

## 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 21<sup>st</sup> 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<sup>52</sup> 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<sup>53</sup>, 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<sup>2</sup>), 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<sup>77</sup>. 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<sup>54</sup> (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<sup>55</sup> 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<sup>56</sup> 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

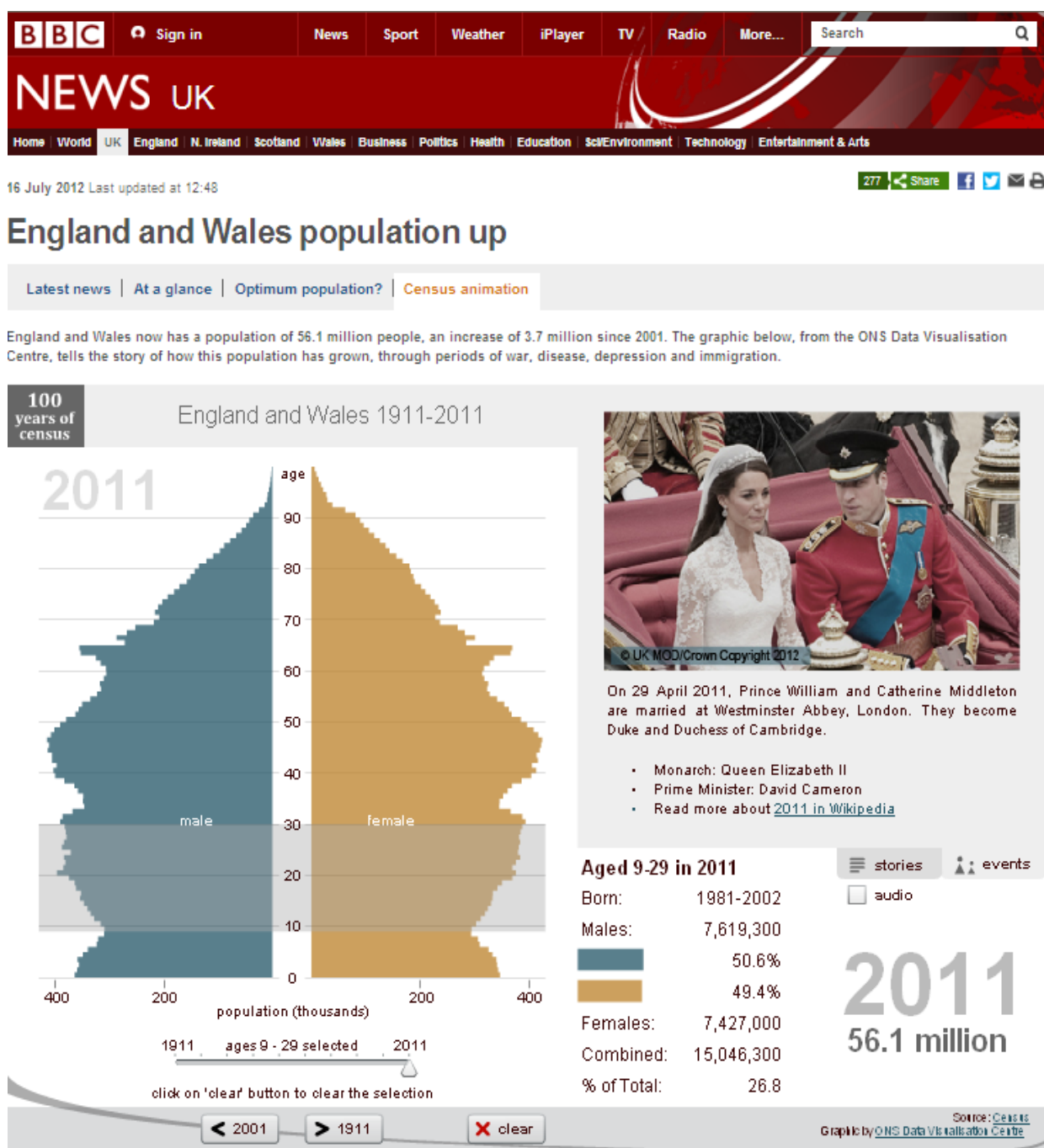
- 7.52 Data visualisation is a widely acknowledged method for bringing statistics to life, summarising patterns in data and allowing new insights which would otherwise be hidden in statistical tables. An added benefit is this output’s broad appeal to a much wider audience than might normally be expected 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<sup>57</sup>.
- 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<sup>76</sup> 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

