodation and type of landlord (where the accommodation is rented) show how much of the housing stock in each area is in owner-occupation and whether or not it is mortgaged, or is local authority housing, privately let, provided by housing associations, or held by other types of tenure. This information helps central and local government to assess changes in housing

demand, to allocate resources, and to review and develop housing plans and policies. It is also used by the housing industry in analysing the housing market and assessing possible mis-matches between housing supply and demand.

Number of rooms and bedrooms

2.103 A question on the number of rooms within the accommodation, together with the number and characteristics of people in each household, helps to show the degree to which accommodation may be overcrowded or under-utilised. Shortage of space is seen as a fundamental indicator of housing deprivation and as such constitutes an integral part of deprivation indices. Furthermore, living in overcrowded conditions is associated with adverse personal, social and health effects. For example, shortage of space is seen as detrimental to children's development. An additional question, new for the 2011 Census, identified the number of bedrooms, which is a measure of overcrowding.

Type of central heating

2.104 The previous long-standing census question on whether or not households have exclusive use of either a bath/shower or toilet, or both, was no longer regarded as providing a sufficiently discriminative indicator in allocating resources for housing development and regeneration. Consequently this question was dropped from the 2011 Census. Instead, the enquiry into central heating was expanded to collect information on the type of central heating in order to provide a more useful indicator of basic housing standards. It also enabled consistency across the UK for a question from which information was primarily required in Scotland to facilitate work on rural fuel poverty. These long standing requirements were reinforced by the need for better information on renewable energy and energy efficiency.

Household transport

2.105 A question, included in the census since 1971, asked how many cars or vans are owned or available for use by the household. This information is widely used to support work on transport policy and planning. In particular it helps to identify areas where private transport makes the most demand on road space, and to assess the demand for public transport and the need for new or improved roads to better manage traffic congestion. The statistics are also used in making projections of future levels of car ownership, studies of road use and appraisals of the need for future investment in public transport. The information is widely used, for example, by local authorities in putting together local strategic and transport plans.

Questions asked of residents in households

2.106 Questions relating to qualifications, economic activity, occupation and industry were not asked of children aged under 16.

Basic population characteristics

2.107 The primary purpose of the census is to give an accurate and authoritative estimate of the number of people in England and Wales and the area where they usually live, and provide a new and up-to-date benchmark for annual mid-year population estimates. Census-based population estimates are central to every national system of official statistics; they are used in statistical formulae that allocate large sums of

public money to the devolved administrations, local government and the health service.

2.108 In the years between censuses the annual population estimates are updated (from the previous census base) by using data from registrations of births and deaths, and estimates of inward and outward migration (based on sources such as GP patient registrations and information from the International Passenger Survey). Without the periodic corrective effect of a census count these estimates, particularly at the local area level, would become progressively less reliable.

2.109 The classification of the population by sex, age and marital status provides a basis for actuarial tables, which allow trends in life expectancy to be monitored and which are used for purposes such as planning provisions for state pensions and life assurance. Analyses of persons in households by combinations of age, sex, marital status and relationship provide information on different types of household, such as those comprising lone-parent families or two persons of pensionable age, and enable statistics to be produced on separate family units. The following questions were asked.

Sex, date of birth and marital status

2.110 Apart from serving the essential needs for national and local population statistics described above, information on sex, age (determined by date of birth) and marital status is important in estimating the demand for local authority services, such as facilities for the young and elderly. The data are fundamental to the major statistical series, allowing age and sex-specific rates for morbidity, mortality, fertility, marriage and divorce to be calculated. They are used to cross-analyse all other census variables by sex, age and marital status or to estimate, for example, the numbers and ages of those married women who are employed in particular occupations or industries.

2.111 Following the Civil Partnership Act 2004, the traditional question on marital status was expanded to include response categories for civil partnership status.

Relationship in household

2.112 In households of two or more people, a question asked about the relationship between each person in the household. This information provides statistics of households analysed by family composition, and is used by, for example, authorities and organisations providing services to families who need to know how many families there are and what changes in family size have been taking place over time. Applications include planning accommodation and services for the elderly and assessment of the potential demand for housing from young families and multi-family households. The combination of the information from this question with that on sex provides statistics on the number of same-sex couple households.

Migration

2.113 A question included in the census since 1961 asked for the usual address of each person one year before the census. Where this is different from the current usual address, statistics can be compiled to give the numbers and characteristics of people and households who have moved from one area to another. The number of moves by type of person and household between areas and regions of the country can also be derived. The figures show arrivals from outside the United Kingdom, but not those

leaving, in the year before the census. Additional questions new to the census in 2011 asked about month and year of entry in to the UK and intended length of stay for all persons born outside UK, as a means of estimating short-term, as well as usual residents.

2.114 This information is particularly important because migration accounts for much of the growth or decline of the population of areas between censuses. The information collected in the census allows inferences to be made about the level and pattern of migration in other years. The universal coverage of the census ensures that there is as complete a count as possible to enable a better understanding of the number of people and households moving in the year prior to the census. The census is the only current source of reliable migration data for small areas, and analysis of migrants by their demographic characteristics and type of move provides more information on this important group of people, for planning purposes, than is available from any other source.

2.115 Information from the traditional question on country of birth provides information on people resident in the UK born in England, Wales, Scotland, Northern Ireland or elsewhere. Together with a new question on passports held (as a proxy for country of citizenship), this information allows estimates to be made of the numbers and circumstances of (sometimes small) immigrant communities from various countries, who may have particular needs, supporting resource allocation and policy development.

Second residence

2.116 One way of better understanding the reasons for under-coverage was to introduce more questions on residence arrangements, particularly multiple residence. To that end, new questions asking about second address and the reasons for staying at such an address were included in the census.

2.117 Understanding of under-coverage is assisted by better measurement of the societal changes that affect the public's traditional concept of 'usual residence'. These changes include the increasing tendency towards: weekly commuting; children of divorced or separated parents having more than one home; second homes; and global living patterns. This information is particularly useful, for housing and transport planning, and to local authorities that want to know the numbers of people who stay in their area and use local services during the week but who have a usual residence elsewhere.

Cultural characteristics

Ethnic group and national identity

2.118 A question on ethnic group was first included in a census in England and Wales in 1991. This information has enabled national and local government and health authorities to allocate resources, and to allow for the special needs of ethnic minority groups when planning programmes. In particular, response to this question has provided baseline figures against which the Government can monitor possible racial disadvantage within minority groups. The question worked well in 1991 and also in 2001, when it was revised to meet user needs for additional information about people of mixed origin and sub-groups within the 'White' population (particularly the 'Irish') and to be as acceptable as possible to respondents. The classification of ethnic

groups used in the census is now widely regarded as a standard for intercensal surveys and ethnic monitoring**.**

2.119 The inclusion of an ethnic group question in the 2011 Census met a wide range of needs for ethnicity data:

- to enable organisations to meet their statutory obligations under race relation and equal opportunities legislation (where other sources of data do not adequately provide accurate data for small, geographically dispersed ethnic minority populations)
- in the formulae for grant allocation by central and local government
- to inform policy development and monitoring, and
- to provide public bodies with a better understanding of the communities they serve, and hence inform service provision

2.120 The response categories were developed from the 2001 Census question to meet changing user requirements. The question continued to adopt the mix of geographic origin and colour characteristics that was shown to be publicly most acceptable in testing in the 1980s and 1990s, and from which the most useable statistics could be obtained.

2.121 While ethnicity is a dynamic characteristic, data about it must be comparable from one census to another, so the 2011 Census question had to retain a degree of stability. Consequently a new, additional and separate part of this question asked about national identity, enabling people to indicate their identity as being British, English or Welsh (or Scottish or Northern Irish, ETC).

2.122 The form and content of the ethnicity and national identity questions resulted from extensive testing and consultation with users and other key stakeholders. In particular there was a formal consultation exercise on census topics in 2005, and a further consultation from November 2006 to March 2007 focused on ethnicity, identity, language and religion, including a round of public meetings (see paragraphs 2.45 to 2.46). This consultation aimed to determine not only requirements for information but also changing public attitudes towards the acceptability of the question among particular ethnic minority communities.

2.123 The questions included in the census in England are shown at figure 2.1. New response categories for ‘Gypsy and Irish Traveller’ and ‘Arab’ were introduced. (For the question used in Wales the wording of the first tick box under ‘White’ put ‘Welsh’ first.)

Religion

2.124 A question on religion was included in the census in England and Wales for the first time in 2001, following the Census (Amendment) Act 2000. Responses to the question provided information which supplemented the output from the ethnicity question by identifying ethnic minority sub-groups in terms of their religion, particularly those originating from the Indian sub-continent. This information is used to improve understanding of local populations and markets for service planning and to promote legal obligations under equality legislation and to prevent discrimination.

2.125 The question was repeated in 2011 and was one of a suite of questions that allowed respondents to indicate their identity in the way they considered appropriate. As was the case in 2001, response to the question was voluntary (in accordance with the

provisions of the Census Act and international recommendations). The question asked in England is shown at figure 2.2. In Wales, the reference to 'including Church of England, Catholic, Protestant and all other Christian denominations' was replaced simply with 'all denominations'. This ensured the question was asked consistently in English and Welsh, because listing denominations was problematic in Welsh, and testing had found this wording worked better in Welsh.

Figure 2.1 The 2011 Census questions on ethnicity and identity, England

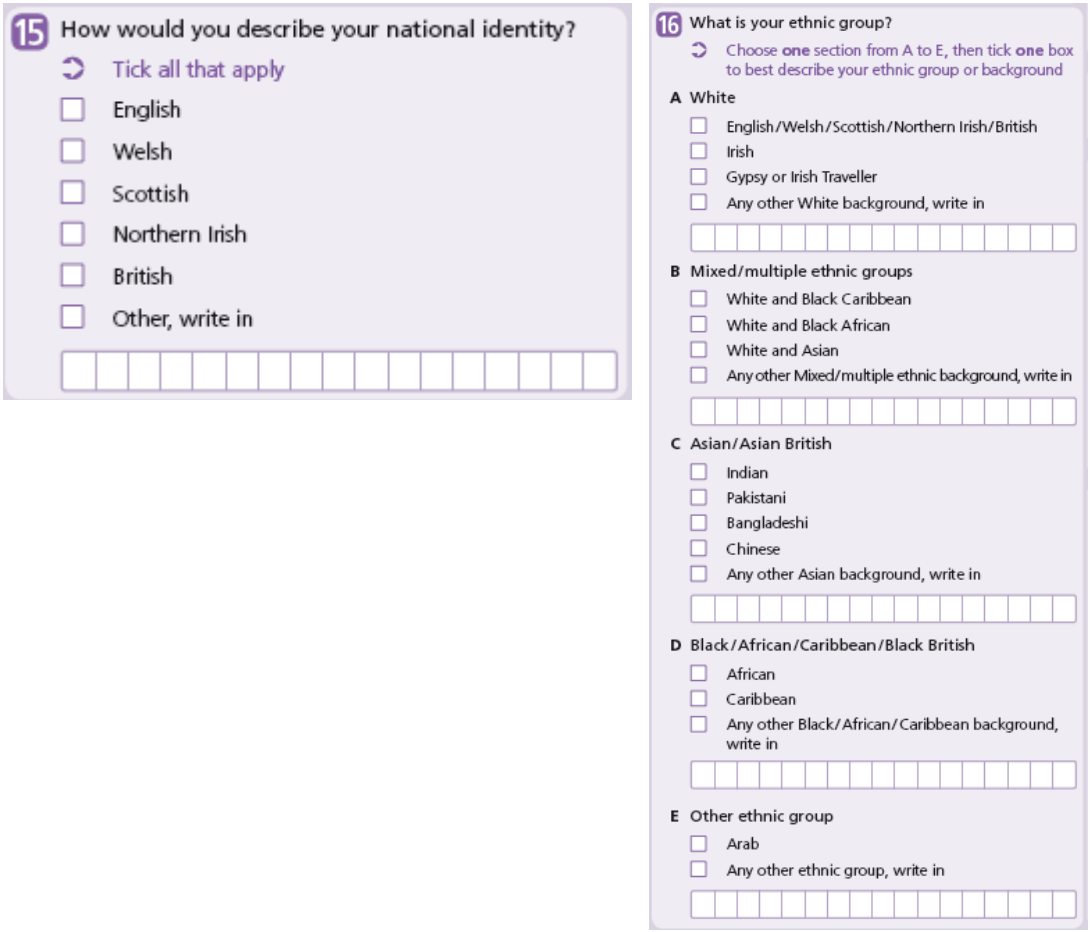
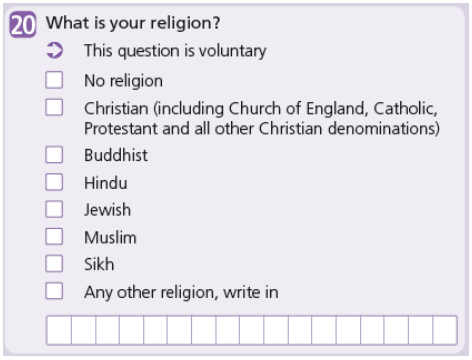


Figure 2.2 The 2011 Census question on religion, England



2.126 Consultation with users had suggested that the form of the 2001 question would not meet all their requirements. In particular they argued that:

(a) the Christian and Muslim categories were too broad
(b) there was a need for information on additional religions and specific non-religious beliefs; and
(c) the concept of 'religious practice' should be distinguished from 'affiliation/identity'

2.127 Regarding points (a) and (b), space constraints on the questionnaire meant that ONS could not provide additional tick boxes for other religions, or break down existing categories further. ONS did explore whether the question could be reworded to reflect the wording used in the Equalities Act, and tested the question: 'What is your religion or belief?' Testing indicated that – regardless of the form of the question – respondents tended to report their 'religious identity'. On that basis it was better to retain continuity with the 2001 question rather than break it and still not be able to quantify the concepts of 'belief' or 'practise'. Also, religious identity or culture is seen as important when monitoring discrimination.

2.128 In response to (c), ONS did not believe that a single question about religion could be reworded in a way that would capture this information suitably, and in a way that would justify losing comparability with the 2001 question. However, ONS acknowledged that the question would not measure religious practice and that for some user needs (particularly for service planning) a measure of practice might have been useful. Instead ONS suggested that a revised question incorporated into social surveys would be the best way to capture such information. ONS also argued that the proposed question would meet other user needs such as understanding populations and monitoring inequalities.

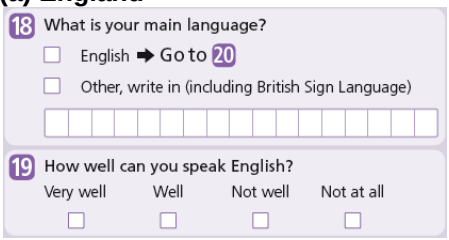
Language

2.129 A question on Welsh language was again asked in Wales – as has been done in one form or other since the 1891 Census**.** Responses provide information that is used to measure the change in Welsh language proficiency to inform policy development and monitoring. The information is also used to inform local resource allocation, (similar questions about the use of Gaelic and Irish languages were asked in Scotland and Northern Ireland respectively). Although a request was made by the then Welsh Language Board to include the question in England, the case to do so was not considered strong enough. Moreover, its inclusion would have necessitated a similar enquiry into the other Celtic languages. As in all previous censuses, therefore the information was collected only in Wales.

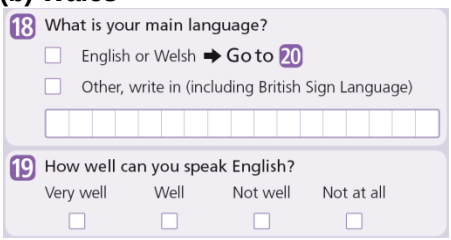
2.130 However, new more general questions on language were included in the 2011 Census which enquired, throughout England and Wales, into the respondents' main language used and their ability in speaking English. The question on main language enabled respondents to record their main language (including sign languages) if this was not English (or Welsh in Wales) (see figure 2.3). Responses provide an indication of areas and communities where foreign language service provision is necessary, and improve understanding of the diversity of the population – in particular the impact of English language ability (English or Welsh in Wales) on employment and other social inclusion indicators.

Figure 2.3 The 2011 Census questions on language

(a) England



(b) Wales



Health and care

Long-standing health problem or disability

2.131 A question asked whether or not a person has any long-standing health problem or disability that causes difficulties in doing day-to-day activities. Problems which arose from old age were to be included (a form of this question was included for the first time in the 1991 Census, and repeated in 2001). This information is used as a measure of the need for health and personal social services at national and health/local authority level, and around particular local facilities, either existing or planned. In line with requirements arising from the Disability Discrimination Act 1995, the 2011 question covered both disability and illness**.**

2.132 Another question, inquiring into the nature of specific disabilities, was considered but not included. The case for doing so was not strong, and it was not possible to devise a self-completion question that would provide sufficiently accurate data to meet user requirements. (a question on the nature of disability was included in Northern Ireland and Scotland to inform their own equality agendas).

2.133 The 2011 question enabled the census to provide information on the circumstances in which the long-term ill and disabled live – for example, whether they live alone or in unsuitable accommodation. It also provided an analysis by age, which is important as the number of elderly people increases.

General health

2.134 In addition to the enquiry into long-standing health problems, the census also included a general health question. This asked the respondents to assess their own health over the preceding 12 months on a five-point scale ranging from 'Very good' to 'Very bad' expanding the three response categories from the 2001 Census question. This information has been demonstrated in surveys to a have a good predictive power for health policy and provision of services, particularly for the elderly. Its inclusion in the census enables such information to be analysed at the local area level.

Provision of care

2.135 The census continued to recognise the increasing amount of unpaid personal care given to people with ill health. The inclusion of a question again in the 2011 Census helps to improve the understanding of the profile of carers (particularly young carers), the variations in the need for care, and the pressure on social services in attempting to target resources more effectively.

2.136 The question recorded whether or not the person provides unpaid personal help for a friend or relative with a long-term health problem or disability, and the time spent each week providing such care.

2.137 Census information on carers is used alongside other measures of health to identify local health inequalities. Carers often experience isolation because of their caring responsibilities and are identified as a group at risk of social exclusion. Census data support the development of policies and plans and the targeting of resources for this priority group.

Qualifications

2.138 The information from a question on educational, professional and vocational qualifications is used to assess educational achievement and labour market participation across the population, looking at demographic groups at a local and regional level. This helps users to understand and respond to equality and diversity issues, in order to widen participation and fair access. The census information on intermediate and higher level qualifications is used in the derivation of the National Statistics Socio-economic Classification (NS-SEC)[23] and assists the understanding of social patterns and local labour markets. Information on those people with no or low levels of qualification is used in deriving indices of deprivation which are used by central government, public and voluntary sector organisations as the primary basis for identifying deprived areas for funding allocations and applications.

2.139 Information was captured on the level of qualifications achieved with the primary intention of deriving the highest qualification and recognising any differences in qualifications in England and Wales. However, the separate 2001 question on whether people had specific professional qualifications such as teaching, medical, nursing and/or dental qualifications was not repeated. This was because it had been poorly answered (having the highest level of non-response of any question), so ONS was not confident that it could achieve sufficient data quality. Moreover, consultation with users suggested that there was less of a requirement for this information compared with other census topics. However, the 2011 question did enable those with professional qualifications generally to be identified.

Employment and the labour force

2.140 The census is a primary source of information about the socio-economic characteristics of the population, and is the most comprehensive source at the local level. It provides statistics about the ages and occupations of workers in different industries. These statistics can be presented both by place of residence and, for those in work, by place of work. The census also provides information about other economically inactive groups such as full-time students, people looking after the home and family, and the retired.

2.141 The census is also the most comprehensive source of labour market information about sub-groups of the population (the Labour Force Survey's sample size at the local area level is too small to provide reliable estimates). For example, the census provides detailed statistics for small areas on employment and unemployment among different ethnic and socio-economic groups.

2.142 Furthermore, the census provides statistics on the pool of labour and the potential reserves of labour in all areas. Particular applications include projections of the future

labour force, drawing up local authority structure plans, and private sector employers wishing to locate operations in areas where there is suitable labour.

2.143 The majority of labour questions referred to a person's main employment in the week before the census or, for those not currently employed, to their most recent job, if any. The questions referred only to those people aged 16 or over, and covered the following topics.

Economic activity in the week before the census

2.144 A number of questions were asked to determine whether the person was in employment (including paid or unpaid or work in own/family business) or was:

- retired
- a student
- looking after the family or home
- long-term sick or disabled
- looking for work
- available for work
- waiting to start a job

These categories provide the basic classification for analysis of economic activity. They are designed to be as consistent as possible with definitions recommended by the International Labour Organisation (ILO) and the Conference of European Statisticians.

Time since employment

2.145 Another question asked those who stated that they were not working in the week before the census to give the year in which they last worked. This helps to determine local differences in the periods of unemployment experienced and the extent of long-term unemployment. Use of this information includes assessing and monitoring disadvantage and exclusion, planning education and training, resource allocation, labour market analysis, and in studies of mortality and morbidity.

2.146 If a person had never worked, no further questions on employment were asked of them. For those persons in paid work, or who had previously worked, further questions covered the following.

Occupation of current main job, or last main job

2.147 Asking people their full job title and the main things done in their job provides detailed and important information about the very wide range of work done nationally and locally. In coding occupation data ONS used the latest revision of the Standard Occupational Classification (SOC 2010)[22]. These statistics are used in analyses of the labour forces of various industries and occupations, in studies of occupational mortality, and they provide the basis for the classification of people and households according to the National Statistics Socio-economic Classification (NS-SEC)[23].

2.148 Two further separate questions enhanced the information collected on main occupation. A question on employment status asked if the person works, or worked, as an employee or as self-employed with, or without, employees; a second question, on supervisor status, asked if the person has or had any supervisory responsibilities

in their job. Responses to these questions help in assigning the person more accurately to the NS-SEC.

Industry of employment

2.149 Information on the industry of employment was determined, as in previous censuses, by asking people the nature of the business of the organisation that employs them. This information is used, for example, in labour market analyses and in the production of regional accounts and economic indicators. Additional information on industry was also obtained for those people currently working from the question asking for the name and address of their employer. This information is used solely as an aid to the accurate coding of the type of industry by reference to the Inter-Departmental Business Register (IDBR) – a list of large employers already classified by type of industry. Responses to the question are not used to produce any information on named individual employers.

2.150 Industry was coded to the current version of the Standard Industrial Classification (SIC 2007)[24].

Hours worked

2.151 A question on the number of hours usually worked in the person's main job distinguished those in full and part-time work. The form of the question was changed from the 2001 write-in response to a pre-banded tick-box response, making it easier for respondents to complete and easier for ONS to code. This information helps to provide a better understanding of changes in working patterns, and how these apply to particular occupations and industries. The Department for Communities and Local Government, in particular, uses this information to improve understanding of employment terms and conditions as applied in practice, particularly in relation to the children and young persons agenda. At a local government level, information on people working long hours is an indicator of deprivation and can inform neighbourhood renewal strategies. The information is also used in labour market studies, in rural policy and regeneration, and in the derivation of area and socio-economic classifications, and provides evidence for the working time directive.

Workplace and journey to work

2.152 From the information collected from the workplace question the census is able to show where people who live in any particular area work, and vice versa. This information is the basis for measuring commuting patterns and assessing the balance of housing and jobs.

2.153 The census also adds to the value and usefulness of many routine employment statistics which are generally based on area of workplace, by providing cross-analysis by area of residence. In addition, information on the number and characteristics of people working in an area is useful for planning and delivering services to the daytime population. In 2011 a new geography workplace zones was developed to support local analyses (see paragraphs 7.26 to 7.28). Two questions were asked, as follows.

Address of Place of work

2.154 Responses to a question on address of place of work show the destination of individual journeys to work in relation to the usual address (which is normally the

origin of the journey). This provides information on the numbers travelling to work from particular origins to particular destinations. Together with information from the question on means of transport to work, the data help to identify commuter routes that are subject to higher pressure on public and private transport.

Main means used for journey to work

2.155 This second question asked about the means of transport normally used for the longest part, by distance, of the journey to work. The detailed analyses of specific commuting flows by the main means of travel are used in planning public transport provision, and facilities for private transport.

2.156 Consideration was given to extending this question to cover journey to place of study for students and schoolchildren (as had been done in Scotland in both the 2001 and 2011 Censuses). However, user demand in England and Wales was less strong and there were concerns that the introduction of this extra dimension would affect the quality of responses on journey to workplace. Consequently, the question was not extended in England and Wales.

Questions asked of visitors

2.157 The 2011 Census included visitors on the household questionnaire. However, only limited information was collected because visitors who were resident elsewhere in the UK were also required to supply full information on the census questionnaire at their usual address. The information collected about visitors was:

- name and usual address (or country of residence if a non-UK resident)
- sex
- date of birth

2.158 The household questionnaire had space for information on up to three visitors together with a count of the total number of visitors. This information was primarily collected to ensure that everyone knew they had to complete a questionnaire and that there was no legitimate excuse to opt out.

Information collected on residents in communal establishments

2.159 The census aimed to enumerate all people resident on census night in communal establishments such as hospitals, nursing and residential homes, educational establishments and hotels (residency in such establishments was determined on the basis of a length of stay of six months or more). Full particulars were required of residents in such establishments, and statistics on these residents, separately identifying resident staff, were produced by each type of establishment. Such communal accommodation is becoming increasingly widely dispersed in small units, which are difficult to cover in sample surveys. The census, therefore, provides a comprehensive and authoritative count of the population living in these establishments that is not available from other sources.

2.160 Information was not, however, collected relating to the person's accommodation (although data about the type of communal establishment was collected separately from the manager or other person in charge of the establishment), or on the relationship to any other person within the establishment.

2.161 Nor was information collected about visitors present in a communal establishment on census night, though the number of such visitors was recorded. If such visitors were resident elsewhere in the UK then, as with visitors to households, they were required to provide full information on their census questionnaire at their usual address. Furthermore, no information was collected on any visitor who was a non-UK resident and who was staying in a communal establishment for a period of less than six months.

Topics that were considered but not included in the 2011 Census

2.162 As noted above, each topic proposed for the 2011 Census should satisfy the criteria in paragraphs 2.80 to 2.92. In addition to previous census topics several other topics were considered but not included either because:

- the case for them was not considered strong enough to displace one or more of the proposed topics or
- tests had shown that the quality of the information obtained from a census question would not be fit for purpose
- the question was too sensitive or would place too great a burden on the public, or
- a combination of these reasons

Two topics in particular were reviewed in detail: income and sexual identity.

The case for and against including a question on income

2.163 Consultations with users prior to the 2001 Census had indicated a widespread requirement for census information about the level of individual gross income. However, at that time the Government felt that this need had to be balanced against: possible public disquiet about the acceptability of such a question in a compulsory census; doubts about the reliability of the information collected; and the availability of possible alternative sources of this information. In its review of the 2001 Census the Treasury Select Committee noted that:

'It is clear that a question on income would have been found useful by many users of census data'

and recommended that:

'...ONS should consult further on whether a question on income should be included in any future census …'.

2.164 As noted in paragraphs 2.38 to 2.46, ONS consulted users widely about their data needs, and again they indicated a strong requirement for an income question. Income is widely seen as a more discriminating variable than occupation or housing condition for the purposes of identifying areas of affluence or deprivation, and in economic and social research.

2.165 All main user communities had made a case for a question on income. In particular, central and local government users expressed a requirement for the information to be used to support a range of activities including resource allocation, policy development and review, the derivation of deprivation indicators, and in the assessment of inequalities and social exclusion. A question on income was

accordingly included in the 2007 Census Test, to assess whether there was any significant evidence of public disquiet about such a question possibly affecting response to the census.

2.166 The design of the test allowed for the effect that the inclusion of a question on income would have on response rates to be assessed. Half of the 100,000 test households received a questionnaire which included an income question, and the other half had a questionnaire without that question. The difference in response rates was, overall, 2.7 percentage points (50.6 per cent for questionnaires with the question compared with 53.3 per cent for questionnaires without). This difference was similar to that obtained in the pre-2001 Census tests and was statistically significant – particularly so given that the test was voluntary and that responses were therefore from households likely to be more compliant. Moreover, an analysis of the completed income questionnaires indicated that a further 9 per cent of responders elected not to answer the income question (the aims and scope of the 2007 Census Test more generally are described in paragraphs 2.233 to 2.241).

2.167 The UK Statistics Authority then considered the user demand for income information against: this evidence of public reluctance to answer such a question; other criteria assessing the public's understanding of the question; and the potential availability of income information from alternative sources. The Authority came to the conclusion that the case for including the question in the 2011 Census did not outweigh the risk of reduced response.

Collecting information on sexual identity

2.168 Consultation with users, particularly during 2005, indicated a strong requirement for information on sexual identity to be collected in order to provide a benchmark for equality monitoring policies. While ONS recognised the potential value of such information, it had also to take account of: concerns about individual privacy and confidentiality within a household; the quality of the resulting data; and the effect that such a question could have on the overall response to the census.

2.169 A small-scale postal survey carried out by the General Register Office for Scotland (GROS) (now National Records of Scotland) in Scotland in 2006, had included a question on sexual orientation. Of the 31 per cent of households that responded, one in seven did not provide useful data on sexual orientation – either because they elected to tick the 'prefer not to answer' box or declined to complete the question at all. This far outweighed the percentage of respondents who declared a non-heterosexual orientation. GROS concluded from this that the results would call into question the accuracy of any data gathered by such a question in the census and hence the utility of the data collected in this way. Furthermore, the terminology and concepts used to attempt to distinguish different sexual behaviours tended to confuse many respondents, leading to additional inaccuracies in the responses**.**

2.170 In the light of this, and of other international research into the viability of including such a question in a population census, it was decided that a census was not a suitable means of collecting sexual identity information, and that a question on sexual identity should not be included in the 2011 Census. However, in recognition of the particular importance of collecting information on this topic for equality monitoring purposes, ONS initiated a project to develop a question on sexual identity that could be used in national surveys. This was subsequently included from 2009 onwards in a large household survey – the Integrated Household Survey (IHS). Estimates from the IHS were available earlier than the 2011 Census results, and can be updated

annually, enabling regular monitoring of the size, distribution and changing social-demographic profile of the lesbian, gay, bisexual and transgender (LGBT) community.

2.171 The main advantage of collecting these data in a household survey is the superior quality of the estimates produced. In a survey environment information is supplied by the person to whom it pertains and is not shared with other householders. Privacy and confidentiality were the key concerns expressed in the focus groups by both LGBT and heterosexual groups.

2.172 A paper that provides further background information and summarises the reasons why ONS felt that a question should not be asked in the 2011 Census is available on the National Statistics website[27].

2.173 In addition to income and sexual identity, the other topics which were considered but not included on the 2011 Census questionnaire are listed in box 1. ONS carefully evaluated all the suggestions submitted. Some topics were rejected at an early stage in planning but many were subjected to both small and large-scale testing. The Welsh Government similarly prioritised the cases made to inform the topic content of the census questionnaire in Wales.

Box 1 Topics considered but not included in the proposals for the 2011 Census

- access to a garden or yard
- access to bank account
- access to bath/shower
- accommodation on more than one floor level
- address five years before the census
- age of dwelling
- asylum or immigration status
- commuting address
- Cornish language and identity
- country of previous usual residence
- duration of residence at current address
- duration of residence in UK
- educational attainment
- fertility
- frequency of use of Welsh language in Wales
- furnished accommodation
- income
- internet access
- lifestyle
- means of travel to, and location of, place of education
- National Insurance number
- nature of long-term illness or disability
- number of current jobs
- number of miles travelled per year
- occupation group and industry using a closed (tick box) question approach
- parents' country of birth
- place of birth
- presence of smoke alarms
- proficiency in foreign languages
- qualification or training required for occupation
- receipt of unpaid personal care
- sexual identity

- Sikh and Kashmiri ethnicity
- size of workplace
- state of repair of accommodation
- taught languages
- type of disability
- type of tenancy agreement
- use of childcare facilities
- use of renewable energy resources
- use of wheelchair
- value of the home

Moving to a four-page-per-person questionnaire

2.174 The original working assumption for the 2011 Census had been for a 24-page household questionnaire with three pages of individual questions accommodating up to six usual residents, together with an additional six pages to record household members, visitors, a matrix of relationships between household members, and the housing questions. This had formed the basis of the ONS bid for census funding from Treasury.

2.175 However, it became clear from consultations with users that there was significant and justified demand for more topics than could be accommodated within three pages of individual questions. The new topics that were at risk of being excluded from the shorter questionnaire were:

- civil partnership categories – included in the marital status question
- second address – to identify and avoid double-counting in the census, and to reconcile population estimates with administrative sources
- month and year of entry into UK – to enable new migrants to be identified and their characteristics to be analysed
- intended length of stay in UK – to enable identification of different population bases (by identifying those who qualified under the internationally agreed definition of short-term migrants)
- citizenship – to identify those eligible to vote and receive services from the Government
- national identity – to allow the indigenous and migrant population to state their identity as English, Welsh, British EtC, and make the ethnicity question more acceptable to ethnic minority communities; and
- language – to improve targeting and provision of services for minority groups

Some of the established topics were also at risk because of the strength of the requirement for new ones or because they were either lengthy (such as qualifications) or expensive to code (industry).

2.176 Work was therefore undertaken to inform decision making on the length of the questionnaire, including:

- research into the effects of questionnaire length on response rates (including international experience)
- costings for 2011 on the difference between a 24-page and a 32-page questionnaire

- a split-sample postal test in April 2007, where half the sample of 10,400 households received a 24-page questionnaire and the other half a 32-page questionnaire (see paragraphs 2.60 to 2.61)

2.177 The postal test in April 2007 showed that increasing the length of the questionnaire from 24 pages to 32 pages did not have a significant effect on overall response rates. The response rates were 31.1 per cent for the 24-page questionnaires and 31.5 per cent for the longer questionnaires. There were also no obvious effects on the level of item response. The conclusion from this research was that there was no evidence that a longer questionnaire by itself would reduce response rates. Other factors such as a cluttered design or the choice of topics had been shown to have more of an impact on response rates. Indeed, there is a significant and consistent body of international research which shows that a long, clearly laid out questionnaire will always receive a better response than a short, congested one. However, the cost of an extra page of individual questions was estimated to be in the region of £22 million.

2.178 The then current funding allowed only for a questionnaire with three pages of questions per person. However, additional funding was provided via a new cross-government funding mechanism which enabled ONS to accommodate more user demands for information from the 2011 Census than would have otherwise been possible.

Quality review of questions and equality impact assessment

2.179 The census questionnaires used in both the 2007 Test questionnaires and the 2009 Rehearsal were subject to quality review by international experts in questionnaire design. The findings from these reviews informed the final questionnaire design and content and helped to ensure that the questions were clear and understandable.

2.180 Furthermore, an equality impact assessment was carried out on the development of the ethnicity, identity, language, and religion questions for the 2011 Census. This is a systematic way of finding out whether or not a function, such as a policy or practice, has a differential impact on particular communities or groups within communities, and the results were published in August 2008[25].

Creating and quality assuring the 2011 Census address register

The need for an address register

2.181 Following the successful trial of posting out census questionnaires in the 2007 Census Test, the decision was made to adopt post-out as the prime means of questionnaire delivery for the 2011 Census.

2.182 The rationale for this strategy was that, even with hand delivery of questionnaires in the 2001 Census, enumerators had failed to make doorstep contact with households at more than a third of addresses, and had resorted to delivering the form through the letter box. The use of an established postal service provider to perform this activity was seen as an opportunity to direct field resources to those areas where a more focused approach to follow-up activities was necessary to improve response rates. ONS expected to post out census forms to as many as 95 per cent of households.

2.183 The availability of a comprehensive, high quality address register for all areas of England and Wales was a crucial pre-requisite to this strategy (in fact, two registers

were required: one for households and one for communal establishments, because these were to be enumerated in different ways). However, none of the three national address products available at that time met ONS quality targets and it was therefore necessary for ONS to construct an address register specifically for the census. In order to build this register parts of the national lists were pulled together from Royal Mail's Postcode Address File (PAF) and the National Land and Property Gazetteer (NLPG, maintained by local government). Data obtained from Ordnance Survey and the Valuation Office Agency were also used. This was made possible only by the willingness of address suppliers to co-operate (Royal Mail, Ordnance Survey and Local Government Information House). Arrangements were formalised in a data sharing agreement in 2009. ONS gratefully acknowledges the trust and partnership shown by all parties to this agreement, without which the address register – and hence the census itself – would not have been so successful.

Development

2.184 ONS was committed to working closely with local authorities throughout the development of the address register, using their knowledge and expertise and seeking their support. Their input was very valuable and ONS was pleased that most local authorities felt that the address register met or exceeded their expectations, and that they felt involved in its development.

2.185 The specific needs of an address register in order for it to serve as the basis for enumeration were that:

- there should be consistency across England and Wales
- there should be minimal under-coverage
- the definition of addresses should be down to the household level
- there should be coverage of, and distinction between, residential household addresses and communal establishments

2.186 The development of the register consisted of three distinct phases:

- the pilot phase – which involved address matching of 24 local authorities and selected field checking exercises (July to December 2008)
- the rehearsal phase – which involved three local authorities and a complete field checking exercise (March to May 2009)
- the national address matching and checking phase – across all of England and Wales (May to September 2010)

2.187 The residential household address register was developed in five stages.

1 - Matching the addresses from the three leading national products

2.188 This involved merging Ordnance Survey's Address Layer 2 (AL2) product and Royal Mail's Postcode Address File, and then matching to the National Land and Property Gazetteer using textual and spatial matching. This process was done some 16 times to enable the matching algorithms to be improved. This resulted in a core of addresses that were consistent between the national products and amounted to more than 94 per cent of the addresses included on the final address list.

2 - Reviewing the remaining, unmatched, addresses

2.189 More than 500,000 addresses remained unmatched after the first stage, and these were sent to local authorities or Royal Mail for checking and resolution. More than 90 per cent of local authorities helped in this exercise, as did Royal Mail staff across England and Wales. This work ultimately led to around 40 per cent of these addresses being identified as invalid and excluded from the list.

3 - Conducting a field check of 3.6 million addresses

2.190 ONS targeted postcodes that contained the highest numbers of unmatched addresses or two or more multi-occupancy addresses (a particular concern for the census). This exercise provided some missing addresses, and also identified nearly half a million addresses to be removed from the list.

4 - Collating information from the address check into evidence base for each address

2.191 This led to difficult decisions on which addresses to include and exclude. To make these decisions consistent, the ONS formulated and applied a set of 'business rules': For example, if Royal Mail's list showed an address as non-residential, but ONS field staff's visit suggested it was residential, then that address was sent a questionnaire. ONS took a cautious approach: wherever there was doubt the addresses were included. Minimising under-coverage was the over-riding objective.

5 - Integrating this work to form the final list

2.192 Most addresses (25.1 million) were supplied in October 2010 for printing directly onto the census questionnaires. A second list of nearly 300,000 addresses was compiled in January 2011, adding late changes and addresses likely to be built and occupied between then and census day (27 March 2011).

2.193 In addition to the household address register a separate list of communal establishments (CEs – places which provide managed residential accommodation such as care homes and prisons) was needed because these were to be enumerated using different methods. Various sources were used to develop the list of communal establishments and ONS used some 50 specialist source lists. However, the same checking approach for the final list was used: assessing evidence for each address to determine which ones were included. Again a cautious approach was taken, including any addresses where there was doubt about their existence and/or whether or not they had any residents.

Cost

2.194 The total cost of the address register project was £7.93 million, made up as follows:

- ONS staff (£2.80 million)
- field address check (£1.56 million)
- address source licence fees, contract costs and consultancy (£3.32 million)
- other miscellaneous costs (£0.25 million)

However, the address register enabled the use of post-out, saving an estimated £24-£35 million and therefore delivered value for money. The savings achieved through post-out allowed ONS to allocate increased funds to the follow up of non-responders, increasing response rates and so improving the quality of the census outputs.

2.195 It is important to note that the production of the address register was to meet the specific needs of the 2011 Census. Any future requirements and goals may be different and require different processes. Options for providing population statistics in the future have been reviewed as part of the ONS Beyond 2011 programme, which concluded that there should be a census carried out in 2021 primarily via an online questionnaire (see chapter 11).

2.196 It is also significant that most of this work was necessitated at the time by the lack of any single definitive national addresses product. The subsequent launch of GeoPlace – a joint venture partnership between Ordnance Survey and the Local Government Group – changes this picture. This is because GeoPlace is developing its AddressBase database. This aims to provide one definitive source of accurate spatial address data, combining the best features of the National Land and Property Gazetteer and Address Layer 2.

2.197 ONS welcomes this initiative, and is working with Ordnance Survey and GeoPlace to improve the quality of AddressBase, ensuring that this new service meets the address requirements of the Beyond 2011 programme.

2.198 A full evaluation of the development and function of the Census Address Register is available on the ONS website[26]. A summary of the evaluation is given in chapter 10.

Local authority liaison programme

2.199 The need for improved engagement with local authorities (LAs) was one of the key lessons learned from the 2001 Census. The Office for National Statistics recognised at an early planning stage that local authorities would be key to the success of the 2011 Census, because of their intimate knowledge and understanding of their areas and communities. In particular, working in partnership with local government would help ONS to:

- provide the most accurate census population estimates for different areas across England and Wales, by partnering with stakeholders who can provide information and operational support
- ensure the widest awareness of census outputs and tools, working with their users, and consulting and communicating effectively; and
- maintain user confidence in the results, consulting widely and working in partnership to verify key steps in census processes

2.200 Local government's interest in the census is high because:

- census data describe the characteristics of local areas and communities and their changes over time and thereby inform local policy and resource decisions and helps local authorities to prioritise their activities
- the census provides rich detail about small geographical areas (such as wards)
- census–based population estimates influence the financial settlement for local councils
- census data are used by other organisations such as central government and business to make investment and planning decisions that affect local authorities

2.201 Following the 2001 Census, some local authorities challenged the census population estimates. In response to this, ONS carried out additional local research and analysis in 30 local authorities to assess the accuracy of the 2001 Census population estimates. A subsequent report in 2004 concluded that, for 15 of these LAs, the 2001 and 2002 mid-year population estimates should be adjusted to account for additional people missing from the 2001 Census[27]. So a major aim of the 2011 Census local authority engagement programme was to work closely with all local authorities to build their confidence in the local estimates and help avoid such challenges.

2.202 The main aims of this programme were: to raise awareness and understanding of the 2011 Census; explain the role that LAs could play in participating in, and supporting, the census; and to build confidence and trust in census methodology and outputs.

2.203 The programme of local authority liaison for the 2011 Census started in 2005 and stepped up significantly from 2008. Liaison with LAs began initially at chief executive level through the Society of Local Authority Chief Executives (SOLACE). A census sub-group met on a number of occasions during 2006-2008, and at this forum ONS proposed the role of census regional champions, either by asking SOLACE for a chief executive to be a regional champion, or to build on the work of the Electoral Leadership Forum (ELF), and use its existing network of regional returning officers.

2.204 The returning officer (RO) for Wales and the nine regional returning officers (RROs) in England were subsequently appointed in 2008 as census regional champions (CRCs) to act as senior ambassadors to create awareness and promote the 2011 Census within the LAs in their region. The role was to:

- assist ONS in creating effective partnerships with all local authorities
- generate a mutual understanding of what constitutes a successful census
- advise ONS on communication strategies and engagement plans
- share best practice with other regional leads and, through advice and intervention, help resolve any difficulties; and
- provide assurance to local government generally that the results of the census are robust

2.205 In broader terms, these regional leads would encourage LAs to work in conjunction with ONS to deliver a successful census in the following aspects:

Operational and enumeration intelligence

- increasing awareness and understanding of census operations and areas for partnership working among LAs

- encouraging LAs to use local intelligence to provide ONS with information on hard-to-enumerate areas
- providing input into strategies for enumeration of hard-to-count population sub-groups such as young males, non-English speakers, those living in houses of multi-occupancy or the politically disaffected; and
- using LA networks to identify those localities with little previous history of receiving international migrants

Field staff and logistical support

- tailoring the approach to enumeration in hard-to-enumerate areas
- encouraging the appointment of census liaison managers within
- publicising job opportunities within LAs during the recruitment of local field staff
- assisting in the resourcing of office accommodation and administrative support; and
- exploring the potential for use of existing LA contact routes (especially call centres) to supplement the ONS process of answering queries from the public

Building assurance and confidence in the census

Through involvement in the review of key processes such as:

- general and special enumeration procedures
- the adjustment methodology, in order to better understand and support the approach and process for estimating and adjusting for under-coverage

2.206 Census regional champions proved to be highly effective in obtaining the commitment and resources of local authorities. They engaged directly with council chief executives and senior managers to persuade them of the importance of the census and why local authorities should help. They provided additional gravitas to the local authority engagement programme. A number of stakeholders subsequently commented on the value of the regional champions. The Greater London Authority (GLA) believed that the 2011 Census local authority engagement was a success and an excellent model for partnership working with local government.

2.207 Seven activities were identified where ONS could work in partnership with LAs:

- address register development
- provision of enumeration intelligence to identify and target local challenges
- identifying and developing community liaison contacts
- support for recruitment of field staff
- support for local publicity and media relations
- provision of logistical support for field staff; and
- provision of local administrative data to support quality assurance of results

2.208 ONS planned two phases of partnership working with local authorities: phase 1 was development and planning (from January 2009 to July 2010), and phase 2 was local implementation (from August 2010 to mid-2011).

Phase 1: Development and planning

2.209 The aims of this phase were to:

- develop a strong partnership with LAs, to gain their trust
- increase their understanding of 2011 Census methodology, to raise confidence in processes and outputs
- encourage LA support and participation in the census, in particular for those areas facing the greatest enumeration challenges
- receive LA feedback to help refine and improve 2011 Census plans, preparations and methodology
- communicate the scope and timing of those partnership activities critical to a successful census; and
- focus LAs' engagement where it was most needed, by working through influential third parties such as the Local Government Association (in both England and Wales), the Greater London Authority, London Councils, and the Local Area Research and Information Association (LARIA)

Phase 2: Local implementation

2.210 This phase would ensure that ONS had effective, fully tested systems and resources ready to deliver the 2011 Census. A rehearsal and small-scale test in 2009 yielded important lessons, and ONS fine tuned its operations. These included the introduction of specialist community advisors to liaise with specific black and minority population groups, and the development of a census local partnership plan (CLPP) for every local authority area. Census local partnership plans identified and recorded local census priorities and challenges. This information was set out in a separate plan for every unitary and district council. They provided the framework for discussions between the area manager and the local authority to identify any groups requiring additional help to complete their questionnaires.

2.211 Feedback from LAs was that these CLPPs were useful in enabling them to structure their involvement and agree priorities and actions. CLPPs helped to promote greater local authority ownership and partnership working, and provided a clear focus on those activities and areas where LAs could provide significant added value, such as an understanding of likely enumeration challenges.

2.212 ONS asked all LAs to nominate officers to the roles of census liaison manager (CLM) and assistant census liaison manager (ACLM). These officers were asked to co-ordinate census engagement within their authority. ONS aimed to engage with all local authorities, including county councils, through national, regional and local organisations – though the level of effective engagement achieved varied across the country.

2.213 More than 98 per cent of local authorities appointed a CLM and/or an ACLM. ONS estimated that more than 95 per cent of LAs provided local intelligence to support the census and 92 per cent provided feedback on address anomalies. Local authorities also contributed significant resources to support the 2011 Census, estimated to be worth more than £10 million. This included staff costs (CLM/ACLM posts, address anomaly resolution and feedback, completion events, and so on), and budgets for local publicity and media coverage. Their media and publicity activity helped to raise awareness and understanding of the census in communities that ONS would have struggled to reach.

2.214 Census liaison managers and ACLMs were the principal local authority audience for ONS, so almost all newsletters, updates, and online content were channelled through them. They were particularly important, and highly effective, in co-ordinating census communications within their councils, working with ONS census area managers to ensure an integrated approach and successful delivery of the census locally.

2.215 A number of CLMs/ACLMs worked more directly with ONS as members of a Local Authority Operational Management Advisory Group, established in 2009 to provide a forum for sharing knowledge, plans and progress of the census field operation. The group was developed from an earlier Local Authority Census Steering Group that had advised on, and supported, the creation of the LA liaison programme in 2006/07. The group focused its attention on:

- plans for general enumeration and enumeration of target population groups
- methods of resource allocation
- effective LA liaison mechanisms
- local authority concerns
- onward communication to other local authorities, and
- interactions with other LA groups and forums

2.216 As noted at paragraph 2.183, the ONS address register was a vital part of the 2011 Census. More than 4.7 million pieces of evidence were collected about addresses, from a number of sources. Almost all LAs helped with this work, and the majority later reported they had themselves benefited from the address register development process. Local authorities contributed a significant amount of time and effort – though many were disappointed that ONS could not share more address information (this was either because of data confidentiality, or because of the provisions of the data sharing agreement between the address suppliers). Some 92 per cent of LAs contributed to the address anomaly resolution process, and almost as many commented on the communal establishment lists. The various information channels used by ONS helped to keep LAs informed and secured their buy-in and ownership.

2.217 Thanks in no small part to the working partnership with local authorities, ONS achieved its 2011 Census targets of an estimated response rate of at least 94 per cent overall and at least 80 per cent in all local authority areas. In addition, more than 90 per cent of local authority areas had an estimated census response rate of 90 per cent or more. This performance indicated the success of local engagement and field operations, and was an excellent foundation for the coverage estimation and quality assurance activity that were to follow (see paragraphs 5.52 to 5.80).

2.218 Local authority knowledge and intelligence greatly assisted ONS with the cross-checking of address lists and helped to target and tailor census engagement and publicity, enabling ONS to reach diverse and challenging communities and encourage their participation. ONS acknowledges the significant contribution made by local authorities and community organisations to the success of the 2011 Census.

2.219 A fuller description and evaluation of the activities of the local authority liaison programme is available on the ONS website and a summary evaluation is given in chapter 10.

Community liaison programme

2.220 The 2011 Census community liaison strategy built on the success of the innovative community liaison activities which had been carried out for the 2001 Census. This time, however, liaison began at a much earlier stage – with the active phase starting some three years earlier than it had for the 2001 Census – and was much more focused.

2.221 Previous censuses have shown that certain population groups are less likely to complete and return their questionnaires. These included young men, certain black and minority ethnic groups, the very elderly, low-income families, non-English speakers, and disabled people. The reasons vary from concerns or misunderstandings about how the information is used to potential cultural barriers such as a lack of English language skills.

2.222 For the 2011 Census, national engagement activities started in 2008 and were carried out by census HQ staff. A large amount of preliminary work was carried out on mapping the requirements for each key population group, and consulting with relevant representative organisations to gain a better understanding of issues and how they could be addressed. This process also opened up important communication channels to key representative groups, so that principal census messages could be disseminated effectively.

2.223 Many national and local groups became motivated to help once the benefits of the census for their communities were understood. Support ranged from the production of leaflets in community languages to organising and resourcing open events that provided practical help with questionnaire completion.

2.224 Local engagement activity was carried out by ONS field staff; specifically the 157 census area managers and 41 specially appointed community advisors working across England and Wales. This started in August 2010 and continued until the end of the field operation in May 2011. Area managers and community advisors engaged with local intermediary organisations, such as community and faith groups, to promote the census. This included encouraging local applications for field staff jobs, offers of support and practical help in the completion of questionnaires particularly where there were language barriers.

2.225 Community engagement was undertaken across all population groups by area managers, who worked in partnership with local authorities to identify and prioritise population groups. Community advisors worked part-time and were recruited for their experience and understanding of the population groups, together with relevant language skills.

2.226 The introduction of community advisors was an important initiative and their end of employment feedback indicated that:

- their role had been well received by communities
- they had helped community groups be better informed about the census and why it was carried out
- they had reached out to community groups and made it clear that ONS considered them to be important
- being able to speak a specific language had been essential in gaining the trust of individuals within a community; and
- language skills showed their awareness of a community's culture

2.227 It was important that the 2011 Census was accessible to all people across England and Wales. With this in mind, great care was taken in developing a range of tools and help materials to support the aim of enabling people to complete their census questionnaire independently.

2.228 Accessibility partnerships with national representative and stakeholder organisations began in 2009, and the following national organisations were consulted in the production of accessible materials:

- Royal National Institute of Blind People (RNIB)
- Action on Hearing Loss (formally RNID)
- British Deaf Association (BDA)
- Deaf Connections
- National Literacy Trust
- People First
- Equality 2025
- Age UK
- Welsh Government; and
- General Register Office for Scotland (GRO(S)) – now National Records of Scotland

These partnerships, combined with work with community groups, central government and local authorities (as well as other specialist and generic consultation groups) proved instrumental in designing the accessibility tools for the census.

2.229 The community liaison team worked with national and local representatives to ensure that those with special difficulties or specific concerns were given appropriate advice and aids to enable them to complete their census questionnaires. In particular, a range of information providing guidance and support was prepared including:

- an information document using large print comprising questions and instructions from the census questionnaire
- an Easy Read information booklet
- Braille versions of census information leaflets and questionnaires
- audio tapes providing information on the census, the census questions and associated instructions in the 10 most widely spoken foreign languages
- a video recording using British Sign Language with subtitles for use by community groups
- a helpline with a dedicated Minicom facility
- British Sign Language interpreters

2.230 In addition, translation leaflets, the census questions and instructions from the census questionnaire (but not the questionnaire itself) were available in the following 56 languages (compared with 26 in 2001 that are identified by*):

- Akan
- Albanian*
- Amharic
- Arabic*
- Bengali (Sylheti)*
- Bosnian/Croatian*
- Bulgarian
- Malayalam
- Mandarin Chinese
- Nepalese
- Pahari
- Pashto
- Persian/Farsi*
- Polish*

- Cantonese Chinese*
- Czech
- Dutch
- Filipino (Tagalog)
- French*
- German*
- Greek*
- Gujarati*
- Hindi*
- Hungarian
- Igbo
- Italian*
- Japanese*
- Korean*
- Kurdish (Kurmanji)
- Kurdish (Sorani)
- Latvian
- Lingala
- Lithuanian
- Luganda
- Malay
- Portuguese*
- Punjabi (Gurmukhi)*
- Punjabi (Shahmukhi)
- Romanian
- Russian*
- Serbian*
- Shona
- Sinhala
- Slovak
- Somali*
- Spanish*
- Swahili*
- Swedish
- Tamil*
- Thai
- Tigrinya
- Turkish*
- Urdu*
- Vietnamese*
- Yiddish
- Yoruba

2.231 Where preferred, or required, assistance in completing and returning the 2011 Census questionnaire included:

- an online help centre
- online questionnaire completion
- a telephone helpline
- field visits

The census website itself was designed to be receptive to screen readers, and a Text Relay service (English only) was also provided.

2.232 Getting a full picture of the impact of the community liaison programme for the 2011 Census is difficult because many of the effects were intangible. However, its benefits were visible through census articles in specialist media; interviews on local radio and TV; the number of completion events held (more than 6,000), and applications for field jobs from many population groups. Another indicator was the support and motivation achieved among community leaders and networks with access to the hardest-to-reach communities. This programme can have only improved response, particularly among the key population groups.

The 2007 Census Test

Aims and design

2.233 The purpose of conducting tests prior to a census is to assess different aspects of the wide range of census operations, from public acceptability of the questionnaires, through the enumeration procedures, to the various stages of data processing.

The changing needs of census users, and developments in computing technology, necessarily lead to innovations in census operations, and these in particular must be thoroughly tested before use.

2.234 As noted in paragraph 2.57, a major census test took place in England and Wales on 13 May 2007. Its main aims were to:

- evaluate the effect on response of (i) the use of post-out to deliver questionnaires, and (ii) the inclusion of a question on income
- assess the feasibility of some major innovations in operational procedures, such as the development of an address register and the outsourcing of field staff recruitment, training and payment
- assess the performances of alternative suppliers as part of the procurement of a number of contracted services

2.235 The 2007 Test was a large-scale test in five local authority areas (four in England and one in Wales) selected to reflect a range of field conditions. The five local authorities represented a range of area types according to the ONS 2001 area classification[28] They were:

- Liverpool (Services and Cities)
- Camden (London centre)
- Bath and North East Somerset (Prospering UK)
- Stoke-on-Trent (Mining and Manufacturing); and
- Carmarthenshire (Coastal and Countryside)

2.236 These areas provided a varied cross-section of the population – a mix of students, the elderly, ethnic communities – and the types of housing that would be covered in a full census.

2.237 The test was designed to enable a statistical comparison between response rates for these categories: post-out/ hand delivery and income/no income. The sample of 100,000 households selected from within the five LAs was divided into five equal strata (approximately 20,000 households) according to an enumeration targeting categorisation (ETC). This assigned a difficulty level of 1 to 5 to each enumeration district (ED), where 5 represents the very hardest households to enumerate. Using 2001 Census EDs which contained between 100 and 300 households, the ETC for the test was developed using factors identified from the 2001 Census found to be most associated with household non-response.

2.238 As a result of an equal apportionment of the test sample to the five ETCs, the hardest-to-count areas (ETC 4 and 5) accounted for about 40 per cent of the test areas, compared with only 10 per cent in England and Wales as a whole. This oversampling in the hardest to count areas was done to allow statistical comparison of the test treatments between ETCs, and to ensure that the operational procedures were sufficiently tested. Within each ETC or stratum:

- half the population received a questionnaire by post, half by hand delivery, and
- half the population received a questionnaire which included the income question, half excluding

Table 2.1 Sample sizes for the 2007 Test (thousands)

	Income	
Post-out	Yes	No
Yes	25	25
No	25	25

2.239 Almost 44,000 questionnaires were delivered by hand, compared with an expectation of 50,668 questionnaires. The reason for this disparity related to derelict and vacant properties and a small proportion of refusals. Post-out via Royal Mail was used to deliver questionnaires to the other half of the sample households. The numbers of questionnaires delivered within each test area were:

Bath and NE Somerset	9,749
Camden	30,273
Carmarthenshire	8,983
Liverpool	37,932
Stoke	14,859
Total	**101,796**

2.240 Because the 2011 Census design relied heavily on an accurate and up to date address list, a separate address check exercise was conducted during September and October 2006. Some 26 address checkers managed by five team managers checked 100,000 addresses in the five test local authorities. Address checkers were given extracts from the Ordnance Survey MasterMap Address Layer 2 product (extract May 2006). Address checkers validated the list by checking the existence of each address, recording additional addresses found (and those not found), and addresses which had changed status (residential to commercial) or were demolished. These changes were updated on the list and supplied to the printers for pre-addressing the questionnaires.

2.241 In those enumeration districts (EDs) selected for hand delivery enumerators delivered the questionnaires over the 15 days before census test day (13 May 2007). This delivery schedule was co-ordinated with the timing of the postal delivery. Up to three attempts at making contact to deliver the questionnaire packs were made at each address. Delivery enumerators were asked to put the pack through the letter box if no contact was achieved during the third visit. Properties that appeared vacant, derelict, or demolished were recorded and excluded from the follow-up in the non-response list. New addresses that were identified received a questionnaire with that address, and enumerators recorded the new address.

Overall response

2.242 Overall response to this voluntary test was 48 per cent, ranging from 35 per cent in Camden to 66 per cent in Carmarthenshire. Response was lower than in the equivalent 1997 Test prior to the 2001 Census. This partly reflected the trend in pre-census tests over the past 30 years for declining public participation, and partly the fact that the areas chosen were biased towards those expected to be particularly hard to enumerate. Nevertheless the response was sufficiently high for valid statistical evaluations to be made.

Method of delivery

2.243 The test was designed to assess whether people are less likely to respond in areas where they received their questionnaire through the post rather than by hand from an enumerator. Based on the likelihood that the delivery method would impact on people's behaviour, the test assessed whether the decline in responses could be recovered with a more intensive follow-up by looking at the success rates between the two delivery methods at follow-up stage.

2.244 Posting questionnaires, rather than the traditional hand delivery approach, was under consideration for the 2011 Census for the following reasons:

- to reduce serious risks experienced in the 2001 Census, in particular the failure to recruit a large number of enumerators
- to provide savings for investment in improving responses from population groups and areas through more targeted follow-up and support processes
- the limited success of making contact at delivery, and
- to enable a re-structuring of the enumerator's role in order to focus on follow-up rather than delivery, with the size of follow-up areas being dependent on expected response rates

2.245 The move to consider postal delivery also followed a key recommendation from the evaluation of the 2001 Census and the Treasury Select Committee that more must be done to improve coverage among target population groups. Although postal delivery had not been applied on a large scale in previous censuses in England and Wales, it had been used in other countries. In particular, it was used successfully in the 2006 Canadian Census, which is closest to the England and Wales census in terms of design. It had also been used in the US Census.

2.246 An assessment of postal delivery considered the results for two key questions:

- can an address list of sufficient quality to support post-out be obtained?
- does post-out have an impact on return rates?

In addition, ONS assessed the costs for post-out and hand delivery for the same overall response. This included the additional follow-up costs necessary to recover from a lower initial response resulting from delivering by post.

2.247 To assess the propensity to respond between hand delivery and post-out, the test was designed so that each of the delivery methods had a maximum of three attempts at follow-up. As a result, more contact was made in areas where the questionnaire was delivered by hand, resulting in a higher response than in post-out areas. Table 2.2 shows the household response rates after follow-up by LA and ETC.

Table 2.2 Response rates and differences in response by delivery method

LA/ETC	Response rates (percentages)			
	Hand delivery	Post-out	Difference	Standard error
LA	62.3	61.0	1.3	2.9
Bath and NE Somerset	35.7	34.6	1.2	1.7
Camden	67.5	62.5	5.1	2.9
Carmarthen	50.8	46.6	4.2	1.4
Liverpool	59.6	56.1	3.5	2.3
Stoke				
ETC				
1	66.9	63.4	3.6	1.5
2	55.7	51.2	4.5	2.5
3	47.8	44.7	3.1	2.2
4	36.8	37.0	-0.2	1.7
5	33.8	29.3	4.5	2.0
All areas	**53.4**	**50.6**	**2.8**	**1.0**

2.248 From this it was concluded that there was a clear, statistically significant difference in the response rates between post-out and hand delivery methods. This represented an overall statistically significant difference in the test areas of 2.8 per cent. However, the differences between post-out and hand delivery did not differ noticeably across ETC categories, apart from ETC category 4. This suggested that, although post-out had an impact on response rates, the difference between the two methods was not affected by the target population characteristics of an area.

2.249 But could a difference in initial response rates (the rates at the start of follow-up) be redressed by more intensive methods of follow-up? Table 2.3 shows the success of follow-up in each EtC category by delivery method, for the initial non-responders who were converted to responders. Some 25.8 per cent of the initial non-responders in post-out areas were converted by field follow-up into responders.

Table 2.3 Percentage improvement in return rates due to follow-up by delivery method

EtC	Percentage improvement		
	Hand delivery	Post-out	Difference (percentage points)
EtC			
1	37.1	35.4	1.8
2	27.0	26.9	0.1
3	23.6	22.2	1.5
4	16.5	17.6	-1.0
5	14.9	13.6	1.3
All areas	**26.0**	**25.8**	**0.2**

2.250 Overall there was a small (and statistically non-significant) difference of 0.2 per cent in follow-up effectiveness when broadly equal levels of follow-up were applied to both post-out and hand delivery areas. Because the differences were very small, the

results supported the assumption that the success of follow-up was not affected by the delivery method, and that a small reduction in response rates associated with posting out questionnaires could potentially be recoverable with more follow-up, although this would increase costs.

2.251 ONS therefore developed a model to estimate the costs for different mixes of delivery method. It used the initial response rates to estimate the number of follow-up visits required to achieve an overall response of 94 per cent, the same rate as in the 2001 Census when the questionnaires were hand delivered. The estimated savings would be due to the significant reduction in the number of field staff required. Hidden within these, however, would be an increased follow-up cost resulting from the expected small increase of non-responders. The cost model indicated that:

- to achieve an overall response rate of 94 per cent, opting for 100 per cent post-out rather than 100 per cent hand delivery would save between £28 - £35 million, depending on the success of follow-up. This assumed a difference in initial response rates of 5 per cent; and
- a difference in initial response rates of more than 10 per cent would be needed before the cost of post-out started to equal, or exceed, the cost of hand delivery.

Including an income question

2.252 As noted in paragraph 2.166, the design of the test allowed for an assessment of the effect on income question would have on response rates. The decision to include income questions in the 2007 Census Test arose from demands from many users for information on income to be collected in the 2011 Census. This was driven by a widely held belief that asking about income is the best method for identifying areas of deprivation and affluence at various levels of geography. For this purpose, previous censuses had used proxy information from questions such as accommodation type, tenure, occupation, and car availability. Users now felt that this method would no longer meet their requirements.

2.253 However, user requirements had to be carefully weighed against the effects that including such income questions would have on response rates and the coverage of individuals within households, other aspects of the field operation, and the public's view of the census generally. In addition, the quality of the data obtained and the availability of alternative sources of information about income were also taken into account.

2.254 Paragraph 2.166 noted that the test had a split sample of just over 100,000 households: half received census questionnaires that included income questions and half did not. The proportions were balanced by the questionnaire delivery method, by LA and by ETC. Income question inclusion was assigned at the enumeration district (ED) level. The questions asked for details of the sources and level of each individual's income, and were designed to encourage individuals to reflect on their various sources of income before answering the income level question, which was the primary focus of interest.

2.255 To determine whether or not the inclusion of income questions resulted in a significant drop in response rates, ONS analysed the response in those EDs with or without the income questions by both ETC and delivery method. Table 2.4 shows that overall there was a drop of 2.7 percentage points in the response rates in those areas that had received questionnaires with the income questions. This was

statistically significant overall, but because of the sample sizes only so in ETC 3 areas. The inclusion of income questions and using post-out delivery had a greater statistically significant drop in responses of 3.3 percentage points.

Table 2.4 Response rates and differences in response by ETC and delivery method

	Response rates (percentages)			
ETC	**No income question**	**Income question**	**Difference**	**Standard error**
1	66.9	63.4	3.6	1.5
2	55.7	51.2	4.5	2.5
3	47.8	44.7	3.1	2.2
4	36.8	37.0	-0.2	1.7
5	33.8	29.3	4.5	2.0
Hand delivery	54.5	52.3	2.2	1.4
Post-out	52.3	49.0	3.3	1.3
All cases	**53.4**	**50.6**	**2.8**	**1.0**

2.256 The test also assessed what impact the inclusion of the income questions had on the quality of the response. Around 91 per cent of individuals who returned a valid questionnaire had completed the income level question. This response rate appeared, on the face of it, to be acceptably high given that this question was the last to be asked on a voluntary test questionnaire. However, the income level question did have one of the lowest response rates of all the questions asked. Moreover, there was evidence that certain population groups who tend to have low incomes (the very groups for whom the information was particularly required) were less likely to answer the question.

2.257 There was no evidence that the presence of income questions either impacted on the response rates for the other questions asked or resulted in household members being missed from completed returns. The most negative aspect of the test arose from the public's reactions to the inclusion of the income questions, as reported in a subsequent Census Test Evaluation Survey(CTES).

2.258 The CTES was conducted to assess the public's views of the census in relation to specific questions and the quality of responses given during the test. The CTES interviewed about 1,200 households who had responded to the test and about 250 non-responding households.

2.259 The test respondents were asked if they had found any questions difficult to answer or were unhappy about answering. Of those respondents who had returned an income questionnaire, 12 per cent said that they had found at least one question difficult to answer and, of these, 19 per cent cited the income level question. Of the 15 per cent who reported that they were unhappy about answering at least one question more than half (58 per cent) referred to the income questions.

2.260 Non-respondents who had received a questionnaire including income questions were asked why they did not make a return and just over half (52 per cent) said that it was because they were too busy, or they did not feel it was important, or they just forgot; only 5 per cent said it was because the income questions were intrusive. However, the accompanying press coverage of the test was generally negative, with many

stating that the income questions were intrusive and that the information might be used in the calculation of tax increases.

2.261 In light of negative comments, ONS took the view that if income questions were to be included in the 2011 Census, there would need to be a sustained national publicity campaign to explain how the information collected would be beneficial and exactly how it would be used. The justification for the wording of the questions would also need to be included in order to prevent misconceptions arising. Any such publicity campaign would have added substantially to the cost of delivering a successful 2011 Census.

2.262 In balancing the user demand for information on income against the evidence gained from the test it was decided not to include a question on income in the census.

Address checking

2.263 Address checking was included in the 2007 Census Test because the design of the 2011 Census demanded an accurate and up to date list of household addresses (see paragraphs 2.181 to 2.193) in order to:

- facilitate the delivery of the questionnaires by post with a unique link between pre-printed questionnaires and addresses
- underpin a questionnaire tracking (QT) system which would monitor the progress of every census questionnaire in the field and provide the necessary control to manage and target field operations most effectively
- support a post-out strategy, because there would be less opportunity at the onset of the census period to identify new households

As noted at paragraph 2.183, the address products currently available at that time did not fully meet census requirements, so the intention was to check and update address lists in the field prior to the 2011 Census.

2.264 The address list used in the test was developed from an address register product updated with an address check during September and October 2006 in the test areas. Address checkers were given extracts from the Ordnance Survey MasterMap Layer 2 for each ED and validated the list by verifying the existence and accuracy of each address, as well as recording any additional addresses found.

2.265 The number of additional households found was an indicator of the quality of the address register. Households found in the hand delivery areas could be used to estimate the numbers that might be identified as missing if postal delivery was adopted for the 2011 Census and therefore not receive a questionnaire.

2.266 Table 2.5 shows the number and percentage of additional households that were found in hand delivery areas during the test within each ETC. The proportion of additional addresses found during hand delivery was 1.1 per cent, and it was estimated that 1.3 per cent of households would be missed on the address register in the 2011 Census, given the same levels of hand delivery coverage across England and Wales. A sixth of the additional addresses found in hand delivery areas were found at follow-up, suggesting that enumerators would still miss some addresses.

2.267 To understand the quality of the register used during enumeration, ONS looked at a sample of just over half of the additional addresses found and discovered that, of the 540 new addresses examined, two thirds (68 per cent) were sub-premise addresses.

It is likely that most of these addresses were present at the time of address checking and should have been identified earlier. Also a fifth of the addresses found during enumeration were actually included in a subsequent version of the Ordnance Survey address list. It was believed, therefore, that some reduction in the number of additional addresses found could be achieved in the 2011 Census by carrying out an update from the address register list before census day.

Table 2.5 New addresses found during the test in hand delivery areas within each ETC, by enumeration phase

	Enumeration phase					
	Found during delivery		Found during follow-up		Total	
ETC	Number	Percentage	Number	Percentage	Number	Percentage
1	88	1.0	26	0.3	114	1.3
2	48	0.5	22	0.2	70	0.7
3	125	1.3	17	0.2	142	1.5
4	138	1.2	36	0.3	174	1.5
5	165	1.5	15	0.1	180	1.6
All areas	564	1.1	116	0.2	680	1.3

2.268 The main conclusions drawn from the address checking exercise were that:

- the quantity of addresses found demonstrated the need for address checking
- the address check did not produce an address list of sufficiently high quality, but the method used in the test was appropriate for address checking in principle
- the main type of addresses found were multi-occupancy sub-divisions, the majority of which were long-standing; an address check would pick these up, but there would be subsequent change between the check and census
- the address checkers did not follow the procedures for full contact address checking in many cases – contact levels recorded were far higher than in any other similar activities conducted by census or other parts of ONS; and
- the keying and quality assurance (QA) of the addresses found was more time consuming and difficult than had been anticipated

2.269 The main recommendations coming out of the address checking were that:

- address checking was likely to be required ahead of the 2011 Census, and further research was needed to identify the amount and location of coverage and quality issues
- the main aim of the check should be to deal with long-standing deficiencies in the address list; there were many operational advantages to conducting an address check over a longer period of six months
- the use of controlled errors, for example fictitious addresses should be used in 2011; this had provided a useful tool for team managers to monitor their staff and helped to ensure a higher quality address check
- progress reporting arrangements from field to managers and from managers to headquarters (HQ) needed to be revised to meet the information requirements of both the field and census HQ, and

- timescales and resources allocated for the keying and geographical matching of addresses after the field exercise needed to be properly planned

Recruitment, training and pay of field staff

2.270 A major element of the test was to assess the effectiveness of outsourcing the recruitment, payroll and training activities of a large temporary field force. As these were not core business of ONS, these functions were to be fully outsourced for the first time (see paragraphs 2.336 to 2.341).

2.271 Recruitment and training had previously been conducted though a cascade system. Census personnel recruited and trained area managers, who in turn recruited and trained the next level of field staff. For the recruitment and payroll in 2011 the main areas of interest were whether or not:

- outsourcing the services through a lead contractor would work, and to identify issues that could arise from such an approach
- the use of a contracted supplier would provide access to a pool of ready applicants, thus enabling quicker recruitment of field staff
- using such a supplier made the team manager's job easier and improved the quality of enumeration, allowing them to focus almost entirely on performance, and
- the public would raise any issues about confidentiality if the field staff were not ONS employees

Transferring the risk regarding the application of employment law and health and safety requirements to a third party was also seen as important.

2.272 For training, the specific areas of interest were:

- to test a combined approach using e-learning to support classroom-based training
- to provide a consistent approach across all areas and to inform any decision on the use of e-learning for 2011; and
- to identify any lessons to improve the quality and effectiveness of training for 2011

2.273 It would be important to see how well a supplier's infrastructure, with office space already in place around the country, could serve ONS. But the test could provide information only about how well the supplier managed recruitment, pay and training for a relatively small field force. It was important to acknowledge that it was not feasible to test the high volumes of staff associated with the actual census.

2.274 However, the 2007 Test provided evidence that outsourcing recruitment, pay and training was feasible and provided significant benefits. The test showed that:

- combining the recruitment and payroll activities removed a significant amount of risk and workload from the ONS team
- linking recruitment and training, while not essential, added significant benefits to managing the recruitment and training timetable

- the operational issues that emerged, such as communication and management information, could be resolved by refining the statement of requirements and enhancing procedures within ONS; and
- the recommendation, on the basis of the test and further analysis of options, was that recruitment, pay and training should be bundled together as one outsourcing package for the 2009 Rehearsal, 2011 Census itself, and the Census Coverage Survey (see chapter 4)

The performance of other operational activities

Field work (follow-up)

2.275 During the test the follow-up procedures were applied equally across all areas to preserve statistical integrity. This constraint meant that the field procedures employed in the test were necessarily different to those that would be designed for the 2011 Census. The main conclusions drawn were:

- the organisation and management of field staff worked well, but continued development of doorstep interaction would be needed in the census to persuade reluctant respondents to participate
- it was important to get a good start to follow-up to ensure that field staff 'hit the ground running'
- to maximise response in assigned areas there was a need to shift field staff culture away from having 'ownership' of an area to having a more corporate 'responsibility' for that area
- the use of management information needed to be improved in order to fully utilise field staff resources (particularly in areas with the lowest response); a review of field procedures, training and position profiles was required before the 2009 Rehearsal, and
- although the deployment of IT equipment was hampered in the test, the take-up and use of the systems provided was variable; recruitment and training needed to be reviewed to ensure census managers had applicable IT skills

2.276 ONS recognised that follow-up was crucial to maximising response rates and as a result of the test further development of the follow-up procedures was required. In particular ONS developed and improved methods for persuading households to respond and for allocating and moving field staff to other areas during the field operation.

Local authority liaison

2.277 The principles and benefits of the local authority liaison programme (see paragraphs 2.199 to 2.218) were clearly proven. This is evidenced by the overall commitment shown by LAs in supporting the census test (including the provision of supporting information and assistance). It was however, clear that the LA liaison approach used for the 2007 Test could not be replicated across all of England and Wales for the 2011 Census, and that ONS would need to continue working with the LAs to develop a process for seeking their assistance in a number of significant activities. These included address register development, local intelligence and community contact, recruitment of LA staff, logistical support, and publicity.

Questionnaire tracking

2.278 Questionnaire tracking (QT) was new for the 2011 Census. Each questionnaire was uniquely linked to an address in the QT system which then logged subsequent activities associated with a questionnaire, such as the issue of replacement questionnaires and recording questionnaires received at the processing site. It provided up to date information on response levels, enabling field resources to be targeted to the poorest responding areas (see paragraph 3.126 to 3.140 for more details).

2.279 For the 2007 Test, information recorded on the QT system reflected status changes associated with, addresses, questionnaires, and requests for further information or support. This gave the census management team at HQ a far better picture of the progress of field activities. It effectively supported the principles of a flexible field force. The QT provided a clear picture of where response rates were below expectations, enabling targeted follow-up through either the use of extra staff or by extension of the follow-up window.

Conclusions

2.280 As a result of the evaluation of the test, several of the design changes from the 2001 Census were endorsed, notably:

- the delivery of the majority of questionnaires by post
- the outsourcing of the recruitment, training and payment of the field force
- the central role that e-learning should play in the delivery of field training, augmented by instructions and classroom-based sessions
- the need to develop a comprehensive and up to date address register to facilitate the delivery of questionnaires; however, conducting a full address check everywhere was an unnecessary use of resources
- closer liaison with local authorities, and
- reliance on a field management system to track questionnaire movement and monitor local area response rates

2.281 In addition, the decision was made not to include any question on income.

The 2009 Census Rehearsal

2.282 A census rehearsal is an essential part of the planning and testing programme in the run-up to any census, and serves as final simulation of all methods, procedures and systems. The rehearsal for the 2011 Census in England and Wales was held on 11 October 2009 and comprised some 135,000 households in Ynys Môn Isle of Anglesey, Lancaster and Newham (at the same time the opportunity was taken to test two field management strategies in a separate small-scale field test of 17,000 households and two large communal establishments in Birmingham).

2.283 The overall objective of the rehearsal was to confirm the viability of the final 2011 Census field procedures and supporting systems. Integrating and running the procedures and systems in the same timescale to be used for the 2011 Census would minimise the risk of failure in 2011 – particularly by rehearsing the new procedures and systems. The main operational activities needing to be proved efficient and effective were:

- the quality of the address register
- the field procedures for delivery and collection of questionnaires to both households and communal establishments, particularly the introduction for the first time of the facility to return a completed questionnaire online
- the management structures for the field operation
- the recruitment, pay and training of the field staff
- the key systems to support the field and public, questionnaire tracking and online response, and
- engagement with local authorities and communities

2.284 In addition, the rehearsal gave ONS, its partners and suppliers experience of a 'live' operation. The 2009 Rehearsal was the first chance to work with near-to-final systems and with the suppliers chosen for the census itself. The 2011 design was more complicated and more reliant on the integration of IT systems than in any previous census. It was important, therefore, to ensure the rehearsal systems were as close as possible to those for the census and that all the interfaces were sufficiently rehearsed.

2.285 It also provided a final opportunity, before the laying of the draft Census Order to assess the reaction of the public to the census questions that had been proposed in the Government's White Paper, published in December 2008.

2.286 The rehearsal was deliberately delayed six months from original plans so that better developed systems could be rehearsed. Ideally the rehearsal would have taken place at the same time in the year that the census itself was to be carried out, but a lesson learned from the timing of the rehearsal prior to 2001 Census was that many of the final systems had not been built and ONS had had less time to work with its contracted suppliers. This had proved to be very challenging during the main census operation.

2.287 Delaying to a date in October meant, however, not only that the time of year did not reflect that of the census (which impacted on the field operation), but also reduced the time needed to make any significant system and design changes without seriously risking delivery for 2011.

