

Some Current Issues of Statistical Research Facing the Office of Population Censuses and Surveys, Great Britain

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Abstract: In recent years the Office of Population Censuses and Surveys has undergone a series of wide ranging changes affecting the way it conducts its business. These changes are continuing and give rise to new opportunities in the range of products and

services that the Office supplies.

Key words: OPCS; census; surveys; data management; population estimates and projections; longitudinal study.

1. Introduction

The Office of Population Censuses and Surveys (OPCS) has two broad functions, registration and statistics. The registration function is to administer the law as it applies to the registration of births, marriages, and deaths in England and Wales, a function which dates back to 1837 when civil registration first began in Great Britain. The Office also maintains the National Health Service Central Register (NHSCR) of all patients and their general medical practitioners, and records of various health related issues such as cancer, congenital malformations, infectious diseases, and abortions. The statistical function is to measure the number and condition of the population. It includes demographic statistics such as population estimates and projections, a range of social statistics, and epidemiological and other health related statis-

tics such as those related to episodes of hospital care. The primary sources of data for the population statistics work include the registration process; the periodic censuses of population; and social surveys covering a wide range of topics relating to the condition, circumstances, behaviour, and attitudes of the population.

Apart from social surveys, the Office's remit covers England and Wales. There are separate Offices in Scotland and Northern Ireland, but close links are maintained between the three Offices to harmonise practices whenever possible and to enable statistics to be produced for Great Britain and the United Kingdom. The social survey remit extends to cover Scotland as well as England and Wales.

OPCS was established in 1970 when the then General Register Office for England and Wales was merged with the then Government Social Survey Department.

Although part of the same Office, the various functions are required to operate

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according to different financial and administrative regimes. For example, some are customer funded (NHSCR, hospital episodes, social surveys) whereas the others are funded by government grant. Moreover, in carrying out its social survey function the Office is increasingly required to compete with private sector research agencies for public sector business using formal competitive tendering arrangements, whereas for some other activities it is in the position of a monopolistic, or near monopolistic, supplier. Many of the Office's functions are covered by statute and there is a compulsory aspect to the collection of some source data (e.g., registration of vital events, compliance with the population census). For others, such as social surveys, there is no legislation and informant participation is voluntary.

Towards the end of the 1980s the Office embarked on a series of wide reaching changes affecting the way it conducts its business and at the beginning of the 1990s the process of change is continuing. Many of the changes relate to organisational structure and procedure, but a number also give rise to new business opportunities and a growing appreciation of the importance of end user/customer needs. To this end the Office is currently developing, with the aid of outside consultants, a new information and marketing strategy and a business focus which will give more coherence to its organisational aims and objectives and to the range of products and services which it supplies. This article describes some current developments designed to enhance that range of products and services as they apply to the statistical outputs of the Office.

2. Data Management Strategy

In 1987, OPCS undertook a major review of its use of information technology. One result of the review was an explicit recog-

nition of the value of the range of data held by OPCS, as the raw material on which nearly all of its products are based. The review recognised the problems that were faced in making full use of the data. Generally, the data were seen as being held in an uncoordinated way. There were examples of data duplication, with various standards of processing and coding frameworks. The data were hard to access, with few on-line systems available. The systems in place were coping satisfactorily with regular processing; but new or ad hoc demands were more difficult, particularly if they involved combining or linking data in different ways.

The review recommended a data management strategy to address these problems. The strategy was based on the key ideas of

- common data standards,
- ownership and control of data usage by end users rather than technicians, and
- common tools for managing and analysing data.

The common tools were to be based on a fourth generation database management system, Model 204, that would facilitate full use of the data to be held in the database.

The adoption of the strategy has led to an extensive programme of work that will cover the period up to 1995. Within this programme, existing systems, and the reports and analyses that they produce, are being reviewed. The aim is to develop new systems that will ensure that OPCS can achieve its business goals as a provider of social statistics, manage its data effectively, and also maintain the confidentiality and security of the data. The new systems are being developed within an overall framework that includes

- a planned technical infrastructure of hardware, software, and communications;
- an overall model of the data held by OPCS;

- standard approaches to managing data;
- database design that incorporates the ability to share and link data across business units, and is flexible enough to respond to changes in information needs; and
- development of systems that provide direct on-line access to the data by end-users.

