

2021 Census Design Document

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1. Introduction

This document sets out initial thinking for the design of the 2021 Census in England and Wales. The paper highlights the main aims of the 2021 Census Transformation Programme that have helped shape the initial design, the major changes proposed from the 2011 Census and gives an indication of some of the risks associated with the programme. The design draws on experiences from the 2011 Census, current world best practice, and consideration of technological and societal changes.

It is important to note that the design remains a proposal at present, the main elements of which will be subject to further research, building on feedback received during consultation and advisory meetings, and a detailed programme of testing over the coming years. In addition, the final design will also be informed by work to understand the cost-benefit trade-offs followed by commitment to resourcing the programme for 2021.

The proposals in this design document do not include the content of the questions to be asked or the detail of the outputs to be delivered. These will be the subject of separate consultations and discussions.

2. Strategic review of the need for a census in 2021

Every decade there is a review to establish whether and what population information is needed and if a ten yearly census is the best way to meet those information needs. In May 2010, ONS began a review of the future provision of population statistics in England and Wales in order to inform government and Parliament about the available options.

The objective of this review, the Beyond 2011 Programme, was to identify the best method for producing population statistics in the future, in the context of:

- Changes in technology, in particular the opportunities offered by the internet, enabling a move away from a traditional paper based census
- A rapidly changing society meaning a stronger demand for more frequent data on the number and make-up of the population
- Improvements in administrative data sources (such as the patient register and tax and benefits data) giving potential for increased use in the production of statistics
- User demands that the census cannot meet (for example information on income)
- Changes in the law through the Statistics and Registration Service Act 2007 that enabled the ONS to access additional government datasets
- The need to make the most effective use of public money

Having extensively reviewed all the available options and evidence through the Beyond 2011 programme – including international comparisons, statistical research, public attitude research, responses to public consultation, cost/benefit analysis and an independent review led by Professor Chris Skinner – in March 2014, the National Statistician recommended:

- An online census of all households and communal establishments in England and Wales in 2021 with special care taken to support those who are unable to complete the census online
- Increased use of administrative data and surveys in order to enhance the statistics from the 2021 Census and improve annual statistics between censuses.

This will make the best use of all available data to provide the population statistics which England and Wales require and offer a springboard to the greater use of administrative data and annual surveys in the future.

While a move to an administrative data and survey based approach had attractions in reduced cost, it presented too great a risk to the delivery of outputs. Unless, and until, it could be made to provide small area data, it did not meet requirements of stakeholders and could not be relied upon on to meet legal requirements with an acceptable level of risk.

This approach was endorsed by the Minister for the Cabinet Office in the Government's formal response to the recommendation:

“The Government welcomes the recommendation for a predominantly online census in 2021 supplemented by further use of administrative and survey data. Government recognises the value of the census ... The census provides information on the population that is of fundamental importance to society. ... We welcome the increased use of administrative data in producing the census in 2021 and other population statistics, and to improve statistics between censuses, since this would make the best use of all available data and provide a sound basis for the greater use of administrative data and surveys in the future.”

The Government's endorsement concerned solely the 2021 Census. The Minister for the Cabinet Office added:

“...our support for the dual running of an online (decennial) census with increased use of administrative data is only relevant to 2021 and not for future censuses. Our ambition is that censuses after 2021 will be conducted using other sources of data and providing more timely statistical information. However, any final decision on moving to the use only of administrative data beyond 2021 will be dependent on the dual running sufficiently validating the perceived feasibility of that approach.”

3. Census Transformation Programme

Both the National Statistician's recommendation and the Government's response made it clear that developing administrative-based statistics is a priority for ONS in both delivering the 2021 Census and enabling change after 2021. To maximise the chances of success in meeting these ambitions, the Census Transformation Programme has been segmented into three clear strands:

2021 Census operation

This involves research, development and operation of a 2021 online census. The census operation is a large complex activity that requires years of planning. Most of the operation related to data collection, occurs in a relatively short period around census day. Once the data collection operation is concluded, a complex set of processes to convert responses into statistics begins.

Integrated population statistics outputs

This strand involves developing and implementing methods for enhancing 2021 outputs (for example potentially linking variables which are a proxy for household income to census outputs by using Department for Work and Pensions (DWP) and Her Majesty's Revenue and Customs (HMRC) data to produce small area, multivariate income statistics); methods for production of more detailed inter-censal annual statistics about the characteristics of the population; and methods for producing and disseminating outputs.

