

## **Information paper**

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**Census strategic development review**

**Alternatives to a Census:**

**Review of previous UK studies**

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# Census strategic development review

## Alternatives to a Census: Review of previous UK studies

### 1 Introduction

The taking of a census in the United Kingdom is rightly accompanied by a series of post-implementation reviews into its benefits, costs, conduct and alternatives. These reviews are usually carried out by a variety of bodies including internal, public, academic, international or ministerial panels. This report examines a selection of these previous reviews of census taking activities, focusing only on those that comment substantively on the design aspects of, or possible alternatives to, a census. The evaluation of all aspects of the 2001 Census has yet to be completed. The main themes arising from these reports are identified and discussed.

The reports reviewed are:

- (a) Philip Redfern (1989), *Population registers: some administrative and statistical pros and cons*. Journal of the Royal Statistical Society Series A, Volume 152, Part 1, pages 1-41.
- (b) OPCS (1993), *Report on review of statistical information on population and housing (1996-2016)*. OPCS Occasional Paper No 40.
- (c) David Wroe (1998), *Beyond 2001: Alternative to the Census*. Study for the Office for National Statistics Volume 1: Report.
- (d) House of Commons Treasury Committee (2002), *The 2001 Census in England and Wales*. First Report of Session 2001-02, HC 310.

### 2 Summary of reviews

#### 2.1 Population registers: some administrative and statistical pros and cons, Redfern (1989)

Although not strictly a review of the methods for undertaking a census, this paper outlines how a population register can contribute to the production of better statistics. Although the paper was written before the 1991 Census, the philosophy behind the ideas contained within it are still valid despite the significant advances in technology since.

Firstly, it outlines the register-based, or administrative record, census, which is noted as 'one of the most ambitious schemes of record linkage for statistical purposes'. The objective of this exercise is to create a record for each person akin to the entries for that person in a census questionnaire. However, the paper emphasises that this method must also include data for units other than persons: household, the housing unit and the workplace. Therefore a register of housing units, business enterprises and workplaces must also be included, and the facility for linking this with the person-level data must also be considered. Refinement of the register information may therefore be required.

In particular, the paper focuses on the methodology employed in the Nordic countries where the pressures of costs and burden of form filling in the traditional census have persuaded each of these countries to adopt the register-based census method in whole or in part. It is noted however that these countries have long established population registers that are integrated into their culture.

Redfern notes that Denmark is the only country to have switched completely from the conventional census to a register-based census (as at 1989), and, more impressively, managed this in little more than a decade, to culminate in the 1981 register-based census, although the population registers had been in existence for a substantial period before this. This now provides annual (or more frequent) statistics of population, employment, commuting, income and housing, although only the full range of census-type data are produced every 10 years in order to reduce costs.

The three other Nordic countries use mail-out/mail-back questionnaires to collect topics that cannot be extracted reliably from administrative sources, and also to correct the population register itself. Norway was looking to reduce this to a sample of around 10 per cent in order to cut costs by around 60 per cent.

Redfern contrasts the position in Nordic countries with that in Western Europe and North America, where conventional census

methods are still in use. He argues that the main reasons for this are that data systems are not yet in place, the quality of administrative data is poorer, statistical and administrative activities are seen as separate, and the public acceptability of a register-based approach is doubtful.

The paper then outlines how a population register and a conventional census can support each other, for instance as a list of names and addresses for pre-printing census forms, or as an update to the population register. However, this is not seen as good practice as it destroys the notion that the census serves purely statistical ends and weakens assurances of confidentiality. The experiences of the Netherlands and Germany are explored, showing the results of an attempt to use both a register and census.

In summary, Redfern argues that while a population register has many direct positive benefits for statistics, it does not mean that conventional data collections should be abandoned, since the quality of the register-based statistics is poorer. The Swedish census has sought to have the best of both worlds by taking data on many topics from registers and data on other topics from a short census questionnaire using personal numbers as the linking mechanism.

## 2.2 Report on review of statistical information on population and housing, OPCS (1996-2016)

This report describes the review of future needs for countrywide local statistical information that the three UK Census Offices completed in 1992. This followed the guidelines for Policy Evaluation and Reappraisal (PEAR) set out by HM Treasury. The review was originally planned to identify users' needs and the options for meeting them and then subsequently evaluate and test the options. However, the user consultation phase highlighted that users were generally satisfied with a traditional census and there was no readily available alternative. Therefore, the second phase was dropped. It is worth noting that this review was carried out prior to the full evaluation and results from the 1991 Census.

The report is interesting from a statistical design perspective in that it does provide an overview of possible options to provide census-type information, and a summary of users' comments on these data collection options. A summary of these aspects is given below.

### 2.2.1 Overview of possible options to provide information

In parallel with the user consultation, the three UK Census Offices identified an initial set of possible options for the provision of census type information. These options were examined and high-level outline systems produced, including a set of evaluation criteria and a weighting and scoring scheme to assess them. This scoring was not carried out, although the evaluation criteria and scoring system are included in the report annexes.

The methodological options were essentially structured around four primary means of data collection:

- Decennial/quinquennial census;
- Rolling census;
- Population register; and
- Administrative data

Other secondary options are also explored, including surveys, record linkage and micro-censuses.

Within each primary collection mode, a number of alternative design options are given and the key strengths and weaknesses are explored under the four headings for evaluation, namely: information content and statistical quality; operational and financial feasibility; dissemination; and public acceptability. These give a good feel for the likely feasibility, costs and benefits of each approach.

The methodological options presented are included within the options that will be considered for the 2011 development project, and therefore the report provides a valuable resource for benchmarking the evaluation of those designs. Furthermore, solutions that overcome many of the weaknesses that have been identified for each option are already being researched within ONS, such as secure data linkage and the development of a population register.