Progress is being made on this programme. The 1991 census is being successfully processed using the new database management software. Several smaller new systems – for processing data on divorces, notifications of abortions, and records of in-vitro fertilisations – have recently become operational. Major systems for processing birth and death registrations are planned to be operational from the beginning of 1993. A range of other systems will follow in the period up to 1995.

At the end of the programme, OPCS expects to have a well managed but flexible data resource that will allow it to respond to the ever growing demands for new and improved social statistics while retaining its reputation for attaching the highest priority to maintaining confidentiality.

3. 1991 Census: New Products

A programme of new census products has been launched which will embrace both enhancements of existing products and developments of new products. For example, agreement has been reached in principle that public use samples of extracts from unit records should be released from the 1991 census. These Samples of Anonymised Records (SARs) comprise a 2% sample of persons in households and communal establishments, and a 1% sample of households which includes all persons in each sample

household and the characteristics of the household as a whole. The data in each will be anonymous and subject to confidentiality measures so that the chance of disclosure of information about any person or household in the samples will be negligible. Geographical codes, for example, will be limited in the 2% sample to local authority areas with populations of 120,000 or more (smaller authorities will be amalgamated), and in the 1% sample (where data about people in combination increase the risk of identification) to standard statistical regions, the smallest of which consists of over two million persons. The SARs will give users considerable scope for preparing tables not otherwise issued or commissioned, and considerable scope for applying techniques of statistical analysis. The SARs will be held and disseminated from a centre specially set up by the Economic and Social Research Council – the funding body for research in universities.

Another new product from the 1991 census is a directory linking census geography for enumeration district with postcodes. A postcode is a combination of up to seven letters and numbers which defines groups of neighbouring addresses – in effect different levels of geographic codes, although there are no defined boundaries of postcode “areas” in England and Wales. It is part of the coding system created and used by the Post Office throughout the United Kingdom to facilitate the mail service. In 1991, for the first time in a British Census, the postcode of the address of enumeration was captured from all forms. In England and Wales, the postcodes cross the boundaries of census enumeration districts (EDs), which are the smallest geographical units for which census statistics are produced. The directory will link whole or part postcodes to the EDs, giving a count of households in each whole or part postcode. The directory will be

produced for general use, allowing non-census postcoded data to be assigned to EDs on a best fit basis. Many non-census data sets, for example in the National Health Service, use the postcode as the geographic identifier at the lowest level. The directory will enable their users to calculate rates on the same geography, using their statistics as numerators and the census statistics as the denominators. (The directory is not required in Scotland as postcode areas there have been mapped, and this has enabled EDs and output areas to be built up from whole postcode units.)

In addition a list of possible new value added products is being prepared with the help of various 1991 Census Advisory Groups (for central government, local authorities, the National Health Service, and academics). Needs, benefits, practical issues, costs, and offers to produce new products are all being reviewed before a formal programme is issued. The list of potential new products includes:

- summary statistics, indicators, and area classifications,
- articles and monographs,
- topic studies prepared in popular style,
- thematic maps,
- users' handbooks,
- guides to information and bibliographies,
- teaching material, and
- supporting material for presentations to seminars and conferences.

The list of possible media includes publications such as the OPCS in-house journal *Population Trends*, a special census value added products series, wallcharts, academic journals, and substantial books. Information may also be held on machine readable media and could consist of packages of data bases providing a range of output beyond the scope of printed publications.

Producers to be considered include the Offices in England and Wales or Scotland or Northern Ireland responsible for the censuses; other government departments; local and health authorities; academic researchers and university research units; learned societies; agencies marketing census statistics; and individual authors. The basis of the relationship between the Census Offices and producer could either be one of informal cooperation or else be a formal commission or agreement.

4. Population Estimates and Projection

One of the main purposes of the Census of Population is to provide a new base for population estimates and the population projections derived from them. Thus, over the next 12–18 months, work will continue to rebase the regular series of estimates and projections on the result of the 1991 census (adjusted as necessary for any deficiencies in coverage). Comparison of these re-based figures with those derived from the previous census in 1981 will provide a measure of the adequacy of present methods of producing population estimates. The comparisons to be made between the estimates carried forward from the 1981 census and the new estimates based on the 1991 census will be examined to see whether there are improvements that could be made in existing methods.