Beyond 2021

This work builds on the methods and research in the second strand to assess the potential use of administrative data and new surveys to produce population, household and characteristic information currently provided by a census. Key to this will be to develop the quality and other assessment criteria that will need to be met to provide evidence to move away from the ten yearly census approach after 2021. An annual assessment showing progress will be published, starting in spring 2016. These assessments will be supported using the production of annual research outputs based on administrative or survey data developed as part of the second strand. The first set of annual research outputs will be published in autumn 2015.

3.1 Objectives of the Census Transformation Programme

The programme has set the following high level objectives:

- To produce statistics of the right quality and timeliness to meet user needs
 - To run a high quality 2021 online census data collection operation¹
 - Maximise response and minimise variability in response rates
 - Maximise online response and maximise data quality gains from online collection (but not at the expense of overall response rates)
 - Offer a high quality, easily accessible online census and minimise digital exclusion
 - Make best use of administrative data in the planning and conduct of the census operation (eg address register and field management)
- Produce integrated outputs from census, administrative and survey data
 - Make best use of administrative data in producing integrated census outputs, including statistical processing, quality assurance and the creation of new outputs
 - Drive the acquisition of new administrative sources for research outputs, covering population estimates, household and person characteristics
 - Between censuses, seek to produce annual research outputs using administrative and survey data incrementally adding geographic and characteristic detail ahead of the 2021 Census
 - Ensure widest possible awareness and use of census outputs
 - Define and deliver future systems for disseminating statistical outputs to optimise the accessibility of census outputs
- Make a recommendation by 2023 about the future nature of the census and methods for production of population statistics beyond 2021
 - Develop future potential designs for the population statistics system
 - Build evaluation into the 2021 Census and tests, minimising any circularity from using administrative data in 2021 Census outputs
 - Define outputs to be produced from administrative data and quality requirements (and measure annual progress towards meeting them)
- Protect, and be seen to protect, confidential personal data
- Maximise the potential for wider benefits to ONS and the statistical system from the investment in the census
- Provide value for money

The first three objectives relate directly to the three programme strands (as described in the strategic case). The last three objectives cut across all three strands.

¹ That enables residents of Wales to complete the census in Welsh if they wish.

4. Shaping the 2021 Census Design

4.1 Scope of the design

For the purpose of this design, a census is defined as the collection of information from all people about their personal and household characteristics in reference to a particular date, census day; and the subsequent production and publication of population statistics.

Furthermore, the design is only for a 2021 Census in England and Wales under the responsibility of the Office for National Statistics and in partnership with the Welsh Government (WG). A main goal for ONS however, is for the production of consistent UK-wide statistics. ONS is working closely with the Registrars General for Scotland and Northern Ireland (who are responsible for the development and conduct of the censuses in Scotland and Northern Ireland, respectively) to identify areas where we can harmonise. There is already a clear commitment from the three offices to produce consistent UK-wide statistics wherever possible and a UK wide agreement setting out the main areas of harmonisation that will be published. A similar agreement was published for the 2011 Census:

<http://www.ons.gov.uk/ons/guide-method/census/2011/uk-census/index.html>

4.2 Drivers for change and design principles for 2021 Census design

The initial high-level design for a 2021 Census is informed by:

- lessons learned and successes, where appropriate, from the 2011 Census
- developments and lessons learned in international census taking
- requirements from the user community about the types, quality, frequency and detail of outputs required
- changes in technology, in particular the opportunities offered by the internet, and changes in the propensity for the public to interact with government, enabling a move away from a traditional paper based census
- improvements in administrative data sources (such as the patient register and tax and benefits data) giving potential for increased use in the production of statistics, and
- the continued and ongoing need to make the most effective use of public money

The design will evolve as the programme develops and the different design elements are first tested independently, and then tested together. We have set design principles that will guide the development and finalisation of the design for 2021. These include:

- utilise the elements of the 2011 Census that worked well and are still relevant
- embrace new technologies and methods wherever possible
- design the operational and statistical processes for online first
- make it as easy as possible for the public to respond independently, whilst ensuring that the design complies with recognised standards on equality and accessibility
- seek to minimise the respondent burden on the public – the length of time to complete the questionnaire (online or paper if applicable) should be about the same, or less, as that in 2011
- protect, and be seen to protect, confidential personal data
- testing the census design iteratively to assure us and stakeholders of the underlying system, processes, and security of the overall design
- attempt to get a response from every person and household in England and Wales
- the operation and statistical methods employed should be developed to deliver the highest quality for the population estimates by age and sex at the local authority level
- overall seek to achieve as good or better quality results than in the 2011 Census
- maximise the use of administrative data in all areas of the operation
- estimate and adjust the results to account for over and under-enumeration as in the 2001 and 2011 Censuses
- for every question (apart from any voluntary question, eg religion) where no response is provided, estimate a response to provide a complete set of outputs
- make the first results available more quickly than results from the 2011 Census and also seek to complete the full suite of outputs (still to be defined) more quickly than 2011

5 Main areas of change in the 2021 Census

The move to a predominantly online census has many opportunities for all aspects of the 2021 Census, from the design of the questionnaire, to the management of the field operation, to the processing and production of outputs. This section provides an overview of the main design features and, where relevant, lists some of the opportunities for particular aspects that will be considered when finalising the design for the 2021 Census. Some of the other, key supporting actions, required to produce statistics that meet user's needs are listed in section 6.

5.1 Accessing census questionnaires

In previous censuses a paper questionnaire was delivered to every household. As a result of going online first, the way householders are introduced to their census questionnaire will be different. The 2011 Census online questionnaire was accessed using a 20 character authentication code printed on the paper questionnaire that was posted to households, and provided a unique link between a response and the address. Work is underway to understand the most effective way of contacting respondents in an 'online first' solution, and to investigate alternative methods of authentication. These include:

- pre-registration
- invitation to complete with or without an authentication code
- use of gov.uk "verify" service

To encourage online response, we need to ensure that services are in place that take account of respondents who would like to complete online but are unable to. Understanding our respondents and how they wish to interact with a census collection exercise, based on an understanding of interactions with other government services, is vital to achieving the required response rate. Current research takes account of assisted digital requirements to meet Government Digital Service (GDS) guidelines.

5.2 Target population and digital inclusion

A primarily online census introduces new challenges. There are always likely to be hard-to-count populations who are at risk of low levels of engagement or response. These are by their nature specific and require special attention. These groups were identified and prioritised in the 2011 Census. We will build on this successful strategy for the 2021 Census, ensuring that any emerging groups are included and engaged with, at an early stage, to understand their needs and explore appropriate ways to achieve higher levels of response.

In addition new digital services need to meet the government digital by default standard and provide services that are so straightforward and convenient to use that all those who can use digital services will choose to do so, while those who can't are not excluded. An estimated 10 per cent of the adult population (not households) may never be able to gain basic digital capabilities because of disabilities or basic literacy skills (see [Cabinet Office Report](#)). Digital exclusion typically affects some of the most vulnerable and disadvantaged groups in society. The design and operation of the census will therefore need to take particular account of the requirements of these individuals.

5.3 Follow-up of non-responding householders

As with previous censuses, we will use different strategies to contact non-responding households and encourage them to take part. The precise timing and combination of follow-up modes is under development, but it will include the use of reminder letters and household visits from census collectors. Use of telephone and email follow-up is also under consideration. As in 2011, there will be support available in local venues such as libraries, drop-in centres and religious centres.

Collectors will make multiple visits to non-responding households to persuade non-responders and offer support where it is needed. If an address has been incorrectly included, they will provide verification before removing from the system. As time progresses, the emphasis would shift from support and encouragement to the legal requirement for completing the census and the penalty for not doing so. Later on, a small, separate field force will manage more persistent non-compliance.

5.4 Operational management

It is expected that collectors and their managers will be provided with up to date information about which households have not completed a questionnaire. As in 2011, this will enable managers to effectively refine and target the follow-up operation, flexibly deploying staff to the areas with the lower response rates. Online collection will also enable up to date information about the types of populations (eg students) that have not responded. This could be used to further target publicity or community engagement activities. The prioritisation of collector resource, publicity and community engagement will be important factors in minimising variability in response rates between areas and also between population sub-groups.

The use of hand-held devices in the field is being actively considered. Subject to security considerations and a cost-benefit assessment, these could be used to manage many aspects of field communication, including collector workloads, and if deemed secure enough, may be also be used for data collection.