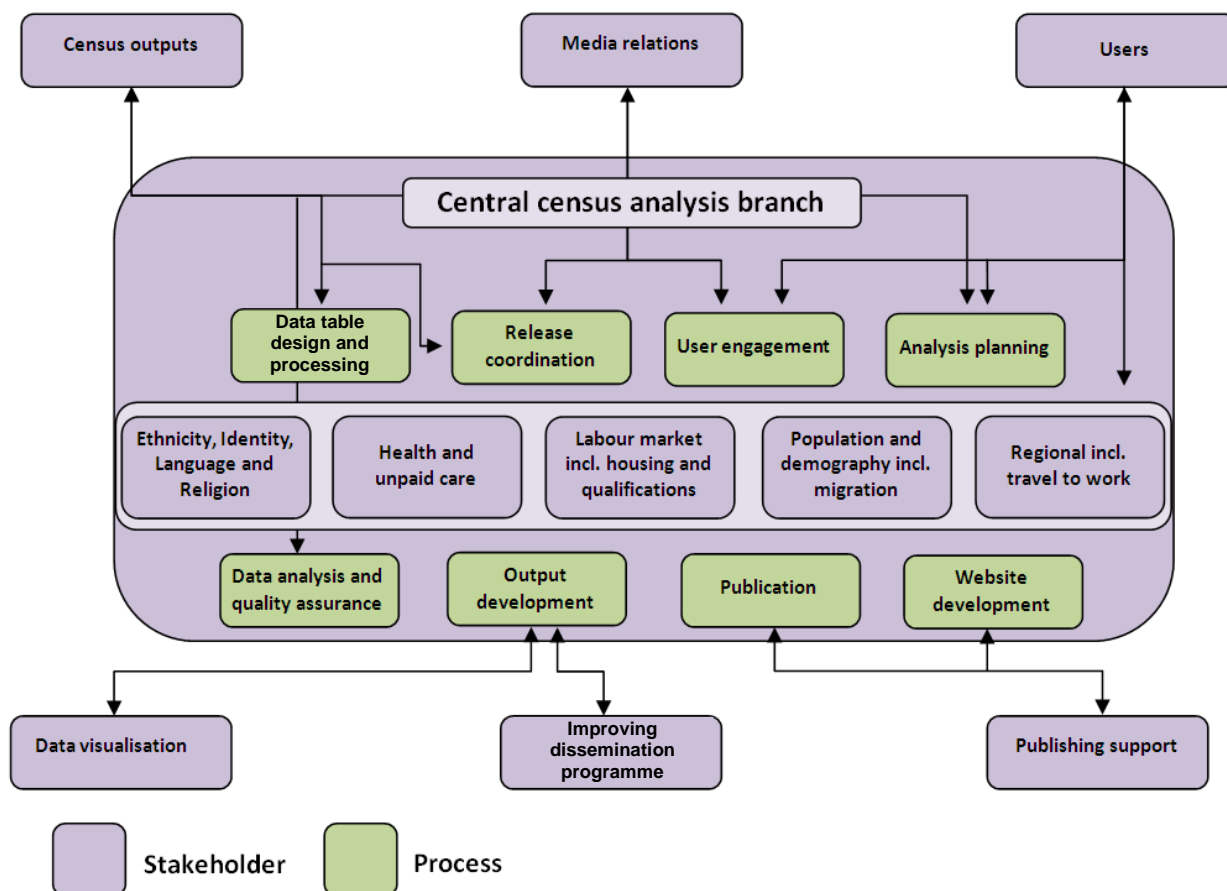
Topics were kept together where possible to make completion of the questionnaire easier and more intuitive for respondents.

- 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<sup>56</sup>. 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 podcasts

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.