2.288 There are, though, some aspects of any full census which cannot be replicated in a rehearsal, most significantly:

- the small scale and localised nature of the rehearsal, which particularly limits publicity options and media coverage, and
- the compulsory nature of the census - a rehearsal is voluntary and relies on public co-operation, and processes for enforcing non-compliance cannot be trialled

Geographic scope and size of rehearsal

2.289 As with 2007 Test, the rehearsal areas were selected to represent a range of area types that would be encountered in the census, and specifically to include:

- a large contiguous area
- areas with both one and two-tier local government structures
- an area in London with a multi-cultural population

- an area in North Wales with a high population of Welsh speakers, and
- areas that included particular communal establishment types (namely a military base, a large hospital, university halls of residence, a prison and traveller sites, as well as a good number of care homes and hotels)

2.290 The areas selected were across three local authorities: all of Ynys Môn Isle of Anglesey (33,547 households), Lancaster (61,735 households) and parts of Newham (38,618 households). In Newham, areas were selected that were considered to be representative of the borough as a whole. As noted in paragraph 2.282, in parallel with the rehearsal, a small-scale test was undertaken in Birmingham that included an area with a large homogenous ethnic minority population (Pakistani). While this did not formally sit within the rehearsal scope it utilised most of the procedures and processes delivered within the rehearsal.

Return rates

2.291 The overall return rate for the rehearsal was 41 per cent (again, as with the 2007 Test, this was lower than the 53 per cent achieved in the 1999 rehearsal for the 2001 Census). The individual area return rates were:

- Ynys Môn Isle of Anglesey 49 per cent
- Lancaster 48 per cent
- Newham 28 per cent

2.292 ONS had stratified enumeration districts throughout the country into five area types according to estimated response levels. The 40 per cent predicted best responding areas were designated as hard to count HtC1, the next 40 per cent HtC2, the next 10 per cent HtC3, the next 8 per cent HtC4 and the remaining 2 per cent (where the lowest return rates were expected) HtC5. The rehearsal return rates for each of these strata were

HtC1	52 per cent
HtC2	42 per cent
HtC3	37 per cent
HtC4	28 per cent
HtC5	25 per cent
All areas	**41 per cent**

2.293 This pattern was what was expected, and demonstrated that the HtC classifications were accurate. The rehearsal areas did not, however, reflect the make-up of the country in terms of the overall proportions of each hard to count stratum. For example, the EDs in Newham made up 29 per cent of the rehearsal population but were exclusively in HtC4 and HtC5 areas, which constitute only 10 per cent of England and Wales as a whole. Weighting the return rates to reflect the national make-up gave an overall return rate of 44 per cent.

2.294 Table 2.6 identifies the main reasons cited for non-response, as assessed in a follow-up survey of non-responding households. The majority of non-responders reported that they did not return their questionnaire solely because the rehearsal was voluntary. Despite some breaches of government security publicised in the media at that time, it appeared that worries about the confidentiality of information given were fewer.

Table 2.6 Reasons for not responding to the 2009 Census Rehearsal

Reason	Number	Percentage
Voluntary exercise/apathy	552	56
Personal reasons (health/age)	157	16
Privacy confidentiality	124	12
Lack of understanding/ language barriers	70	7
Other reasons	91	9
Total	994	100

Delivery of questionnaires

2.295 Questionnaires were delivered through two different methods: mostly postal (via Royal Mail) and some hand delivery (by field staff). Questionnaires to communal establishments were hand delivered by field staff, as were around five per cent of all household questionnaires (in a sample of areas in Newham, where hand delivery was expected to offer the most benefit).

2.296 The rehearsal post-out operation was completed on time, finishing one week before rehearsal day with no significant problems encountered. A little over 2 per cent of questionnaires were returned from Royal Mail marked 'undeliverable'. The accuracy of the address register would have had an impact on the number of undelivered addresses. However, a sample of addresses with undelivered questionnaires was checked and 13 per cent were found to be valid addresses. A questionnaire returned as 'undeliverable' by Royal Mail did not necessarily mean a non-existent address.

2.297 As noted in paragraph 2.250, the conclusion from the 2007 Census Test had been that the lower initial return rate from postal delivery could be more than made up through the extra follow-up. Such follow-up was affordable from the savings achieved by post-out, which resulted in the decision to post-out to at least 95 per cent of households. For 2011 it had originally been planned to retain a small proportion of hand delivery in areas where there was evidence of large households, or where contact at delivery may have a greater impact on response, or where there were concerns about the quality of the address register. Accordingly, questionnaires were hand delivered to five per cent of households in the rehearsal. Although hand delivery worked and contact rates were 63 per cent, it did not have the anticipated positive impact on return rates.

2.298 Indeed, the postal and hand delivery return rates were very similar and called into question the benefit of hand delivery given the extra cost involved. The rehearsal experience suggested that even five per cent hand delivery was not cost effective for the returns gained. Dropping hand delivery to households in 2011 would enable more effective use of resources through targeted follow-up.

Collection

2.299 It was possible to identify quickly which questionnaires had been returned for each method of return:

- postal returns - the envelope was designed so that Royal Mail scanners could read the barcode through the window while the envelope was in the postal system. This information was then uploaded daily to the

questionnaire tracking system, and

- online returns - the householder entered a unique internet access code which was associated with their address. Once the householder had submitted their questionnaire the information was uploaded onto the questionnaire tracking system

Field staff were therefore quickly and accurately informed of returns and so knew which households did not need follow-up visits.

Postal returns

2.300 From both a technical perspective in terms of questionnaire receipting, and from a security and confidentiality perspective, the postal process worked well. There were some problems due to questionnaires being inserted into the envelopes the wrong way around so that the barcode was not visible. The design of the questionnaire, envelope and instructions was subsequently improved.

2.301 Also, during the postal return period, there were seven days of industrial action. Royal Mail had contingency plans to reduce disruption (for example, redirecting census mail elsewhere for sorting) and the impact of the strike action was minimised. The strike action was also an opportunity to assess Royal Mail's contingency plans and to make changes for 2011.

Online returns

2.302 The rehearsal provided the first opportunity to trial online completion. The overall user experience was good, evidenced by the low level of users dropping out, with 89 per cent of people who started the online questionnaire subsequently making a submission. The average length of time for an average sized household (of 2.5 people) to complete an online return was 27 minutes.

2.303 The rehearsal identified a number of small improvements needed to the website design and underlying validation and routing. For example, in some instances when users went back to correct previous answers, the route through the questionnaire did not change appropriately.

2.304 The proportion of people responding online in the rehearsal was, however, less than expected (8 per cent). This low proportion may have been due to the types of areas chosen for the rehearsal, with preference for the online option being higher amongst students and in city areas. But it was also evident that there was a general lack of awareness of the online option, with respondent surveys showing that awareness was relatively low at 45 per cent. It was also reported that the questionnaire and follow-up literature did not make the online response facility sufficiently prominent. As a result this was changed for the 2011 Census, with the online option being promoted more prominently.

2.305 Links through to the website from other sites and search engines were not as high profile for the rehearsal as they would be for the census. The limited scope of the rehearsal had meant that it was not worth paying for promotion that could not be geographically contained. A strategy for making the website more prominent on search engines was developed for 2011 and many local authorities and key stakeholders put links to the census website on their own websites.

Follow-up of non-responding households

2.306 Census collectors (the new name for enumerators) were scheduled to begin visiting non-responding households on 21 October 2009, 10 days after census rehearsal day. The enumeration design and the size of the follow-up field force was based around evidence that most of the population would return their questionnaire without any prompting.

2.307 The receipting process identified responding households and updated the questionnaire tracking system. Follow-up lists of non-responding households were printed from the tracking system by the co-ordinator. These lists were given to collectors who were instructed on the number of hours to spend in each area. Areas with low return rates were prioritised ahead of those with (comparatively) high return rates.

Communal establishment enumeration

2.308 Few changes were made from the 2001 Census in the enumeration of communal establishments (CEs). In simple terms, the process for enumerating CEs in the rehearsal was that:

- questionnaires were delivered to the manager or person in charge of the establishment by a special enumerators (special enumerators cover only CEs, not households, and so are trained for the different procedures required)
- the CE questionnaire (which asked questions about the type of establishment) was completed by the CE manager
- individual questionnaires were delivered to individual residents by the CE manager
- residents completed a paper questionnaire or an online return, and
- the special enumerator returned to collect the completed questionnaires after census day and to help resolve any queries

2.309 This process varied for larger establishments. In these there was a degree of liaison before the operation and/or the enumeration was handled by the census co-ordinator rather than a special enumerator. Also, the contact and interaction between residents and the special enumerator varied depending on the nature of the establishment and the level of involvement of the CE management.

2.310 Overall, the processes for enumerating CEs worked well, in particular:

- the use of specific staff
- the distribution and collection of questionnaires, and
- the estimation of staff numbers required and workload planning

2.311 In general, procedures worked for encouraging participation from CE managers but were less effective for obtaining responses from individuals within CEs. The overall return rate from CEs was lower than expected, even when the return rates of the universities were excluded. A range of generic issues was encountered in enumerating CEs:

- management information on progress was lacking. The QT system, which worked effectively for households (being based on receipting

questionnaires returned through the postal system) did not apply to questionnaires from CEs. Replacement manual processes did not work or were not scalable for 2011. The need for action to address return rate problems was not identified, or was identified too late
- the collection phase clashed with the preparation and start of household follow-up, and co-ordinators did not have sufficient time to manage both effectively, and
- a number of large CEs were incorrectly identified from the address check as having usual residents and/or the estimated number of usual residents was inaccurate

2.312 The rehearsal return rates from students in university halls of residence were very disappointing. The level of support from universities was mixed. Many accommodation managers said they were too busy, though some did assist with delivery. Some university managers were helpful in sending out emails to students as a method of publicity, and to remind students to complete questionnaires online. Other halls of residence did not have a manager or warden to take responsibility for enumeration of residents, and some field staff were not given access to halls of residence to deliver or collect questionnaires.

2.313 A variety of tracking methods for questionnaires was used in universities in the rehearsal. None of these proved particularly effective. In light of this, the processes for enumerating student halls in 2011 were improved by:

- liaising with each university to determine the best way to enumerate their student halls to take into account variations in term times and access arrangements, and
- associating questionnaires with individual rooms within student halls to enable more effective follow-up of non-responders

Public engagement

2.314 Public engagement activities for the rehearsal were designed to raise awareness among the general population and were also directed at specific segments of the population.

2.315 The rehearsal publicity campaign was designed to trial what would be done in 2011. Inevitably this could not be a complete prototype because certain media – TV, many radio stations and newspapers – were ruled out because their geographical reach was wider than the rehearsal areas and could potentially have caused public confusion. Instead, a number of different media were used:

- local radio
- local press
- billboards and posters
- internet advertising, and
- advertising on pizza boxes, beer mats and take-away lids

2.316 The main messages were:

- the census is coming soon
- the rehearsal is happening and why
- the value of the census in planning services for the future

- the need to make a return
- the online option, and
- the confidential nature of the census

2.317 The impact of the publicity campaign was assessed using surveys carried out before and after the campaign. The main findings were that:

- a high proportion of people recalled seeing promotional advertisements
- there was higher awareness of publicity using traditional media (press, posters and radio) than online media (though these worked with students), and
- positive media coverage had as much impact as advertising

2.318 Interviews were conducted in rehearsal areas before and after the publicity campaign, and showed that over the period of the rehearsal:

- awareness of both the census and rehearsal increased
- awareness of online completion increased from 16 to 45 per cent
- understanding of the purpose of the census increased but was still comparatively low, and
- trust in ONS and the confidentiality of the census increased

2.319 The research showed that, although publicity did improve awareness of the census and attitudes to it generally, the level of likelihood to complete a return differed by age and ethnicity. Analysis of the rehearsal suggested that for 2011 more resource would be needed for advertising and publicity, the messaging should be clearer, simpler and bolder, and that there was a need for targeting messages at particular population groups.

Telephone helpline and online help

2.320 A telephone helpline for the public to call was available and the rehearsal also had extensive online support. The online help offered great opportunities to provide much more information to the public than is practical on paper (for example extensive notes about the census and why there is a need for it, advice on completing the questionnaire and available translation support).

2.321 The service provided to the public by the telephone helpline was efficient, so little change to the services planned for 2011 was needed apart from scaling up. The online help website received over 9,000 visits during the rehearsal operation. The most popular queries/visits related to:

- how to complete a return online (10 per cent)
- what is a household (7 per cent)
- who to include on the questionnaire (7 per cent)
- who should complete the questionnaire (7 per cent), and
- what to do if away on rehearsal day (6 per cent)

2.322 Online help was clearly going to be valuable to the public for the 2011 Census, and the rehearsal showed that, with much more information on the website, it would need to be easy to find and navigate.

Conclusions

2.323 Overall the rehearsal was deemed a success and provided a good opportunity to rehearse systems and procedures. Return rates were considerably lower than expected, showing that more promotion would be needed for the census itself.

2.324 The main conclusions and lessons learned from the rehearsal were that:

- the address register was of sufficient quality for the rehearsal but not for the 2011 Census
- the printing process worked well, but due to the complexity and scale of the task more time was needed for quality assurance
- the post-out and post-back operations worked smoothly
- hand delivery to households did not improve return rates, nor reduce the follow-up workload
- online completion worked well technically and was easy to use, but return rates were low and more promotion would be needed
- the questionnaire tracking system worked effectively and enabled the identification of addresses for follow-up
- field staff with the required skills in the required numbers were recruited and trained (and paid accurately, and on time)
- the follow-up procedures needed tightening to ensure the field staff call at appropriate times, are effective at converting contact into returns, and that workloads are planned to reduce variability
- the procedures for the enumeration of student halls were not effective and would need to be redesigned
- more time was needed for area managers and co-ordinators (the senior levels of field staff) to carry out their roles effectively
- the publicity campaign did reach people, but more advocacy was needed and messaging should be clearer and better targeted
- more community engagement would be needed
- the online help and telephone helpline supported the public effectively, and
- reminder letters were found to be particularly effective, increasing return rates by nearly 4 per cent

Improvements for 2011 arising from the rehearsal

2.325 In response to these findings, a number of improvements to the 2011 plans were made. Most of the changes implemented were designed to improve return rates, particularly in the most difficult geographic areas. These included:

- an increase in the resources put into follow-up by approximately half a million extra man-hours
- putting a greater proportion of resources into areas where achieving high return rates was more challenging
- increasing the resources put into managing the field operation, particularly in challenging areas, by increasing the number of area managers from 118 to 157 and reducing the average number of staff that a co-ordinator managed from 15 to 12 in the more challenging areas
- increasing community engagement activities and appointing community advisors to work with target population groups to raise their awareness, understanding and trust
- extra publicity, sending out replacement questionnaires, and sending

reminder letters

Some other minor changes to processes and systems were needed but no major re-designs.

2.326 In order to fund these additional initiatives and resources, the design was reviewed to ensure it made the most effective use of resources. As a result the most significant change was to reduce hand delivery of census questionnaires to communal establishments only. Initial plans had been to hand deliver questionnaires to 5 per cent of households, but it was found to have a minimal effect on return rates and that resource would be better spent on follow-up.

2.327 For more information about the rehearsal see the published report Evaluation of the 2009 Rehearsal[29] and also an article in ONS *Population Trends*[30].

Outsourcing and contract management

Background

2.328 As it had done in the 2001 Census, ONS again contracted out a number of services as a major part of ensuring a value-for-money census in 2011. External suppliers bring with them considerable technical experience and expertise. Furthermore, given the 10-year cycle for the census and the relatively short processing timetable (requiring a large temporary workforce) it is not appropriate for ONS to recruit and train such personnel itself.

2.329 The activities that were outsourced covered:

- the recruitment, training and payment of field staff*
- the printing of the questionnaires
- the delivery of questionnaires*, and the collection of completed returns via a postal service
- the provision of a questionnaire-tracking system*
- the provision of an online questionnaire completion system
- a contact centre
- the translation, printing and distribution of non-questionnaire material and other field logistics services
- the publicity campaign
- the capture and coding of census data in electronic format
- the production of the archival records, and
- the development of a web data access (WDA) system* (though this was not a function that was exclusive to the census)

2.330 Those activities marked with (*) were new to the 2011 Census. The recruitment, training and payment of field staff were outsourced early on to a contractor with particular expertise in field operations. This was done in response to the National Audit Office (NAO)[8] report to the Public Accounts Committee on *Outsourcing the 2001 Census* in the light of the difficulties encountered at that time. It was recognised that such services are clearly a non-core activity for ONS and cannot be provided internally, to this scale, without significant additional investment.

2.331 The NAO's report on the 2001 Census also noted a number of deficiencies in the management of the procurement process and made recommendations on procuring services for future census operations. Noting the NAO's concerns**,** ONS imposed much tighter contract management, training and budgetary controls on the procurement processes than was the case for the 2001 Census, and these were subjected to rigorous external scrutiny through the Office of Government Commerce Gateway Review procedures.

The main contract

2.332 As a result, the procurement phase of the operation was completed at a much earlier stage in the programme than was the case for the 2001 Census. The process to select a supplier for the major part of the data processing operation began in September 2005. Following an extensive evaluation of candidates, two companies – Lockheed Martin UK and T-Systems Ltd – were short-listed in September 2006, and both worked together with ONS to deliver different components of the 2007 Census Test. The tendering process for support services for the 2011 Census covered the technical ability to provide the services, the cost and the assessment of risks associated with such services. Following refinement of the 2011 Census requirements and further evaluation a single supplier**,** Lockheed Martin UK, was selected and the decision announced on 28 August 2008.

2.333 The five operational areas within the scope of the contract were:

- questionnaire tracking (QT)
- printing of census questionnaires and related information leaflets
- paper questionnaire data capture and coding
- internet response and coding, and
- public interface, consisting of a contact centre and online help (formerly referred to as 'web self-help')

2.334 As required by law, the procurement was conducted in line with EU and UK Public Procurement Directives and Regulations. The law requires that any organisation with the correct technical capability, financial stability and experience can compete openly for government business throughout the European Union without discrimination. Though Lockheed Martin UK won the contract as the main provider of a number of support services it was not directly responsible for the delivery and collection of questionnaires and did not have any access to any personal census data. Indeed, Lockheed Martin UK subcontracted a number of support services to a consortium of British and European companies, including bss, Steria, Royal Mail, and Cable and Wireless. A company called UK Data Capture received, scanned and processed questionnaires at a specially commissioned site in Manchester.

2.335 For added assurance, and in response to some public concern about the award of such a contract to a supplier whose parent company was a United States-based arms manufacturer, ONS put in place additional contractual and operational arrangements to ensure that United States authorities could not gain access to census data under the US Patriot Act (see paragraph 6.27 to 6.28). These included assurances that only ONS's own staff would analyse the data to produce census statistics, and that no processing of any census data would be carried out overseas.

Recruitment, training and payment of field staff

2.336 ONS recognised that its core skill was not in mass recruitment and training, nor in operating major short-term payroll systems. In the 2001 Census recruitment and training had been carried out by census HQ for the top two tiers of field staff, who in turn recruited and trained the higher-volume roles ('cascade' recruitment and training). While effective in some areas, this approach was considered unsuccessful. There had been inconsistency in training, poor communication, and conflicts in the appointment process, with some field managers employing friends and family members. Additionally, in 2001 the payroll had been outsourced as a stand-alone service. Significant issues had been experienced and the supplier had been unable to deliver the requirements, resulting in field staff payment delays and under and over-payments. The shortcomings of the 2001 payroll were well documented, both in the press at the time and later by the National Audit Office and House of Commons Committee of Public Accounts.

2.337 So the recruitment, pay and training (RPT) of field staff was outsourced as a package for the first time to one supplier. The contract to provide integrated nationwide personnel services for the 2011 Census was awarded to Capita Business Services. It provided services to help recruit, train and pay the 35,000 staff needed to deliver both the 2009 Rehearsal and the 2011 Census itself.

2.338 The Capita contract ran from 16 March 2009 (to include recruitment for the rehearsal) and closed on 15 September 2012. This was the second largest procurement for the 2011 Census and the first time the entire RPT service had been outsourced. It is worth noting that while Capita had strong experience in the individual service streams of recruitment, pay, training and human resources (HR), this was the first time they had combined all four services to form a cohesive end-to-end solution for the recruitment, engagement, training, payment and retention of temporary field staff. The service included:

- recruiting the required number of field staff, and security vetting them in line with HMG Baseline Personnel Security Standard (BPSS)
- providing adequate contingency to cover field staff attrition
- providing an HR service
- registering recruits on the payroll, processing and paying timesheets/expenses
- operating a payroll helpdesk for all field staff
- delivering instructions to candidates receiving a conditional offer of employment
- developing e-learning materials, running and hosting an e-learning site
- delivering classroom training and supplying qualified trainers (excluding the Census Coverage Survey (CCS))
- producing DVDs for each recruit to support census and CCS training

2.339 The role of ONS was to:

- ensure these solutions were fit for purpose, robust and would deliver the service
- develop terms and conditions of employment for the large temporary field force
- manage delivery of the Capita HR service and any complex HR cases, and
- develop and deliver field staff training instructions to Capita

2.340 Field staff were recruited from local communities across England and Wales to carry out census field roles. Posts included area managers, local team co-ordinators and census delivery and collection staff. Recruitment for the rehearsal started in the rehearsal areas in May 2009, and nationwide recruitment for the 2011 Census itself in June 2010.

2.341 ONS worked with the Welsh Government and the then Welsh Language Board (WLB) to develop a Welsh recruitment strategy for the 2,000 census field staff needed in Wales. Recruitment campaigns in Wales were bilingual and application forms could be completed in Welsh. All interviews were available bilingually, and candidates applying for 'Welsh speaking essential' areas had a short interview in Welsh. The target for 17 per cent of field staff in Wales to be Welsh speaking was met.

Other contracts

2.342 The scope and outcome of a number of other key outsourced services are described in the relevant sections later in this report.

The Parliamentary and legislative process

The Government's White Paper

2.343 Since the 1981 Census the government of the day has announced its plans for each forthcoming census several years in advance in the form of a White Paper. Such a document provides the opportunity for informed public and parliamentary debate on those issues that affect every household and person in the country, and before the UK Parliament and the respective legislatures for Wales, Scotland and Northern Ireland consider and approve the legislation which is necessary before it is possible to take any census.

2.344 The White Paper on the 2011 Census in England and Wales, '*Helping to shape tomorrow'*, published as a Command Paper in December 2008 (CM7513)[1], set out the UK Statistics Authority's proposals for the census, and covered (among other issues):

- the date of the census
- strategic aims
- the population base
- questions to be included
- those questions considered but not included
- the field operation (delivering the questionnaires and collected the completed returns)
- processing the data
- disseminating the results
- confidentiality and disclosure control
- the legislative process

2.345 The White Paper reflected the outcome of consultation with government departments and other users of census data on their requirements for information from the census

and the results of a programme of both small and large-scale question tests (see paragraphs 2.53 to 2.56).

2.346 Particular attention was given to ensuring that the White Paper presented the right balance between making clear, on the one hand, that the proposals for the census should be clearly seen to be those of the newly-created UK Statistics Authority, and as such be independent of Government, while on the other, the same statement should be seen equally as representing the Government's endorsement of proposals that would require legislative support in Parliament. Equivalent, but separate documents, were published in Scotland and Northern Ireland.

2.347 The value of having a White Paper as a clear statement of intent, put into the public domain, was evident by the extent to which it was subsequently referred to in correspondence and other literature in the lead up to the census.

Primary legislation

2.348 The Census Act 1920 is the statutory authority for taking a census of population in England and Wales (it covers the census in Scotland also). The Act gives powers for taking a census in any year which is at least five years from the year of the previous census, and provides for information to be collected on specific topics, or generally, in order to ascertain the social and civil condition of the population. It was amended in 2000 to provide for information on religion to be collected on a voluntary basis, and further amended (in respect of England and Wales), when the provisions covering the confidentiality and protection of personal information collected in the census (previously set out in section 8 of the Act), were subsumed by the confidentiality provisions of the Statistics and Registration Service Act 2007 (SRSA).

2.349 The SRSA, which came into effect on 1 April 2008, also transferred the statutory responsibility for carrying out the census from the Registrar General to the Statistics Board (UK Statistics Authority), and transferred ministerial responsibility for the census from the Chancellor of the Exchequer to the Minister for the Cabinet Office.

2.350 The Census Act 1920 requires that every time a census is to be taken, two pieces of additional secondary legislation first have to be approved by Parliament: these are a Census Order (see paragraphs 2.355 to 2.365) followed by Census Regulations (paragraphs 2.366 to 2.374).

Transfer of Functions Order 2006

2.351 During 2003-2005 the ONS and the Welsh Government discussed issues arising from the lack of a specific tick box to record 'Welsh' as an ethnic group in the 2001 Census. Subsequently the then Financial Secretary to the Treasury and the Registrar General for England and Wales agreed that the National Assembly for Wales should have a more formal role in agreeing the scope of the format, content and conduct of future censuses in Wales. Furthermore, the Treasury Select Committee's report on their enquiry into the 2001 Census endorsed the proposal that the National Assembly for Wales should have a more formal role in agreeing future census questionnaires for Wales.

2.352 After discussion and taking legal advice it was agreed that there should be devolution of secondary legislative powers, and that the vehicle for the transfer of such powers should be a Transfer of Functions Order (TFO) under the Government of Wales Act 1998. The scope of such secondary legislation would be to:

- transfer the power to make Census Regulations (required under section 3 of the Census Act) from the then Chancellor of the Exchequer to the National Assembly for Wales; and
- to provide the Assembly with the right to be consulted on the content of the Census Order

2.353 The Welsh Government also proposed that the Welsh ministers should have the opportunity to discuss a draft of any future census White Paper insofar as it related to Wales. Because this would be a purely administrative process, no specific provision for this in the TFO would be necessary.

2.354 The power to make Regulations for Wales was, accordingly, transferred from the Chancellor of the Exchequer to the National Assembly for Wales in December 2006 (by the Transfer of Functions (No 2) Order 2006[31]) and subsequently to Welsh ministers (through the Government of Wales Act 2006).

The Census Order

2.355 Section 1(1) of the Census Act 1920 requires that, for any census to be carried out, an Order in Council directing that a census shall be taken, has first to be approved by both Houses of Parliament. The Census Order is the secondary legislation which sets out:

- the date on which the census is to be taken
- who is responsible for completing the census questionnaires
- who has to be included on a census questionnaire, and
- the question topics (referred to as the 'particulars') to be included in the census

2.356 The timing of the Order was crucial to the subsequent planning of the 2011 Census because it provided the only opportunity for Parliament to debate and agree the proposed question set. Prior to its debate, the Draft Order had been sent to the UK Census Committee, the UK Statistics Authority Board, the Cabinet Office Minister and the Welsh Assembly for discussion and approval. The Draft Order was laid before both Houses of Parliament on 21 October 2009 where it lay for 40 days, during which time it was scrutinised and debated.

2.357 During this time the Draft Order was submitted to, and scrutinised by, two parliamentary committees:

- The Joint Committee on Statutory Instruments (JCSI) – which looks at all secondary legislation to ensure that it makes sense, is well drafted and will work in practice. JCSI duly approved the Draft Order, and
- The Lords Committee on the Merits of Statutory Instruments – which checks that all legislation is necessary, will not adversely affect sections of society and that proper consultation has been undertaken. The Committee requested more information on any cost benefit analysis that had been undertaken, and subsequently also approved the Draft Order

2.358 After submitting the Draft Order for debate in Committee, the minister tabled a motion in Parliament on 22 October 2009 seeking its approval. Under normal circumstances such motion would then be voted on in the House, which, in effect, approves the Draft Order. However, as in previous censuses, the Order's mix of *affirmative* and *negative* resolutions caused confusion among MPs and peers about which elements may or may not be discussed and voted on. The type of motion tabled proved to be incorrect: it could be used only for statutory instruments subject wholly to *affirmative resolution*, which are always debated in committee. However, because the Census Order also involved *negative resolutions* that are not debated, House of Commons officials advised that a new 'special referral' motion would have to be tabled and approved. This resulted in the scheduled committee debates being postponed.

2.359 All this occurred just before the State Opening of Parliament, which meant that no motion could be tabled and approved in the House of Commons for more than a week. This caused further delay before a new date for the debates could be negotiated.

2.360 At this point there was a danger that the debates might not be rescheduled before the December 2009 Privy Council meeting. So the timetable was revised in time for the Draft Order to be approved in the February 2010 Privy Council (leaving less time to get the subsequent Census Regulations through Parliament). Fortunately, the special referral motion was approved on 23 November 2009, and negotiations between the Cabinet Office and the Parliamentary Whips eventually secured slots for debates in both Houses of Parliament just days before the Privy Council's December deadline.

2.361 The Draft Order was debated by the First Delegated Legislation Commons Committee on 30 November 2009. However, this committee was only able to consider the Order but not approve it, which caused annoyance to some committee members who had wanted to amend specific elements of the provisions, and who voted to the effect that they had not considered it.

2.362 On 1 December, when the Order was debated in the House of Commons, an amendment was proposed to include 'Cornish' as a separate national identity category, but this was not approved. A vote was then taken to approve the Census Order as a whole with the result that the Order was approved by 298 votes to 127. The House of Lords Grand Committee subsequently considered the Order on 2 December with somewhat less controversy, and it was approved in the Lords on 3 December, and 'made in Council' on 9 December 2009. It became law the next day.

2.363 The unusual nature of census secondary legislation, combined with its occurrence only once every 10 years, had inevitably caused some lack of ministerial and parliamentary understanding and contributed to delays. The original timetable had proposed that the Order should be presented to the Privy Council meeting of February 2010. This would have required the draft Order to be ready to put before Parliament in December 2009, allowing Parliament sufficient time to approve it before the Privy Council meeting. This, in turn, would have given enough time to lay the Regulations before Parliament, and to get them approved prior to appointing the first tranche of field staff.

2.364 However, by summer 2009 it was apparent that a general election could be held in May 2010. In light of this the decision was made to bring forward the necessary legislative programme by two months, to ensure that the subsequent Regulations

would finish their parliamentary stage prior to Parliament being prorogued for the election.

2.365 The Census Order[33] was, despite the delays, completed two months ahead of its original schedule, and must therefore be considered a significant success and an improvement on the 2001 Census timetable.

The Census Regulations

2.366 For the Census Order to take effect the Minister for the Cabinet Office 'makes' Regulations governing the census arrangements in England. These detail the method of carrying out the census, prescribe the field activities, and authorise the duties of field staff. They also contain a copy of each questionnaire to be used in the census. The Regulations cannot be laid before Parliament until the Census Order has been made in Council.

2.367 Separate Regulations are required for England and for Wales, made respectively by the Minister for the Cabinet Office and the Welsh Ministers. This satisfies both the Statistics and Registration Service Act 2007 (which amended the relevant section of the Census Act concerning the Regulations), and the Transfer of Functions (No. 2) Order 2006.

2.368 The Regulations for England were drafted by Treasury solicitors on instruction from the ONS census legislation team, checked by Cabinet Office lawyers, further scrutinised by the lawyer for the Joint Committee on Statutory Instruments, and approved by the UK Statistics Authority. The Regulations were made (approved and signed) by the Minister for the Cabinet Office on 27 February 2010 and then laid before both Houses of Parliament on 4 March. After 21 days the Regulations came into force on 31 March 2010, because no motion to annul them had been passed by either House.

2.369 During these 21 days the regulations were further scrutinised and approved by the Joint Committee on Statutory Instruments (JCSI) and the Lords Committee on the Merits of Statutory Instruments (Merits Committee). Though the Regulations would come into force after 21 days, they still had to sit before Parliament for 40 days in total, allowing further time for any objections. In the event, this 40-day period was extended because of the Easter Parliamentary recess, and again when Parliament was prorogued for the general election.

2.370 During this extended period the Leader of the Opposition raised an objection and called for the Regulations to be annulled. However, no parliamentary time was given for a debate, the annulment motion expired when Parliament rose for the election, and the Regulations stood unchanged.

2.371 *The Census (England) Regulations 2010*[34] came into force 31 March 2010 and provided for the:

- appointment of temporary local staff to conduct the census in the field
- obligation of prescribed persons to make a return
- requirement of ONS to keep an electronic record of the despatch and receipt of questionnaires
- preparation of packs of questionnaires
- arrangements for the delivery of questionnaires by post or by census coordinator

- arrangements for the return of completed questionnaires
- procedures if an incomplete questionnaire or no questionnaire was received
- obligation of any person to provide information if required
- safe custody of questionnaires and other documentation; and
- requirement for field staff and other persons employed for the purposes of the census to make statutory declarations or undertakings

2.372 For the first time there were separate Regulations for England and for Wales. The Welsh Government prepared the Regulations for Wales but close liaison with ONS ensured that the Regulations for England and those for Wales were as similar as possible to ensure that the same processes and procedures were followed.

2.373 The procedure for laying the Regulations in the National Assembly for Wales was almost identical to that in the UK Parliament, with a scrutiny committee ensuring that the Regulations were fit for purpose. The original aim was for the Regulations to come into force on the same date as those for England. In the event they were delayed, were not laid before the Assembly until 28 April, and did not come into force until 16 June 2010. This was primarily because of:

- having to wait until the Census Order was made before a version of the Regulations could be prepared for agreement by Welsh Ministers and submission to the UK Statistics Authority; and
- the timetable to prepare and back-translate the Welsh language version of the Regulations could not readily accommodate the late decision to bring forward the date of the Regulations in England

2.374 Fortunately this was not crucial to the implementation of subsequent field activities. In addition the Welsh Government benefited from having a more direct and immediate relationship with its minister and the Assembly than was the case in England. Consequently there were no objections, and the *Census (Wales) Regulations 2010* duly became law on 16 June 2010[35].

Publicising the 2011 Census

2.375 The overall objective of the 2011 Census publicity campaign was to maximise overall response rates and minimise non-response in specific areas and among particular population groups. To do this, the prime aim for the campaign was to reach the entire population.

2.376 The second aim was to have inclusive messages and universal appeal. To achieve this, all elements of the 2011 Census campaign had to be inclusive, meaning 'respectful to all', and communicate the message that 'the census is for everyone'. Furthermore, it had to be enabling, meaning that it had to communicate the message that participation would help to make a positive impact on people's lives, and to have a clear call-to-action to 'Fill in your questionnaire'.

2.377 Every census presents a unique challenge in that it necessitates communicating with, and motivating, every household in England and Wales to fill in their census questionnaires. The target audience is effectively 'everyone'. However, almost by definition, most publicity campaigns are targeted to specific audiences, and, therefore, focus on those channels that deliver to that particular audience. Very few public awareness campaigns have such broad audience goals, that are required to

reach everyone but with a finite media buying budget, as the census. Furthermore, such a finite media budget necessitated the prioritisation of specific audiences.

2.378 The success of the census depended on communicating with every household in England and Wales. The greater diversity of households made this increasingly difficult for key population groups, such as ethnic minorities, migrants and young adults, which are the very groups for which census information is critical.

2.379 Low return rates from any particular population group affect the quality of census outputs for that group or area. The strategy for the 2011 Census was to acknowledge this challenge and devote more resource on those households that were difficult to engage with less resource on those households which would generally comply.

2.380 The census communications activities, including the paid-for advertising, were designed to reinforce this strategy. Furthermore, there were several changes (both to society and census strategy) which made the communication challenge for the 2011 Census significantly greater than in 2001.

2.381 Changes in society included:

- an increasingly diverse population with a particular increase in migrant communities with different cultural experiences of a census
- an ageing population and changing lifestyles
- a significant reduction in compliance noted in response to ONS social surveys
- some observed hardening of attitudes towards census and government of those likely to be non-compliant

2.382 Changes in the census strategy included:

- running the first online census
- measuring success not just by overall response rate but by response from key population groups and those areas that are harder to count
- delivering questionnaires by post rather than by hand for the first time, which would reduce the opportunity for an initial explanation and face-to-face communication with the public, and where, instead, the focus would be on non-response follow-up

2.383 The development of the 2011 campaign was informed by findings from the 2001 Census, government communication best practice and market research insights. Furthermore, the campaign gave equal weight to Welsh issues; this was reflected in:

- bilingual census branding (English and Welsh) in Wales – approved by the Welsh Government in 2008; and
- advertising (including TV, outdoor, radio, press, online) in Wales available in English and Welsh – every advertising version for Wales (both in English or Welsh) was quality assured and signed-off by a dedicated Welsh editorial officer who was part of the advertising development and production phases, being responsible for Welsh copy, selection of Welsh voice-over/speakers and supervision of all Welsh recordings

2.384 The starting point for the 2011 Census campaign development was the review of the 2001 Census campaign. Analysis of the 2001 Census and subsequent ONS

evaluations indicated that the overall target audience could be split into three broad sections:

- the willing and able – this group are already predisposed to identify with the census (provided they are made aware of it) and to complete their questionnaire. This group was estimated to comprise around 60 per cent of the population
- the undecided – this significant group are, in principle, in support of the census, but are, or could be, reluctant to participate for a variety of reasons. This group was estimated at 30 per cent of the population, and
- the hard-to-reach – this group was made up of the various population sub-groups among whom there was under-enumeration in 2001 and comprised a significant proportion of young adults (both males and females,18 to 29), the elderly, single-person households, people living in house shares/multi-occupancy dwellings and privately rented accommodation, Black and Minority Ethnic groups (BME), students, and the unemployed/low income groups. Collectively they were estimated to comprise about 10 per cent of the population

2.385 A key finding from 2001 and subsequent research was that the majority of the population will willingly complete the census if they understand what it is and what their obligations are. The recommendation for 2011 was to allocate resource where it was most required – to some extent among the undecided, but to a much greater extent among the hard-to-reach.

2.386 The creative platform for the campaign was the 'Help tomorrow take shape' concept. This simple call-to-action was literally an invitation for everyone to participate in shaping the future of their local environment, in everything from key services such as health and education to local parks and facilities – the 'planning story'. The central metaphor of the campaign took as its starting point the census folded origami logo and purple branding, and used it to create origami objects, such as schools, hospitals and buses, which in themselves are the end 'benefit' of the census. These life size origami objects gave the campaign relevance, impact, and a strong visual identity that was carried through from the purple questionnaire and accompanying literature to the smallest piece of campaign material at each phase of the messaging.

2.387 Qualitative message development research and findings from the 2009 Census rehearsal revealed that response levels would be influenced by three key factors:

- awareness and understanding of the census benefits
- clear direction of what people need to do and when; and
- acceptance of legal obligation as a consequence of a potential £1,000 fine

2.388 Mirroring this, a three-phase campaign was devised:

- Phase 1: Educate – census awareness and understanding of census benefits
- Phase 2: Call-to-action – clear direction to complete the questionnaire NOW
- Phase 3: Enforce – focus on the possible fine and consequences of non-completion

2.389 Integration of media channels and relevant activity, with key dates within the overall census operation, the go-live date of the website, the post-out of the census

questionnaires and the commencement of the field follow-up operations, was crucial. But the need for flexibility was also important. Any delays in printing or the distribution of the questionnaires, for example, could have meant delaying the start of Phase 2 communications. The census communications team therefore had to be able to either withdraw media, re-shape the campaign or change the messages at short notice.

2.390 After a review by the Cabinet Office Efficiency and Reform Group (ERG), the media budget was reduced to £4.7 million from the original £6.7 million. A £1 million contingency budget was set, but would not be released until the response levels had been assessed after census day. This decision was made principally on the rationale that if the budget was not necessarily required it should not be committed.

2.391 The 2011 Census employed a wide range of communications channels and activities depending on the target audience. It was impossible to reach all census audiences through one communications channel. However, particular channels were very effective in reaching specific audiences. The 2011 Census used a combination of channels and activities, including paid-for, owned and earned (free) media channels.

2.392 The paid-for media channels for the campaign approved by the ERG were:

- TV advertising (for Phase 1 and 2 only)
- outdoor/out-of-home advertising
- digital and social media
- BME radio and print advertising, and
- magazine advertising targeting young adults

2.393 The net result of the decision to withhold this budget until after census day was that the media choices at the contingency planning stage were severely limited to those that could be planned, bought and implemented at very short notice – as little as 24 hours. Crucially this denied the use of television at this stage of the campaign to drive home the hard 'non-compliance' message.

2.394 An additional £1 million contingency was spent where response rates were lower than anticipated; paid-for media channels approved by the ERG were:

- regional press
- regional radio
- digital out-of home advertising, and
- digital and social media

2.395 Pro-active media relations worked alongside advertising and paid-for communication, and compensated for the reduced advertising spend by generating earned (free)

coverage on radio, TV and in print. ONS news releases, 27 in total, generated more than 4,000 items of coverage – mostly positive with an estimated advertising value equivalent of around £9 million.

Programme governance and organisation

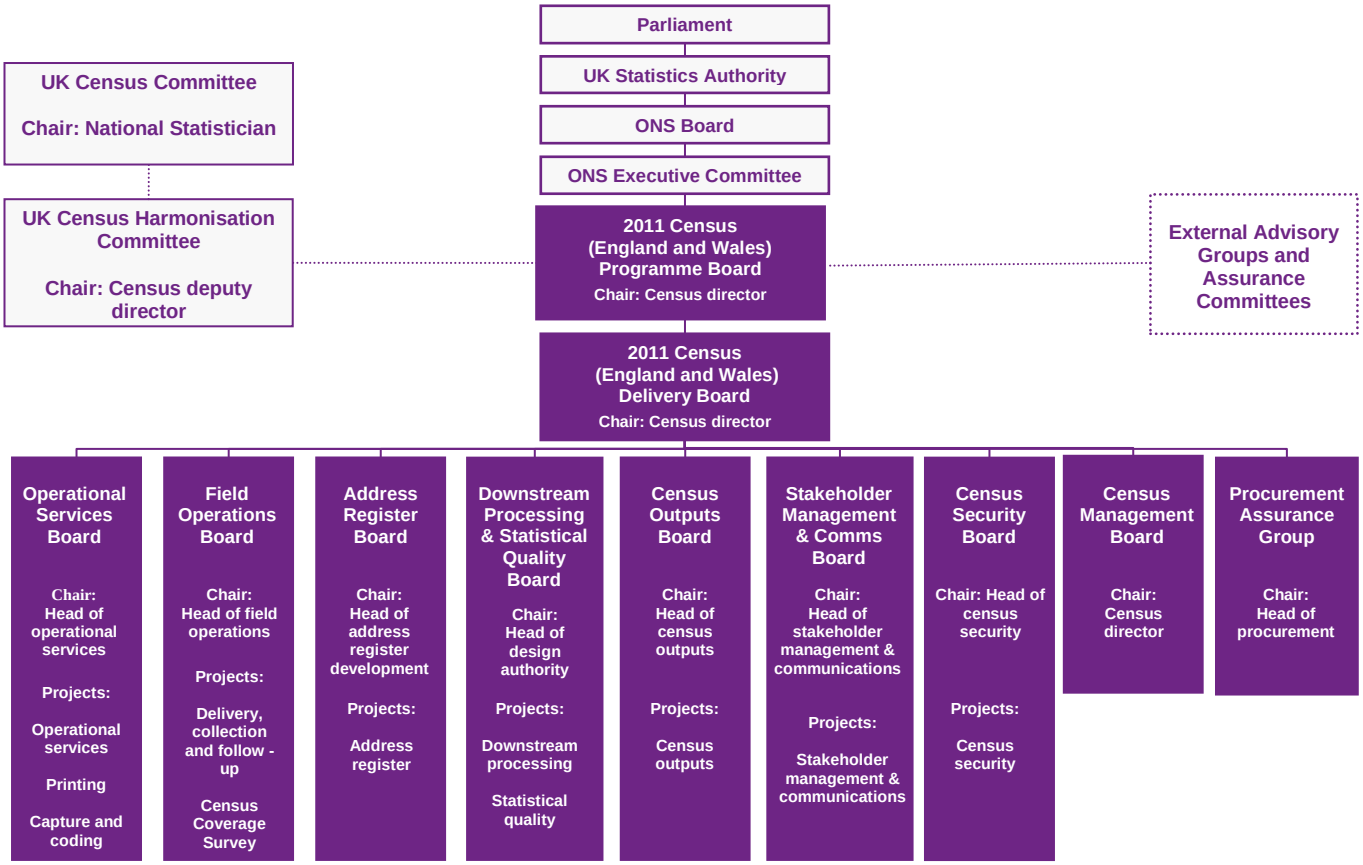
Committees and boards

2.396 ONS had been able to base its 2001 Census operation entirely at Titchfield in Hampshire for the first time. All disciplines of staff working full-time on the census, which included statisticians, researchers, information management specialists and those providing administrative support, had been brought together into one ONS Census Division. This had had the advantage of enhanced working level communications and training. However, the subsequent move of the greater part of ONS business activities to Newport in South Wales, together with the restructuring of the main ONS business areas meant that it become more difficult for the 2011 Census operation to be entirely self-contained at Titchfield - but more effective means of communication meant that this did not, in the main, diminish working efficiency.

2.397 The number of permanent core census staff at Titchfield was around 12 at the start of the planning period in 2003/04, rising to a maximum of around 450 in 2010/11 during the run-up to census day (27 March 2011).

2.398 A multi-tier governance structure was put in place to support the control and co-ordination of policy and operations both within ONS and across the three UK census offices. This ensured the greatest possible harmonisation between the three censuses, and optimum operational efficiency (see figure 2.4).

Figure 2.4 2011 Census governance structure, September 2010



2.399 Policy was co-ordinated by the long-standing United Kingdom Census Committee (UKCC). This was chaired by the National Statistician, and comprised the Registrars General for Scotland and for Northern Ireland, the chief statistician for Wales, the census director, and senior census officials across the UK. Its role was to:

- agree the scope for common strategic activity across the three UK census offices, to establish a common UK census in 2011
- ensure UK-wide outputs from the 2011 Census were coherent, with particular reference to consistent methodologies, geographic boundaries, definitions, classifications, and questions meet the need for such outputs by taking into account:
  - the functions and independent authority of the devolved administrations
  - the specific need to provide a more formal role for the Welsh Assembly in the governance of the census in Wales
  - UN-ECE/Eurostat recommendations on, and the need for statistics to be harmonised with, international censuses
- identify the areas where, in order to maximise efficiency:

  - there was a benefit in adopting a common approach across the UK in line with the National Statistician's and Registrars General's Agreement (see paragraph 1.20)
  - a common approach was desirable but not necessarily achievable
  - a degree of flexibility was necessary

- resolve issues where there were conflicting views or objectives across the three census offices which could not be resolved within the lower level management board, and which had subsequently been reported and escalated through any of the three project boards, and
- agree the cross-office funding and resourcing for shared and specific activities

2.400 The committee met every three to four months throughout the census programme and was supported by the UK Census Harmonisation Committee (UKCHC), chaired by ONS census deputy director. Its role was to achieve high quality censuses across the UK by identifying and agreeing research into issues covered by the main 2011 Census projects, where there was scope for, and benefit in, following a common approach across the three UK census offices.

2.401 UKCHC also met every three to four months to consider joint approaches to research into issues relating to:

- systems design (including operational intelligence, data capture, internet collection, and geo-referencing)
- statistical developments (population base definitions, topics and questions, questionnaire design, coverage adjustments, edit and imputation, disclosure control and output requirements), and
- outsourcing (including the use of corporate tools) for processing and other operations; and legislation

It was charged, in particular, with responding to the demand for consistent and comparable UK-wide information in 2011 on:

- population benchmarks and denominators for people, households, families and dwellings
- finely-grained information about small areas and small groups within the population, and
- household and person-based information collected on a range of common topics

2.402 The UKCHC reported in the main as a sub-group to the Census Programme Board (CPB), which managed the progress of the 2011 Census programme. The function of the CPB in England and Wales was to drive the programme forward to ensure delivery of the planned outcomes and benefits. Board members provided the necessary resource and specific commitment to support the senior responsible owner (SRO) who was accountable for the successful delivery of the programme, and who chaired the board. Each member was individually accountable to the SRO for their particular area of responsibility and delivery in the programme by:

- ensuring that the programme met its objectives and delivered the projected benefits
- providing direction and advice to the SRO

- providing overall strategic guidance for the programme
- agreeing all major plans
- authorising any deviations from the plans (beyond agreed tolerances), escalating upwards as necessary
- agreeing the delegated tolerances for time, quality and cost
- ensuring that the required resources were available
- resolving any conflicts or issues escalated by the programme, referring upwards if appropriate
- ensuring that the risk(s) associated with the programme were effectively managed
- ensuring that there was effective quality assurance
- ensuring that the programme was subject to review at appropriate stages and that recommendations or concerns were met or addressed
- ensuring arrangements were in place to manage external communications
- communicating information about the programme to the rest of the office, and
- managing the interfaces with the rest of the office in general and in particular with their own business area

2.403 At the level immediately below the CPB, a Census Delivery Board (CDB) was established. This helped to deliver the programme's outcomes and benefits by co-ordinating and managing individual project delivery according to the wider programme plan and to ensure that project outputs were harmonised. Members of the board were collectively responsible for the delivery of the programme. To achieve this purpose each of the projects reported in a standard format so that information could be consistently aggregated to the programme level. The CDB met monthly and focused on those areas that were most important to the programme, ensuring that:

- projects adhered to plans and that exceptions were reported as soon as possible
- dependencies and interfaces between projects were managed
- those risks and issues escalated from projects were managed appropriately with full mitigation/contingency plans
- the impact of any change was recognised and managed to avoid 'scope creep'
- project outputs delivered the agreed goals and quality standards, and contributed appropriately to benefits realisation, and
- costs and resources were managed

2.404 Figure 2.4 shows that, below the CDB level, there were a number of project boards responsible for the management and delivery of specific census activities within the overall programme. These included:

- operational services
- field operations
- address register
- downstream processing and statistical quality
- outputs
- stakeholder management and communications
- security
- management
- procurement assurance

2.405 Figure 2.4 also shows that a number of external groups fed into this high level governance. These encompassed a wide range of users and other stakeholders who provided vital input into the design and quality assurance of the census methodology and outputs. Most prominent of these were the several census advisory groups (see paragraph 2.34).

2.406 It should be noted however, that the governance structure shown in figure 2.4 was active during the main operational phase of, and in the run up to the census. At the earlier development phases of the census programme other boards existed to manage specific pre-census activities, such as procurement and the management of contracts for outsourced services, the 2007 Census Test, and the 2009 Rehearsal. Moreover, in the later output production phase of the census new boards were created that reported to the census delivery board to manage a range of post-census activities. These included:

- Census Operations Board
- IT Delivery Board
- Census Release Panel
- Dissemination Delivery Board
- Information Assurance Board
- Statistical Outputs Board
- Analysis Project Board
- Evaluation Board
- Benefits and Exploitation Group

2.407 Figure 2.4 also shows that the census programme board reported upwards to the ONS board through its executive committee, and thence to the UK Statistics Authority with its statutory responsibility for carrying out the census. And ultimately, the UK Statistics Authority is required to report to Parliament.

Project support

2.408 A project management office (PMO) was set up to provide programme support to the 2011 Census. Its function was, in particular, to:

- develop and maintain the project plans, control processes and tools for use throughout the project
- support the census project staff's application of project management and control through day-to-day support, training, advice and guidance, and
- provide a secretariat for the key governance boards, including the census delivery board, census programme board, UK Census Committee and UK census harmonisation committee

2.409 The 2011 Census programme used programme and project management principles based on Managing Successful Programmes (MSP) and PRINCE2. These covered a number of different management processes, including:

- planning
- risk management
- issues management
- incident management
- configuration and document database management
- change control

- decisions made
- commitment log
- lessons learned log
- programme progress reporting
- registry services
- business continuity planning
- accommodation planning

2.410 The PMO also co-ordinated the input into the regular gateway reviews that were carried out by the Office for Government Commerce at appropriate points during the programme. These provided confidence that the programme was being managed effectively.

2.411 Between 2006 and 2010 the PMO evolved from a small administrative team supporting a single project to a large business unit providing widespread project management services across the census programme. It was at this stage that many of the heads of individual projects requested more control over individual PMO resources.

2.412 The case for this requirement had merit. The centralised PMO had been finding it difficult to build relationships with the various projects, and the belief was that embedding project support staff would not only build stronger relationships, but also increase their knowledge of the specific project. Therefore, in the first quarter of 2010 it was decided that most of the project support function would be devolved from the PMO and staff were embedded in the respective project teams, leaving only a small residual central team to focus on programme-wide support tasks.

2.413 This gave the projects full control over the size and scope of their project support function, including line management responsibility, budgets for resource and training, and allowed the projects to dictate how they could best support their respective work streams. In hindsight, devolution was necessary. Because each project was structured differently the project support functions could be tailored to suit their specific projects' requirements. It would have been very difficult to retain the project support function within the PMO due to the eventual size and complexity of the census programme.

Main events of the census programme

2.414 Because the date of the census is set by legislation (see 2.1 and 2.2) many of the activities are time critical. The dates of main events of the census programme are shown in box 2.

Box 2

2003	
11/12 November	ONS/Royal Statistical Society (RSS) Conference "Census 2001 and beyond"
2004	
25 March	Initial design for 2011 Census published
2005	
13 May	Consultation programme launched on user need for content of 2011 Census
2006	
1 December	Consultation launched on user need for information on Ethnicity, Identity, Language and Religion
15 December	Transfer of Functions Order came into force
2007	
13 May	Census Test
19 July	Decision made on post-out methodology
2008	
1 April	Statistics and Registration Service Act 2007 came into effect
9 July	EU Census Regulations came into force
July - November	Pilot phase of address register project carried out
28 August	Contract with Lockheed Martin UK announced
11 December	Proposals for 2011 Census published in White Paper 'Helping to shape tomorrow'
2009	
16 March	Contract with Capita Business Services signed
14 September	2011 Census stakeholder website launched
11 October	Census Rehearsal
19 October	Final recommended questionnaire content published
21 October	Census Order laid
9 December	Census Order made
2010	
27 February	Census Regulations (England) made
4 March	Census Regulations (England) laid
31 March	Census Regulations (England) came into force
24 April	Census Regulations (Wales) made
28 April	Census Regulations (Wales) laid before the National Assembly for Wales
16 June	Census Regulations (Wales) came into force
June	Field recruitment started
2011	
21 February	Publicity campaign launched
4 March	Census online launched
27 March	Census Day
9 May	Census coverage survey field work started

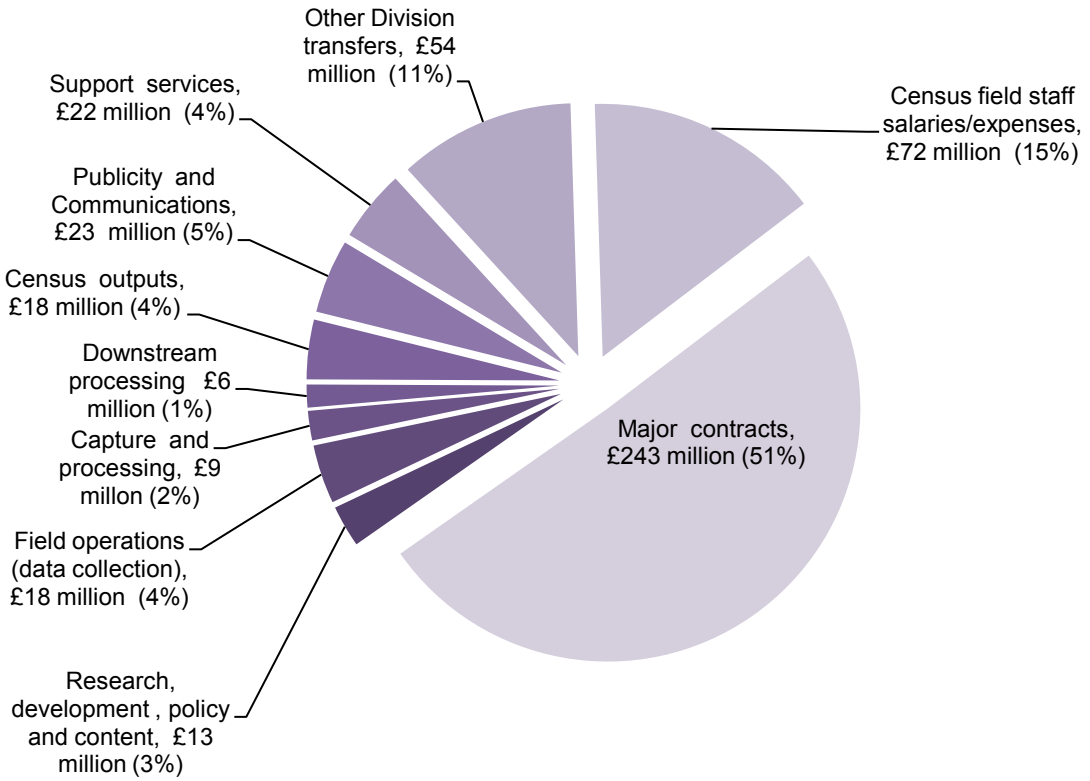
May	Data processing began
2 June	Census coverage survey field work completed
October	Initial consultation launched on Beyond 2011
2012	
16 July	First census outputs released
2012 - 2014	Further census outputs released
2014	
27 March	National Statistician published recommendation for 2021 Census
18 July	Government's decision on 2021 Census announced

Financial management and costs

2.415 The cost of the 2011 Census over the 12-year planning and operational period 2003/04 to 2014/15 was £478 million. This was £4 million less than the budgeted figure of £482 million that was estimated in 2008 and published in the Government's White Paper. The breakdown of the total cost into its component elements is shown in figure 2.5.

Figure 2.5 2011 Census costs by component elements 2003/04 to 2014/15

Total cost £478 million



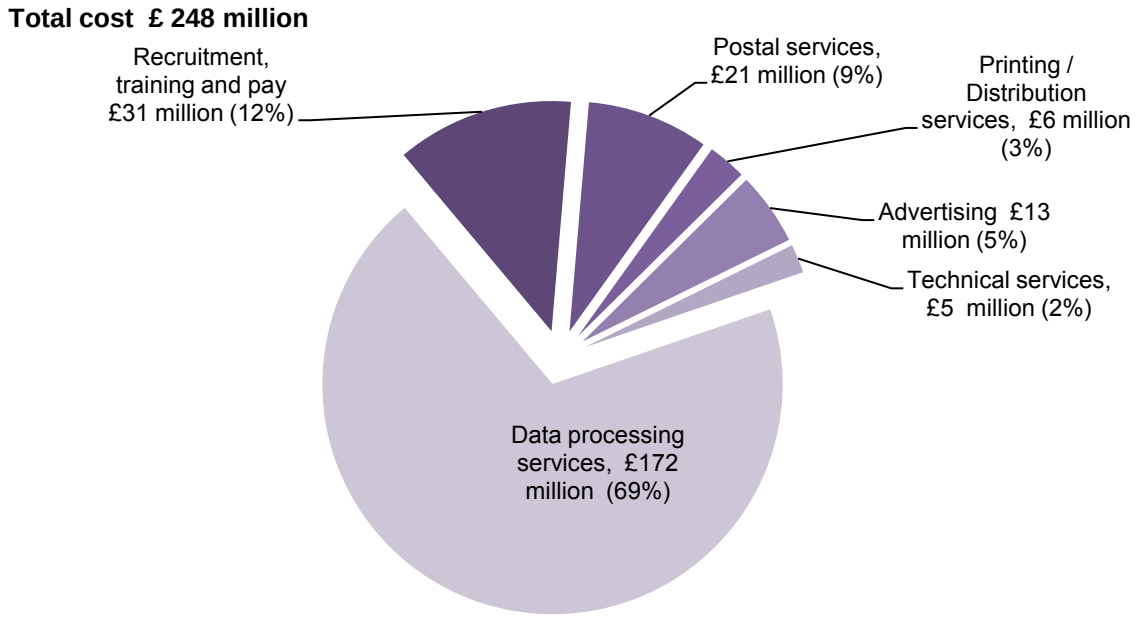
Note: figure 2.5 shows costs rounded to £million. Major contracts excludes £5 million relating to smaller technical service contracts (such as legal services and technical advice) supporting the relevant business operational costs.

2.416 Costs were closely controlled and monitored throughout the whole of the census programme. Leaving aside for the moment the costs of the major outsourced services (data capture and coding operations), the largest element of the total cost was the field operation. This included the contract for the recruitment, training and payment of the field staff (£30.9 million) and other ancillary data collection costs (£17.9 million).

2.417 Reference has already been made (see paragraphs 2.328 to 2.342) to the increased use of external suppliers for a wide range of specialist services. Consequently a little over half the total cost went towards major contracts (compared with 37 per cent in 2001). A breakdown of the proportion spent on each outsourced activity is shown in figure 2.6. More than two thirds of these costs covered services to support the main data processing operation. These included:

- printing of questionnaires
- scanning of questionnaires
- data capture and coding
- helpline services and the self-help website
- questionnaire tracking
- online data capture
- secure destruction of the questionnaires

Figure 2.6 2011 Census outsourced activity costs 2003/04 to 2014/15

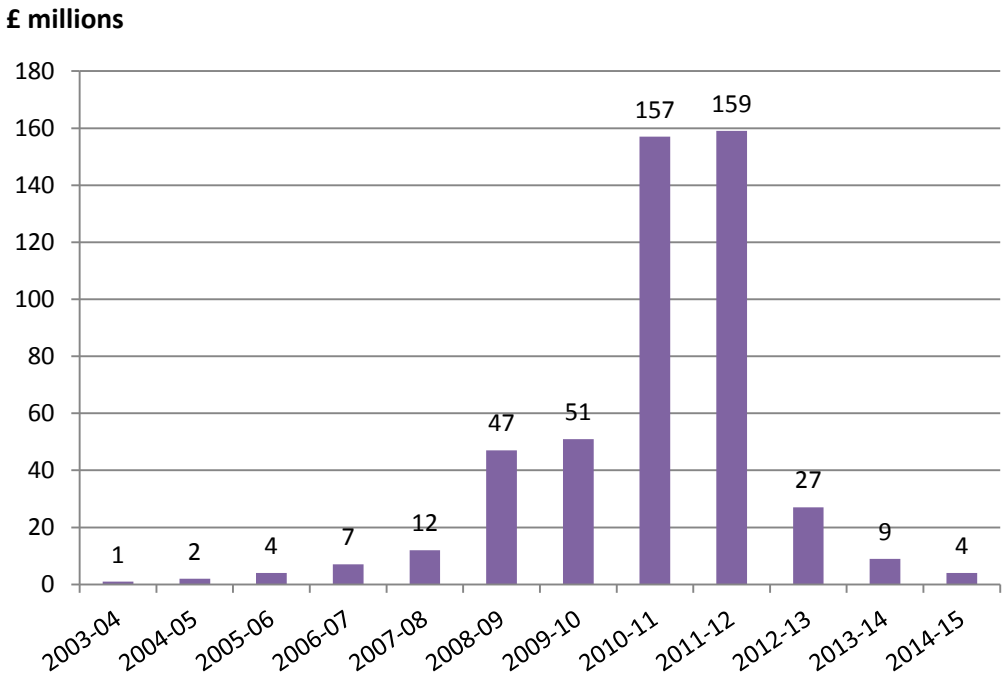


Note Figure 2.6 shows costs rounded to £million.

2.418 In any census, costs are not spread evenly over the whole period of the operation; typically the year of greatest expenditure is the year in which census day falls. For the 2011 Census, however, census day was 27 March, at the very end of the financial year 2010/11. Consequently the greatest spend was spread more evenly over the two consecutive years: 2010/11 (which accounted for much of the development and

checking of the address register and the recruitment and training of field staff), and 2011/12 (in which the field operation and the whole of the outsourced data processing operation took place - figure 2.7).

Figure 2.7 2011 Census costs by year 2003/04 to 2014/15 (rounded to nearest million)



Chapter 3

Data collection

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

Accounts[9] 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.

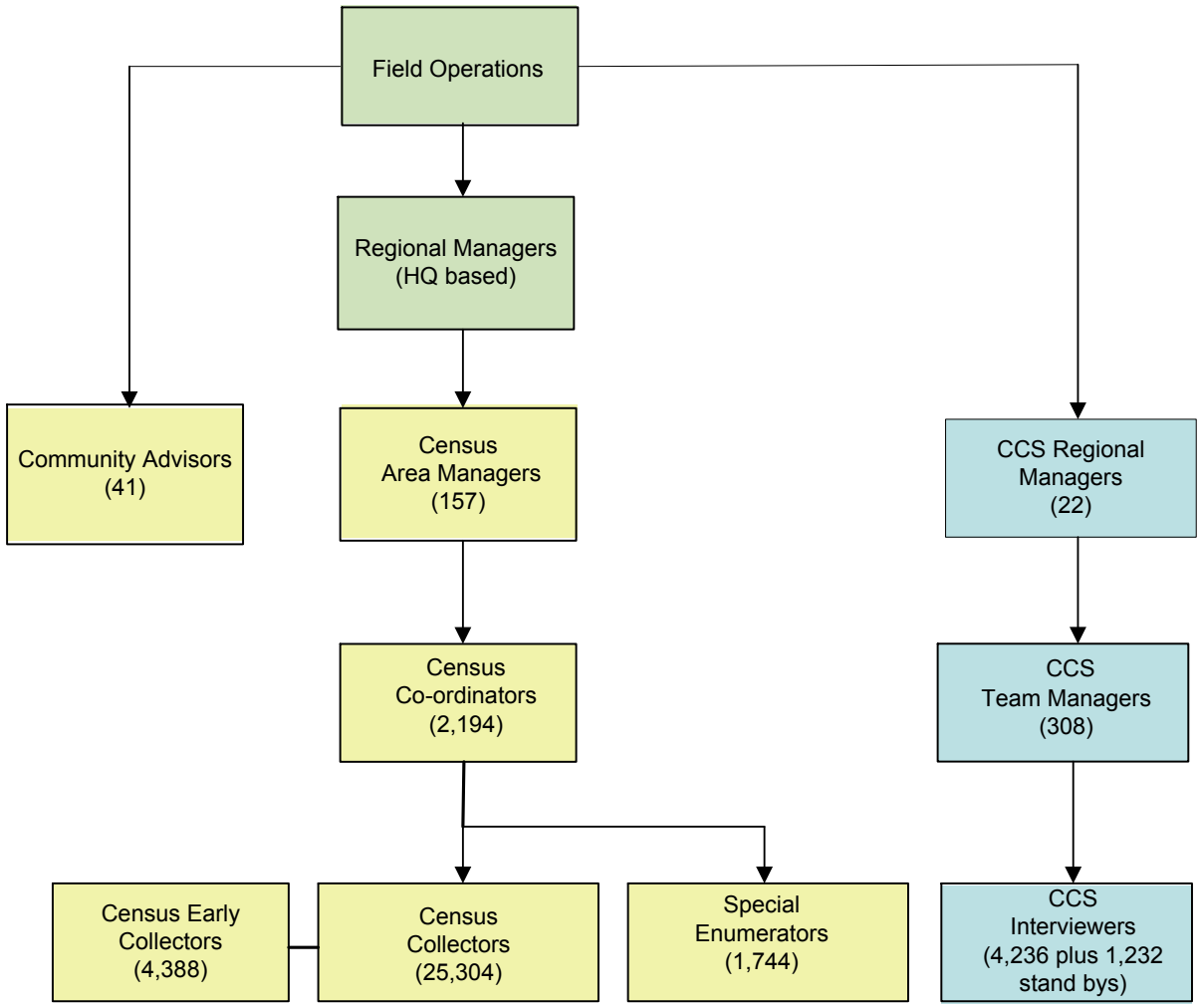
3.36 The CE delivery operation started on Monday 7 March, three weeks before census day, and continued up to census day itself. CE questionnaires were collected by census staff rather than being posted back. This was primarily to ensure good coverage (the special enumerator could check that the questionnaires 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	2001-2011
	2001	2011	Hours	Factor
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 over-flowing 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 where 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

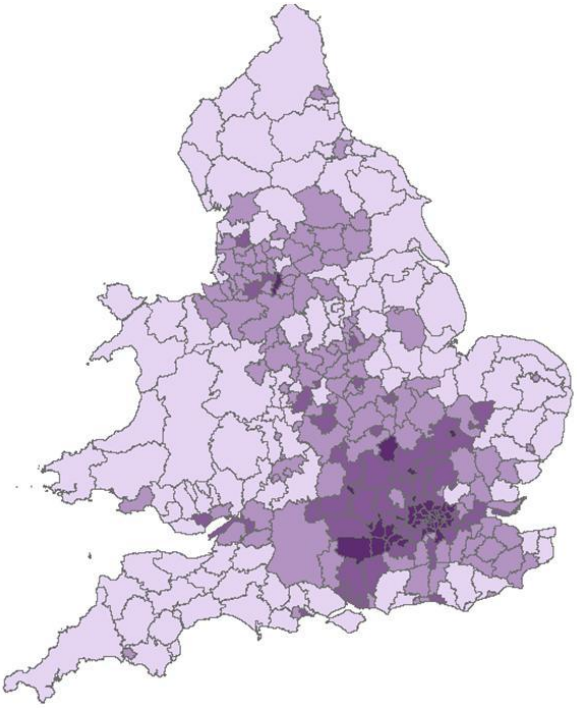
Online completion

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.

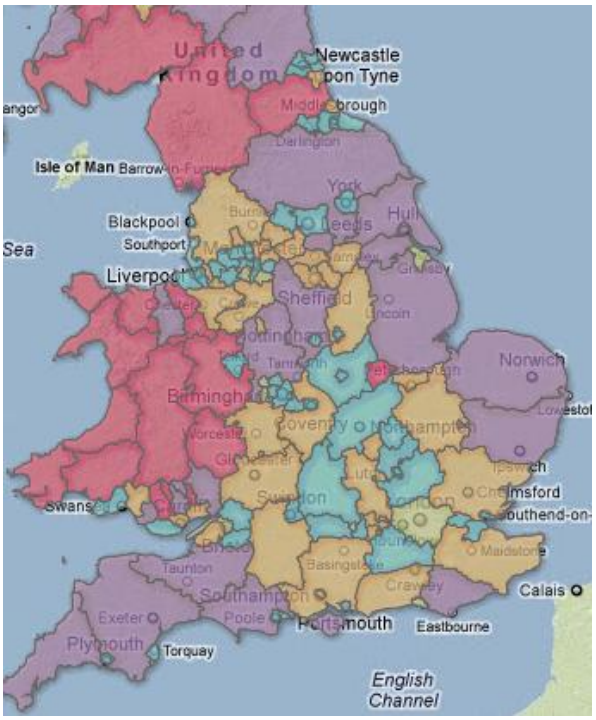
3.155 This less than expected level of online response was probably due to several factors. Responding on paper may have seemed easier to many people than going online, because a paper questionnaire had been delivered to every household and was readily to hand (some countries such as Canada had achieved 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

Online response



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.

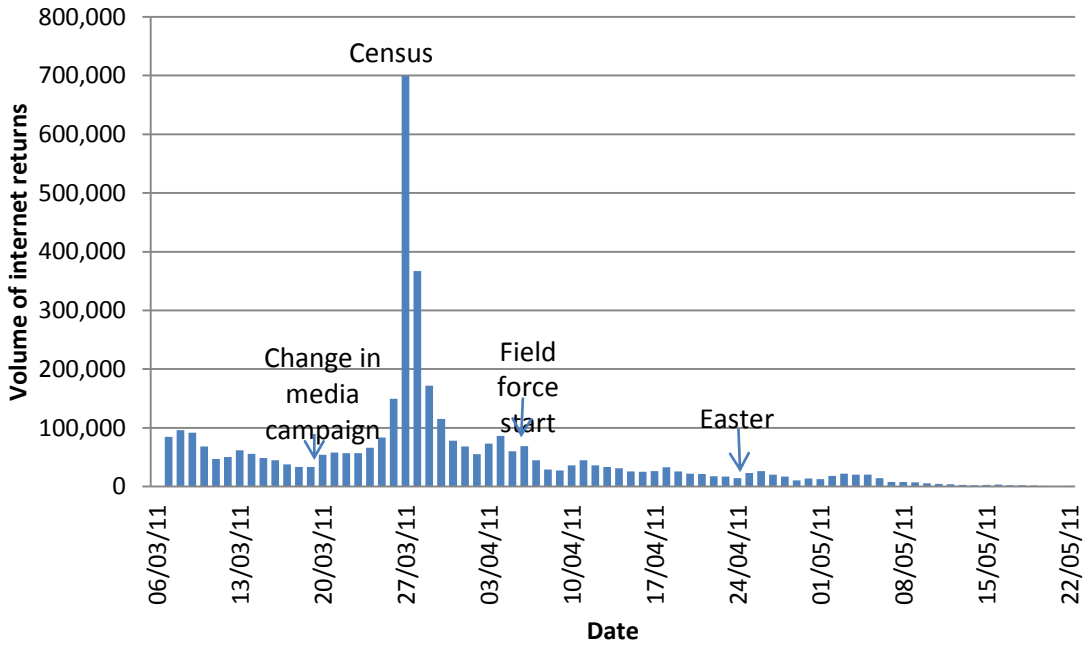
Validation

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

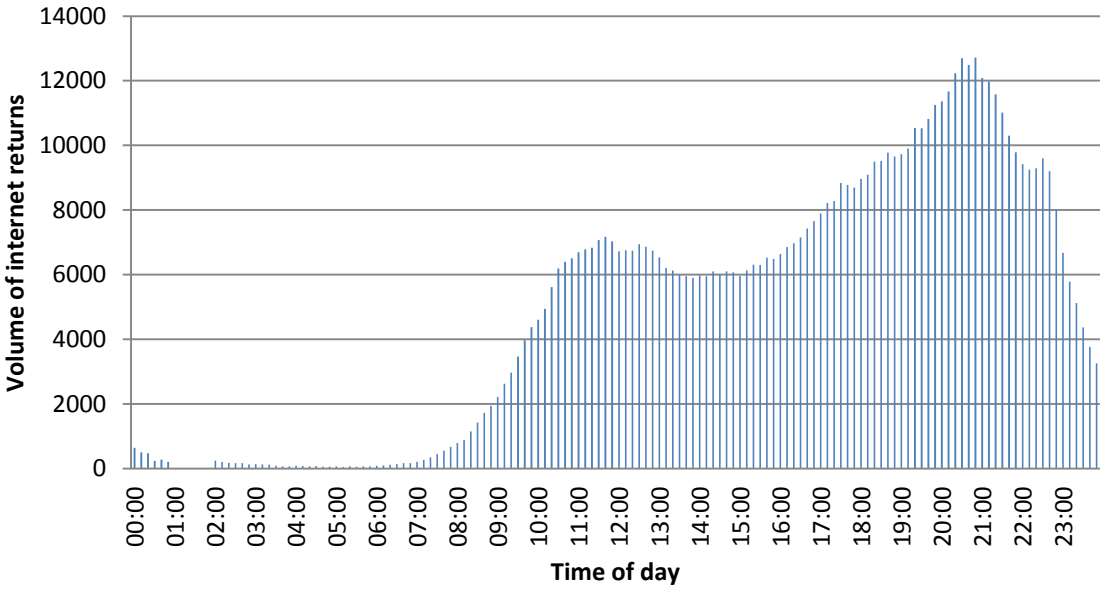


Figure 3.5 Percentage of online census returns by time and day of the week

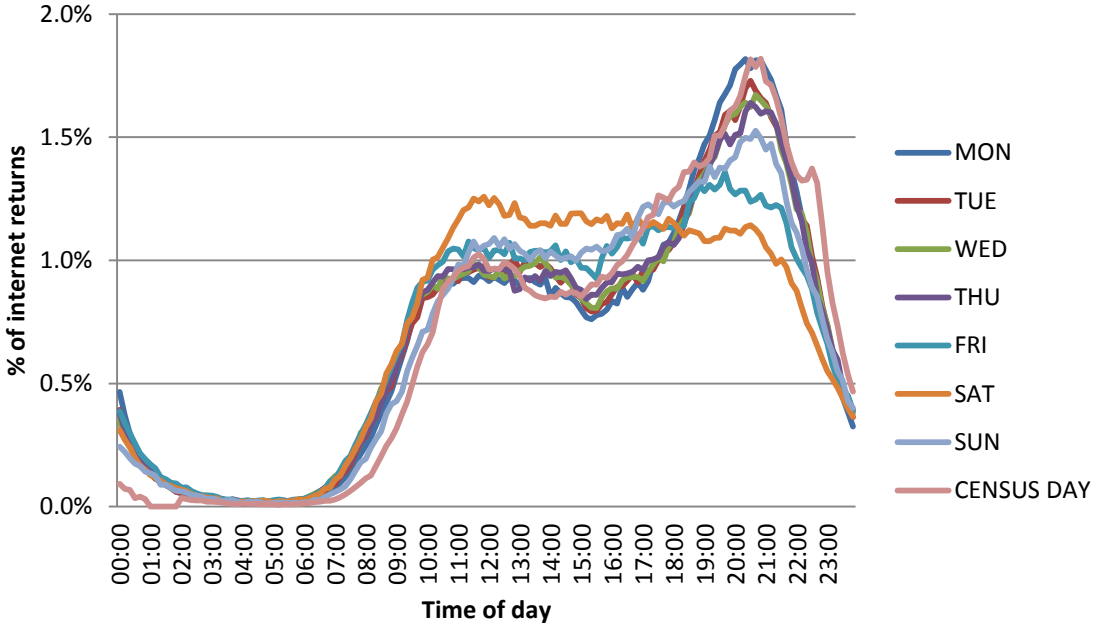
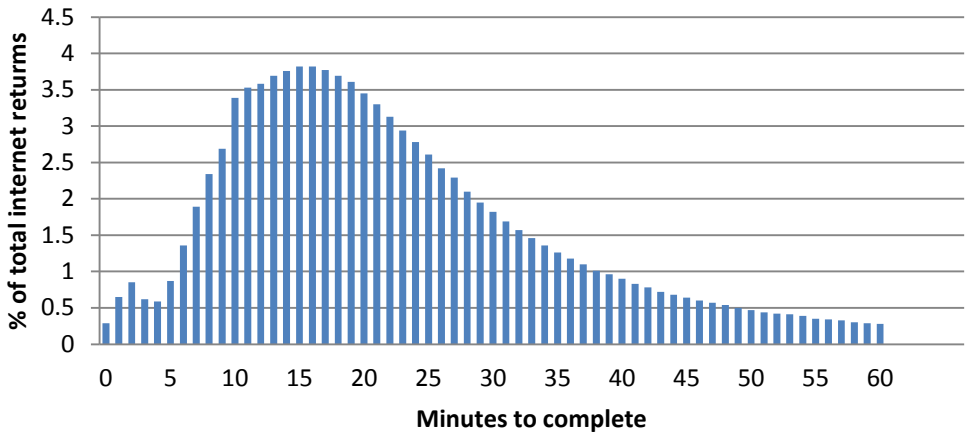


Figure 3.6 Volume of online census returns by minutes taken to complete questionnaire



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

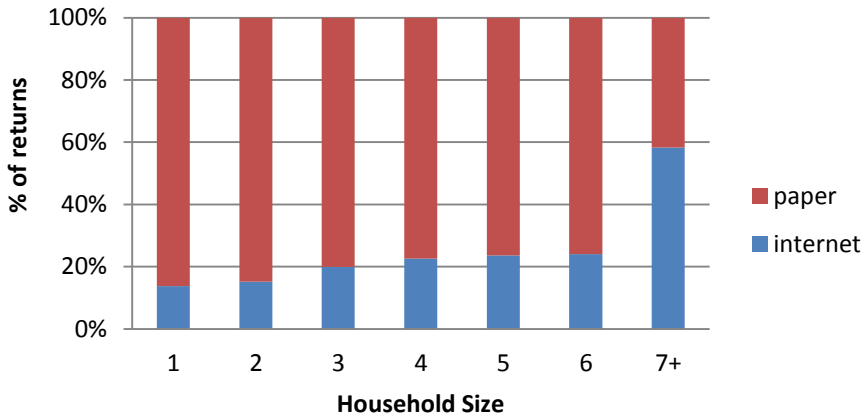
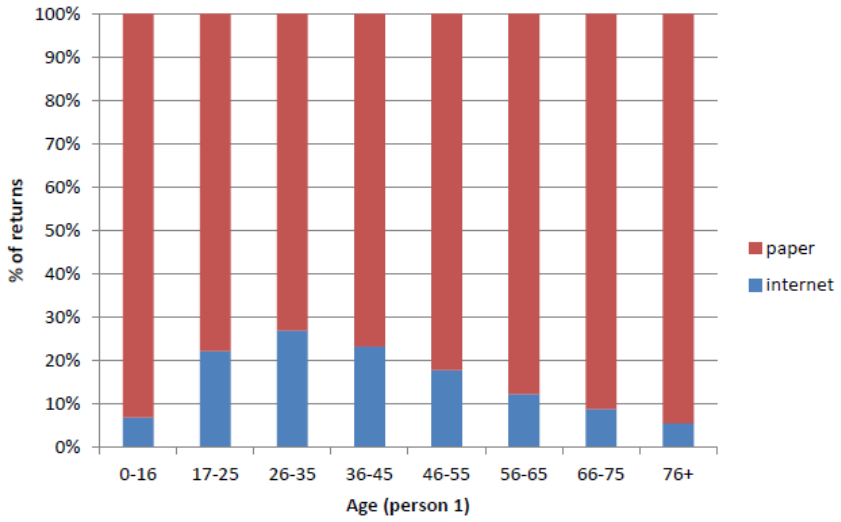


Figure 3.8 Percentage of census returns submitted on paper/by internet, by age of respondent



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

Chapter 4

Census Coverage Survey

4 Census Coverage Survey

Introduction

4.1 Every effort is made to ensure everyone is counted in a census. However, no census is perfect and some people are inevitably missed. This undercount does not usually occur uniformly across all geographical areas or evenly across sub-groups of the population. The measurement of small populations – one of the main reasons for carrying out a census – is becoming increasingly difficult. This is a big issue in terms of resource allocation, because the people who are missed (such as the elderly, young males in inner city areas, recent migrants) tend to be those who attract higher levels of funding. Therefore money may be wrongly allocated if the census is not adjusted.