### 2.2.2 Users' comments on the data collection options

There was widespread support for a *quinquennial census*, although not to meet all needs. There was some support for a more simple 5-yearly headcount, perhaps with variables that change the most.

Local Authorities were generally opposed to a *rolling census* on the grounds of the loss of comparability between areas. However, some

users were attracted by the frequency of outputs from this approach. It is noted that because there are many possible design alternatives within the option, it might have been difficult for users to appreciate the full benefits.

Users were mixed in their feedback on the option of a *population register*, although this may have been because the consultation did not distinguish clearly between a proper population register and a multi-purpose register.

The provision of data from single, unlinked databases was not seen as adequate. A census from *administrative records* was not commented upon widely, possibly due to concerns made public by the Data Protection Registrar.

The conclusion of the consultation exercise was that *'User response indicated a general satisfaction with the traditional type of compulsory census as a primary means of data collection... There was no widespread support or enthusiasm for any of the other means of data collection... User comment centred on the need for information to be made available more regular'*.

### 2.3 Beyond 2001: Alternative to the Census, Wroe (1998)

This report is concerned with the possibility of finding alternative ways to obtain the information traditionally collected in the census of population. It considers the experience of other European countries in moving to register-based censuses, and possible ways forward within a UK context. It is focused on the use of administrative data to provide census-type information.

The paper reviews the Nordic methodologies, and those employed in Germany and the Netherlands, updating the information gathered by Redfern (1989). Wroe notes that it is clear that since the mid 1980s the use of administrative registers in place of data collection by census questionnaires has increased or is planned to increase, and not just in Nordic countries. However, he advocates the importance of using multiple sources rather than just using one administrative system to improve the possibility of identifying changes and prevent the statistics being exposed to changes in administrative arrangements.

Wroe then modifies the Finnish approach to propose a register-based census model for the UK. The core of this model is a central population register, and the main administrative

elements are identified, noting that much of the data is already in existence across the UK. The report then considers the technical difficulties of access (although developments in this area are noted), the formation of a population register and issues regarding access to administrative data. In summary, Wroe concludes that the feasibility of a Nordic style approach in the UK is heavily dependent on the establishment or creation of a population register, possibly through the use of existing sources to create a 'statistical' register. However, it would be necessary to test empirically how reliable such a register would be.

The paper examines the topics that could be provided from administrative sources, and those that cannot at present. It concludes that most topics are available though they are not readily accessible in all cases.

The paper concludes that without access to most administrative sources, it is difficult to say whether they can replace the need for a questionnaire-based census in 2001. A pilot study is required to determine the quality of the results that would be obtained. However, Wroe argues that several factors do point strongly to the need to look carefully at alternative arrangements - notably enumeration problems, costs, and antipathy.

Wroe recommends a strategy for developing the use of administrative sources, the following are those that relate to census design issues :

- (i) to investigate further the feasibility and cost of linking birth, marriages and divorces to the records for parents and spouses;
- (ii) the investigation of the practicality of obtaining access to administrative data, and contributing to the design of the systems with a view to improving the linkage facility between sources;
- (iii) to use multiple sources of information where possible, particularly on addresses; rules based on empirical analysis would be needed to decide which sources to use in different circumstances when there are conflicts; and
- (iv) to carry out pilot studies to establish the extent to which records can be matched and the quality of the resulting statistics.

### 2.4 The 2001 Census in England and Wales, House of Commons Treasury Committee (2002)

The Treasury Select Committee announced in October 2001 that it would scrutinise the work of ONS on the 2001 Census in England and Wales. The inquiry focussed on the adequacy of preparation, consultation, conduct and the utility of the outputs for users with a view on identifying lessons for any future census. The review also explored the alternatives to undertaking a full census.

The Committee considered evidence from Sir John Kingman, Chair of the Statistics Commission who commented:

*‘We live in an age of information technology and we are talking about information so it should not be assumed that the pencil and paper methods which were all the 19th Century had available are the right things to do in the 21st Century. There is a lot of information in the computers that exist already. By 2011 there will be a great deal more. It may be that the right thing to do is to develop the present sort of census or it may be that a much simpler census which simply gives you a framework of who there is and where they are would be the basis for an analysis drawing in all the administrative data that had been collected in other ways, or it may be that there is some quite radically different way of handling the problem that we had not really thought of.’*

The review also examines the methodology employed in other countries, highlighting that the shift in access to administrative data in the UK is moving more and more to a Nordic country-type model. The National Statistician noted that ‘we can look at the balance of what we collect in the census and what we get from other sources’.

The Committee concluded that in evaluating the benefits of any future census all alternatives should be considered, such as relying on administrative records, conducting a rolling census, reverting to a simple headcount, or doing without a census altogether. They stress that any evaluation will also need to take account of the likely acceptability to the general public of drawing on other data sources, such as tax and benefit records, for census purposes.

### 3 Key themes

There are a number of themes that are common amongst these reviews. It is important to draw them out, as this will provide a good indication of the most important issues to consider when examining the way in which census data is produced. These key themes are:

*All alternatives need consideration.* Wroe advocates the use of multiple sources, and Redfern stresses that conventional collections should not be abandoned. The Treasury Select Committee asks for all alternatives, including radical options, to be considered.

*A population register will heavily influence the design.* Any move towards using administrative registers will be dependent on successful development and implementation of a population register.

*More use of administrative data* or multiple sources of information is seen to be an important way forward by all reviews and reviewers.

*Public acceptability* is the key to successful implementation of any alternative.