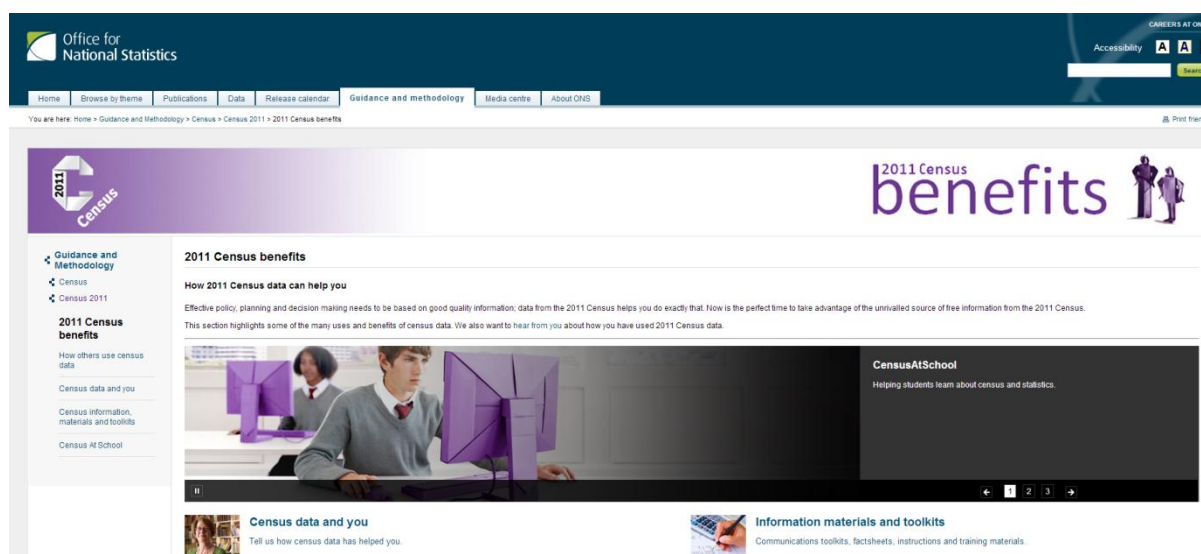
## Widening the census user base

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



How 2011 Census data can help you  
It's easier than you think

Find & follow us




### 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

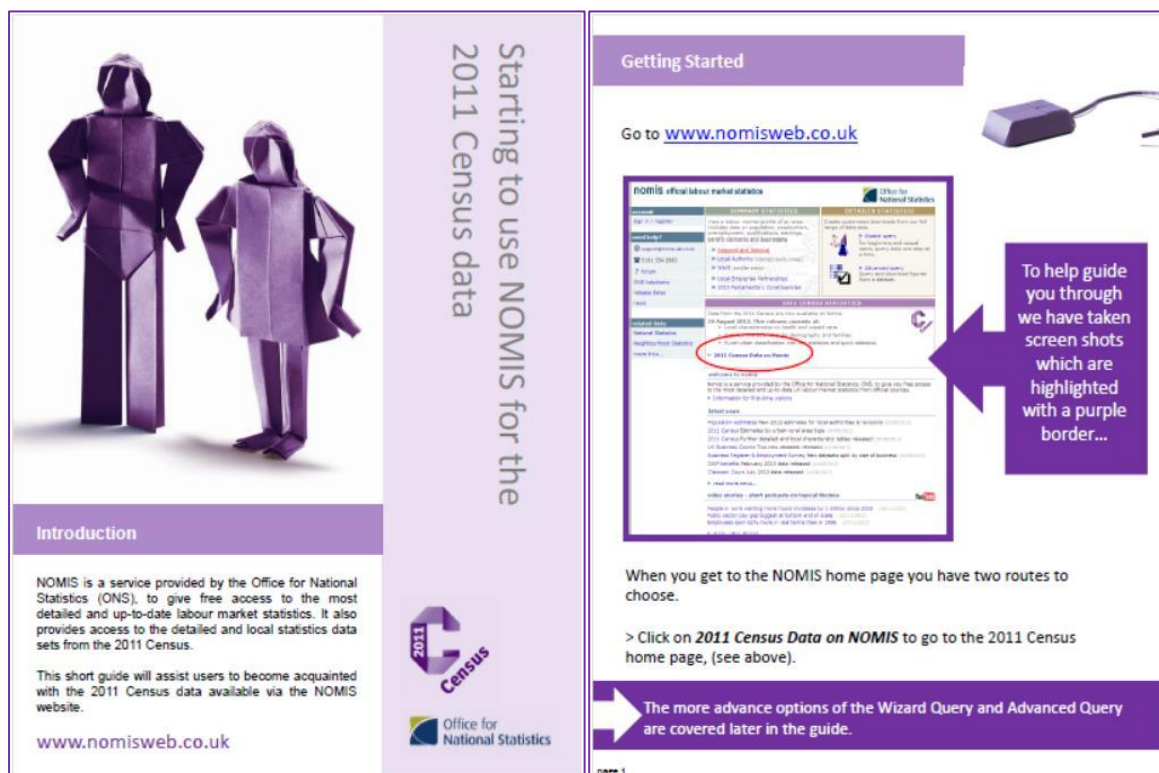
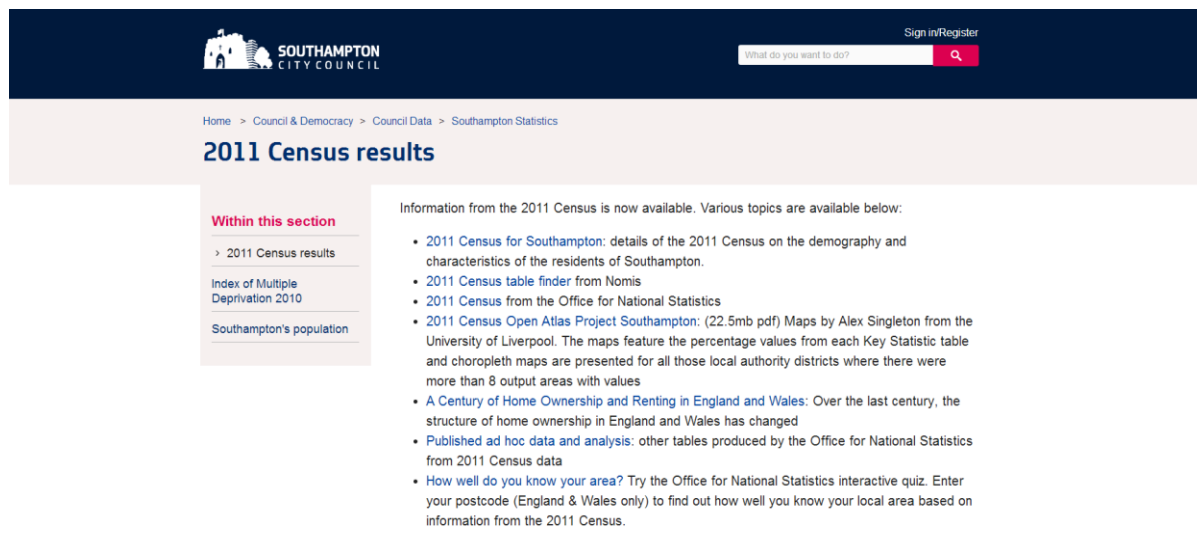


Figure 7.4(c) Example of a local authority publicising the 2011 Census results, Southampton City Council



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

**Focus on the Census Bureau**

By Census Benefits Team, Office for National Statistics

### Serving local communities with 2011 Census statistics

Ambulance services across England and Wales serve ever changing local communities and that's no easy task. More than ever before, plans and campaigns need to be based on good quality information – and FREE statistics from the 2011 Census can help you do that. The census shares facts about the make-up of today's society and can help you to underpin your understanding of the communities and geographic areas you are working in. What's more, you don't even have to be a statistician.

A census of the UK population takes place every ten years and the last one was in March 2011 when the Office for National Statistics (ONS) sent questionnaires to every household in England and Wales (Scotland and Northern Ireland carried out their own censuses at the same time). Over the last few months, ONS has published data from the 2011 Census in England and Wales covering everything from the number, sex-age structure and ethnicity of the population to our living conditions, housing, health education/qualifications and economic activity.