4.2 It is a widely accepted practice when conducting a traditional census that an assessment of coverage should be part of the statistical operation. The 2001 Census represented the first real attempt to fully integrate the census and coverage measurement processes, resulting in the development of the One Number Census (ONC) methodology. The aim at that time was to provide a population estimate that would be the basis for the 2001 mid-year estimate, and to which all census tabulations would add. The ONC estimated the undercount in the 2001 Census to be 6.1 per cent of the total population in England and Wales (see also paragraphs 5.54 to 5.55).

4.3 A Census Coverage Survey (CCS) was the key source of information on the extent and distribution of the census undercount in 2001. The CCS was a separate sample survey carried out over a three to four week period after the field work for the census itself had been concluded. It took the form of a short interview (10 to 15 minutes) to check on the coverage of households and people within households, and to collect some basic demographic characteristics (such as age, sex, marital status, ethnic group and economic activity). The information obtained from the survey was used, in conjunction with the census data, to produce a consistent set of census-based estimates, which formed the new base for the series of annual mid-year population estimates for local and health authorities.

4.4 The 2001 methodology was a big step forward. The CCS had covered around 325,000 households (about 1 per cent of all households) and achieved an interview completion rate of 90.8 per cent. This information helped to adjust the main 2001 Census estimate with the addition of around 1.5 million households and 3.1 million individuals. Both the Statistics Commission and the Local Government Association published reviews that concluded that the census adjustment methodology used in 2001 was the best available and that no alternative approach would have produced more reliable results overall (see paragraph 5.55).

4.5 The improvement to the accuracy of population estimation as a result of the 2001 CCS and the associated coverage adjustment methodology convinced ONS, early on in the planning for the 2011 Census, to include a similar coverage survey. But given that the 2001 CCS was the first of its kind, there were inevitably improvements that could be made based on the lessons learned.

Design and fieldwork

4.6 To measure coverage in the 2011 Census and adjust the census database for those estimated to have been missed, ONS conducted a Census Coverage Survey across England and Wales. This was a voluntary survey carried out independently of the census. It took place over a four-week period (6 May to 2 June 2011), starting six weeks after census day – a start date that was eight days later after census day than had been the case in 2001 as a result of the longer census fieldwork period. The CCS sample included 17,400 postcodes (some 1.5 per cent of all postcodes) containing nearly 340,000 households. While this sample size was similar to that in 2001, the sample design was revised using the information on coverage patterns to address some of the lessons from 2001.

4.7 The sample design, which ensured that the sample was spread across all local authorities, is described in the 2011 Census Coverage Assessment CCS sample sizes and Estimation Areas for local authorities[36]. The survey was a stratified two-stage sample, first selecting output areas by local authority and the hard-to-count (HtC) index, and then selecting approximately half the postcodes from within those output areas[37]. The numbers of sampled postcodes by estimation area and local authority, and the process for deciding to remove some of these postcodes from the sample where no data was collected, are set out in other reports[38].

4.8 The design and implementation of the 2011 CCS closely followed the successful 2001 CCS. As noted in paragraph 4.4, the 2001 CCS had achieved a 90.8 per cent interview completion rate (defined as 'the number of completed household interviews at sampled households as a percentage of households within the workload') Note that 'interviews' here included self-completion questionnaires returned by the householders in response to the 'post-back' facility made available where no other contact had been possible. Further improvements were implemented for 2011 such as:

- increased stratification of the sample to improve overall population estimates. This resulted in more postcodes being drawn from the areas where census response was expected to be lower
- more flexible working hours for interviewers enabling them to work their contracted hours whenever they wanted, and therefore increase the range of times at which they could obtain interviews; and
- extended fieldwork for low response areas where CCS interview completion rates were lower than expected

This led to a 90.4 per cent interview completion rate in 2011 – exceeding the initial target rate of 87 per cent and despite the sample being skewed much more towards harder-to-count areas than had been the case in 2001.

4.9 A key requirement of the CCS was that its process of data collection should be independent from the census itself. Consequently, although recruitment processes were developed in line with the main census recruitment, training was handled differently. As in 2001, a 'cascade' approach was adopted, whereby HQ staff trained the regional managers, and this training was cascaded through the staffing structure. Any CCS fieldworkers who worked on the census were not made aware of the CCS sampled postcodes until after the census, and they did not conduct CCS interviews in postcode areas that they had worked in during the census. Unlike the census collectors who were provided with address lists, CCS interviewers used maps to

construct their own address list and independently identify all households in their area.

4.10 In the fieldwork, interviewers attempted to contact household members for every household in their allocated postcodes, in order to verify the household's existence. To reduce interview times, the questionnaire consisted of a subset of key social and demographic questions from the census. To maximise coverage, questions about household members likely to be counted elsewhere or likely to be missed (for example, those temporarily out of the UK), were included.

4.11 The field force consisted of three tiers: 22 regional managers, 308 team managers and 5,468 interviewers (including 1,232 'standbys'). The regional managers reported to one of six survey managers at HQ in ONS.

4.12 Following the construction of their address list, the interviewers conducted doorstep interviews with a member of each household. A telephone-based interpretation service contractor (the Big Word) was used when necessary. The interviewers made repeated attempts to gain an interview, returning to non-responding households at different times of the day and on different days of the week.

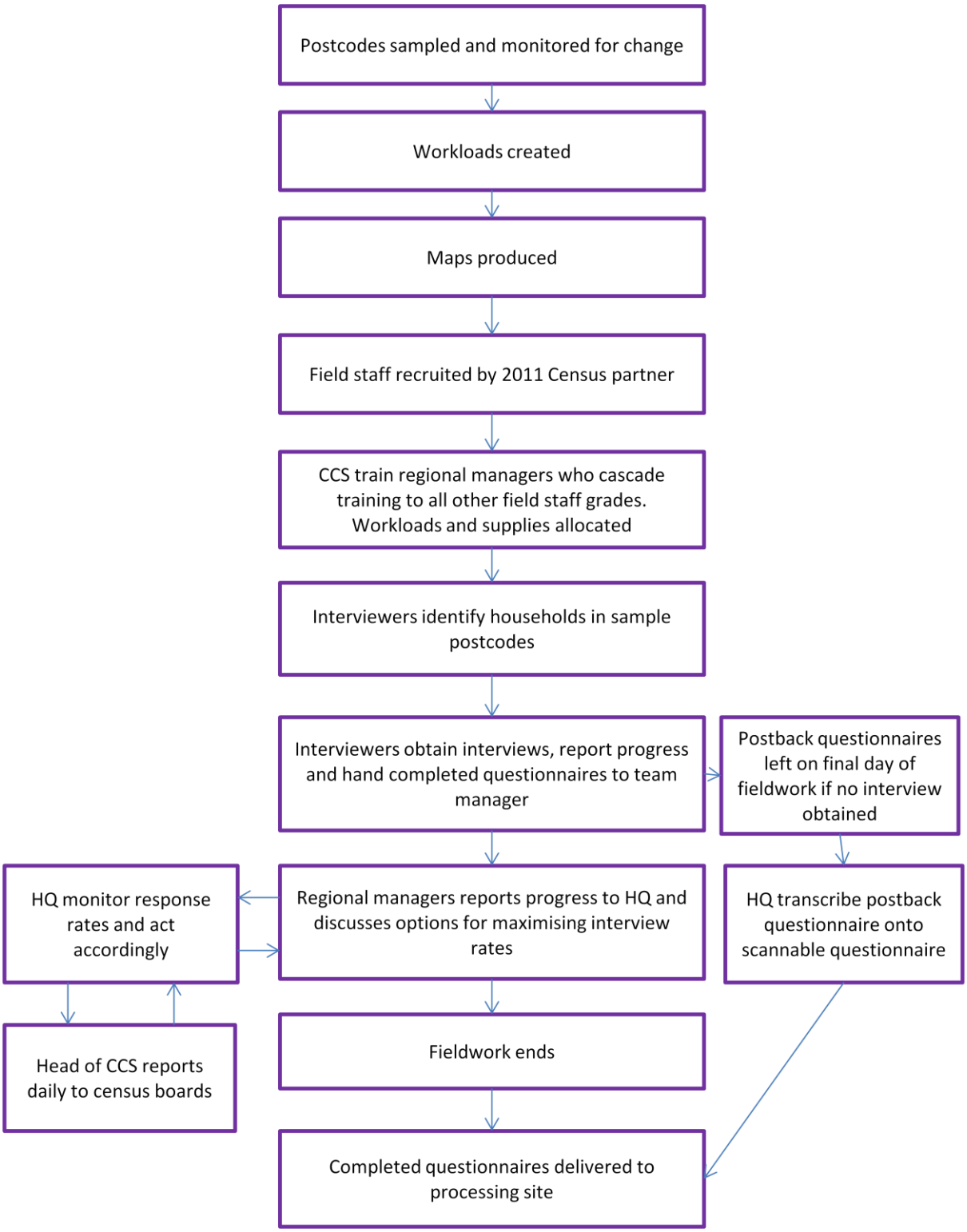
4.13 They were mentored by experienced household/social survey interviewers from ONS HQ. These were trained to: answer queries on field procedures; accompany the more hesitant CCS interviewers to help them gain confidence; and help to overcome interviewees' reluctance or refusal to take part. Their questioning was more probing on areas such as missing populations (for example young babies), and on residents who were possibly counted elsewhere.

4.14 To achieve high response rates there was also a self-completion questionnaire and post-back option, for households where contact was not made. This was used towards the end of the fieldwork and only after several unsuccessful visits. The self-completion questionnaires contributed 5.7 percentage points to the final interview completion rate. In some areas, where interview rates were lower than expected, the fieldwork was extended. Where no contact was made dummy forms were completed by interviewers, who recorded some basic information about household characteristics that was used in assessing CCS coverage.

4.15 In some areas fieldwork was challenging and included difficult to access buildings, large proportions of vacant properties and/or second homes. An additional 5 per cent of households were expected to be discovered during the address listing phase, but interviewers actually found 14 per cent more households. Following the fieldwork, some 700 sampled postcodes (4 per cent) were removed from the estimation process. This was for a number a reasons and included cases where: no valid interviews were achieved; there were no residential households; all households had moved since census day; or there had been recruitment difficulties and not all postcodes were able to be covered. Many of these outcomes were expected, and the estimation process was designed to identify and remove such postcodes to ensure they did not impinge on quality. However, these challenges did not affect the strategy of skewing the sample towards the harder-to-count areas.

4.16 Progress on interview success rates was reported up the management chain to HQ every two days. This was useful in flagging-up areas with unexpectedly poor completion rates that needed more work, and allowed resources to be assigned more effectively. This process flow is summarised in figure 4.1.

Figure 4.1 The high-level CCS process flow



Survey response rates, refusal rates and sample sizes

4.17 Household response rates in the CCS are defined as *the number of valid responses achieved divided by the number of occupied households found by either the census or the CCS*. This includes households that were missed by the CCS but found in the census. Similarly, person response rates in the CCS are defined as *the number of persons within valid interviewed households in the CCS divided by the number of persons in households found by either the census or CCS.* This is different to an interview completion rate which, as noted above, was 90.4 per cent, and which included interviews that were not included in the estimation process (for example, communal establishments and responses from households that moved in between the census and CCS). The data used to calculate response rates are from the coverage matching process.

4.18 For England and Wales as a whole, the 2011 CCS achieved an 87.3 per cent household response rate on this basis (the equivalent figure for 2001 was 79.8 per cent). The coverage survey person response rate for England and Wales as a whole was 87.0 per cent (the equivalent figure in 2001 was 88.4 per cent). The seeming anomaly of having higher household response rates in 2011 but lower person response is an impact of having a skewed sample. This may be explained by both the size of households being smaller in the skewed sample, and the lower coverage of persons within the responding households. It may also be due to some of the adjustments made in 2011 that were not part of the census coverage process in 2001 (making direct comparisons between the two surveys difficult).

4.19 Household refusal rates in the CCS were defined as the number of refusals divided by the number of occupied households found by either the census or the CCS; that is, using the same denominator as for response rates.

4.20 The number of postcodes selected (16,723) in the sample is defined as those that were used in the estimation process. An innovation for the 2011 CCS was having a 'flexible' sample that could be decided late in the process to increase the sample in areas that had showed poor census completion rates. In some areas, therefore this initiative allowed the CCS team to increase the number of interviews conducted. It involved giving some interviewers in those areas two or three more postcodes – about 250 extra households – to interview. ONS planned the flexible sample so that it could be invoked in up to 100 local authority areas. In the event, 392 additional postcodes (2.7 per cent of the final total number) were sampled across 44 local authorities.

4.21 Table 4.1 shows the response rates, refusal rates and postcode sample sizes for the English regions and Wales. The highest response was in the North East region, and the lowest, not unexpectedly, in London.

4.22 The response rates by local authority area ranged from 73 per cent in Wellingborough to 97 per cent in Cannock Chase (compared with a range of 67-99 per cent in 2001). Of the 348 local authority areas, only 16 (4.6 per cent) had a response rate below 80 per cent (in 2001 the proportion, 23 per cent, was five times greater), and 168, just under half, achieved a response rate of 90 per cent or more (compared with 188 in 2001). The CCS exceeded its objective of ensuring that an interview completion rate of 80 per cent or more was achieved in least 95 per cent of LAs. In fact, the completion rate target was exceeded in 98 per cent of areas.

Table 4.1 Census Coverage Survey household response rates, refusal rates and sample sizes for English regions and Wales

English regions and Wales	Household response rate (%)	Person response rate (%)	Household refusal rate (%)	Postcode sample size
North East	91.4	90.9	0.1	786
North West	89.1	89.1	0.1	2,173
Yorkshire and Humberside	89.7	89.4	0.2	1,421
East Midlands	89.5	89.4	0.1	1,012
West Midlands	87.8	87.1	0.2	1,377
East of England	88.8	88.7	0.2	1,630
Inner London	79.6	79.4	0.3	1,431
Outer London	83.3	82.8	0.3	1,733
South East	89.6	89.6	0.2	2,454
South West	88.6	88.6	0.2	1,632
England	87.2	87.0	0.2	15,649
Wales	87.8	87.6	0.3	1,074
England and Wales	**87.3**	**87.0**	**0.2**	**16,723**

Performance

4.23 In developing and undertaking the CCS, the objective was to assess coverage of the 2011 Census by building robust operational processes and associated infrastructure; recruiting sufficient staff to deliver a successful CCS, and managing the research, development, testing and implementation of all CCS procedures in the field and at census HQ.

4.24 More specific targets were set to measure the objectives, which were:

- to achieve an overall interview completion rate for England and Wales of 90 per cent or above initially, but this was later revised to 87 per cent to reflect the revised CCS sample design, which increased the difficulty of some of the postcode samples chosen compared to 2001, and
- to ensure at least 95 per cent of local authorities achieved an interview completion rate of 80 per cent or higher

As has been noted the CCS exceeded both targets in that:

- the interview rate achieved for England and Wales was 90.4 per cent; and
- the interview rate for local authorities of 80 per cent or higher was met for 98 per cent of them

4.25 While there were some challenges in its implementation, such as ensuring there were sufficient field staff and reserves in all areas (see chapter 10), overall, the CCS was considered very successful considering the interview rate achieved with a sample targeted more towards harder to count areas.

Chapter 5

Data processing

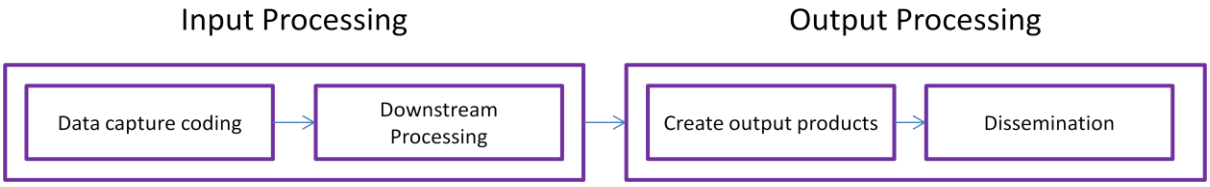
5 Data processing

Introduction

5.1 Before outputs from the census could be produced, responses on the 2011 Census questionnaires and Census Coverage Survey had to be captured. Responses were converted into coded data and then validated and cleaned so that the outputs were of high quality.

5.2 As was the case in 2001, the 2011 Census was processed in phases.

- Input processing - comprising two stages
  - the main data capture and coding stage,and
  - downstream processing - the subsequent process to clean, adjust, validate and protect the data (including edit and imputation, coverage assessment and adjustment process, and statistical disclosure control)
- Output processing - comprising the creation of an outputs database, from which census output products were produced and subsequently disseminated



5.3 This chapter deals with the data processing stages up to and including the coverage assessment and adjustment, and summarises the quality assurance processes built in to the data processing operations. Statistical disclosure control is covered in chapter 6 and the tabulation process is described in chapter 7.

Data capture and coding

5.4 As with the 2001 Census, it was decided that better value for money could be obtained from contracting-out the main scanning, data capture and coding services. Paragraphs 2.328 to 2.335 report on the strategy that was adopted for the 2011 Census. ONS carried out an 'open options' procurement exercise in 2005 to select a contractor to provide services for the printing and processing of the census questionnaire and other support services. The contract was awarded in August 2008 to Lockheed Martin (UK), which sub-contracted the operational elements of the data capture and coding process to UK Data Capture Ltd. The processing was carried out at a specially commissioned and secure site in Trafford Park, Manchester. More than 24 million census questionnaires were handled between March and November 2011, with processes to capture and code all of the ticks and texts on these questionnaires.

5.5 The paper census questionnaires were securely stored at the processing centre until an electronic archive copy was made for retention for 100 years as a historical record. The paper questionnaires were then destroyed (shredded) in a secure, controlled manner, witnessed and verified by ONS census staff. The electronic archive copy was copied to microfilm for retention at a secure ONS site and will be

transferred to the National Archives for eventual release in 2112. The captured and coded data was securely transferred to ONS systems for further processing and validation as part of the downstream processing stage.

Data capture

5.6 Questionnaire processing began by scanning the questionnaires and capturing the data in a four-stage process:

1. Scanning – to obtain images of the completed questionnaires

2. Image checking – to check the quality of the images produced from scanning and to prepare them for data capture. This comprised:

   a) automated image quality assurance (AIQA) to check the size of the image and that the expected barcodes were present
   b) data lift and registration (DLR) to undertake additional quality checks and prepare the images for data capture, and
   c) document analysis where an interactive user could verify or reject the quality of captured images if either of the two previous components (AIQA or DLR) had identified an error

3. Recognition – to capture automatically the data from the questionnaires.

   This was achieved via:
   a) optical mark recognition (OMR) to capture the tick box data
   b) optical character recognition (OCR) to capture the characters from text boxes and numeric responses, and
   c) contextual analysis (CTX) to ensure the captured data was contextually logical, with the expected type of text entered in the appropriate sections of the questionnaires

4. Keying – to capture manually the fields that could not be recognised automatically with sufficiently high accuracy

5.7 Accuracy rates were used to report on the quality of the captured data, and were measured against a set of targets. To calculate the accuracy rates a sample of data was presented to a team of keyers. The values obtained were then compared with the original values, and agreement between the two values was considered to be an accurate result. In cases where the two values differed, the record was passed to another keyer. Table 5.1 shows the possible outcomes of the verification.

Table 5.1 Possible outcomes of verification

Original value	Keyer 1	Keyer 2	Outcome
Value 1	Value 1	-	Pass
Value 1	Value 2	Value 1	Pass
Value 1	Value 2	Value 2	Fail
Value 1	Value 2	Value 3	Inconclusive

5.8 The accuracy rates were calculated as the percentage of passes out of the total number of cases sampled. The sample sizes used depended on the number of people expected to provide responses for the field being sampled, the expected accuracy, and the acceptable bounds for error in the sample. Inconclusive outcomes were excluded from accuracy calculations, but were monitored to ensure that their volume remained within acceptable limits.

5.9 All of the targets set for data capture accuracy were exceeded. These are set out in Table 5.2 (with accuracy achieved in 2001 for comparison). For all of the field types, the accuracy achieved for the 2011 Census was higher than the targets set and was broadly in line with achieved accuracy rates for the 2001 Census.

Table 5.2 Accuracy results for paper questionnaire data capture, 2011 and 2001

		Achieved accuracy (%)	
Field type	**Target (%)**	**2011**	**2001**
Marks	99.30	99.85	99.84
Numeric	98.00	98.93	99.75
Alpha numeric	95.00	97.58	98.99
Year of birth	99.95	100.00	99.93
Sex*	99.50	99.96	-
Marital status*	99.50	99.92	-

*Accuracy rates for these questions was not separately reported for the 2001 Census

Coding

5.10 The data were then loaded into a database and validated to ensure that the values for each question were within the range specified in the relevant coding frame.

5.11 The coding process assigned numerical values to written text and ticked boxes. This involved applying coding rules and standardised national coding frames, such as SIC07 (Standard Industrial Classification 2007) and SOC2010 (Standard Occupational Classification 2010), which allow data from different sources to be easily compared. The data were loaded into a database and validated to ensure that the values for each question were within the range specified in the relevant coding frame. The text responses provided on both the paper and online questionnaires were converted into coded data using this coding process.

1. Automatic coding – the first step for all responses was to attempt to match them to the appropriate reference data and assign a code automatically

2. Frontline coding – responses that could not be automatically coded were assigned to a team of coders who attempted to code the response using defined business rules

3. Expert coding – responses that could not be coded at frontline coding were referred to another team of coders, who had additional reference materials available to code the response,and

4. Welsh expert coding – responses in Welsh were assigned to bilingual coders who used the same process as expert coders to code the response

5.12 Table 5.3 shows that the targets set for coding accuracy in the 2011 Census were exceeded and, again, are broadly similar to the accuracy achieved in the 2001 Census. The majority of records found to have been coded incorrectly were only minor inaccuracies, for example, a primary school teacher coded as a secondary school teacher.

Table 5.3 Accuracy results for coding, 2011 and 2001

		Achieved accuracy (%)	
Field type	**Target (%)**	**2011**	**2001**
Country of birth	96.00	99.87	99.80
Ethnic group	96.00	98.80	98.60
Religion	96.00	99.11	98.80
Citizenship (passport)	96.00	99.82	*
Language	96.00	99.58	*
National Identity	96.00	99.66	*
Occupation	88.00	94.14	91.10
Industry	88.00	93.11	89.10
Workplace address	85.00	93.28	94.10
Address one year ago	96.00	98.33	98.10
Visitor address	96.00	98.63	*
Second address	96.00	98.65	*

*Data not collected on these topics in 2001

Completion of upstream processing

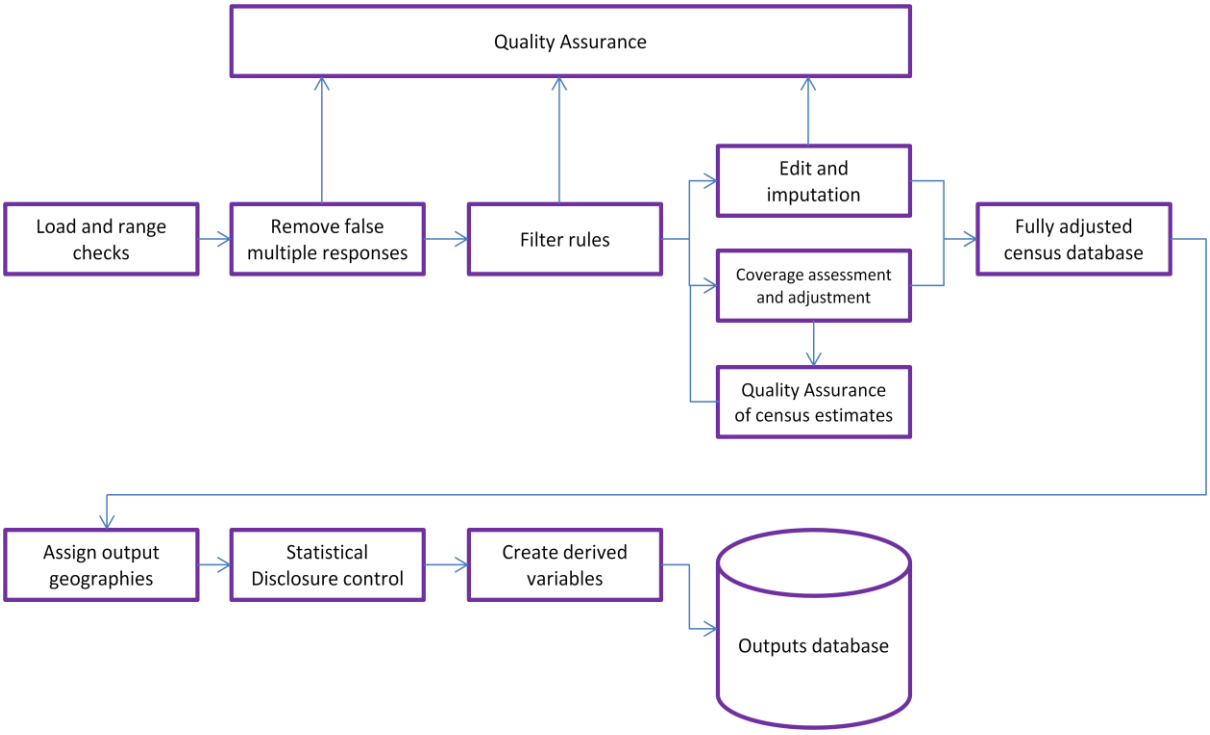
5.13 After completing these processes the captured and coded data was then securely transferred for loading on to ONS systems for further processing and validation (downstream processing). The data was sent in encrypted form for increased security and in batches (processing units) to facilitate processing. The physical archive data (recorded on microfilm) was transferred by secure transport to a secure ONS site.

Downstream processing

5.14 The downstream processing (DSP) project provided a set of IT systems capable of carrying out the subsequent processing of all 2011 Census and Census Coverage Survey data. The project was responsible for the live running of the data through the downstream process and providing operational support during live running.

5.15 The whole process started with the loading of the data and ended with a disclosure control process, before the production of outputs (see the main steps in figure 5.1). The process control centre for DSP monitored the movement of each processing unit (PU) through the system, with validation and checks at the completion of each stage. Each process could handle multiple areas at a given time. For example, in item imputation up to four PUs could be run simultaneously and this was later upgraded to eight for coverage imputation.

Figure 5.1 The main steps in downstream processing



Range checks

5.16 The range checks process checked that the value of each variable was within the valid range for that variable. For example, there were four valid values for the sex variable: male, female, missing or multi-tick. The range checks process verified that all values for the sex variable were one of these four valid values. If an invalid value was found it was set to 'missing' or 'not required', so that all values were valid for the statistical processes that would be applied to the data later. The missing or multi-tick values were then imputed as part of the edit and imputation process.

5.17 The range checks process also cleaned up all postcode fields by removing any invalid characters. At the data capture stage the strings of text in postcode fields were captured without any validation of the text being performed. Because statistical processes carried out on the data at a later stage required postcode fields to contain only valid values, any invalid characters were changed to blank during the range checks.

Removing false person records

5.18 As part of the data capture process, a person record was created during the recognition phase each time at least one mark was detected in any of the person questions. But such records could be created in error if, for example: there was dust on the scanners that was incorrectly interpreted as a mark; or where respondents crossed through whole pages of the questionnaire as not being relevant and this had been identified as a response; or where respondents may have accidentally skipped pages, completing their response over two different person records. A process was developed to identify genuine person records, after analysing data from the 2001 Census to establish which combinations of key variables were most often present on genuine responses.

5.19 For a person record to be counted as a genuine response and kept in the data the following information had to be present on the record:

- name (from individual questions or household members table) or date of birth, and
- at least one other item, different from the above filter, from: name (from individual questions), date of birth, sex, marital status, or name (from household members table)

If a person record did not meet these requirements then it was considered to be a false person and was flagged as an invalid person record.

5.20 The removal of false persons process removed a total of 982,400 person records (1.8 per cent), compared with the removal of 3,297,800 person records (6.3 per cent) in the 2001 Census. It should be noted, however, that a large proportion of the false person records identified in the 2001 Census had been created by processing errors rather than respondent errors: marks on forms that were the result of printing quality and handling, as well as dust settling on the scanners, had been captured as responses. Fewer records had to be removed in the 2011 Census because of improvements in the processing as a result of the lessons learned from 2001, and because a modification to the rule used to identify false persons minimised the number of genuine responses removed.

Resolving multiple responses

5.21 There was an increased likelihood of multiple responses from the same household occurring in the 2011 Census compared with previous censuses, because of the introduction of online completion and the post-back of paper questionnaires. Multiple responses at the same address could be created in a number of ways: for example, both a paper and an online response being returned for the same address effectively created a multiple household response; or a person being included on the same questionnaire more than once could create a multiple individual response. A new process was therefore developed to resolve both household and individual multiple responses at the same address.

5.22 Multiple household responses were identified by looking for more than one response for an address ID, and matching the people on the different responses to determine if they related to the same or different households. All individuals on one questionnaire were matched to all individuals on all other household questionnaires returned for the same address. Name, date of birth, and sex were the variables used for matching.

5.23 Initially the following criteria were used to determine whether individuals were a match:

- first name and surname matched exactly
- date of birth matched on day and month, or month and year, and
- sex matched, or was missing or multi-ticked on one or more of the records

5.24 If a match was not found using the above criteria, additional matching was carried out for individuals aged 30 or over using the following criteria to determine a match:

- ‘soundex’ of both first and last names matched, or name was missing on one or more of the records
- date of birth matched exactly, and

- sex matched, or was missing or multi-ticked on one or more of the records

('Soundex' is an algorithm for indexing names by sound, which allows for names that are spelt differently to be matched. The algorithm converts names into a four digit code by retaining the first letter of the name and assigning a code to the consonants in the rest of the name. Similar sounding consonants are assigned the same code, therefore similar sounding names will match on 'soundex'.)

5.25 The second set of matching criteria was not applied to individuals aged under 30, to minimise the risk of identifying twins as matching individuals.

5.26 If any matching individuals were found the multiple responses were considered to relate to the same household and were resolved into one response. If no matching individuals were found the multiple responses were considered to relate to different households and were left in the data, unless one of the following applied:

- all of the usual residents on one of the responses were aged under 16
- one of the responses was on a Welsh language questionnaire, or
- one of the responses was on an online questionnaire

These responses are likely to be a continuation of another response, and therefore even if there were no matching individuals in these cases, multiple responses were considered to relate to the same household and were resolved into one response.

5.27 When multiple responses relating to the same household or individual were identified, the records were merged to leave just one record for the household or individual. The most complete response was kept, with any missing variables being filled in from the other response(s) if possible. In the case of multiple individual responses, a response on an individual questionnaire was given priority over a response on a household questionnaire.

5.28 Any multiple communal establishment responses found for the same address were assumed to relate to just one communal establishment and were resolved into one response. Again, the most complete response was kept, with any missing variables being filled in from the other response(s) if possible.

5.29 Addresses where both a household and communal establishment response had been returned were assumed to relate to a communal establishment, and the household response was deleted after any individuals on the household response had been moved to the communal establishment response.

5.30 The process also dealt with multiple responses involving dummy records. Dummy questionnaires were completed by field staff for addresses where no census questionnaire had been returned. The dummy questionnaire collected basic information about the property. If there was more than one dummy record for an address the records were resolved into one by starting with the most complete record and filling in any missing variables from the other record(s) if possible.

5.31 For some addresses both a dummy record and household or communal establishment record existed. In these cases the dummy record was deleted, but information that was missing on the household record but present on the dummy record was first copied on to the household record.

5.32 Although the main purpose of the resolving multiple responses (RMR) process was to identify and deal with any duplicate responses, the process also had a secondary function of moving records to ensure that all individuals from individual or continuation questionnaires were included on the household or communal establishment record to which they belong.

5.33 Individual questionnaires could be requested by anyone in a household who did not want to answer their individual questions on the main household questionnaire. They were also issued to all usual residents of communal establishments, because the main communal establishment questionnaire collected only information about the establishment and not personal information about the residents. Continuation questionnaires were used for households with more than six usual residents, where there was not enough space on the main household questionnaire for all residents to answer the individual questions.

5.34 Household or communal establishment records were also created for addresses where only a dummy record existed, or 'orphan addresses' where only individual or continuation responses existed without the main household or communal establishment response.

5.35 Table 5.4 shows the number of records that were removed as part of the RMR process, while table 5.5 shows the number of records that were created as part of this process. Individual records were only deleted during the RMR process; none were created.

5.36 Table 5.6 shows the overall change in the number of records as a result of the RMR process. Note that records removed and created may not sum to the net change because of rounding. However, the work to assess overcount (see paragraph 5.60(c)) identified that in future the RMR process should also consider resolving duplicates or multiple responses in the same postcode as well as at the same address.

Table 5.4 Records removed by the resolve multiple responses process

	Records removed	
Record type	Number	Per cent
Individual	237,200	0.44
Household	181,300	0.78
Communal establishment	300	0.71

Table 5.5 Records created by the resolve multiple responses process

	Number of records created	
Record type	From dummy responses	From orphan addresses
Individual	1,466,500	5,500
Communal establishment	6,900	5,700

Table 5.6 Overall change in the number of records during the resolve multiple responses process

Record type	Number of records	
	Net change	Percentage Change
Individual	-237,200	-0.44
Household	+1,290,600	+5.32
Communal establishment	+12,300	+26.45

Filter rules

5.37 A further process provided a consistency check that reconciled contradictory responses arising from instances where a questionnaire filter had been ignored; for example:

- when a respondent had misunderstood the second address question and re-entered their enumeration address instead, or
- when a child aged 14 had been recorded as being in full-time employment

Edit and imputation

5.38 As with all social surveys, the 2011 Census data contained item non-response and inconsistent responses to the census questionnaire. Typically, item non-response refers to an event where a respondent does not know or refuses to answer a particular question in an otherwise completed questionnaire. Inconsistent responses are relationships between recorded values for two or more variables that are clearly invalid, such as a parent being younger than their child. Item non-response and inconsistent responses can have a detrimental impact on the utility of the census data in three basic ways.

- Missing and/or inconsistent data can lead to a reduction in the precision of population estimates
- If the characteristics of the non-respondents differ from the respondents, population estimates may also be biased. This is referred to as a non-response bias, and
- Users of census data may try to account for item non-response and inconsistencies in the data in different ways, leading to disparity in population estimates derived by different analysts

5.39 Imputation is a widely recognised statistical framework that serves to minimise these risks. The census imputation strategy had one overarching objective to replace all missing and inconsistent data with imputed values. This is done by using a robust statistical method that estimates the distributional properties of the missing/inconsistent data as accurately as possible.

5.40 To meet this aim, several objectives served to underpin two key aspects of the imputation system.

The baseline statistical methodology used to impute the census data should:

- resolve inconsistencies with minimal change to the observed data
- implement a consistent approach to the imputation of all census variables, and
- focus on estimating accurately the multivariate joint distributions in the data. This means imputing accurately the relationships between variables such as age by gender by marital status where one or more of these variables are missing, rather than imputing the variables independently from each other

5.41 To ensure that the imputed data had a beneficial impact on the utility of the census data, the statistical performance of the system during live processing should also:

- avoid introducing bias or inconsistency into the census data through the imputation process
- adjust for non-response bias where appropriate

5.42 Development of the 2011 Census imputation strategy began in 2005 with a review of the 2001 Census methodology and an evaluation of alternative processing platforms. In 2001 the UK Census Office developed the edit and imputation system (EDIS) for resolving inconsistencies and imputing for item non-response. From the review, the Canadian Census Edit and Imputation System (CANCEIS) (Bankier, Lachance, Poirier 1999; Canceis, 2009[72]) was identified as a potential alternative.

5.43 Both EDIS and CANCEIS implement a donor-based/minimum-change imputation strategy (Fellegi & Holt 1976[73]), widely recognised as a methodological standard for imputing census and social survey data. In this approach inconsistencies are identified by a set of pre-defined edit rules specifying invalid relationships between variables and identifying how they could be resolved causing the minimum amount of change to observed data. Missing values are replaced by drawing an observed value from another record in the data, referred to as a donor. A donor is selected from a small pool of potential donors with characteristics similar to the record currently being imputed. Similarity is measured by comparing the differences between the record needing imputation and each potential donor across a set of key demographic and other predictive matching variables.

5.44 CANCEIS was better designed to optimise the statistical advantages of a donor-based approach (Rogers & Wagstaff, 2006[74]). Amongst others, significant optimisation strategies included:

- simultaneous multivariate processing of inconsistent and missing data under edit constraints. For resolving inconsistencies, this allowed all plausible solutions from every potential donor to be evaluated and only those leading to minimum change in the record needing imputation to be included in the potential donor pool. For imputing missing data, it also served to ensure a more accurate imputation of the relationships between variables with missing data. Imputing under edit constraints meant that invalid relationships between variables belonging to an individual and between people in a household did not arise through the imputation process

- staged near donor search strategies. This contributed to the accuracy of the imputation by ensuring that imputed values were drawn from donors living in close geographic proximity to the record being imputed
- stratification by household size. This ensured that donor selection was not only based on the observable characteristics of the person having data imputed, but also on the composition and structure of other people living at the same address, and
- a soft editing strategy. Soft edits were employed to identify records in the data with valid but unique or unusual characteristics. The soft edit strategy allowed such records to remain in the data but did not allow the characteristics associated with them to be propagated. This served to preserve the quality of the observed data and help minimise the risk of introducing bias into the data through the imputation process

5.45 Early design and development of the end-to-end imputation processing strategy and parameterisation of CANCEIS was conducted through a systematic empirical research programme (Rogers & Wagstaff, 2006[74]). A synthetic census data set consisting of fully observed records from the 2001 Census was created and perturbed in a way consistent with the item non-response patterns also observed in 2001. Optimal tuning was based on analyses focusing on how well the system recovered the observable statistical properties of the perturbed data. Based on this research, the recommendation that CANCEIS was the most appropriate platform for the 2011 Census imputation strategy was approved through an independent quality assurance process by leading academics at the University of Southampton.

5.46 Research and development directed at optimising the performance of the 2011 Census imputation system continued up to and throughout live processing. This ensured that the structure and characteristics of the 2011 Census data that may have differed from these in 2001 were included in the fine tuning of the CANCEIS system parameters.

5.47 A detailed report of the development and final design of the 2011 imputation strategy can be found online[38].

5.48 Table 5.7 provides some key post-census processing measures comparing how well the 2001 and 2011 imputation systems met the statistical objectives of the baseline methodology.

5.49 In general, the investment in the design and development of the 2011 Census imputation baseline methodology led to some significant improvements over that applied in 2001. The most notable improvements are clearly linked to the statistical objectives for this aspect of the imputation system. The baseline methodology ensured that:

- inconsistencies were always resolved with minimal change to the observed data
- almost all of the 18.6 million people and 2.8 million households needing at least one value imputed were treated consistently using the same processing method, and
- the imputed data for all household records and a high proportion of person records (82 per cent) were drawn from an implicit multivariate model of all plausible values specific to each particular record that needed imputing while taking into account within and between person edit constraints

5.50 Typically, records that were not imputed using the standard baseline methodology had unusual characteristics such as extremely young parents or extremely young people reporting a duty of care to someone else in the household. In most cases, these records were imputed by passing them through the same system but with slight adjustments to some of the parameters in CANCEIS. For a very small number of records where this did not provide a solution, inconsistent and missing data was edited based on a record by record domain expert review.

5.51 Overall, the methodology implemented in the imputation system was successful in meeting the main aims and objectives of the strategy. A complete and consistent database was achieved within the timescales available in the downstream processing timetable.

Table 5.7 Operational comparisons of CANCEIS and EDIS

		EDIS (2001)[a]	CANCEIS (2011)[b]
Persons			
Records processed		49.4 million	53.5 million
Average number of records in processing unit		500,000	530,000
Average time to take to impute a processing unit		48 hours	12 hours
Persons needing at least one question imputed		13.8 million[c]	18.6 million
Percentage		28%[c]	35%
-	Percentage imputed as household taking into account multivariate joint distributions between persons and between questions	34%	82%
-	Percentage imputed as individuals	72%	18%
-	Percentage imputed using alternative methods to that implemented in the primary imputation system	3%	0.10%
-	Persons imputed by more than one method	Over 1 million	Under 300
Households			
Records processed		22.3 million	24.3 million
Households requiring at least one item imputed		2.5 million	2.8 million
Percentage		11%	9.5%
-	Percentage imputed taking into account multivariate joint distributions between questions	97%	100%

a Census 2001 Review and Evaluation Report[40]
b Data derived through the 2011 CANCEIS system diagnostics
c Excludes overlap with deterministic applied to 11.8 million persons

Coverage assessment and adjustment

Introduction

5.52 Most census-taking countries carry out some form of coverage assessment and adjustment, often using a post-enumeration survey (PES). Measured undercount levels have, on the whole, been increasing over the past few decades. More importantly, the differential nature of the undercount has worsened with, for example, young males in inner city areas becoming increasingly difficult to enumerate. This has led to increasing priority and focus on the methods for measuring this differential undercount.

5.53 The coverage assessment and adjustment (CAA) process was designed to identify and adjust for the number of people and households not counted in the 2011 Census. The extent of this under-enumeration was identified using a large survey covering approximately 340,000 households, the Census Coverage Survey (CCS) (see chapter 4). Standard statistical estimation techniques were then used to produce an adjusted database from which the final census results were produced. These results also formed the new 2011 base for the mid-year population estimates produced by the ONS. The overriding strategy was to build on the 2001 One Number Census (ONC) framework, using it as a platform to develop an improved methodology.

The 2001 One Number Census

5.54 For the 2001 Census the ONC project had the goal of providing a methodology and processes to identify and adjust for the number of people and households not counted (see Brown *et al* 1991, Holt *et al* 2001). The ONC estimated the undercount in the 2001 Census to be 6.1 per cent of the total population in England and Wales.

5.55 The ONC was a big step forward. Both the Statistics Commission and the Local Government Association published reviews that concluded that the methodology used in 2001 was the best available and no alternative approach would have produced more reliable results overall. However, there were some issues with the results which led to further studies and adjustments. The lessons taken from these were that:

- the ONC had not been able to make robust adjustments in all situations, particularly when there were pockets of poor census response
- engagement with stakeholders was critical to facilitate user acceptance of the methodology
- the methodology needed to be robust to failures in underlying assumptions and in particular to have inbuilt adjustments for such failures – for example, any lack of independence between the census and CCS
- two of the weaknesses of the were not having additional sources of data to complement the CCS, and the perception that it would solve all ‘missing data’ problems
- the measurement of over-count required greater attention, and
- the balance of 'measurement' resource between easier-to-count and harder-to-count areas needed careful consideration

2011 methodology

5.56 Accordingly the strategy for the programme of coverage assessment and adjustment in the 2011 Census aimed to develop an improved methodology, by not only addressing the lessons from 2001 but taking into account changes to the 2011 Census design. The programme had a number of specific objectives.

- Gain acceptance of the methodology from users. This was important because users, particularly local authorities, would not trust their census population estimates if they were not confident about the methodology used to derive them
- Develop simple methods where possible, to aid communication of the methodology
- Measure the extent of each of these, permitting more transparent adjustments. (there are a number of ways in which undercount can occur (such as missing a whole household or missing a person from a counted household).
- Provide local authority and age-sex level population estimates with minimal variation of precision, therefore ideally being the same relative precision across all
- Target precision rates (for sampling errors only) of 95 per cent confidence intervals of 0.2 per cent around the national population estimate (ie plus or minus 120,000 persons) and 2 per cent for a population of half a million (ie plus or minus 10,000 persons), and
- There should be no local authorities with a precision worse than the worst that was achieved in 2001, and to improve the worst 5 per cent of areas (ie there should be no relative confidence interval for a local authority total population that is wider than 6.1 per cent, and a 5 per cent confidence interval is the desirable upper bound)

5.57 The methodological improvements necessary to meet the objectives were developed in the years leading up to 2011 when the methods were finalised. The methodology had wide scrutiny and peer review during development, by:

- Census Design and Methodology Advisory Committee
- GSS Methodology Advisory Committee
- ONS Statistical Policy Committee, and
- International and other academic peer review (such as the RSS)

5.58 In addition, the CAA and QA process (see paragraphs 5.65 to 5.78) were subject to an independent review of the methods. This review, led by Professor Ian Plewis at the University of Manchester, reported initially in February 2011, and subsequently in June 2011. The review made a number of recommendations, all of which ONS accepted and addressed, and the review team concluded that:

'We would like to put on record our belief that many lessons have been learned from the Census in 2001 (which was itself a considerable improvement over the 1991 Census). We have been impressed by the scope and depth of the methodological investigations initiated by ONS, by their willingness to discuss with a wide range of interest groups concerns about coverage and Quality Assurance (QA), and by the procedures that are in place to use field staff flexibly. We are reasonably optimistic that, having taken account of our recommendations to develop, document and consult on specific aspects of methodology, the 2011 Census in England and Wales will provide population estimates that can guide resource allocation and social policy

in the right direction for the next ten years. It must, however, be recognised that the target 95 per cent confidence intervals set by ONS for the population counts – a maximum interval of ± 3 per cent for all LAs – are entirely contingent on achieving local as well as national targets for non-response.' [45]

'We are delighted to learn from ONS that early indicators of response to the Census suggest that the targets will be met. If confirmed, this will be a considerable achievement at a time of falling response rates to official enquiries.'

5.59 The full review and the ONS response to the recommendations can be found on the ONS website[44].

5.60 The methodology implemented is summarised below and the corresponding stages are shown graphically in figure 5.2:

(a) As noted in chapter 4, a Census Coverage Survey (CCS) was conducted independently of the 2011 Census. The survey was designed to estimate the under-enumeration (undercount) in the census. A sample of output areas (OAs) was drawn from each local authority in England and Wales, stratified by a hard-to-count (HtC) index. The HtC index was a proxy for non-response in the census. The sample included approximately 17,400 postcodes (around 340,000 households)

(b) The CCS records were matched with those from the census using a combination of automated and clerical matching

(c) A large sample (around 5 per cent) of census individuals were checked to see if they were duplicated within the region and within Wales, and the CCS data were used to help estimate the levels of over-count in the census by broad age-sex groups and region

(d) The undercount was estimated within groups of geographically contiguous (neighbouring) local authorities called estimation areas (EAs) to ensure that CCS sample sizes were of a sufficient size to produce estimates that met the target precision rates above. The matched census and CCS data were used within a dual system estimator (DSE) to estimate the population in the areas sampled in the CCS. The DSEs were then used within a simple ratio estimator to derive population estimates for the whole of the estimation area. As the data were processed, various modifications were made to the DSE and ratio estimation process to ensure that the estimates were robust and to reduce variability where appropriate. This included in some cases collapsing HtC groups, collapsing age-sex groups and removing CCS sample postcodes with no data

(e) The DSEs were assessed for any bias at household level using an alternative household estimate (AHE) from the census field process. The assumption of independence for individuals within households was explored using social survey data

(f) The sample was assessed for balance, which would affect the ratio estimator, using the dummy questionnaire data from the census field process

(g) The population within communal establishments (CEs), which were defined as managed accommodation, was assessed for under-enumeration using both the CCS (for CEs with less than 100 bed spaces) and administrative data and local information (for CEs with more than 100 bed spaces). Adjustments were made to the CE population where these checks highlighted significant undercount

(h) The national population estimates were assessed for quality and plausibility by comparisons with sex ratios from alternative sources

(i) A synthetic estimator (a robust statistical methodology for estimating small areas) was used to estimate the local authority population, using the patterns observed at EA level

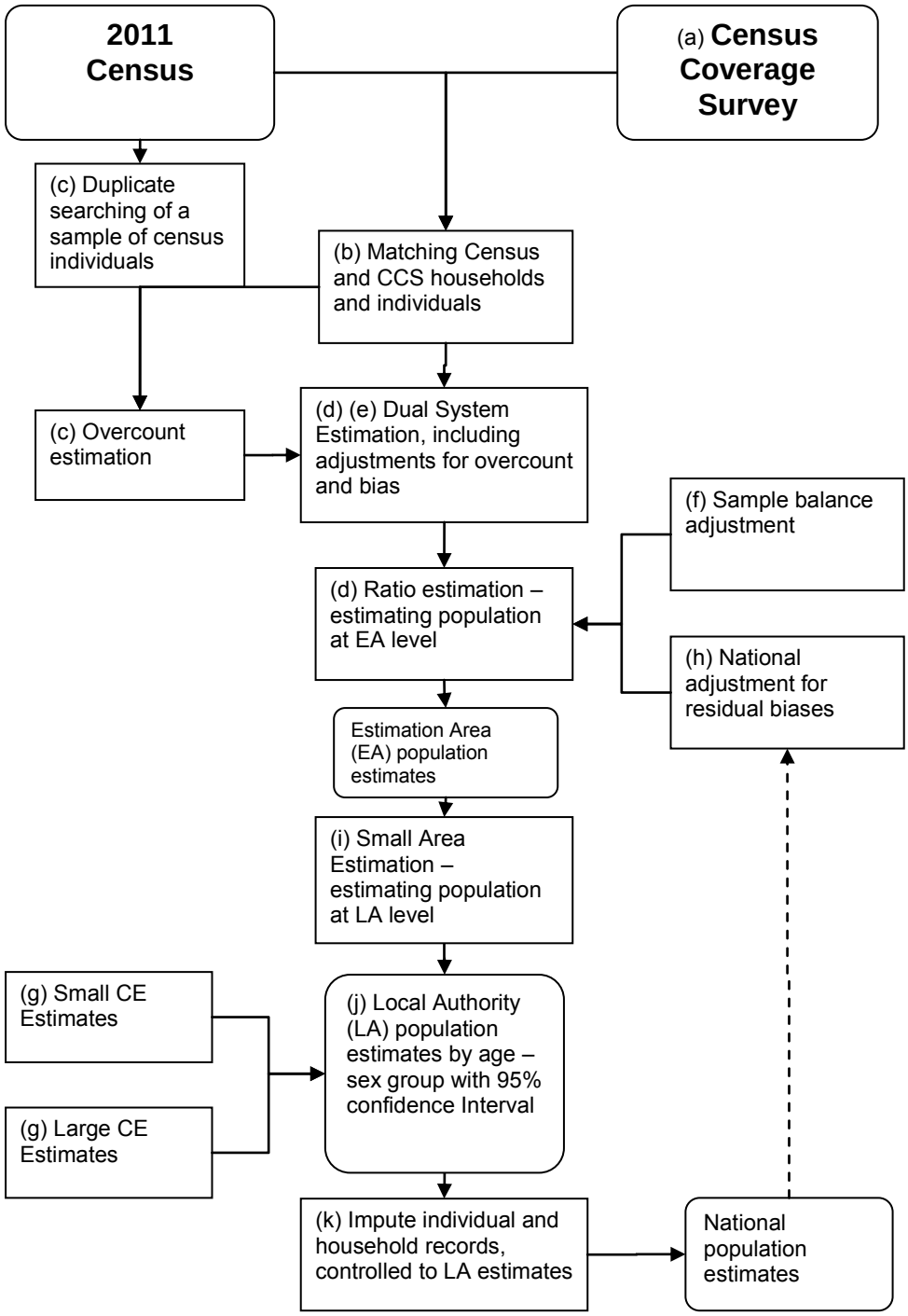
(j) To provide a measure of the variability in the estimates, 95 per cent confidence intervals were calculated for the EA and LA estimates by age-sex group using a 'bootstrapping' statistical technique, a re-sampling method for calculating the variance of a complex estimator

(k) Households and individuals estimated to have been missed from the census were imputed onto the census database, after reducing the measured under count by the estimated level of over count. This process copied a subset of characteristics from real households and individuals to create the imputed households, and imputed individuals estimated to have been missed. Information recorded on dummy forms was used to impute households and persons into geographical locations across the whole EA and LA

5.61 The above process from step (c) onwards was iterative. Some of the processes could not be carried out until all data had been processed at least once through the basic estimation process at step (d). For example, the national population estimates could not be assessed until all estimation areas had completed the estimation process. Once the national adjustment had been defined, then all areas were rolled back to the appropriate stage and re-estimated using new parameters.

5.62 Following each iteration of the coverage assessment process, all the population estimates were quality assured using demographic analysis, survey data, qualitative information, administrative data and local information to ensure the estimates were plausible (see paragraphs 5.65 to 5.78) The quality assurance results were examined by a quality assurance panel, which recommended acceptance of the estimate or asked for further work to explore the estimates or the comparator data.

Figure 5.2 Overview of the 2011 Census coverage assessment and adjustment process



5.63 An assessment of the various stages of the 2011 design, together with some conclusions and lessons learned, is given in chapter 10. More information on the different components of the CAA process as shown in figure 5.2 (such as matching rates, CE adjustments, overcount) are available on the ONS website[32].

5.64 The coverage assessment process estimated some 3.79 million people and 2.26 million households were missed in the 2011 Census, and subsequently included in the census outputs database through the adjustment process. This adjustment for usual residents is broken down into its several components (rounded to the nearest thousand in table 5.8 for both the 2011 and 2001 Censuses.

Table 5.8 Components of the census estimates of usual residents, 2011 and 2001, England and Wales

	2011		2001	
Component	**Number**	**%**	**Number**	**%**
Census (enumerated) count	52,639,000	93.9	48,843,000	93.4
Change due to				
Estimation and sample bias	+2,805,000	+5.0	+2,919,000	+5.6
Bias adjustment	+583,000	+1.0	+253,000	+0.5
Over-count adjustment	-352,000	-0.6	0	0
National adjustment	+303,000	+0.2	+27,000	+0.1
Communal establishment adjustment	+98,000	+0.5	0	0
Total changes	**+3,436,000**	**+6.1**	**+3,199,000**	**+6.2**
Total published census estimate	**56,075,900**	**100.0**	**52,042,000**	**n/a**
Adjustment made to mid-year estimate after the census as a result of estimation inaccuracies	n/a	-	+275,000	+0.5
Total census estimate after post-census adjustment	**n/a**	**-**	**52,317,000**	**100.0**

Quality assurance

5.65 Quality assurance procedures were built into all stages of data processing, and the 2011 Census estimates were subject to a rigorous QA process prior to their release. The overall aim was to provide confidence in the estimates by using comparator data sets and by conducting a series of vital checks.

5.66 The QA process was the subject of wide consultation with a variety of stakeholders, including academics, statisticians, demographers and expert census users. The process was designed to:

- ensure 2011 Census estimates were fit for purpose
- use comparator sources to identify discrepancies with census estimates
- use contingencies, where required, to improve census estimates
- ensure census population characteristics were accurate, and
- build user confidence through transparency in the methods

5.67 Key steps in the process were:

- a range of quality assurance panels reviewed estimates at varying levels of detail, including different geographic levels
- a range of evidence was considered, including comparison with administrative data sources

- the quality assurance process checked persons and their key characteristics (for example, students, armed forces, ethnicity)
- estimates of households occupied by usual residents were also quality assured
- identifying issues which were adjusted for in the data processing, and
- further analysis to explain inconsistencies with the comparator data against which census estimates were evaluated

5.68 After the coverage assessment and adjustment step, census population estimates for all 348 local authorities were compared with upper and lower tolerance bounds derived from administrative and survey data sources. These gave a range of plausible values within which census estimates were expected to fall. The tolerance bounds were designed to reflect known differences between alternative sources and census estimates in terms of definitions, accuracy and timing. The main comparator data sets were:

- birth registrations (ONS)
- school census (Department for Education, Welsh Government)
- social security information (Department for Work and Pensions)
- mid-year population estimates (ONS)
- GP NHS patient register (National Health Service)
- census address register (ONS)
- household projections (Department for Communities and Local Government)
- council tax data (Department for Communities and Local Government, Valuation Office Agency)
- local authority supplied council tax data
- integrated household survey (ONS)
- population estimates by ethnic group (ONS)
- migrant worker scan (HM Revenue and Customs)
- short-term migration estimates (ONS)
- students in higher education (Higher Education Statistics Agency)
- further education data (Department for Business, Innovation and Skills, Welsh Government),and
- armed forces data (Defence Analysis Service Agency, United States Air Force)

5.69 While these administrative data sources were used extensively to quality assure the 2011 Census estimates, direct comparisons between these datasets and the census should be treated with caution. This is because there are differences in definitions, recording practices and data quality; and because these datasets were set up for specific administrative purposes they are unlikely to measure the same population. A paper summarising the strengths and limitations of each source in relation to these topics is available on the ONS website[46].

5.70 The following indicators from the census estimates were routinely compared against the comparator data sources:

- age and sex
- household numbers
- household size
- ethnicity
- international migration

- identifying issues which were adjusted for in the data processing, and
- further analysis to explain inconsistencies with the comparator data against which census estimates were evaluated

5.71 After the coverage assessment and adjustment step, census population estimates for all 348 local authorities were compared with upper and lower tolerance bounds derived from administrative and survey data sources. These gave a range of plausible values within which census estimates were expected to fall. The tolerance bounds were designed to reflect known differences between alternative sources and census estimates in terms of definitions, accuracy and timing. The main comparator data sets were:

- short-term UK residents
- students, and
- armed forces

In addition, demographic analyses such as fertility and mortality rates (using census estimates as the denominator), and the ratios of males to females were examined to see if they were in line with historical time series.

5.72 Checks were also developed to validate census estimates by topic against 2001 Census and/or ONS survey data. The broad topic areas covered included:

- demography
- ethnicity, identity, language and religion
- health
- education
- labour market
- travel/transport, and
- households/housing

ONS and other topic experts were periodically invited to review the checks for their specialist subject areas and identify instances where census estimates deviated from expectations. Anomalies were investigated and the process refined as appropriate.

5.73 Other information taken into account during the quality assurance process included:

- operational intelligence compiled from the main census and Census Coverage Survey (CCS) field operations, such as return rates, new addresses identified and addresses deactivated
- local authority intelligence (where provided) such as locally held council tax data, identification of new builds or demolitions in particular small areas, areas or populations which were particularly difficult to enumerate, and
- the profile of the local authority, which included such information as its hard-to-count and multiple deprivation index, and any enumeration challenges identified during the field operation.

5.74 All checks were routinely undertaken at the local authority level. In addition, population and occupied household estimates by LSOA were compared with patient register counts. Data that was significantly out of line with other information (outliers) were explored in detail to ensure discrepancies could be explained and people/households had not been missed. Where comparisons highlighted discrepancies between the census and alternative data sources, more detailed investigations were carried out. This frequently involved drawing on locally provided

intelligence, analysis below local authority level, cross referencing with additional data sources, and an assessment of the accuracy of comparators, in particular mid-year population estimates. Where necessary and where data were available at record level, anomalies were resolved by data matching.

5.75 Quality assurance panels were central to the process. Four panels reviewed the evidence provided for all 348 local authorities and made recommendations about whether local authority estimates should be accepted. These were:

- an internal QA steering group which reviewed coverage-adjusted estimates by sex and five-year age group and sex ratios against comparators and tolerance bounds at local authority level
- main QA panels - which included representatives from a range of disciplines within ONS and the Welsh Government. It reviewed estimates for all the checks against comparators and bounds at local authority level, and within each local authority (there were a number of panel groups to cover the high number of estimation and LA areas)
- a high level QA panel which included census/demographic experts and individuals independent of the census process. It also included academic expert membership, an expert former user and representatives from the Welsh Government and devolved administrations (National Records of Scotland, and Northern Ireland Statistics and Research Agency). This panel was responsible for reviewing census estimates for the whole of England and Wales, and separately for the English regions and Wales. It also considered estimates for specific issues and groups raised by the main QA panel on topics such as babies, students, armed forces and international migrants. In addition it reviewed the proposed methods and evidence for making adjustments to census estimates, providing input into and agreement for any methodological changes needed, and
- an executive QA panel was responsible for final agreement to publish the census estimates. This panel included the National Statistician, ONS Director General, ONS executive management and executive management representation from the Welsh Government. This panel considered the England and Wales census population estimates and local authority estimates where inconsistencies with comparator data were greatest. It also reviewed the quality assurance evidence at England and Wales level. This panel was accountable for the final sign-off of the national and local census population estimates ahead of publication

5.76 As expected, there were instances where estimates fell outside the bounds set. For the majority of cases further investigation and analysis was able to explain differences between census and comparator sources. For a small number of cases issues were identified which resulted in adjustments to the data prior to publication. This included the correction of a small number of communal establishments that had been misclassified as households. Some communal establishments had been enumerated correctly but needed to be moved to the correct geographical area in the census data. Single year of age ‘spikes’ (which occurred when a particular donor was used several times during the imputation process), were also identified and resolved.

5.77 This was the final process in agreeing the census population estimates that were published on 16 July 2012. Information from both the CAA and the quality assurance process was published alongside the census population estimates to help users understand the quality of the estimates (such as how much adjustment was applied

by area or response rates) and place the estimates in the context of other administrative data sources. This package of supporting information included:

- response rates by local authority and by age and sex
- 95 per cent confidence intervals by local authority
- the size of the household bias adjustment, overcount and CE adjustments
- census estimates against other sources for each local authority, such as patient register, school census and child benefit, but also showing the tolerance bounds for each area, and
- how the estimates were built from their count, quantifying the effects of the various processing steps.

5.78 Overall, the process to quality assure the results has been highly successful and met its key objectives. Most importantly, the methods and data sources used were transparent and gave users confidence in the process and hence the census population estimates. This was a significant improvement on 2001, when the estimates for 15 LAs were adjusted after the census results had been published.

Remaining processing steps

5.79 After quality assurance, the data then went through a number of further processing steps to prepare the data for outputs. These include:

- assigning output geographies, where each person and household record has a number of geographies assigned to it based on the address information collected in the census (such as usual residence, workplace address, second address). These can then be used to allocate the records to any particular output geography, such as output area or workplace zones
- applying statistical disclosure control routines to protect the confidentiality of the standard outputs
- creating derived variables. Some outputs use variables derived from more than one census question; for example, age is derived from date of birth, and distance travelled to work is estimated from the location of the addresses of the place of usual residence and the place of work

5.80 The whole process from data capture to completion of an outputs database took about 18 months – an improvement on the 2001 timetable. The length of time reflects the vast quantity of information to process (24 million household questionnaires with 56 million people) involving some very complex computing such as the CAA and edit and imputation processes. Although lessons have been identified for individual processing steps and methods, the main challenge for a future census (see chapter 11) is not only to maintain similar levels of quality but to complete processing more quickly. Certainly, higher volumes of online completions will help because this significantly reduces some of the lengthy early steps involved in data capture from paper questionnaires; and good design of the online questionnaire will help minimise the level of missing variables and improve the quality of the data recorded.

Chapter 6

Confidentiality, security and privacy

6 Confidentiality, security and privacy

Confidentiality principles

6.1 The White Paper on the 2011 Census in England and Wales (*Helping to shape tomorrow*)[1] noted that achieving maximum coverage in the census required public participation to be mandatory. This in turn obliged the Government to ensure that the information given in confidence by the public is treated with the strictest confidentiality. The statutory requirement to provide personal census information was prescribed by the Census Act 1920 and in the Order and Regulations made under the Act. The Act – now strengthened by the confidentiality provisions of the Statistics and Registration Service Act 2007 (SRSA) – also imposed strict requirements on the UK Statistics Authority (Statistics Board), and consequently on ONS, to protect the confidentiality of such information.

6.2 ONS recognises that the public need to be confident that their personal census records are held securely. As in previous censuses, assurances were given to the public that all the information provided would be treated in strictest confidence and that ONS would uphold its long-established reputation for maintaining census confidentiality.

6.3 The information collected in the 2011 Census is used solely for the production of statistics and statistical research. Usage complies fully with the Census Act, the Statistics and Registration Service Act and the requirements of data protection, freedom of information, and human rights legislation (see paragraphs 6.6 to 6.17). There are legal penalties for the unlawful disclosure of personal information collected in the census.

6.4 ONS ensures that government-wide standards relating to information risk management and data security are met. The following principles governed the treatment of the information given in the census returns.

1. Only persons under the management and/or control of the UK Statistics Authority including those agents acting, or providing services, on its behalf for the purpose of the census**,** and researchers approved under the provisions of the Statistics and Registration Service Act 2007 (SRSA), had access to personal census information

2. In most cases one questionnaire covered all members of the household and information was returned by post; people could choose to give personal information on a separate questionnaire or via the secure census online, in a way that would not reveal it to others in their household or establishment, or to the collector

3. All members of the census organisation and outside agents providing services to the UK Statistics Authority were given strict instructions, and were required to sign undertakings in the form of declarations, to ensure their awareness of their statutory confidentiality obligations. They were (and continue to be) liable to prosecution for any breaches of the law

4. The physical security of personal census information held in the census office, by field staff or by authorised agents, is strictly enforced. All sites where the processing of census data was carried out had continuous security

arrangements in place including access control, CCTV, security guards, intruder alarms, ONS staff to monitor suppliers, and independent checks by an accredited UK security organisation of physical and electronic security

5. All relevant UK government security requirements applicable to a RESTRICTED rated project/system were (and are) adhered to in all areas to ensure the overall security of IT systems, processes and procedures. Such measures conform to the mandatory requirements in the procedures for the handling of personal data within government

6. The computer systems handling census data have strict safeguards to prevent unauthorised access

7. There were (and are) systemic modifications of the data in the preparation of the results of the census in order to preserve statistical confidentiality (see paragraphs 6.36 to 6.44).

6.5 The security and confidentiality arrangements covering the collection and processing of census questionnaires were subject to an independent review (see paragraphs 6.50 to 6.56).

Legislation

6.6 The confidentiality of personal census information is protected by several pieces of legislation: the Statistics and Registration Service Act 2007 (SRSA), the Census Regulations, Data Protection Act, the Freedom of Information Act, the European Convention on Human Rights, and EC regulations on European statistics.

Statistics and Registration Service Act

6.7 The Statistics and Registration Service Act 2007 (SRSA) makes it a criminal offence for a member or employee of the United Kingdom Statistics Authority (referred to in the Act as the Statistics Board, of which ONS is the executive arm) to disclose personal information held by the Authority in relation to any of its functions. This covers personal census information. The maximum penalty is 24 months' imprisonment or a fine or both. Section 39 deals with the duties of the UK Statistics Authority concerning the confidentiality of all personal information held by it. This states that it is illegal to disclose personal information, except in a number of specific circumstances, where disclosure is decriminalised rather than empowered. This means that any person disclosing data under these circumstances would not face criminal proceedings, but does not mean that any such disclosures must take place. The ONS policy is to refuse all requests for release of personal data.

6.8 This policy was tested in a judicial review in 2012 when a claimant asked for a declaration from the Birmingham Administrative Court stating that Section 39 4(f) of the Statistics and Registration Service Act 2007 (SRSA) was incompatible with Article 8 of the European Convention on Human Rights (ECHR) and that the policy did not properly comply with the Data Protection Act 1998 (DPA). The High Court judge in the case assessed the UK Statistics Authority's current policy on disclosure and ruled that the policy complied fully with the ECHR. The judge also dismissed the arguments that the UK Statistics Authority does not follow the DPA correctly and that therefore the current policy and practice is unlawful, in regard to:

- not providing sufficient information to people whose data are collected and held by the UK Statistics Authority about how these data are used, and
- not informing people whose data are requested to be disclosed prior to any disclosure

6.9 The ruling went on to state that there was no need for the UK Statistics Authority to inform a data subject that a request has been made for disclosure of their personal information, but that the UK Statistics Authority should tell people about how their data are used. The judge was of the view that the information that ONS puts on its website is more than enough for data subjects to read, should they wish to do so, to inform them about the uses made of their personal data. Data subjects could also ask the Information Commissioner to investigate any practices that they were unsure of or uncomfortable with.

Census Regulations

6.10 The Census Regulations (see paragraphs 2.366 to 2.374) prescribed measures to ensure the security of the completed questionnaires and confidentiality of the data in the field. The sections described below relate to both the Census (England) Regulations 2010[34] and the Census (Wales) Regulations 2010[35].

6.11 Section 14 related to the giving of information and was concerned about the confidentiality of personal information given to the 2011 Census field staff; it prescribed that any person:

'…to whom personal information is given in accordance with these Regulations must not without lawful authority -

(a) make use of that information; or
(b) publish it or communicate it to any other person.'

6.12 Section 15 was concerned with the safe custody of questionnaires and documents, and prescribed that:

1) *'Any person having custody, whether on their own behalf or on behalf of any other person, of questionnaires or other documents (including electronic documents) containing personal information relating to the census must keep those documents in such manner as to prevent any unauthorised person having access to them.'*

2) *'When directed to do so by the Authority, any appointee must send the Authority all records in that appointee's possession (including any electronic record) which contain personal information relating to the census.'*

3) *'The Authority must arrange for the secure storage of questionnaires, electronic storage devices, or other documents containing personal information relating to the census.'*

6.13 Section 16 set out the provisions for all field and data processing staff to make statutory declarations or sign undertakings which required that they would not, except in the performance of their census duties, disclose or make known, now or at any

time after, any matter which came to their knowledge relating to any person, family or household.

Data Protection Act

6.14 In addition to the protection afforded by the census-specific legislation referred to above, the Data Protection Act 1998 (DPA) specifies that, where personal data are processed on behalf of the 'data controller' (ONS in the case of the census), that data controller is responsible for ensuring that any contractor processes them in accordance with the data protection principles. Accordingly, ONS provided its contractor with instructions to ensure that this happened.

Freedom of Information Act

6.15 Information collected from the 2011 Census (and from all censuses from 1921) is protected from the general disclosure provisions of the Freedom of Information Act 2000 by Section 44 of the Act, which exempts such information if disclosure is prohibited by or under any enactment. ONS frequently relies on this exemption in order to protect personal data in response to freedom of information requests.

European Convention on Human Rights

6.16 Article 10 of the Convention for the Protection of Human Rights and Fundamental Freedoms concerns the rights of freedom of expression and the rights of citizens to

'….*hold opinions and to receive and impart information and ideas without interference by public authority and regardless of frontiers*'.

However, where confidentiality is concerned, Article 10 says that these freedoms, carry with them duties and responsibilities, and so may be subject to such

'… *formalities, conditions, restrictions or penalties as are prescribed by law and are necessary in a democratic society for preventing the disclosure of information received in confidence*'.

6.17 Article 8 concerning the 'right to respect for private and family life', affords further protection regarding confidentiality of information:

'Everyone has the right to respect for his private and family life, his home and his correspondence'.

However, the UK and European courts have ruled that the census itself does not infringe this right, because the article goes on to state that:

'There shall be no interference by a public authority with the exercise of this right except such as is in accordance with the law and is necessary in a democratic society in the interests of national security, public safety or the economic well-being of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others'.

EU statistical legislation

6.18 The UK is required to make data available by a European Union (EU) regulation to provide comparable statistics and transparency about the quality of census outputs across all EU member states (EU Regulations 763/2008[4], 519/2010[5] and 1151/2010[76]).

6.19 The European Commission has a number of regulations concerning the confidentiality of European statistics, in particular *Commission Regulation (EC) 223/2009* on access to confidential data for scientific purposes, and *Commission Regulation (EC) 831/2002* on the transmission of data, subject to statistical confidentiality, to the Statistical Office of the European Communities (Eurostat). Consequently the UK census data that are provided to the EU are completely anonymised and protected against disclosure using techniques that apply to all other census outputs (paragraphs 6.36 to 6.44). In addition, all of the information provided to the EU has been rounded to the nearest five.

6.20 To ensure transparency, each member state is also required to provide a quality report to Eurostat. This includes definitions, legal acts covering the collection of the census, confidentiality policies, and a list of statistics that have been published from the census. Section 7 of this quality report concerns confidentiality and sets out the UK's policy on confidential data.

Security measures

6.21 Data security is a top priority for the census. In addition to the strong protection provided by the law (described above), ONS put in place stringent additional safeguards.

Data and systems security

6.22 All staff who process census data are security cleared. This requirement was extended to all employees of the contracted supplier and their sub-contractors who handled any personal census data during the data processing operation. Staff who have access to the full census data set or substantial parts of it have security clearance to handle material classified as 'Secret'.

6.23 Underlying security requirements for census data are based on UK Government security guidelines issued by the Cabinet Office and by the Communications Electronic Security Group (CESG), the UK Government's National Technical Authority for Information Assurance which assists government departments with their own communications security. Furthermore, the census security programme is managed to the framework of ISO 27001, the internationally recognised Information Security Management Standard.

6.24 Census data are classified as 'restricted' under the Security Policy Framework, the government's information classification scheme. This classification brings a set of standards and safeguards which ensure that data remain secure. This includes control of physical access to any site or room where the data are kept, secure control of access to IT hardware and of course IT systems.

6.25 ONS controls system access rights to all systems and data. All security measures cover the completed questionnaires, the electronic data set, the website, the archive

image system and the communications links relating to any of these items. All of the electronic communications links used for routing personal census information are encrypted (scrambled) to the levels recommended by the Government Security Services.

Security and external suppliers to the census

6.26 As noted at paragraphs 2.332 to 2.335, ONS carried out a fully compliant procurement, in accordance with European law and the European Union Procurement Directives, to source a range of support services for the 2011 Census. Lockheed Martin UK was selected as the main contractor.

6.27 The 2011 Census White Paper '*Helping to shape tomorrow*' reported that:

'*The UK Statistics Authority is satisfied that ONS has fully addressed concerns about the security and confidentiality of census data arising from the involvement of Lockheed Martin UK*'[1].

However there was some public concern about the possibility of the United States Patriot Act being used by United States intelligence services to access confidential data collected in the census.

6.28 Consequently, ONS put in place additional contractual and operational arrangements to ensure that US authorities could not gain access to census data. These ensured that:

- all data processing was carried out in the UK
- ONS would retain custody of the data at all times
- only people who worked for ONS had access to the full census dataset in the operational data centre
- no staff from Lockheed Martin UK (the contracted supplier) or Lockheed Martin (the US parent company) would have access to any personal census data
- ONS controlled access rights to all data systems
- everyone working with census data signed declarations of confidentiality, and
- independent checks by an accredited UK security consultancy of both physical and electronic security were carried out

6.29 The prime contractor was Lockheed Martin UK Ltd. Additional specialist services were provided by Cable and Wireless, Logica, UK Data Capture, bss, Steria, Polestar, Oracle and Royal Mail. Lockheed Martin UK designed the processing systems for ONS using its expertise and experience. However, the day-to-day running of operational services was provided by the consortium of specialist service providers. All of these specialist subcontractors were registered and owned in the UK or elsewhere in the EU.

Alleged breach of security

6.30 In June 2011 some media stories alleged a breach in the security of census data. The notorious hackers LulzSec claimed that they had gained access to the full census database. ONS immediately confirmed that the security measures in place were more than adequate to protect the public's confidential data. A press briefing

was issued on 22 June explaining that personal census information was secure and the allegation that it had been hacked was a hoax. The hackers subsequently admitted that this was the case.

Online security

6.31 Security was, of course, a fundamental aspect of the 2011 Census, and was built into the whole of the census design. The online census, in particular, was built with data security as a primary requirement and met government information assurance and data security standards, as well as ISO 27001, the industry standard for information security management.

6.32 The online census was subject to rigorous security tests, and underwent a formal accreditation process before it went live. In addition to the security testing by Logica, ONS commissioned its own independent security testing by consulting specialists SOPRA - a service provider accredited by CESG.

6.33 The method of security used to protect the confidentiality of census data transmitted over the internet from individual PCs to the ONS servers was SSL. ONS installed EV certificates issued by Verisign. ONS were verified by Verisign as the certified issuing authority. Steria, an ONS subcontractor, was the authorised holder of the private keys installed on the systems load balancers. Servers were based at the Manchester census data capture centre, with strong physical and system security measures protecting them. No personal census data were transmitted outside the UK over the internet.

6.34 All households received a paper questionnaire before they were given the option of making their return online. There was no facility to enable a householder to pre-register an intention to respond online as the risk of failure to make a return was considered to be too high. Instead, a unique 20 digit reference number on each paper questionnaire formed the security code for accessing and completing an online return.

6.35 Particular protection was given to the information provided via the online completion system. The online questionnaire was delivered and accessed within a secure architecture with multiple layers of firewalls and intrusion detection systems that incorporated industry-leading technologies to monitor and protect against cyber attacks. This kept the personal data provided by the public confidential throughout its capture, storage and processing. All the systems were subject to security testing by two separate government-approved security testing companies, which provided independent assurance that they were secure, free from technical vulnerabilities, and had been developed in accordance with best practice.

Statistical disclosure control

6.36 Statistical disclosure control (SDC) involves measures to support the 2011 Census confidentiality commitments that no statistics will allow the identification of an individual (or any information about an individual) with a high degree of confidence. It covers a range of methods to protect individuals, households and organisations, and their attributes (characteristics), from identification in published results (see Chapter 7). As noted above, ONS has legal obligations under the Statistics and Registration Service Act (SRSA) 2007 and the Data Protection Act 1998 (DPA) to protect the confidentiality of census data. In addition, the Code of Practice for Official

Statistics requires ONS not to reveal the identity or private information about an individual or an organisation.

