

Beyond 2011 - A new paradigm for population statistics?

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Abstract

All of the indications are that the censuses held in 2011 across the countries of the United Kingdom have been highly successful – but there are clear signs that taking the census is becoming increasingly challenging and costly. The dynamic nature of populations, advances in information technology and demand for more frequent and more detailed statistics are driving changes in methods. This trend can be seen across many developed countries. The Office for National Statistics set up the ‘Beyond 2011’ Programme in April 2011 to take a fresh look at options to meet future user needs for population and small area socio-demographic statistics for England and Wales. A range of statistical options is being considered, including census-type solutions; administrative data solutions; and survey solutions. Countries that have moved towards administrative data solutions generally have established population registers. The UK does not have a population register, so producing statistics based on administrative data would require linkage of data from multiple sources, which are known to have multiple data quality problems, including: incorrect residential address information; duplicate records; inclusion of people who have died or have left the country; and omission of recent migrants to the country. New surveys and statistical methods are therefore being explored, both to address population coverage problems and to enable collection of data on additional topics not included in administrative data. Recommendations on the way forward will be made in 2014. This paper will provide a summary of research to date and emerging findings.

Key Words: census; population register; coverage survey; administrative data

1. Background

The Census is a cornerstone of the UK statistical system and provides a wealth of consistent, comparable data at small areas and for a range of topics from the local to the national level. It provides a key source upon which other statistics are built and a benchmark against which many are judged.

All the signs are that the most recent Census in England and Wales (in March 2011) was highly successful. A response rate of 94 per cent was achieved nationally with over 80 per cent in every local authority – this represents a real improvement on the results in 2001. An option for online completion was introduced for the first time and around 16% of the 23 million census returns were completed this way.

Nonetheless the Census has been becoming increasingly costly and changes in society are making it more challenging to carry out. A more mobile population and the increasingly complex ways in which people live make the process of taking a Census more difficult – and the concept of a snapshot every 10 years, arguably, less relevant. At the same time improvements in technology and the growth of computerised records about people and services (referred to here as ‘administrative sources’) would seem to suggest an alternative approach – could we pull together what we already know about the population from these records and only supplement this where there are gaps?

As a direct response to these issues and challenges ONS established the **Beyond 2011** Programme to assess user need and investigate options for producing the population data required in England and Wales. A programme of work has been established to test all of the alternative ways in which these data might be produced.

2. The initial set of statistical options

Initial work focused on a set of 8 options falling into three broad groups:

'Census type' options

1. Traditional Census (long form questionnaire to everyone every 10 years)
2. Rolling Census (over a 5/10 year period)
3. 10 yearly Short Form Census plus Continuous Survey (US model)
4. 10 yearly Census Long Form (to a sample) Short Form (to everyone else)

Administrative data + survey options

5. Administrative Data - Record level linking
6. Administrative Data - using Aggregate data (for small areas) only
7. Administrative Data - Partial linkage (linking only a sample of records)