That one in six people in England and Wales is over 65, the number of over-65s has increased by nearly 900,000 over the decade. Even more striking, the number of people aged over 90 increased by more than 26 per cent from 340,000 in 2001 to 430,000 in 2011. Asked about their health, 3.1 million people described their health as bad or very bad. What's more, 10 million people reported a long-term activity-limiting illness or disability (including those related to age).

This has huge implications for emergency services that rely on these census characteristics to identify local areas requiring extra focus, e.g. standby locations of ambulance crews in areas with a higher population of elderly residents. It's all about planning ahead and making informed decisions.

The second big trend is the rising diversity of our society. The 2011 Census explored the diversity of our society in much more detail with new questions on national identity, passports held, immigrants' intended length of stay and main languages spoken. This information now provides one of the most detailed pictures of the true nature of diversity across the England and Wales.

But there is so much more

The 2011 Census also tells us how we live, what we do for living and where we work – all key information when planning the provision of local ambulance services.

ONS recently published statistics on workday populations. In an increasingly complex and mobile society there is a need for population statistics to be produced more flexibly to accommodate a range of analyses: in addition to the usual residence base (where people usually live), the

workday population details where people usually work – while those not working are recorded at their usual address. This enables service providers to target their resources where they are most likely to be needed at certain times of the day.

Like this, knowing how people live can come in handy. Over the decade to 2011, the overall proportion of owner occupier households fell by 5 percentage points to stand at 64% – the first drop in ownership since 1918. In particular, the proportion of owner occupiers among those aged 25 to 34 has also declined from 58 per cent in 2001 to 40 per cent in 2011.

In contrast, the number of households who were renting went up 1.6 million to 8.3 million (36 per cent), either privately from a landlord or letting agency, or from a social landlord such as local authorities, housing associations, housing co-operatives or charitable trusts. Interestingly, renting from private landlords has almost doubled (1.7 million to 3.6 million compared to 2001) and social renting has fallen by 100,000 over the last decade.

Statistics from the 2011 Census can help you to understand the type of accommodation people are living in. Most of the households, 79 per cent, lived in a house, with 21 per cent living in a flat. Living in a house is more usual for those who are owner occupiers with 91 per cent of those living in a house compared with 56 per cent of those renting.

Overall, two person households were the most common household size across England and Wales; the average household size was 2.4 people. Almost two thirds of households were one or two person households; 34 per cent were two person households and 30 per cent were one person households.

Still, there were more one person households among those renting at 38 per cent.

But you could also run your own census data queries to give you the number of lone parents with dependent children within a very small area, (down to 40 households in some instances), as well as the number of elderly people living on their own. This

type of data can assist in the understanding and training of crews that work in these communities.

**Research your target audiences or local areas with 2011 Census data**

The first key advantage of census data is that they are available down to very small geographical areas. So, as well as information about the population at national level, you can also drill down to individual local authorities and even to postcodes. In no time you will be able to run your own data queries for more complex information such as how many people in a local authority, of a given age range and ethnicity, long-term activity-limiting illness or disability.

In times where budgets are tight the second key advantage is that standard census data tables are free-of-charge. Only when someone needs a specific piece of data that does not form part of the standard range of statistical output tables will any charge be levied.

The original model of an ambulance used in the poster campaign explaining that census data was used in the planning of public services.

The Census outputs a wealth of data but help is available when it comes to finding the information that you need. Alongside the statistics themselves, ONS publishes statistical bulletins summarising the key points for each census release. ONS also produces analysis articles that get behind the data on themes such as ethnicity and national identity, health, housing, language or religion. And there is a suite of interactive maps and charts to help uncover your local area. Perhaps the real value comes when you combine your own internally generated statistics with those from the census and other surveys to give the most complete picture available for your area and population.

In summary, the 2011 Census provides a rich vein of data about the community you serve, this may be new information or data that underpins your beliefs, but what is sure is that it's worth a look when planning services. Best of all – it's free.

To explore the range of census data, visit the Office for National Statistics website at [www.ons.gov.uk/census](http://www.ons.gov.uk/census), or contact Census Customer Services: 01329 444972 or [CensusCustomerServices@ons.gov.uk](mailto:CensusCustomerServices@ons.gov.uk)

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### *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 identified 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.