6.37 The key strength of the census is its completeness of coverage and its ability to generate statistics about very small areas and groups of people (which help public policy makers to take account of local communities' needs). Particular care must therefore be taken to balance the need to ensure complete statistical confidentiality against the need to avoid damaging the utility of the data. This has always been paramount. In a census context, where thousands of cross-tabulations are generated from one database, the protection of the statistical confidentiality is best addressed by introducing uncertainty about the true value of small cells. In order to meet the agreed interpretation of the code of practice, ONS, together with the other two UK Census Offices, agreed that small counts could be included in publicly disseminated census data provided that:

- uncertainty as to whether or not the small cell is a true value has been systematically created, and
- creating that uncertainty does not significantly damage the data

6.38 Following the Treasury Select Committee's recommendation to review the mechanism to protect statistical confidentiality[6], ONS took steps to ensure a high degree of confidence that no statistics would be produced that allowed the identification of an individual (or information about an individual).

6.39 There are a variety of statistical disclosure control methods available that can be applied to census data before the statistics are released such as:

- restricting the number of output categories into which a variable may be classified, such as aggregated age groups
- amalgamating any small area in which the number of people or households falls below a minimum threshold, with a neighbouring area such that the threshold for the combined area is exceeded, and
- modifying some of the data through one or more of a variety of means such as record swapping, over-imputation and some form of cell perturbation

6.40 Some 13 different SDC methods were initially compared in order to discount those methods that would not be able to satisfy the strict disclosure control requirements for 2011 Census outputs. The short-listed SDC methods were assessed using a risk-utility framework. Record swapping was recommended as the primary disclosure control method for 2011 Census. This recommendation was accepted by the ONS Statistical Policy Committee, and endorsed by the UK Census Committee in 2009.

6.41 In the method adopted, every individual and household was assessed for uniqueness or rarity on the basis of a small number of characteristics, and every household given a risk score. A sample of households was selected for swapping. The chance of being selected in the sample was based largely on the household risk score, so that households with unique or rare characteristics were much more likely to be sampled. However every household had a chance of being swapped. Once selected it was swapped with another 'similar' household from another area.

6.42 Households in the 2011 Census were usually swapped only within local authorities; households with very unusual characteristics were swapped with matches in nearby authorities. So, for example, a household in Cornwall would not be swapped with one

in Birmingham. As every household had a chance of being selected for swapping, there is a level of doubt as to whether a count of one in any cell is real. It may be that a person has been imputed or swapped so as to appear in that cell; or there may have been another person or persons swapped out of that cell, thus creating a count of one. So no one can ever be absolutely sure that a value of one that they see in a table is really the true value.

6.43 Before publication, each census output table is assessed to ensure there are no disclosure issues. At this stage any necessary disclosure can be further managed by restricting the design and complexity of the tables, by collapsing variable categories, or by raising geographical thresholds.

6.44 Links to the documents **'***Statistical disclosure control for 2011 Census'* and **'***Confidentiality protection provided by statistical disclosure control'* are available on the ONS website[49]. Further SDC related links on the topic of **'***Protecting confidentiality with statistical disclosure control***'** are available at the webpage[49].

Privacy impact assessment

6.45 Projects that involve collecting personal information inevitably give rise to privacy concerns. A privacy impact assessment (PIA) is a self-assessment process developed by the Information Commissioner's Office (ICO) to help organisations foresee the likely privacy impacts on individuals and to weigh these against the benefits to society in the collection, use and (secure) disclosure of information.

6.46 The PIA process was introduced by the Information Commissioner around 2009, and so the 2011 Census programme was already well established before the PIA process was published. There is no legal requirement to carry out a privacy impact assessment. However, it is a legal requirement for everyone in England and Wales to participate in the census, and it is recognised that some members of the public have concerns over privacy, so ONS carried out a full-scale PIA for the 2011 Census. Because privacy and confidentiality are of prime importance to ONS, most of the good practice in the PIA process was already well established in the 2011 Census programme, needing only to be collated into a single document.

6.47 Different types of privacy impact are possible depending on the scale and nature of the project. ONS carried out a full-scale PIA which covered an in-depth internal assessment of privacy risks and liabilities. ONS sought advice from the Information Commissioner's Office on the scope of the PIA. Given that a census has been carried out decennially since 1801, the advice was to focus on those aspects of the 2011 Census which were new and had been introduced since the 2001 Census.

6.48 The Information Commissioner's Office suggested that a number of organisations and individuals representing privacy concerns/interests be invited to a meeting on the census and privacy in June 2009, or asked to make representations in writing. The main concerns raised as a result were:

- justifying the need to collect any census information at all, and
- the publication of census results to ensure that individuals were not identifiable

6.49 The PIA was published[50] in November 2009 and focused on:

- considering the need for a 2011 Census, and whether or not there were alternative ways of providing census-type information
- the legal basis for the census
- the questions to be asked, especially those new to the census, and the analyses of the acceptability of the questions
- equality impact assessments and considerations
- the use of third parties, and how privacy concerns were addressed in supplier contracts
- security and confidentiality considerations regarding the 2011 Census operations (such as the online census, questionnaire tracking, decommissioning and destruction of information after the census), and
- measures to ensure that individuals are not identified in the published results

Independent reviews of security and confidentiality

6.50 Security and confidentiality have been reviewed and reports published by ONS (and its predecessors) for each census since 1981. For the 2011 Census, and in light of the increased public concern about the security of personal information generally, ONS invited an independent team to review in detail the arrangements in place to ensure the security and confidentiality of census data. The independent information assurance (IA) review was undertaken in two phases.

6.51 The first phase started in March 2010 and reviewed the arrangements and undertakings in place prior to the census up to mid-December 2010. It was published in February 2011 (in advance of census day) and covered issues such as:

- the legal framework
- questionnaire development
- the 2009 rehearsal and lessons learned
- printing, distribution and data collection
- online response
- support to the public
- support to the census operations
- the census quality survey
- data processing
- end users of the data
- contractual arrangements
- management of information assurance

6.52 The key conclusions of the review, published on the ONS website[51] (and which in fact covered the arrangements for all three UK censuses) were that:

- there was a sound basis of commitment, knowledge and personal responsibility underpinning the information security management aspects of the 2011 Census operations
- there was solid management resolve towards ensuring that the 2011 Census should build upon previous experience in securely managing census operations and data

- the assurances given to the public by the census office regarding the US Patriot Act were consistent across the legal and operational arrangements set in place with its commercial partners. The issues of potential access to census data under the Patriot Act had been well addressed
- there had been a significant increase in the level of public awareness of data security and the need for demonstrable protection of personal information. Against that background ONS had risen to the challenge of implementing effective information security as part of its census operations
- online data gathering was expected to account for approximately a quarter of the total number of returns (in the event it was just 16.4 per cent). The review team were satisfied that the information assurance measures put in place for this relatively new aspect of census operations were appropriate and could be expected to be effective
- the review team made suggestions for improvement, mostly in terms of achieving greater consistency across the three census operations. These were welcomed by ONS, and the short timescales in which the suggestions were implemented demonstrated both commitment and capability, and
- ONS had undertaken assurance activities not just as a matter of adopting a professional approach and implementing best practice, but as a crucial part of the preparation for the census

6.53 The review team noted in their report that ensuring the protection of personal information provided by the public had been a core objective from the outset in planning the 2011 Census. The review team had had the opportunity to thoroughly review planning, management and implementation aspects, with the full co-operation of the staff involved, and had had complete access to 2011 Census staff, sites and documentation.

6.54 The reviewers concluded that:

'*As a result of our review, we are very satisfied that the three census offices are managing Information Assurance pragmatically, appropriately and cost-effectively. We are, therefore, confident that they are capable of delivering their IA objectives and that information will be held in secure environments and that it will be handled in line with best practice and Government standards. The public can be assured that the information they provide to the 2011 Censuses will be well protected.'*

6.55 The aim of the second phase of the review, which covered the period from the initial report to the first release of census data in July 2012, was to build on the earlier findings by examining the evidence relating to:

- the operations undertaken immediately prior to census day
- the census activities themselves, and
- the secure decommissioning and archival activities which marked the end of the data collection process

6.56 The final report of the review team was published on the ONS website in June 2012[51], and concluded (in referring to all the census offices) that:

'*As a result of our review, we are very satisfied that the IA operations undertaken by each Office were matched to their business objectives and business environment, and that as a result, the personal census data gathered and handled by each was subject not only to an adequate degree of protection, but also to a degree of*

protection which was appropriate to individual circumstances. It is clear to the review team that the tightly focused work undertaken by each organisation has had benefits not only across the three Census Offices, but also across Government, and that the benefits will be felt for some time to come…

…this has probably been the most rigorous census in terms of IA ever conducted in the UK. The fact that there have been no significant security incidents in the course of the project to date is not simply a matter of good luck. It is a reflection of sound IA planning, which has been well implemented in the form of an effective through-life approach. We remain satisfied, therefore, that the public can be assured that the information they have provided to the 2011 Census has been well protected and that sound plans are in place to ensure that this will continue to be the case'.

Chapter 7

Output production, dissemination and analysis

7 Output production, dissemination and analysis

Strategic aims

7.1 Outputs from the 2011 Census form the most complex and comprehensive set of information about the population produced to date. The growth in information provision in the early part of the 21st century, especially through the internet and social media, has encouraged high user expectations regarding content and delivery, assessed through close collaboration with users throughout the output design and planning stages.

7.2 The ultimate benefits of the census are realised only when users of census data exploit the published outputs. Therefore the investment of time and resources in a census can be justified only when the results are made accessible, and the outputs meet users' needs.

7.3 The vision for 2011 was that web would be the primary dissemination route, and that the delivery would give end users the flexibility to create their own products, including comparisons of 2001 data with 2011 data. To realise this vision existing ONS web services were enhanced and a web data access (WDA) programme initiated to provide a data explorer (DE) and application programming interface (API).

7.4 The key business objectives of the 2011 Census that were directly related to outputs were to:

- provide accessible output systems with the right content and functionality
- ensure the widest possible awareness of census outputs and tools
- ensure user confidence in the results
- protect, and be seen to protect, confidential personal census information, and
- provide value for money

7.5 ONS used its experience of the 2001 Census, user feedback and newly developed technologies to meet these objectives, delivering a suite of products and services which included:

- the web as the primary dissemination route, with minimum paper products
- data explorer functionality to enhance the usability of census results online
- comprehensive metadata delivered alongside the data
- utilities to enable bulk download of census results via the web
- larger set of products, ensuring maximum analytical use
- DVD products to supplement the online product set
- microdata products (provided via secure mechanisms as appropriate)
- the provision of updated data for inclusion in the ONS Longitudinal Study
- licensed access for trusted users to more complex outputs that do not satisfy disclosure control requirements for public availability
- the provision of outputs to meet the requirements of EU Regulations

Consultation

7.6 From the first release of 2001 Census results onwards ONS actively sought feedback on all aspects of census outputs. User forums such as the long running Census Advisory Groups (see paragraph 2.34), and specific interest groups such as the Microdata Working Group, continued to provide ONS with mechanisms, during the intercensal period, for gaining an understanding of the census users continuing and developing needs. The 2011 Census outputs team also carried out focused consultations using mechanisms such as web surveys, blogs and wikis. The outcomes from all these consultations were collated and used to influence the decisions taken in defining the 2011 Census output programme.

7.7 ONS held extensive consultations to define a range of 2011 Census products and services that would meet the needs of users (see paragraphs 2.33 to 2.52). These products and services were intended to cover both those users who wished to obtain a broad overview for a particular area, and the more experienced users who required very detailed and specific information about a particular topic. As far as possible, a UK-wide approach was taken to understanding users' high level output requirements, with ONS, National Records of Scotland (NRS) and the Northern Ireland Statistics and Research Agency (NISRA) collaborating on different aspects of the user consultation programme on planned output.

7.8 In 2008 a 12-week UK census output consultation was carried out by the three UK Census Offices via an online survey. The aim was to find out what potential users of the 2011 Census wanted from the data collected, and to help ONS in particular to prioritise identified output needs, with a focus on high level output issues. Topics covered include products, access, dissemination and metadata.

7.9 A consultation programme on the detail of the statistical outputs was then carried out to establish the extent, scope and detail that users would like to see from the 2011 Census. The consultations on main statistical outputs had two distinct phases, running from 14 December 2009 to 26 March 2010, and from 7 February 2011 to 28 April 2011. These phases included formal consultation feedback documents for completion and return, and were supported by national public consultation events as well as direct engagement with key users and user groups. All views received were considered and analysed.

7.10 The consultation process was considered a success by ONS in terms of the high quality of responses received, and the positive feedback on the package of proposed outputs. Users from all sectors – academic, commercial, central government, local government, health and others – confirmed that the planned design of outputs reflected their interests in, and needs for, both the retention of comparability with 2001 and for information on new topics to be collected in 2011.

7.11 Smaller-scale, focused consultations on more specialist products and services also took place throughout 2011. These covered:

- microdata products and origin-destination data (internal migration and travel to work flows)
- regionally-based minority group outputs, and
- analytical products

7.12 The main outcomes from the consultation that influenced the design and development of the census outputs were:

- for comparability and continuity purposes, only minor or no changes were made to the majority of existing 2001 Census outputs, other than those necessary due to changes in questions, or for statistical disclosure control purposes
- to preserve stability, some outputs had additional age breakdowns incorporated (for example, where an output had been made available for the 16 to 74 age group in 2001, the output in 2011 had an age breakdown of 16 to 74, and 75 and over wherever possible
- the statistical disclosure control method of targeted record swapping was developed to address the additivity and consistency problems arising from the post-tabular application of small cell adjustment in 2001
- quality assurance and extensive checking procedures were applied to the design of table layouts to maximise consistency
- comparability documentation was published, highlighting areas of change between 2001 and 2011 and describing how outputs may be affected
- an increased volume of outputs, harmonised across the UK, was made available, and a single point of access was provided
- the outputs reflect the width and breadth of the data collected on those topics included for the first time, and
- the generation, for the first time, of alternative population bases was a particularly popular innovation, particularly the bases for short-term migrants, workplace, workday, and out-of-term populations

Output geography

7.13 Geography is a key element of census outputs. Every statistic produced from the 2011 Census is available for at least one of the various administrative or statistical geographies in England and Wales.

7.14 An overall aim of the 2011 Census was to provide outputs in line with the National Statistics (NS) geography policy. The policy sets out the principles for using geographic information to produce and disseminate statistics. Its principles are driven by the objectives to:

- reference statistical events accurately, consistently and at as low a level of geographical referencing as possible
- maximise the comparability of National Statistics
- minimise the impact of changing area boundaries on National Statistics outputs, and
- provide the framework for defining and standardising how geographies and associated information are defined, used and presented in the production of statistics

Standard geographies

7.15 A full list of all geographies for which 2011 Census outputs have been produced is given at table 7.1, together with the date of currency, their exact/best-fit basis and the numbers of each. The 2011 Census results for output geographies are aggregations of whole OAs, which have been best-fitted to the higher geographies that were current at 31 December 2011. This is the method used to produce all 2011 Census and national statistics, so that statistics produced on the same geography are

consistent, comparable and non-disclosive. The exceptions to this are the exact-fit estimates for local authority areas (to which whole SOAs and thus OAs are constrained), workplace zones (which have been created by merging or splitting whole OAs – see paragraphs 7.26 to 7.28), and national parks (because best-fit estimates were considered to be inappropriate for this largely rural geography).

Table 7.1 2011 Census geographies

Geographical unit	Currency	Exact fit/ best fit	Number of units
Output areas (OAs)	December 2011	Exact fit	181,408
Lower layer super output areas (LSOAs)	December 2011	Exact fit	34,753
Middle layer super output areas (MSOAs)	December 2011	Exact fit	7,201
Workplace zones	December 2011	Exact fit	53,578
National parks	December 2011	Exact fit	13
Local authority districts	December 2011	Exact fit	348
Wards	December 2011	Best fit	8,588
Parish/communities	December 2011	Best fit	11,360
Countries (England)	December 2011	Best fit	27
Former countries	December 2011	Best fit	34
Regions (England)	December 2011	Best fit	9
Westminster parliamentary constituencies	December 2011	Best fit	573
National Assembly for Wales constituencies	December 2011	Best fit	40
Primary care organisations (PCOs) (England)	December 2011	Best fit	151
Strategic health authorities (England)	December 2011	Best fit	10
Local health boards (Wales)	December 2011	Best fit	7
Built-up areas	December 2011	Best fit	5,493
Local administrative units (LAU) 2	December 2010	Best fit	8,588
Local administrative units (LAU) 1	December 2010	Best fit	348
Nomenclature of units for territorial statistics (NUTS) 3	December 2008	Best fit	105
Nomenclature of units for territorial statistics (NUTS) 2	December 2008	Best fit	32
Nomenclature of units for territorial statistics (NUTS) 1	December 2008	Best fit	10

Output areas: the stable building block geography

7.16 ONS has aimed to meet users' requirements for statistical results at varying levels of detail, for a number of geographies, subject to the overriding requirement to protect statistical confidentiality. Such geographies (as noted above) have been created essentially from the same building blocks as in the 2001 Census – the output areas (OAs). These have been specifically designed as the smallest area for which census statistics (other than simple head counts) can be released without being disclosive. There are at least 100 persons and 40 households in each OA in England and Wales. Using output areas as building blocks for best-fitting to any target geography reduces the risk of disclosure.

7.17 Output areas were first created for the 2001 Census in such a way that the homogeneity of housing and population characteristics within each was maximised. The OAs were built automatically using the 2001 Census data. They were later grouped together to form higher-level tiers (known as super output areas – SOAs) for statistical reporting, and have been extensively used for the publication of statistics from the 2001 Census.

7.18 A lower layer super output area (LSOA) and middle layer super output area (MSOA) were produced. These tiers were designed to allow statistics to be disseminated at the lowest reporting level in the hierarchy that would not risk disclosing information that could identify an individual person or household.

7.19 The 2011 Census provided an opportunity to use up-to-date population estimates to consider if any 2001 OAs and SOAs needed to be changed to reflect population change. ONS carried out consultations between November 2006 and February 2007 about how the OAs and SOAs should be maintained. Responses to the consultations were extremely positive and revealed a great deal of support for the key principles of stability and continuity with outputs from 2001.

7.20 The need to reflect the most current population distribution in the design of the OAs and SOAs was balanced against the strong demand to keep a stable set of OAs and SOAs for time series analysis. The policy was also driven by the National Statistics geography policy, which sets out best practice for the production of national and official statistics by geography to ensure outputs are accurate, consistent and comparable.

7.21 After the extensive public consultation ONS set out a policy that the changes to 2001 OA and SOA boundaries would be kept to a minimum. Changes were to be made only where there was a good reason, in particular where:

- there was a significant change in the OA/SOA population size (if they were now too big in population size, they were split into smaller areas; if their population size had become too small, they were merged with one or more neighbouring areas)
- the local authority boundary had changed since the OA/SOA had been created, and therefore no longer aligned with the current OA/SOA boundary, and/or
- the OAs/SOAs were considered unsuitable for statistical outputs by their local authorities following consultation and where agreement with ONS had been reached

7.22 Of the 175,434 output areas created for the 2001 Census, 2.6 per cent were changed using the equivalent 2011 Census population data. Less than one per cent (0.6 per cent) were merged with one or more other 2001 OAs; here direct comparisons can be made with the 2001 OAs, aggregated together. Only 0.1 per cent were redesigned (mainly because of local authority boundary changes) and cannot easily be compared to an equivalent 2001 OA.

Best-fit geographies

7.23 A central element of the National Statistics geography policy[52] is that source data must be referenced to other geographies on the basis of its stable small area building block ‘best-fitted’ to those geographies when creating National Statistics outputs. Best-fitting ensures that all National Statistics are consistent and comparable because their method of dissemination is the same.

7.24 Best-fitting from OAs helps ensure that census statistics are non-disclosive and consistent with all other national statistics produced using the best-fitting method. If the same statistics were published as exact-fit on a number of different geographies then, where these geographies overlap, confidential information could be disclosed about the small population contained in the overlaps or 'slivers' (often referred to as ‘disclosure by differencing’). The difference between best-fit and exact-fit estimates

will depend on the target geography. Generally the bigger the target geography, the less difference there will be. Recent ONS research concluded that, overall, the differences are not statistically significant but could be disclosive.

7.25 Best-fit estimates for a geography are produced by aggregating whole output areas of statistics together to form the total estimate for the target geography. The OA can therefore be seen as a building block to build statistics for any target geography. Note that these are always whole OA building blocks of statistics that are never split or apportioned; either all the statistics for that output area are included in the aggregation, or they are excluded.

Workplace zones

7.26 Following substantial user interest, a new output geography – workplace zones was developed from the 2011 Census data. These zones are more suitable for disseminating and analysing workplace-based employment statistics because they provide consistency in the level of numbers of workers or businesses between workplace zones.

7.27 They have been created by splitting and merging the 2011 Census OAs to produce a workplace geography that contains more consistent numbers of workers. The workplace zones therefore align to the existing OA hierarchy, but are constrained to MSOAs in order to provide consistency between the OA and workplace zone geographies, and to allow comparison of the 2001 and 2011 Census workplace outputs at the MSOA level.

7.28 Workplace zones were published in May 2013 and outputs based on these areas were produced for England and Wales in May 2014.

Built-up areas

7.29 Built-up areas (BUAs) and sub-divisions of these areas (BUASDs) are another new geography[53], created to support the 2011 Census outputs. The geography allows the identification of traditional villages, towns and cities, and thus provides comparisons between people living in built-up areas and those living elsewhere (in so-called rural areas).

7.30 Census data for such areas (previously called urban areas) have been produced every 10 years since 1981. A new methodology to define these areas was adopted for the 2011 Census; this still follows the basic rules used in previous censuses so that outputs will be broadly comparable. As before, the definition follows a 'bricks and mortar' approach, with built-up areas defined as land with a minimum area of 20 hectares (200,000 m^2), where settlements within 200 metres of each other are linked.

Area classifications

7.31 Places differ according to their social, economic and environmental characteristics. Geodemographic classifications help to characterise areas based on their socio-economic traits. Such classifications using the description 'area classifications' have been produced by ONS using data from every census since 1971. Early area classifications have covered Great Britain and, following the 2001 Census, have been extended to cover the whole UK. Separate area classifications have been produced for different geographies, including output areas, local authorities and health areas.

7.32 A feature of such classifications is that they group areas into clusters based on similar characteristics in a hierarchical manner. So with the 2001 Area Classification for Output Areas, for example, the largest cluster was the supergroup, of which there

were seven. Each supergroup was further split into 21 groups and further into 52 subgroups. Descriptive names were given to the supergroups and groups.

7.33 Following the release of 2011 Census data ONS is in the process of updating the 2001-based area classifications for the UK, beginning with the area classification for output areas that was published in July 2014[77]. These use a number of key census variables, covering demographic information, household composition, housing, and socio-economic and employment information.

Digital geography products

7.34 As well as supporting all of the statistical outputs from the 2011 Census, ONS also made the following products available to enhance the use of census and other statistical products.

- Digital boundaries of OAs, SOAs and workplace zones were produced for users to carry out spatial analysis in a geographical information system (GIS) or for web mapping. These are available in industry standard (Esri shapefile) formats
- Digital spatial files (median population weighted centroids) were also created for OAs, SOAs and workplace zones (a centroid is a summary single reference point which represents the 'centre of gravity' of the population of an area. Centroids allow users to get consistent and comparable best-fit allocations to a higher geography using a GIS). These are also available in Esri shapefile formats
- Lookup files allow users to compare data output from 2001 and 2011 geographies. As noted above, most geographies, including wards, are best-fitted from OAs in line with the National Statistics geography policy. Therefore a number of lookup files from 2011 OAs to other output geographies have been produced. There are also lookups from workplace zones and enumeration postcodes (those identified during the census) to other census geographies. Lookups are supplied in comma separated value (csv) and delimited text file formats.

Charging policy

7.35 ONS does not charge users for standard published census tables, although it reserves the right to charge for:

- the supply of such on media other than the internet
- the services to supply commissioned output, and
- access to special 'secure' products to meet users' requirements that are not met by data in the published tables

7.36 Commissioned tables (see paragraph 7.89) are issued to the requesting customer under an open government licence (OGL) by the provision of a link to a URL on the ONS website, and are then available free to all other users. The cost of the commissioned output reflects the amount of time taken to develop the table(s) together with statistical disclosure check (pre- and post- production) and associated processes. The charges reflect the full economic costs associated with the delivery of the service. Delivery via other means such as portable media is also available on request.

2011 Census prospectus, catalogue and user guide

7.37 Information regarding plans for the content and timing of standard output products was described in the 2011 Census Prospectus for England and Wales[54] (this also included details of releases of UK outputs.) The prospectus was updated regularly to give users as much notice as possible about the release schedule and any changes to publication plans. All dates for the release of census results were announced at least four weeks prior to the release date, in compliance with the Code of Practice for Official Statistics.

7.38 All 2011 Census data releases were detailed in a census catalogue[55] which provides links to the locations of data and supporting documents on the ONS website.

7.39 ONS also produced a web-based user guide[56] containing links to a range of explanatory material to aid the use and better understanding of census statistics. This was a dynamic document, updated and expanded as each subsequent release of statistics was published. The range of material covered included:

- quality and methodology papers
- a set of frequently asked questions on key census issues
- a glossary of terms used in planning, processing and reporting
- information on the comparability of the statistics with the 2001 Census taking into account differences in the definitions, concepts and conventions, the population base, new topics, question wording, and ONS's output policy
- details of the variables and classifications

Data production systems

7.40 As with the 2001 Census, Space Time Research table-build software was adopted for 2011 Census outputs and was used in the production of most standard outputs. SAS software was implemented across ONS to create the more specialised outputs of origin-destination data, microdata, and data for Eurostat. Datasets were created that could be readily transferred into new dissemination systems as well as the systems of external organisations that reuse and distribute census data.

7.41 ONS worked closely with Eurostat on the implementation of statistical data and metadata exchange (SDMX), a data transfer format that enables information about the data to be included so that the data can describe itself to other systems. In particular, this facilitated the loading of data and metadata together into the new ONS data explorer and API (see paragraph 7.45 to 7.48).

7.42 Third parties that add value to and distribute census data received csv versions of the outputs, in a structure agreed through consultation in 2011 that met their need for loading data into their own systems (either a single standard structure or one that was bespoke for each customer).

Dissemination and access

Internet access

7.43 All ONS census data that are published under open government licence have been made available using the ONS family of websites. ONS has published structured

datasets complemented by rich supporting information in the form of reference metadata that are linked or attached to the datasets and classifications.

7.44 The aims for dissemination of the 2011 Census results included:

- the publication of all census outputs in open explorable formats, available from a single web platform (the ONS data explorer), so that users can find the data they need
- the provision of these same outputs via the application programming interface (API), to promote and maximise the use and reuse of data
- the integration of rich supporting information with and within datasets (reference metadata are linked to each dataset and the classifications that constitute them), so that the information that users need to understand and interpret data always accompanies it
- the availability of this same metadata in a viewable or downloadable form, from the same source as the linked metadata content, so eliminating inconsistency and providing users with the information in standalone forms

ONS data explorer and open API

7.45 To help users access and use the data in familiar ways, the 2011 Census output project team worked closely with all of the different ONS dissemination platforms to exploit the traditional ONS web dissemination systems to the fullest extent. In particular the team worked closely with the WDA project to:

- specify and test an enhanced website with better search and discovery, and the tools to explore datasets and view linked reference metadata
- develop an API system that would enable third parties to re-use census data programmatically in existing and new applications, thereby extending the reach of the data to new and wider audiences; and
- implement a dataset management system to load datasets, link metadata, and publish these into the enhanced website

7.46 The WDA systems went live in two phases with an initial beta release in October 2013 with some of the more straightforward census results. In the summer of 2014 a second release went live (again initially as a beta version) with the full range of census data (mostly for lower geographies and more complex datasets), and additional user functionality such as charting and creating user defined outputs.

7.47 Census data were released on both the Neighbourhood Statistics Service (NeSS) and nomis. Neighbourhood Statistics is an ONS web service specialising in the dissemination of detailed, small-area univariate data of the type published in the second census release (see paragraphs 7.62 to 7.64). The NeSS website has an API. Nomis is a web service provided by the ONS to give access to detailed UK labour market and other population statistics from official sources. This site is designed to handle complex multivariate tables of the type published in the third, fourth and fifth census releases (see paragraphs 7.65 to 7.69). Both sites provide established user communities with routes to detailed small area data as well as tools with which many are already familiar.

7.48 The main ONS website provides summary census data, mostly first releases for local authorities, and in 2013 launched new data explorer and API functionality for a range of census data at lower geographies. More census data and more data explorer/API functionality became available on the ONS website in July 2014, aimed at both

inexperienced and experienced users. The ONS website also published over 50 statistical bulletins and commentaries that accompanied the releases as well as offering background information and guidance.

Secure and safeguarded environments

7.49 A number of changes between 2001 and 2011 have affected the way ONS protects census data, to take account of the level of detail users are demanding. In particular, the Statistics and Registration Service Act 2007 gives ONS legal authority to make data available to 'approved researchers' and prescribes the criteria by which it may do that.

7.50 Increased computing power within ONS and externally means there are potentially more ways in which ONS can provide census data. At the same time, users are making greater demands for quicker, easier access to statistics generally and to microdata in particular (see paragraphs 7.73 to 7.78), and for more detail in the census statistics that ONS provides.

7.51 The transparency and open government agenda puts the onus on government departments to make more information available free at the point of delivery. But there are increased concerns both within Government and amongst the public about privacy and the protection of confidentiality, and requirements to protect data have increased markedly since 2001. Improving the quality and utility of data increases the degree to which the data needs to be protected (particularly the origin-destination flow – see paragraphs 7.79 to 7.81). ONS therefore provides restricted access to potentially sensitive data in its secure and controlled virtual microdata laboratory. Some data is distributed outside ONS to trusted users who have accepted terms and conditions that safeguard their use, via the UK Data Service (UKDS), an Economic and Research Council (ESRC) -funded resource to support researchers, teachers and policymakers who depend on high-quality social and economic data (see also paragraph 7.92).

Data visualisation

7.52 Data visualisation is a widely acknowledged method for bringing statistics to life, summarising patterns in data and allowing new insights which would otherwise be hidden in statistical tables. An added benefit is this output's broad appeal to a much wider audience than might normally be expected for official statistics. These characteristics made data visualisation an important tool for communicating 2011 Census results.

7.53 Interactive graphics of 2011 Census data produced in-house by the ONS data visualisation centre were widely syndicated – and praised – across traditional media websites and social media. These interactives allowed the *user* to decide what to look at, making them highly personal visualisations which could then be shared across social networks. These interactives formed an important part of many census releases and a dedicated web page was created for them[57].

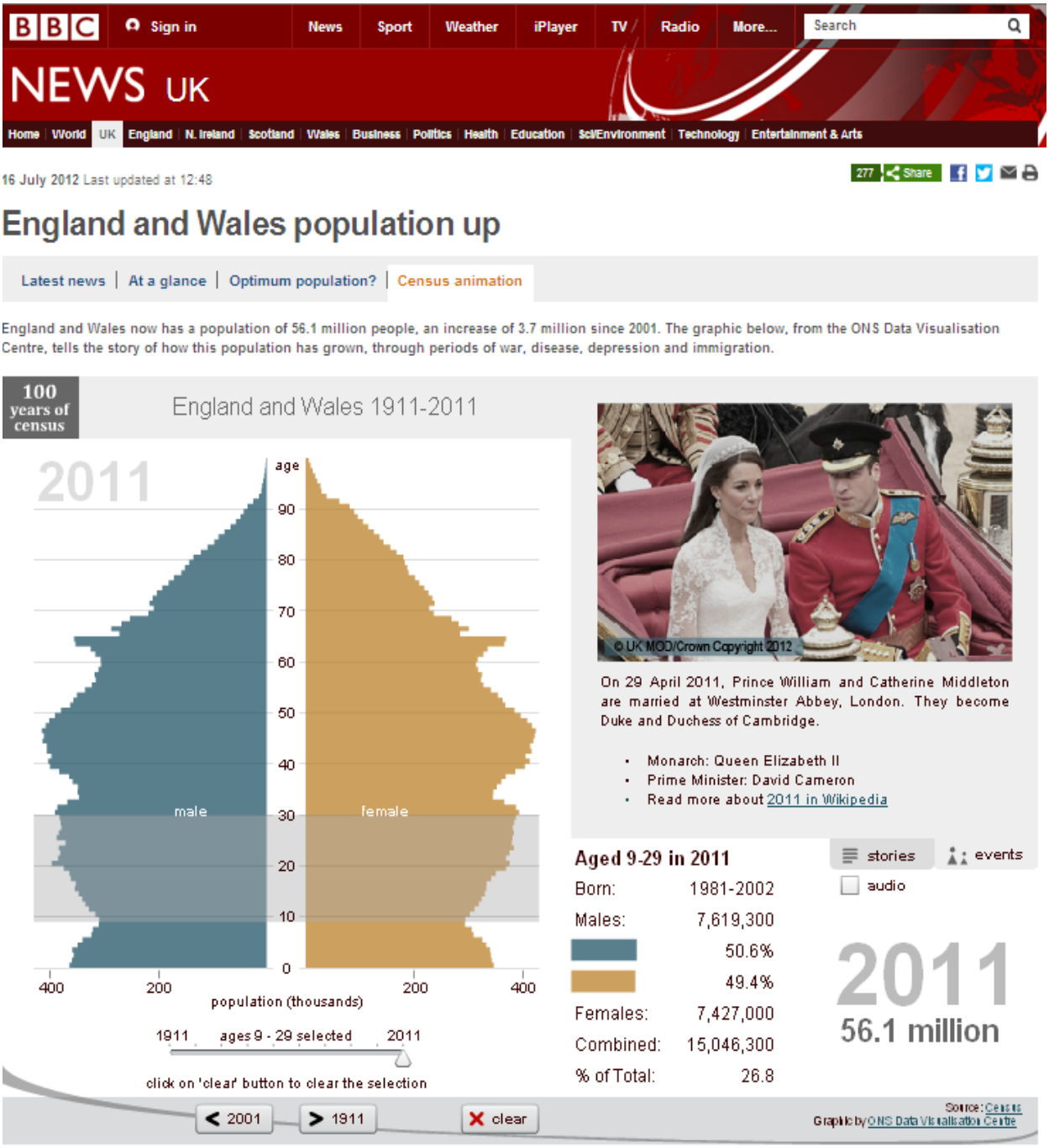
7.54 Media syndication of these interactive visualisations greatly increased the public profile of the 2011 Census. For the first release, viewing figures for the ONS website had a ten-fold increase, including direct syndication via the BBC (see figure 7.1), *Daily Telegraph* and *Guardian* Datablog. For the second release, syndication was even wider across local and national media, with interactive Google Maps produced by ONS attracting at least 500,000 unique visitors from all platforms. These figures represented the most popular content items ONS had ever produced and they

continue to be popular, with widespread usage, for example in the educational sector.

7.55 Feedback on the data visualisations was almost universally positive. For example, in referring to ONS as one of the winners at the Royal Statistical Society 2013 Awards for Excellence in Official Statistics, the judging panel commented that:

"ONS's work on data visualisation and interactive graphics is widely considered to be world class, so it is perhaps no surprise that data visualisations of the 2011 Census also featured among the awards".

Figure 7.1 2011 Census screenshot from BBC News website



Statistical releases

7.56 Because of the breadth and depth of census results, the statistics have traditionally been released in stages. This was also the case for the 2011 Census. The following statistics were released or are planned for release. These are summarised here, with more details on each given in subsequent paragraphs.

First release: July – November 2012

- age and sex, and occupied household estimates for England and for Wales
- information about second addresses by age, sex, and type of second address

Second release stage: December 2012 – March 2013

- key and quick statistics, and postcode estimates

Third release stage: May 2013 – March 2014

- detailed characteristics

Fourth release stage: July 2013 – March 2014

- local characteristics

Fifth release stage: October 2013 – September 2014

- alternative population bases

Specialist products: November 2013 – March 2015

- origin-destination data
- microdata
- small population groups

7.57 Reference material appeared alongside every release, providing:

- description, definition and context around each topic
- comparability with the 2001 Census outputs
- updates to the user guide, and
- further sources of information where applicable

First releases (via the ONS website)

7.58 The first 2011 Census estimates were published on 16 July 2012, some 16 months after census day on 27 March 2011 (and a month sooner than the equivalent report after census day in 2001). This first release included usually resident population estimates for England and Wales at regional and local authority level by age and sex, and estimates of occupied households. Data on short-term resident population statistics for local authorities in England and Wales were also included. A printed copy of the report was also laid before Parliament.

7.59 The time between census day and the first published output reflects the time needed to carry out the Census Coverage Survey (CCS), to process the large volumes of census questionnaires (more than 20 million), to carry out complex statistical processes to produce population estimates adjusted for under and over-coverage, and to fully quality assure the estimates.

7.60 This process results in a consistent and complete set of census outputs which improves the quality and usefulness of the 2011 Census for users, but takes longer than simply publishing the results without the benefit of statistical estimation and quality assurance. In order to meet the July 2012 deadline the figures were rounded to the nearest 100, because they were extracted from an output database that had not yet been fully edited and quality assured. Subsequently, in September that year, these data were superseded by final, unrounded, figures.

7.61 In October 2012 estimates of the number of residents of England and Wales who had a second address elsewhere were published. These data (new to the census in 2011) were produced earlier than planned. Users were eager to have them because they help central and local government better understand the total number of people who may require services in their areas. In November 2013 population estimates by five-year age group and sex were published at the OA level.

Second release (via the ONS website, NeSS, and nomis)

7.62 This series of tables provided summary, univariate, information relating to all questions on the census form, giving a comprehensive picture of the population of England and Wales. There were two products:

- Key Statistics – which were largely percentages of selected key variables, designed to enable easy comparison across the geographies for which they were produced (for example local authorities), and
- Quick Statistics – which provided more detail on the breakdowns, or classifications, within a single census topic or variable, for output areas and higher (for example, a full breakdown of the ethnic group categories or single year of age population for a given geography)

7.63 Key Statistics tables for local authorities were published in December 2012, and Quick and Key Statistics for other geographies were published in January 2013, including the output area hierarchies, administrative wards, UK parliamentary constituencies and civil parishes.

7.64 In February 2013 ONS published Key Statistics for national parks, and the Key and Quick Statistics for postcode sectors, health areas and Welsh Assembly constituencies. In March 2013 Quick Statistics on national identity, passports held, country of birth, and approximated social grade were published.

Third and fourth releases (via nomis)

7.65 Between May 2013 and March 2014 a series of releases provided more complex information, much at lower geographies, in tables combining more than one topic and often accompanied by commentaries. These corresponded to some extent to the Standard and Census Area Statistics released from the 2001 Census. These so called Detailed Characteristics provided data for all local authorities and at ward or MSOA levels where disclosure control permitted. Data were published for all areas though in some cases wards were merged in order to create areas with large enough populations to prevent disclosure.

7.66 Initially data released for local authorities covered several topics in the one release: migration, ethnicity, national identity, language, religion, unpaid care, and health. Subsequent releases each focused on one theme in the series; these were, in order of release: housing, migrants, demography and families, communal establishments,

labour market and qualifications, approximate social grade, travel to work, and car and van availability.

7.67 From 31 July 2013 to March 2014 a series of Local Characteristics data were released. These generally corresponded to the statistics in the 2001 Census Area Statistics tables, and in many cases also corresponded to the Detailed Characteristic tables. They provided the greatest level of detail possible for OAs and LSOAs, providing information on local areas.

7.68 As with the Detailed Characteristics, these local data were released in a series by topic. These started with tables on ethnicity, national identity, language and religion, and were followed by health and unpaid care, migration, demography and families, housing, labour market, qualifications, travel to work, and car or van availability.

Fifth release (via nomis)

7.69 From 31 October 2013 a fifth series of releases began with short-term resident population statistics for local authorities (the characteristics of non-UK-born short-term residents living in England and Wales on census day) and workday population statistics for OAs (the resident population in areas during the working day); again these were accompanied by commentaries. These were followed in May 2014 by releases on populations in workplace zones, and in OAs and MSOAs during the workday. The series was completed with a release on the out-of-term population of local areas (for which students were included at their home/non-term time address rather than their term-time address, where these were different – see paragraph 7.82).

Specialist census products

7.70 To supplement the main sets of tabulations, a number of specialist products were scheduled for release in late 2014, early 2015.

Small population groups

7.71 Subject to disclosure control restrictions, ONS intends to publish outputs that explore the detailed characteristics of some small population sub-groups, such as the Ravidassian and Nepalese communities who had made strong representations to ONS prior to the census. Populations being considered will be drawn from the very detailed write-in responses to the ethnicity, religion and country of birth questions (the publication of the 2011 Census Quick statistics included detailed estimates of ethnic and religious groups, down to the lowest level of census geography).

7.72 The threshold for table production is 50 or more qualifying people in any given MSOA. Separate sets of outputs have been developed for areas where there are 100 or more, and 200 or more, people from the same small population group.

Microdata

7.73 Microdata files (often referred to as samples of anonymised records – SARs) have been produced from each census since 1991. These datasets comprise files containing a sample of individual record-level persons drawn from the census database that have been anonymised (these were originally restricted to academic use through the Census Microdata Unit at the University of Manchester on behalf of the Economic and Social Research Council).

7.74 Each file from the 1991 and 2001 Censuses contained a broad range of socio-demographic characteristics for respondents, with a particular emphasis on individual, household or geographical detail. The files were designed to ensure that sample members cannot be identified. In order to achieve this necessary confidentiality the amount of detail available is restricted to a non-disclosive level (for example, at higher levels of geography only), and individual respondents appear only in one file.

7.75 The strength of SARs is that, to the user, the data are similar to that which might be collected if users conducted a survey themselves, and which can be analysed in the same way. SARs have a further advantage in that the sample sizes are much larger than in a typical alternative data source. For example, the 2001 Individual SAR contains 3 per cent of the UK census records, equating to some 1.84 million records, while the largest file (the 2001 Small Area Microdata – SAM), is a 5 per cent file containing nearly three million cases.

7.76 An innovation for the 2011 Census was the production of a teaching file which was published on 23 January 2014 and is available from the ONS website. The primary purpose of the file is to serve as an educational tool. The release of this non-disclosive, individual-level file is in line with the Government's transparency agenda. It is a 1 per cent non-disclosive sample of individuals with less detail than the similar product from 2001 that was made available under an end-user licence.

7.77 Some census outputs are available under specific terms and conditions of use. For the 2011 Census a safeguarded file, with a maximum sample size of 5 per cent, is disseminated via the UK Data Service (UKDS) and after application is accessible via users' desktops. This provides data at the individual person level and contains a level of detail similar to the 2001 SAM and the individual-level SAR. The details of the conditions of use are available on the ONS website.

7.78 A third type of anonymised microdata sample, a secure file, will be held in ONS's virtual microdata laboratory (VML) and made available only to approved researchers. This will generally be similar to the 2001 Controlled Access Microdata Sample (CAMS), for both households and individuals, and contain a maximum sample size of 10 per cent.

Origin-destination data

7.79 Origin-destination data (also known as flow data) comprised the travel-to-work and migration patterns of individuals, cross-tabulated by key variables of interest (for example, occupation). As in previous censuses the travel to work flows used the area of usual residence as the origin and the area of workplace as the destination, while the migration flows respectively used the areas of usual residence one year before the census and at the census as the origin and destination. New products for the 2011 Census, however, provided the flow patterns separately for those living at a student address one year before the census, and also provided data on the movement of people between their usual address and any second address on which information was collected for the first time.

7.80 A large number of the origin-destination data are at UK level, providing flows for usual residents within and between England, Wales, Scotland, and Northern Ireland. Any statistics that could not easily be harmonised across the UK due to differences in the data collected were provided for usual residents of England and Wales only. Moreover, the travel-to-work data for England and Wales use the new workplace

zone geography to show flows between the OAs of usual residence and workplace zones (see paragraphs 7.26 to 7.28).

7.81 However, for the 2011 Census, the UK Statistical Disclosure Control policy required that the disclosure protection of the most detailed origin-destination tables should be controlled, in the main, through access only via ONS's secure environment. This is a change from the 2001 Census, where the protection for similar outputs came from the post-tabular small cell adjustment that still allowed wide and easy access, but which also adversely affected the utility of the outputs. There are, however, a small number of less detailed tables that are available publicly.

Alternative population bases

7.82 The main output base for the 2011 Census results is usual residents. However, to meet other user demands, some basic demographic outputs using population bases other than usual residents have been produced, or are planned, from the 2011 Census. This is possible using information from a combination of different census questions (such as second address) to focus on alternative population bases.

- Workplace population: figures for a given geography during standard working hours, taking account of the number of people who, for example, travel into a city to work (effectively a geographical redistribution of the usually resident population who are in work, allocated to their place of work)
- Workday population: figures for persons present in any given geography during the day including non-residents with a workplace in the area but excluding residents with a workplace outside the area
- Out-of-term population: figures for a given geography, including students counted at their non term-time address (that may or may not be the same as their term-time address)

7.83 A wide range of univariate variables have been published for the workplace and workday population bases, for OA and workplace zone geographies. Such variables included: sex and age; National Statistics Socio-economic Classification (NS-SEC); social grade and distance travelled; industry; occupation; qualifications; tenure; cars or vans; ethnic group; religion, and language. Look-up tables that relate OAs to workplace zones were also published.

UK-based statistics

7.84 ONS has responsibility for disseminating 2011 Census statistics for the UK as a whole (such as those required to fulfil international obligations as well as meet domestic users' requirements). Because the outputs for England and Wales and for Northern Ireland were produced before the corresponding tables for Scotland, the following UK statistics were released in stages, to a timetable in line with the release of the equivalent Scottish data by the National Records for Scotland:

- preliminary population figures (rounded to the nearest thousand); UK level only, December 2012
- population figures (rounded to the nearest hundred) and household figures (rounded to the nearest ten); UK level only, March 2013
- unrounded population figures by single year of age and sex; for the UK and all local authorities (or equivalent) in the UK, along with UK historic population pyramids (1911 to 2011), July 2013

- Key Statistics and Quick Statistics for all local authorities: Part 1, October 2013; Part 2, December 2013; and Part 3, January 2014, and
- a compendium of data already released by each country; Key Statistics and Quick Statistics for OAs, SOAs and equivalents in the UK, May 2014

These statistics, together with interactive maps and tools, are available on the 2011 UK Census web pages.

European Union outputs

7.85 A new EU regulation[76] requiring Member States to make available to Eurostat a set of harmonised 2011-based, census-type statistics, came into force on 9 July 2008. This was aimed at meeting the European Commission's long-standing need for reliable, detailed coherent and comparable data on population and housing across the EU. Earlier attempts to collate such information from previous European censuses (using instruments such as directives or the less formal 'gentlemen's agreement') had resulted in a lack of a consistent set of EU data. The new regulation specified the outputs to be delivered, but not the way that Member States should collect the data.

7.86 The data is publically available from the European Census Hub which went live on 31 March 2014. Census data from all EU Member States can be accessed from this website. To meet the EU obligation under the Regulations, all Member States were required to join the EU Census Hub but with the interactive service hosted in their own country, so that the national experts can answer any enquiries about their own census data. People around the world can now compare and contrast the UK data provided by ONS (some 660 million data observations) with those from the 27 other Member States.

7.87 The UK's 60 data hypercubes (large multi-dimensional tables) and 21 quality cubes were built by a small team from ONS, with assistance from the Northern Ireland Statistics and Research Agency and National Records of Scotland. At the same time they built the infrastructure to host this information and provide the web service. Reusing existing components wherever possible and developing lean processes to support the project meant that meeting this EU obligation was also very cost effective.

UN outputs

7.88 As in previous decades, ONS has also provided the UN Statistical Division with a set of tabular UK outputs as part of its commitment under the 2005-2014 World Census Programme.

Commissioned tables

7.89 ONS continues to provide a commissioned table service for census statistics, for which charges apply (see paragraph 7.36). Commissioned tables (from the 2011 Census and earlier censuses) can be ordered from Census Customer Services. The supply of commissioned tables are subject to checking disclosure control and sufficiently protecting confidentiality. All commissioned tables are published on the ONS website under the Open Government Licence.

Corrections and updates

7.90 All 2011 Census statistical releases are rigorously quality checked in line with the ONS revisions and corrections policy. ONS may occasionally need to revise statistics and update information. In this event users are informed via Census News Alerts, notifications on the relevant website systems and by updates to a dedicated page on the ONS website.

Role of third parties and value added suppliers

7.91 The 2011 Census programme engaged with key users through the established Census Advisory Groups, and the census outputs team attended regular user forums organised by user communities in commercial, academic and local government sectors. These included:

- the Market Research Society's Census Geo-demographic Group, and the Association of Census Distributors which represents business users
- the ESRC/JISC census programme, which provides census data access and expert support to users in UK higher and further education through a series of data support units, and
- the Central Local Information Partnership, which enables central and local government to work together to develop efficient and effective statistical information

There has also been a close working relationship with the Greater London Authority, in particular with SASPAC - a service providing software to access and manipulate census data; frequently used in local authorities.

7.92 ONS collaborated with UK Data Service (UKDS) Census Support Services on the development of the INFUSE system that provides innovative access to 2011 Census aggregate data. This was developed to: help people easily find census information which meets their needs; enable users to understand the meaning and derivation of census information; and to deliver census information in forms that facilitate its use. To do this the UKDS team restructured the data in such a way that users no longer had to search many tables to locate their variable of interest. In addition, the data was tightly linked to the definitions of variables. The search and navigation were consequently much easier to use.

7.93 Census Support Services worked closely with ONS teams in the specification of UKDS origin-destination data and microdata samples (see paragraphs 7.73 to 7.81) and, as with the 2001 Census, continue to play a key role in the dissemination of that data through UKDS systems.

Comparisons with 2001 Census outputs

7.94 A key objective of the 2011 Census output programme was to meet users' requirements for statistical comparability with the 2001 Census results, so much effort went into the design of the questionnaire and wording of individual questions to ensure optimal comparability. Indeed, for most topics the 2011 Census outputs are directly comparable with those for 2001, and the trends over time are evident.

7.95 However there are inevitably some differences between consecutive censuses that result in some lack of comparability in some outputs. For the 2011 Census such differences arose mainly from:

- the extension of the enumeration base to include, and distinguish between, visitors and short-term UK residents
- changes to the topic content, and
- efforts to improve the design of the questionnaire itself

7.96 Questions were changed, removed or added for 2011 for a number of reasons:

- to improve accuracy of data collected
- to reflect changes in user requirements
- to reduce the level of respondent burden, making the questionnaire easier to complete, and/or
- to reflect changes in society and/or legislation

7.97 There were, for example, eight new topics – national identity, passports held, month and year of arrival in the UK, intended length of stay in the UK, second address, main language, number of bedrooms, and type of central heating – together with a number of changes to the content and design of questions on previous topics, such as:

- the addition of civil partnership categories to the marital status question
- the addition of new tick box response for 'Gypsy/Irish Traveller' and 'Arab' in the ethnicity question, and the reordering of some of the other response categories (such as 'Chinese'), and
- expanding the number of response boxes for, and revising the wording of, the question on limiting long term illness

Moreover, some topics included in the 2001 Census were dropped in 2011, such as the number of people working at the person's place of work, and the household's exclusive use of a bath/shower and/or toilet facilities.

7.98 Best practice in questionnaire design (from the experience gained from censuses and other social surveys) was taken into account when designing the questionnaire. This included minor instructional changes regarding tick-box guidance, the removal of 'please', or a change from numeric figures to words. Where appropriate, ONS aligned its census response categories to the Labour Force Survey, the General Household Survey and the Annual Population Survey as well as meeting the requirements of the disability part of the Equality Act 2010, the Civil Partnership Act 2004 and other legislation.

7.99 There were also some differences in the layout of the questionnaires in 2011 which now included:

- space for a sixth household member
- a two-column rather than three-column format for individual questions, to aid respondent navigation through the questionnaire, and
- the re-ordering of questions to meet routing needs

Topics were kept together where possible to make completion of the questionnaire easier and more intuitive for respondents.

7.100 ONS also decreased the number of write-in option response boxes to reduce the burden on respondents. For example, in 2011 the relationship matrix question on the continuation form was designed to reduce response burden. Respondents needed to state only their relationship to Person 1 (likely to be the household reference person) on the main questionnaire and those other persons on the continuation form. This made it easier to link the data from the continuation form to the rest of the data about the household.

7.101 To help users to be aware of these and other differences when comparing census figures ONS published a set of guidance documents on its website[56]. A copy of the 2011 household questionnaires is shown in Annex A and B.

Census analysis

7.102 In a strategic shift compared with previous censuses, a 2011 Census analysis programme was established to better meet user needs and to promote the understanding, interpretation and use of census data through the provision of timely and informative analyses. This programme was a significant advance over the 2001 Census, for which ONS analyses were generally limited in scope and often published some time after the relevant data release.

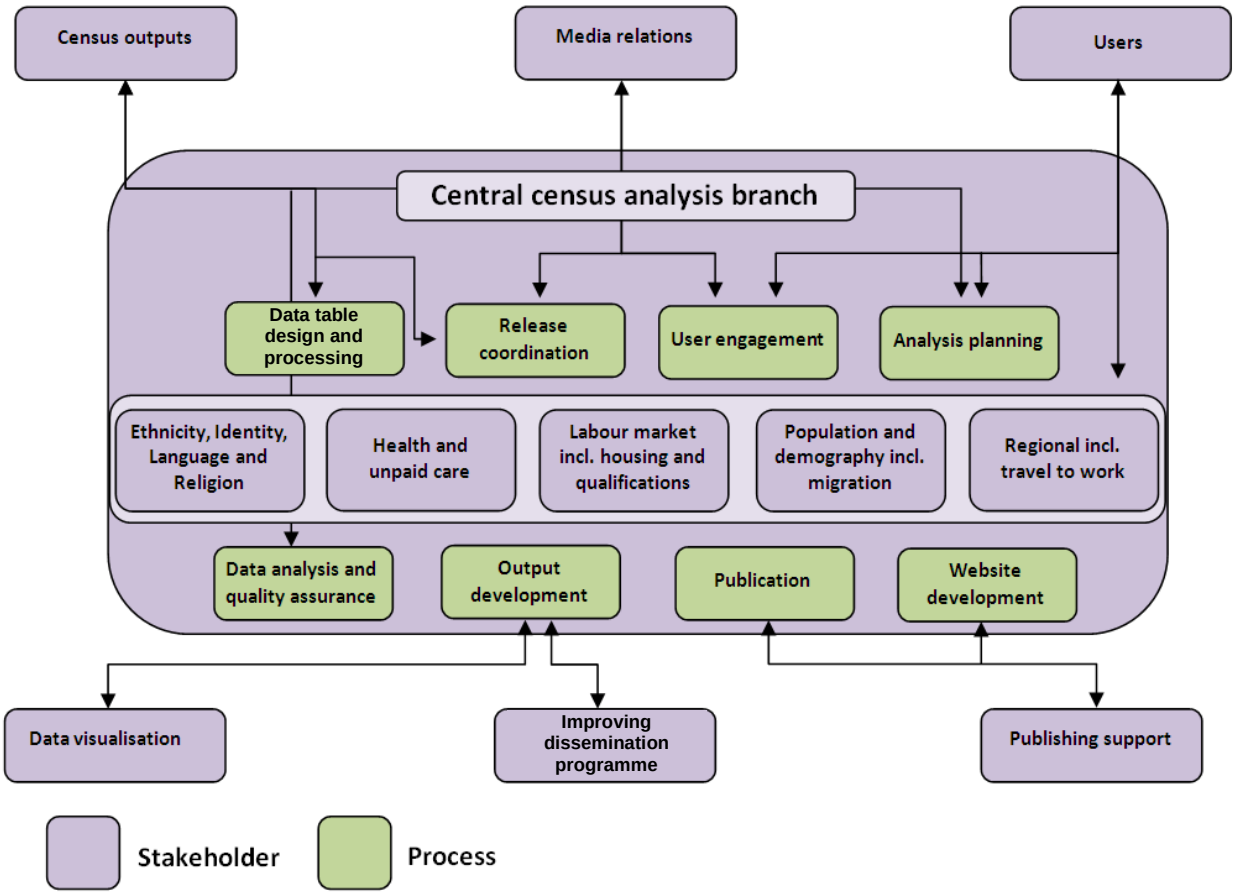
7.103 The 2011 Census analysis work programme was designed to meet user needs by publishing a variety of co-ordinated analytical products that:

- added value to census data outputs by helping users to understand and interpret census data
- co-ordinated analyses across ONS and with external researchers, and communicated a timetable for the production and publication of analytical work
- improved the standard of reporting and commentary across analytical outputs and used the census to improve other ONS outputs
- made geographical comparisons, comparisons with data from previous censuses, and comparisons with other data sources
- created additional information by linking to ONS surveys and other data sources, and
- produced more detailed analysis than could be done from other ONS surveys and to explain differences with these

7.104 This work programme was overseen by a central team in ONS which was responsible for the co-ordination, development, publication and timing of analytical outputs. This team had a close working relationship with the census team involved in specifying and producing the outputs in consultation with users. Theme business areas for analysis were determined by ONS on the basis of prior knowledge and expertise.

7.105 The structural and organisational framework of the census analysis programme is illustrated in figure 7.2. The programme involved a variety of processes to deliver analytical outputs and relied on good communication links between the central census analysis branch, analytical topic teams and stakeholders across ONS, and external users.

Figure 7.2 The structural and organisational framework of the 2011 Census analysis programme



7.106 From December 2012 each major release of census data was accompanied by at least one related analysis report. Publications that did not accompany specific census data releases were produced to a timetable designed to sustain interest in the 2011 Census by maintaining a flow of analytical releases. Where appropriate, publication dates were also timed to coincide as closely as possible with national events/campaigns such as carers week (10 - 16 June 2013), which was supported by ONS with a summary, video podcast and infographic detailing the extent of unpaid care across England and Wales.

7.107 Five main approaches were taken to producing analysis that showcased census data: stories, summaries, infographics, video podcasts, and interactive content. These are described in more detail below.

Stories

7.108 Stories were designed specifically for web publication. Each had a title that reflected content, ideally drawing out a key finding. The first page summarised the main findings of the analysis as a series of bullet points. Subsequent sections were accessed through a navigation pane featuring:

- a brief description of what the story was about and the context of the analysis

- a description of the findings of the analysis using charts, maps and other data visualisation tools and commentary, with hyperlinks to additional material, and
- brief descriptions of methods used and notes for consideration, including references to associated technical or metadata content

Summaries

7.109 Summaries were concise articles featuring only the key findings of a piece of analysis, and were used as accompanying material to analytical stories or released as standalone analyses featuring key points and background notes. *Unpaid care provision by 5 to 17 year olds* (published 4 June 2013) is an example of a standalone summary. This was produced rapidly in response to policy debate and discussion following census analysis of *Inequality in unpaid care provision* published three weeks earlier (16 May 2013).

Infographics

7.110 Infographics were graphical representations of the key findings of the analysis featuring some contextual or notational information, designed for accessibility and high utility for embedding in external websites. For example, an infographic looking at a century of housing that was embedded on the websites of both the *Telegraph* and the *Daily Mail* newspapers proved very popular.

*Video podcast*s

7.111 Video podcasts comprised short PowerPoint animations (less than five minutes) with audio explaining the key findings of the analysis. One example was the podcast relating to English language proficiency, which was hosted on the ONS website and on the ONS YouTube channel.

Interactive content

7.112 Interactive content included maps, charts and graphics that the viewer can manipulate to highlight areas of interest. For example an analysis of general health in England and Wales featured interactive maps allowing users to compare relative general health reporting in local areas between 2001 and 2011.

7.113 Excerpts from several analytical reports are given in chapter 9 to illustrate the range of analyses prepared, particularly for those topics included in the census for the first time.

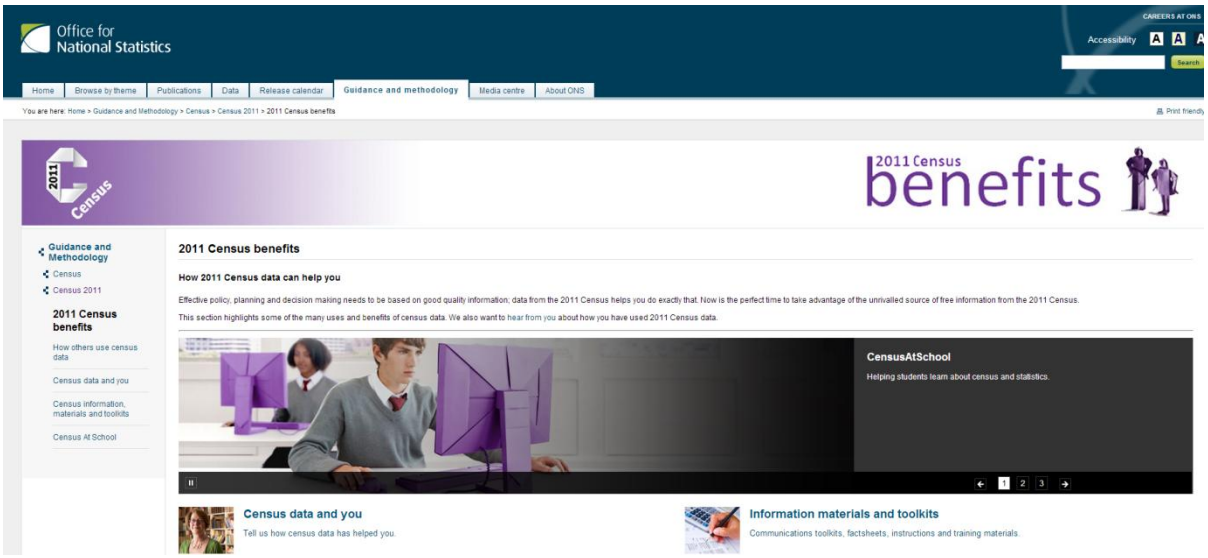
Widening the census user base

7.114 Making the 2011 Census accessible is paramount. However, widening the census user base is possible only when potential users are educated about how they can benefit from its data; potential new users also require help on how to access the data. Case studies are a good and easy way to showcase different uses and benefits of census data to potential new users.

7.115 The census benefits web pages (figure 7.3) illustrate how people/organisations can benefit from the 2011 Census by showing examples of the many ways of using census data and how different organisations from the private, public and voluntary

sectors also benefit. Furthermore, toolkits, factsheets and instructions to help get people started were made available to download.

Figure 7.3 Illustration of the 2011 Census benefits pages on the ONS website



Promoting the 2011 Census releases

Via the media

7.116 ONS hosted four press conferences/media briefings to promote the releases, in July and December 2012, and in January and May 2013. Press attendance included representatives from key national and broadcast media and this generated substantial media coverage in broadcast, national and regional print media and online from all events.

7.117 The 2011 Census featured extensively in the media, with over 300 pieces of coverage in the national media for the first release of data alone. The 2011 Census also continues to feed the public's insatiable appetite for history and about who we are as a nation. According to BBC Wales: "The census is the gift that keeps on giving", and as a journalist and academic recently put it: "The 2011 Census revealed a treasure-trove of facts we did not know about Britain".

7.118 This all helped to publicise the availability of the 2011 Census data and encourage census data use. By March 2014 ONS had 2.3 million page views for 2011 Census data online, more than 500,000 page views of the census analyses and over 600,000 page views of the census data visualisations.

Across the user sectors

7.119 The following are examples of the work done by the census team to publicise the 2011 Census data to various user sectors.

Government departments and wider public sector

7.120 ONS raised awareness of the census results across central government departments. The National Statistician updated under secretaries at their weekly

meeting prior to each of the first three major census releases, and an email was sent to each GSS Head of profession on the day of each key release. Regular email alerts were also sent out for each 2011 Census data release. In addition, ONS offered meetings to all key central government departments' research and policy teams to update users on the 2011 Census data releases and the topics covered. The 2011 Census results were also publicised in the Houses of Parliament *House Magazine*.

7.121 ONS wanted to ensure that other professions/professional functions in government also derived benefits from the 2011 Census data, including government communications professionals who could use them in audience segmentation/targeting and campaign planning. ONS therefore liaised with the Government Communication Service (GCS), part of the Cabinet Office, to publicise and educate users about the 2011 Census data availability. The GCS is the strategic centre for proactive government communication and works collaboratively with all central government departments and arm's length bodies on communication activities. Promotion of the 2011 Census data was through GCS speaker events, GCS website blogs and the cascading of census presentations through GCS alerts to government communication professionals.

Local authorities

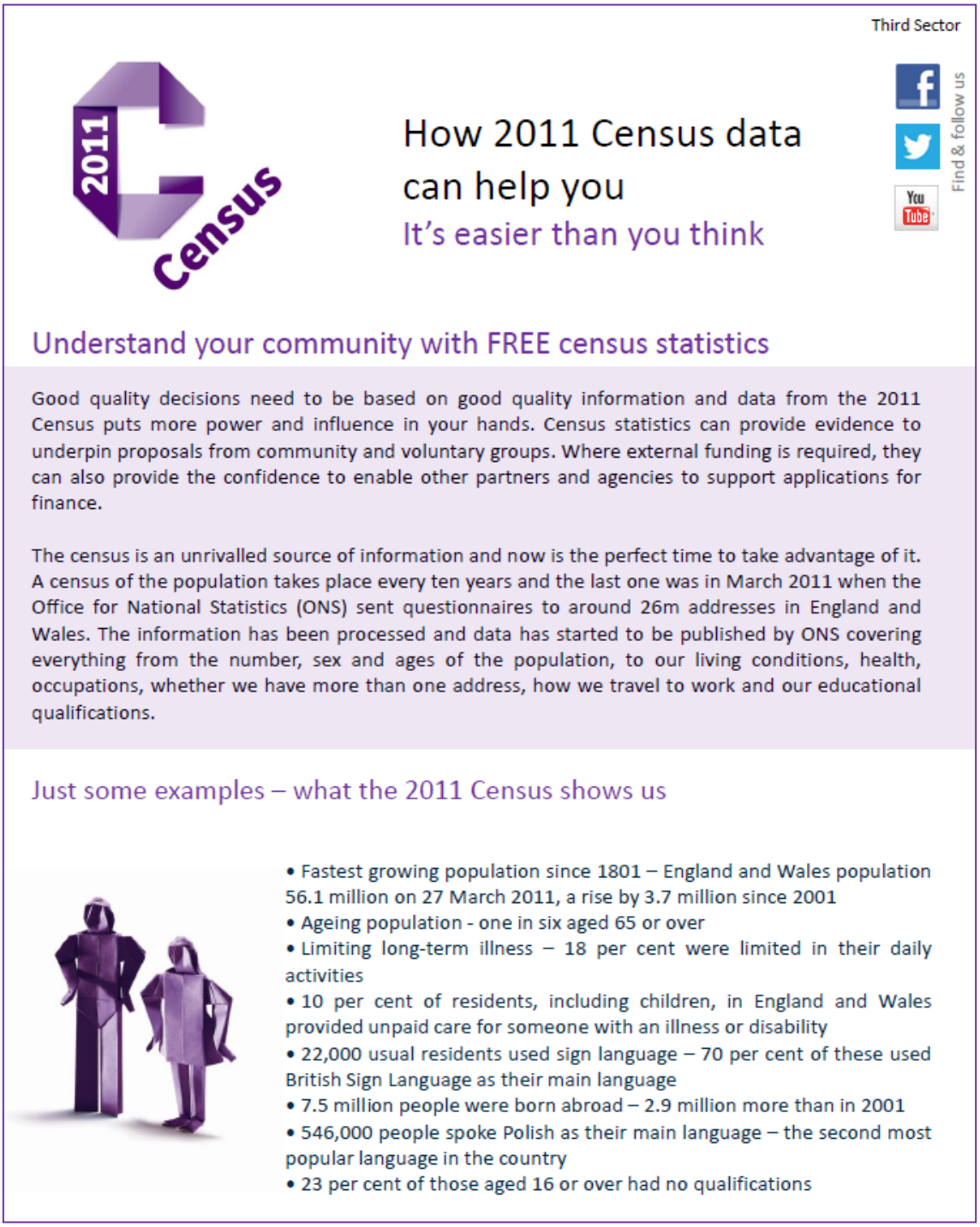
7.122 Well established channels were used to communicate the availability of census outputs to local authorities. ONS communications with the local authorities were done mainly through the dedicated local authority assistant census liaison manager/census liaison manager (see paragraphs 2.212 to 2.215). The use of newsletters, dedicated online forums, census alerts and roadshow events ensured that local authorities were able to keep abreast and informed of the 2011 Census.

7.123 ONS ran an extensive series of events to publicise the upcoming 2011 Census results and to give local authority users confidence in the quality of the results. This included census coverage estimation and QA methodology events in June/July 2012 and two series of roadshows in autumn 2011 and spring 2012.

7.124 For the first release of 2011 Census outputs, ONS emailed letters to a range of local authority users including local authority chief executives. Following the first release of the 2011 Census outputs in July 2012 engagement with local authorities has been through newsletters and census alerts at each release of data; messages were also posted on the Royal Statistical Society's Statsusernet forum and Local Government Association's KnowledgeHub. Many local authorities promoted the 2011 Census by having prominent articles on their websites about the results.

7.125 As well as being key users of census data, local authorities are an important route for ONS to promote census outputs to community groups. To this end the census team met with local authority outreach/community liaison teams to establish the data needs of teams such as the community liaison and planning sections of the authority partners. This helped with the development of factsheets and instructions to get people started, including user guides on how to use NeSS and nomis to access census data.

Figure 7.4(a) Information factsheet for outreach teams and community groups



Third Sector

Find & follow us

How 2011 Census data can help you

It's easier than you think

Understand your community with FREE census statistics

Good quality decisions need to be based on good quality information and data from the 2011 Census puts more power and influence in your hands. Census statistics can provide evidence to underpin proposals from community and voluntary groups. Where external funding is required, they can also provide the confidence to enable other partners and agencies to support applications for finance.

The census is an unrivalled source of information and now is the perfect time to take advantage of it. A census of the population takes place every ten years and the last one was in March 2011 when the Office for National Statistics (ONS) sent questionnaires to around 26m addresses in England and Wales. The information has been processed and data has started to be published by ONS covering everything from the number, sex and ages of the population, to our living conditions, health, occupations, whether we have more than one address, how we travel to work and our educational qualifications.

Just some examples – what the 2011 Census shows us

- Fastest growing population since 1801 – England and Wales population 56.1 million on 27 March 2011, a rise by 3.7 million since 2001
- Ageing population - one in six aged 65 or over
- Limiting long-term illness – 18 per cent were limited in their daily activities
- 10 per cent of residents, including children, in England and Wales provided unpaid care for someone with an illness or disability
- 22,000 usual residents used sign language – 70 per cent of these used British Sign Language as their main language
- 7.5 million people were born abroad – 2.9 million more than in 2001
- 546,000 people spoke Polish as their main language – the second most popular language in the country
- 23 per cent of those aged 16 or over had no qualifications

Figure 7.4(b) User guides on how to use nomis to get 2011 Census data

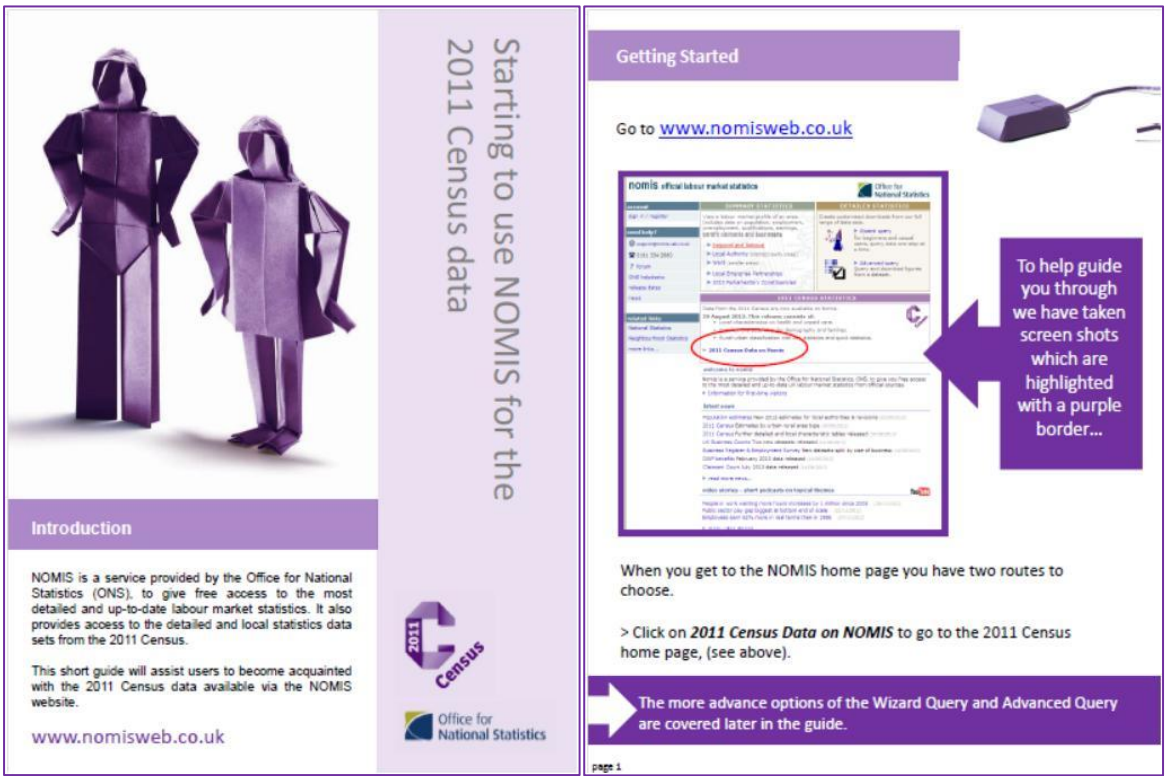


Figure 7.4(c) Example of a local authority publicising the 2011 Census results, Southampton City Council

Source: https://www.southampton.gov.uk/council-democracy/council-data/statistics/2011-census.aspx 13 November 2014.

Business and commerce

7.126 The benefits of census data to the private sector fall broadly into two categories. Firstly, they provide an intermediate input to the geo-demographic resellers and specialist consultants (such as specialists in local authority housing/planning issues) who, in turn, generate added value from it. Secondly, they help to inform the business decisions of a large and varied set of private sector users including market researchers, retailers, and financial service providers.

7.127 There are several million businesses in the UK; 99 per cent of them are small and medium sized enterprises (SMEs). Many businesses already benefit from census data, specifically in the sectors of market research, retailing, utilities and financial services. However, many more businesses could benefit from census data; potential applications include business planning and demand forecasting, audience segmentation and targeting, development of targeted products/services and market research.

7.128 Many SMEs are potential users but, some are likely to be unaware of the 2011 Census data availability and do not recognise how this freely available resource could benefit their business. Therefore the approach was to educate business and commerce about the potential census benefits and to give clear signposting to the 2011 Census data. Because of the size of this audience it is impossible to contact all organisations individually, but ONS was able to use existing communication channels to reach many of them.

7.129 ONS engaged with industry associations and partnership networks to reach and educate businesses about the benefits of census data. A network that reaches thousands of SMEs is the Local Enterprise Partnerships Network, which is made up of Local Enterprise Partnerships (LEP) across the country. LEPs are locally-owned partnerships between local authorities and businesses, and play a central role in determining local economic priorities and activities to drive economic growth and local job creation. Furthermore, the national LEP network is a gateway to news and information, and ONS used this communication channel to send information out to LEPs.

7.130 Similarly, the census benefits team engaged with representative organisations such as the Employer's Network for Equality and Inclusion (Enei), the Institute of Practitioners in Advertising (IPA), the Chartered Institute of Library and Information Professionals (CILIP), the Chartered Institute of Marketing (CIM), the Chartered Institute of Personnel and Development (CIPD), the Chartered Institute of Public Relations (CIPR) and the Chartered Institute of Linguists.

7.131 For example, Enei is a leading employer network covering all aspects of equality and inclusion issues in the workplace. Reaching predominantly larger businesses, Enei has over 250 corporate members in the UK and communicated key 2011 Census results on diversity – an important topic in human resources and personnel – to their members via news bulletins and Twitter throughout 2013.

7.132 Another use of 2011 Census data was by the Institute of Practitioners in Advertising (IPA). The IPA had previously used census statistics to highlight the changing population in the UK and in particular the increase of diversity in communities. Their census interest is in changing ethnicity and how diversity should be reflected in the industry's work force.

7.133 Many utility companies, both energy and water, are existing users of census data but there is potential for utility companies to use different types of census data. Engaging with industry associations enabled the census benefits team to reach a large number of potential users but also to understand the industry's census data needs. An example of this engagement is the census benefits presentation at the Chartered Institution of Water and Environmental Managers (CIWEM) Water Resources. Similarly, ONS also gave conference presentations to groups such as the housing associations/housing sector. The advantage of such targeted audiences was that it was possible to tailor the 2011 Census messages and make the benefits relevant to the specific audience.

7.134 Representative/membership organisations were also important intermediaries to reach individuals in specific industries/professions. Census editorial features in membership magazines and on websites helped to reach professionals with a potential interest in census data, including the Chartered Institute of Public Relations (CIPR) and the Chartered Institute of Linguists (figure 7.5).

Figure 7.5 Census article in the Chartered Institute of Linguists' magazine *The Linguist*

Emergency services

7.135 Emergency services across the UK use census statistics to allocate resources and plan services based on the local area's characteristics. The three main emergency services – fire and rescue, ambulance, police – represent a large body of potential census outputs users. The primary aim of statisticians in these services is to measure the efficiency of the operating organisations but they also assist in policy making. In order to understand each service, and the opportunities for engagement at a national level, ONS targeted two divisional organisations from each service. The objective was to promote the 2011 Census outputs and encourage their use, to understand the needs of each organisation for census data, and understand national organisations and get assistance in engaging with them.

7.136 As part of the work to widen the census user base among the emergency services community, ONS placed editorial features in relevant trade magazines, including *On the Bell* and *Ambulance Today* (figure 7.6).

Figure 7.6 Census article in *Ambulance Today* magazine

Third sector and community groups

7.137 There are more than 150,000 registered charities and over 360,000 voluntary organisations/groups in England and Wales. They range from well known national charities to very small local interest/support groups. Irrespective of their size many of these voluntary organisations are potential users of census statistics and can all benefit from using 2011 Census statistics.

7.138 Some larger charities are existing users of census data, but the 2011 Census operations showed that there was huge potential to widen the census user base in this sector to include many smaller and local voluntary organisations. The 2011 Census was very successful in raising awareness in this sector of the importance of participating in the census, and publicising the outputs was an opportunity for voluntary organisations to derive tangible benefits from the census. However, the size of the voluntary sector posed communication challenges, so ONS used direct communication channels and also communication via intermediaries to reach individual organisations.