Survey option

8. Use of the Address Register plus a large ongoing survey

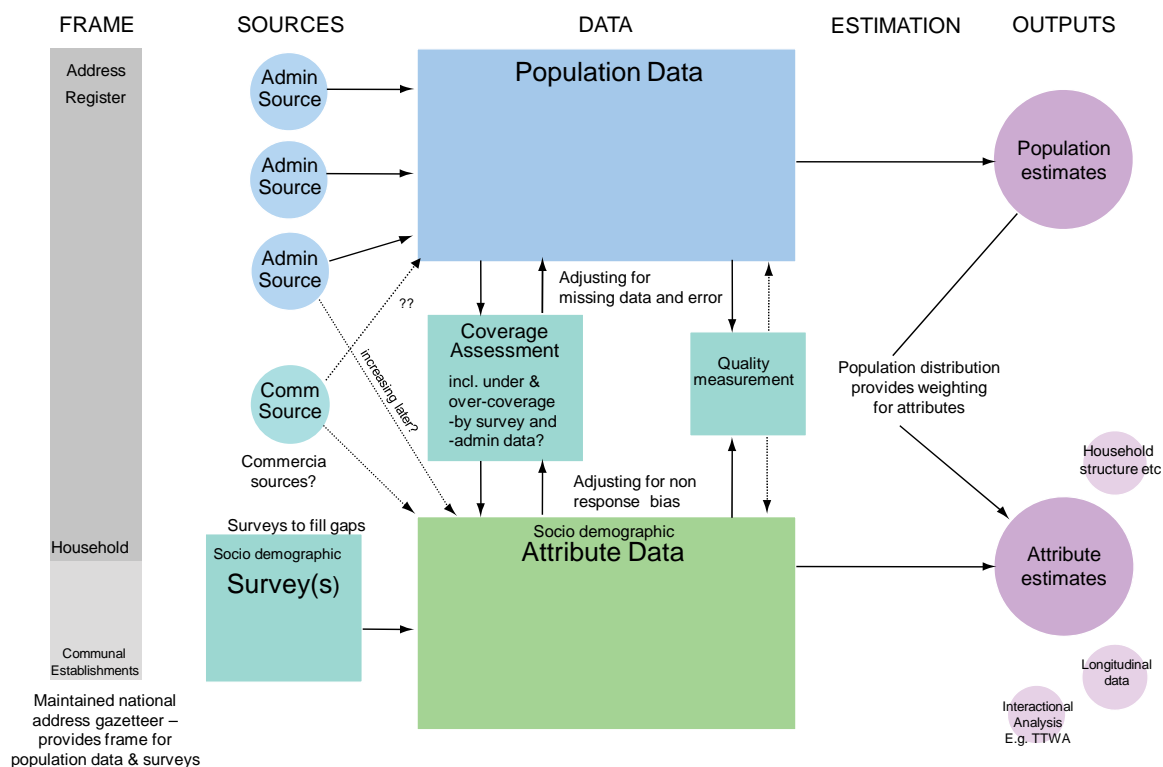
Full details and explanation of the options that have been investigated (as well as details of the research findings discussed below) are available at:

<http://www.ons.gov.uk/ons/about-ons/what-we-do/programmes---projects/beyond-2011/index.html>

In practice, as the census and survey options are well understood already, much of the statistical research has focussed on the administrative data options. Figure 1 provides a summary view of how administrative sources and surveys might be used in combination to create population and attribute estimates.

The population estimates would be produced by matching between multiple 'administrative sources' while the 'attributes' would be estimated from a very large survey – potentially carried out annually. There would still be the need for a large coverage survey to allow us to check and adjust for the quality of the different sources.

Figure 1 : Beyond 2011 – Administrative sources options - Overview



A six-monthly cycle of research has been undertaken, with the options re-assessed and the business case updated at the culmination of each cycle. This has involved production of six-monthly research reports setting out what has been learned about the options, data sources and modelling methods. The final recommendation is due to be made in September 2014 but attempts are being made to harden up the recommendation earlier than this – ideally by the end of 2013.

3. Criteria for Assessing the Statistical Options

The options are being iteratively assessed against a set of criteria including:

- Fitness for purpose i.e. ability to meet user requirements including:
 - Accuracy of the statistics produced (now defined as quality targets)
 - Frequency of the outputs e.g. updated annually, or every 5 or 10 years
 - Geographic level at which outputs can be produced
 - Consistency and comparability of the outputs across geographic areas
- Cost (both total cost and cost profile over time)
- Technical and legal feasibility
- Risk
- Public burden and public acceptability.

Scoring the options against these criteria determines which options remain under consideration and will dictate which will become our final recommendation.

We have now established a set of strict quality standards which our options need to conform to in order to be considered further. Further details are available online in the link provided above.

Following our first full assessment of the options the following options have now been rejected:

OPTION 4. 10 yearly Census Long Form (to a sample) Short Form (to everyone else)

It is felt that this option would not offer sufficient savings to justify the reduction in quality that would result (in our particular context).

OPTION 6. Administrative data – Aggregate data

Our research has proven that, although results have been interesting, estimating using only aggregate administrative data does not provide sufficient quality.

OPTION 7. Administrative data – Partial Linkage

We have come to think of partial and full linkage options as being variants of a single approach - 'annual linkage'. Early evidence suggests that we do need to link a good deal of data to obtain acceptable results (a view confirmed by our International Review Panel – see below) but work continues to investigate how much linking is really required.