5.5 Data processing

The aim to have a high proportion of online completions will also provide opportunities to improve the quality of processing of the information. As shown in the 2011 Census, the quality of online completions was significantly better than that of paper questionnaires. There were substantially lower rates of question non-response for internet returns (in comparison with the Census Quality Survey), and internet responses were generally more accurately completed than paper responses. Given that only 16.4 per cent of household responses were completed online in 2011, there is an opportunity to increase the quality of the information captured.

A substantial online response also provides opportunities to speed up the processing of census information, compared to a predominantly paper operation. We aim to exploit the early availability of data and publish results earlier.

5.6 Census outputs

For 2021 we will continue to seek ways of making outputs available more quickly, while maintaining the high levels of quality and confidentiality of the information provided by the census. We will be reviewing the way that we process, protect and disseminate a range of census outputs to ensure that we continue to meet evolving user needs.

Subject to research and consultation with users, we will seek a move away from the large number of pre-specified tables and make data available in open formats. There is a desire to make data available from a larger data store, but this will be dependent on the development of appropriate disclosure rules. This would complement, rather than fully replace the availability of pre-canned standard outputs. This service would most likely cover some but not all of the current needs for commissioned outputs

Importantly we will also aim to produce similar ranges of output products as in previous censuses but will consider the full suite of products, including specialist products (for example microdata and origin-destination) when developing output systems to ensure that the more complex, specialist products are not lost in our thinking.

6 Key elements of the design

6.1 Address register

As for the 2011 Census, a high quality address list will be essential for delivery and linking of internet access codes to addresses, to allow targeting of follow-up for non-responding households and to underpin estimation and the production of outputs following the census. Work is already underway to investigate options for developing a suitable register including all residential and communal addresses in England and Wales.

The core of this register is likely to be the National Address Gazetteer (AddressBase) being maintained on behalf of government by Geoplace, which incorporates address information supplied by local government, Royal Mail and Ordnance Survey (the main sources used in 2011). In 2011 we accepted an element of over-coverage in the address register (including recently built properties for example) to maximise the chance that a household was sent a questionnaire. This caused some problems in later processes. For 2021 we will be looking to focus more closely on this over-coverage to reduce such problems.

We aim to include the use of more address-level intelligence from administrative, commercial and open-data sources. By knowing more about addresses it may be possible to better target resources by, for example, identifying those areas where we are likely to find vacant properties, second residences, or encounter problems with access.

A register of communal establishments such as university accommodation, prisons, caravan parks and army camps, will form an integral part of the address register – again drawing on the best sources to ensure the proper enumeration of residents. This will be developed in line with the address register to reduce elements of duplication between residential and communal properties, which was an area that caused some local operational difficulties in the 2011 Census.

ONS will work with data suppliers to ensure improvements to, and improved links between, address sources. A main part of the work will be to assess the quality of such sources. This will probably include some field address checking although the scale and nature of this checking are yet to be determined.

As well as being central to the census operation, address level data is increasingly important in the linking of administrative and other sources to produce statistics. Work on the address register will underpin research on the reuse of administrative data for 2021 outputs and beyond. The quality of administrative sources would be improved if all owners of such data used a harmonised address framework.

6.2 The online questionnaire

The 2021 Census will be primarily an online census. Building on the successful 2011 online questionnaire design, research is being undertaken to understand how to transfer the questions to mobile and electronic devices.

The online questionnaire will take account of best practice standards and guidance, and will be monitored throughout the development phase to ensure compatibility with the most common browsers, devices and operating systems. The collection instruments will be independently accredited to demonstrate compliance with recognised standards (for example Level AA of the Web Content Accessibility Guidelines (WCAG) 2.0). The service will be tested thoroughly so that predicted capacity can be met, and in the event of unexpected overload, the respondent's experience is managed and not degraded in any way.

In addition, the online questionnaire will be designed independently from any paper questionnaire to maximise online take up and data quality. Opportunities that will be considered and tested include:

- contextual help to help complete questions
- use of detailed drop down boxes to reduce, or eliminate altogether, the amount of coding for more detailed questions like occupation, industry or country of birth
- more comprehensive validation within and between questions
- design of questions to fit smaller screens

6.3 Stakeholder engagement

Partnerships with, and support from our stakeholders helped to make the 2011 Census such a success. Our aim is to build on these strong relationships to help to design and run the 2021 Census, and to provide users with the census outputs they need.