7.139 The 2011 Census engaged with several umbrella organisations in the voluntary sector. Smaller charities and community groups were the most likely new users. They needed to be made aware of the availability of census data and educated about how their organisations could benefit from it. Many voluntary bodies were reached through organisations such as the National Council for Voluntary Organisations (NCVO), which has over 10,000 members. ONS also gave census presentations and held census workshops at the Royal Statistical Society and at the Social Research Association's event in June 2013. Umbrella organisations also helped to promote the census results among their members by agreeing to run census articles/content, including 2011 Census features in the NCVO members' bulletin and the small charities coalition members' email bulletin.

7.140 ONS had built strong relationships with many voluntary organisations leading up to census day, and 50 of the largest voluntary organisations were contacted directly to publicise the first release of census data and to advise them of the census release schedule. Depending on topic relevance to them, organisations were also advised about upcoming census topic releases.

7.141 Local authorities were also important intermediaries, because they have a good understanding of the voluntary sector in their area, and many of them have outreach teams who engage these local groups and can cascade important information/knowledge.

Equality and diversity

7.142 The 2011 Census explored the diversity of our society in great detail with questions on age, ethnicity, national identity, religion, passports held and main languages spoken. The information derived from these questions now provides one of the most detailed pictures of diversity across England and Wales and will help organisations, in the private and public sectors, to manage diversity issues more effectively.

7.143 Census diversity information is particularly relevant to human resources (HR) organisations, and ONS's approach to them was similar to that for the business and commercial sector engagement, liaising with professional associations and institutes such as the Advisory, Conciliation and Arbitration Service (ACAS) and the previously

mentioned CIPD and Enei. The advantage of communicating through these intermediaries is that large numbers of organisations and HR professionals can be reached. The census continues to liaise with HR intermediaries in promoting the 2011 Census through editorial features.

7.144 Examples of uses made of census data to promote equality and diversity include:

- The Equality and Human Rights Commission has a statutory role to monitor equality and human rights in British society and to monitor public authorities' compliance with the Public Sector Equality Duty. For the purposes of statutory reporting to Parliament and fulfilling international treaties, the Commission populates its Measurement Framework with data which allows the experiences of different groups to be compared. These groups comprise people who share one or more protected characteristics under the Equality Act 2010, which are: age, disability, gender, gender reassignment, marital and civil partnership status, pregnancy and maternity, race, religion or belief, sexual orientation, plus socio-economic group. The latest data from the 2011 Census was used to populate the Measurement Framework in three broad ways:

  1. measures of equality – comparisons between equality groups in relation to: overall health and disability, highest qualification, housing quality and living standards, employment and occupation
  2. population profiles – a baseline for comparison with other sources; also used for monitoring the size and distribution of equality groups and changes over time
  3. population profiles and measures of equality for specific populations – often used in vulnerable situations where their human rights may be at risk, for example: care home residents by age; children in care; Gypsies and Travellers; people with no permanent address, living in temporary accommodation, hostels or sleeping rough

- Similarly, the ESRC Centre on Dynamics of Ethnicity (CoDE) is concerned with understanding ethnic inequalities and identities in the UK and their variation over time and place. Its studies compare ethnic groups and their socio-economic, political and health situations. Examples of census analyses of ethnic inequalities are: the CoDE census briefings '*Dynamics of Diversity; and evidence from the 2011 Census*' that have been produced in partnership with the Joseph Rowntree Foundation. These briefings have been widely disseminated to academic, government and third sector audiences. These robust, detailed snapshots of the state of ethnic groups are considered extremely valuable for informing policy actions and for teaching.

Academic community

7.145 The census plays an important role in statistics and social sciences but many more university students could benefit from using census data in their studies. Census data are also relevant to subjects beyond the traditional social sciences (such as economics, politics, human geography) in areas such as business, management, marketing/communications, and media/journalism. The majority of business and communications university degrees have modules in market research and audience segmentation/ targeting where census data is of particular importance.

7.146 Students in social sciences already learn about the census in their degrees, and research bodies such as the Economic and Social Research Council (ESRC) promote the use of social science statistics, including census statistics. Consequently the approach of ONS was to target potential new users in the broad fields of business and communication with the aim to widen the existing user base of census statistics.

7.147 Communication through trusted intermediaries such as university course leaders and lecturers was identified as the best approach to reach a large proportion of the student population. ONS consulted several university course leaders in business and communications about how they use census data in their courses. This consultation also informed the development of information materials and instructions for university students.

7.148 Applications for census data identified in business/marketing studies included:

- audience segmentation/targeting and marketing research (such as sampling and analysis)
- population trend tracking (important in helping students to understand today's consumers and market place)
- understanding the relationship between 2011 Census data and the socio-economic classification NS-SEC

Applications identified in communications/journalism studies included:

- lower level geographic census data is essential and helps students to understand local communities and areas; census data in itself offers news stories for aspiring journalists. Similarly, communications/public relations students are interested in this data to develop well targeted local campaigns
- according to a university, 50 per cent of media/journalism graduates still start their careers in local/regional news media outlets. For them, detailed census data are an essential source of information to help them understand their local/regional audience and to tailor news stories accordingly

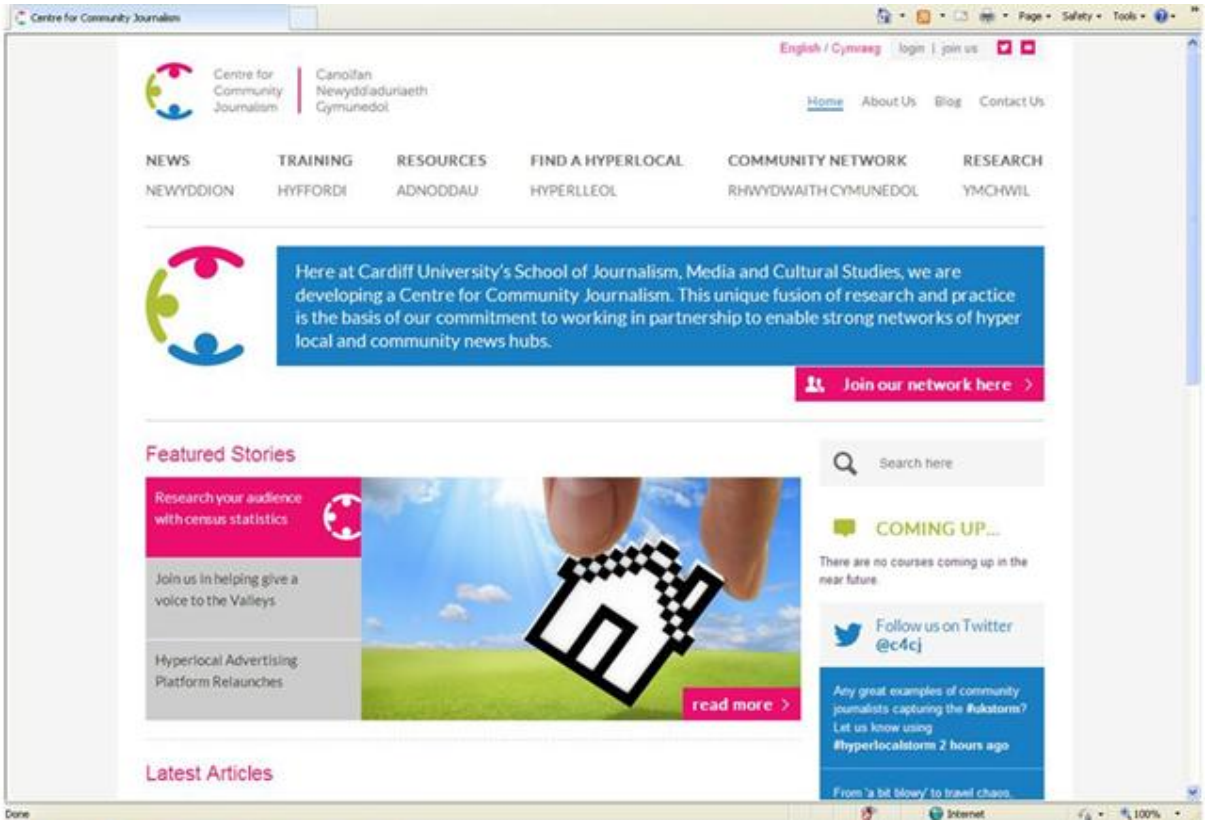
7.149 Academic staff agreed on the relevance of census data in studies and indentified 2011 Census uses to enrich their lectures and seminars; students will be more likely to be exposed to the 2011 Census in their lectures and course work. Following the engagement with universities, ONS finalised the information materials and instructions for 2011 Census statistics and made them available on the new web pages dedicated to census benefits.

7.150 Examples of how universities have since included the 2011 Census in their course modules for students include:

- a strategic marketing course leader included the 2011 Census in his lectures and included census tables in the strategic marketing course assignment
- Cardiff University ran the Centre for Community Journalism website (figure 7.7), which is the leading information resource for community journalists in Wales. It published a successful feature *'Research your audience with census statistics'*

- due to the success of this feature Cardiff University asked for a 2011 Census contribution to their 'Massive Online Open Course (MOOC), on Future Learn (MOOC platform in UK), which focuses on community journalism. The MOOC courses provide unlimited participation and open access via the web. In addition to traditional course materials such as videos, readings and problem sets, the courses provide interactive user forums supporting communities of students, professors, and teaching assistants. MOOCs are a recent innovation in distance education and Cardiff University attracted over 8,000 online students

Figure 7.7 Centre for Community Journalism website



7.151 As noted at paragraph 7.76, ONS also released a microdata teaching file aimed at encouraging use of statistics in the learning environments such as schools and colleges. The file has been promoted through CensusAtSchools and is freely available to download under the terms of the Open Government Licence from the ONS website. This may assist with the teaching of statistics and geography at GCSE and higher levels of education.

Conclusion

7.152 ONS started releasing data from the 2011 Census in July 2012 and since then has published more than 600 data sets, with over 8 billion cells of data. This compares with the 360 data sets from the 2001 Census, at the same relative time 10 years ago.

7.153 A number of new outputs have been possible through the collection of information from new questions on national identity, passports held, year of entry to the UK, period of intention to stay, language, and second addresses.

7.154 Online publishing has made census data more accessible than ever before to users and the general public, which has helped to widen the census user base. The ONS website with the www.ons.gov.uk/census census landing page plays a vital role – it is the online home for all census related content and information. It is a portal directing people not only to census data but also to statistical bulletins (summary reports of each individual census release), data visualisations, analyses and the 2011 Census prospectus. Due to the complexity and volume of 2011 Census data, it was hosted on three different platforms. To ensure ease of use, the census landing page guided people to the 2011 Census data, and depending on the type of data, to either the ONS Neighbourhood Statistics or nomis websites. Furthermore, technological developments enabled ONS to present data in more innovative ways, including infographics and data visualisations.

7.155 Infographics in particular are an effective way to summarise census data and highlight key insights. Similarly, products such as data visualisations allowed users to explore different variables and have more control over what they want to see. These technological advances have helped make 2011 Census data more relevant to people. This is reflected in their popularity with hundreds of thousands of people viewing and using these innovative online tools. National newspapers such as *The Guardian* are also enthusiastic users of these graphics on their own websites.

7.156 ONS also provided detailed analyses of census data on a variety of topics, to help expert and non-experts alike understand the stories behind the data. Focusing on the insights and trends, these census stories gave people alternative ways of understanding the potentially complicated subject matter.

7.157 Finally, digital technology enabled ONS to make the census more accessible to users and the wider general public. In particular, social media was an opportunity to engage with new audiences and the 2011 Census was promoted regularly via Twitter and YouTube.

Reconciling the 2011 Census and the mid-year estimates

7.158 One of the key purposes of taking a census is to provide a 'stock take' of the population by age, sex and geography. In the years between consecutive censuses ONS makes estimates of the population by age, sex and geography using the cohort component method. This takes the population at a point in time and ages it on one year, adds births, subtracts deaths, and accounts for internal migration flows, cross-border between England and Wales and the other countries of the UK, and international migration. While births and deaths are well measured through a vital registration system that has been operating since 1837, estimates of migration are based on a number of different sources. International migration to and from the UK is measured using a sample survey (the International Passenger Survey), with geographic distributions provided by administrative data. Internal and cross-border migration numbers are derived from administrative data.

7.159 Mid-year estimates are produced using an agreed high quality methodology. However, the complexity of migration data, which requires information about intention for international migration and contains sampling error, and the other elements of migration requiring timely interaction with General Practitioner services, mean that mid-year estimates at both the national, and particularly the local, level are likely to drift from the true population the further away they get from the census base.

Table 7.2 Comparisons between the mid-year estimates and the 2011 Census, England and Wales

thousands

	Estimates data		2011 Census data	Difference
1 Mid-year estimate rolled forward from 2001 to 2010, including migration improvements and then extrapolated to census day	55,548	As at census day	56,076	528
2 Mid-year estimate rolled forward from 2011 to census day, excluding migration improvements	55,612	As at census day	56,076	464
3 Mid-year estimate rolled forward from 2001 to census day, including migration improvements	55,600	As at census day	56,076	475
4 Mid-year estimate rolled forward from 2001 to mid-year 2011, excluding migration improvements	55,707	2011 Census rolled forward to mid-year	56,171	464
5 Mid-year estimate rolled forward from 2001 to mid-year 2011, including migration improvements	55,695	2011 Census rolled forward to mid-year	56,171	476

7.160 Comparing the 2011 Census results with the mid-year estimates (MYEs) reveals where the mid-year estimates have drifted. Table 7.2 shows the differences between the 2011 Census total and the MYEs. A number of different comparisons are possible at various points in time, including and excluding improvements made in the mid-year estimates methodology for distributing international immigration around the time of the census.

7.161 Overall the census found just under half a million more people than expected based on the mid-year population estimates rolled forward from 2001. The main explanation for this is likely to be errors in the measurement of international migration. However there may also be elements of the difference that relate to uncertainty around the 2001 and 2011 Census figures (see chapter 8 for more information on the statistical uncertainty around census figures). The following paragraphs highlight some of the key messages published in the various reconciliation documents produced.

7.162 Figure 7.8 shows how that difference is split by age and sex for row 3 of table 7.2 (results for other rows would look similar). It shows that around 240,000 more males and females aged 10 to 19 were found. Additionally many more adult women aged 20 to 40 were found. There were also more adult males, in particular age 30 to34 but also ages 50 to 64. However, the mid-year estimates had shown a surplus of young adult males aged 20 to 29.

Figure 7.8 Difference between mid-year estimates and 2011 Census by age and sex (positive = census > estimates)

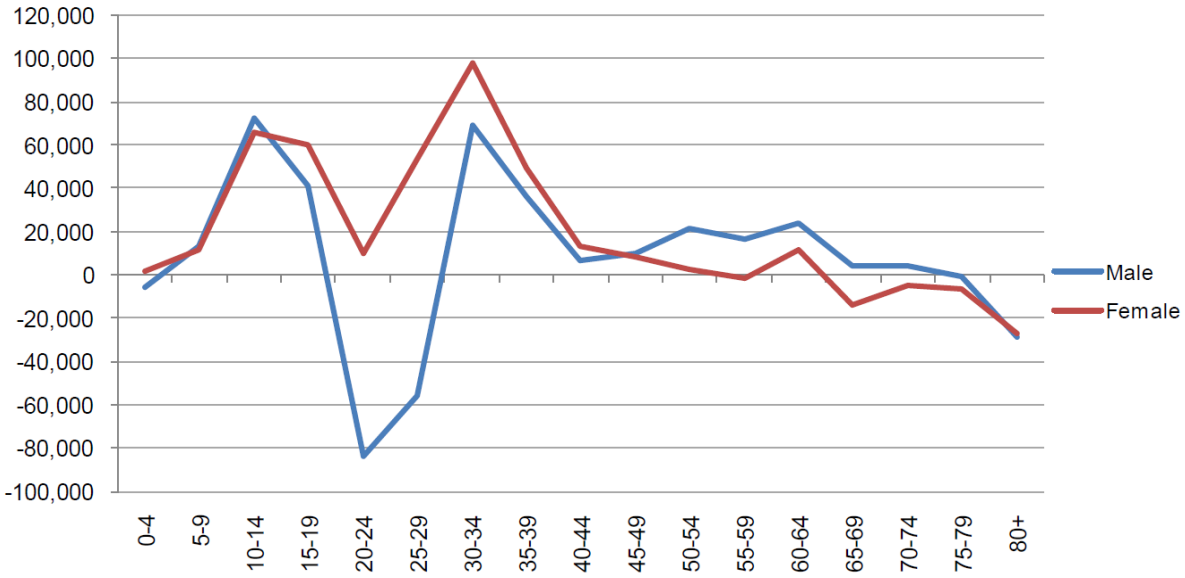
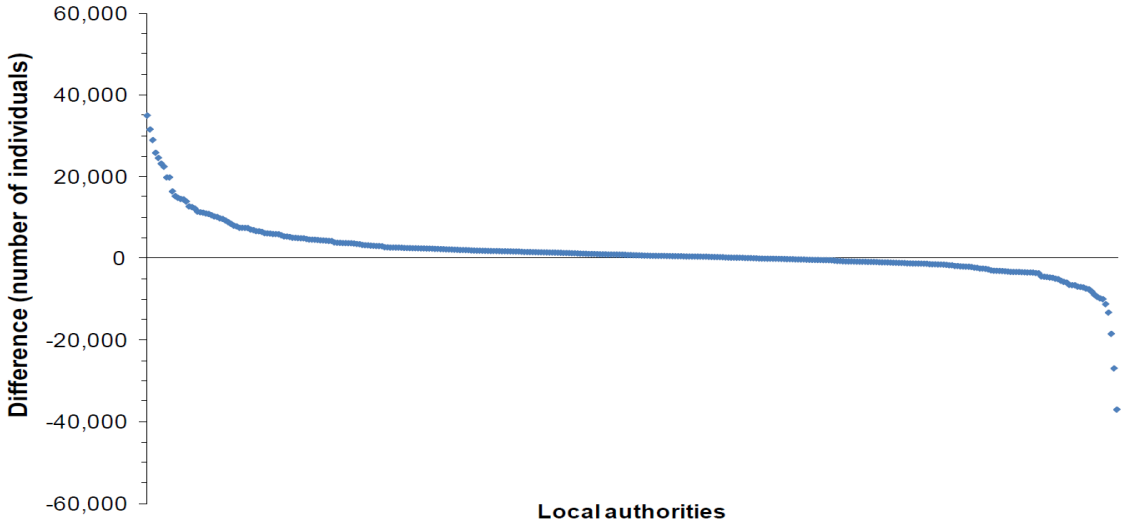


Figure 7.9 Comparison of ranked differences by local authority (positive = census > estimates)



7.163 Figure 7.9 shows the percentage distribution difference by local authority between the census estimates and the mid-year estimates for comparison row 3 in table 7.2, previous page. For the majority of LAs the difference between the 2011 Census estimate and the population estimate is relatively small, with 89 per cent of local authorities having a difference of less than 5 per cent, and 91 per cent of local authorities having a difference of less than 10,000.

7.164 After a census the mid-year estimates are rolled forwards from the new census base. An exercise is also carried out to rebase the mid-year population estimates back from the census to an appropriate point where the utility of making an adjustment is

justified. After the 2011 Census the decision was made to make adjustments back to mid-2002[60]. This compares with the decision after the 2001 Census to revise populations back to mid-1982.

7.165 Table 7.3 shows the how differences found between the rolled-forward population estimate from 2001 at mid-2011 and the mid-2011 estimate re-based from the 2011 Census were allocated to the components in the mid year estimates.

7.166 The specific components for which quantities were identified were allocated back over the intercensal years appropriately. The remaining other components of 134,500 was spread evenly over the years. It should be noted that the above numbers are net differences. The other category while reduced to a net 134,500, will be made of up positives and negatives by age and sex which sum to that net difference. However, 134,500 is a number not much larger than the confidence interval around the 2001 Census.

Table 7.3 Allocation of differences to components

Factor	Impact on difference	Remainder
Initial difference	n/a	464,200
EU8 immigration	250,000	214,200
Republic of Ireland migration roll-back	65,800	148,500
Migrant switcher roll-back	37,000	111,500
Visitor switcher roll-back	-7,500	119,000
Armed forces adjustment	-7,100	126,000
Cross-border migration correction	2,400	123,700
Mid-2009 asylum seekers and visitors switcher correction	-11,600	135,000
Removal of historic processing adjustments	800	134,500
Other	134,000	0

7.167 Further reconciliation work has taken place to look at the components of population change, in particular to look at which groups may have been underestimated. This concluded that:

- evidence shows that the IPS did not sufficiently identify migration of EU nationals between 2004 and 2008
- the improvements delivered to the IPS in 2009 were successful in adequately increasing coverage and improving the accuracy of the estimates
- there is no evidence to suggest that further changes in methodology are necessary to long-term international migration adjustments (LTIM) for intention to stay, and
- analysis of 2011 Census data on 'address one year ago' showed that LTIM estimates were lower for immigration flows for EU-born people but were higher for immigration flows for non-EU born people

7.168 Some evidence suggests that the IPS may not adequately identify migrant children aged under 15 years. Further investigation is planned for 2014 and will continue until data are available from Border Force systems to compare immigration flows with the IPS for this age group.

Chapter 8

Data quality

8 Data quality

Introduction

8.1 The quality of a census is about producing results that are fit for purpose and meet user requirements, ensuring that accurate and relevant results are produced to sufficient quality when they are required. Informing users about the quality of the data, and hence its limitations, is also crucial to aiding users' interpretation and understanding of the results. This chapter summarises the results of ONS's assessment of the accuracy of the 2011 Census.

8.2 The key measures of accuracy in a census are as follows:

Sampling error

- Where estimates of the population were based on a sample, they were subject to sampling error. ONS used confidence intervals to measure the sampling variability.

Non-sampling error

- *Coverage error*: is expressed as a response rate derived using information from the Census Coverage Survey (CCS) and the subsequent process of coverage assessment and adjustment to measure and adjust for under- and over-count (see paragraphs 5.60 to 5.64)
- *Non-response error*: occurred when respondents failed to answer all the questions or made errors in their responses, and is measured from the results of the edit and imputation process (see paragraphs 5.38 to 5.51). ONS used item non-response and item-imputation rates for the main census questions to assess item non-response error. This chapter focuses on item non-response
- *Measurement error*: occurred when respondents failed to provide correct information. ONS used results from a census quality survey (CQS) to measure the accuracy of respondents' answers to the census questions

8.3 This section focuses on sampling errors and the main sources of non-sampling errors. Not all of the non-sampling errors relevant in a census are covered here. For example, non-sampling errors arising from error in online response and coding; frame errors from the address register; and timing or recall errors (where not everyone is responding about the same day) are not discussed either because they are not major sources of error or because they cannot be measured.

8.4 More information about other standard dimensions of quality used by ONS (such as relevance, timeliness and punctuality, comparability, coherence, output quality tradeoffs, and assessment of user needs) are covered in more detail in an ONS *Census Quality and Methods* paper on the ONS website[61]. Some of these aspects are also covered indirectly in other chapters of the General Report. For example, relevance relates to how well the information relates to user needs; the section on questionnaire design (see paragraphs 2.72 to 2.94) outlines the extensive and thorough user consultation done by the programme to ensure that the information collected met user needs.

Accuracy of the census population estimates

Sampling error: confidence intervals around the census estimates

8.5 The 2011 Census built on the methods and processes used in 2001 to measure and adjust both for under-coverage (those people and households missed from the census count) and over-coverage (those people and households counted more than once). This measurement and adjustment process was called coverage assessment and adjustment (CAA) – see paragraphs 5.60 to 5.64.

8.6 The main success criteria for the CAA process centred on the degree of precision it could achieve in estimating the population from those who responded to the census when compared with a sample of respondents to the independent CCS– see chapter 4. Because the census estimates produced using the CAA process were based on the CCS sample, they were subject to sampling error. As with any sample, different people would be selected if the sample was randomly drawn again, and slightly different estimates would be produced based on this different sample. The spread of these estimates is known as the sampling variability, and confidence intervals are used to present the sampling variability. A 95 per cent confidence interval is a range within which the true population parameter would fall for 95 per cent of all possible samples that could have been selected. If an estimate has a large error level, the corresponding confidence interval will be very wide.

Table 8.1 Confidence intervals (95 per cent) for 2001 and 2011 Censuses, England and Wales

Census	Population estimate	95 per cent confidence interval (+/-)	Lower confidence interval	Upper confidence interval
2001	52,042,000	0.21%	51,932,700	52,151,300
2011	56,075,900	0.15%	55,992,900	56,158,900

8.7 Table 8.1 shows the 95 per cent confidence interval achieved on the population estimate for England and Wales for the 2011 and 2001 Censuses. It shows that the 95 per cent confidence interval achieved on the population estimate was +/- 0.15 per cent (83,000 people). That is, the true population count is expected to be within 83,000 of the published population estimate. This is an improvement over 2001 when the confidence interval was wider at +/- 0.21 per cent (109,300 people).

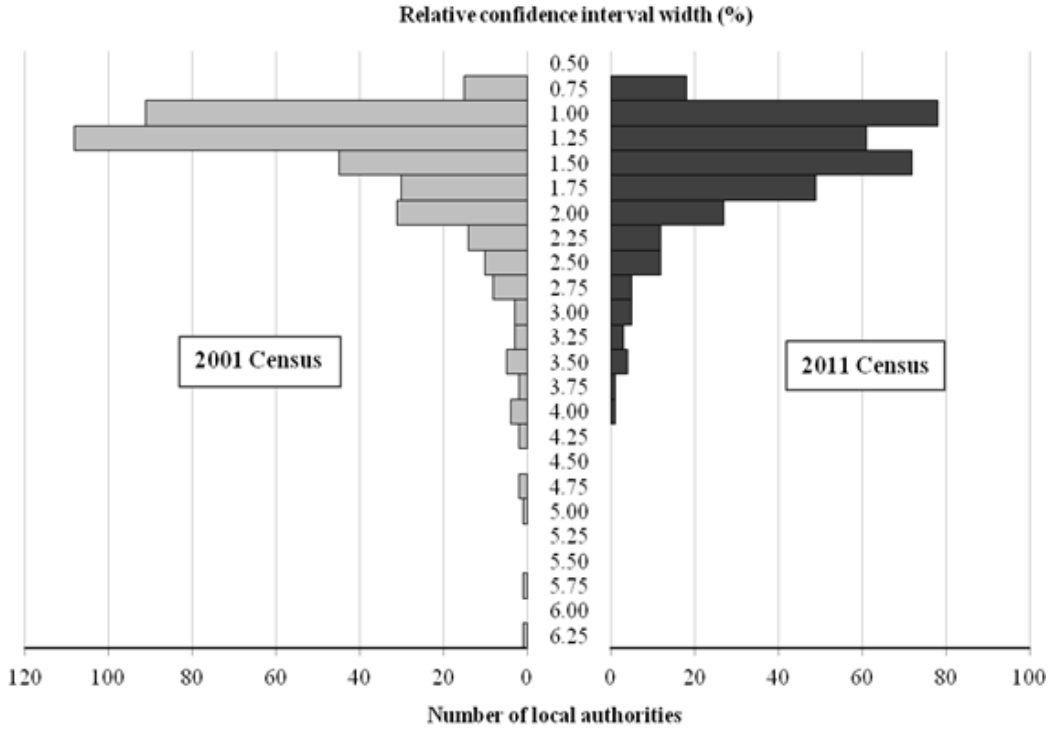
Confidence intervals around the local authority estimates

8.8 A key aim of the census was to produce robust, fit for purpose estimates at the local authority (LA) level, and this drove the design of the census. Robust estimates for LAs are important because this geography has the greatest use in policy planning and delivery of services, for example the allocation of resources from central to local government. This was interpreted to mean that the quality of the LA level estimates should be high, and the quality should not vary substantially across LAs (as they had done in 2001).

8.9 The sampling error associated with the 2011 Census estimates at the LA level depended on: the CCS sample size; the size of the population; the census response rate; the variability of the response rate within the LA; the CCS response rate; and the degree of similarity of the population that the error level related to.

8.10 As shown in figure 8.1, for the 2011 Census the range of relative 95 per cent confidence intervals for local authorities is considerably narrower than in 2001, ranging from an interval of +/- 0.6 per cent to +/- 3.8 per cent in 2011, compared with +/-0.6 per cent to +/- 6.1 per cent in 2001.

Figure 8.1 Distribution across local authorities of 95 per cent relative confidence interval width for the 2001 and 2011 Censuses



8.11 Table 8.2 summarises the proportion of LAs whose confidence interval fell within a particular range for both the 2011 and 2001 Censuses. In 2011 more than 97 per cent of LAs had a 95 per cent confidence interval of +/- 3 per cent or better, with the widest interval at +/- 3.8 per cent. That is, nine LAs (nearly 3 per cent of all LAs), had a 95 per cent confidence interval wider than 3 per cent compared with 21 LAs (5.6 per cent) in 2001.

Table 8.2 Percentage of LAs with their relative 95 per cent confidence intervals for the 2011 and 2001 Censuses, England and Wales

		Relative confidence interval						
Census	**Total LAs**	**+/- 1%**	**+/- 2%**	**+/- 3%**	**+/- 4%**	**+/- 5%**	**+/- 6%**	**+/- 7%**
2011	348	27.6	60.1	9.8	2.6	0.0	0.0	0.0
2001	376	28.2	56.9	9.3	3.7	1.3	0.3	0.3

8.12 Further reporting on confidence intervals for age, sex, ethnic group, activity last week and tenure, all by region or local authority, are available to download from the report *Confidence intervals for the 2011 Census*[62].

Response rates

8.13 As well as depending on the CCS sample size, confidence intervals are also dependent on the response rate to the main census; in particular the variability in response rates between areas.

8.14 Achieving narrow confidence intervals was not enough to deliver the quality estimates that users required, especially for small areas and small populations. Maximising overall response rates and minimising variation in response rates across population groups were also critical to ensure that there were no particular gaps in the population estimates. Therefore, reviewing response rates and variation in response helps to understand further the coverage of the census estimates.

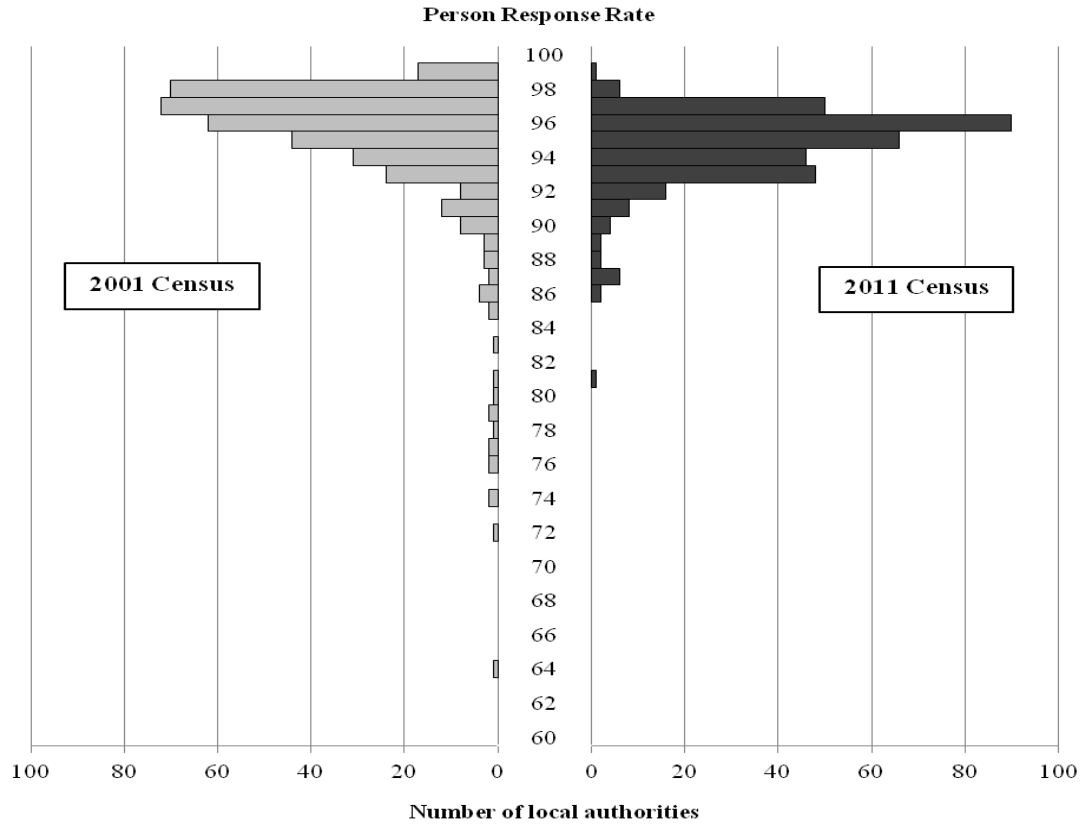
8.15 The overall response rate to the 2011 Census was 94 per cent. The 2011 CAA methodology was able to derive census population estimates that represented 100 per cent of the population, by using the CCS and other statistical techniques to estimate the numbers and characteristics of the people who were missed.

8.16 A response rate of 93.9 per cent indicates that an estimated 6 per cent of the total population of England and Wales did not respond to the census. In all, of the 56.1 million estimated people, about 3.8 million were thought to have been missed and subsequently adjusted for during data processing. This overall response rate of 93.9 per cent is slightly higher than the 93.7 per cent achieved in 2001. Note that after publishing census population estimates in 2001 there were further revisions to the estimate of non-responders which suggested a final post-census adjusted rate of 93.4 per cent.

8.17 As mentioned in paragraph 8.8, a key aim of the census was to produce robust, fit for purpose estimates at the LA level, and, in particular, to minimise the variation in response across local authorities.

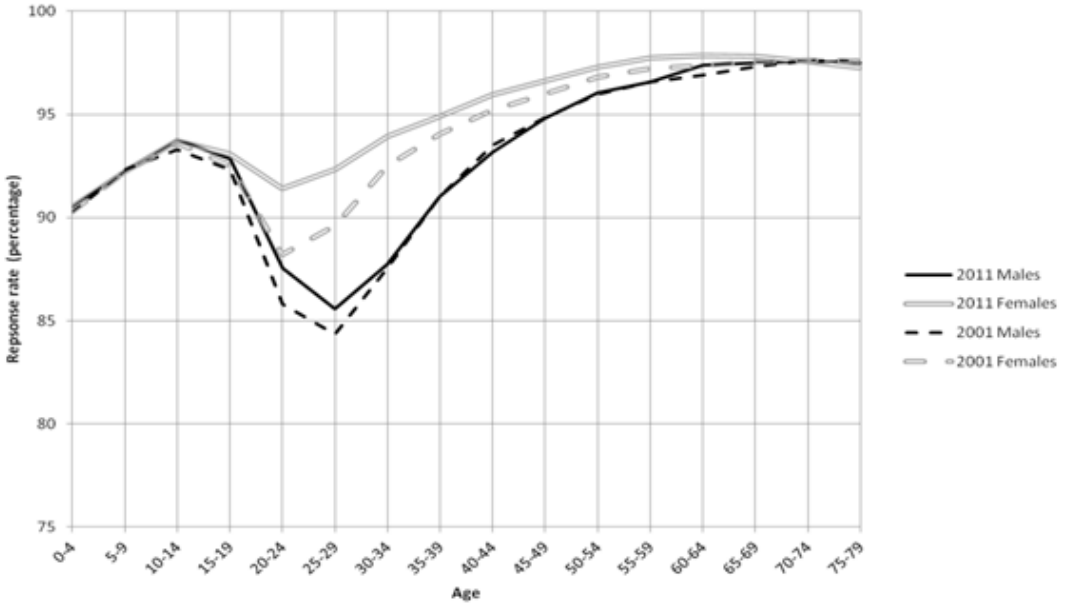
8.18 Figure 8.2 shows the distribution of response rates by LA for the 2001 and 2011 censuses. It shows a significantly reduced variation across LAs between the two censuses. In 2001 some 13 local authorities had response rates below 80 per cent and 38 below 90 per cent, whereas in 2011 response rates were over 80 per cent in all LAs, and in only 13 were they below 90 per cent – indicating that the 2011 Census was successful in achieving its aim.

Figure 8.2 Distribution of person response rates across local authorities, 2001 and 2011Censuses



8.19 Figure 8.3 compares age-sex response rates for the 2001 and 2011 Censuses. An aim for the 2011 Census was to ensure that the lowest response was as least as good as that achieved in 2001. In 2011, some 33 out of 36 age-sex groups (92 per cent) had response rates of 90 per cent or higher. All but one had a response rate of 87 or higher, with only males aged 25 to 29 with a lower rate (86 per cent). The figure shows that the 2011 Census was more successful at counting both young females and young males, especially those aged 20 to 29, to whom additional resources and priority was given during the enumeration. However, the differential response rate between males and females has widened in these groups.

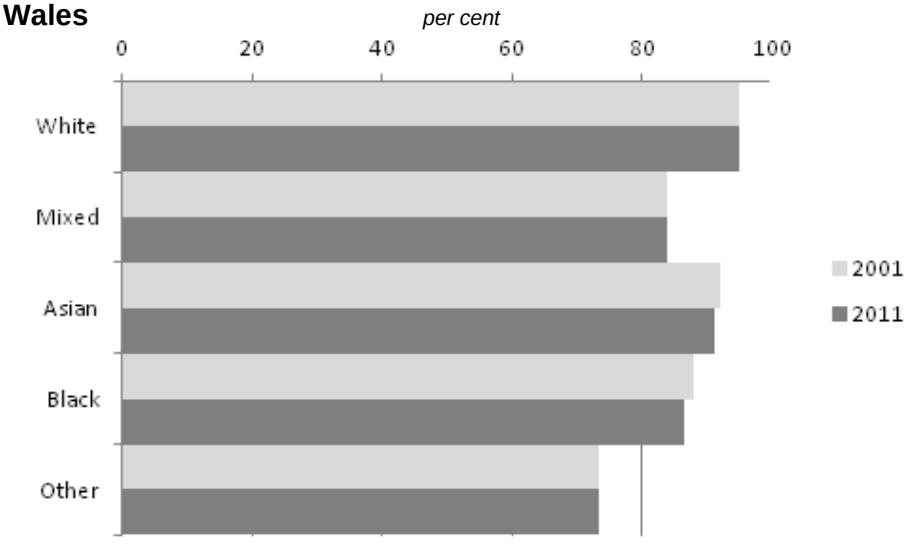
Figure 8.3 Response rates by five-year age group and sex group, 2001 and 2011 Censuses



Ethnicity

8.20 There was also an aim that response rates among ethnic groups should be better, or at least no less, than in 2001. Again the aim was to minimise the variation of levels of response among particular groups of the population. Figure 8.4 shows response rates for the main ethnic groups recorded in the 2001 and 2011 censuses. It shows that for each group there was very little difference between the 2011 and 2001 response rates, with the largest difference being in those who identified themselves as 'Black' (1.7 percentage points). However, it is worth noting that it is not possible to adjust the 2001 response rates by ethnic group to take account of the post-census adjustments. If this adjustment was possible, the 2001 response rates would be slightly lower, but would be unlikely to significantly alter the comparison.

Figure 8.4 Response rates by ethnic group, 2001 and 2011 Censuses, England and Wales



Non sampling error: accuracy of information collected

8.21 Another key objective for the quality of data was to provide the most accurate possible information about the structures and characteristics of the population of England and Wales. Meeting this objective mainly depended on a combination of high levels of completeness of the census questionnaires, and accurate responses to the individual questions on which information was collected. These two aims were assessed as follows:

- *levels of completeness* measured through item non-response rates (for example the rate of non-completion for a particular question, such as 'sex', on a returned questionnaire) as derived from the start of the edit and imputation process, and
- *measurement error* as measured through the CQS, in which a sample of respondents to the census were re-asked the census questions in a face-to-face interview, and their answers compared with their responses in the census to derive measures of agreement

Assessing the completeness of census responses: item non-response rates

8.22 A key user requirement for the 2011 Census was that the census database should be as complete and consistent as possible. To meet this need, as in 2001, an edit and imputation system was developed to estimate missing or invalid responses and correct inconsistencies in the data, while at the same time preserving the relationships between variables (see paragraphs 5.38 to 5.51).

8.23 Completeness is an indirect assessment of how well the self-completion census questionnaire was designed. High levels of completeness indicate that the methods and effort put into qualitative and quantitative testing of individual groups of questions and then the whole questionnaire were successful and had a positive impact on maximising completeness and the accuracy of responses. Other key factors which contributed to completeness were: the online help available for both those that completed their questionnaire online and for respondents who used the paper form; the availability of the contact centre to answer questions by phone; and the support and guidance of collectors on the doorstep. Completeness was assessed by measuring how many responses to each census question were missing as a proportion of all of the people who should have responded to that question (but not including persons and whole households that were missed).

8.24 Item non-response includes all responses that were missing or not valid, including multi-ticks, out-of-range values and partially answered responses. Item imputation was applied to estimate for a missing value when there was item non-response or where there were inconsistency errors. The latter were where correctly recorded values were considered invalid because they were inconsistent either with other values on the questionnaire, or with auxiliary information or definitions. Inconsistency errors were detected by validating the data against a set of pre-defined edit rules. For example, the rule which stated that a person aged less than 16 cannot have a qualification would have flagged a record where a person was recorded as being aged five but with a university degree.

8.25 Item non-response rates for the main census questions are shown in Table 8.3. Item non-response rates for the household questions ranged from 2.3 per cent for 'tenure of household' and 'number of cars and vans' to 3.6 per cent for 'type of central heating'. All household questions had item non-response rates lower than in 2001,

apart from the question on central heating where the rate increased from 2.2 per cent to 3.6 per cent.

8.26 For individual questions, the item non-response rate showed wider variation ranging from only 0.4 per cent for 'sex' to 14.5 per cent for the new question on 'intention to stay'. Other notably high item non-response rates were for the 'workplace postcode' (12.5 per cent) and 'year last worked' (10.9 per cent). Of the 43 variables shown, 35 (81 per cent) had an item non-response rate of 5 per cent or less.

8.27 The item non-response rates for the majority of questions were lower or very close to the 2001 rates apart from 'workplace postcode' (4.7 percentage points higher), 'marital status' (3 percentage points higher), and 'schoolchild/student indicator' (2 percentage points higher). However, it is worth noting that there are some differences in the way non-response rates were calculated between the two censuses. The overall message that there has been less non-response in 2011 than in 2001 does not change. But the 2001 results were measured after the application of some hard edits which means that for some questions they will underestimate the level of non-response. There were considerably fewer hard edits applied in 2011 than in 2001.

Table 8.3 Item non-response rates, 2001 and 2011 Censuses, England and Wales

	2001 Census			2011 Census		
	Total* (000s)	Non-response		Total* (000s)	Non-response	
Census questions		(000s)	Rate (%)		(000s)	Rate (%)
Household questions						
Type of accommodation	22,305	671	3.0	22,877	583	2.5
Self contained	22,305	870	3.9	22,877	638	2.8
Number of rooms	20,542	1,117	5.4	22,877	710	3.1
Number of bedrooms	-	-	-	22,877	600	2.6
Central heating	20,383	442	2.2	22,877	821	3.6
Tenure	20,383	685	3.4	22,191	508	2.3
Type of landlord	5,954	175	2.9	7,718	215	2.8
Number of cars or vans	20,383	554	2.7	22,191	501	2.3
Individual questions						
Age	49,359	262	0.5	53,483	319	0.6
Sex	49,359	199	0.4	53,483	225	0.4
Marital/civil partnership status	49,359	372	0.8	53,483	2,052	3.8
Second address indicator	-	-	-	53,483	1,486	3.5
Type of second address	-	-	-	3,274	219	6.8
Schoolchild/student	49,359	622	1.3	53,483	1,745	3.3
Term-time address indicator	-	-	-	11,607	159	1.4
Activity last week	-	-	-	43,041	2.172	5.1
Relationship to person 1	28,065	971	3.5	30,335	1,203	4.0
Country of birth	48,848	1,211	2.5	52,791	800	1.5
Arrival in the UK	-	-	-	6,858	326	4.8
Intention to stay	-	-	-	594	86	14.5
National identity	-	-	-	52,791	1,023	1.9
Ethnic group	48,848	1,405	2.9	52,791	1,595	3.0
Welsh language	2,754	151	5.5	2,861	96	3.4
Main language	-	-	-	52,791	1,328	2.5
Proficiency in English	-	-	-	3,929	142	3.6
Religion	48,848	3,721	7.6	53,068	3,759	7.1
Usual address one year ago	48,848	2,198	4.5	52,150	2,004	3.8
Passport held	-	-	-	56,754	1,315	2.3
General health	48,484	1,525	3.1	52,791	853	1.6
Provision of unpaid care	48,848	2,967	6.1	52,791	1,855	3.5
Long-term health/disability	48,848	1,899	3.9	54,791	1,675	3.2
Qualifications	35,367	2,187	6.2	43,041	2,433	5.7
Ever worked	-	-	-	17,787	316	1.8
Year last worked	-	-	-	14,433	1,569	10.9
Employment status	33,686	2,205	6.5	39,687	1,582	4.0
Occupation (working)	21,741	694	3.2	25,255	578	2.3
Supervisor status	33,686	2,294	6.8	39,687	1,711	4.3
Industry (working)	21,741	1,702	7.8	25,255	1,813	7.2
Workplace postcode	22,396	1,744	7.8	20,371	2,548	12.5
Method of travel to work	22,533	1,410	6.3	25,255	796	3.2
Hours worked	22,533	1,804	8.0	25,255	854	3.4

* The total columns refer to the number of household or people in scope for each particular question

Assessing measurement error: Census Quality Survey (CQS)

8.28 Measurement errors in individual data can occur during the data collection stage of a census. Measurement error can be introduced by poorly designed questionnaires, field staff errors or respondent error.

8.29 The 2011 Census questionnaire was carefully designed and tested to reduce the likelihood of measurement error. Testing had determined the appropriate content and design for the questionnaire based on consultations with experts into design and format, as well as the assessment of public acceptability. Features aimed at reducing measurement error included:

- clarity of questions and the provision of clear instructions on the questionnaire
- the exclusion of sensitive questions, such as income
- careful ordering of the questions to avoid any context effects (which can occur when respondents answer an identical question differently depending on where on the questionnaire it was asked)
- keeping the average time taken to fill in the questionnaire to a minimum to reduce burden
- a written assurance of the strict confidentiality of any information collected

8.30 The CQS was a voluntary survey carried out across England and Wales after the 2011 Census. It aimed to measure the accuracy of answers given to census questions by asking a sample of households the census questions again in a face-to-face interview. By comparing the responses given in the CQS to those given in the census, agreement rates were calculated which provided an indication of how accurately the 2011 Census questionnaire had been completed by the general public. Along with other quality information published about the 2011 Census, the CQS results are intended to help users understand the strengths and limitations of the 2011 Census data and how to use them appropriately. Table 8.4 shows the agreement rates for individual and household questions.

Table 8.4 Agreement rates between 2011 Census and Census Quality Survey, individual and household questions

Census questions	2011 CQS agreement rates (per cent)	2011 CQS confidence interval width (+/- percentage points)
Household questions		
Type of accommodation	91.6	0.8
Self-contained	98.6	0.3
Number of rooms	66.5	1.3
Number of bedrooms	91.4	0.8
Central heating	90.2	0.8
Tenure	95.0	0.6
Type of landlord	87.6	1.8
Individual questions		
Age	98.4	0.3
Sex	99.7	0.1
Marital/civil partnership status	98.1	0.3
Second address indicator	97.1	0.4
Schoolchild/student	97.6	0.3
Term-time address indicator	98.9	0.5
Activity last week	91.2	0.6
Country of birth	99.1	0.3
National identity	60.4	1.4
Ethnic group	94.7	0.8
Main language	96.3	0.7
Religion	90.4	0.9
Usual address one year ago	95.5	0.6
Passports held	91.8	0.7
General health	68.2	1.2
Provision of unpaid care	90.9	0.7
Long-term health/disability	88.9	0.7
Qualification	67.6	1.0
Ever worked	94.4	0.7
Year last worked	55.0	1.5
Employment status	94.7	0.5
Occupation (highest)	67.5	1.0
Supervisor status	86.2	0.7
Industry (section code)	74.2	0.9
Workplace postcode	82.2	1.1
Method of travel to work	85.5	0.9
Hours worked	83.9	0.9

8.31 The CQS found that agreement rates ranged from 99.7 per cent for the question on 'sex' to 55.0 per cent for the question on 'year last worked'. The extent of agreement varied depending on the type of question: whether it was objective or subjective; whether it was answered by tick box or free text; and how many response categories it had.

8.32 More detailed analyses of the CQS are available from the report *2011 Census Quality Survey* which is downloadable from the ONS website[63].

Conclusion

8.33 Various indicators of data quality have been presented in this chapter that were used to guide the 2011 Census programme in its design and decision making. The overall aim of these indicators was to do at least as well as similar measures in 2001. In summary:

- 95 per cent confidence interval achieved on the population estimate was +/- 0.15 per cent (83,000 people), much narrower than the confidence interval in 2001 of +/- 0.21 per cent (+/-109,300 people) indicating more accurate population estimates (see paragraph 8.7)
- In 2011, 97 per cent of local authorities had a 95 per cent confidence interval of +/- 3 per cent or better, compared with 94 per cent of local authorities in 2001 (paragraph 8.11)
- The overall response rate for England and Wales in 2011 was 93.9 per cent, slightly better than the 2001 overall response rate of 93.7 per cent (paragraph 8.16)
- All local authorities had a response rate above 80 per cent and only 13 had a response rate below 90 per cent, compared with 2001 where 13 local authorities were below 80 per cent and 38 were below 90 per cent (paragraph 8.18)

8.34 Based on these indicators the overall aim to maintain or improve data quality compared with 2001 has been very successful. Bearing in mind the trend of declining response to, and participation in, social surveys and previous censuses over the last three decades, these were challenging targets which the census has met.

Chapter 9

Summary of results

9 Summary of results

Introduction

9.1 This chapter brings together some analysis and commentary from the 2011 Census to give a feel for the richness and variety of the census as a data source. It is not intended to provide a fully balanced summary of the census output programme as a whole.

Demography

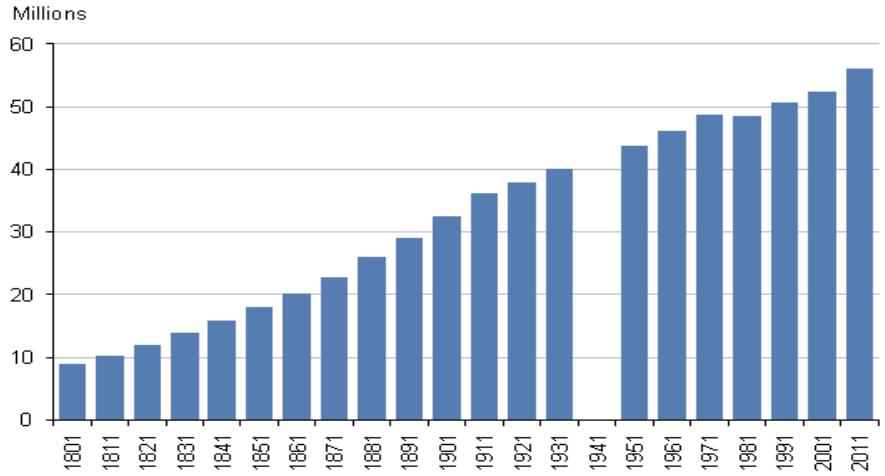
Population

9.2 The population of England and Wales in 2011 was 56.1 million, the largest this population had ever been; of the total, 53.0 million people (94.5 per cent) lived in England and 3.1 million people (5.5 per cent) lived in Wales. There were 27.6 million men and 28.5 million women.

9.3 Since 2001 the England and Wales population had increased by 3.7 million, an increase of 7.1 per cent. This was the largest growth in population numbers in a 10-year period since the first census in 1801 (figure 9.1).

9.4 The population of England had increased by 3.6 million (7.2 per cent) since the estimate of 49.5 million in 2001; the increase in Wales was 153,000 (5.3 per cent).

Figure 9.1 Population, 1801-2011, England and Wales



Note : No census was held in 1941 due to the Second World War.

Population density

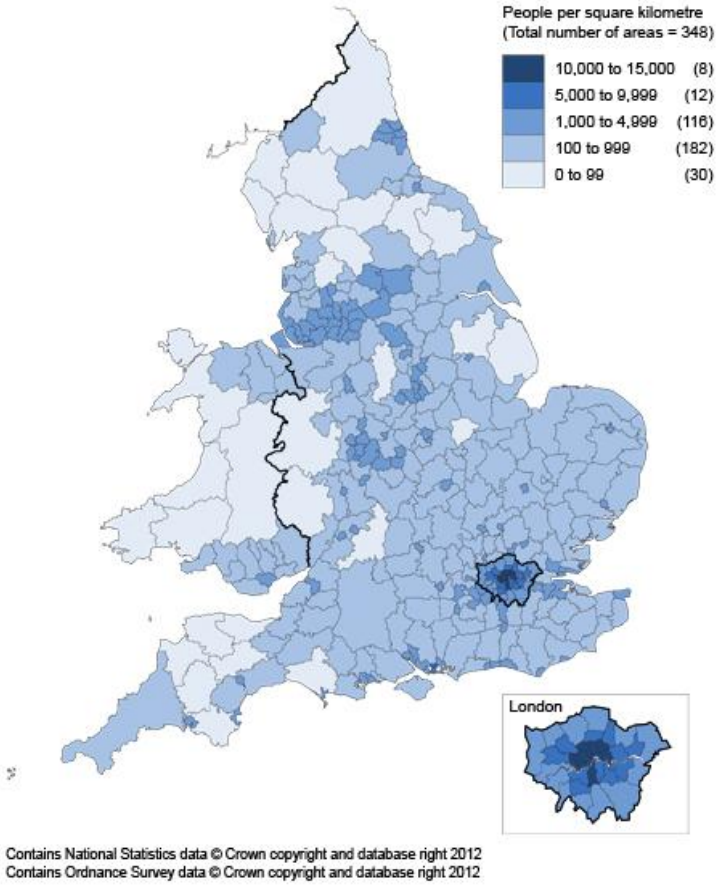
9.5 In England and Wales there were 371 residents per square kilometre compared with 239 in 1911, 305 in 1961, and 347 in 2001. If the figures for the London region were excluded, the average population density for the rest of England and Wales was 321 people per square kilometre.

9.6 However, population density varies geographically. When the average population densities for England and Wales are calculated separately, there were 407 and 148 residents per square kilometre respectively for the two countries.

9.7 The difference between the two countries is in part due to the very high population density of the London region with 5,199 residents per square kilometre, or 14 times the England and Wales average. All other regions in England had population densities ranging between 222 and 500 residents per square kilometre, with the average being 349 people per square kilometre in England excluding London.

9.8 The 19 most densely populated local and unitary authorities in England and Wales were all London boroughs (figure 9.2). The only non-London area in the top 20 was Portsmouth. The least densely populated London area was Bromley, with 2,061 residents per square kilometre; this was still over five times the population density of England and Wales as a whole.

Figure 9.2 Population density, 2011 England and Wales local and unitary authorities



Short-term residents

9.9 In 2011 there were an estimated 195,000 short-term residents (STRs) in England and Wales on census day, (the equivalent of 35 STRs per 10,000 usual residents). A STR was defined as anyone living in England and Wales who was born outside the UK and who intended to stay in the UK for a period of between three and 12 months, for any reason. The 2011 Census was the first time these data were recorded.

9.10 The age breakdown of this population is much younger than the usual resident population, with nearly 70 per cent aged 15 to 29 compared with 20 per cent of usual residents (figure 9.3).

9.11 The top 10 countries of birth for STRs in England and Wales accounted for 52 per cent of the total STR population. The highest ranking countries were India and China with 11 per cent of STRs being born in each country, followed by the United States and France with 5 per cent each (figure 9.4). Together, these four countries contributed nearly a third of the STR population in 2011.

Figure 9.3 Age distribution of non-UK born short-term residents compared with usual residents in England and Wales, 2011

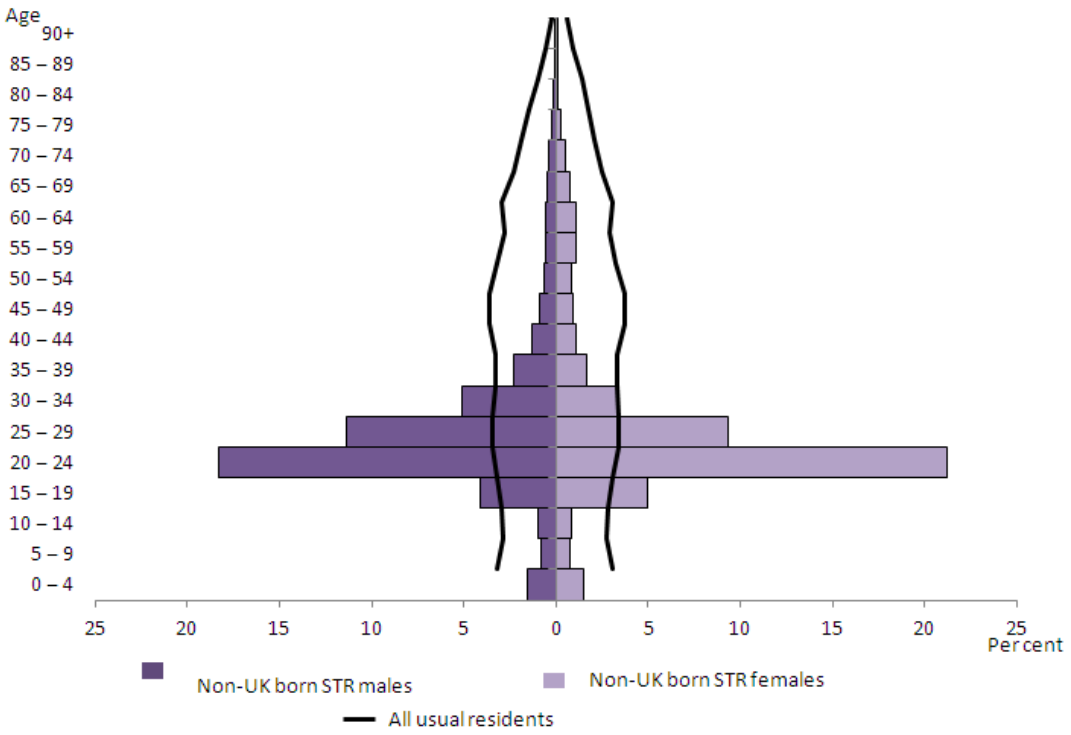
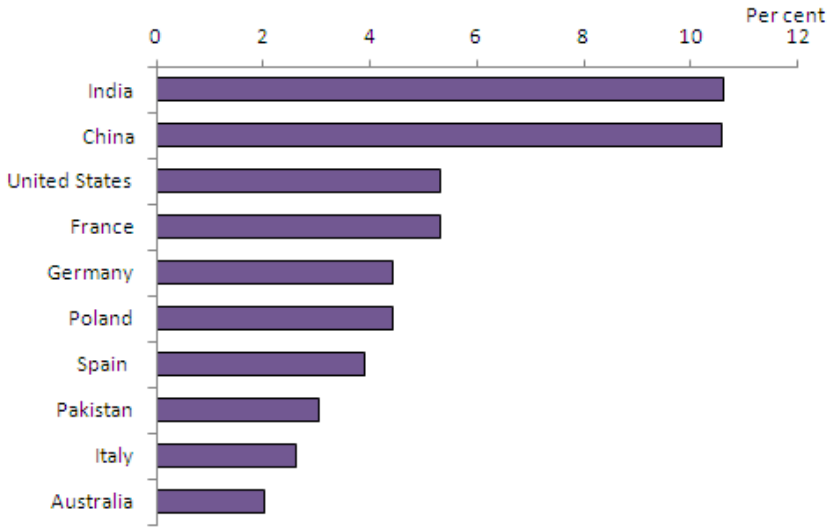


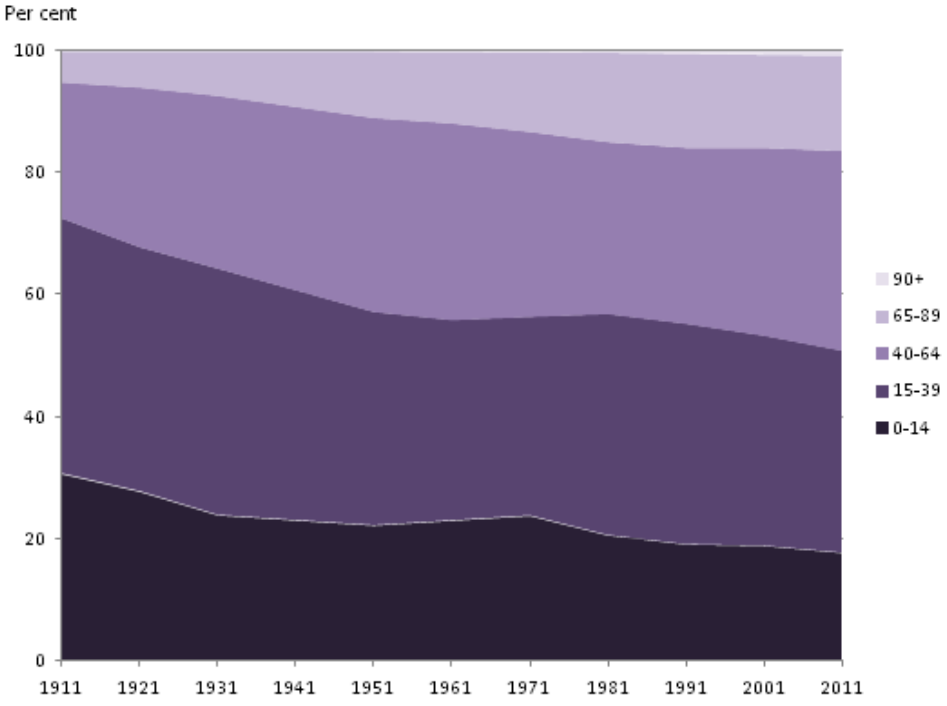
Figure 9.4 Top 10 countries of birth for short-term residents in England and Wales, 2011



Sex and age structure

9.12 People in England and Wales were living longer in 2011 than they did 100 years ago. This can be seen in figure 9.5 which shows the decreasing proportion of the population aged under 15 and the increasing proportion aged 65 and over. The percentage of residents aged 65 and over (16.4 per cent or one in six) was the highest seen in any census of England and Wales.

Figure 9.5 Population by broad age groups, 1911-2011, England and Wales



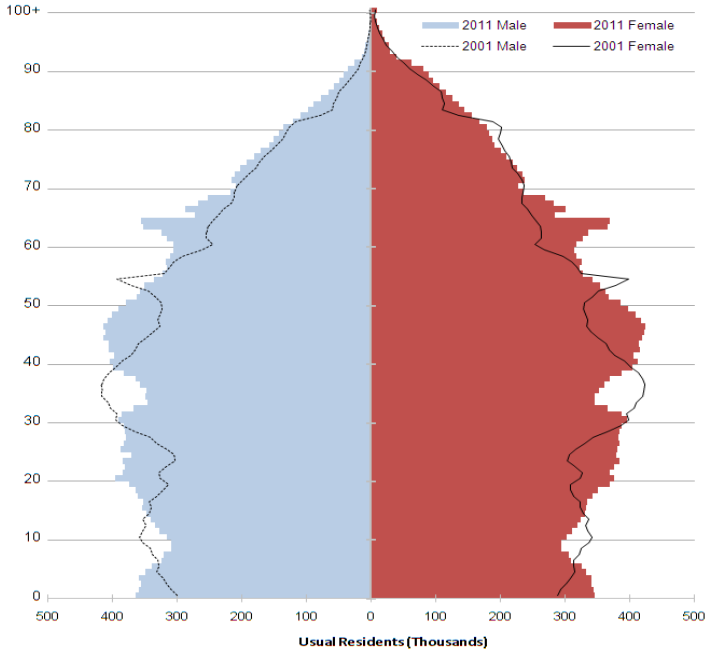
9.13 There were 430,000 residents aged 90 and over in 2011, compared with 340,000 in 2001 and 13,000 in 1911.

9.14 In 2011 there were 3.5 million children under five in England and Wales, 406,000 more than in 2001.

9.15 The change in the broad composition of the population from younger to older can also be seen in the rise of the median age of the population, from 25 years in 1911 to 35 in 1961, and to 39 in 2011. In 2011 the median age for men was 38 and 40 for women. The rise in median age would have been more marked if there had not been growth in the younger age groups as a result of migration.

9.16 The structure of the population as defined by its age and sex can be visualised using a population pyramid. The overall shape of the pyramid for 2001 and 2011 (figure 9.6) confirms an ageing population as shown for example, by the numbers of people aged 85 and over being generally higher in 2011 than in 2001, particularly for males.

Figure 9.6 Population by age and sex, 2001 and 2011, England and Wales

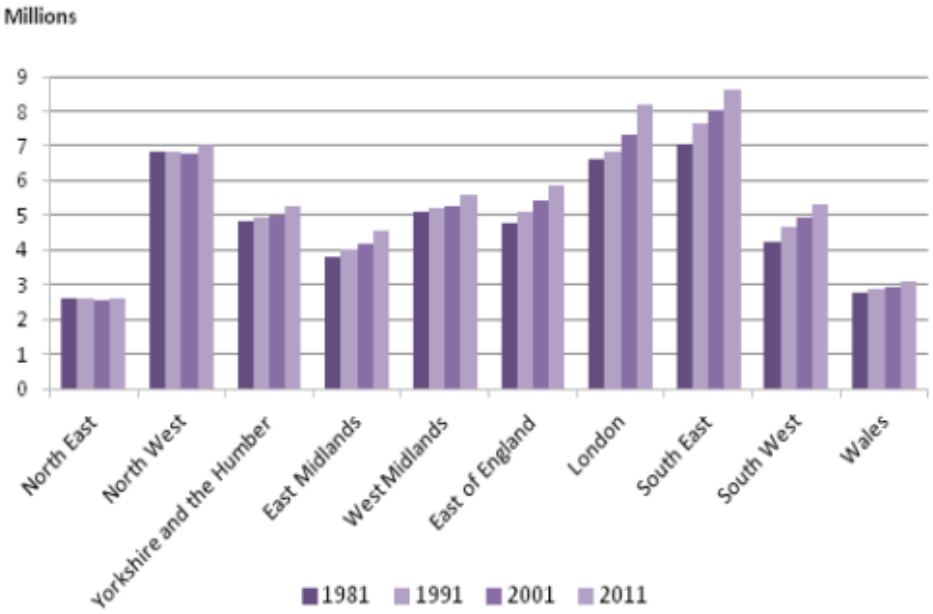


Regional change

9.17 Between 1991 and 2001, seven of the nine regions in England grew in population size, while the North East and North West declined. Between 2001 and 2011 all regions experienced population growth. Indeed, the population size of all regions, apart from the North East and the North West, increased every 10-year period between 1981 and 2011 (figure 9.7).

9.18 The highest population growth between 2001 and 2011 was in the London region, which gained more than 850,000 residents, an increase of 11.6 per cent. The South East of England also experienced large growth: 611,000 residents (7.6 per cent). The lowest increase was in the North East, which nonetheless gained 56,600 residents in the 10 years since the last census, an increase of 2.2 per cent.

Figure 9.7 Population by region, 1981-2011, Wales, English regions



9.19 In 1981 the South East had the largest population, and the second largest was the North West. By 2001 the population of London was larger than that of the North West. In 2011, the South East remained the region with the largest population, while the North East had the smallest population throughout.

9.20 These differences in rates of growth may relate to the movement both of international and internal migrants towards London and the South East. Furthermore, areas with older populations are likely to have relatively more deaths and fewer births (figure 9.7).

Full-time students

9.21 In 2011, seven per cent (3.7 million) of usual residents aged 16 to 74 reported that they were full-time students. This is a two percentage point increase from 2001, when there were 2.6 million students.

9.22 In the census, students are considered to be resident where they live during term-time. In all regions, except London, between five and seven per cent of usual residents aged 16 to 74 were full-time students. In London, however, this figure was nine per cent (700,000).

9.23 Students can be either economically active (employed or unemployed) or economically inactive (not looking for work). In 2011 some 29 per cent (1.1 million) of full-time students aged 16 to 74 reported that they were employed; nine per cent (334,000) reported that they were unemployed, and 62 per cent (2.3 million) were economically inactive.

Marital and civil partnership status

9.24 The introduction in 2005 of civil partnerships in England and Wales, led to a change in the profile of marital status data since 2001. In analyses of marital and civil partnership status users should note that the categories shown in figure 9.8 are not

wholly comparable between 2001 and 2011. However, because the number of civil partnerships at the time of the 2011 Census was relatively few the overall patterns of change are not significantly affected.

9.25 Some 47 per cent (21.2 million) of the resident adult population were either married or in a civil partnership in 2011. This was a decrease of four percentage points by comparison with the 2001 Census estimate of 51 per cent (21.2 million). In 2011 there were 105,000 (0.2 per cent) adults in civil partnerships.

9.26 Of all the marital status categories the greatest increase between 2001 and 2011 was for single people. Single people (those never married or never in a civil partnership) numbered 15.7 million (35 per cent) in 2011, an increase from 12.5 million (30 per cent) in 2001.

Figure 9.8 Marital and civil partnership status of the resident adult population in England and Wales, 2001 and 2011

9.27 The only status category to show a numerical decline was widowed or surviving civil partner (falling by 8.8 per cent between 2001 and 2011); a possible explanation for this may lie with rising life expectancy, especially for males.

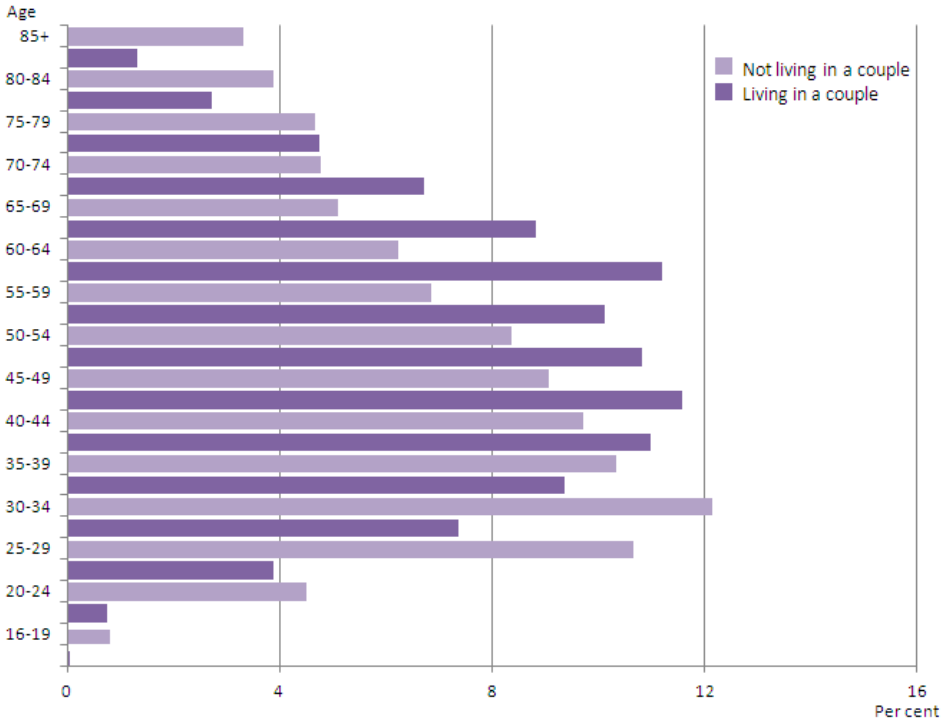
Living arrangements

9.28 In 2011, 46 per cent of the household population aged 16 or over (20.4 million) were living together as a married couple, a decrease from 51 per cent (20.6 million) in 2001. Such couples comprised 96 per cent of the total married household population in 2011 compared with 98 per cent in 2001.

9.29 In 2011, some 3.7 per cent of those who were married or in a civil partnership in households (785,000) were not living with their partner. Of these, 82 per cent (640,000) reported that they were not living in a couple, while the remaining 18 per cent (145,000) were cohabiting with a different partner.

9.30 Figure 9.9 shows the difference in age distribution between those who were married and living together and those who were married and not living together as a couple. Those cohabiting with someone other than their spouse are excluded. Those married and not living together as a couple have a younger age structure: 38 per cent were under 40, compared with 21 per cent of those who were living in a couple. This may reflect the incidence of people living separately for employment purposes.

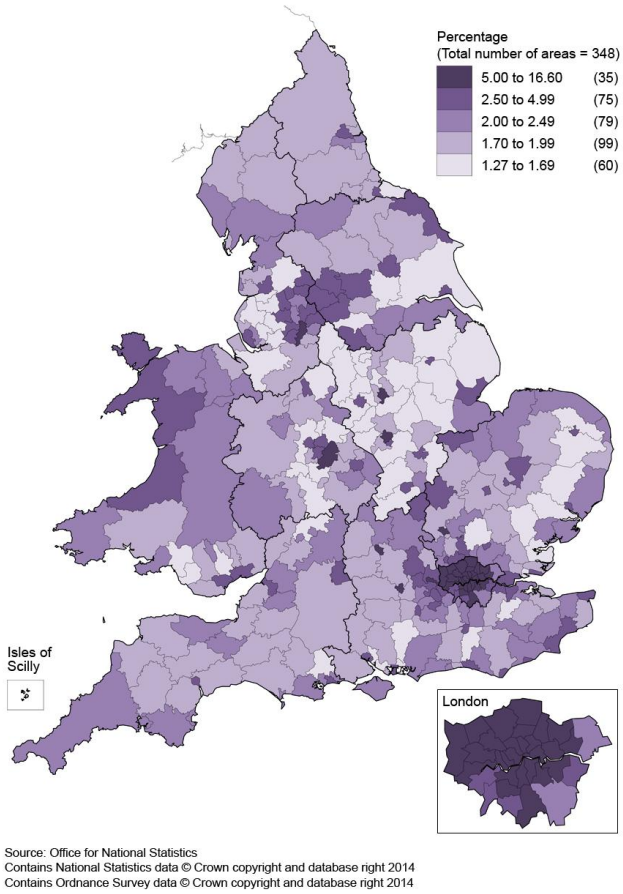
Figure 9.9 Age distribution of the adult household population who were married or in a civil partnership, by living arrangement, in England and Wales, 2011



9.31 Figure 9.10 shows by local authority, the percentage of the married adult population not living in a couple. The highest concentrations of those either married or in a civil partnership and not living as a couple were in London, with the highest percentage in the City of London (17 per cent). Slough, Manchester, Leicester and Luton were the highest ranking areas outside London, with Cardiff ranking highest in Wales.

9.32 These large urban areas are likely to have high proportions of married people living apart from their partner due to work. Some of these areas, such as Newham, Brent and Leicester, also have high proportions of their population born in South Asia who have migrated to the UK, but whose spouses may still live abroad. Some 23 per cent of people in Newham were born in Southern Asia (indeed, a total of 54 per cent of the population living there were born abroad), while 16 per cent of people in Brent were born in Southern Asia (and where a total of 55 per cent of the population were born abroad).

Figure 9.10 Percentage of the married population aged 16 and over who were not living in a couple (not separated), by local authorities, 2011

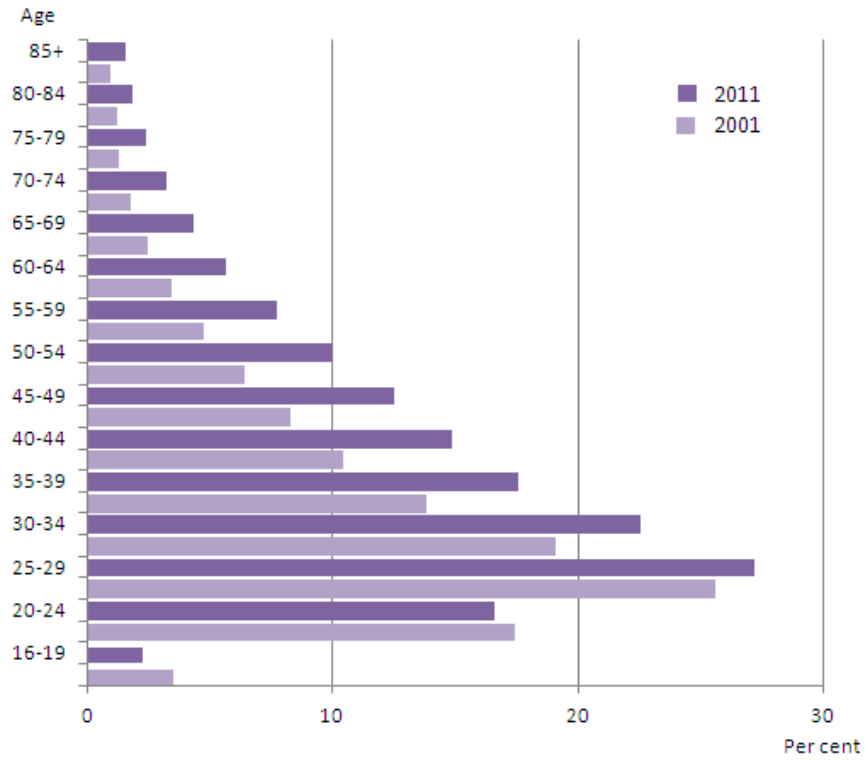


Cohabitation

9.33 In 2011, cohabiting couples accounted for 12 per cent (5.3 million) of the adult household population in England and Wales (5.3 million), compared with 9.8 per cent (4.1 million) in 2001.

9.34 In both 2011 and 2001 the largest cohabiting group was those aged 25 to 29 (figure 9.11). However the proportion of all cohabiting people who are in this age group declined from 22 per cent (862,000) in 2001 to 19 per cent (1.0 million) in 2011, as a result of increasing proportions in older age groups.

Figure 9.11 Age distribution of the adult household population who were cohabiting in England and Wales, 2001 and 2011



9.35 Table 9.1 lists the 10 local authorities with the highest and lowest proportions of persons cohabiting in the adult household population. The local authorities with the highest proportions of the population cohabiting were Norwich, and Brighton and Hove (both at 16 per cent), with the rest distributed across England. These areas correspond closely with the high proportions of persons reporting 'no religion' in the census. Eight of the 10 areas with the lowest proportions were London boroughs, and these areas tended to have low levels of people reporting 'no religion'.