OPTION 8 Use of the Address Register plus a large survey

This option was essentially a variation upon the Rolling Census (Option 2).

The link provided above provides access to reports on the research and assessments that have resulted in these findings.

4. The revised shortlist of options

Following this assessment, our list of options have been redrawn – to remove those options which fail our quality standards – but also to provide more detail on the size and design of the socio-demographic survey required in the case of the administrative data options. The new list consists of four of our original approaches – but this time with variants (5A,5B & 5C) on the full linkage administrative option to take account of different attribute survey designs.

The shortlist of 6 options being taken forward for further assessment is as follows:

- 1) Full Census** - every 10 years as previously - but modernising our approach to census taking, with much more emphasis on internet collection
- 2) Rolling Census** - an annual 'census' of up to 10% of the population – the survey carried out in different areas each time – an approach like this is currently used in France
- 3) Short Form Census and 4% Annual Survey** - a short form is delivered to everyone every 10 years and supplemented by a continually rolling survey - similar to the approach in the USA

5A) Annual Linkage and 10% 10-yearly Survey - linking administrative data and supplementing it with a large 10-yearly survey to produce attribute information

5B) Annual Linkage and 4% Annual Survey - as option 5A above but with a rolling annual survey (rather than the 10-yearly survey) – producing more frequent statistics

5C) Annual Linkage and 40% 10-yearly Survey - as option 5A above but with a much larger 10-yearly survey – producing attribute data down to very small areas

All of these options will be designed to reduce field costs through online completion where possible and would be complemented by a 1% coverage survey – either annually or 10-yearly.

5. Future work

The following are key blocks of work now being taken forward. An update will be provided at the ISI meeting.

Further statistical research

At present a solution based on pulling together administrative data is looking very attractive. This approach has the potential to cut costs while providing more frequent statistics. It remains to be proven, however, whether such a solution can provide the quality of statistics required and it is in this area that most of our research will focus over coming months.

Most countries that have moved towards administrative data solutions generally have established population registers. The UK does not have such a population register, so producing statistics based on administrative data would require linkage of data from multiple sources. These datasets are known to have multiple data quality problems, including: incorrect residential address information; duplicate records; inclusion of people who have died or have left the country; and omission of recent migrants. New surveys and statistical methods are therefore being explored, both to address population coverage problems and to enable collection of data on additional topics not included in administrative sources. Work will continue in this area during the course of 2013.

Public acceptability and anonymous data-matching.

There is potentially considerable sensitivity in the UK around the linking data about individuals. Public opinion and the public acceptability (or otherwise) of alternative solutions will play a key part in our criteria and we are running surveys and focus groups to test public opinion as well as engaging with groups with a special interest in privacy and confidentiality. At the same time we are focusing research on methods of matching datasets which have already been pseudonymised. We are encouraged by progress in this area and will be happy to discuss results with others and report on this work later in the year.

Stakeholder engagement and consultation

Beyond 2011 has a wide and complex set of stakeholders across all sectors of government, and society – not least, established users of census statistics. We are investing heavily in engaging with the full range of users as well as other stakeholders

including government and ‘political’ stakeholders who will be involved in the final decision. A full public consultation is planned to run at the end of 2013 – and this will provide an opportunity for users and other stakeholders to comment on the emerging recommendations.

The Beyond 2011 International Review Panel met in June 2012 and includes experts from the US Census Bureau, Statistics Canada, Australian Bureau of Statistics, Statistics New Zealand, as well as from Netherlands, Austria, Ireland and the devolved administrations of the UK. A further meeting is planned for May 2013.

Building the business case and operational design

Our other key focus at present is upon building the business case to justify any change – and particularly to quantify user benefits. ONS is not baseline funded to carry out the census – a bid for funding is required before each census. A business case based upon the benefit gained by users will be required whether a census or an alternative approach is recommended.

As part of this work, and in order to ensure an easy transition to any new approach, work has started looking at options and costs for building systems required to operationalise any new approach (or potentially plan for a census).

Timetable

The Beyond 2011 Programme is due to provide a final costed recommendation in 2014 but every attempt is being made to clarify our leading options before the end of 2013.

We are very keen to share experience internationally and build on best practice developed elsewhere. To discuss further or for more details on any aspect of this work please contact us at **beyond2011@ons.gov.uk**