

Chapter 11 - Beyond 2011: future options for population data collection

An invited chapter from David Martin, Professor of Geography at the University of Southampton and Director of the Economic and Social Research Council's Census Programme.

Introduction

This year's Registrar General's annual review comes at a unique moment in the production of Scottish population statistics. The decennial census, the most important instrument for measuring the characteristics of Scotland's population, was conducted on 27 March 2011 and we are now waiting for census results to be generated and quality assured. In the meantime, National Records of Scotland (NRS) has commenced a programme of research and consultation entitled '[Beyond 2011](#)', examining possible alternatives to a 2021 census, addressing a very similar agenda to the similarly-named research programme of the Office for National Statistics in England and Wales. It is quite normal for national statistical organisations to follow each census with a period of evaluation and reflection on lessons learned, but at first glance it may seem somewhat premature to be considering options for gathering population data in 2021, especially as these include a variety of radical alternatives to a conventional census. However, the process of planning and implementing either a census or, particularly, a non-census alternative approach would be a very long one and international experience suggests that such a major change to the statistical system may indeed take several decades. This article briefly reviews why timely population data are so important and why alternatives to the census are currently receiving so much attention. It then considers in outline the range of alternatives being implemented internationally and reflects on possible futures for the statistical system. Being written from an academic (and English) perspective the writer enjoys the luxury of being able to present and comment on the principal options without any danger of pre-empting Scottish policy decisions which will be taken after thorough evaluation of the options in the period following publication of 2011 census results.

Census strengths and weaknesses

The population census is a unique and enormously rich data source which combines the key strengths of breadth and depth: extensive socio-economic detail is combined with small area geographical detail allowing an integrated series of data products to be generated. To take just one example, the census allows us to discover the numbers of elderly people living alone in privately owned properties – an item of information which at national and regional level is relevant to debates about the nature and funding of care in older age but which at the small area level can provide vital insights into the planning and delivery of health and care services. The census is a source of myriad such statistical counts which inform particular policy and business decisions as well as building up into a rich evidence base from which to develop a broader understanding of changing social and economic circumstances. Data products include counts of persons in places (e.g. elderly persons living alone, cited above), flows of persons between places (e.g. mode of journey to school) and anonymised microdata (i.e. complete records for households and individuals whose identity and location are unknown to the researcher). A chapter by Graham et al. (2011) in last year's Registrar General's annual report ably demonstrates the value of the census as a research resource. This power is achieved through the very high population

coverage rates which we expect from a census which permit the production of statistical tables for small areas while still protecting the identity of individual respondents.

Despite these great advantages, the census results are in some respects becoming less fit for purpose, while at the same time it is becoming increasingly difficult to conduct a successful census. We have already seen that one of the strengths of the census is its broad applicability, yet many users of census data are finding that the decadal timescale of data production does not meet their needs. By the time new census results are published, the best available data will be approaching twelve years old. This means that the most recent census data at the time of writing in June 2012 pre-date (for example) the accession of the A8 member states to the European Union in 2004, the global financial crisis of 2007 and changes of government – with all the consequent policy changes – in both Holyrood and Westminster. In those areas of greatest social change and redevelopment, our small area population characteristics may be very out of date. The structure of society itself is also changing, with more complex household structures and multiple places of residence of individuals (Baker, 2004) increasingly defying standard census definitions such as ‘household’ and ‘usual place of residence’. From international experience, we know that a variety of household characteristics are associated with census non-response (Carter, 2009). All this means that conducting a census is a complex, expensive and fundamentally risky venture which may be upset either by external factors such as the 2001 foot and mouth epidemic and 1991 protests over the poll tax, or by operational difficulties such as address listing and fieldwork failures in 2001 (Statistics Commission, 2007). Undertaking and evaluating the results of a modern census rely on use of administrative data sources to aid enumeration and to validate population counts. Examples include the use of an address register to plan the delivery of census forms and alternative sources such as the health service register and council tax lists as comparators for the counts of persons and households found by the census. There is understandably a growing demand for approaches which might deliver more timely data with lower cost and risk and which draw on the wide range of data already continuously collected about members of the population. In this context, the House of Commons Treasury Committee (2008) recommended that the 2011 census should be ‘the last census in the UK where the population is counted through the collection of census forms’.

Potential alternatives

Disquiet over the conventional census is not by any means limited to the UK. Internationally, it is possible to see a variety of alternatives being developed, with Valente (2010) describing the mixture of approaches employed within Europe in the 2010-11 round of population data collection. There is wide diversity of approaches being employed, but a helpful three-fold division is between: (a) continuation with a conventional census, (b) replacement of the census with an alternative system based primarily on administrative records or (c) hybrid models which involve some form of census enumeration coupled with increased use of non-census sources. We shall briefly consider these in turn, recognising that each country adopts a unique mixture of approaches and that in many countries long-term strategy is not firmly set, but is currently the subject of intense debate. The different national positions reflect remarkable differences in the public acceptability of alternative data collection models and ways in which these are reflected in national statistics legislation.