Table 9.1 Local authorities with the highest and lowest proportions of cohabiting adults, and percentage of persons reporting no religion, 2011

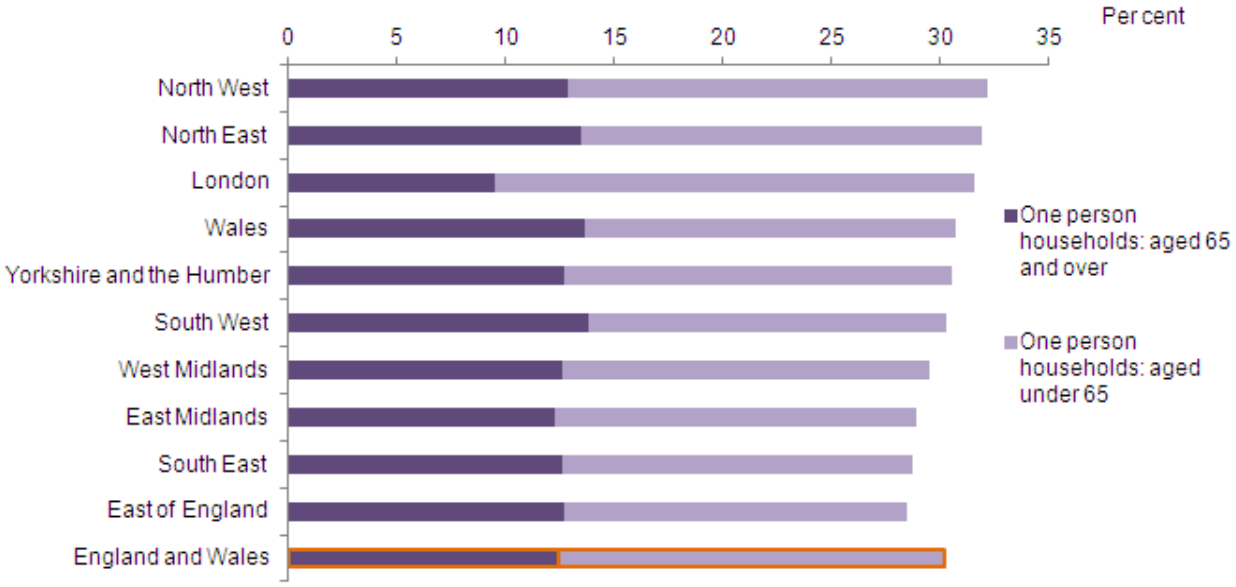
Highest ranked local authorities (proportion cohabiting)	Percentage of adults cohabiting	Percentage of population reporting no religion	Lowest ranked local authorities (proportion cohabiting)	Percentage of adults cohabiting	Percentage of population reporting no religion
1 Norwich	16.3	42.5	1 Harrow	5.7	9.6
2 Brighton and Hove	15.9	42.5	2 Redbridge	6.9	11.0
3 Lincoln	15.8	32.6	3 Newham	7.5	9.5
4 Corby	15.5	33.3	4 Brent	7.6	10.6
5 Kingston upon Hull	15.4	34.8	5 Barnet	8.3	16.1
6 Ipswich	15.2	35.0	6 Endfield	8.4	15.5
7 Islington	15.2	30.0	7 Chiltern	8.8	23.6
8 Wandsworth	14.9	27.0	8 East Dorset	8.8	24.2
9 Hastings	14.6	36.6	9 Ealing	8.9	15.0
10 Cannock Chase	14.6	23.7	10 Hillingdon	9.1	17.0

One-person households

9.36 There were 23.4 million households in England and Wales in 2011 with an average of 2.4 residents per household. Some 7.1 million (30 per cent) consisted of one-person households. This is an increase from 2001 when there were 21.7 million households, with 6.5 million (30 per cent) consisting of one-person households.

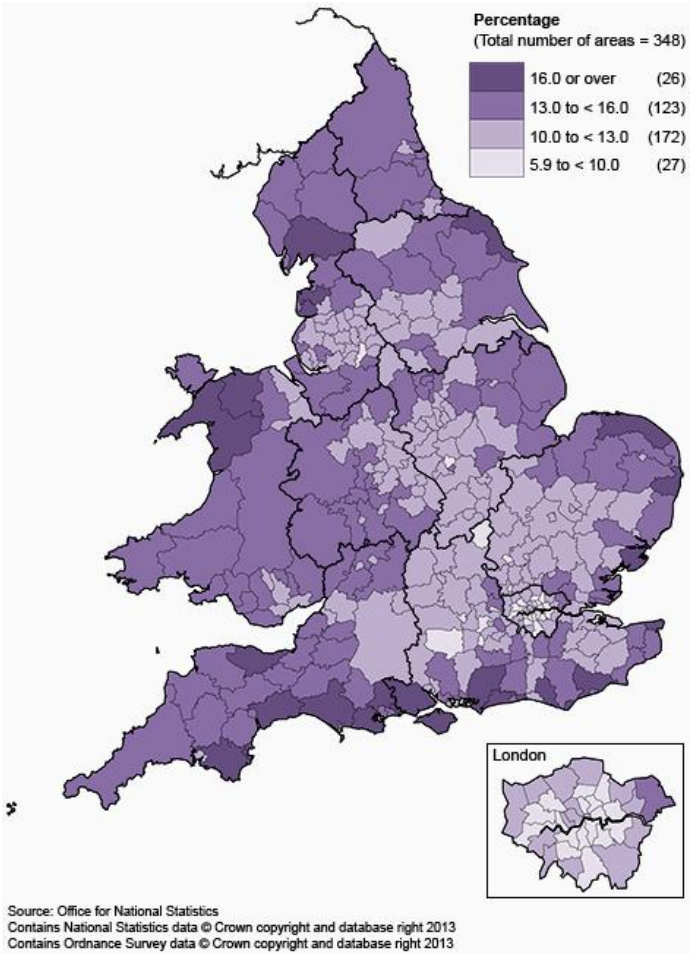
9.37 The regional profile of one-person households is shown in figure 9.12, which distinguishes between those aged 65 and over, and under 65. The regional variation in the proportion of all one-person households ranged from 28 per cent in the East of England to 32 per cent in the North West. London had the lowest proportion of persons living alone aged 65 and over (9.6 per cent of all households) and, conversely, the highest proportion of persons living alone aged under 65 (22 per cent). The South West, Wales, and the North East also have high proportions of those living alone aged 65 and over, approaching 14 per cent.

Figure 9.12 One-person households as a percentage of all households, divided into those aged 65 and over and those aged under 65, for English regions and Wales, 2011



9.38 The national distribution of the 65 and over population living alone across England and Wales can be seen in figure 9.13; the lowest levels are found in London, Leicester, Nottinghamshire, Manchester and the Thames Valley. The very high levels of age 65 and over living alone in the coastal areas of England and Wales are apparent, reflecting the high concentrations of older people living in these locations.

Figure 9.13 Percentage of all households made up of lone persons aged 65 and over, England and Wales, 2011

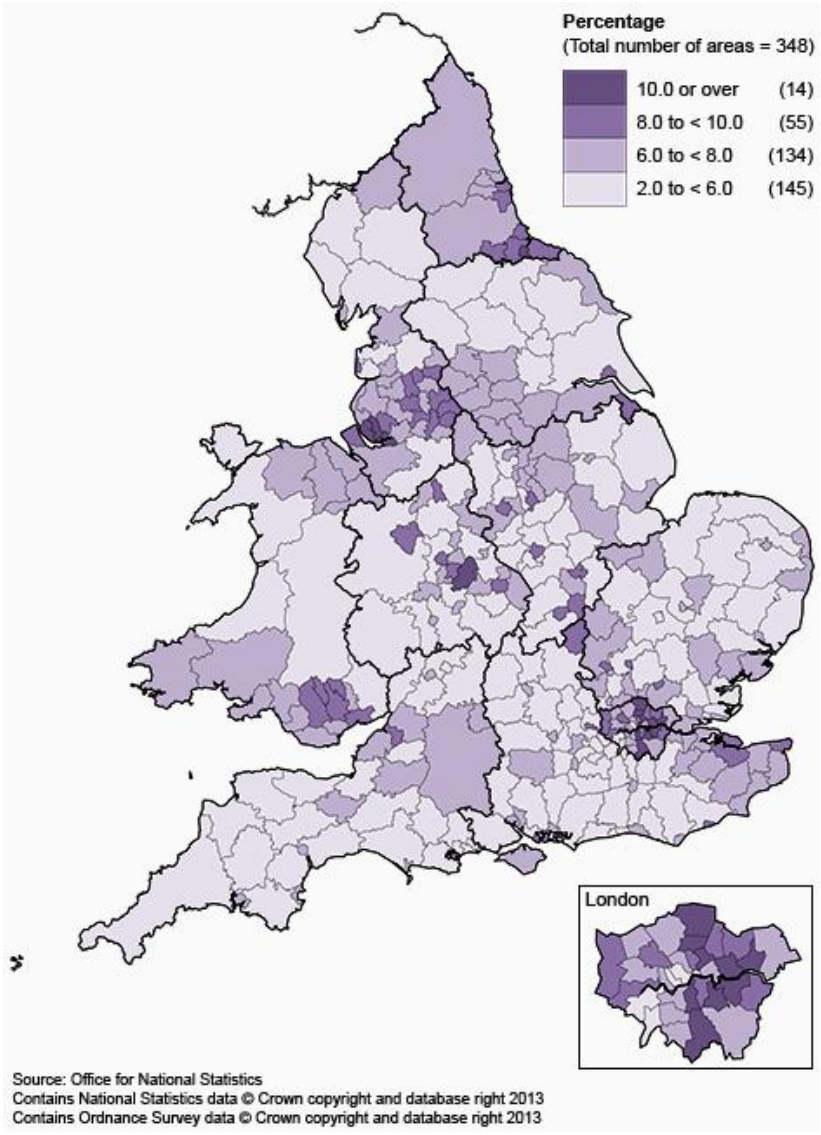


Lone-parent households

9.39 In 2011 there were 2.5 million lone parent households. Some 1.7 million (7.2 per cent of all households) consisted of a lone parent with dependent children. Both the numbers and proportions have increased from 2001 where comparable figures were 2.1 million lone parent households of which 1.4 million (6.5 per cent of all households) included dependent children.

9.40 Figure 9.14 shows the national distribution of lone parent households with dependent children. Higher levels were reported in London and other conurbations (Bristol, Birmingham, Nottingham/Derby, Greater Manchester, Merseyside, Tyneside/ Wearside and Teesside) and also South East Wales and North Kent. Barking and Dagenham (14 per cent) and Knowsley (12 per cent) were the local authorities with the highest concentrations. The lowest levels of lone parent households were generally in the more rural areas. Some of these areas also have a higher proportion of older people, thus lowering the relative proportion of younger people with dependent children generally.

Figure 9.14 Percentage of all households consisting of lone parents with dependent children, England and Wales, 2011



Ethnicity, identity, language and religion

Ethnic group

9.41 England and Wales has become more ethnically diverse, with increasing numbers of people identifying with minority ethnic groups in 2011.

9.42 The census has shown that 86.0 per cent of the population identified themselves as 'White' (48.2 million) (figure 9.15). This represented a proportionate decrease from 91.3 per cent in 2001 and 94.1 per cent in 1991. Within this ethnic group, 'White British' was the largest group at 45.1 million (80.5 per cent).

Figure 9.15 Ethnic groups, England and Wales, 2011

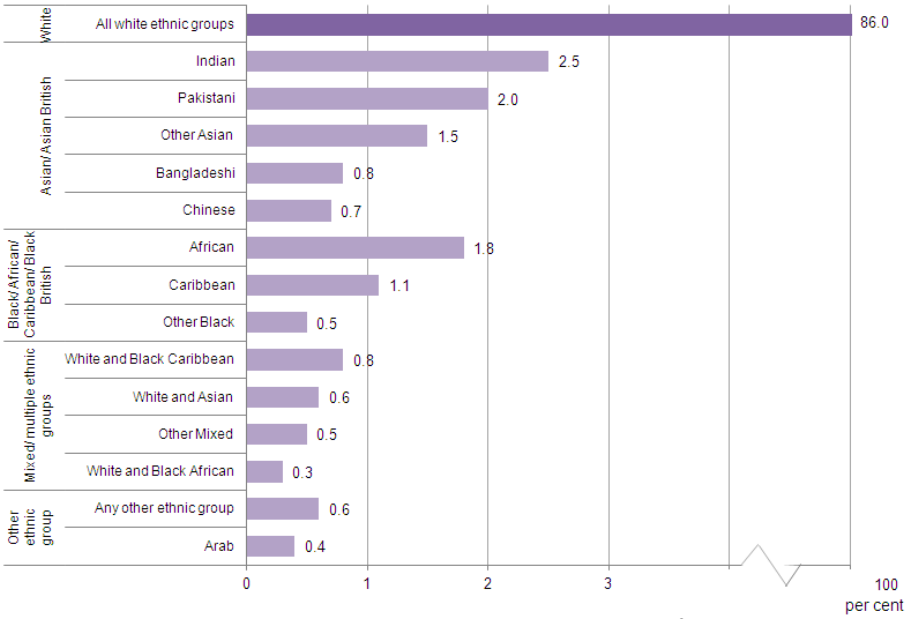


Figure 9.16 Ethnic Groups, 2001–2011, England and Wales[3]

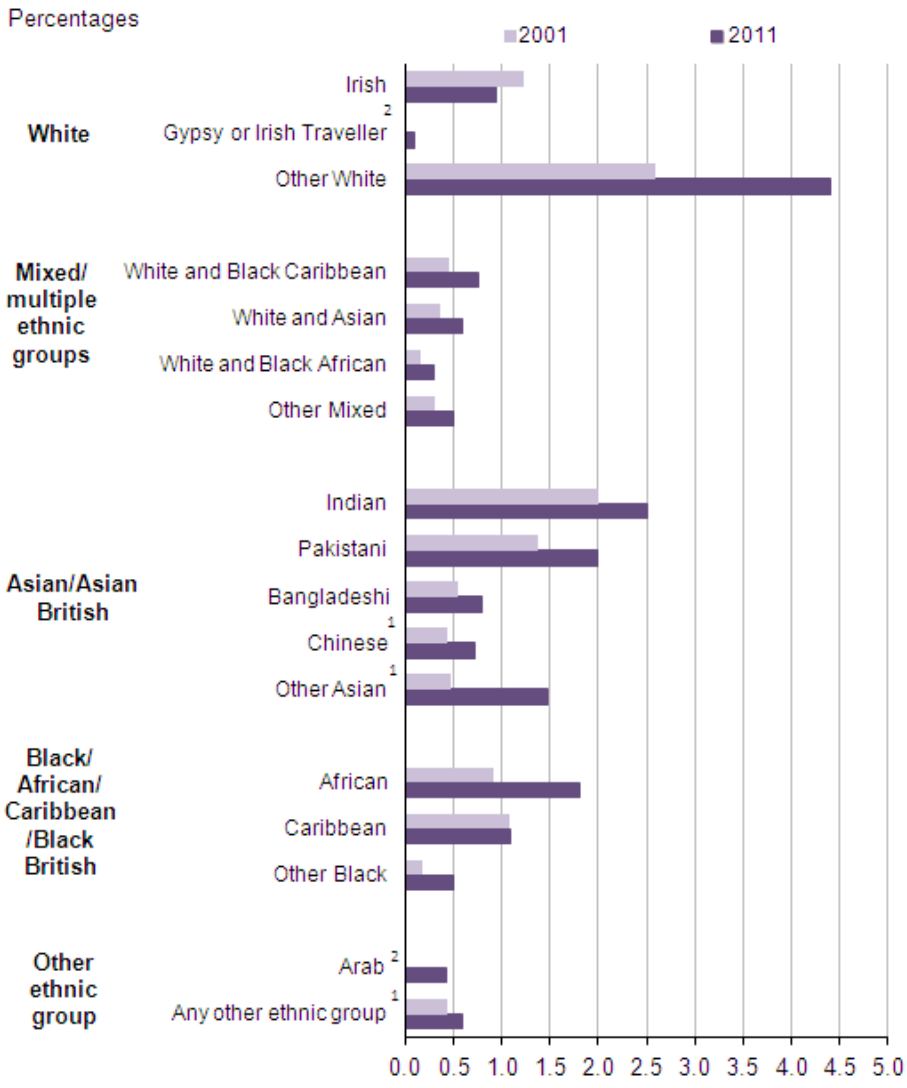


Figure 9.16 notes:

1. Comparability issues exist between these ethnic groups for the 2001 and 2011 Censuses.
2. No comparable data exists for these ethnic groups in 2001 Census.
3. This chart excludes White British (80.5 per cent in 2011 and 87.5 per cent in 2001).

9.43 'Indian' was the next largest ethnic group with 1.4 million people (2.5 per cent) followed by 'Pakistani' (2.0 per cent). This is consistent with census findings on international migration, which found that South Asian countries (India, Pakistan and Bangladesh) continued to rank highly within the most common non-UK countries of birth. The remaining ethnic groups each accounted for up to 2 per cent of the population in 2011.

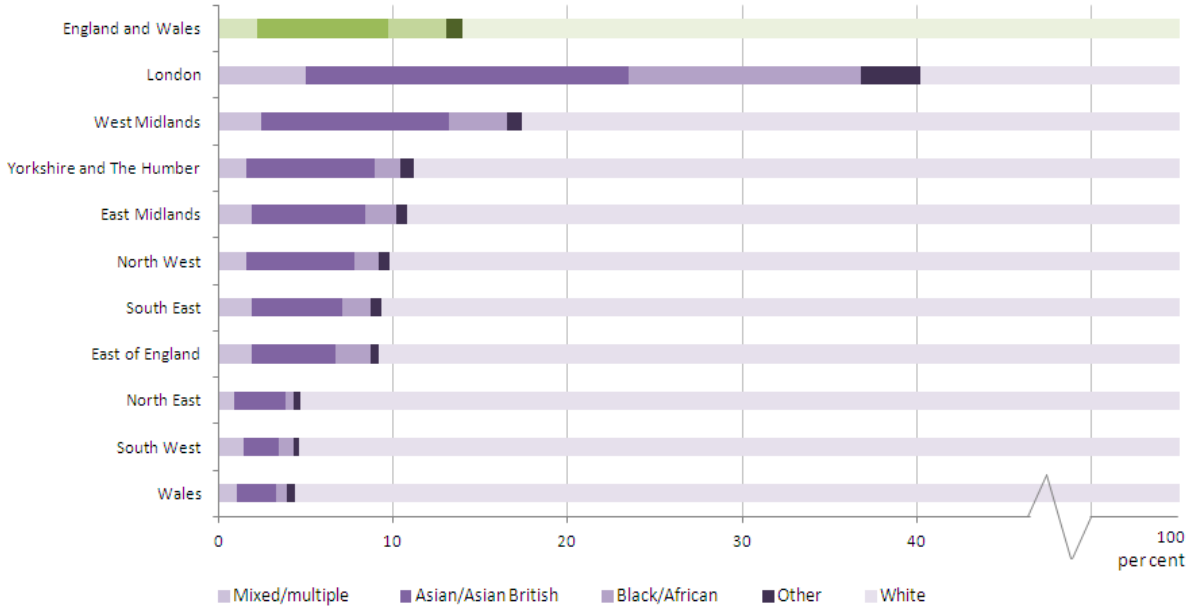
9.44 There were two new tick boxes in the 2011 Census: 'Gypsy or Irish Traveller' and 'Arab'. 'Arab' accounted for 240,000 usual residents (0.4 per cent of the population), while 'Gypsy or Irish Traveller' accounted for 58,000 usual residents (0.1 per cent of the population), making it the smallest ethnic category (with a tick box) in 2011, as shown in figure 9.16.

9.45 'White British' and 'White Irish' both decreased proportionately between 2001 and 2011. The remaining ethnic groups increased, with 'Any other White background' showing the largest increase of 1.1 million (1.8 percentage points - figure 9.16). This includes people with Poland as a country of birth, who were the second largest group of non-UK-born residents in 2011 and increased by 0.5 million (a nine-fold increase) between 2001 and 2011. Some caution is needed, however, when comparing ethnic responses between the two censuses due to the changes to the wording of the questions and the increase in the number of tick box response categories.

9.46 The 'Asian/Asian British' ethnic group categories had some of the largest increases between the 2001 and 2011 Censuses. People identifying as 'Indian' and 'Pakistani' each increased by around 0.4 million (0.6 percentage points and 0.5 percentage points respectively).

9.47 Across the English regions and Wales, London was the most ethnically diverse area, and Wales the least (figure 9.17).

Figure 9.17 Ethnic groups by English regions and Wales, 2011



National identity

9.48 The 2011 Census introduced a question on national identity for the first time. This resulted from an increased interest in national consciousness and demand from people, particularly in Wales, to acknowledge their national identity. National identity is multi-dimensional, so the 2011 Census respondents were able to tick more than one national identity.

9.49 Some 91.0 per cent of the population identified with at least one UK national identity (English, Welsh, Scottish, Northern Irish, or British). English (either on its own or combined with other identities) was the most common response, with 37.6 million people (67.1 per cent) identifying in this way. English as a sole identity (that is, not combined with other identities), was chosen by 32.4 million people (57.7 per cent).

9.50 British identity (either on its own or combined with other identities) was chosen by 16.3 million people (29.1 per cent). Of these, 10.7 million people (19.1 per cent) identified themselves as British only.

9.51 Welsh identity (either on its own or combined with other identities) was chosen by 2.4 million people (4.3 per cent). Of these, 2 million people (3.7 per cent) identified themselves as Welsh only.

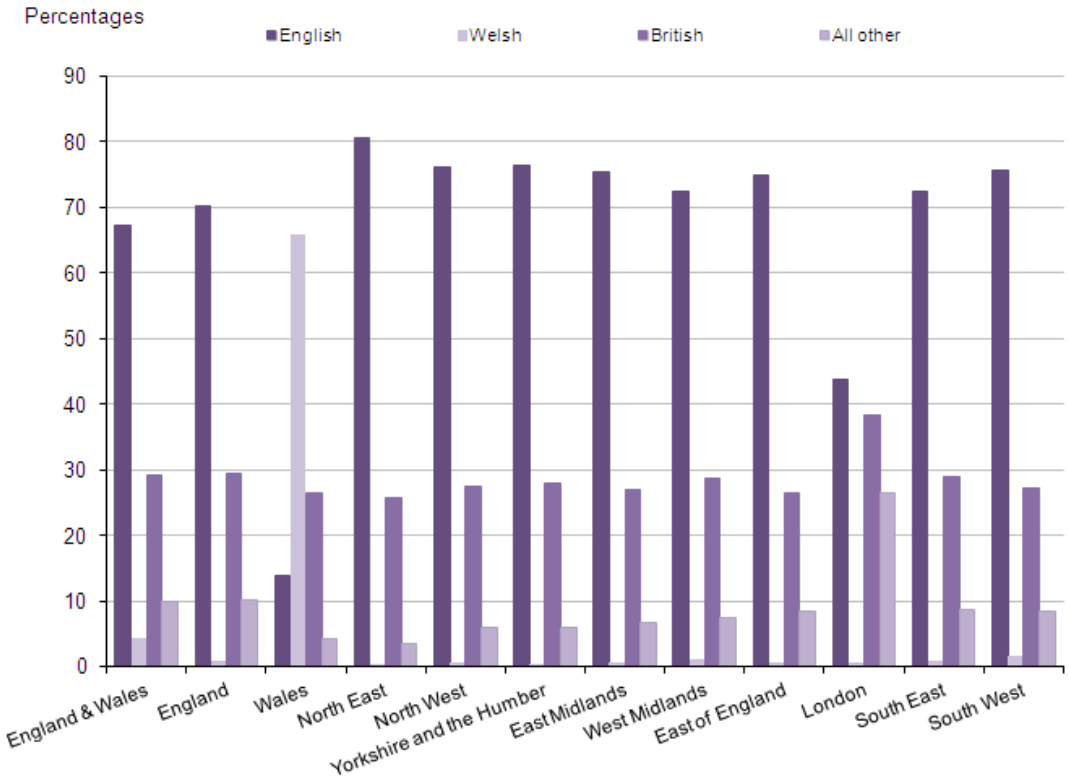
9.52 Some 5.5 million people (9.8 per cent) reported a national identity which was classed as 'Other'.

9.53 A person's national identity can depend on many factors such as where they live, country of birth and ethnicity. For example, 70.1 per cent of people residing in England identified themselves as English (either on its own or combined with other identities), while 65.9 per cent of people in Wales similarly said they were Welsh (figure 9.18).

9.54 The highest percentage of the population who stated an English identity (on its own or combined with other identities) was found in the North East (80.5 per cent), a region with one of the highest proportions of 'White' population.

9.55 The highest percentage (38.3 per cent) of the population with a British identity (either on its own or combined with other identities) was found in London, an ethnically diverse area. London also had the highest percentage of people self-reporting an 'Other' national identity (26.4 per cent) and the lowest with an English identity (43.7 per cent).

Figure 9.18 National identity by English regions and Wales, 2011



Note: Percentages will not round to 100 per cent as respondents could tick more than one national identity

Main language

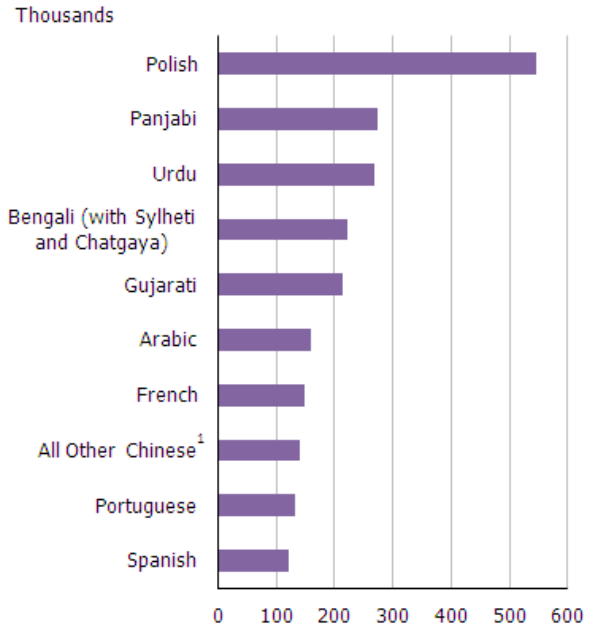
9.56 The 2011 Census collected information for the first time on main language. It showed that 49.8 million (92.3 per cent) people aged three and over reported English (or English or Welsh for people living in Wales) as their main language.

9.57 Some 4.2 million people (7.7 per cent) reported some other main language. Polish was the most common with 546,000 people (1.0 per cent) reporting this as their main language (figure 9.19).

9.58 London was the region with the highest proportion of people with a main language other than English (22.1 per cent).

9.59 The local authority with the highest proportion of people with English (English or Welsh in Wales) as their main language was Redcar and Cleveland (99.3 per cent). The London Borough of Newham had the lowest proportion (58.6 per cent). Half (10,800) of those who reported Pakistani Pahari (with Mirpuri and Potwari) as their main language lived in Birmingham. Three quarters (3,000) of those who reported Yiddish as their main language were in the London Borough of Hackney (figure 9.20).

Figure 9.19 Top 10 main 'Other' languages in England and Wales, 2011



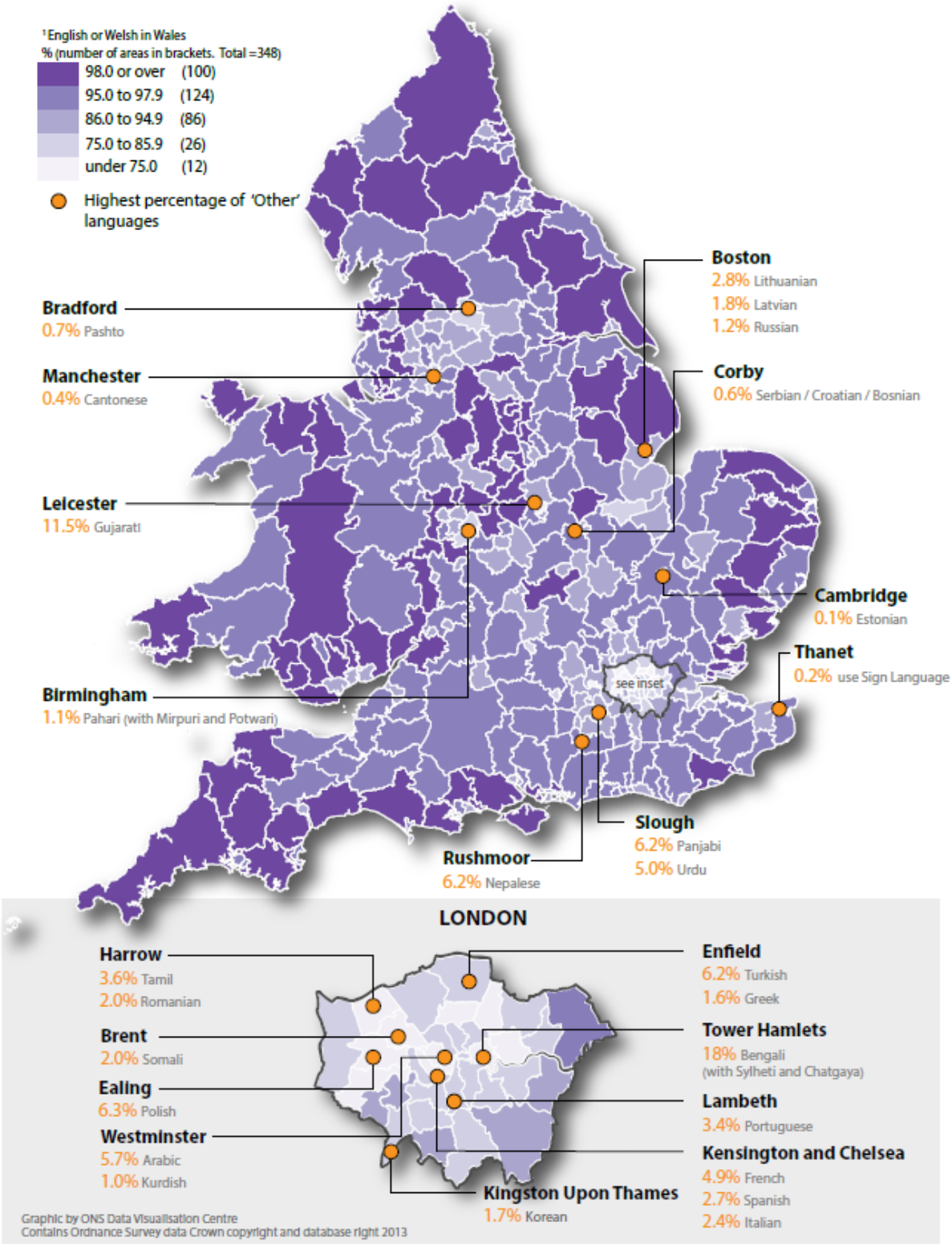
1. 'All Other Chinese' is an aggregate of Chinese languages and excludes those that wrote in Mandarin Chinese and Cantonese Chinese.

Proficiency in English

9.60 The 2011 Census was also the first to ask how well people could speak English if it was not their main language. While 7.7 per cent of the population (4.2 million) aged three and over in England and Wales had a main language other than English, only 1.3 per cent of the population (726,000) reported that they could not speak English well, and 0.3 per cent (138,000) reported that they could not speak English at all. These proportions were highest in London with nearly 4.1 per cent of the population (320,000 people) unable to speak English well or not at all, followed by the West Midlands (2.0 per cent). The North East had the lowest proportion of people who were unable to speak English well or not at all, reflecting its low level of ethnic diversity.

9.61 Across local authorities, the percentage of people who could not speak English well or not at all was highest in the London Borough of Newham (8.7 per cent).

Figure 9.20 Main language in England and Wales, 2011



Welsh language in Wales

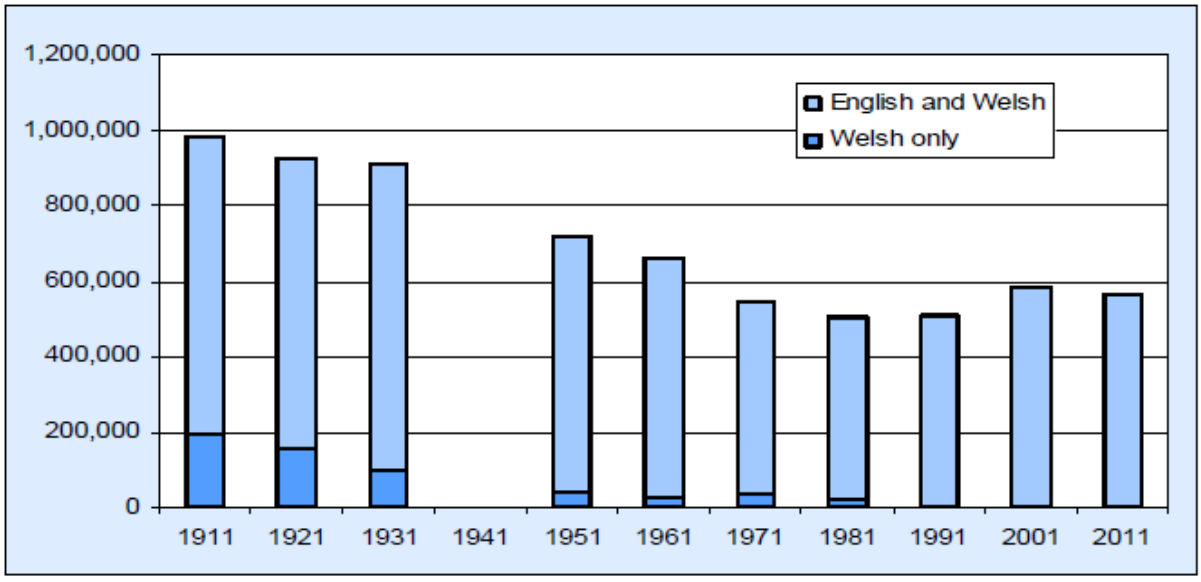
9.62 As in all censuses since 1891, the 2011 Census included (in Wales only) a question on the Welsh language. The 2011 question was the same as asked in 2001, 'Can you understand, speak, read or write Welsh?'

9.63 Between 2001 and 2011, there was a decrease in the number and proportion of people aged three and over able to speak Welsh. The decrease was due to demographic changes in the population (including fewer children, more older adults and the loss of older cohorts with higher levels of Welsh speakers), migration and changes to people's skills between the two censuses. The proportion of people able to speak Welsh decreased from 582,000 (20.8 per cent) in 2001 to 562,000 (19.0 per cent) in 2011. The decline continues a long-term trend since 1911 interrupted by an increase in 2001 (figure 9.21)

9.64 Differences between 2001 and 2011 varied by age group, with considerable increases for younger children (aged 3 to 4), a slight increase for adults 20-44, and decreases for other age groups (figure 9.22).

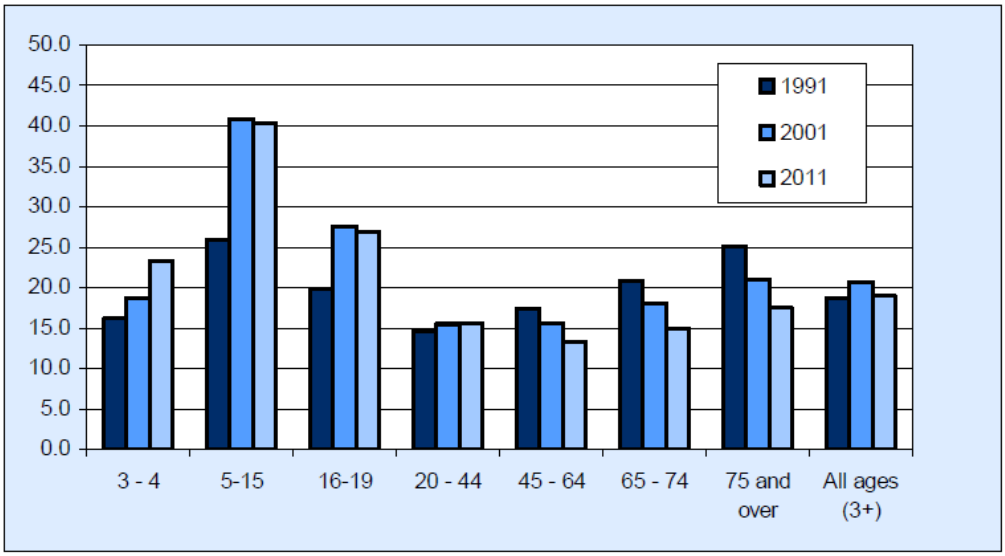
9.65 The proportion of people aged three and over able to speak Welsh decreased in nearly all local authorities. The largest decreases were in areas with the higher proportions of Welsh speakers.

Figure 9.21 Number of people aged three and over able to speak Welsh in Wales, 1911-2011



Note: Due to the Second World War, no census was taken in 1941
Source: Wales statistical bulletin, 11 December 2012

Figure 9.22 Proportion of people able to speak Welsh in Wales, by age group, 1991-2011



Source: Wales statistical bulletin, 11 December 2012

Religion

9.66 Christianity was the largest religious group reported in the census: some 33.2 million people (59.3 per cent of the population). The second largest religious group were Muslims with 2.7 million people (4.8 per cent); see figure 9.23.

9.67 Some 14.1 million people, around a quarter of the population, reported that they had no religion in 2011.

9.68 The religion question was the only voluntary question on the 2011 Census questionnaire and 7.2 per cent of people did not answer the question.

9.69 Between 2001 and 2011 there had been a decrease in the number of people who identified themselves as Christian (from 71.7 per cent to 59.3 per cent) and an increase in those reporting no religion (from 14.8 per cent to 25.1 per cent). There were increases in the other main religious group categories, with the number of Muslims increasing the most (from 3.0 per cent to 4.8 per cent).

9.70 London was the most diverse region in terms of religious affiliation with over a fifth of the population identifying with a religion other than Christian. London had the highest proportion of Muslims at 12.4 per cent, followed by the West Midlands, and Yorkshire and the Humber (both under 7 per cent). London also had the highest proportion of other religious groups including Buddhist, Hindu and Jewish (figure 9.24).

Figure 9.23 Religious affiliation, England and Wales, 2011

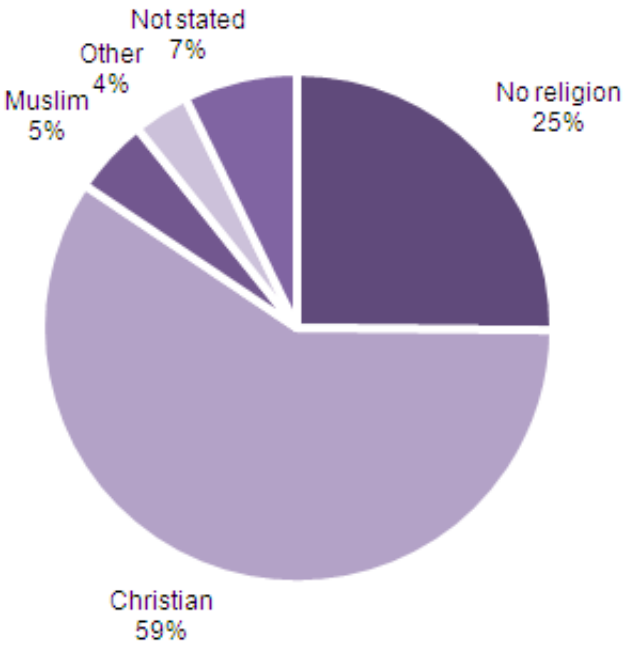
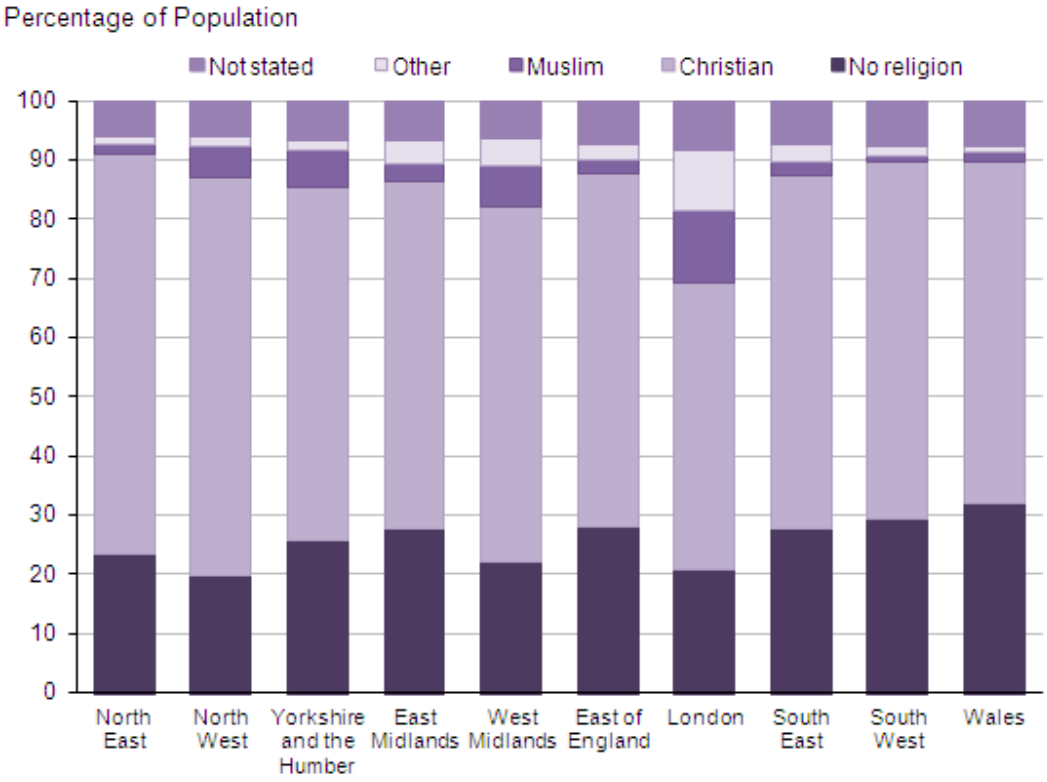


Figure 9.24 Religious affiliation, English regions and Wales, 2011



9.71 Christians formed the majority religion across most local authority areas in England and Wales (figure 9.25). In over nine out of ten areas, the proportion of people who were Christian was over 45 per cent. It was the largest religious group in all local

authorities except the London Borough of Tower Hamlets where there were more people who identified as Muslim.

9.72 The 13 local authorities with the highest proportions of the population reporting to be Christian were all in the North West, with the highest in Knowsley at 80.9 per cent. Tower Hamlets was the lowest at 27.1 per cent. Leicester, Camden, Redbridge, Harrow and Hackney all had proportions under 40 per cent.

9.73 The proportion of people identifying themselves as Christian has decreased in all local authorities in England and Wales since 2001, with the largest drop of 16.8 percentage points in Kingston upon Hull.

9.74 Norwich had the highest proportion of people reporting 'no religion' with 42.5 per cent, closely followed by Brighton and Hove with 42.4 per cent (figure 9.26). In Wales, Caerphilly had the largest increase since 2001, from 16.7 to 41.0 per cent. Blaenau Gwent, Rhondda Cynon Taf and Torfaen also saw large increases of 'no religion' with 16.0, 15.5 and 15.4 percentage points respectively.

9.75 In London, the boroughs of Newham, Harrow, Brent and Redbridge had the lowest proportions of the population reporting 'no religion'. Other areas under 15 per cent included Slough in the South East, and Knowsley, Blackburn with Darwen, Copeland, Ribble Valley, and St Helens in the North West.

Figure 9.25 Christian population, 2011, England and Wales, by local and unitary authorities

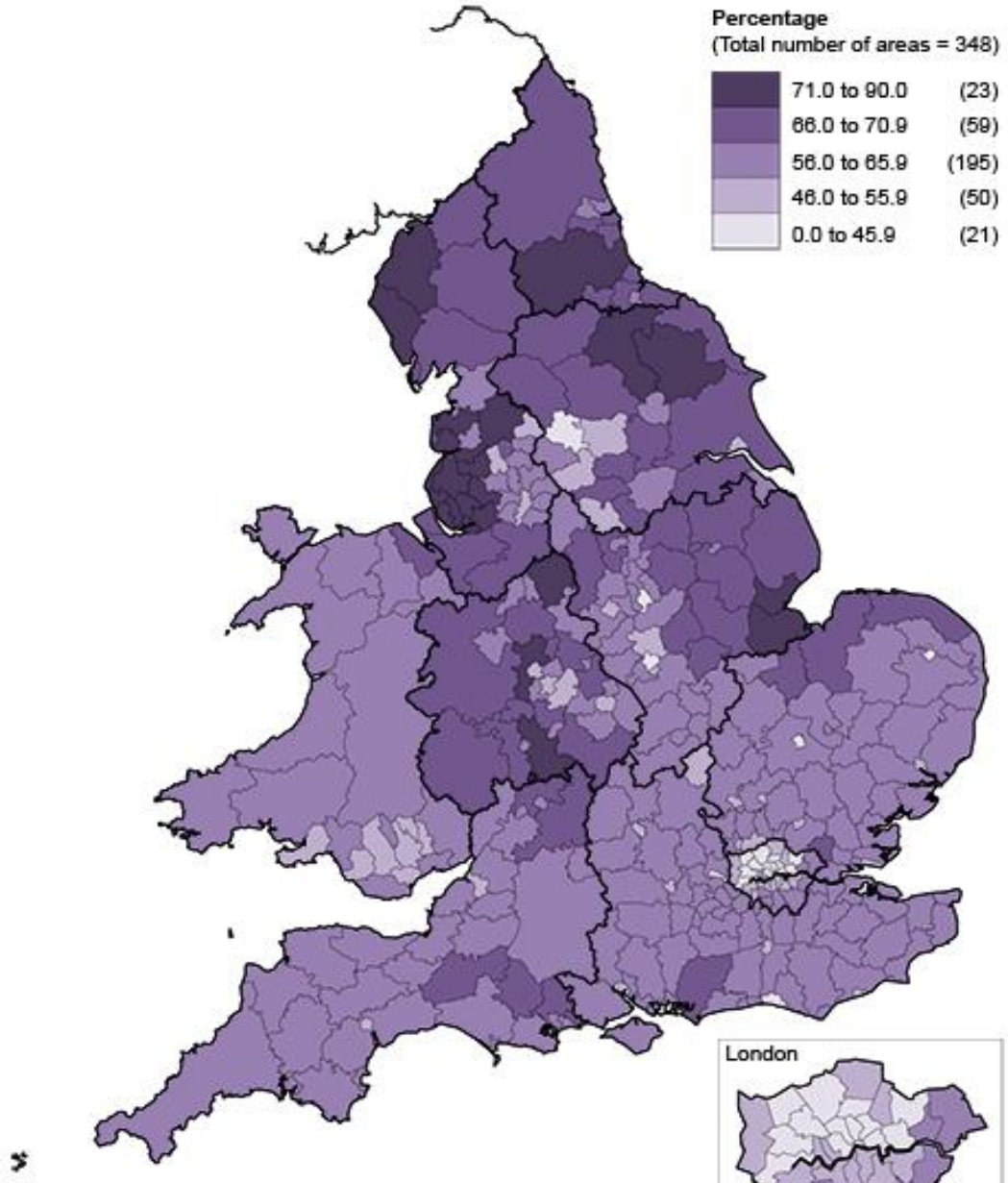
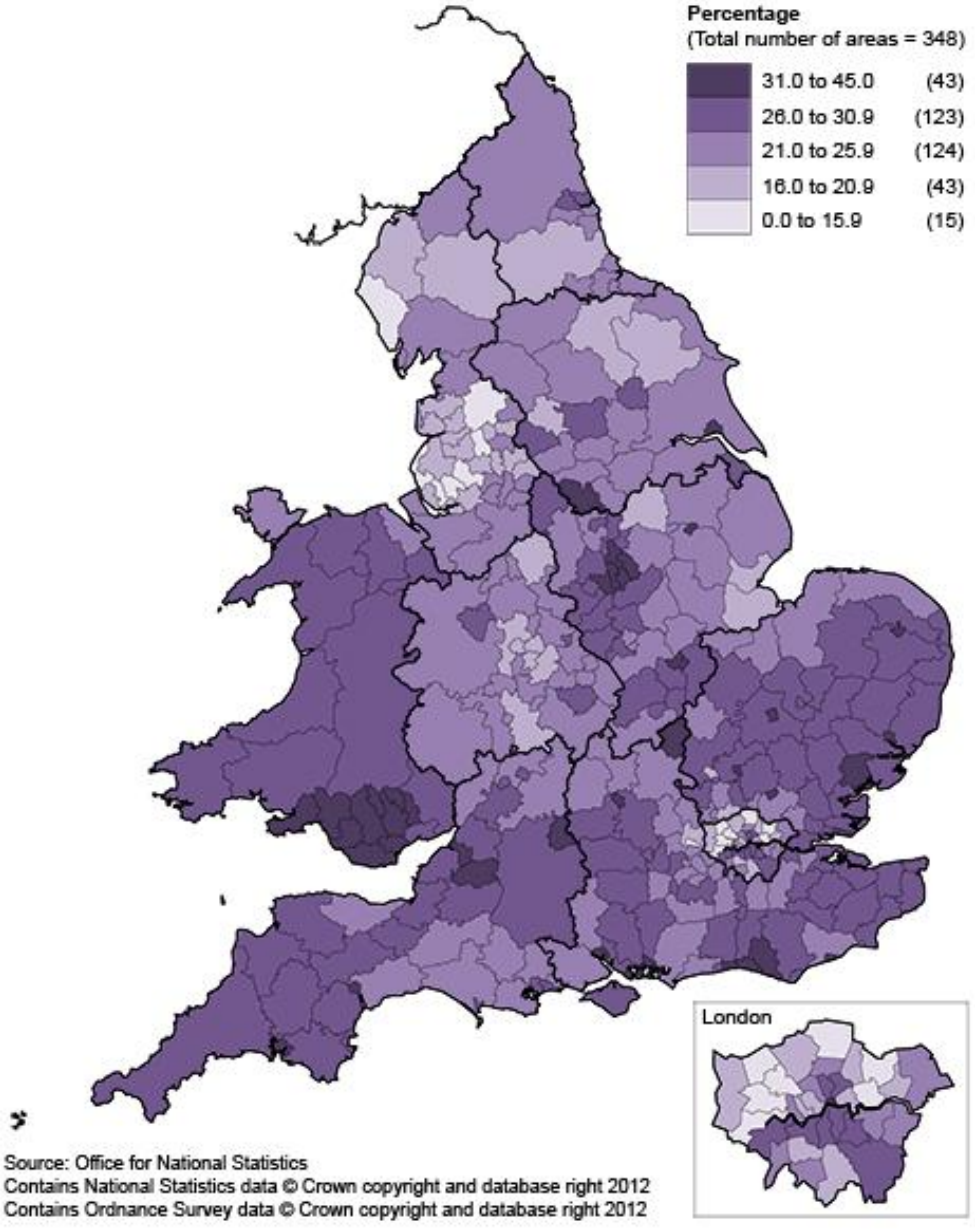


Figure 9.26 Population reporting no religion, 2011, England and Wales, by local and unitary authorities



General health

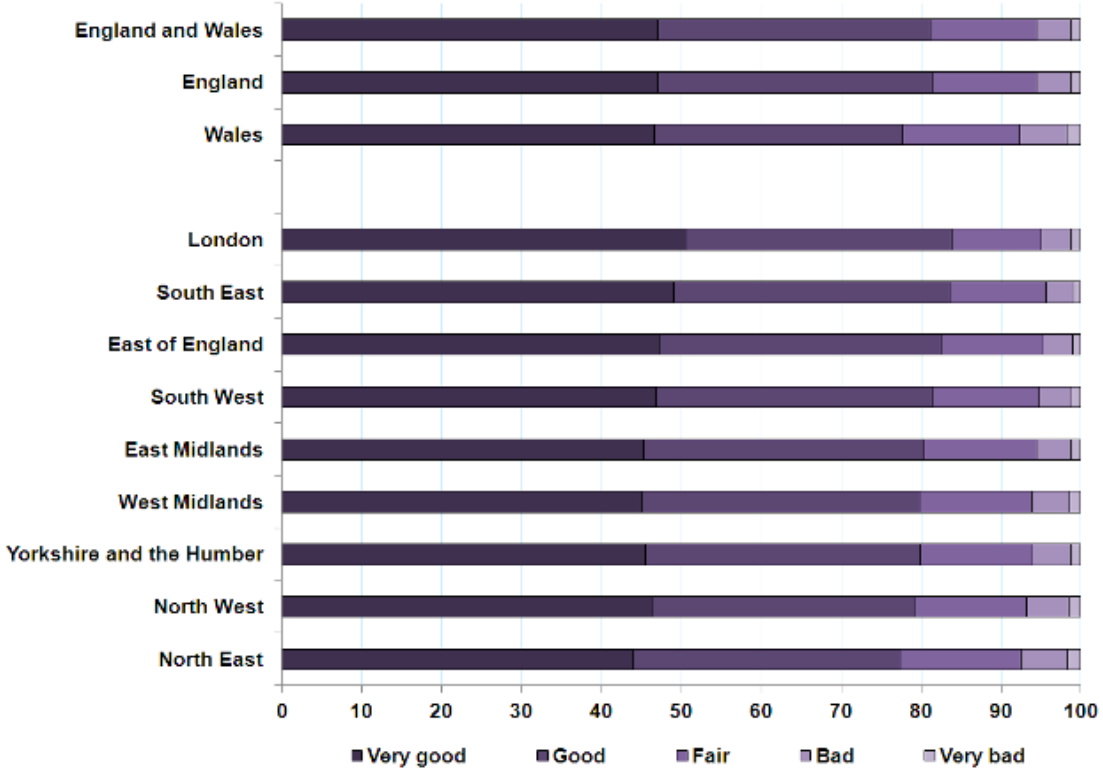
9.76 In 2011, 81.2 per cent of people in England and Wales reported their general health as either 'Very good' or 'Good'; in England it was 81.4 per cent and in Wales it was 77.8 per cent (figure 9.27). The general pattern of better health in London and the South East region and worse health in the Northern regions, which had been reported in 2001, was maintained in 2011.

9.77 People living in London and the South East regions had the highest percentages of 'Very good' or 'Good' general health; Wales and the North East region had the lowest.

9.78 There was a 15.5 percentage points gap between local authorities reporting the highest (Hart, 88.1 per cent) and lowest (Blaenau Gwent, 72.6 per cent) percentages of 'Very good' and 'Good' general health.

9.79 Some traditionally deprived local authorities experienced a notable improvement in 2011, specifically Newham, Tower Hamlets, Hackney and Manchester.

Figure 9.27 General health, 2011



Long-term illness or disability

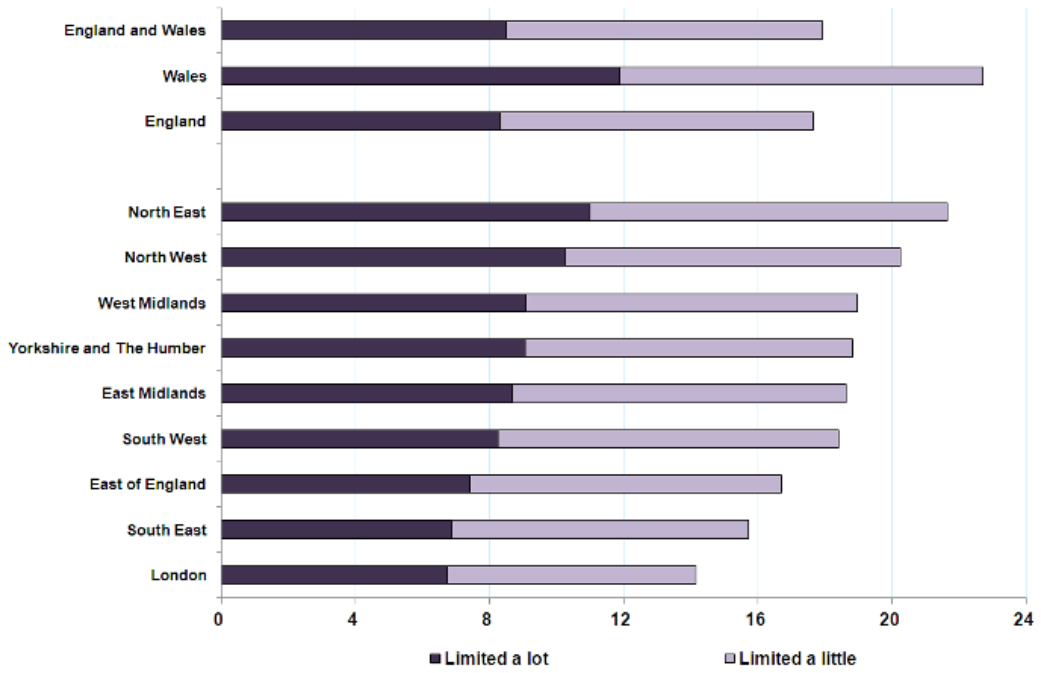
9.80 More than 10 million people reported that they were limited in their daily activities through a long-term health problem or disability in 2011.

9.81 The percentage of people with activity limitations had fallen slightly since 2001, by 0.3 of a percentage point in England and 0.6 of a percentage point in Wales. However, prevalence remains 5 percentage points higher in Wales (figure 9.28).

9.82 The number of people whose activities are 'limited a lot' because of a health problem or disability was more than 3 percentage points higher in Wales (11.9 per cent) than in England (8.3 per cent) in 2011.

9.83 Across English regions there was a general north-south divide with percentages of people limited 'a lot' or 'a little' in daily activities lower in the south and higher in the north. The North East region (21.6 per cent) had the highest overall percentage of activity limitations, and London (14.2 per cent) the lowest.

Figure 9.28 Activity-limiting heath problem or disability English regions and Wales, 2011



9.84 The ten English local authorities with the lowest percentage of activity-limiting health problems or disabilities were located exclusively in London and the South East.

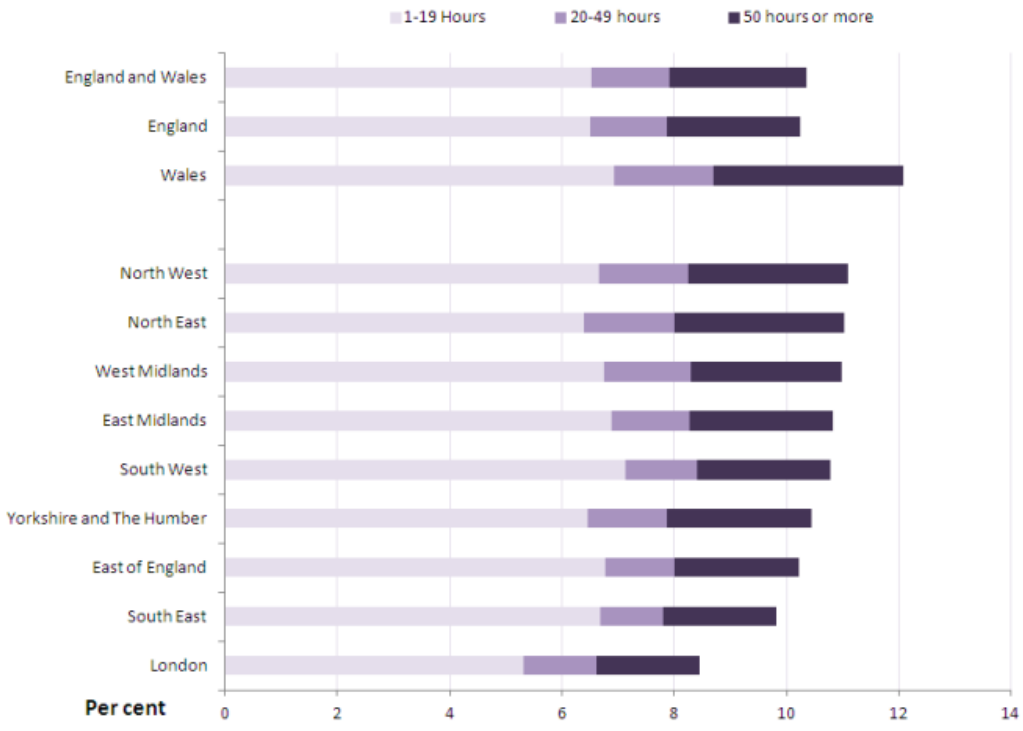
9.85 London and other large urban conurbations in England such as Manchester experienced the greatest reductions in activity limitations since 2001, while rural local authorities, such as East Lindsey in Lincolnshire, experienced the greatest rise in prevalence.

Unpaid care

9.86 There were approximately 5.8 million people providing unpaid care in 2011, representing just over one tenth of the total population.

9.87 The absolute number of unpaid carers had grown by 600,000 since 2001; the largest growth (an additional 272,000) was among those providing 50 or more hours' care per week. The number of additional carers providing 1 to 19 hours care was 109,000 and in the 20 to 49 hours category there were an additional 202,000 carers. The percentages of the population providing such care in the English regions and Wales are shown in figure 9.29.

Figure 9. 29 Provision of unpaid care across English regions and Wales, 2011



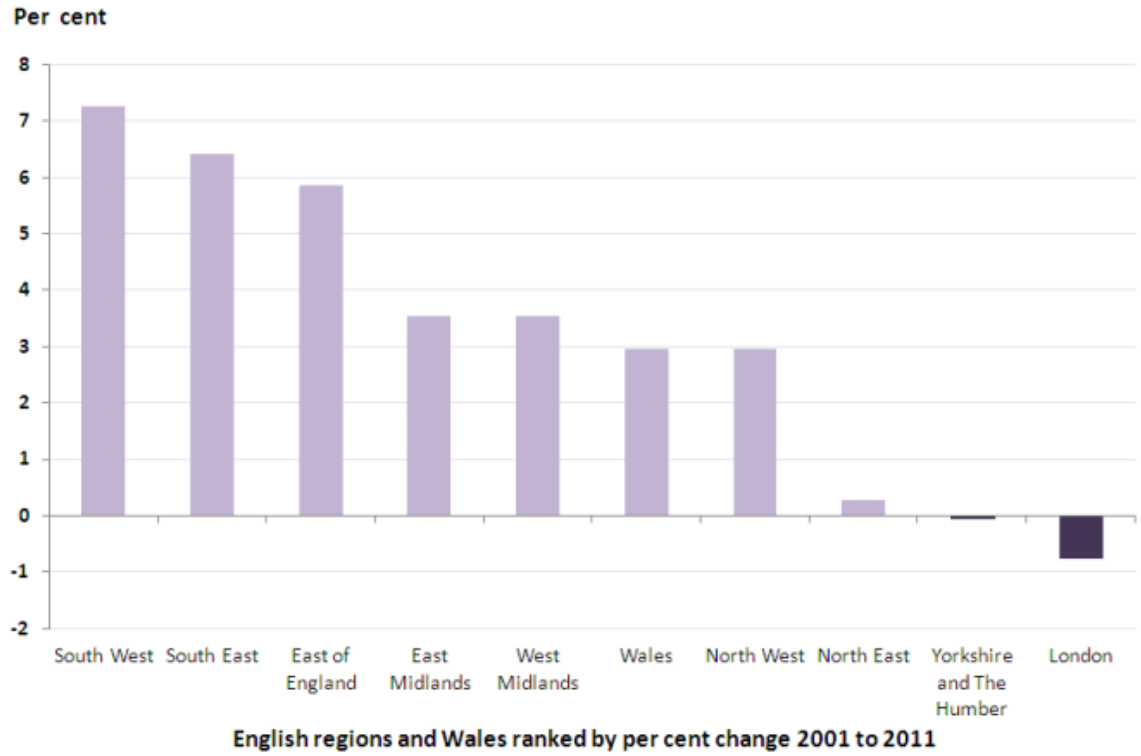
9.88 If it is assumed that people were, on average, providing towards the mid-range of hours per week in the 1 to 19 or 20 to 49 hour categories, and 50 hours in the 50 hours or more category, then this amounts to approximately 3.4 million working weeks of care provided (based on a standard 37 hours working week) in a given week in 2011.

9.89 As with general health and disability, a clear north-south divide exists in England, with the highest percentages of care provision being in the North West, North East, East and West Midlands. The only exception to this was Yorkshire and the Humber having a lower percentage than the South West. The relatively older age structure of the South West population was also likely to influence the underlying need for care compared with other southern regions such as the South East and London (figure 9.30).

9.90 The proportion of people providing care had increased between 2001 and 2011 in Wales and across all English regions other than London and the North East, where it had decreased.

9.91 Most local authorities experienced increases in the level of unpaid care provided between 2001 and 2011. Those authorities with higher percentages of their population who are 'limited a lot' in their daily activities also tended, not surprisingly, to have higher levels of unpaid care provided.

Figure 9.30 Percentage change in provision of total unpaid care between 2001 and 2011, English regions and Wales



Migration

Country of birth and citizenship (passport held)

9.92 In 2011, 13 per cent (7.5 million) of the resident population of England and Wales were born outside the UK.

9.93 The overall increase in the non-UK born population (from 9 per cent in 2001 to 13 per cent in 2011) has been the result of a range of distinct migrations from a wide variety of different countries. Figure 9.31 shows the top ten non-UK countries of birth recorded in each Census since 1951. Key points include:

- The Republic of Ireland was the top non-UK country of birth for foreign born in each census from 1951 until 2001, but the numbers of Irish-born declined after 1961
- In 1951, India was the third highest non-UK country of birth. The number of people born in India then increased and almost doubled between 1961 and 1971. From 1961 until 2001 Indian-born was the second highest ranking non-UK country of birth and in 2011 became the largest foreign born population
- The Pakistani-born population saw a noticeable rise between 1961 and 1971 (and to a lesser extent 1971 to 1981), and has continued to increase since then, ranking third in 1981 and subsequent censuses
- In 1951 Poland was the second highest non-UK country of birth; however this population did not grow again substantially until a new influx of Polish-born migrants in the period following Poland's accession to the EU before the 2011 Census, when the Polish-born were once again the second

highest non-UK born group, although with a much larger number of residents

- The Jamaican-born population saw substantial rises between 1951 and 1971 before peaking in 1971.

Figure 9.31 Top ten non-UK countries of birth for the resident population in England and Wales; 1951-2011

9.94 Almost half (46 per cent, 3.4 million) of the non-UK born usually resident population held a UK passport in 2011; of those born abroad who held a foreign passport, 11 per cent (383,000) were Indian-born, followed by 10 per cent (332,000) Pakistani-born. Those holding only a foreign passport accounted for 51 per cent (3.8 million) of non-UK born usual residents. There were also 4 per cent (269,000) who reported having no passport.

9.95 The most common non-UK citizenship was Polish (558,000 residents); this was followed by Irish (372,000) and Indian (315,000). These three countries together accounted for 30 per cent (1.2 million) of all foreign nationals and 22 per cent (1.7 million) of the non-UK born (figure 9.32).

9.96 The non-UK born population was younger than the UK-born, with 36 per cent (2.7 million) aged 25 to 39, compared with 20 per cent (11.3 million) in the usually resident population as a whole. For non-UK passport holders (non-UK nationals) this was even higher, with 43 per cent (1.8 million) aged 25 to 39.

Figure 9.32 Top 10 non-UK passports held as a percentage of non-UK-born residents, 2011

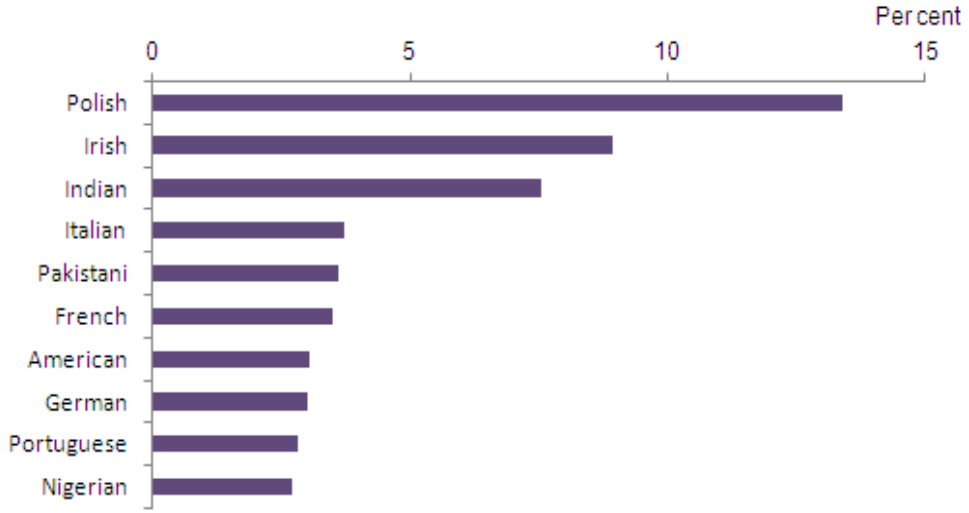


Table 9.2 Top 10 non-UK passports held compared with country of birth, 2011

Highest ranking country of passport held	Passport holders	Country of birth
1 Poland	558,000	579,000
2 Ireland	372,000	407,000
3 India	315,000	694,000
4 Italy	155,000	135,000
5 Pakistan	149,000	482,000
6 France	146,000	130,000
7 United States	126,000	177,000
8 Germany	125,000	274,000
9 Portugal	118,000	88,000
10 Nigeria	112,000	191,000

9.97 Table 9.2 compares the top 10 non-UK passports held with the country of birth data. India was ranked first for non-UK country of birth (694,000), but third in terms of non-UK passports (315,000). This difference was similar for the Pakistani-born with 482,000 compared to just 149,000 Pakistani passport holders. This is due to the more established nature of migrants from India and Pakistan, many of whom came to the UK from the 1960s onwards, and have since gained British citizenship.

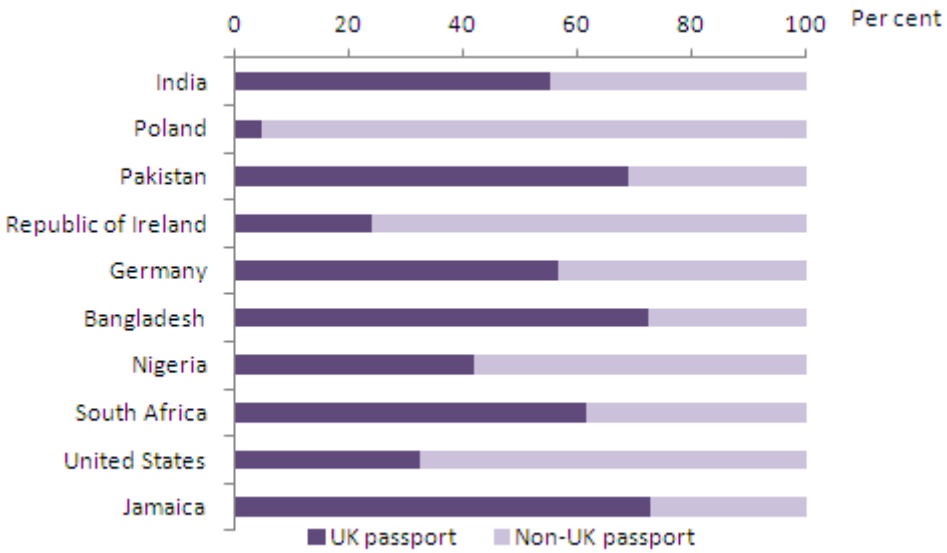
9.98 The Polish were the highest ranking foreign passport holders (558,000), and there were a similar number of UK residents who were born in Poland (579,000). This is likely to be due to the free movement rights of EU citizens: Polish nationals, unlike

many non-EU nationals, do not need to acquire UK citizenship in order to live and work in the UK.

9.99 Figure 9.33 shows the proportion of UK passports held for the top 10 non-UK countries of birth. The largest proportion holding a UK passport from the top 10 countries of birth were the Jamaican-born with 73 per cent (117,000), followed by Bangladeshi-born with 72 per cent (153,000), and Pakistani-born with 69 per cent (332,000). These three countries also feature in the top 10 listing of proportions holding a UK passport in Table 9.2.

9.100 By contrast, only five per cent (29,000) of Polish-born residents held a UK passport. This is likely to be due to a more recent migration pattern (92 per cent arrived after 2001) and EU passport holders having similar rights to UK passport holders. Nigeria was also lower with 42 per cent (80,000) holding a UK passport, but this may be a result of recent migration from that country over the last decade (58 per cent), which has not yet led to a larger uptake of UK citizenship acquisition.

Figure 9.33 Proportion of UK held passports held for the top 10 non-UK countries of birth , 2011



Year of (most recent) entry into the UK

9.101 Whereas some people born overseas had recently migrated to the UK, others had been resident in the UK for many years. Half (50 per cent or 3.7 million) of the non-UK born usually resident population had lived in the UK for 10 years or more, while, just over a quarter (26 per cent, 1.9 million) had been resident in the UK for 5 to10 years.

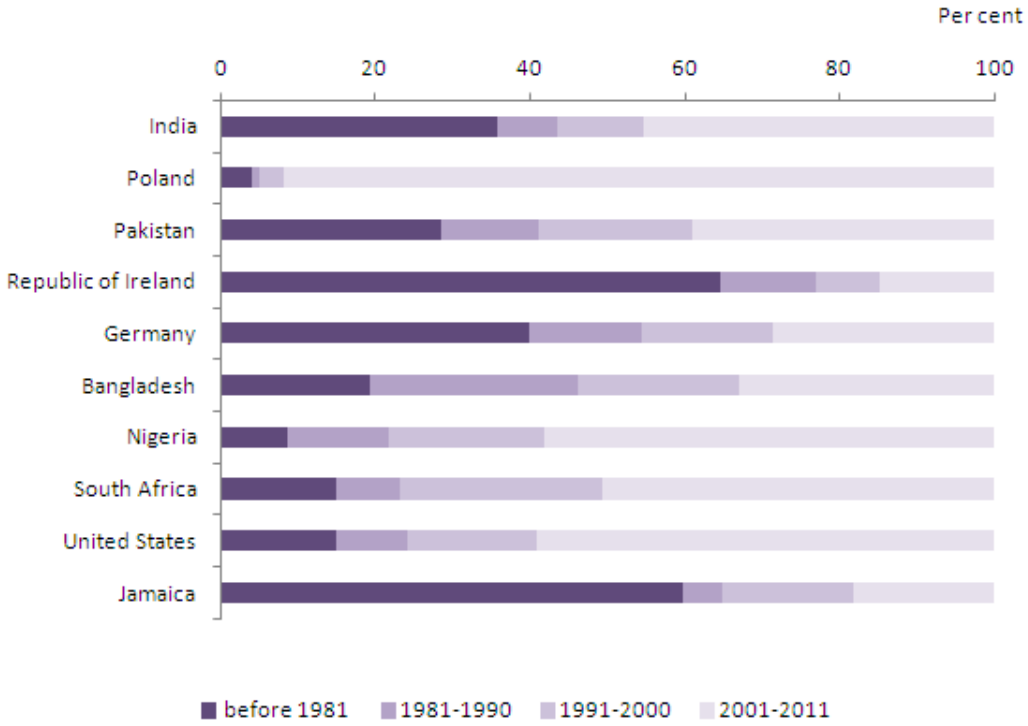
9.102 Non-UK born usual residents who last arrived since 2001 accounted for 3.8 million people. This number can be further divided into: 10 per cent (786,000) who first arrived during the period 2001 to 2003; 15 per cent (1.2 million) during 2004 to 2006; 16 per cent (1.2 million) during 2007 to 2009; and 8 per cent (613,000) in 2010 to 2011.

9.103 There will be a bias in the census data towards more recent years of arrival, because these groups will have been less affected by mortality, or onward or return migration.

Figure 9.34, which shows the year of arrival for the top 10 non-UK countries of birth, therefore refers only to those who were still alive and resident in England and Wales on census day rather than illustrating the historic trend of arrivals.

9.104 There are clear differences in the timing of migration patterns from those countries shown in figure 9.34. Polish-born residents were dominated by arrivals since 2001 (92 per cent). Poland is the largest accession country, and Polish arrivals in the decade 2001 to 2011 represent 57 per cent of all arrivals from accession states. By contrast 65 per cent of Irish-born residents had arrived before 1981. Historically there has never been a need for Irish citizens to acquire UK citizenship in order to reside here, or indeed have a passport in order to travel to the UK.

Figure 9.34 Year of arrival for the top ten non-UK countries of birth for usual residents in England and Wales, 2011



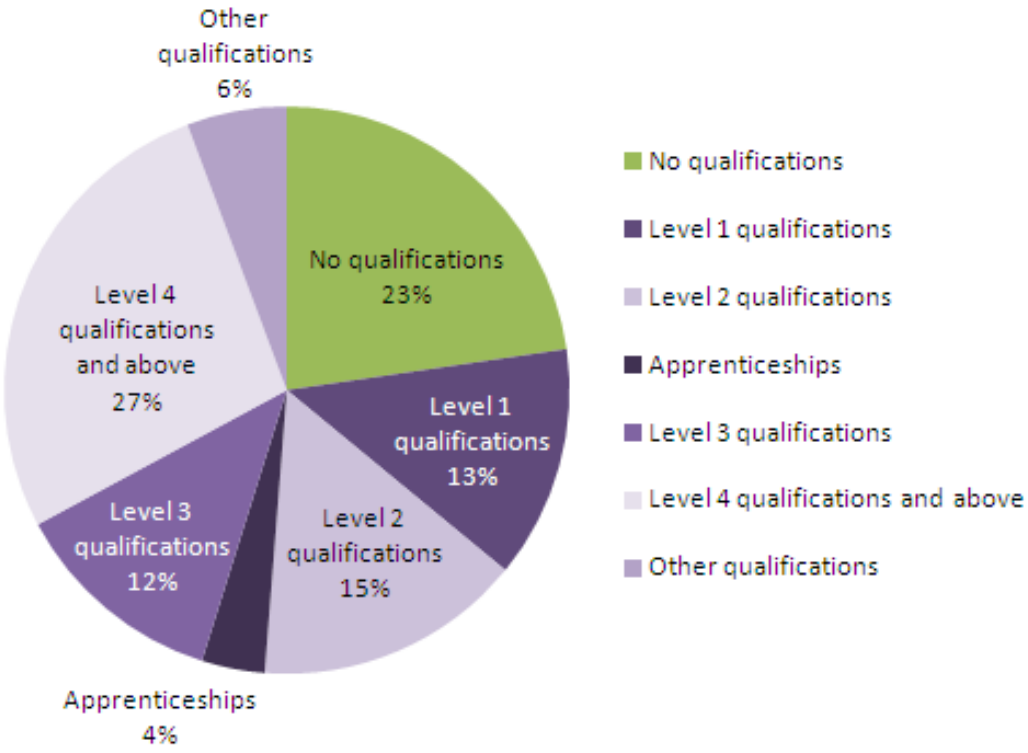
9.105 German-born residents arrived in a more historically consistent pattern, probably because many German-born are actually the children of UK service personnel stationed in Germany.

9.106 Countries from the rest of the world show different patterns for arrivals. Over half of all residents born in Nigeria, South Africa and the United States arrived since 2001. For residents born in India, Pakistan and Bangladesh the decade 2001 to 2011 also had the highest percentage of arrivals, although Indians and Pakistanis also experienced earlier peaks in migration before 1981. By contrast 60 per cent of Jamaican-born residents arrived before 1981.

Qualifications

9.107 The qualifications classification used in the census enables figures to be produced for the percentage of the population obtaining the highest level of qualifications. Although not a new question in 2011, some of the qualification data are not directly comparable with 2001. This is due to several factors including changes in the level assigned to some qualifications, and the addition of a foreign qualification tick-box.

Figure 9.35 Qualifications of persons aged 16 and over, England and Wales, 2011



9.108 In 2011, 27 per cent (12.4 million) of usual residents aged 16 and over had achieved Level 4 or above qualifications in 2011. This was more than those who had reported no qualifications (23 per cent, 10.3 million, figure 9.35). However those who reported having no qualifications included those aged 16 and over who, at the time of the census, were still studying and thus had not yet completed their education.

9.109 Over half of the population aged 65 and over (52.9 per cent) had no qualifications. This was the only age group with a higher proportion of people reporting no qualifications than those with at least one qualification. Up to the age of 50, there were a higher proportion of men with no qualifications than women, whereas for those aged 50 to 64 there were more women (27.0 per cent) than men (23.2 per cent) with no qualifications.