Based on our experiences from the 2011 Census, we know that local authorities' knowledge and understanding of their local areas and communities significantly contributed to the success of the census. The need for early engagement with local authorities is a recommendation for the 2021 Census and the aim of our planned 2021 Census local authority engagement programme will be: to raise awareness and understanding of the 2021 Census; explain to local authorities the role that they can play in participating in and supporting the 2021 Census; and to build confidence and trust in the 2021 Census methodology and outputs.

For example, the 2011 Census worked in partnership with local authorities in England and Wales, most of whom nominated officers to census liaison manager (CLM) and assistant census liaison manager (ACLM) roles. These officers coordinated census engagement within their authority and with ONS; including gathering of local intelligence, community outreach activities and promotion of the census. This model proved very effective and we envisage similar partnerships for the 2021 Census.

Previous censuses have shown that certain population groups are less likely to complete their census questionnaires for a number of sometimes complex reasons. These include young men, students, certain black and minority ethnic groups (BME), the very elderly, low-income families, non-English speakers, and people with disabilities. The 2021 Census will give support to these groups (as was done in 2011).

The 2011 Census community engagement programme included partnerships with community representatives and groups to understand barriers to census participation, to communicate the value of the census and to encourage people to take part. Many national and local groups supported the 2011 Census and actively promoted the census and organised community events, including events helping people to fill in their questionnaires. Similarly, universities and charities promoted the 2011 Census, organised events and provided support. Our planned 2021 Census community engagement programme will again aim to encourage strong partnerships with community groups, charities and voluntary organisations, and universities.

We value feedback from our stakeholders and census users. Throughout the programme, ONS will engage with them to consult on our 2021 Census plans and proposals, through public consultations and census advisory groups (CAGs).

6.4 Publicising the census

Every census presents a unique publicity challenge in that it means communicating with, and motivating every household to fill in their census questionnaires. The target audience is effectively 'everyone.'

As in 2011, a paid-for publicity campaign – including TV, radio, outdoor and digital advertising – will be needed in 2021 to raise awareness of the census and to communicate a clear call-to-action to the entire population at the same time.

With the greater diversity of our population; the fragmentation of media channels; and the proliferation of digital media channels, it is impossible to reach everyone through one channel. On the upside, particular channels can still be very effective in reaching specific audiences. Consequently, the 2021 Census will use a combination of channels to make contact with every household in England and Wales. Digital channels have become the default communication channel used by government to engage with the public and will play a more prominent role in 2021. Social media will be more important than it was in 2011.

In 2021, we will need to encourage some audiences more than others to fill in their census questionnaires. Learning from the 2011 Census, the publicity campaign in 2021 will have an additional focus on specific audiences such as young people, students and Black and Minority Ethnic (BME) groups. Similarly, some audiences such as the elderly will require more help to fill in their questionnaires online and the publicity campaign will need to steer people to the support available.

Regular user research will inform the design of the 2021 Census publicity campaign and ensure that we give the public both motivation and guidance to complete their census questionnaires online. The publicity campaign will adhere to the ONS Welsh Language Scheme.

At an operational level, the publicity campaign will have to align with census operation milestones including the go-live date of the online questionnaire and the commencement of the field operations follow-up activity. In addition, the publicity campaign will need to be flexible enough to be able to respond to up-to-date management information (MI) from field operations such as questionnaire online completion rates.

The 2011 Census publicity campaign benefited from the support of local authorities and community groups who publicised the census through their channels on our behalf. Similarly, pro-active media relations will support the paid-for publicity campaign and will aim to generate additional positive coverage of the 2021 Census in the press. In 2021, a census publicity campaign will likewise need the support of partnerships – including local authorities and community groups – in order to be truly successful.

6.5 Supporting respondents

As in the 2011 Census, ONS will offer a comprehensive support structure for respondents. This will range from initial contact and requests for questionnaire access through to the supply of translation services and ensuring ONS meets all the requirements of 'Assisted Digital' ensuring support is provided to those who can't use online government services on their own.