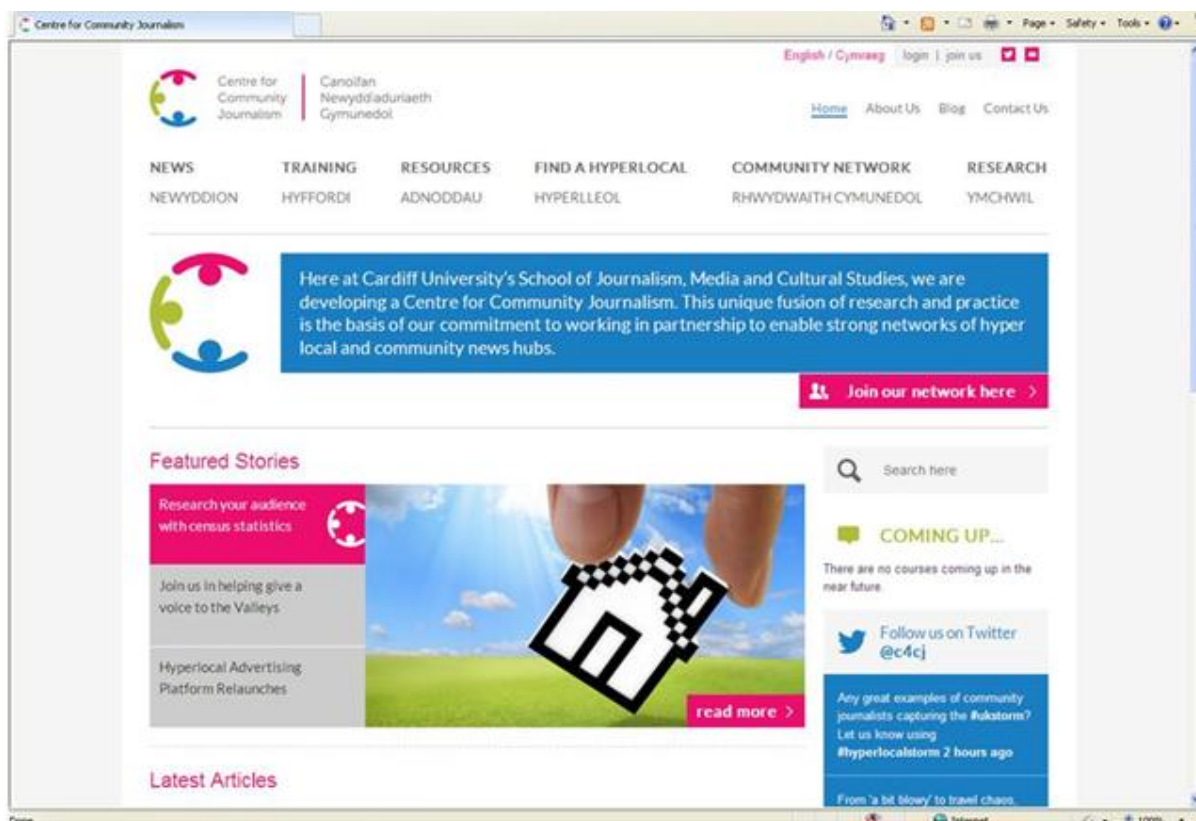
7.150 Examples of how universities have since included the 2011 Census in their course modules for students include:

- 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](http://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**