9.110 There were 4 per cent of people aged 16 to 64 (1.1 million) with an apprenticeship as their highest level of qualification. Among men aged 16 to 64, some 5.3 per cent reported apprenticeship as their highest level of qualification compared with 0.9 per cent of women. Apprenticeships were generally more common among men than women across all age groups, because they were mostly found in male dominated occupations such as skilled trades.

9.111 Under the age of the 50, proportionately more women than men reported having a degree level or above qualification.

9.112 Blaenau Gwent (27.1 per cent) and Merthyr Tydfil (26.2 per cent) in Wales were the local authorities with the highest proportions of their population aged 16 to 64 reporting no qualifications. In contrast, local authorities in the south of England had the lowest proportions reporting no qualifications

9.113 Great Yarmouth (15.7 per cent) and Corby (16.1 per cent) were the local authorities with the lowest proportions reporting degree level or above qualification. The five local authorities with the highest proportions were all in the London region.

9.114 The North East of England had the highest proportion of people reporting apprenticeships as their highest level of qualification, with Barrow-in-Furness in the North West having the highest proportion across all local authorities. Conversely, local authorities in London accounted for the 20 lowest proportions; the three lowest proportions were the City of London, and Kensington and Chelsea (both with 0.6 per cent) and Westminster (0.7 per cent).

Labour market and travel to work

Economic activity

9.115 Among the 45.5 million usual residents aged 16 and over, 26.7 million were in employment during the week before the census, 2.1 million were unemployed and 16.7 million were economically inactive.

9.116 More than 8 out of every 10 of those in employment were employees (85 per cent), while the rest (15 per cent) were classified as self-employed, either working on their own or employing other staff.

9.117 Of the 16.7 million people aged 16 and over who were economically inactive more than half (58 per cent) reported that they were retired, while 14 per cent were students, 11 per cent were looking after the home/family, and a similar proportion reporting long-term sick or disabled. The remaining 6 per cent were economically inactive for other reasons.

9.118 Across England and Wales there were 8.4 million people aged 16 to 64 who were economically inactive, representing 23 per cent of the 16 to 64 population. There were a higher proportion of females who were inactive (28 per cent) than males (18 per cent) primarily because females were more likely to be ‘looking after the family or home’, while for males the primary reason for inactivity was being a ‘student’.

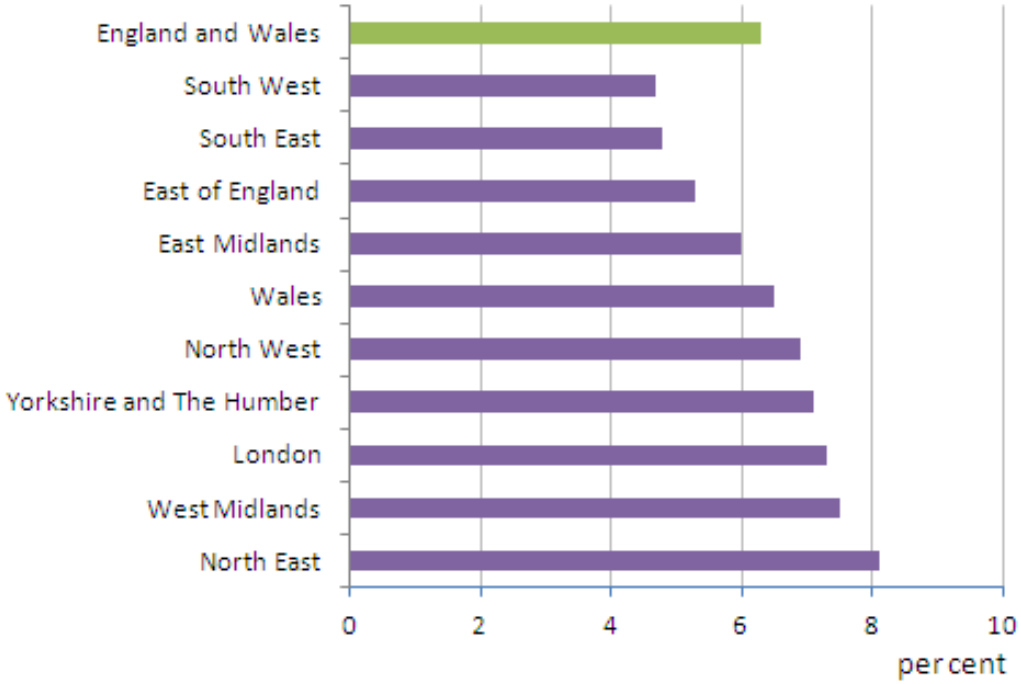
9.119 There were 25.7 million people across England and Wales who were aged between 16 and 64 years in employment on census day 2011 – representing an employment rate of 71.0 per cent.

9.120 Figure 9.36 highlights the differences in male and female employment types among 16 to 74 year olds. In 2011, almost four times as many women as men were part-time employees – 4.4 million women (33 per cent) compared with 1.2 million men (8 per cent).

Figure 9.36 Economic activity by sex, England and Wales, 2011

9.121 The level of unemployment varied across the English regions and Wales, from 8 per cent (103,000) of those economically active aged 16 to 64 in the North East to 5 per cent (126,000) in the South West (figure 9.37).

Figure 9.37 Unemployment, England regions, Wales, 2011

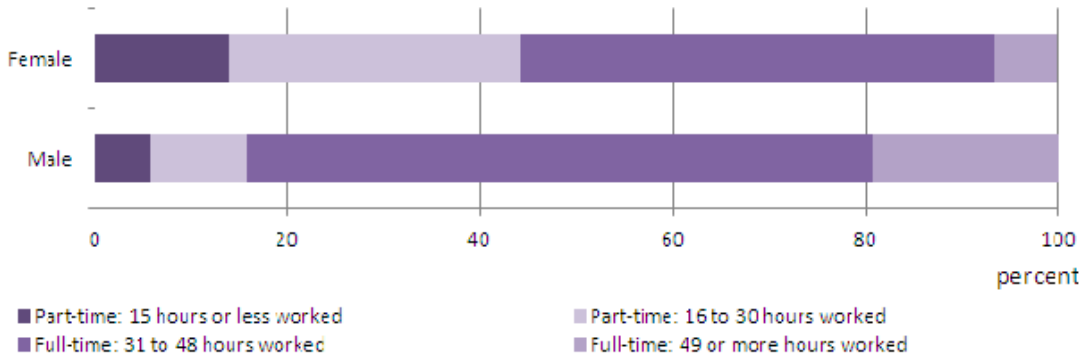


Hours worked

9.122 The number of hours worked by employed persons aged 16 to 74 decreased overall between 2001 and 2011. In 2001, 16 per cent (3.8 million) of this group worked 49 hours or more. This decreased by three percentage points to 13 per cent in 2011. Similarly in 2001, 59 per cent (14.0 million) worked 31 to 48 hours, but this decreased by one percentage point to 58 per cent (15.3 million) in 2011.

9.123 Figure 9.38 below shows a distinct difference between males and females in the numbers of hours worked.

Figure 9.38 Hours worked per week by sex, England and Wales, 2011



Occupation and industry

9.124 In 2011, for those aged 16 to 74, the broad occupation group with the highest number of respondents was the 'Professional' group (17 per cent, 4.6 million). 'Process, plant and machine operatives' was at the opposite end of the scale (7 per cent, 1.9 million). These occupation groups are based on the 2010 Standard Occupational Classification.

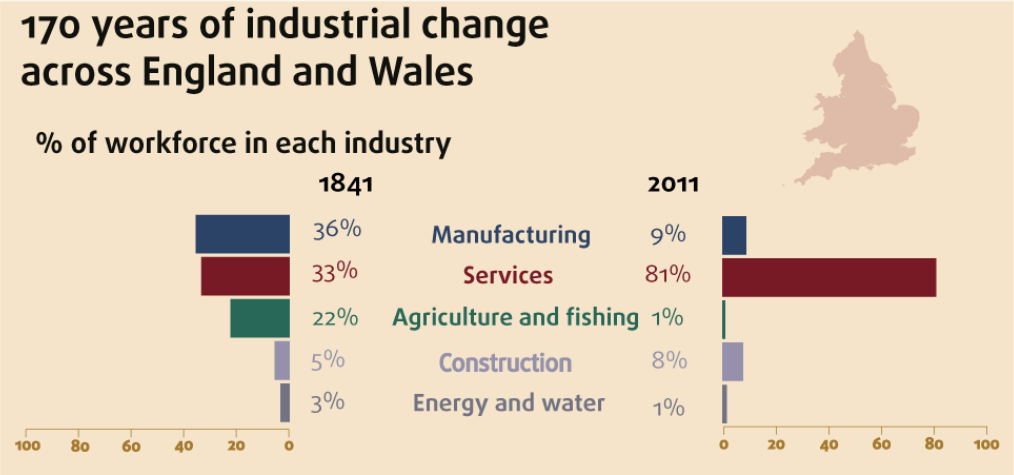
9.125 The largest industry sector (based on the 2007 Standard Industrial Classification) was 'Public administration, education and health', in which over a quarter (28.4 per cent) of workers were employed. This sector was also the largest employer of women, in which two out of every five employed women worked.

9.126 At every census from 1841 the percentage of people working in agriculture and fishing has declined. In 1841, 22 per cent of people worked in this sector, but 170 years on this had fallen to less than 1 per cent (figure 9.39).

9.127 Manufacturing was the most dominant industry in 1841 accounting for over a third (36 per cent) of the workforce, followed closely by services at 33 per cent. The expansion of services and decline in manufacturing meant that by 2011 only 9 per cent worked in manufacturing while 81 per cent worked in services.

9.128 Women are more likely to work in the service sector than men are and, in 2011, 92 per cent of employed women worked in the service sector. This compared with 71 per cent of employed men.

Figure 9.39 170 years of industrial change in England and Wales



Travel to work

9.129 In the 2011 Census, driving to work was reported as the most common form of commuting, with 15.3 million people (57.5 per cent of the working population) taking to the road. Of these, 882,000 stated that they worked mainly at, or from, home.

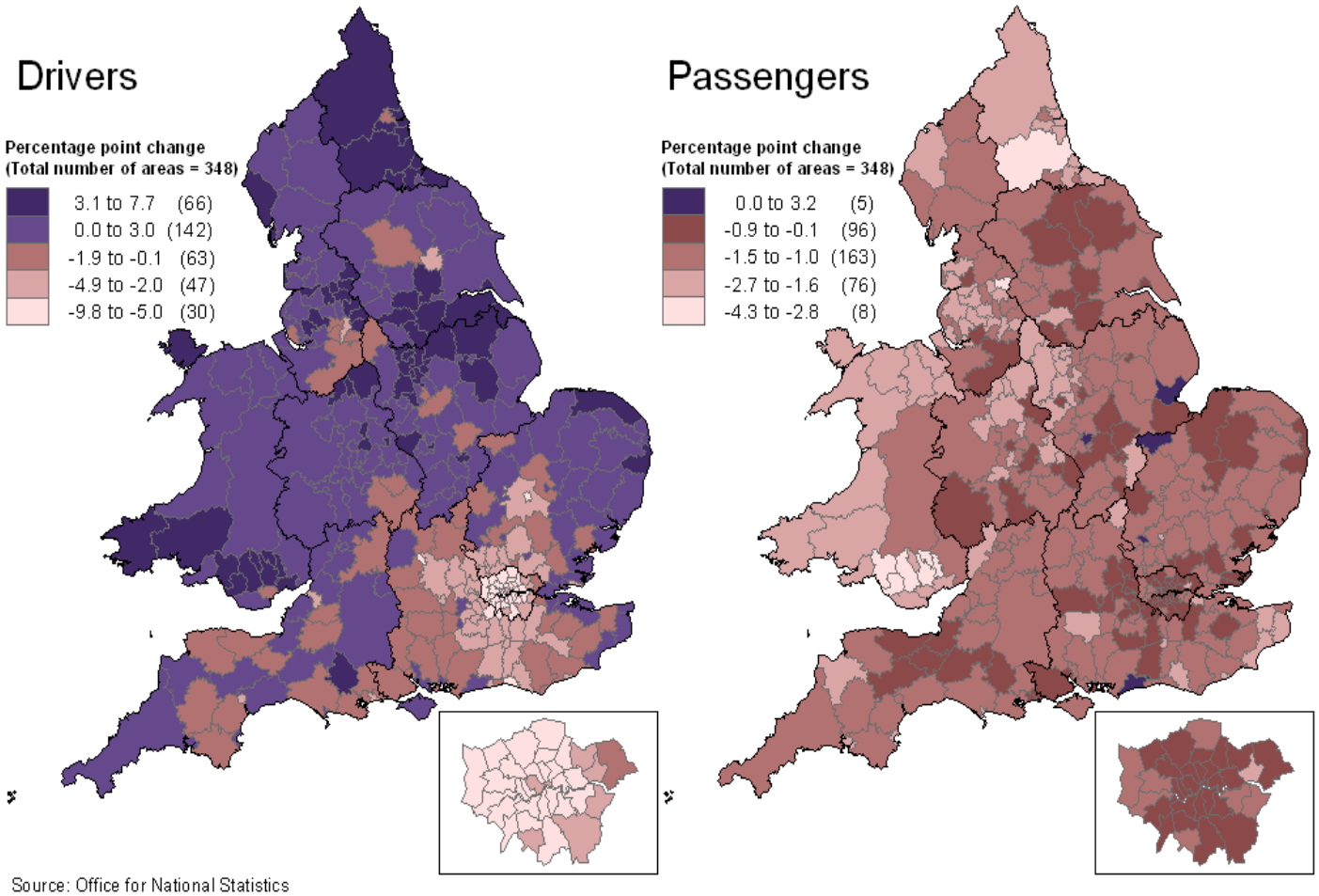
9.130 Commuting as passengers in a car decreased from 6.3 per cent in 2001 to 5.0 per cent in 2011. Consequently, the vehicle occupancy rate for cars and vans decreased from 1.11 in 2001 to 1.09 in 2011.

9.131 But the pattern of change in driving to work varied across England and Wales. In 2001, London had by far the lowest proportion of workers driving to work (33.5 per cent). This had reduced to 26.3 per cent by 2011. In absolute terms, the number of drivers fell by 58,000. Five of the English regions and Wales experienced an increase in the proportion of workers who drove to work, with the North East having the largest growth (3.5 per cent, figure 9.40).

9.132 A proportional decrease in passengers was seen across each of the nine English regions and Wales. Wales (2.4 percentage points) and the North East (2.3 percentage points) experienced the largest decreases.

9.133 Boston was one of only five local authorities to have had an increase in the proportion of commuters travelling to work as car or van passengers (3.2 percentage points). This increase is likely to be related in part to eastern European migrants employed in agricultural work. Such work may involve communal transport to various locations (figure 9.40).

Figure 9.40 Percentage point change in workers who commute to work as car or van drivers and passengers, England and Wales, local authorities, 2001-11



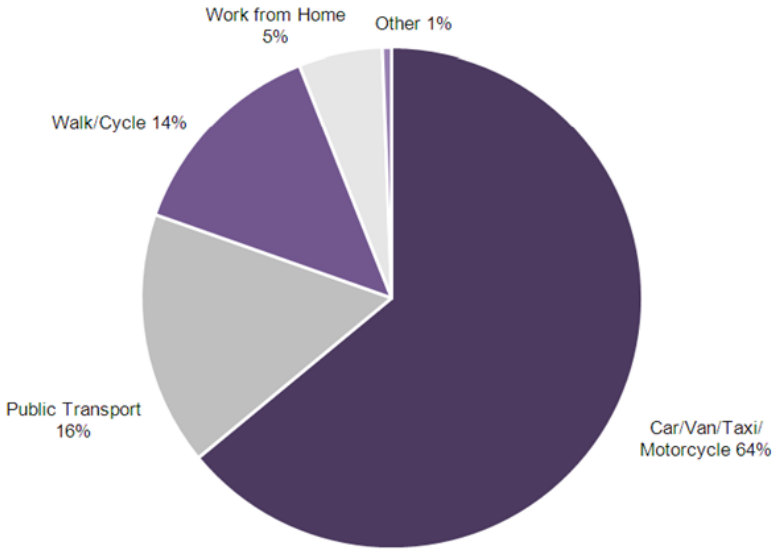
Source: Office for National Statistics

9.134 Other local authorities with high passenger rates in 2011 are in areas that have traditionally had large single-site employers. For example, the Sellafield nuclear reprocessing site in Copeland, Cumbria employs over 10,000 people. A single site with a large number of employees is more conducive to car sharing than multiple employers spread across a larger area. This may explain why Copeland has the fifth highest rate of passenger commuting out of the 348 local authorities in England and Wales, at 9.4 per cent of workers.

9.135 Some 4.3 million people (16 per cent) commuted to work by public transport, while 2.8 million people (11 per cent) walked and 760,000 (3 per cent) cycled to work (Figure 9.41).

9.136 While 214,000 people (0.8 per cent) commuted to work by motorcycle, moped or scooter, taxis and minicabs were used by 138,000 people (0.5 per cent) as their main means of travel to work, and 171,000 people (0.6 per cent) commuted by other methods (such as a ferry).

Figure 9.41 Method of travel to work, England and Wales, 2011



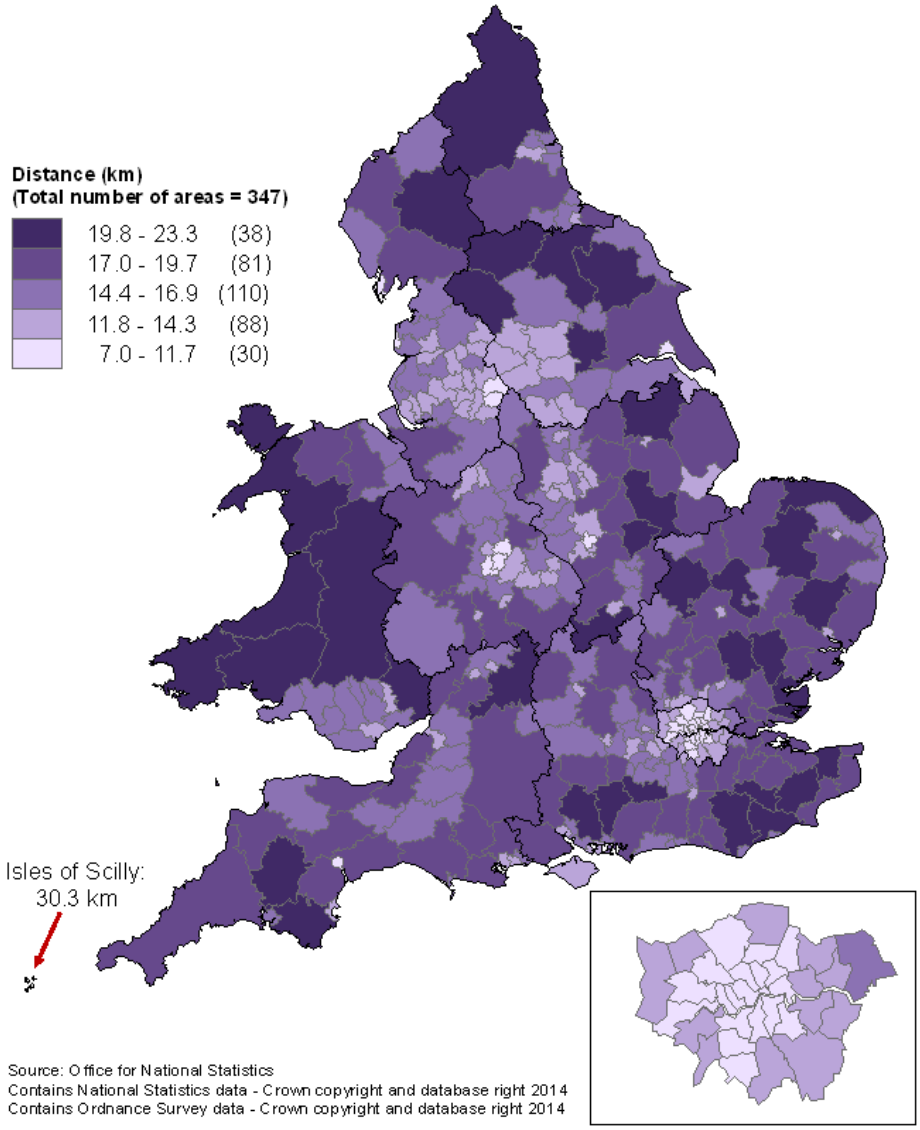
9.137 The average distance travelled to work increased from 13.4 km in 2001 to 15.0 km in 2011. This is estimated using only those workers making a regular commute between their enumeration address and their workplace address.

9.138 On average, workers resident in the East of England had the longest commute (17 km) while those in London had the shortest (11 km); see figure 9.42.

9.139 In both 2001 and 2011, males commuted further than females. In 2001, 39 per cent of males and 25 per cent of females commuted more than 10 km. By 2011, the rates of commuting such distances had increased to 42 per cent for males and 30 per cent for females.

9.140 Full-time workers commuted longer distances in 2011 than their part-time counterparts. While 55 per cent of part-time workers commuted less than 5 km, only 38 per cent of full-time workers did so.

Figure 9.42 Average distance travelled to work, England and Wales, local authorities, 2011



Housing

Type of accommodation

9.141 The relative proportions of types of accommodation remained broadly the same between 2001 and 2011. The percentage of households living in purpose-built flats, maisonettes or apartments in a block of flats or tenements rose by two percentage points from 14 per cent (3.1 million households) in 2001 to 16 per cent (4.0 million) in 2011.

9.142 The England regions and Wales showed similar percentages of households residing in the different types of accommodation, with the exception of London which had the smallest percentage (48 per cent, 1.6 million) of households residing in houses or bungalows (figure 9.43). The percentage of households residing in terraced houses varied from 21 per cent (407,000) in the East Midlands to 30 per cent (359,000) in the North East.

Figure 9.43 Accommodation type, England regions, Wales, 2011

Tenure

9.143 The four most frequently reported tenure types for households in 2011 were 'Owned with a mortgage or loan', followed by 'Owned outright', 'Renting from a private landlord or letting agency', and then 'Renting from the council'.

9.144 Ownership with a mortgage or loan had decreased six percentage points from 39 per cent (8.4 million households) in 2001 to 33 per cent (7.6 million households) in 2011. Ownership outright had increased by two percentage points from 29 per cent (6.4 million) in 2001 to 31 per cent (7.2 million) in 2011.

9.145 Renting from the council had decreased four percentage points from 13 per cent (2.9 million) in 2001, to nine per cent (2.2 million) in 2011. Renting from a private landlord or letting agency increased six percentage points from 9 per cent (1.9 million) in 2001 to 15 per cent (3.6 million) in 2011. The decline in rental from a council reflects in part the policy of transferring housing stock from councils to housing associations.

Rooms and occupancy rating

9.146 In 2011 there was an average of 5.4 rooms per household, an increase of 0.1 on the measure of 5.3 in 2001.

9.147 This ranged from 4.7 in London (the only region with an average of less than 5.3 rooms), to 5.6 in the East Midlands, East of England, South East and South West. Wales had the highest average number of rooms per household, 5.7.

9.148 The average number of bedrooms per household in England and Wales was 2.7. There was little variation across England and Wales, with London reporting the

lowest average, 2.5 bedrooms per household, and all other England regions with an average of either 2.7 or 2.8. Wales had an average of 2.9.

9.149 The occupancy ratings of rooms and bedrooms are indicators of deprivation and overcrowding in a household. An occupancy rating of -1 implies that there is one room too few for the number of people living in the household. In 2011, some 9 per cent of households (2.0 million) in England and Wales had an occupancy rating of -1 or less for rooms. This is an increase of two percentage points on 2001, when seven per cent (1.5 million) of households in England and Wales had an occupancy rating of -1. Five per cent (1.1 million) had an occupancy rating of -1 or less for bedrooms.

Central heating

9.150 Nearly all households in England and Wales in 2011 reported that they had central heating (97 per cent, 22.7 million). In 2001, the proportion was five percentage points lower at 92 per cent (19.8 million). Houses built in the intervening 10 years tended to have central heating as a standard feature.

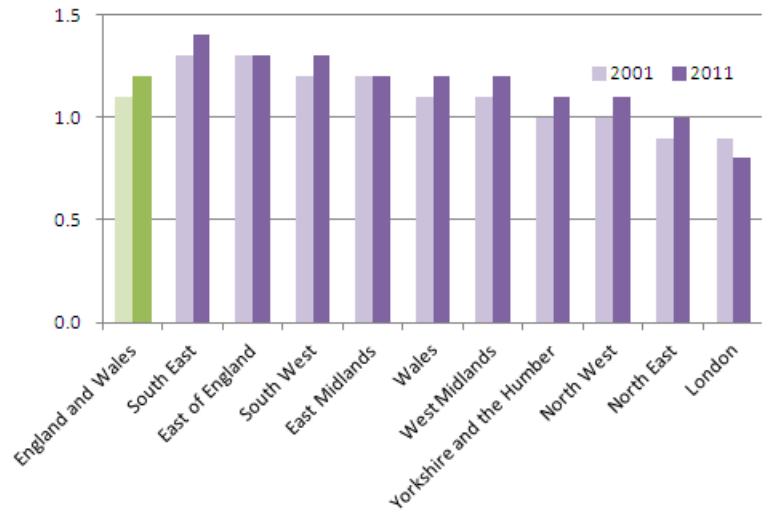
Car or van availability

9.151 The number of cars and vans available to households in England and Wales increased from 23.9 million in 2001 to 27.3 million in 2011. The increase of 3.4 million cars and vans is proportionately similar to the overall increase in the usually resident population (3.7 million) over the same period. In 2001 there were on average 1.1 cars per household whereas in 2011 there were 1.2 cars.

9.152 In London there was a decrease of 0.1 cars or vans available per household. The percentage of households with no cars or vans increased from 37 per cent (1.1 million) in 2001 to 42 per cent (1.4 million) in 2011.

9.153 Figure 9.44 shows that London was the only region in 2011 with fewer cars and vans (2.7 million) than there were households (3.3 million).

Figure 9.44 Average number of cars or vans per household, England regions, Wales, 2001 and 2011



Second address

9.154 The 2011 Census was the first to collect information on second addresses. The question was included primarily to better understand and determine the concept of 'place of usual residence' for those people who live or stay at more than one address during the year.

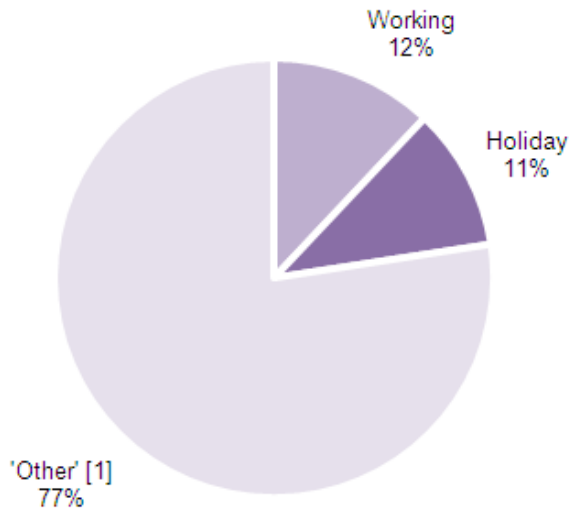
9.155 At the time of the 2011 Census, 1,570,228 usual residents in England and Wales (2.8 per cent of the usual resident population) reported having a second address in another local authority in England and Wales that they use for 30 days or more in the year.

9.156 Some 47,733 usual residents (around 0.1 per cent) had a second address in either Scotland or Northern Ireland, while 820,814 usual residents (1.5 per cent of the usual resident population) had a second address outside the United Kingdom.

9.157 Some 12 per cent (188,837) of second addresses were for work and 11 per cent (165,095) were for holiday, but the majority were for a purpose other than work or holiday, such as the home address of students. Over three quarters of second addresses (77 per cent, 1,216,296) were used for some other purpose (figure 9.45).

9.158 More than half of all usual residents with a second address in England and Wales were male. This was most prevalent for second addresses used for work, where there were 2.6 males with a second address to every female with a second address.

Figure 9.45 Percentage of second addresses in England and Wales by type



Communal establishments

9.159 Communal establishments provide managed residential accommodation; examples include sheltered accommodation units, student halls, large hotels, hospitals and prisons. The 2011 Census estimated that 98 per cent (55.1 million) of usual residents in England and Wales lived in households. Two per cent (1.0 million) lived in communal establishments – slightly more people (858,000) but the same proportion as in 2001.

9.160 In 2011, 57 per cent (572,000) of all communal establishment residents in England and Wales resided in non-medical establishments, including large hotels, student halls or prisons. This was a increase of three percentage points on the 2001 Census figure (54 per cent, 460,000).

9.161 Forty two per cent (420,000) of communal establishment residents were in medical and care establishments; 38 per cent (383,000) of this group were in care homes and four per cent (38,000) were in other medical establishments.

9.162 The percentage of communal establishment residents in non-medical establishments varied across the England regions and Wales from 51 per cent (23,000) in the North East to 58 per cent (58,000) in London. The percentage of communal establishment residents in care homes ranged from 33 per cent (33,000) in London to 44 per cent (20,000) in the North East.

Sources of data

9.163 This chapter of the General Report provides only a summary review of the main results that emerged from the 2011 Census and some comparisons with 2001. More details of the analyses from which these summary points have been taken are available on the ONS website in the following documents:

- ONS Statistical Bulletin 2011 Census - Population and Household Estimates for England and Wales, 16 July 2012
  http://www.ons.gov.uk/ons/rel/census/2011-census/population-and-household-estimates-for-england-and-wales/stb-e-w.html

- Short-term residents
  http://www.ons.gov.uk/ons/rel/census/2011-census/short-term-resident-population-statistics-for-local-authorities-in-england-and-wales/index.html

- Regional change
  http://www.ons.gov.uk/ons/rel/census/2011-census/population-and-household-estimates-for-england-and-wales/stb-e-w.html#tab-The-populations-of-the-regions-and-where-these-have-changed-the-most

- Marital and civil partnership status
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/stb-2011-census-key-statistics-for-england-and-wales.html#tab---Marital-status

- Full-time students
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-and-quick-statistics-for-wards-and-output-areas-in-england-and-wales/STB-2011-census--quick-statistics-for-england-and-wales--march-2011.html#tab-Students

- Living arrangements
  http://www.ons.gov.uk/ons/rel/census/2011-census-analysis/how-have-living-arrangements-and-marital-status-in-england-and-wales-changed-since-2001-/STY-living-arrangements-and-marital-status.html#tab-Living-arrangements-for-the-household-population

- Lone-parent households
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/stb-2011-census-key-statistics-for-england-and-wales.html#tab---Household-composition

- Ethnic group
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/rpt-ethnicity.html

- National Identity
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/rpt-ethnicity.html#tab-National-identity-in-England-and-Wales

- Main language
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-and-quick-statistics-for-wards-and-output-areas-in-england-and-wales/STB-2011-census--quick-statistics-for-england-and-wales--march-2011.html#tab-Main-language

- Proficiency in English
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-and-quick-statistics-for-wards-and-output-areas-in-england-and-wales/STB-2011-census--quick-statistics-for-england-and-wales--march-2011.html#tab-Proficiency-in-English

  http://www.ons.gov.uk/ons/rel/census/2011-census/detailed-characteristics-for-local-authorities-in-england-and-wales/stb---detailed-characteristics-for-england-and-wales--march-2011.html#tab-Proficiency-in-English-

- Welsh language in Wales
  http://www.ons.gov.uk/ons/rel/census/2011-census-analysis/language-in-england-and-wales-2011/rpt---language-in-england-and-wales--2011.html#tab-Welsh-Language--

- Religion
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/rpt-religion.html

- General health
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-and-quick-statistics-for-wards-and-output-areas-in-england-and-wales/rpt-general-health-short-story.html

- Long-term illness or disability
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-and-quick-statistics-for-wards-and-output-areas-in-england-and-wales/rpt-disability-short-story.html

- Unpaid care
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/stb-2011-census-key-statistics-for-england-and-wales.html#tab---Provision-of-unpaid-care

- Country of birth and citizenship (passport held)
  http://www.ons.gov.uk/ons/rel/census/2011-census/detailed-characteristics-for-local-authorities-in-england-and-wales/country-of-birth---rpt.html

- Year of (most recent) entry into the UK
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/rpt-international-migrants.html#tab-Year-of-arrival-and-age-at-arrival-for-the-usual-resident-population-born-outside-the-UK

- Qualifications
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/stb-2011-census-key-statistics-for-england-and-wales.html#tab---Qualifications

- Economic activity
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/stb-2011-census-key-statistics-for-england-and-wales.html#tab---Economic-activity

- Hours worked
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/stb-2011-census-key-statistics-for-england-and-wales.html#tab---Economic-activity

- Occupation and industry
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/stb-2011-census-key-statistics-for-england-and-wales.html#tab---Industry-and-occupation

- Travel to work
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-and-quick-statistics-for-wards-and-output-areas-in-england-and-wales/STB-2011-census--quick-statistics-for-england-and-wales--march-2011.html#tab-Method-of-travel-to-work

- Type of accommodation
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/stb-2011-census-key-statistics-for-england-and-wales.html#tab---Accommodation-and-tenure

- Rooms and occupancy rating
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/stb-2011-census-key-statistics-for-england-and-wales.html#tab---Rooms--bedrooms-and-central-heating

- Car or van availability
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/stb-2011-census-key-statistics-for-england-and-wales.html#tab---Car-or-van-availability

- Second address
  http://www.ons.gov.uk/ons/rel/census/2011-census/second-address-estimates-for-local-authorities-in-england-and-wales/index.html

- Communal establishments
  http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/stb-2011-census-key-statistics-for-england-and-wales.html#tab---Residents-in-communal-establishments

Chapter 10

Evaluation

10 Evaluation

Introduction

10.1 This General Report summarises the planning, conduct and results of the 2011 Census in England and Wales. It has noted that many aspects of this census were innovative and worked well. It also reports that there were, as with any census, a number of challenges and issues which ONS resolved and learned lessons from, to improve the planning of similar census operations in the future.

10.2 This chapter summarises the main conclusions from the evaluations of several major and innovative elements of the 2011 Census programme. Those issues relating to the evaluation of the response to, and quality of, the census data have already been covered in chapter 8.

10.3 The evaluations referred to in this chapter are not intended to provide comprehensive coverage of all the different elements of the census operation. The census evaluation reports published to date are available on our website[71].

Highlights from the 2011 Census

10.4 There are many highlights from the 2011 Census which where relevant will be used and built upon for the next census and other related programmes. But the value of any census is determined by the quality and utility of its outputs, and the extent to which the anticipated benefits have been fully realised. One of the aims of the census was not only to maximise coverage across England and Wales but to also minimise variation in levels of response between areas within population sub-groups (such as between age/sex population groups, or and ethnic groups). The census design and operation was geared to ensure that this could be achieved by:

- the design of the field operation and accompanying processes such as publicity, public interface (being able to answer the public's questions), and online completion
- maintaining the confidentiality of the information collected to ensure public trust and therefore public response, both for this and future censuses and for other ONS data collection exercises
- stakeholder engagement to advise and support the census operation, particularly from local authorities and community groups
- capture and processing of census questionnaires and responses, and the effective and efficient cleaning and validating

10.5 Ensuring good data quality was paramount to the next step of benefits realisation – making the information available and promoting it for the uses for which it was collected. Considerable effort was made before publishing the 2011 Census outputs to promote the results and ensure maximum use of the information, particularly by less experienced users of census data such as those in the voluntary sector, emergency services and citizen users.

10.6 The main successes from the 2011 Census were:

- better engagement with users and other stakeholders, particularly local authorities, which engendered higher levels of support for and confidence in the census
- inclusion of several new topics in the census questionnaire, including national identity, passports held, year of entry into the UK, main language, ability to speak English, second address, and type of central heating
- improvement in overall response, and exceeding the target for reducing the variation of non-response across local authority areas
- development of a purpose-built address register to facilitate mail-out of questionnaires and improve management of the field operation, including questionnaire tracking
- use of a reduced and more flexible and specialised field force, to enable more resource to be focused on achieving increased response rates in hard to enumerate areas
- introduction of a secure online census
- outsourcing of a range of support activities to specialist service providers
- more flexible dissemination and analysis of an increased range of census data via the ONS website and other means, including the development of innovative data visualisation techniques, and
- keeping costs within budget

Looking forward to the 2021 Census

10.7 Chapter 11 sets out the recommendation from the National Statistician for a 2021 Census and for more research to be put into developing alternative sources of population data for use in the longer term. Given the technological and societal changes that are likely to occur over the next decade, it will be important to build on some of the significant lessons from the 2011 Census in order to deliver a census of equivalent or better quality next time. This chapter sets out the more important lessons and considerations for a 2021 Census.

Programme management and organisation

10.8 The successful delivery of the 2011 Census programme provided a valuable opportunity for ONS and its partners to develop their expertise in managing and delivering large-scale, complex development programmes. Chapter 2 outlined how the programme was initiated, organised and governed through the various phases of the census cycle. Initiating and managing a programme the size of the census is challenging and the experience of the 2011 Census was no different. The following are the main lessons learned.

- Planning: detailed resource and activity planning must take place at the early stages of the programme. Planning activities should begin earlier both for development and delivery, and should include estimates of time and allocation of resources. Maintaining a full set of detailed plans from the start of the programme will give a clear overview of the census operation, and enable team leaders to understand their relationships with each other. The programme initiation/start up stage is critical for a successful programme or project and must devote time to the activities that move the

programme forward. For example, prioritising and planning initiation/ start up, and produce a project initiation document (PID) setting direction and priorities that is signed off and communicated to all levels. The PID should be reviewed at each major stage to ensure delivery is on course, and to re-plan accordingly

- Staffing/resource: the programme must ensure there are enough skilled people in post at the time they are needed, sufficiently trained/developed and capable of delivery
- Governance, controls and decision making: governance has to be clear right from programme initiation and where possible should avoid changes, particularly during programme initiation up to operations. Staff need to be clear on governance and decision making authority and responsibilities. Decision making should be prompt and avoid too many decisions being escalated
- Testing: the testing programme needs to be realistic for the timescales to which ONS needs to work. It may be better to have more smaller-scale tests, than to carry out a full-scale test at a time when systems and processes are still under development

Legislation and the parliamentary process

10.9 The legislation and parliamentary programme for a census in 2021 is likely to be broadly similar to that conducted for the 2011 Census. That is, before any census can be carried out, the primary legislation – the Census Act 1920 – requires two pieces of secondary legislation to be approved by Parliament: a Census Order (to be made in Council) followed by Census Regulations for both England and Wales. The (sometimes difficult) passage of these through Parliament is described in chapter 2.

10.10 In securing the necessary legislation for the 2011 Census, including the relevant Transfer of Function to Wales Order (which transferred the authority to make Regulations for the census in Wales to Welsh ministers) there were a number of lessons that should be considered for the next census.

- The Government's White Paper is a statement covering significant aspects of the census operation such as: the topics for which information is to be collected on the questionnaire; the arrangements for conducting the census in the field; the processing of data and disseminating results; the confidentiality provisions to protect the data; and requirements for the legislation necessary to implement these arrangements. This is a valuable document setting out plans for the census well in advance of the event, and becomes a useful reference tool in the run up to the legislation process and the census itself
- Close liaison and a good working relationship with stakeholders, particularly between ONS, the Welsh Government, the Cabinet Office Minister and officials, and their respective solicitor's offices, are essential to ensure the legislation's smooth progress through Parliament and the Welsh Assembly
- Involving experienced ONS staff who are aware of the detailed and unusual legislative procedures for the census, the Census Order and Census Regulations is beneficial
- Keeping up-to-date, detailed briefing materials, designed for multi-purpose use is critical. This ensures the necessary preparation of timely, consistent

and clear briefings at short notice, making the passage of the legislation smoother; and
- When dealing with ministers, government departments, Parliament and the Welsh Assembly, the timing of planned activities and events can easily be disrupted by procedural delays and other circumstances beyond the control of ONS. Therefore, a clear plan with good risk mitigation to minimise delays is crucial to ensure legislation is approved by the deadlines

Address register

10.11 As noted in chapter 2 an address register was central to the operational design of the 2011 Census. The register developed for the 2011 Census enabled ONS to address and uniquely code every census questionnaire before distribution. As plans for the 2021 Census are developed with the primary form of response being online, the address register will be even more central to a good design and successful operation.

10.12 Since the 2011 Census was held GeoPlace has been launched. This is a joint venture partnership between Ordnance Survey and the Local Government Association to develop an AddressBase database to provide one definitive source of accurate spatial address data, combining the best features of the National Land and Property Gazetteer (NLPG) and Address Layer 2. ONS welcomes this initiative, and will be working with Ordnance Survey and GeoPlace to share some of the main lessons to ensure that this new service will meet the address requirements of any future census design. The issues include:

- continuing to work and build new relationships with stakeholders to maximise the quality of the address register and identify new information that may also be relevant to addresses and the census operation (for example, whether a property is vacant)
- further work will be needed to research and test the business rules that decide which addresses should be included in the census or excluded. The hardest judgement is balancing the risk of under-coverage with the risk of over-coverage
- an ONS field check to identify new addresses should be used as a last resort of any requirement for the manual reviewing of individual addresses should fully explore automated or office-based checking rather than use field checkers
- more effort should be focused on building a list of communal establishments. Any source products need to be thoroughly understood in terms of coverage, definitions and whether they contain overall/shell or sub-addresses. The task should not be divorced from compiling the residential list because this increases the risk of duplication between the lists. The residential and communal establishment lists should be linked and maintained in tandem, and
- addresses change all the time. It is impossible to get a perfect address list, so it is essential to clearly define and communicate quality goals at the start. It is important to be aware of the weaknesses of address lists used and how these will impact the field work, the public and other processes, ideally with targeted testing in the field

Stakeholder management

10.13 A census has an exceptionally large number of stakeholders with differing degrees of influence and interest in the various aspects of the census operation. Managing the complex interactions with these stakeholders is essential to a successful operation, achieving good coverage and realising the benefits of the census through the use of the census results. For the 2011 Census, ONS implemented an approach to provide consistency in communicating with stakeholders as a whole.

10.14 ONS recognised that the many stakeholder groups would require different methods and degrees of approach, so different modes of engagement were developed to reflect this. Overall the engagement process can be considered a success and was a major factor in assisting ONS in reaching its response rate targets and the utilisation of its outputs.

Local authority engagement

10.15 The local knowledge and intelligence provided by stakeholders (particularly local authorities and community groups) helped ONS to target and tailor its field operation and communications more effectively. In looking ahead ten years, a more diverse society can be expected, suggesting that building on the successful 2011 engagement programme will be crucial to delivering a successful census. Some of the significant successes were:

- the census advisory groups and working groups who helped ONS significantly to refine and improve detailed aspects of field operations planning. This led to improvements such as:
  - local authority employees seconded to fill some area manager posts
  - development of the community adviser role
  - refinement of local census partnership plans, and
  - guidance on supporting the field operation

10.16 Local authorities contributed significant resources to support the 2011 Census: ONS estimates these to be worth more than £10 million. This included staff costs (CLM/ACLM posts, address anomaly resolution and feedback, and questionnaire completion events), and budgets for local publicity and media coverage.

Lessons learned

10.17 ONS identified the following lessons from its liaison with local authorities in 2011. These not only helped to inform the programme of census outputs but were shared with other ONS business areas to help the continual improvement of ONS's wider stakeholder management strategies:

- The local authorities' network of census regional champions worked well and helped to secure high-level commitment and resources from councils
- Earlier engagement with local authorities, and earlier guidance on the support they could provide, would help councils to plan and allocate resources more effectively; and
- ONS did not fully exploit the potential of county councils in England, and consideration should therefore be given as to how to better engage with county councils in future

Community liaison programme

10.18 As noted in chapter 2, the 2011 community liaison strategy was designed as a result of the success of the 2001 Census liaison activities. Proactive engagement was recognised as an essential part of the 2011 Census process, and this began three years earlier than for 2001. In support of the strategic aims and objectives of the 2011 Census, the strategy supported the active engagement of communities at national, regional and local levels to increase the overall response rates in their areas.

10.19 The community liaison programme clearly played a part in helping ONS to achieve its 2011 Census target response rates but there were other tangible achievements resulting from the engagement with local communities. These can be summarised under three main categories.

Developing strategic partnerships with stakeholders

10.20 The development of strategic partnerships with stakeholders resulted in:

- hints and tips on best methods of engagement, and data regarding different population groups and their motivation and sensitivities to participation
- access to current, established and effective networks and communication channels set up by independent, interested bodies such as 'umbrella' organisations in the voluntary sector
- assistance in the development of community engagement toolkits and methodologies for the local engagement phase, and in the development of training and instructions manuals for census field staff
- questionnaire completion advice events being run by community groups, who provided translators and assistants
- access to well used and recognised local venues (such as Polish Orthodox church halls) for census presentations and completion events to help hard-to-reach groups, or access to secure computer terminals for completing online questionnaires as part of a national approach
- fast-track access to important and respected contacts in local populations, where other forms of engagement were shown not to be working well

Innovative techniques

10.21 Innovative techniques and approaches included:

- establishing community panels for in-depth consultations with specialist community networks, gatekeepers and umbrella organisations for advice, consultation, and partnership, regarding awareness and barriers (including literacy and learning disabilities) or issues for questionnaire completion
- designing tailored approaches to best suit different groups (for the Traveller community, for example); presenting and interacting at the main gatherings of community leaders of some hard-to-reach population groups

Major investment by communities

10.22 Communities, networks and organisations that had a strong sense of citizenship and motivation conducted many additional engagement activities themselves, such as the:

- British Chinese community, who sponsored Chinese media events, ran stalls at high level events such as the Chinese New Year, and funded a Chinese 'Purple Bus' tour to cities with high Chinese populations
- British Ravidassians, who produced more than 10,000 leaflets, gave national presentations (in English and Punjabi), provided online videos and Facebook/Twitter campaigns, conducted community TV debates, and organised a census engagement ceremony by national leaders at the House of Commons, and questionnaire completion events at every temple
- partnership with influential and strategic organisations including RNIB, Deaf Connections, People First, Scope, Citizens Advice Bureau at national and local levels that resulted in targeted information campaigns and helping respondents to find census helplines and other completion facilities.

Lessons learned

10.23 Notwithstanding the success of the programme, a number of important lessons were identified:

Supporting material

- It is important to provide community information packs – or at least supporting publicity materials – as early as possible in a census programme. This gives time for community organisations to tailor these for their own presentations with local messages and then cascade them through their networks

Face to face contact

- The most effective engagement is achieved in person. ONS should ensure that the balance between direct or indirect engagement is considered. Direct engagement can really make a difference to a particular section of the population

Strategic planning

- Develop an approach where engagement activities that prove successful at national level are then rapidly planned into regional and local strategies. This will give local networks proven ideas for initiatives that can be exploited locally in good time

Understanding leads to motivation

- Ensure that there is sufficient dedicated resource to engage with stakeholders to understand the potential barriers to participation to enable solutions to be implemented

The importance of local knowledge

- Gather information on how local barriers, local issues, and local geographies will affect the census enumeration. This knowledge will provide valuable benefits, particularly if it is based on the real experiences of people in the area.

Census Coverage Survey

10.24 As in 2001, ONS carried out a Census Coverage Survey (CCS) soon after the main census fieldwork was completed. This is described in chapter 4. The main purpose of the CCS was to measure and adjust for both undercount and overcount; this was done by gathering information about a representative sample of the population and comparing it with the census responders.

10.25 The CCS was a successful field operation in that it completed on time, was £0.3 million under budget and, most importantly, achieved a combined interview rate for England and Wales of 90.4 per cent (including self-completion questionnaires which were left at households that had not been contacted by the end of the field period). This exceeded the target set by ONS of 87 per cent and was roughly equivalent to the 2001 interview completion rate of 91 per cent, despite a sample more biased towards harder areas.

10.26 In any future CCS there should be a review of the sample that may provide further changes/improvements to the measurement of coverage. In addition, in the light of the main lessons learned from the 2011 CCS, a number of recommendations have been proposed for consideration in any future similar exercise, as follows.

- As was done in 2011, consider promoting the CCS in all publicity material for the main census, to raise its profile as an essential part of the census process
- Ensure that the CCS is put high on the agenda of local authorities. ONS should build on the relationships established with local authorities for the census itself, while being careful to assure the independence of the survey
- CCS managers should not be expected to train staff. This distracts them from their main function, especially when new recruits start late. The training model used for the main census field workforce is a proven alternative
- Review the householder interview methods, particularly for hard-to-contact householders, to understand possible alternative methods for achieving increased contact and interviews earlier in the CCS

Data collection and the field operation

10.27 The collection of responses from over 20 million households is the most challenging aspect of the census and is critical to delivering robust, high quality census statistics. Data collection covers a number of different activities that are heavily inter-related to ensure that the public are aware of the census, can easily respond to it, and can access the additional information or support they need to complete their questionnaire.

10.28 Ensuring that this takes place requires the recruitment, training and management of a large field force of 35,000, a complex logistical operation to give them relevant materials and payment systems, and an online completion facility for the public.

10.29 Planning for the field operation of the 2011 Census began in 2003, alongside other elements of the programme. The issues encountered in 2001 informed a number of major design decisions that led to further fundamental changes to the structure and management of the large field force.

10.30 ONS assessed these design decisions through many small 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 with more than 130,000 households in 2009.

10.31 The decision following the 2007 Test to make the 2011 Census the first one to deliver questionnaires primarily by post enabled the size and structure of the field force to be based on the effort needed to follow up non-responding households, rather than on the effort needed to deliver questionnaires. Two fundamental design changes resulted from this. The first was that field staff would work as a team in an area and could be flexibly deployed within that area (rather than, as had previously been the case, having each field staff worker allocated one specific enumeration district). The second was that the amount of staff effort needed in each area was determined primarily by how hard it was expected to be to get a response, and the anticipated amount of follow up activity, rather than how long it would take to deliver questionnaires. The savings from using post-out rather than hand delivery meant that the focus of effort shifted to follow-up, with considerably more hours being spent on follow-up activities compared with 2001.

10.32 Recruiting, paying and training the field force was outsourced as a package for the first time. While there were some issues the approach worked well in most areas. Notable achievements were: improvement in the calibre and diversity of the staff recruited; the robustness and accuracy of the payroll function; and the implementation of required disclosure checks for all field staff.

10.33 However, there were some issues: some areas did not have all staff recruited in time, and in others some staff could not start because of delays in issuing identity passes. ONS had anticipated there would be some localised recruitment difficulties and so, to help manage the risk of under recruitment. Proactive management by the field managers, the recruitment agency Capita, and ONS, meant that there was no adverse effect on the follow-up operation.

10.34 Much emphasis was placed on field staff assisting people with completing their census returns. Local liaison work by field managers encouraged a positive response to the census. Field staff at all levels were involved in the running of hundreds of questionnaire completion events based on local intelligence about the groups in their area that needed support or advice.

10.35 More than 25 million questionnaires were successfully delivered by Royal Mail in the two weeks from 7 March – faster than anticipated. By the end of the follow-up operation Royal Mail had collected, receipted and delivered to the data capture centre more than 20 million returns.

10.36 The development of a questionnaire tracking (QT) system that could track each questionnaire was significant and provided important field information that was lacking in 2001. This system enabled ONS and the field managers to monitor and

manage the follow-up operations far more effectively. The questionnaire tracking system was updated daily as questionnaires were returned through the post or online. This information was used to direct staff to the areas of poorest response.

10.37 The enumeration of communal establishments, special accommodation sites and special population groups was improved by a greater focus on such groups and by the introduction of a specific field role – the special enumerator. Special enumerators received role-specific instructions, training and procedures that focused exclusively on the execution of the special enumeration, making them experts in their areas.

10.38 ONS concentrated on ensuring that the worst-responding areas in previous censuses achieved improved response rates, which would significantly increase the quality of census outputs. Resources were targeted on the hardest-to-count areas. It is clear that this approach worked: those local authorities with the lowest response rates in 2001 saw significant improvements. For example, response rates in inner London authorities increased by between 5 and 15 percentage points compared with 2001.

10.39 The 2011 Census has been highly successful in meeting or exceeding some very demanding targets. The follow-up field operation played a significant part in this success, despite the adverse trends of a changing society and lower response rates in survey-taking generally.

10.40 There were some generic lessons learned during the data collection phase that should be considered in the design and operation of the next census. However each census is unique, designed to take account of the societal challenges relevant at the time and to maximise the benefit of improved and increased use of technology. The next census will be no different.

Lessons learned

10.41 A significant issue for the 2011 field operation was the overloading of the co-ordinator's role (the co-ordinator was the line manager for the collectors). In particular:

1. the planned manager-to-staff ratios were too high. The original plan to keep the ratio between 1:10 and 1:12 was later amended to 1 co-ordinator to 15 collectors plus special enumerators. Some coordinators ended up with teams of more than 20
2. late changes and new work was expected to be absorbed by the co-ordinators. The extent of their involvement in special enumeration tasks was not fully understood until close to the operation. The number of early collectors in some of the co-ordinator teams was also increased at a late stage, resulting in extra people and new tasks to manage
3. there was no contingency built into the management roles to deal with unplanned operational issues and, as had been the case in 2001, there were many of these in 2011. Co-ordinators spent most of their time either dealing with the mechanics of operating their teams or fire-fighting problems (such as chasing up recruitment and supplies and managing workloads on the questionnaire tracking system)

10.42 As a result there was too little time for co-ordinators to provide quality team management. Debriefings with co-ordinators showed they felt that their job description was incorrect: the job was 'sold' as having an 80 per cent management/ 20 per cent administration split, but the reality was felt to be the reverse of this.

10.43 ONS consequently had to pay large amounts of overtime to co-ordinators throughout the operational period. ONS employed many experienced staff, but lost the opportunity to fully utilise the management and motivation skills they possessed.

10.44 Arising from these, the recommendations for any field operation for the 2021 Census are to:

- reduce the staff-to-manager ratios. The numbers will depend on the final census design, but for most teams 1:10-12 would seem to be a more practical span of control
- build considerable contingency time into the field management roles. For this type of operation it is a fair assumption that there will be unplanned operational issues to deal with, and contingency should be allowed for these in the task analysis
- make sure that the management roles include time to manage: coaching, developing and motivating their teams is an important task that, if done properly, should optimise the value of the field operation
- consider the need for additional field team roles; administrative support for essential but less skilled tasks would have helped, as would a separate manager for special enumeration work
- avoid late operational changes if possible, or at least be realistic as to what the operational impact might be, and work harder to mitigate potential problems

10.45 The main enumeration challenges that were encountered in 2011 look set to remain relevant for the next census, such as:

- second homes/holiday homes
- new developments
- gated communities
- complex multi occupied housing, and
- particular hard to count communities

To deal with these ONS stuck with a tried and tested method: if a response was not received, a member of field staff was despatched to find out why. This could result in persuading a reluctant householder to take part, or in the field staff completing a short dummy form that describes the non-responding address to the best of their knowledge. The field work required to complete dummy forms was quite labour intensive, and often involved collectors making educated guesses as to what lay behind front doors. Greater use of administrative information may provide alternative ways to obtain the information contained on the dummy form in the next census.

10.46 Using area managers and co-ordinators to gain local contacts and knowledge to help with address and enumeration problems (through the local authority and community liaison programmes) proved to be really useful. Some of their solutions and suggestions came quite late in the cycle, and could be further developed for 2021. The LA liaison work carried out by area managers in the eight months leading up to census day might be built on to provide more advanced knowledge of the problematic addresses, perhaps by involving them with more local contacts such as housing associations and developers. It proved difficult to find managers who excelled at both the local liaison work and the operational management of their team. ONS may therefore have been expecting too wide a skill set in its area managers and may need to consider separate roles.

10.47 More forward planning should have been undertaken in areas where address problems were clustered together – in, for example, massive new developments or holiday areas. Tasking early collectors on this work helped, as did additional letter drops in areas with high volumes of second homes. However more detailed contingency plans for these types of areas, with more preparation, could have made this part of the enumeration more effective and efficient.

10.48 Clear and simple processes that field staff understood from the start, and were properly trained for, would maximise the effectiveness of their procedures. A modern census is intrinsically, complex with large numbers of inter-related teams, systems and processes. Field staff tasks need to be simple enough to enable training en masse in a relatively short period, and easily understood in order that they are done effectively.

10.49 The recommendations for use of field resources for the 2021 Census are to:

- build on the 2011 strategy of using field staff to identify and resolve local enumeration problems. For example having a local presence to investigate address issues that are hard to resolve centrally could bring much value before and during the operational period. This should be considered early as part of the overall fieldwork design
- review the effectiveness of the dummy form as a way of getting information about non-responding households. In some cases administrative data, or work done on the address register, could perhaps provide more accurate information more cost effectively
- consider procedures to cope with the clustering effect of the 2011 enumeration challenges such as second homes in central London. There may be a need to prepare different field strategies for different types of hard to count area
- balance the cost savings of recruiting less specialised staff (who could do several jobs at different stages) with the efficiencies of having staff with the right skill sets to do specific jobs
- develop contingencies early for all enumeration problems, so that their effectiveness can be optimised. A guiding principle is to avoid late changes unless they are really necessary, and attempt to keep field processes simple.

10.50 One aspect of data collection that creates significant risk if not tackled properly is the design of the field staff employment contracts. A lack of understanding of all the operational requirements did result in some contractual gaps.

- Lack of clarity on which field staff role could be done on top of other full- or part-time work caused issues at the recruitment and operational stages. In particular, ONS allowed co-ordinators who already had full-time jobs to continue their existing employment. This became impractical by the time the enumeration period started
- Some collectors completed their work earlier than expected and were retained as special enumerators. However this involved last minute negotiations to resolve contractual issues.

10.51 One strength was the contractual requirement for collectors to work 60 per cent of their time at evenings and weekends. This might vary for 2021, assuming that a fair proportion of visits might be needed to support members of the public who are not

able to complete the census online. However, it is worth being very precise in the contract about such requirements.

10.52 Recommendations for field staff contracts are to:

- ensure that there are good levels of field operations and employment contract law experience amongst the teams negotiating the field staff contracts
- make greater use of the experience of ONS social survey staff to determine how the detail of field staff contracts will work in an operational environment

10.53 Field staff experienced serious problems in getting all the supplies they needed to do their jobs. Issues ranged from inadequate supplies for new recruits, and delays in restocking essential supplies of questionnaires, to a shortage of printer cartridges for co-ordinators to print out their follow-up lists. Although many of these issues were only relevant to the circumstances in 2011, it should be noted that there were also considerable problems caused by supplies and logistics failures in the 2001 Census. Some of these issues may therefore still be relevant for 2021.

10.54 The key lessons to learn regarding supplies and logistics are:

- getting the right supplies to the right people at the right time remains a high risk on the success of any field operation. The field operation will always be a vast and complex logistical process with the potential to cause a good deal of error and delay; and
- as well as creating practical problems, failure to deliver supplies has a big effect on field staff morale and on their confidence in ONS.

10.55 The main recommendations regarding supplies and logistics.

- Provide local stores to hold field supplies. Although there are likely to be fewer paper questionnaires issued, additional hubs could help alleviate other supply issues. It is especially critical to have a logistics store for London
- Put as much effort into monitoring the amount and location of field supplies as is put into monitoring response rates
- Undertake more contingency planning to establish the processes if supply routes break down
- Test field staff support processes, systems and any contractors as fully as possible. This part of the operation presents significant risks if it is not done well

10.56 The field force was managed and supported by an HQ based team, consisting of regional managers and their administrative support. The regional management team (RMT) faced a number of significant issues.

- Many of the team had no previous census experience, and delays with recruitment meant that they received only minimal training. Some RMT staff joined ONS only two months before census day. Many managers did not understand the organisational structure or know anyone outside their team
- The scale of the main operation magnified problems to an extent that could not be rehearsed. The RMT was therefore overwhelmed with a large

number of calls and emails throughout the operational period (up to 1,000 a day at the peak period). The most frequent problems were supplies and logistics, recruitment concerns, and technology issues
- The RMT was trying to carry out too many functions. The main tension was whether the RMT's role was to manage and direct, or to support. Many of the area managers were very experienced, and were used to working at a senior level. Remote management is challenging at the best of times, but it was difficult for many of the HQ based regional managers to provide leadership, particularly because they were effectively the same grade. Some of the regional teams proved much more comfortable providing an administrative support/problem solving role than offering real management direction
- The RMT was very large (60 plus) in order to cope with the volume of work, but this made it difficult to communicate with them and ensure that every member of the team was dealing with issues in a standardised way.

10.57 The main recommendations regarding HQ management and support structure for the 2021 Census.

- Enable the different RMT functions (support and query resolution, line management and communication) to make sure they are carried out effectively. It would make sense to use a call centre type technology to properly log, prioritise and deal with field staff queries and requests. An obvious solution is to use the public call centre to support field staff as well, and have a small team of HQ experts who can be consulted for technical queries
- A smaller HQ-based RMT could then focus on managing the field staff rather than supporting/dealing with their problems
- Having a communications expert responsible for all communications to field staff would ensure consistent, well written messages
- The workload for the head of the RMT was too large, consider splitting this role
- Attempt to rehearse these support systems as closely as possible before the census, to ensure working systems are in place, even though the volume of issues will not be comparable

Data processing

10.58 Future requirements and implementation of data processing may be very different because of an increased use of online completion, changes in output requirements and the methods of dissemination. Therefore it is likely that a number of the more detailed lessons learned from processing the 2011 Census will not be relevant. However there are some strategic lessons that are important to heed for the 2021 Census and this section seeks to highlight them.

Data capture and coding

10.59 Chapter 5 reported that the accuracy levels of the data capture and coding processes more than exceeded the targets set. However, the setting of targets, the training of coders, and the quality checks around this work will need to be freshly reviewed in the light of new and improved methods for capturing this information and the relevant output requirements. The following are examples.

Workplace coding

10.60 An important use of census data is the analysis of workplace statistics and information on commuting patterns. Although the levels of accuracy achieved were higher than the targets, some small, localised issues meant that some areas' commuting patterns looked implausible. The coding of this information has always been problematic because respondents often do not know either their own workplace address or the workplace address for others in the household. This situation is not likely to change, but more needs to be considered in the design of the online questionnaire, the capture and coding of responses, and data processing to improve the accuracy of the information collected. Checks should be built in to identify the more obvious anomalies found in 2011 (for example Newport in Wales or Newport on the Isle of Wight).

Date of birth capture

10.61 A respondent's age, derived from the date of birth they give, is critical to later statistical processing and is an important constituent of almost every census output. Despite the very high level of capture and coding accuracy, some issues were associated with the scanning information. There was evidence that the numbers 6 and 7 were sometimes scanned as a 1. For the vast majority of errors this has a negligible and unnoticeable effect, but in this example instances where year of birth of 1961 was captured as 1911 was noticeable because the numbers of centenarians is small – resulting in a disproportionately larger impact on a particular age group.

Downstream processing

10.62 As shown in chapter 5, the systems and processes that cleaned, validated, adjusted and protected the data largely worked as intended within the overall timetable for outputs. Again, given developments in technology and online data capture, this is an area likely to undergo significant change for the next census. However, there are a number of over-arching strategic design and methodology lessons that should be considered for future census design.

Timetable

10.63 Consultations with census data users identified that they would prefer 2011 Census results to be provided 'right first time', even if they took longer to produce. The first results were produced on 16 July 2012, nearly 16 months after census day. The speed of the release of results from the census depends on how quickly the information can be processed, validated, quality assured, tabulated, and made ready for publication. This date met the target that was set for the census and was, in fact, a small improvement on the equivalent date in 2001.

10.64 To speed up production of the initial outputs would rely on a number of factors, and in particular on an increase in online responses. This can significantly reduce the time required to capture and code the responses. The two major statistical processes of coverage assessment and adjustment, and edit and imputation, were designed to be carried out sequentially, area by area. If it was possible to clean and adjust the data accurately without relying on the processing of an entire area to complete, this would significantly speed up the production of outputs.

Systems and system development

10.65 One of the main difficulties experienced in downstream processing was that, prior to live processing, the systems were not completely tested with data from census type scenarios. The effect of this was that there were:

- a large number of requests for change that needed to be implemented to ensure that the processing would work in an automated, robust manner, and
- delays within individual processes had knock-on effects on later processes. This created pressure on the operational teams, and reduced time for some other activities, such as quality checking

10.66 For the next census the design and development of downstream processing systems need to be ready earlier, so that they can be rehearsed as part of the census rehearsal. This was an aim for both the 2001 and 2011 Censuses, but was not achieved in either.

Methodology lessons

10.67 There are many detailed lessons about the methods employed that should be reviewed for the next census. Many depend on the systems employed, the content of the questionnaire and output requirements, but strategically there are areas where methods for the next census should be reviewed and improved if relevant.

Edit and imputation

10.68 As in previous censuses and as noted in chapter 5 the primary objective of the 2011 item editing and imputation strategy was to produce a complete and consistent database by replacing all missing and inconsistent data with imputed values using a robust statistical method that estimates the distributional properties of the missing/inconsistent data as accurately as possible.

10.69 In general, the 2011 Census item-level edit and imputation strategy was successful in meeting all of its main aims and objectives. On reflection, one of the most important decisions contributing to this success came from the early development phase of the project where the decision was made to design and develop a processing strategy based on the already tried and tested methodological software platform, CANCEIS. Investing time and effort into optimising the parameters of the CANCEIS platform rather than building a bespoke system as in 2001, clearly contributed not only towards the delivery of a complete and consistent Census database, but also to several advantages over the 2001 Census edit and imputation strategy. The system was faster and more efficient, but perhaps more significantly, there were a number of improvements to the quality of statistical outcomes. A more detailed overview of the 2011 objectives and how the CANCEIS based system performed compared to the 2001 system can be found in chapter 5.

10.70 Although the 2011 Census edit and imputation strategy met all of it aims there were a number of issues that were not identified until evaluation of the imputed 2011 Census data began in the early stages of live processing. A detailed review of these issues can be found in the 2011 Census edit and imputation evaluation report. Without exception, all of the issues arising during 2011 processing could fundamentally be attributed to unexpected characteristics of the 2011 Census data and how these factors influenced the end-to-end edit and imputation processing strategy. In general, adjustments were required for all key processing stages. For example.

- In the pre-imputation editing phase, at first, the complex reciprocal relationships between people in households with more than four people could not be resolved efficiently or accurately through the original design of the edit and imputation strategy. To resolve this, a deterministic editing process based on triangulation rules between people in a household had to be implemented prior to statistical imputation
- During the imputation phase, in addition to those already anticipated, new edit rules had to be designed and implemented to prevent the propagation, or worse, the removal of rare characteristics by the imputation process. For instance, there were fathers in the data who were more than 65 years older than their children. While there is no reason to remove such rare characteristics from the data it would not be appropriate for similar characteristics to arise due to the imputation process
- Also during the imputation phase, adjustments had to be made to the donor selection parameters of the CANCEIS system to ensure the statistical accuracy of the imputation. For example, based on 2011 Census data and questionnaire design the CANCEIS donor selection parameters could not account adequately for the complex relationships arising through the routing/skip patterns in the 2011 Census questionnaire, the complex relationships between student-age, working-age, marital/civil partner-age and parent-age, and the patterns of non-response related to these variables. Before amendments were made this lead to an over estimate of 15 year old and an under estimate of 16 year old students in the imputed data

10.71 As the parameterisation of the end-to-end edit and imputation strategy for 2011 was primarily based on 2001 Census data it is perhaps no surprise that adjustments to several aspects of the 2011 strategy were required once the system was set to treat live 2011 data. Undoubtedly, the detailed record of adjustments made to the 2011 Census edit and imputation system will serve as lessons to carry forward into preparations for the 2021 Census. However, it is also important to recognise that data-driven processes are very difficult to fully specify up front. With data collected 10 years on from that used to define a data-driven system it will always be likely that last minute changes to processing methods will be required. With this in mind, perhaps the most important lesson to be drawn from application of the 2011 Census edit and imputation strategy is related more to the way the strategy was integrated into the overall processing operation.

10.72 In general, a requirement of the overall processing operation was that the edit and imputation process had to be programmed into a semi automated IT system along with all of the other steps associated with processing census data. However, the initial edit and imputation prototype based on 2001 data delivered for the census processing environment required more tuning and adjustments than had been anticipated and this need had not been sufficiently recognised during the planning of the census processing timetable. As a result, the overall processing system had not been set up to receive updates and changes to edit and imputation parameters easily. This meant that the changes that had to be made during live processing were difficult and time consuming. Once resolved, processing was generally smooth and efficient. There are a number of recommendations that can be carried forward that would serve to minimise problems like this in future:

- The design of the edit and imputation strategy should be developed in relation with the development of other census outputs and processes such as data dictionaries, derived variables, rule based editing

strategies, and the development of rules serving to maintain consistency in the data
- Sufficient time for analysing the live data in order to identify unexpected issues and find solutions to remedy them
- The edit and imputation process looks across all relationships between characteristics in the entire data for the first time. As a result it often finds errors in earlier processes
- The overall census production system needs to be far more flexible in terms of making frequent updates or changes to the edit and imputation methodology or parameterisation of the strategy; and
- As edit and imputation is an iterative process the overall processing system should also be designed to allow data to be fed back easily into earlier stages of the edit and imputation process

10.73 Processing was generally smooth and efficient; however, there were some challenges in implementing and running the methods in an automated production environment.

- The development and implementation of the method was more iterative than originally planned. Future development would benefit from considering an iterative design and testing approach with robust review cycles but accepting that some flexibility in the final system during live operations is required to manage outliers and unexpected change
- The timetable needs to consider dedicated time to optimise the criteria for selecting donors and therefore minimising the failure of records to impute successfully first time. These criteria are specific to the characteristics in the data and require a number of iterations.

Coverage assessment and adjustment

10.74 The primary objective of the coverage assessment strategy was to identify and adjust for the number of people and households not counted in the 2011 Census. A secondary objective was to identify and adjust for the number of people and households counted more than once, or counted in the wrong place, in the 2011 Census. The strategy was to build on the 2001 methods, using it as a platform to develop an improved methodology. The methods and results are detailed in chapter 5.

Sample design

10.75 The sample design for the Census Coverage Survey (CCS) was one of the main improvements made to the methodology, and it proved to be successful in providing the data for measuring coverage patterns across local authorities and by age and sex. It also contributed to the aim of reducing the variability in quality of estimates between areas by allocating a larger sample to harder-to-count areas.

10.76 The improved methodology for deriving the hard to count (HtC) index proved successful, as it worked extremely well in both the census fieldwork and the CCS design in reducing the variability in census response rates and quality of the estimates. Using up to date information reduced the risk of having poor samples, although it was not removed entirely (see below). The use of the HtC index was important, and the skewed nature of the index improved the design compared with the 2001 version. This was particularly true in large cities, which contained the top 10

per cent of the hardest-to-count areas. With the additional data obtained in the 2011 Census it may be possible for any future index to be refined further.

10.77 There were a few issues with the design as implemented.

- In drawing the sample, the information used from the Postcode Address File (PAF) underestimated the number of households in the postcodes. This led to more households being selected than planned, which resulted in larger workloads for interviewers. However, this had been identified in advance as a risk and was mitigated by interviewers flexibly working additional hours. For any future survey a better estimate of the number of households in each sampled area would make implementation easier
- A method to boost the sample was developed to increase the sample size in areas where census response was lower than expected. This was intended to help reduce variability in the estimates. However, implementation issues limited the size of the boost, so it was of limited value. The indications are that it made little difference to the variability of the estimates due to its small nature, and also given that the areas that were boosted tended to have fairly large sample sizes without the boost.

Matching

10.78 The overall matching strategy worked well, although there were some issues with its implementation. The automatic strategy was good and the methodology worked flexibly and extremely well. Constrained by the requirement for no false positive matches, the automatic matching made exact and very high probability matches for 60 per cent of households and 70 per cent of persons. This was despite the quality of the capture of names from both the census and CCS being lower than expected, mainly due to poor handwriting.

10.79 The main issue with the matching implementation was the structure of the clerical matching. The system specification was very rigid in an attempt to achieve near perfect accuracy. This included enforced triple checking of all unmatched records (one by one) by experts and supervisors. The system as specified did ensure accuracy, but affected timeliness. There was no flexibility within the specified system to adjust the matching strategy.

10.80 To help meet the original deadline additional short-term staff were recruited to increase throughput. It is estimated that the hours worked by the matchers were 30 per cent greater than anticipated, and the estimated quality levels in terms of matching accuracy were 0.2 per cent false negatives and 0.06 per cent false positives. The false negative rate was higher than the target (0.1 per cent); while this will have inflated the initial population estimates slightly (by causing a positive bias in the dual system estimator) the adjustments for bias in the estimates will have dampened the impact.

10.81 In summary, the lessons learned from this were that:

- systems involving a large element of manual work are more challenging than the underpinning methodology, particularly where high quality is essential
- operational procedures require significant time and resource to develop, test and refine, and

- large operational activities such as matching teams should be run by the census operational management

Estimation

10.82 The estimation methodology worked well to provide a consistent analysis of census coverage. The outcomes met prior expectations, and provided a rich source of information on patterns across the country and within each estimation area. The improvements to the methodology worked as expected and were integrated into the processing procedures; these included the use of simpler ratio-based estimators, improved bias adjustments, and bootstrapping for variance estimation. The Dual System Estimation (DSE) bias adjustment was successful, and the adjustments made were plausible, based on the alternative household estimate.

10.83 There were some issues with elements of the estimation methodology. Most importantly, the method for measuring coverage within household bias, using social survey data, did not detect any bias. This did not mean it did not exist, and any residual bias was included as part of the national adjustment process. Some form of administrative data may be a helpful source for checking this in the future.

Adjustment

10.84 The basic imputation methodology worked well to provide a database that was fully adjusted to take account of the measured coverage, adding wholly missed households, and persons within existing households.

10.85 However, the implementation of the methodology was challenging. The main issue was with the calibration process which derived the household weights for imputing wholly missed households (and the people within them). The method attempted to calibrate the household weights to both household estimates (tenure and household size) and person estimates (age-sex group, activity last week and ethnicity). The issue was that while it was guaranteed to obtain the correct weighted total of households by tenure, it was not always close enough to the person estimates by age and sex. The development work had not highlighted this as an issue, although further simulations might have done so. A solution was delivered which allowed the adjustment process to proceed but with delays that impacted later processes.

10.86 The main lessons learned from the adjustment system problems were not to leave development and testing of the most complex part of the methodology until last, and to ensure there are sufficient statistical resources to deal with any unforeseen methodological problems.

Conclusions

10.87 It was a considerable achievement to improve, implement and apply the methodology to produce census estimates that are of extremely high quality, and that were delivered to time. The evaluation has provided lessons to be learned for other large-scale statistical developments and processing operations, but has also demonstrated that the framework first laid down in 2001 provided a platform on which to build a more robust methodology. It has also provided a way of developing new methodology and accompanying systems that can be harnessed for the 2021 Census.

10.88 In summary, the most significant lessons learned from the coverage assessment project were that:

- Investment in sufficient resources during the development phase, which allows sufficiently robust testing of methods, will help to mitigate the risk of having methodological problems during the operational phase
- Complex methodological components should not be developed late, as this hinders the proper understanding of complex components that is needed to inform decision making during the live operation
- Transparency is important, and the ongoing stakeholder engagement provided assurance to users and helped guide the research. This worked well; the events held to explain the methodology were well attended and good feedback was received. Information papers published as part of the first release (and subsequently) fully explained the methods and adjustments made

10.89 Statistical developments and operations such as this must have flexibility in their development and implementation, allowing planned time for the methods and systems to be updated when real data are available. Development using historic data did not tease out all issues, and not all results can be predicted.

10.90 The main points from the evaluation that will assist future developments are that:

- working groups, involving relevant experts and business areas, and external reviews are critical to ensuring that high quality methods are developed to provide the basis for engaging with stakeholders, and
- transparent communications are important to help users understand complex methods

10.91 There were a number of lower level recommendations for any future methodological development and implementation.

- Any future hard-to-count index can be refined using the data obtained from the 2011 Census
- It is important to consider the possibility that any sample can be, due to random chance, unbalanced so a mitigation strategy (such as a specific adjustment) is important
- Construction of a good estimate of the number of households in each sampled area would make the implementation of any future area-based survey easier
- A sample boost strategy should be considered early in the planning process, and consideration given to only using such a strategy if it can be shown to significantly improve the estimates to balance against the risk to data collection
- For any future assessment of within-household bias in a DSE, some form of administrative data may be the only source that could be used for this; and
- In any future coverage adjustment development, more resources are required to give more attention to lower level variables

Statistical disclosure control

10.92 The record swapping measures described in chapter 6 proved satisfactory for protecting the statistical confidentiality during data processing, but did create some difficulties during later stages of output production. The level of detail available was slightly less in many tables (in terms of number of rows and columns) compared with equivalent outputs in 2001, and this may have disappointed some users, but it did have a distinct advantage of providing considerably more detail in terms of small counts.

10.93 This was not apparent to users at first and, in hindsight, ONS might have assisted users more by demonstrating clearly how the advantages outweighed the perceived disadvantages. One of the main alternative disclosure control options considered (a form of cell perturbation developed by the Australian Bureau of Statistics) had shown considerable promise, and would have allowed both small counts and the detail. However there was insufficient confidence in being able (a) to test the method within the tight timescale, and (b) convince users that a method that gave rise to inconsistent counts, albeit rarely, was better.

10.94 ONS was mindful of the users' well-voiced dissatisfaction with the 2001 small cell adjustment methodology weighed heavily on ONS's shoulders, and record swapping was regarded as a safe option, compared to the relatively untried Australian method. Engagement with users was quite strong, but the user community were pushing for assurance that ONS was *definitely not* going to use small cell adjustment again.

10.95 The statistical disclosure control (SDC) evaluation and development work started at around the same time as the statement made by the National Statistician and Registrars General (RsG) of Scotland and Northern Ireland in November 2006. In this they agreed to aim for a common UK SDC methodology for 2011 Census outputs, and considered that, as long as there has been systematic perturbation of the data, the guarantee in the code of practice would be met. It was therefore agreed that small counts (0s, 1s, and 2s) could be included in publicly disseminated census tables provided that:

- uncertainty as to whether the small cell is a true value has been systematically created, and
- creating that uncertainty does not significantly damage the data

10.96 Though pre- and post-tabular methods were considered, the National Statistician and RsG expressed a preference for pre-tabular methods, provided there was no undue damage to the data.

10.97 Subsequent to agreeing the UK SDC policy, the Statistics and Registration Service Act 2007 (SRSA) came into force, Section 39 (2) of which defined 'personal information' as information which relates to and identifies a particular person, or body corporate. It specified what constitutes a disclosure of information and the sanctions that may apply for any breach of confidentiality.

10.98 The UK SDC policy was in line with Section 39 of the SRSA. However, in hindsight, there was confusion as to what was meant by 'uncertainty' and, particularly, the level of uncertainty that would be acceptable. It would have been advisable to have obtained a clear statement at this point as to what was the appropriate level, how to measure it, and any related legal issues.