Census will provide a telephone helpline in 2021 and, as in 2011, we will provide online help, Interactive Voice Response (IVR), translation services (both 'live' and via documentation) and services for the visually or hearing impaired. For 2021 consideration is being given to extending the support services available. Research and testing will be completed on providing live web chat, as well as visual Interactive Voice Recognition (IVR) and social media interactions via Twitter, Facebook, LinkedIn and the like. We will remain open to further developments in all these areas and will continue to research appropriate channels.

6.6 Field force management

The objective of the field design will be to maximise overall response, whilst achieving sufficient response in all local authorities to enable successful estimation of the population. To achieve this we need to track responses to understand response patterns and, using area based response targets identified by the hard-to-count work, allow us to direct follow-up activities. The 2021 Census will be primarily online, but we need to recognise that maximising response is our overriding objective. Whilst encouraging the vast majority of respondents to complete online, we will need to minimise digital exclusion, assisting respondents to complete online, providing support through the field force and community liaison, or by providing paper questionnaires.

To achieve this objective we will require a large field force. We currently anticipate we will need a similar number of field staff as we had in 2011. Lessons learned from 2011 indicate that we should consider a lower ratio of census collectors to census co-ordinators (1:10 - 1:12, rather than 1:15). In addition, we would look to change the workload of the census co-ordinator. We are expecting that the recruitment, pay and training of the field force will be outsourced, as in 2011.

We currently anticipate that 5-10% of census collectors will start approximately two weeks before census day, to align with the start of the telephone helpline operations. They will support requests from the public for help in completion, and requests from HQ for address verification. The remainder of the census collectors will start about ten days after census day, and continue to work for approximately four weeks, following up in the areas with the poorest response first. As in 2011, we expect that census area managers would start during the year before the census to allow them to build relationships with local authorities and communities, and census co-ordinators to start in the early part of 2021.

There are several design changes being explored that would facilitate changes to the field force number, structure and workload.

- Designing with more cost effective methods of non-respondent follow-up - extensive use of follow-up letters (and possibly emails), reducing the need for census collectors to be 'on the ground' in areas with higher initial response rates
- Investigating the use of administrative data to inform follow-up - reducing wasted visits by understanding the type of resident (for example those who are out all day), and giving us a better understanding of the type of property (high turnover of residents, or second home)
- Early analysis of online responses - comparison of distributions of main characteristics of responding households and people, with expected distributions, enabling flexible deployment of the field force in areas where distributions are not as expected
- Equipping the field force with hand-held technology to allow collection of personal data to support those who cannot complete online, to enable automatic direction of census collectors to follow-up addresses in priority areas, route planning capability, assistance with provision of training (YouTube videos), help, communication and tracking of hours and expenses. This would also reduce the census co-ordinators workload which in 2011 concentrated on allocation of work. This is subject to considerations of security/ privacy and cost / benefit

6.7 Communal establishments (CEs)

In reviewing the 2011 Census, the enumeration of communal establishments was identified as an area where significant improvements could be made for 2021.

Previously, paper questionnaires were hand delivered to communal establishment managers by a member of field staff. The manager was responsible for distributing and collecting questionnaires, which the member of field staff then collected.

As a result of having a predominantly online census in 2021 and a greater use of administrative data, there are opportunities to improve the enumeration of communal establishments. A main focus of the 2021 design will be to tailor the enumeration approach for the type of establishment, but in full consideration of the administrative data available for that type. For some communal establishments where good administrative data exists a less extensive enumeration approach may be appropriate. For those communal establishments where residents may have difficulty completing a questionnaire online, extra support will be given, including the option of completing on paper.

6.8 Use of administrative data in the census design

A significant change from 2011 will be the greater use of administrative data in the design and conduct of the 2021 Census.

As part of the Beyond 2011 Programme, and previously during the Migration Statistics Improvement Programme, ONS has acquired access to a number of administrative datasets. Further details are set out in the programme's Privacy Impact Assessment: <http://www.ons.gov.uk/ons/guide-method/census/2021-census/confidentiality/index.html?format=contrast>

Most of the data acquired to date only provides basic demographic information such as age and sex. Further details on the topics covered by these sources are given in the topic consultation document: <http://www.ons.gov.uk/ons/guide-method/census/2021-census/consultations/index.html>.

ONS is pursuing access to further administrative data. These data fall into three types.