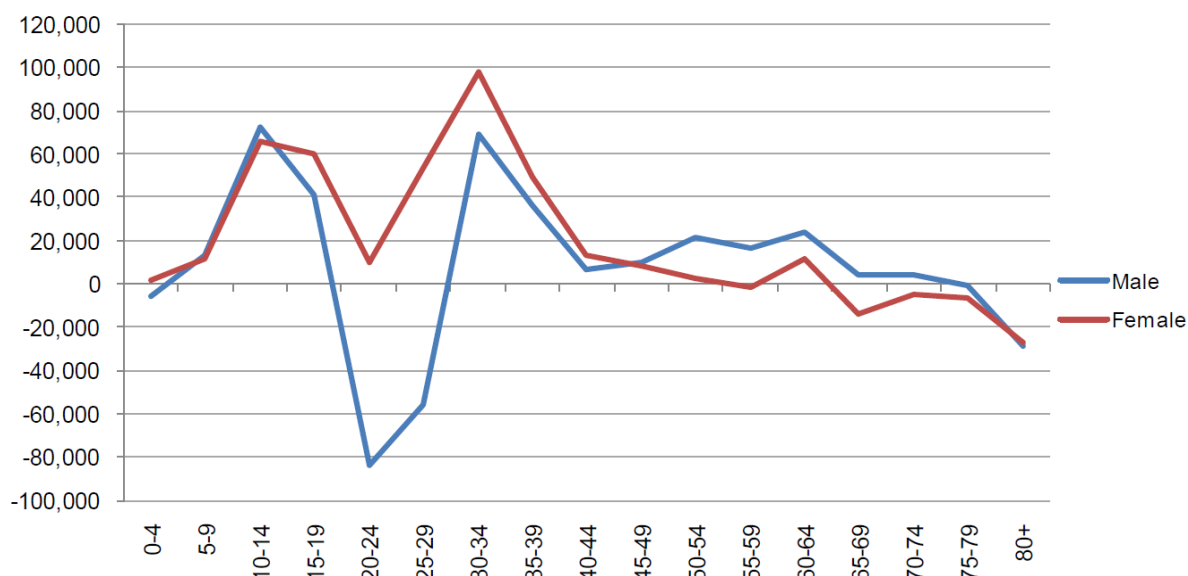
	<b>Estimates data</b>		<b>2011 Census data</b>	<i>thousands</i> <b>Difference</b>
1 Mid-year estimate rolled forward from 2001 to 2010, including migration improvements and then extrapolated to census day	55,548	As at census day	56,076	528
2 Mid-year estimate rolled forward from 2011 to census day, excluding 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.

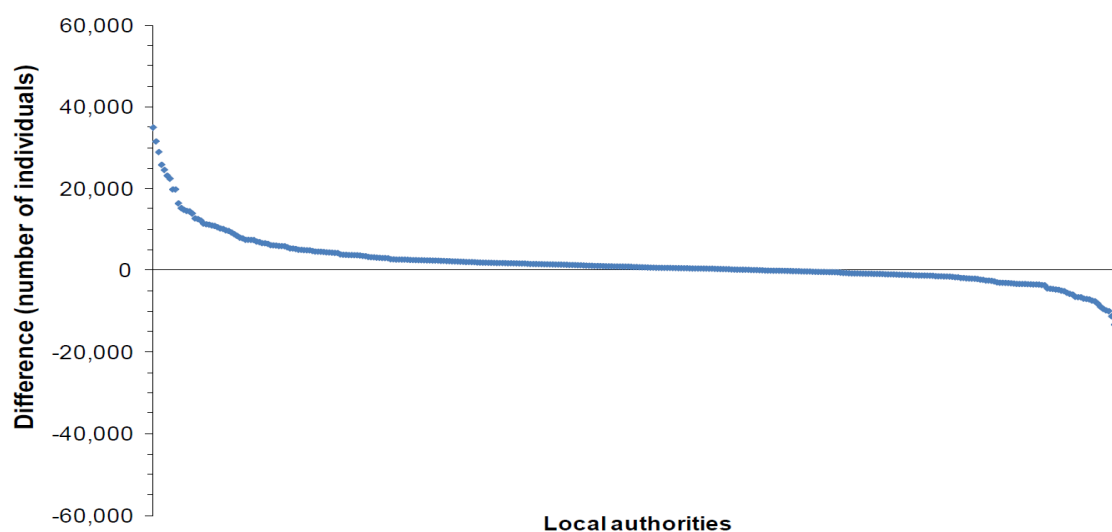
7.161 Overall the census found just under half a million more people than expected based on the mid-year population estimates rolled forward from 2001. The main explanation for this is likely to be errors in the measurement of international migration. However there may also be elements of the difference 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 to 34 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<sup>60</sup>. 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**

<b>Factor</b>	<b>Impact on difference</b>	<b>Remainder</b>
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.