10.99 The main lessons to emerge from the 2011 Census experience were that in any future census:

- a record key/ cell key perturbation method should be considered in order to provide small counts and greater detail in tables. The challenge will be to persuade users that the presence of a small number of slight inconsistencies between tables is acceptable
- 'real' test data should be used for the development of methods and systems
- any census test or rehearsal should test the whole of the process from start to finish, including SDC processing and outputs
- a UK wide disclosure control working group should be set up during the evaluation and development phases
- a clear steer on legal issues should be obtained early in the evaluation, and
- the measures of 'doubt' should be revisited

Quality assurance

10.100 Quality assurance of the 2011 Census was more rigorous and comprehensive than in previous censuses. An independent review of the QA approach lead by Professor Ian Plewis from the University of Manchester, concluded that:

'*...many lessons have been learned from the Census in 2001 (which was itself a considerable improvement over the 1991 Census). We have been impressed by the scope and depth of the methodological investigations initiated by ONS, by their willingness to discuss with a wide range of interest groups concerns about coverage and Quality Assurance (QA), and by the procedures that are in place to use field staff flexibly*...'

'*....the methods give confidence that the resulting final census population estimates will be better than any other method and will be suitable for use in resource allocation and planning*'[45].

10.101 Every 2011 Census QA panel (described in chapter 5) considered a much wider range of evidence than those run for the 2001 Census. The evidence assessed included operational intelligence and information provided by local authorities, the diagnostics from the coverage estimation process and data from comparator sources. Administrative data were used extensively for core checks on all 348 local authorities in England and Wales. However, because there was limited time and resource available for supplementary analysis, this extra research had to focus on data discrepancies that were of particular concern. The high quality of the 2011 Census, together with work on an accurate address register and use of intelligence from administrative sources, ensured there were relatively few significant discrepancies.

10.102 The data and evidence for each local authority were reviewed at least twice, with some local authorities going through several iterations of the process.

10.103 The QA process gave ONS confidence that the census estimates were correct and the executive panel recommended acceptance of the census estimates for all 348 local authorities prior to publication.

10.104 The methods, procedures and participation in the quality assurance process were very successful in 2011, with some innovative use of people and systems to aid the quality assurance process. However not all aspects of the results were quality assured, and some issues arose after outputs were released and experienced users began detailed analyses; these highlighted the need for some additional checks in future. This will always be the case given the sheer volume of information to process and check (more than 8 billion census statistics have been published), and the difficulties with trying to automate the interpretation of rare events or respondent circumstances.

10.105 Some of the main issues to take forward for the quality assurance process .

- Maintain a high level of transparency and openness in the QA methods and process, involving experts from outside the census programme and ONS
- Further improve the tools to quality assure the results, using more visualisations of possible errors or implausibilities
- Consider how to look at changes over time using the previous census information to highlight significant and implausible outliers over time, particularly for small areas

10.106 In addition, the main QA panels required quite a lot of training and briefing around estimation issues so that they understood what could be achieved and what could not. The lesson here is that members of the QA panel should be trained and briefed using actual data and QA materials, to help their understanding and clarify expectations around the likely outputs and communications.

Output content, production and dissemination

10.107 A primary objective of the census is to produce easily accessible and reusable outputs and results that meet user requirements. The value of the census is not realised until the outputs are produced and used to inform decisions on the delivery of services and public debate on important social and economic issues. Census outputs are still being published. However, based on early user feedback and experience from developing, producing and disseminating census outputs since 2010, some of the main lessons are noted in this section.

10.108 Producing outputs from the census is complex. User needs must be balanced against protecting confidentiality of the information and the resource required to disseminate the results in a way that will maximise their use. Chapter 7 summarises the outputs and analyses that were produced from the census along with some examples of uses of the information. However, the production and dissemination of these outputs was not without its challenges.

10.109 One of the main challenges faced in the 2011 Census, and faced by most censuses was that output production is the end of the operational processes. Therefore consideration and development of these processes was also done last as the programme naturally focuses on earlier priorities. However some of the main interdependent decisions around dissemination approach, disclosure control methodology and user requirements were taken too late in the process. This left insufficient time for system development and testing ahead of the main output production phase. This resulted in a sub-optimal production system that was resource intensive. Output content was, in some instances, not to user expectations

from previous consultations. Managing this process was challenging and, at times, communication with users suffered, leaving them with some uncertainty about the output timetable.

10.110 Evolving dissemination techniques, supported by new methods for protecting the confidentiality of information will be available and will be important considerations for the next census. How these advances are incorporated into an overall outputs strategy for the next census will significantly affect how we deliver and maximise our outputs. The outputs strategy and the approach to dissemination for the next census should be decided early and should set the direction and tone for significant developments, primarily the disclosure control methodology and geographical detail. The outputs strategy/plan should steer and guide consultations with users on topics and questions. The strategy should consider and focus on the following important areas.

Approach to dissemination

10.111 There are effectively two approaches to disseminating census results:

- produce large numbers of small datasets
- produce small numbers of large datasets

10.112 The first is the approach taken in 2011 and for previous censuses, where more than 600 different datasets were produced, each available for one or more geographies. This approach sat more easily with a disclosure control methodology that enabled complete additivity and consistency within and among datatsets (including small numbers in cells, such as 1s and 2s). But it did have drawbacks. It made the definition, production and checking for disclosure of the datasets lengthy and resource intensive. The dissemination of the results was inefficient and less accessible to users, particularly the multivariate datasets.

10.113 The second approach should be given serious consideration for a future census design. It can provide users with much easier access to the information and more flexibility for them to create bespoke datasets that meet their needs. It also makes it easier for the data to be reused in an open format and combined with other open datasets, which increases the benefits of the census. However, protecting the confidentiality of data in this approach is likely to involve some form of post-tabular perturbation, which could be complex to implement and may lead to inconsistencies between queries or to the loss of some small cell data.

10.114 Both approaches have their trade-offs, so it is important that the approach chosen for 2021 be decided early, giving enough time for the necessary system and methodological developments to be successfully implemented and tested. An early decision on the approach to dissemination is critical because this will provide clear requirements for developing the appropriate methodology, ie a post-tabular or pre-tabular method. An early decision will also assist consultations with users about the content of outputs, because clarity on the level of detail available from the new outputs will help them specify their requirements.

Disclosure control

10.115 Decisions on outputs and dissemination should be taken before decisions on disclosure control and geography. Choosing the method of disclosure control for protecting the content of future census outputs also requires early thought and development method. More on disclosure control is given in paragraphs 10.92 to 10.99.

Timing of outputs

10.116 The results from the 2011 Census were, on the whole, delivered more quickly than the previous census. Nonetheless the first results were available 16 months after census day, and the first set of detailed characteristics outputs were published nearly 21 months after census day. The development of an output strategy, in conjunction with a data processing strategy, should aim to deliver results earlier, and also complete the entire suite of census products earlier.

Benefits realisation

10.117 Chapter 7 outlined the excellent work done to promote the use of 2011 Census results and realise their benefits. Benefits realisation was highly successful both in broadening the use of the results and in understanding the uses of data that ONS was previously unaware of. Developing and promoting wider understanding of the applications of census data is an important activity to take forward into 2021.

Checking the quality of the outputs

10.118 Paragraphs 10.100 to 10.106 cover some of the successes of the quality assurance process and the main lessons to consider in future censuses. In addition the plausibility of the results needs to be considered as early as possible. There were no significant issues with the publication of the 2011 results, following the extensive quality assurance process. Future plans should consider using more visualisation techniques to help to check for plausibility at small areas, plausibility of change compared with the previous census and other complex outputs such as origin-destination.

Communicating with users

10.119 During the production and release of census outputs ONS took decisions on priorities considering trade-offs between user needs and ensure timely publication. Users were involved in informing some but not all of these decisions. With more user engagement during the production phase some of the output content could have better met user needs. Ongoing dialogue with users is important for understanding their changing needs and priorities, and for operational decision making. Consequently future censuses should consider how best to involve users during output production to understand their experiences and requirements.

Chapter 11

Beyond 2011

11 Beyond 2011

Background

11.1 ONS has periodically reviewed its methods for collecting population data and the effectiveness of potential alternatives. It did so particularly in the wake of the 1991 and 2001 Censuses as part of its planning for the next census. These reviews have been well documented[65].

11.2 The post-2001 review for example, carried out in 2003 in the light of criticisms from some local authority users about the accuracy of the previous census's population count in a number of areas, considered a number of alternative ways of collecting the information that were being adopted internationally. In particular, it examined the use of administrative data sources that, in a number of Scandinavian and other northern continental countries, are now being linked together with population registers. Attention was given to the consideration of a rolling census approach (that has since been introduced in France), and the adoption of an annual population survey (as now used in the USA). The potential for linking existing administrative records in the UK for the purpose of the census was also examined.

11.3 In planning for the 2011 Census, the key message to come out of that review was that the traditional census was still regarded by the majority of users as the most authoritative source of information for a wide range of uses, providing consistent and comparable information for small areas and sub-populations, and allowing multivariate analyses that were not practicable using any other source. The review also noted that using administrative data would not be feasible until a reliable population register was established, and then only after considerable public debate and changes to legislation.

11.4 The ONS post-2011[66] review needed to address the requirements of users for more frequent population data, and concerns in the media and the public about perceptions of greater intrusiveness and the increasing cost to taxpayers. This review also re-assessed the alternative ways of collecting census-type information that had been examined in 2003 to see if any were now viable. Together with NRS and NISRA, ONS set up a Beyond 2011 programme to examine these issues, and test new models for gathering population and socio-demographic statistics. Improvements in technology and in government data sources offered the opportunity either to modernise the census or to develop an alternative approach based on re-using the administrative data that the public has already provided to government.

Review and user consultation

11.5 ONS initially planned two phases for this latest review. First a four-year 'proof of concept' phase, to test the feasibility of alternative approaches to producing statistics that would meet the existing and new needs of government, European policy makers and the wider user community. This phase of the review covered:

- the identification and prioritisation of all options
- a review of international practices
- the identification of alternative data sources, including surveys, that could be used to meet the statistical requirements not only for the census but also wider topics
- the development of survey approaches to meet such needs

- the testing and evaluation of: (a) models based on low level aggregate administrative data; and (b) administrative data models based on linking data at person level
- the evaluation of alternative census models such as a long-form/short-form census (as used in the USA) and the rolling census (as used in France); and
- a review of the need for a traditional 2021 Census to provide a benchmark for the other options

11.6 The second phase of the Beyond 2011 programme would then follow, a longer-term project to implement the agreed option

11.7 The effective stakeholder engagement and consultation exercise enabled the programme to:

- develop a clear understanding of users requirements and priorities
- understand the relative importance of accuracy, frequency and geography, as well as the overall value of population and small area socio-demographic statistics, and
- take account of any special concerns

11.8 Stakeholder engagement and communication plans were designed to ensure that users, stakeholders and all those with an interest in the programme clearly understood the work being done, its research findings, evaluation results, decision making processes and procedures. All the options considered were carefully researched and tested, and then assessed transparently using an agreed set of criteria to ensure that they could meet users requirements, provide population and socio-demographic statistics of the required quality, and were acceptable to the public.

First consultation

11.9 Consultation with users was a key component of the Beyond 2011 programme, helping to inform the assessment and evaluation of options as well as the final recommendation. The initial public consultation, between October 2011 and January 2012, included a series of workshops and an online questionnaire seeking information from users about their information requirements and priorities, and their views on the relative importance of accuracy, frequency and geography in the production of population and socio-demographic statistics.

11.10 All sectors of users were represented in the responses to the consultation; most were from local authorities (44 per cent), from genealogists and family historians. Although aware of the particular genealogical interest in the census, the consultation was primarily designed to capture the views of ‘statistical’ users, and focused on two broad areas:

- the current and future requirements for population and socio-demographic statistics on different topics, and
- the trade-off between accuracy, geography and the frequency at which the statistics are produced

11.11 A short list of six options was then reviewed (four different approaches with variants):

1. *Full census*: to be carried out decennially as at present, but modernising the methodological approach by, for example, putting more emphasis on data collection via the internet (similar to the approach in Canada)
2. *Rolling census*: an annual enumeration of up to 10 per cent of the population, carried out in different areas each time so that, over 10 years, the whole country is covered (similar to the approach in France)
3. *Short-form census with annual sample (4 per cent) national survey;* in which a short form is delivered to every household every 10 years, supplemented by an annual survey using a long-form to collect the full range of census characteristics (similar to the approach in the USA)
4. *Annual data linkage with decennial sample (10 per cent) national survey;* where administrative data is linked to produce population estimates, supplemented by a decennial large-sample long-form survey to derive the necessary population characteristics
5. *Annual data linkage with annual sample (4 per cent) national survey;* similar to the previous option but with a smaller, annual, survey, which could produce more frequent statistics
6. *Annual data linkage with decennial sample (40 per cent) national survey;* similar to the fourth option above but with a much larger sample survey that would allow small area statistics to be produced

11.12 Of the options reviewed, two clear front runners emerged at that time: the full online census and the administrative data linkage with 4 per cent annual survey. There were clear pros and cons to these two approaches in terms of quality, frequency and the nature of outputs, and they carried with them different risks. An online census would produce the wealth of small area data and detailed cross-tabulations that have traditionally come from the census, but only every 10 years. On the other hand, an administrative data solution would deliver statistics much more frequently (annually for many key topics). This had the potential to be more responsive to user needs, but would not provide the level of detail provided by the traditional census option for the smallest areas or smallest population groups.

Second consultation

11.13 The second public consultation ran from 23 September to 13 December 2013. This presented the pros and cons of the two options in a detailed consultation document, and invited views via an online questionnaire on which approach would best fit user needs. The results would enable the National Statistician to make a recommendation for the collection of future population statistics.

11.14 The three-month public consultation resulted in more than 700 responses from government, local authorities, public bodies, commercial organisations, charities, academics and genealogists. Two thirds were from individual citizens and users, while a third were from organisations representing users. The report of the public consultation was published in March 2014[67]; its key messages were that:

- Population statistics were highly valued by a range of national and local users across England and Wales
- There was continuing demand from government, local authorities, public bodies, business, the voluntary sector and individual citizens for the detailed information about small areas and small populations offered by the decennial census, whether online or paper-based; such statistics were

regarded as essential to local decision making, policy making and diversity monitoring in fulfilment of legally binding public duties

- Most users recognised the value of making greater use of administrative data to produce more frequent population statistics. There was a strong concern that the proposed use of an annual survey of 4 per cent of households (to support the use of existing administrative data) would not meet these needs, nor deliver the required small area and small population statistics offered by the decennial census
- While the methods using administrative data and surveys showed considerable potential, and the more frequent statistics they could provide between censuses would be welcome, there was concern that these were not yet mature enough or of sufficient statistical quality to replace the decennial census
- Many respondents noted that other countries have taken decades to develop replacement systems, and some stated that it would be 'reckless' to move too fast in that direction
- Many respondents proposed a hybrid approach, making the best of both approaches, with an online census in 2021 enhanced by administrative data and household surveys
- Many individual users acknowledged that their primary interest was in the census as a historical source and urged continuation of the historic series

11.15 The consultation did not divide respondents into opposing camps, although there was a small but vocal minority of individuals who did not want to see any move away from the traditional paper-based decennial census. The great majority of respondents valued the decennial census and particularly the small area and small population data at its heart. However, they also saw the potential benefits of using administrative data to increase frequency and potential range of population statistics. Support for one approach clearly did not preclude support for the other.

Methodological review

11.16 At the same time, ONS also commissioned an independent review of the methodologies of the two options[68]. Led by Chris Skinner, Professor of Statistics at the London School of Economics, the review sought, in particular to:

- assess the methodological research and evidence reported by ONS as the basis of its evaluation of the alternative options
- identify the main risks with the two front-running options, and to identify areas where further work is required to mitigate these risks, and
- enable a sound assessment of methodology issues relevant to the decision on how to proceed

The review team gave more attention to the administrative data option, because it represented a more radical change in methodology than the online census option.

11.17 The review commended ONS for the thoroughness of the Beyond 2011 Programme and commented that:

'*ONS has a strong understanding of the methodological challenges and risks it faces*'.

The review noted that the online census would represent a natural evolution of the traditional decennial census and would mirror lines of development in some other

countries, for example Canada where 54 per cent completed the census online in 2011. It also emphasised that the administrative data option would represent:

'*the most substantial change in the production of statistics for over one and a half centuries*'.

11.18 The review team read and analysed the many reports and publications produced by the ONS Beyond 2011 Programme. It also engaged with key users in order to ensure that no needs were overlooked, and that relevant experts on specific issues had been consulted.

11.19 The review team noted the success of the administrative data option in census taking in other countries but attached a higher risk to it in the UK at present. In particular it noted the problems surrounding population estimation in a country without a population register and the consequent risk of over-estimating the population. In practice this could mean that the administrative data option would not produce reliable estimates of some population counts. But in order to progress the administrative data option for the future provision of population statistics, the review proposed further research by ONS and the statistical community.

11.20 Furthermore, the review team noted that:

'…*a key requirement is that there is suitable data sharing legislation between the statistical office and the authorities with control over the administrative systems so that these data will meet the statistical needs over time*'.

ONS recognised that this legislation, desirable as it is for statistics and their users, requires better understanding and support from an informed general public, and appropriate safeguards to protect personal privacy. It should be noted that the review was also clear that the administrative data option would require the proposed annual survey of 4 per cent of the population to be compulsory, in order to guard against non-response distorting the statistics.

11.21 Professor Skinner and his colleagues came to the conclusion that the online census option was relatively low risk and

'...*would represent a natural evolution of the traditional census, drawing on technological innovations and developments in best practice for census taking around the world*'.

The review team stressed the importance of maintaining the compulsory nature of the census and following up any households where there was no online return. They had no hesitation in saying that an online census represented:

'…. *a methodologically sound basis for replacing Census 2011'*

but were not prepared to say the same for the administrative data option at the current stage of development in England and Wales.

National Statistician's recommendation

11.22 Following discussions with the Registrars General for Scotland and Northern Ireland, and with the Chief Statistician for Wales, the National Statistician recommended[69] on 27 March 2014 that the UK Statistics Authority should make the best use of all sources, using data from an online census in 2021 *and* administrative data and surveys. This would include:

- an online census of all households and communal establishments in England and Wales in 2021, as a modern successor to the traditional, paper-based decennial census, taking special care to support those who are unable to complete the census online, and
- increased use of administrative data and surveys in order to enhance statistics from the 2021 Census and improve statistics between censuses.

11.23 The recommendation added that this approach would provide the population statistics which the nation requires for the next decade and offer a springboard to the greater use of administrative data and annual surveys. This approach may offer a future government and Parliament the possibility of moving further away from the traditional decennial census to annual population statistics provided by the use of administrative data and annual surveys.

11.24 It was noted that further research would be required to determine the optimal blend of methods and data sources. It was made clear that the future development of the administrative data approach would depend on public consent, as expressed through Parliament, and it was recognised that data sharing legislation would be required to maximise the benefits of use of administrative data for statistical purposes.

The next stage

11.25 The National Statistician's recommendation was commended to the Government in a letter from Sir Andrew Dilnot, Chair of the UK Statistics Authority, to the Rt Hon Francis Maude MP, Minister for the Cabinet Office on 27 March 2014[70].

11.26 On 18 July 2014 the Minister for the Cabinet Office wrote to Sir Andrew Dilnot endorsing the National Statisticians recommendation for a predominantly online census in 2021 supplemented by further use of administrative and survey data. The requirement for secondary legislation under the provisions of the Census Act 1920 for such a census to take place still remains, but any decision to go forward on the basis of the recommendation must await a detailed estimate of the costs, to be prepared later in the year.

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Abbreviations

Abbreviations

A

ACLM	Assistant Census Liaison Manager
AL2	Address Layer 2
AP	Address Point (Ordnance Survey's address product)
APPG	All Party Parliamentary Group

B

BDA	British Deaf Association
BSL	British Sign Language
BUA	Built-up Areas
BUASD	Built-up Areas Sub Division

C

CAA	Coverage Assessment and Adjustment
CAG	Census Advisory Groups
CAMS	Controlled Access Microdata Sample
CCS	Census Coverage Survey
CDB	Census Delivery Board
CE	Communal Establishment
CESG	Communications Electronic Security Group
CLIP	Central and Local (Government) Information Partnership
CLM	Census Liaison Manager
CLPP	Census Local Partnership Plans
CMB	Contracts Management Board
CMIS	Census Management Information System
CNA	Census News Alerts
COB	Census Operations Board
CPS	Crown Prosecution Service
CQS	Census Quality Survey
CRC	Census Regional Champion
CSV	Comma Separated Variables
CTX	Contextual Analysis

D

DCLG	Department for Communities and Local Government
DCM	Data Collection Methodology
DoH	Department of Health
DSE	Dual Systems Estimation
DSP	Downstream Processing

E

ED	Enumeration District
EDIS	Edit and Donor Imputation System
ERG	Efficiency and Reform Group
ESRC	Economic and Social Research Council
EU	European Union

G

GAPS	Geography Area Planning System
GDP	Gross Domestic Product
GIS	Geographic Information System
GRI	Geographic Referencing Infrastructure
GROS	General Register Office for Scotland

H

HtC	Hard to Count
HQ	Head Quarters

I

ICO	Information Commissioners Office
IPS	International Passenger Survey

J

JCSI	Joint Committee on Statutory Instruments

L

LA	Local Authority
LARIA	Local Area Research and Information Association
LAU	Local Administrative Units
LGA	Local Government Association
LGBG	Lesbian, Gay and Bisexual Groups
LLPG	Local Land and Property Gazetteer
LMUK	Lockheed Martin UK
LSOA	Lower Super Output Area

M

MoD	Ministry of Defence
MP	Members of Parliament
MSOA	Middle Super Output Area
MYEs	Mid-Year Estimates

N

NAO	National Audit Office
NAW	National Assembly for Wales
NeSS	Neighbourhood Statistics
NHS	National Health Service
NISRA	Northern Ireland Statistics and Research Agency
NLPG	National Land and Property Gazetteer
NRS	National Records for Scotland
NS	National Statistics
NS-SEC	National Statistics Socio-economic Classification
NSAI	National Spatial Address Infrastructure
NUTS	Nomenclature of Units for Territorial Statistics

O

OA	Output Area
OAPS	Output Area Production System
OCR	Optical Character Recognition
OGL	Open Government Licence
OJEU	Official Journal of the European Union
OMR	Optical Mark Recognition
ONC	One Number Census
ONS	Office for National Statistics
OOH	Out-of-home

P

PAF	Postcode Address File
PACE	Police and Criminal Evidence Act
PASC	Public Administration Select Committee
PES	Post Enumeration Survey
PIA	Privacy Impact Assessment
PMO	Project Management Office
PRINCE	Projects In Controlled Environment (project management system)
PSO	Programme Support Office

Q

QA	Quality Assurance
QT	Questionnaire Tracking

R

RM	Regional Manager
RMT	Regional Management Team
RNIB	Royal National Institute of Blind People
RNID	Royal National Institute for the Deaf
RO	Returning Officer
RRO	Regional Returning Officer
RsG	Registrars' General

S

SAR	Sample of Anonymised Records
SASPAC	Small Area Statistics Package
SDC	Statistical Disclosure Control
SDMX	Statistical Data and Metadata Exchange
SIC	Standard Industrial Classification
SLA	Service Level Agreement
SOA	Super Output Area
SOC	Standard Occupational Classification
SOLACE	Society of Local Authority Chief Executives
SRSA	Statistics and Registration Service Act 2007
STRs	Short Term Residents

T

TSC	Treasury Select Committee

U

UAA	Undelivered As Addressed
UK	United Kingdom
UKCHC	United Kingdom Census Harmonisation Committee
UKCQDWG	United Kingdom Census Questionnaire Design Working Group
UKDS	United Kingdom Data Service
UN	United Nations
UN-ECE	United Nations Economic Commission for Europe

V

VML	Virtual Microdata Laboratory

W

WDA	Web Data Access

Annex A

2011 Census Household Questionnaire (H1)

Household Questionnaire
England

Office for National Statistics

2011 Census

Return to:
FREEPOST 2011 Census,
Processing Centre, UK

A message to everyone - act now

Everyone should be included in the census - all people, households and overnight visitors.

It is used to help plan and fund services for your community - services like transport, education and health.

Please complete your census questionnaire **on 27 March 2011, or as soon as possible afterwards.** You can fill it in online or on paper.

Taking part in the census is very important and it's also compulsory. You could face a fine if you don't participate or if you supply false information.

Your personal information is protected by law. Census information is kept confidential for 100 years.

So help tomorrow take shape and be part of the 2011 Census.

J. N. Matheson

Jil Matheson
National Statistician

Complete online

www.census.gov.uk

Your personal internet access code is:

OR fill in this paper questionnaire and post it back using the pre-paid envelope supplied.

If your address is incorrect or missing, enter your correct address here:

Postcode

Declaration

This questionnaire has been completed to the best of my knowledge and belief.

Signature

Date

Telephone number

We may contact you if we need to collect missing information.

If you have lost your envelope, please return to:
FREEPOST 2011 Census, Processing Centre, UK

Where can you get help?

www.census.gov.uk

Census helpline 0300 0201 101

Text Relay 18001 0300 0201 160

Help is available in large print and Braille

H1

101001

Before you start

Who should complete this questionnaire?

The householder is responsible for ensuring that this questionnaire is completed and returned.

The **householder** is the person who lives, or is present, at this address who:

- owns/rents (or jointly owns/rents) the accommodation; and/or
- is responsible (or jointly responsible) for paying the household bills and expenses

A **household** is:

- one person living alone; or
- a group of people (not necessarily related) living at the same address who share cooking facilities and share a living room or sitting room or dining area

What should you complete on this questionnaire?

- **Household questions on pages 3-6** about this household and its accommodation
- **Individual questions on pages 7-30** for every person who usually lives in this household. Every person who has been, or intends to be, in the UK for 3 months or more should be included in these questions at their usual UK address
- **Visitor questions on the back page (page 32)** for all other people staying overnight in this household on 27 March 2011

  It is important to include visitors staying overnight in this household to make sure no-one is missed. Visitors who usually live elsewhere in the UK must also be included on a census questionnaire at their usual address.

You will find further information about who to include in this questionnaire on page 31.

Will you need extra questionnaires?

- If there are more than six people in this household, or there are more than three visitors staying overnight, you can choose either to complete the entire questionnaire online, or fill in this questionnaire and contact us to request one or more **Continuation Questionnaires**
- If any member of this household aged 16 or over does not want to disclose their information to others in the household, you can request an **Individual Questionnaire**. Remember to include these people in Household questions (H1 to H14) on this questionnaire, but leave blank their Individual questions (1-43)
- If there is more than one household at this address, contact us to request one or more additional **Household Questionnaires**

You can request extra questionnaires online at **www.census.gov.uk** or by calling 0300 0201 101.

This questionnaire will be scanned by a computer

You should:

- use black or blue ink to answer
- tick your answers within the box like this: ☑
- print your answers within the box like this: SMITH Use capital letters - one letter per box
- correct any mistakes by filling in the box like this: ☒ or: SMITH
- continue onto the next line (if possible) when a word will not fit, like this: PADDINGTO / N STREET
- follow the ➡ **Go to** instructions and leave any questions or pages you do not need to answer completely blank; any marks or lines can be mistaken for answers

Household questions

H1 Who usually lives here?

➔ Tick all that apply

- ☐ Me, this is my permanent or family home
- ☐ Family members including partners, children, and babies born on or before 27 March 2011
- ☐ Students and/or schoolchildren who live away from home during term time
- ☐ Housemates, tenants or lodgers
- ☐ People who usually live outside the UK who are staying in the UK for 3 months or more
- ☐ People who work away from home within the UK, or are members of the armed forces, if this is their permanent or family home
- ☐ People who are temporarily outside the UK for less than 12 months
- ☐ People staying temporarily who usually live in the UK but do not have another UK address, for example, relatives, friends
- ☐ Other people who usually live here, including anyone temporarily away from home

OR ☐ No-one usually lives here, for example, this is a second address or holiday home ➔ Go to **H4**

H2 Counting everyone you included in question H1, how many people usually live here?

☐☐

H3 Starting with yourself, list the names of all the people counted in question H2 including children, babies and lodgers.

➔ If a member of this household has requested an Individual Questionnaire, tick the box beside their name and leave blank the Individual questions 1 to 43 for that person

	First name	Last name	Individual Questionnaire requested?
Yourself (Person 1)			☐
Person 2			☐
Person 3			☐
Person 4			☐
Person 5			☐
Person 6			☐

If there are more than six people, complete the entire questionnaire online or contact us to get a Continuation Questionnaire.

H4 Apart from everyone counted in question H2, who else is staying overnight here on 27 March 2011? These people are counted as visitors. Remember to include children and babies.

➔ Tick all that apply

- ☐ People who usually live somewhere else in the UK, for example, boy/girlfriends, friends, relatives
- ☐ People staying here because it is their second address, for example, for work. Their permanent or family home is elsewhere
- ☐ People who usually live outside the UK who are staying in the UK for less than 3 months
- ☐ People here on holiday

OR ☐ There are no visitors staying overnight here on 27 March 2011 ➔ Go to **H6**

H5 Counting only the people included in question H4, how many visitors are staying overnight here on 27 March 2011?

☐☐

➔ Remember to answer the Visitor questions on the back page (page 32) for these people

➔ If there is no-one usually living here (there are only visitors staying here) answer questions H7 to H11 on page 6 and then go to the back page (page 32) to answer the Visitor questions

Household questions - continued

H6 How are members of this household related to each other? If members are not related, tick the 'Unrelated' box.

- If there are more than six people, contact us to request a Continuation Questionnaire
- If you live alone ➡ Go to **H7**
- If no-one usually lives here and there are no visitors staying overnight here on 27 March 2011, answer questions H7 to H11 on page 6 and then go to the Declaration on the front page

Example:

This shows how a household with two parents and four children are related to each other

	Name of Person 1	Name of Person 2	Name of Person 3
First name	ROBERT	MARY	ALISON
Last name	SMITH	SMITH	SMITH
How is Person 2 related to Person: →		1	
How is Person 3 related to Persons: →			1 2
Husband or wife		✓	☐ ☐
Same-sex civil partner		☐	☐ ☐
Partner		☐	☐ ☐
Son or daughter		☐	✓ ✓
Step-child		☐	☐ ☐
Brother or sister		☐	☐ ☐

- Using the same order you used in question H3 (page 3), write the name of everyone who usually lives here at the top of each column. Remember to include children, babies and people who have requested an Individual Questionnaire
- Tick a box to show the relationship of each person to each of the other members of this household

	Name of Person 1	Name of Person 2	Name of Person 3
First name			
Last name			
How is Person 2 related to Person: →		1	
How is Person 3 related to Persons: →			1 2
Husband or wife		☐	☐ ☐
Same-sex civil partner		☐	☐ ☐
Partner		☐	☐ ☐
Son or daughter		☐	☐ ☐
Step-child		☐	☐ ☐
Brother or sister		☐	☐ ☐
Step-brother or step-sister		☐	☐ ☐
Mother or father		☐	☐ ☐
Step-mother or step-father		☐	☐ ☐
Grandchild		☐	☐ ☐
Grandparent		☐	☐ ☐
Relation - other		☐	☐ ☐
Unrelated (including foster child)		☐	☐ ☐

ENTER NAME OF PERSON 1 HERE AS IN QUESTION **H3**

For Person 5 (James), there is a tick next to 'Son or daughter' in the columns for Persons 1 and 2 to show he is the son of Robert and Mary. Columns 3 and 4 show he is the brother of Persons 3 and 4 (Alison and Stephen).

Name of Person 4
First name: STEPHEN
Last name: SMITH

How is Person 4 related to Persons: → 1 2 3

	1	2	3
Husband or wife	☐	☐	☐
Same-sex civil partner	☐	☐	☐
Partner	☐	☐	☐
Son or daughter	☑	☑	☐
Step-child	☐	☐	☐
Brother or sister	☐	☐	☑

Name of Person 5
First name: JAMES
Last name: SMITH

How is Person 5 related to Persons: → 1 2 3 4

	1	2	3	4
Husband or wife	☐	☐	☐	☐
Same-sex civil partner	☐	☐	☐	☐
Partner	☐	☐	☐	☐
Son or daughter	☑	☑	☐	☐
Step-child	☐	☐	☐	☐
Brother or sister	☐	☐	☑	☑

Name of Person 6
First name: SARAH
Last name: SMITH

How is Person 6 related to Persons: → 1 2 3 4 5

	1	2	3	4	5
Husband or wife	☐	☐	☐	☐	☐
Same-sex civil partner	☐	☐	☐	☐	☐
Partner	☐	☐	☐	☐	☐
Son or daughter	☑	☑	☐	☐	☐
Step-child	☐	☐	☐	☐	☐
Brother or sister	☐	☐	☑	☑	☑

Name of Person 4
First name
Last name

How is Person 4 related to Persons: → 1 2 3

	1	2	3
Husband or wife	☐	☐	☐
Same-sex civil partner	☐	☐	☐
Partner	☐	☐	☐
Son or daughter	☐	☐	☐
Step-child	☐	☐	☐
Brother or sister	☐	☐	☐
Step-brother or step-sister	☐	☐	☐
Mother or father	☐	☐	☐
Step-mother or step-father	☐	☐	☐
Grandchild	☐	☐	☐
Grandparent	☐	☐	☐
Relation - other	☐	☐	☐
Unrelated (including foster child)	☐	☐	☐

Name of Person 5
First name
Last name

How is Person 5 related to Persons: → 1 2 3 4

	1	2	3	4
Husband or wife	☐	☐	☐	☐
Same-sex civil partner	☐	☐	☐	☐
Partner	☐	☐	☐	☐
Son or daughter	☐	☐	☐	☐
Step-child	☐	☐	☐	☐
Brother or sister	☐	☐	☐	☐
Step-brother or step-sister	☐	☐	☐	☐
Mother or father	☐	☐	☐	☐
Step-mother or step-father	☐	☐	☐	☐
Grandchild	☐	☐	☐	☐
Grandparent	☐	☐	☐	☐
Relation - other	☐	☐	☐	☐
Unrelated (including foster child)	☐	☐	☐	☐

Name of Person 6
First name
Last name

How is Person 6 related to Persons: → 1 2 3 4 5

	1	2	3	4	5
Husband or wife	☐	☐	☐	☐	☐
Same-sex civil partner	☐	☐	☐	☐	☐
Partner	☐	☐	☐	☐	☐
Son or daughter	☐	☐	☐	☐	☐
Step-child	☐	☐	☐	☐	☐
Brother or sister	☐	☐	☐	☐	☐
Step-brother or step-sister	☐	☐	☐	☐	☐
Mother or father	☐	☐	☐	☐	☐
Step-mother or step-father	☐	☐	☐	☐	☐
Grandchild	☐	☐	☐	☐	☐
Grandparent	☐	☐	☐	☐	☐
Relation - other	☐	☐	☐	☐	☐
Unrelated (including foster child)	☐	☐	☐	☐	☐

Household questions - continued

H7 What type of accommodation is this?

A whole house or bungalow that is:

- ☐ detached
- ☐ semi-detached
- ☐ terraced (including end-terrace)

A flat, maisonette or apartment that is:

- ☐ in a purpose-built block of flats or tenement
- ☐ part of a converted or shared house (including bedsits)
- ☐ in a commercial building (for example, in an office building, hotel, or over a shop)

A mobile or temporary structure:

- ☐ a caravan or other mobile or temporary structure

H8 Is this household's accommodation self-contained?

➔ This means that all the rooms, including the kitchen, bathroom and toilet, are behind a door that only this household can use

- ☐ Yes, all the rooms are behind a door that only this household can use
- ☐ No

H9 How many rooms are available for use only by this household?

➔ Do NOT count:

- bathrooms
- toilets
- halls or landings
- rooms that can only be used for storage such as cupboards

➔ Count all other rooms, for example:

- kitchens
- living rooms
- utility rooms
- bedrooms
- studies
- conservatories

➔ If two rooms have been converted into one, count them as one room

☐☐ Number of rooms

H10 How many of these rooms are bedrooms?

➔ Include all rooms built or converted for use as bedrooms, even if they are not currently used as bedrooms

☐☐ Number of bedrooms

H11 What type of central heating does this accommodation have?

➔ Tick all that apply, whether or not you use it

➔ Central heating is a central system that generates heat for multiple rooms

- ☐ No central heating
- ☐ Gas
- ☐ Electric (including storage heaters)
- ☐ Oil
- ☐ Solid fuel (for example wood, coal)
- ☐ Other central heating

H12 Does your household own or rent this accommodation?

➔ Tick one box only

- ☐ Owns outright ➔ Go to H14
- ☐ Owns with a mortgage or loan ➔ Go to H14
- ☐ Part owns and part rents (shared ownership)
- ☐ Rents (with or without housing benefit)
- ☐ Lives here rent free

H13 Who is your landlord?

➔ Tick one box only

- ☐ Housing association, housing co-operative, charitable trust, registered social landlord
- ☐ Council (local authority)
- ☐ Private landlord or letting agency
- ☐ Employer of a household member
- ☐ Relative or friend of a household member
- ☐ Other

H14 In total, how many cars or vans are owned, or available for use, by members of this household?

➔ Include any company car(s) or van(s) available for private use

- ☐ None
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4 or more, write in number ☐☐

Individual questions - Person 1 start here

1 What is your name? (Person 1 on page 3)

First name

Last name

2 What is your sex?

☐ Male ☐ Female

3 What is your date of birth?

Day Month Year

4 On 27 March 2011, what is your legal marital or same-sex civil partnership status?

☐ Never married and never registered a same-sex civil partnership

☐ Married

☐ Separated, but still legally married

☐ Divorced

☐ Widowed

☐ In a registered same-sex civil partnership

☐ Separated, but still legally in a same-sex civil partnership

☐ Formerly in a same-sex civil partnership which is now legally dissolved

☐ Surviving partner from a same-sex civil partnership

5 Do you stay at another address for more than 30 days a year?

☐ No ➡ Go to 7

☐ Yes, write in other UK address below

Postcode

OR ☐ Yes, outside the UK, write in country

6 What is that address?

☐ Armed forces base address

☐ Another address when working away from home

☐ Student's home address

☐ Student's term time address

☐ Another parent or guardian's address

☐ Holiday home

☐ Other

7 Are you a schoolchild or student in full-time education?

☐ Yes ☐ No ➡ Go to 9

8 During term time, do you live:

☐ at the address on the front of this questionnaire?

☐ at the address in question 5? ➡ Go to 43

☐ at another address? ➡ Go to 43

9 What is your country of birth?

☐ England ➡ Go to 13

☐ Wales ➡ Go to 13

☐ Scotland ➡ Go to 13

☐ Northern Ireland ➡ Go to 13

☐ Republic of Ireland

☐ Elsewhere, write in the current name of country

10 If you were not born in the United Kingdom, when did you most recently arrive to live here?

➲ Do not count short visits away from the UK

Month Year

11 If you arrived before 27 March 2010 ➡ Go to 13

If you arrived on or after 27 March 2010 ➡ Go to 12

12 Including the time you have already spent here, how long do you intend to stay in the United Kingdom?

☐ Less than 6 months

☐ 6 months or more but less than 12 months

☐ 12 months or more

13 How is your health in general?

Very good ☐ Good ☐ Fair ☐ Bad ☐ Very bad ☐

14 Do you look after, or give any help or support to family members, friends, neighbours or others because of either:

- long-term physical or mental ill-health/disability?
- problems related to old age?

➲ Do not count anything you do as part of your paid employment

☐ No

☐ Yes, 1 - 19 hours a week

☐ Yes, 20 - 49 hours a week

☐ Yes, 50 or more hours a week

Person 1 - continued

15 How would you describe your national identity?

➔ Tick all that apply

- ☐ English
- ☐ Welsh
- ☐ Scottish
- ☐ Northern Irish
- ☐ British
- ☐ Other, write in

16 What is your ethnic group?

➔ Choose **one** section from A to E, then tick **one** box to best describe your ethnic group or background

A White

- ☐ English/Welsh/Scottish/Northern Irish/British
- ☐ Irish
- ☐ Gypsy or Irish Traveller
- ☐ Any other White background, write in

B Mixed/multiple ethnic groups

- ☐ White and Black Caribbean
- ☐ White and Black African
- ☐ White and Asian
- ☐ Any other Mixed/multiple ethnic background, write in

C Asian/Asian British

- ☐ Indian
- ☐ Pakistani
- ☐ Bangladeshi
- ☐ Chinese
- ☐ Any other Asian background, write in

D Black/African/Caribbean/Black British

- ☐ African
- ☐ Caribbean
- ☐ Any other Black/African/Caribbean background, write in

E Other ethnic group

- ☐ Arab
- ☐ Any other ethnic group, write in

17 This question is intentionally left blank ➔ Go to **18**

18 What is your main language?

- ☐ English ➔ Go to **20**
- ☐ Other, write in (including British Sign Language)

19 How well can you speak English?

Very well	Well	Not well	Not at all
☐	☐	☐	☐

20 What is your religion?

➔ This question is voluntary

- ☐ No religion
- ☐ Christian (including Church of England, Catholic, Protestant and all other Christian denominations)
- ☐ Buddhist
- ☐ Hindu
- ☐ Jewish
- ☐ Muslim
- ☐ Sikh
- ☐ Any other religion, write in

21 One year ago, what was your usual address?

➔ If you had no usual address one year ago, state the address where you were staying

- ☐ The address on the front of this questionnaire
- ☐ Student term time/boarding school address in the UK, write in term time address below
- ☐ Another address in the UK, write in below

Postcode

OR ☐ Outside the UK, write in country

22 What passports do you hold?

- Tick all that apply
- ☐ United Kingdom
- ☐ Irish
- ☐ Other, write in
- ☐ None

23 Are your day-to-day activities limited because of a health problem or disability which has lasted, or is expected to last, at least 12 months?

- Include problems related to old age
- ☐ Yes, limited a lot
- ☐ Yes, limited a little
- ☐ No

24 If you are aged 16 or over ➡ Go to **25**

If you are aged 15 or under ➡ Go to **43**

25 Which of these qualifications do you have?

- Tick **every** box that applies if you have **any** of the qualifications listed
- If your UK qualification is not listed, tick the box that contains its nearest equivalent
- If you have qualifications gained outside the UK, tick the 'Foreign qualifications' box and the nearest UK equivalents (if known)

- ☐ 1 - 4 O levels / CSEs / GCSEs (any grades), Entry Level, Foundation Diploma
- ☐ NVQ Level 1, Foundation GNVQ, Basic Skills
- ☐ 5+ O levels (passes) / CSEs (grade 1) / GCSEs (grades A*-C), School Certificate, 1 A level / 2 - 3 AS levels / VCEs, Higher Diploma
- ☐ NVQ Level 2, Intermediate GNVQ, City and Guilds Craft, BTEC First / General Diploma, RSA Diploma
- ☐ Apprenticeship
- ☐ 2+ A levels / VCEs, 4+ AS levels, Higher School Certificate, Progression / Advanced Diploma
- ☐ NVQ Level 3, Advanced GNVQ, City and Guilds Advanced Craft, ONC, OND, BTEC National, RSA Advanced Diploma
- ☐ Degree (for example BA, BSc), Higher degree (for example MA, PhD, PGCE)
- ☐ NVQ Level 4 - 5, HNC, HND, RSA Higher Diploma, BTEC Higher Level
- ☐ Professional qualifications (for example teaching, nursing, accountancy)
- ☐ Other vocational / work-related qualifications
- ☐ Foreign qualifications
- ☐ No qualifications

26 Last week, were you:

- Tick all that apply
- Include any paid work, including casual or temporary work, even if only for one hour

- ☐ working as an employee? ➡ Go to **32**
- ☐ on a government sponsored training scheme? ➡ Go to **32**
- ☐ self-employed or freelance? ➡ Go to **32**
- ☐ working paid or unpaid for your own or your family's business? ➡ Go to **32**
- ☐ away from work ill, on maternity leave, on holiday or temporarily laid off? ➡ Go to **32**
- ☐ doing any other kind of paid work? ➡ Go to **32**
- ☐ none of the above

27 Were you actively looking for any kind of paid work during the last four weeks?

☐ Yes ☐ No

28 If a job had been available last week, could you have started it within two weeks?

☐ Yes ☐ No

29 Last week, were you waiting to start a job already obtained?

☐ Yes ☐ No

30 Last week, were you:

- Tick all that apply

- ☐ retired (whether receiving a pension or not)?
- ☐ a student?
- ☐ looking after home or family?
- ☐ long-term sick or disabled?
- ☐ other

31 Have you ever worked?

- ☐ Yes, write in the year that you last worked

☐☐☐☐ ➡ Go to **32**

- ☐ No, have never worked ➡ Go to **43**

Person 1 - continued

32 Answer the remaining questions for your main job or, if not working, your last main job.

- Your main job is the job in which you usually work (worked) the most hours

33 In your main job, are (were) you:

- ☐ an employee?
- ☐ self-employed or freelance without employees?
- ☐ self-employed with employees?

34 What is (was) your full and specific job title?

- For example, PRIMARY SCHOOL TEACHER, CAR MECHANIC, DISTRICT NURSE, STRUCTURAL ENGINEER
- Do not state your grade or pay band

35 Briefly describe what you do (did) in your main job.

36 Do (did) you supervise any employees?

- Supervision involves overseeing the work of other employees on a day-to-day basis

☐ Yes ☐ No

37 At your workplace, what is (was) the main activity of your employer or business?

- For example, PRIMARY EDUCATION, REPAIRING CARS, CONTRACT CATERING, COMPUTER SERVICING
- If you are (were) a civil servant, write GOVERNMENT
- If you are (were) a local government officer, write LOCAL GOVERNMENT and give the name of your department within the local authority

38 In your main job, what is (was) the name of the organisation you work (worked) for?

- If you are (were) self-employed in your own organisation, write in the business name

☐ No organisation, for example, self-employed, freelance, or work (worked) for a private individual

39 If you had a job last week ➡ Go to **40**

If you didn't have a job last week ➡ Go to **43**

40 In your main job, what is the address of your workplace?

- If you work at or from home, on an offshore installation, or have no fixed workplace, tick one of the boxes below
- If you report to a depot, write in the depot address

Postcode

OR

- ☐ Mainly work at or from home
- ☐ Offshore installation
- ☐ No fixed place

41 How do you usually travel to work?

- Tick one box only
- Tick the box for the longest part, by distance, of your usual journey to work

- ☐ Work mainly at or from home
- ☐ Underground, metro, light rail, tram
- ☐ Train
- ☐ Bus, minibus or coach
- ☐ Taxi
- ☐ Motorcycle, scooter or moped
- ☐ Driving a car or van
- ☐ Passenger in a car or van
- ☐ Bicycle
- ☐ On foot
- ☐ Other

42 In your main job, how many hours a week (including paid and unpaid overtime) do you usually work?

- ☐ 15 or less
- ☐ 16 - 30
- ☐ 31 - 48
- ☐ 49 or more

43 There are no more questions for Person 1.

➡ Go to questions for Person 2

OR If there are no more people in this household,
➡ Go to the Visitor questions on the back page

OR If there are no visitors staying here overnight,
➡ Go to the Declaration on the front page

Further information

Students / schoolchildren who live away from home during term time

All students or schoolchildren who live away from home during term time need to be included on a questionnaire at both their home and term time addresses.

- At their home address they must be included in Household questions (H1 to H3 and H6) and Individual questions (1 to 8)
- At their term time address they must be included in Household questions (H1 to H3 and H6) and Individual questions (1 to 43)

Children with parents who live apart

Children with parents who live apart should be included on the questionnaire for the address where they spend the majority of their time. They should be included in Household questions (H1 to H3 and H6) and Individual questions (1 to 43).

If they are staying overnight at their other address on 27 March 2011, they must also be included on the questionnaire for that other address in Household questions (H4 to H5) and Visitor questions (V1 to V4).

If they live equally between two addresses, they should be included at the address where they are staying overnight on 27 March 2011 in Household questions (H1 to H3 and H6) and Individual questions (1 to 43).

People from outside the UK

People from outside the UK whose total length of stay in the UK will be 3 months or more should be included on the questionnaire where they usually stay. They should be included in Household questions (H1 to H3 and H6) and Individual questions (1 to 43).

If their total length of stay is less than 3 months, they should only be included as a visitor on the questionnaire at the address where they are staying overnight on 27 March 2011, in Household questions (H4 to H5) and Visitor questions (V1 to V4).

People with no usual address

People who usually live in the UK but have no usual address should be included on a questionnaire at the address where they are staying overnight on 27 March 2011, in Household questions (H1 to H3 and H6) and Individual questions (1 to 43).

Households away on 27 March 2011

If this address is unoccupied overnight on 27 March 2011 because the whole household is away, the questionnaire should be completed as soon as possible upon their return.

People temporarily away from home

Anyone who is temporarily away from their permanent or family home on 27 March 2011 should be included at their home address in Household questions (H1 to H3 and H6) and Individual questions (1 to 43). This includes people who are:

- staying, or expecting to stay, in an establishment such as a hospital, care home or hostel, for less than 6 months
- living away from home while working, on holiday or travelling (unless outside the UK for 12 months or more)
- members of the armed forces
- staying at their second address
- visiting friends or relatives
- in prison on remand (for any length of time), or sentenced to less than 6 months' imprisonment

People who live at more than one UK address

People with more than one UK address, for example people who live away from home while working, should be included on the questionnaire at:

- their permanent or family home; or
- the address where they spend the majority of their time, if they do not have a permanent or family home

They should be included in Household questions (H1 to H3 and H6) and Individual questions (1 to 43).

If they are staying overnight at their second UK address on 27 March 2011, they must also be included as a visitor on the questionnaire for that address in Household questions (H4 to H5) and Visitor questions (V1 to V4).

Lodgers

Lodgers who live full time at their lodging address should be included on the questionnaire where they lodge, in Household questions (H1 to H3 and H6) and Individual questions (1 to 43).

People who only lodge part time should refer to the other section on this page 'People who live at more than one UK address'.

Unrelated / shared households

One of the householders / tenants must complete Household questions (H1 to H14) and ensure Individual questions (1 to 43) are completed for each household member. The Individual questions may be completed separately by requesting an Individual Questionnaire.

Visitor questions

V How many visitors did you include in question H5?

- ☐ 1 to 3 - answer questions V1 to V4 below for each visitor
- ☐ 4 or more - answer questions V1 to V4 below for the first three visitors then go to **www.census.gov.uk** or call 0300 0201 101 to request a Continuation Questionnaire

Visitor A

V1 What is this person's name?

First name

Last name

V2 What is this person's sex?

☐ Male ☐ Female

V3 What is this person's date of birth?

Day Month Year

V4 What is this person's usual UK address?

Postcode

OR ☐ Outside the UK, write in country

Visitor B

V1 What is this person's name?

First name

Last name

V2 What is this person's sex?

☐ Male ☐ Female

V3 What is this person's date of birth?

Day Month Year

V4 What is this person's usual UK address?

☐ Same address as Visitor A

Postcode

OR ☐ Outside the UK, write in country

Visitor C

V1 What is this person's name?

First name

Last name

V2 What is this person's sex?

☐ Male ☐ Female

V3 What is this person's date of birth?

Day Month Year

V4 What is this person's usual UK address?

☐ Same address as Visitor A

Postcode

OR ☐ Outside the UK, write in country

Now ➡ Go to the Declaration on the front page

Annex B

2011 Census Household Questionnaire (H2)

Household Questionnaire
Wales

Office for National Statistics
Swyddfa Ystadegau Gwladol

2011 Cyfrifiad Census

Return to:
FREEPOST 2011 Census,
Processing Centre, UK

A message to everyone - act now

Everyone should be included in the census - all people, households and overnight visitors.

It is used to help plan and fund services for your community - services like transport, education and health.

Please complete your census questionnaire **on 27 March 2011, or as soon as possible afterwards.** You can fill it in online or on paper.

Taking part in the census is very important and it's also compulsory. You could face a fine if you don't participate or if you supply false information.

Your personal information is protected by law. Census information is kept confidential for 100 years.

So help tomorrow take shape and be part of the 2011 Census.

J. N. Matheson

Jil Matheson
National Statistician

Complete online

www.census.gov.uk
Your personal internet access code is:

OR fill in this paper questionnaire and post it back using the pre-paid envelope supplied.

If your address is incorrect or missing, enter your correct address here:

Postcode

Declaration

This questionnaire has been completed to the best of my knowledge and belief.

Signature

Date

Telephone number

We may contact you if we need to collect missing information.

If you have lost your envelope, please return to:
FREEPOST 2011 Census, Processing Centre, UK

Where can you get help?

www.census.gov.uk

Census helpline 0300 0201 130

Text Relay 18001 0300 0201 160

Help is available in large print and Braille

H2

108001

Before you start

Who should complete this questionnaire?

The householder is responsible for ensuring that this questionnaire is completed and returned.

The **householder** is the person who lives, or is present, at this address who:

- owns/rents (or jointly owns/rents) the accommodation; and/or
- is responsible (or jointly responsible) for paying the household bills and expenses

A **household** is:

- one person living alone; or
- a group of people (not necessarily related) living at the same address who share cooking facilities and share a living room or sitting room or dining area

What should you complete on this questionnaire?

- **Household questions on pages 3-6** about this household and its accommodation
- **Individual questions on pages 7-30** for every person who usually lives in this household.
  Every person who has been, or intends to be, in the UK for 3 months or more should be included in these questions at their usual UK address
- **Visitor questions on the back page (page 32)** for all other people staying overnight in this household on 27 March 2011

  It is important to include visitors staying overnight in this household to make sure no-one is missed. Visitors who usually live elsewhere in the UK must also be included on a census questionnaire at their usual address.

You will find further information about who to include in this questionnaire on page 31.

Will you need extra questionnaires?

- If there are more than six people in this household, or there are more than three visitors staying overnight, you can choose either to complete the entire questionnaire online, or fill in this questionnaire and contact us to request one or more **Continuation Questionnaires**
- If any member of this household aged 16 or over does not want to disclose their information to others in the household, you can request an **Individual Questionnaire**. Remember to include these people in Household questions (H1 to H14) on this questionnaire, but leave blank their Individual questions (1-43)
- If there is more than one household at this address, contact us to request one or more additional **Household Questionnaires**

You can request extra questionnaires online at **www.census.gov.uk** or by calling 0300 0201 130.

This questionnaire will be scanned by a computer

You should:

- use black or blue ink to answer
- tick your answers within the box like this: ☑
- print your answers within the box like this: DAFYDD Use capital letters - one letter per box
- correct any mistakes by filling in the box like this: ☒ or: JOSNES
- continue onto the next line (if possible) when a word will not fit, like this: PADDINGTO N STREET
- follow the ➡ **Go to** instructions and leave any questions or pages you do not need to answer completely blank; any marks or lines can be mistaken for answers

Household questions

H1 Who usually lives here?

Tick all that apply

- ☐ Me, this is my permanent or family home
- ☐ Family members including partners, children, and babies born on or before 27 March 2011
- ☐ Students and/or schoolchildren who live away from home during term time
- ☐ Housemates, tenants or lodgers
- ☐ People who usually live outside the UK who are staying in the UK for 3 months or more
- ☐ People who work away from home within the UK, or are members of the armed forces, if this is their permanent or family home
- ☐ People who are temporarily outside the UK for less than 12 months
- ☐ People staying temporarily who usually live in the UK but do not have another UK address, for example, relatives, friends
- ☐ Other people who usually live here, including anyone temporarily away from home

OR ☐ No-one usually lives here, for example, this is a second address or holiday home ➡ Go to **H4**

H2 Counting everyone you included in question H1, how many people usually live here?

☐☐

H3 Starting with yourself, list the names of all the people counted in question H2 including children, babies and lodgers.

If a member of this household has requested an Individual Questionnaire, tick the box beside their name and leave blank the Individual questions 1 to 43 for that person

	First name	Last name	Individual Questionnaire requested?
Yourself (Person 1)			☐
Person 2			☐
Person 3			☐
Person 4			☐
Person 5			☐
Person 6			☐

If there are more than six people, complete the entire questionnaire online or contact us to get a Continuation Questionnaire.

H4 Apart from everyone counted in question H2, who else is staying overnight here on 27 March 2011? These people are counted as visitors. Remember to include children and babies.

Tick all that apply

- ☐ People who usually live somewhere else in the UK, for example, boy/girlfriends, friends, relatives
- ☐ People staying here because it is their second address, for example, for work. Their permanent or family home is elsewhere
- ☐ People who usually live outside the UK who are staying in the UK for less than 3 months
- ☐ People here on holiday

OR ☐ There are no visitors staying overnight here on 27 March 2011 ➡ Go to **H6**

H5 Counting only the people included in question H4, how many visitors are staying overnight here on 27 March 2011?

☐☐

- Remember to answer the Visitor questions on the back page (page 32) for these people
- If there is no-one usually living here (there are only visitors staying here) answer questions H7 to H11 on page 6 and then go to the back page (page 32) to answer the Visitor questions

Household questions - continued

H6 How are members of this household related to each other? If members are not related, tick the 'Unrelated' box.

- If there are more than six people, contact us to request a Continuation Questionnaire
- If you live alone ➡ Go to H7
- If no-one usually lives here and there are no visitors staying overnight here on 27 March 2011, answer questions H7 to H11 on page 6 and then go to the Declaration on the front page

Example:

This shows how a household with two parents and four children are related to each other

	Name of Person 1	Name of Person 2	Name of Person 3
First name	ROBERT	MARY	ALISON
Last name	JONES	JONES	JONES
How is Person 2 related to Person: →		1	
How is Person 3 related to Persons: →			1 2
Husband or wife		✓	☐ ☐
Same-sex civil partner		☐	☐ ☐
Partner		☐	☐ ☐
Son or daughter		☐	✓ ✓
Step-child		☐	☐ ☐
Brother or sister		☐	☐ ☐

- Using the same order you used in question H3 (page 3), write the name of everyone who usually lives here at the top of each column. Remember to include children, babies and people who have requested an Individual Questionnaire
- Tick a box to show the relationship of each person to each of the other members of this household

	Name of Person 1	Name of Person 2	Name of Person 3
First name			
Last name			
How is Person 2 related to Person: →		1	
How is Person 3 related to Persons: →			1 2
Husband or wife		☐	☐ ☐
Same-sex civil partner		☐	☐ ☐
Partner		☐	☐ ☐
Son or daughter		☐	☐ ☐
Step-child		☐	☐ ☐
Brother or sister		☐	☐ ☐
Step-brother or step-sister		☐	☐ ☐
Mother or father		☐	☐ ☐
Step-mother or step-father		☐	☐ ☐
Grandchild		☐	☐ ☐
Grandparent		☐	☐ ☐
Relation - other		☐	☐ ☐
Unrelated (including foster child)		☐	☐ ☐

ENTER NAME OF PERSON 1 HERE AS IN QUESTION H3

For Person 5 (James), there is a tick next to 'Son or daughter' in the columns for Persons 1 and 2 to show he is the son of Robert and Mary. Columns 3 and 4 show he is the brother of Persons 3 and 4 (Alison and Stephen).

Name of Person 4
First name: STEPHEN
Last name: JONES

How is Person 4 related to Persons: → 1 2 3

	1	2	3
Husband or wife	☐	☐	☐
Same-sex civil partner	☐	☐	☐
Partner	☐	☐	☐
Son or daughter	✓	✓	☐
Step-child	☐	☐	☐
Brother or sister	☐	☐	✓

Name of Person 5
First name: JAMES
Last name: JONES

How is Person 5 related to Persons: → 1 2 3 4

	1	2	3	4
Husband or wife	☐	☐	☐	☐
Same-sex civil partner	☐	☐	☐	☐
Partner	☐	☐	☐	☐
Son or daughter	✓	✓	☐	☐
Step-child	☐	☐	☐	☐
Brother or sister	☐	☐	✓	✓

Name of Person 6
First name: SARAH
Last name: JONES

How is Person 6 related to Persons: → 1 2 3 4 5

	1	2	3	4	5
Husband or wife	☐	☐	☐	☐	☐
Same-sex civil partner	☐	☐	☐	☐	☐
Partner	☐	☐	☐	☐	☐
Son or daughter	✓	✓	☐	☐	☐
Step-child	☐	☐	☐	☐	☐
Brother or sister	☐	☐	✓	✓	✓

Name of Person 4
First name
Last name

How is Person 4 related to Persons: → 1 2 3

	1	2	3
Husband or wife	☐	☐	☐
Same-sex civil partner	☐	☐	☐
Partner	☐	☐	☐
Son or daughter	☐	☐	☐
Step-child	☐	☐	☐
Brother or sister	☐	☐	☐
Step-brother or step-sister	☐	☐	☐
Mother or father	☐	☐	☐
Step-mother or step-father	☐	☐	☐
Grandchild	☐	☐	☐
Grandparent	☐	☐	☐
Relation - other	☐	☐	☐
Unrelated (including foster child)	☐	☐	☐

Name of Person 5
First name
Last name

How is Person 5 related to Persons: → 1 2 3 4

	1	2	3	4
Husband or wife	☐	☐	☐	☐
Same-sex civil partner	☐	☐	☐	☐
Partner	☐	☐	☐	☐
Son or daughter	☐	☐	☐	☐
Step-child	☐	☐	☐	☐
Brother or sister	☐	☐	☐	☐
Step-brother or step-sister	☐	☐	☐	☐
Mother or father	☐	☐	☐	☐
Step-mother or step-father	☐	☐	☐	☐
Grandchild	☐	☐	☐	☐
Grandparent	☐	☐	☐	☐
Relation - other	☐	☐	☐	☐
Unrelated (including foster child)	☐	☐	☐	☐

Name of Person 6
First name
Last name

How is Person 6 related to Persons: → 1 2 3 4 5

	1	2	3	4	5
Husband or wife	☐	☐	☐	☐	☐
Same-sex civil partner	☐	☐	☐	☐	☐
Partner	☐	☐	☐	☐	☐
Son or daughter	☐	☐	☐	☐	☐
Step-child	☐	☐	☐	☐	☐
Brother or sister	☐	☐	☐	☐	☐
Step-brother or step-sister	☐	☐	☐	☐	☐
Mother or father	☐	☐	☐	☐	☐
Step-mother or step-father	☐	☐	☐	☐	☐
Grandchild	☐	☐	☐	☐	☐
Grandparent	☐	☐	☐	☐	☐
Relation - other	☐	☐	☐	☐	☐
Unrelated (including foster child)	☐	☐	☐	☐	☐

Household questions - continued

H7 What type of accommodation is this?

A whole house or bungalow that is:

- ☐ detached
- ☐ semi-detached
- ☐ terraced (including end-terrace)

A flat, maisonette or apartment that is:

- ☐ in a purpose-built block of flats or tenement
- ☐ part of a converted or shared house (including bedsits)
- ☐ in a commercial building (for example, in an office building, hotel, or over a shop)

A mobile or temporary structure:

- ☐ a caravan or other mobile or temporary structure

H8 Is this household's accommodation self-contained?

➔ This means that all the rooms, including the kitchen, bathroom and toilet, are behind a door that only this household can use

- ☐ Yes, all the rooms are behind a door that only this household can use
- ☐ No

H9 How many rooms are available for use only by this household?

➔ Do NOT count:

- bathrooms
- toilets
- halls or landings
- rooms that can only be used for storage such as cupboards

➔ Count all other rooms, for example:

- kitchens
- living rooms
- utility rooms
- bedrooms
- studies
- conservatories

➔ If two rooms have been converted into one, count them as one room

☐☐ Number of rooms

H10 How many of these rooms are bedrooms?

➔ Include all rooms built or converted for use as bedrooms, even if they are not currently used as bedrooms

☐☐ Number of bedrooms

H11 What type of central heating does this accommodation have?

➔ Tick all that apply, whether or not you use it

➔ Central heating is a central system that generates heat for multiple rooms

- ☐ No central heating
- ☐ Gas
- ☐ Electric (including storage heaters)
- ☐ Oil
- ☐ Solid fuel (for example wood, coal)
- ☐ Other central heating

H12 Does your household own or rent this accommodation?

➔ Tick one box only

- ☐ Owns outright ➔ Go to H14
- ☐ Owns with a mortgage or loan ➔ Go to H14
- ☐ Part owns and part rents (shared ownership)
- ☐ Rents (with or without housing benefit)
- ☐ Lives here rent free

H13 Who is your landlord?

➔ Tick one box only

- ☐ Housing association, housing co-operative, charitable trust, registered social landlord
- ☐ Council (local authority)
- ☐ Private landlord or letting agency
- ☐ Employer of a household member
- ☐ Relative or friend of a household member
- ☐ Other

H14 In total, how many cars or vans are owned, or available for use, by members of this household?

➔ Include any company car(s) or van(s) available for private use

- ☐ None
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4 or more, write in number ☐☐

Individual questions - Person 1 start here

1 What is your name? (Person 1 on page 3)

First name

Last name

2 What is your sex?

☐ Male ☐ Female

3 What is your date of birth?

Day Month Year

4 On 27 March 2011, what is your legal marital or same-sex civil partnership status?

☐ Never married and never registered a same-sex civil partnership

☐ Married

☐ Separated, but still legally married

☐ Divorced

☐ Widowed

☐ In a registered same-sex civil partnership

☐ Separated, but still legally in a same-sex civil partnership

☐ Formerly in a same-sex civil partnership which is now legally dissolved

☐ Surviving partner from a same-sex civil partnership

5 Do you stay at another address for more than 30 days a year?

☐ No ➡ Go to **7**

☐ Yes, write in other UK address below

Postcode

OR ☐ Yes, outside the UK, write in country

6 What is that address?

☐ Armed forces base address

☐ Another address when working away from home

☐ Student's home address

☐ Student's term time address

☐ Another parent or guardian's address

☐ Holiday home

☐ Other

7 Are you a schoolchild or student in full-time education?

☐ Yes ☐ No ➡ Go to **9**

8 During term time, do you live:

☐ at the address on the front of this questionnaire?

☐ at the address in question 5? ➡ Go to **43**

☐ at another address? ➡ Go to **43**

9 What is your country of birth?

☐ Wales ➡ Go to **13**

☐ England ➡ Go to **13**

☐ Scotland ➡ Go to **13**

☐ Northern Ireland ➡ Go to **13**

☐ Republic of Ireland

☐ Elsewhere, write in the current name of country

10 If you were not born in the United Kingdom, when did you most recently arrive to live here?

Do not count short visits away from the UK

Month Year

11 If you arrived before 27 March 2010 ➡ Go to **13**

If you arrived on or after 27 March 2010 ➡ Go to **12**

12 Including the time you have already spent here, how long do you intend to stay in the United Kingdom?

☐ Less than 6 months

☐ 6 months or more but less than 12 months

☐ 12 months or more

13 How is your health in general?

Very good ☐ Good ☐ Fair ☐ Bad ☐ Very bad ☐

14 Do you look after, or give any help or support to family members, friends, neighbours or others because of either:

- long-term physical or mental ill-health/disability?
- problems related to old age?

Do not count anything you do as part of your paid employment

☐ No

☐ Yes, 1 - 19 hours a week

☐ Yes, 20 - 49 hours a week

☐ Yes, 50 or more hours a week

Person 1 - continued

15 How would you describe your national identity?

➔ Tick all that apply

- ☐ Welsh
- ☐ English
- ☐ Scottish
- ☐ Northern Irish
- ☐ British
- ☐ Other, write in

16 What is your ethnic group?

➔ Choose **one** section from A to E, then tick **one** box to best describe your ethnic group or background

A White

- ☐ Welsh/English/Scottish/Northern Irish/British
- ☐ Irish
- ☐ Gypsy or Irish Traveller
- ☐ Any other White background, write in

B Mixed/multiple ethnic groups

- ☐ White and Black Caribbean
- ☐ White and Black African
- ☐ White and Asian
- ☐ Any other Mixed/multiple ethnic background, write in

C Asian/Asian British

- ☐ Indian
- ☐ Pakistani
- ☐ Bangladeshi
- ☐ Chinese
- ☐ Any other Asian background, write in

D Black/African/Caribbean/Black British

- ☐ African
- ☐ Caribbean
- ☐ Any other Black/African/Caribbean background, write in

E Other ethnic group

- ☐ Arab
- ☐ Any other ethnic group, write in

17 Can you understand, speak, read or write Welsh?

➔ Tick all that apply.

- ☐ Understand spoken Welsh
- ☐ Speak Welsh
- ☐ Read Welsh
- ☐ Write Welsh
- ☐ None of the above

18 What is your main language?

- ☐ English or Welsh ➔ Go to **20**
- ☐ Other, write in (including British Sign Language)

19 How well can you speak English?

Very well	Well	Not well	Not at all
☐	☐	☐	☐

20 What is your religion?

➔ This question is voluntary

- ☐ No religion
- ☐ Christian (all denominations)
- ☐ Buddhist
- ☐ Hindu
- ☐ Jewish
- ☐ Muslim
- ☐ Sikh
- ☐ Any other religion, write in

21 One year ago, what was your usual address?

➔ If you had no usual address one year ago, state the address where you were staying

- ☐ The address on the front of this questionnaire
- ☐ Student term time/boarding school address in the UK, write in term time address below
- ☐ Another address in the UK, write in below

Postcode

OR ☐ Outside the UK, write in country

22 What passports do you hold?

Tick all that apply

- [ ] United Kingdom
- [ ] Irish
- [ ] Other, write in
- [ ] None

23 Are your day-to-day activities limited because of a health problem or disability which has lasted, or is expected to last, at least 12 months?

Include problems related to old age

- [ ] Yes, limited a lot
- [ ] Yes, limited a little
- [ ] No

24 If you are aged 16 or over ➡ Go to 25

If you are aged 15 or under ➡ Go to 43

25 Which of these qualifications do you have?

Tick **every** box that applies if you have **any** of the qualifications listed

If your UK qualification is not listed, tick the box that contains its nearest equivalent

If you have qualifications gained outside the UK, tick the 'Foreign qualifications' box and the nearest UK equivalents (if known)

- [ ] 1 - 4 O levels / CSEs / GCSEs (any grades), Entry Level
- [ ] NVQ Level 1, Foundation GNVQ, Basic Skills
- [ ] 5+ O levels (passes) / CSEs (grade 1) / GCSEs (grades A*-C), School Certificate, 1 A level / 2 - 3 AS levels / VCEs, Welsh Baccalaureate Intermediate Diploma
- [ ] NVQ Level 2, Intermediate GNVQ, City and Guilds Craft, BTEC First / General Diploma, RSA Diploma
- [ ] Apprenticeship
- [ ] 2+ A levels / VCEs, 4+ AS levels, Higher School Certificate, Welsh Baccalaureate Advanced Diploma
- [ ] NVQ Level 3, Advanced GNVQ, City and Guilds Advanced Craft, ONC, OND, BTEC National, RSA Advanced Diploma
- [ ] Degree (for example BA, BSc), Higher degree (for example MA, PhD, PGCE)
- [ ] NVQ Level 4 - 5, HNC, HND, RSA Higher Diploma, BTEC Higher Level
- [ ] Professional qualifications (for example teaching, nursing, accountancy)
- [ ] Other vocational / work-related qualifications
- [ ] Foreign qualifications
- [ ] No qualifications

26 Last week, were you:

Tick all that apply

Include any paid work, including casual or temporary work, even if only for one hour

- [ ] working as an employee? ➡ Go to 32
- [ ] on a government sponsored training scheme? ➡ Go to 32
- [ ] self-employed or freelance? ➡ Go to 32
- [ ] working paid or unpaid for your own or your family's business? ➡ Go to 32
- [ ] away from work ill, on maternity leave, on holiday or temporarily laid off? ➡ Go to 32
- [ ] doing any other kind of paid work? ➡ Go to 32
- [ ] none of the above

27 Were you actively looking for any kind of paid work during the last four weeks?

- [ ] Yes
- [ ] No

28 If a job had been available last week, could you have started it within two weeks?

- [ ] Yes
- [ ] No

29 Last week, were you waiting to start a job already obtained?

- [ ] Yes
- [ ] No

30 Last week, were you:

Tick all that apply

- [ ] retired (whether receiving a pension or not)?
- [ ] a student?
- [ ] looking after home or family?
- [ ] long-term sick or disabled?
- [ ] other

31 Have you ever worked?

- [ ] Yes, write in the year that you last worked

➡ Go to 32

- [ ] No, have never worked ➡ Go to 43

Person 1 - continued

32 Answer the remaining questions for your main job or, if not working, your last main job.

- Your main job is the job in which you usually work (worked) the most hours

33 In your main job, are (were) you:

- ☐ an employee?
- ☐ self-employed or freelance without employees?
- ☐ self-employed with employees?

34 What is (was) your full and specific job title?

- For example, PRIMARY SCHOOL TEACHER, CAR MECHANIC, DISTRICT NURSE, STRUCTURAL ENGINEER
- Do not state your grade or pay band

35 Briefly describe what you do (did) in your main job.

36 Do (did) you supervise any employees?

- Supervision involves overseeing the work of other employees on a day-to-day basis

☐ Yes ☐ No

37 At your workplace, what is (was) the main activity of your employer or business?

- For example, PRIMARY EDUCATION, REPAIRING CARS, CONTRACT CATERING, COMPUTER SERVICING
- If you are (were) a civil servant, write GOVERNMENT
- If you are (were) a local government officer, write LOCAL GOVERNMENT and give the name of your department within the local authority

38 In your main job, what is (was) the name of the organisation you work (worked) for?

- If you are (were) self-employed in your own organisation, write in the business name

☐ No organisation, for example, self-employed, freelance, or work (worked) for a private individual

39 If you had a job last week ➡ Go to **40**

If you didn't have a job last week ➡ Go to **43**

40 In your main job, what is the address of your workplace?

- If you work at or from home, on an offshore installation, or have no fixed workplace, tick one of the boxes below
- If you report to a depot, write in the depot address

Postcode

OR
- ☐ Mainly work at or from home
- ☐ Offshore installation
- ☐ No fixed place

41 How do you usually travel to work?

- Tick one box only
- Tick the box for the longest part, by distance, of your usual journey to work

- ☐ Work mainly at or from home
- ☐ Underground, metro, light rail, tram
- ☐ Train
- ☐ Bus, minibus or coach
- ☐ Taxi
- ☐ Motorcycle, scooter or moped
- ☐ Driving a car or van
- ☐ Passenger in a car or van
- ☐ Bicycle
- ☐ On foot
- ☐ Other

42 In your main job, how many hours a week (including paid and unpaid overtime) do you usually work?

- ☐ 15 or less
- ☐ 16 - 30
- ☐ 31 - 48
- ☐ 49 or more

43 There are no more questions for Person 1.

➡ Go to questions for Person 2

OR If there are no more people in this household,
➡ Go to the Visitor questions on the back page

OR If there are no visitors staying here overnight,
➡ Go to the Declaration on the front page

Further information

Students / schoolchildren who live away from home during term time

All students or schoolchildren who live away from home during term time need to be included on a questionnaire at both their home and term time addresses.

- At their home address they must be included in Household questions (H1 to H3 and H6) and Individual questions (1 to 8)
- At their term time address they must be included in Household questions (H1 to H3 and H6) and Individual questions (1 to 43)

Children with parents who live apart

Children with parents who live apart should be included on the questionnaire for the address where they spend the majority of their time. They should be included in Household questions (H1 to H3 and H6) and Individual questions (1 to 43).

If they are staying overnight at their other address on 27 March 2011, they must also be included on the questionnaire for that other address in Household questions (H4 to H5) and Visitor questions (V1 to V4).

If they live equally between two addresses, they should be included at the address where they are staying overnight on 27 March 2011 in Household questions (H1 to H3 and H6) and Individual questions (1 to 43).

People from outside the UK

People from outside the UK whose total length of stay in the UK will be 3 months or more should be included on the questionnaire where they usually stay. They should be included in Household questions (H1 to H3 and H6) and Individual questions (1 to 43).

If their total length of stay is less than 3 months, they should only be included as a visitor on the questionnaire at the address where they are staying overnight on 27 March 2011, in Household questions (H4 to H5) and Visitor questions (V1 to V4).

People with no usual address

People who usually live in the UK but have no usual address should be included on a questionnaire at the address where they are staying overnight on 27 March 2011, in Household questions (H1 to H3 and H6) and Individual questions (1 to 43).

Households away on 27 March 2011

If this address is unoccupied overnight on 27 March 2011 because the whole household is away, the questionnaire should be completed as soon as possible upon their return.

People temporarily away from home

Anyone who is temporarily away from their permanent or family home on 27 March 2011 should be included at their home address in Household questions (H1 to H3 and H6) and Individual questions (1 to 43). This includes people who are:

- staying, or expecting to stay, in an establishment such as a hospital, care home or hostel, for less than 6 months
- living away from home while working, on holiday or travelling (unless outside the UK for 12 months or more)
- members of the armed forces
- staying at their second address
- visiting friends or relatives
- in prison on remand (for any length of time), or sentenced to less than 6 months' imprisonment

People who live at more than one UK address

People with more than one UK address, for example people who live away from home while working, should be included on the questionnaire at:

- their permanent or family home; or
- the address where they spend the majority of their time, if they do not have a permanent or family home

They should be included in Household questions (H1 to H3 and H6) and Individual questions (1 to 43).

If they are staying overnight at their second UK address on 27 March 2011, they must also be included as a visitor on the questionnaire for that address in Household questions (H4 to H5) and Visitor questions (V1 to V4).

Lodgers

Lodgers who live full time at their lodging address should be included on the questionnaire where they lodge, in Household questions (H1 to H3 and H6) and Individual questions (1 to 43).

People who only lodge part time should refer to the other section on this page 'People who live at more than one UK address'.

Unrelated / shared households

One of the householders / tenants must complete Household questions (H1 to H14) and ensure Individual questions (1 to 43) are completed for each household member. The Individual questions may be completed separately by requesting an Individual Questionnaire.

Visitor questions

V How many visitors did you include in question H5?

- ☐ 1 to 3 - answer questions V1 to V4 below for each visitor
- ☐ 4 or more - answer questions V1 to V4 below for the first three visitors then go to **www.census.gov.uk** or call 0300 0201 130 to request a Continuation Questionnaire

Visitor A

V1 What is this person's name?

First name

Last name

V2 What is this person's sex?

☐ Male ☐ Female

V3 What is this person's date of birth?

Day Month Year

V4 What is this person's usual UK address?

Postcode

OR ☐ Outside the UK, write in country

Visitor B

V1 What is this person's name?

First name

Last name

V2 What is this person's sex?

☐ Male ☐ Female

V3 What is this person's date of birth?

Day Month Year

V4 What is this person's usual UK address?

☐ Same address as Visitor A

Postcode

OR ☐ Outside the UK, write in country

Visitor C

V1 What is this person's name?

First name

Last name

V2 What is this person's sex?

☐ Male ☐ Female

V3 What is this person's date of birth?

Day Month Year

V4 What is this person's usual UK address?

☐ Same address as Visitor A

Postcode

OR ☐ Outside the UK, write in country

Now ➡ Go to the Declaration on the front page

The General Report is the official, and comprehensive account of the census in England and Wales. Information from the decennial census underpins public policy and service provision, in both the public and private sector. The results from the census will form the basis for key decisions throughout the decade.

The report reviews the entire census operation from the early consultation and planning stages, through the field activities and data processing, including the data capture and coding of questionnaires and the full adjustment of the census counts, to the production and dissemination of outputs and evaluation.

It provides a wealth of detail about how the census was carried out and what lessons have been learned to take forward in plans for the next census. It is aimed at both the experienced and occasional user of census data, but it is hoped the wider public may also find it useful and informative.

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