- activity information such as evidence of contact with government agencies to help improve our estimates of the size and geographical location of the population from administrative data (described in Section 3)
- information to supplement the address register such as information on occupancy status (see Section 6.1), and
- information about characteristics of the population such as ethnicity, income or qualifications to potentially replace or supplement information collected in the census

There are three areas where administrative data will improve the efficiency, effectiveness and quality of the 2021 Census.

6.8.1 Design and prioritisation

In the 2011 Census, the strategic aim was to maximise overall response but also minimise the variability in non-response. This resulted in the initial collector resource allocation being targeted at areas where the initial return was predicted to be lowest. This allowed the movement of those resources to focus on areas where the actual return rates during the field operation were lowest. A hard-to-count index was used to drive this allocation and prioritisation. The index was based on external data for areas containing around 750 households.

For 2021, the strategic aim is the same. However, there are likely to be data that could support lower level targeting, potentially at address level. This could enable a more efficient targeting of resources, provided that predictions of likely non-response patterns are accurate. Research is underway to identify such data and assess its ability to predict non-response patterns. However, it is worth noting that predicting the patterns of non-response may be more of a challenge than in 2011 as a result of the online-first approach.

6.8.2 Operational improvements

Administrative data may help us in better understanding the status of addresses and therefore enable us to prioritise field resources. For example administrative data may be able to identify households that are vacant or second residences. This would enable field resources to be prioritised to those households which are harder to contact or need further encouragement for completing their questionnaire.

Other data sources are being explored to evaluate whether there is potential to provide information that will enable collectors to plan their workloads efficiently.

6.8.3 Statistical quality

Administrative data could be used to improve the quality of the census estimates. In the 2011 Northern Ireland Census, high quality administrative data was added to the census data for some households that did not respond. This improved the quality of the resulting statistics. Such an approach would depend on the quality and availability of suitable administrative data and the outcome of further research to understand the implications and quality gains of such an approach.

6.9 Coverage assessment

Every effort is made to ensure everyone is counted in a census. However, no census is perfect and some people are missed. This under-enumeration does not usually occur uniformly across all geographical areas, or across other sub-groups of the population such as age and sex groups. In order to achieve the objectives of the Census Transformation Programme, coverage assessment and adjustment is required.

This is achieved by conducting a Census Coverage Survey (CCS), independent of the census. This is a large focused survey undertaken shortly after the census, collected using a different method from the census. The current expectation is that it will be similar to the survey conducted in 2011. It will be a short, doorstep interview of around 350,000 households across all local authorities. The questions asked and scope of the coverage survey will evolve as the requirements develop, particularly around the use of administrative data. An important innovation might be interviewer collection using tablets and a less complex questionnaire

Coverage assessment and adjustment is a critical part of data processing which measures and adjusts the results for the number of people and households not counted in the 2021 Census. The approach for 2021 will build on the successful framework and methodology used in the 2011 Census. It will aim to address the lessons from the 2011 Census, looking for improvements and taking into account the changes to the census design. The intention is to try to deliver results that are better than the 2011 results. Improvements to be researched include:

- greater use of administrative data
- alternative estimation strategies that rely less on matching
- estimation that uses larger areas
- improved methods for adjusting the database

6.10 Outputs

Our current assumption is that we will continue to use output areas as our base geography to provide data for small areas, comparability with previous censuses, and as building blocks for additional and changing geographies. Given the success of the additional population bases in 2011, we will look to retain those and consider additional bases for 2021.

We will be seeking to integrate additional administrative data within the main census outputs as much as possible, and building a platform enabling the provision of small area statistics beyond 2021.

The systems developed for the creation and dissemination of 2021 Census outputs will be fully aligned to best practices around Open Data at the time, and built following Government Digital Service standards. The services developed for producing outputs from the 2021 Census and making them available to users, will be designed with the intention of wider use for other ONS (and potentially GSS) outputs.

7 Beyond 2021

The Beyond 2021 strand of work is focussed on considering options for replacing the ten-yearly census beyond 2021. The objective is to have robust evidence to inform recommendations by 2023 about the future of the population statistics system.

It continues and expands the research into the use of administrative data and surveys carried out during the Beyond 2011 Programme. We will be seeking to improve the quality of administrative data based estimates of the size of the population and researching ways to produce statistics for characteristics of the population, housing and households using administrative data and surveys.

We will produce annual 'research' statistics using administrative and survey data (investigating what can be produced without a ten-yearly census) starting in autumn 2015. By the time of the 2021 Census, we aim to have covered as much of the breadth and detail of the 2021 Census outputs as possible. The major constraint on how far this will progress is ONS having access to good quality administrative data covering the range of census topics.