In parallel with this there has been a review of data sources used to estimate migration. On the basis of the recommendations of this review, a programme of improving estimates of migration has been prepared. This will be achieved partly by seeking to harness new data sources and partly by making improved use of the sources already employed. Work is also in hand to produce regular population estimates for smaller areas than hitherto (i.e., for electoral

wards as distinct from the complete local authority areas of which they form a part).

Plans are also being made to include population estimates and sub-national projections on the office wide database referred to earlier. This development should make it easier to associate population estimates and projections with the relevant statistics of vital events, and should also improve access to such data by a wide range of users.

5. The Longitudinal Study

Although not a new development as such, the OPCS Longitudinal Study (LS) (Craig 1990) is about to have 1991 census data added to the records of sample members. The Longitudinal Study started in 1971 and is an ongoing study based on the information provided at census and at registration (births, cancers, and deaths). It covers approximately 1% of the population of England and Wales (about 500,000): that is all those individuals born on one of four dates in each year. The sample is kept up to date by the addition of immigrants and new births and by the removal of emigrants and sample members who have died. For each sample member the LS includes, where available, information from the 1971 and 1981 censuses about individuals and their families and households, emigration from England and Wales, re-entry, birth of children and subsequent infant deaths (women members only), cancer registration, widow(er)hood, and death. Information from the 1991 census is being included in the sample. No information that is not routinely collected by OPCS is included.

Linkage of the full registration and census records within the LS is a complicated administrative process. It largely relies on name and date of birth to identify uniquely individuals, but checks are incorporated in the process to allow for inconsistencies that occur in these particulars. The linkage rates

achieved are generally good. For example about 91% of LS members in the 1971 census were either alive and found in the 1981 census (80%) or were known to have died (11%) or to have emigrated (1%). The remaining 40,000 could not be found – mainly because of inconsistent recording of dates of birth.

When the 1991 census data are available within the LS, it will contain linked data at three time points for a considerable proportion of the sample. (The passage of time also adds more of the other events and so further increases the longitudinal value.) All this will make more sophisticated analyses of the longitudinal elements of the data worthwhile, though subject as ever to the requirements of confidentiality.

6. Social Surveys

There are two particular developmental areas within the social survey activities of OPCS. The first is the start of three new major continuing survey enquiries. These are:

- A Family Resources Survey for the Department of Social Security. This is primarily a survey of personal incomes from an achieved sample of 25,000 households a year. Pilot work took place in spring 1992 and the main survey started in October 1992. A feature of this survey is that it uses computer assisted personal interviewing (CAPI).
- A Multi-purpose Housing Survey for the Department of the Environment. This will collect housing information from an achieved sample of 20,000 households a year and again will use CAPI interviewing. The start of the main stage is planned for spring 1993.
- A Health Survey for the Department of Health. This also started on a continuing basis in October 1992. The sample size is around 17,000 persons a year.

Together these three new surveys will extend the range of OPCS continuing surveys to nine. The others are: the Family Expenditure Survey (started in 1957); International Passenger Survey (1961); General Household Survey (1971); Labour Force Survey (1973); National Travel Survey (1988); and Omnibus Survey (1990).

This will mean that the size of the OPCS survey business, in real expenditure terms, will have increased by about 45% in four years. The other major expansion in business came from the enlargement of the Labour Force Survey to 60,000 households a quarter from March 1992.

The second main development in survey activity is the increasing use of computer assisted interviewing, especially CAPI. This was first used, in a full production sense, on the LFS from September 1990. It will be used on the new Family Resources and Multi-purpose Housing Surveys and trials are already in hand to use it for the Family Expenditure Survey. It is envisaged that, with further enhancement to the BLAISE software to handle more easily hierarchical data structures, this system will be used for most OPCS continuing surveys within about three to five years. The plan is that by the end of 1993 practically all OPCS face-to-face survey interviewers will be equipped

with lap-top computers and trained in CAPI interviewing. In this development the cooperation of the Netherlands Central Bureau of Statistics in the application of BLAISE is gratefully acknowledged.

7. Conclusions

OPCS has undergone, and is undergoing, considerable change in its response to customer needs and technological opportunities to extend and improve its services to meet those needs. In meeting the new challenges of the 1990s, however, it has reaffirmed its belief in the importance of maintaining its traditional values with regard to adherence to high technical standards, quality of the service, and integrity in its operations.

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