These research statistics, and user feedback on them, will provide a set of evidence in assessing progress towards the criteria that will need to be met to move away from the online census approach after 2021. An early objective of this strand will be to develop these criteria. An annual assessment showing progress against meeting these criteria will be published starting in spring 2016, culminating in a final validation of administrative data based statistics against the 2021 Census.

Over 30 research reports were published by the Beyond 2011 Programme 2011 to 2014: <http://www.ons.gov.uk/ons/guide-method/census/2021-census/reports-library/beyond-2011-reports-archive/index.html>

Further details on the research outputs, associated research to support them and the annual assessment will be published later in 2015.

8 Risks

As with any large data collection exercise or statistical operation there are a number of risks that must be identified and managed over the lifecycle of the programme. The census is not different. We have identified and are managing a number of risks that affect all aspects of the programme. The main risks associated with the design of the 2021 Census are:

- the impact of digital exclusion on response rates and hence quality (and cost of remedying this through assisted digital services)
- the risk of not delivering wider legacy benefits to the rest of ONS and the wider UK statistical system
- the challenge of developing, and proving, sufficiently robust methods for use of administrative data to provide useful statistics in addition to the 2021 Census
- the challenge of developing administrative data methods and surveys of sufficient quality and detail to be able to produce statistics of the right quality and timeliness to meet user needs, without the need for a census in 2031
- changes to administrative data or the access to it, thereby comprising the ability to produce integrated outputs
- developing an output strategy and plans in time to rehearse in 2019 (something we failed to do in 2001 and 2011)
- fully moving to a predominantly online census introduces some bias between online and paper, or historical time series, which affects the value of the outputs, and
- insufficient funding to support the work of the programme

9 The census in Wales

The design of the 2021 Census in Wales will build on the successful aspects developed for the 2011 Census in Wales. ONS will work closely with the Welsh Government to identify the areas that require careful consideration of the Welsh language throughout the whole design and that it complies with the ONS Welsh Language Policy and any standards issued by the Welsh Language Commissioner as a result of the ONS Welsh Language Standards Investigation.

More specifically, the design will enable residents of Wales to complete the census in Welsh if they so wish. Whilst the main design of the 2021 Census will reflect the design of the census in England there will be specific additional aspects to support Welsh language. The questionnaire (online or on paper), publicity and public support will need to be available in Welsh and stakeholder engagement and field force recruitment and management activities will be designed to reflect this element within the census operation. The production and dissemination of census outputs will also consider the availability of Welsh language outputs in line with the ONS Welsh Language Policy.

2021 Census iterations

The Beyond 2011 Programme (Jan 2011-March 2015), conducted the relevant research into the options for, and made a recommendation to Government on, the future production of population statistics

The Census Transformation Programme will deliver the 2021 Census through three iterations:

First iteration (April 2015 – 2017 Test) – covers research and testing to develop the statistical and operational design for all three strands, including development of prototypes. This work will focus on developing evidence to underpin the planning and cost assumptions resulting in revised costs for the programme and an initial design for the 2021 Census. During this phase we will carry out tests (including a large scale field test during 2017) to validate some of the design assumptions to enable us to firm up on the design.

Second iteration (post 2017 Test leading to 2019 Rehearsal) - Development and system/customer testing of the systems and services needed to support the Rehearsal. During this phase we will carry out a large scale rehearsal of the systems and services needed to deliver the census collection, processing, analysis and dissemination operations, including any considerations required to assist with the evaluation of the Beyond 2021 design. Information and feedback from this phase will enable us to finalise the design for all three strands.

Third iteration – (post 2019 Rehearsal to 2021 Census outputs) this phase relates to the census field and processing operations ie. the collection and processing of census information for every household, communal establishment and person in England and Wales. We will also collect and process administrative data to produce population statistics in parallel with the census operation. Having collected the information, this phase will analyse the data, produce and disseminate the census results, enhanced by administrative data. We will also analyse the results from the alternative approach using administrative data and evaluate them against census results to provide evidence to underpin a recommendation on the future production of population statistics in 2023.

Evaluation/future planning will follow the operational phases. We will also make a recommendation to government on the future of population statistics in England and Wales.