Certainly there are numerous countries that are continuing with conventional census programmes. Australia and Ireland are already well-advanced in their plans for censuses in 2016, following a five-yearly cycle. The reviews undertaken by these countries suggest that many of the pressures already identified, such as the challenge of achieving full coverage and need for a comprehensive address list, are certainly present but the five-yearly cycle improves data currency. The Irish Central Statistics Office (2012) set out a strategy which includes developing the future role of administrative data sources and making greater use of internet-based enumeration. Internet enumeration also features strongly in Australia's plans for 2016, recognising high census costs and coverage challenges as key issues. The planning of even a conventional census on a five-yearly cycle in the Australian system is an operation spread over seven years (Hillermann, 2011). Despite the challenges involved, these countries are pursuing a clear path to the continued use of a census as the principal tool for the next major round of population data collection.

The Scandinavian countries have adopted a very different strategy whereby the primary population data sources are administrative and therefore collected continuously (United Nations Economic Commission for Europe (UNECE), 2007). Essentially, the linkage of person, address and business registers provides a foundation for linkage of data about individuals, dwellings and workplaces allowing many of the key census-type variables to be reproduced. To return to our earlier example, it is possible to see how information about elderly persons living alone in privately owned property might be extracted by some combination of a health service register which recorded ages and a property tax register which recorded discounts for single person occupancy. The practical implementation of such a system is dependent on the presence of key linking fields such as a citizen number, health service number etc. and is most readily achieved in those countries where the same citizen number is used across all public services, ideally where there is a requirement for citizens to register their place of residence. Once established, a variety of alternatives exist as to whether the data sources are linked once only for the purpose of producing statistics or are routinely integrated. Population statistics may be extracted from these systems as required, for example the production of annual data. These approaches do not provide all the socio-economic detail provided by a full conventional census, nor do they resolve the many definitional issues, particularly concerning the composition of households and families. Greater socio-economic detail is typically provided by additional social surveys, albeit providing data at coarser geographical scales. International experience suggests that the use of linked administrative registers offers a viable route to cheaper and more frequent population statistics but is also not without risks – particularly those associated with lack of control of the source data by the national statistical organisation. Those countries using a register-based approach have had very long lead-in times to ensure that the available registers are compiled and made available in ways which make them fit for statistical purposes. Ralphs and Tutton (2011) note that the production of a reliable dwelling and housing unit register was a significant step required in Sweden's move to wholly register-based data collection in 2005 from its five-yearly census last held in 1990. They also observe that other countries have begun to adopt comparable register-based systems, including Austria, where a register-based census was implemented for the first time in 2011. Two decades does not seem an unreasonable estimate for a successful full transition from a census to an administrative solution.

France, the USA and Canada each offer various hybrids of the census and alternative methods. These countries have each taken unique steps away from conventional census

enumeration by combination of adapted census designs and ancillary data collection. Of these, the most radical has been France's transition to a rolling census model (Ralphs and Tutton, 2011) whereby a continuous programme of census enumeration has been initiated since the last conventional census in 1999. French communes are stratified and sampled each year on a rolling five-yearly cycle offering complete geographical coverage of small communes and around 40% coverage of large communes (population over 10,000) within each cycle. A composite statistical dataset can be produced which is based on data from the last five years – essentially a series of rolling averaged values. Another alternative design with a complex temporal component has been the move to a short form census and American Community Survey (ACS) in the United States (US Census Bureau, 2009). Until 2000, a short census form covering basic demographic and residence details was delivered to all households and a long form, covering many of the more detailed social and economic topics found in UK census questionnaires, was delivered only to 1/6th of households. From 2005 the ACS began to survey a stratified sample of addresses at the rate of 2.5% per year. The 2010 census employed a short form only, the ACS providing the equivalent to the traditional long-form information. As with the French model, the ACS permits data for different years to be pooled, allowing estimates to be produced for smaller geographical areas by combining multiple years of survey data. These continuous designs place new conceptual demands on users, who must have a sufficient understanding of the survey structure to be able to make appropriate use of the data in their own analyses. There are also considerable challenges in obtaining comparable data from the traditional census system and its successor. In France and the US, the first decade of the 2000s has thus been spent in undertaking a planned transition from a traditional census to new hybrid systems. Canada offers a rather different trajectory, whereby a conventional census using short and long forms was planned for 2011 but the long form content was redesigned in 2010 as a new voluntary National Household Survey (Statistics Canada, 2012). It is still too soon to assess the full implications, but with anticipated response rates of 50% compared to 94% for the compulsory long form, the experience serves witness to the very long timescales required for significant redesign of a national population statistics system without the potential for disruption to data availability and quality. Interested readers will readily find online extensive reporting and ongoing public discussion about the future of the ACS and decision to adopt the Canadian National Household Survey. These debates bring to the fore diverse and deeply-held positions regarding the social acceptability of supplying personal data to government and the rights and responsibilities of citizens.

Ways forward

It is tempting to read into the above account an inevitable transition from conventional censuses to alternative means of population data collection, albeit one that is operating at different speeds in different countries. The unique nature of each national context has been stressed and it is essential that each country determine its own solution, appropriate to its own particular circumstances but with regard to international practice. It does seem increasingly unlikely that unmodified census models will continue to simultaneously meet national information needs alongside political and social expectations of quality, cost and acceptability. Given the very long timescales required for well-managed change, we should now be seeking to foster the best possible informed public debate. In this context the reader will do well not only to reflect on the enormous value of the information contained in this Registrar General's annual review but also to eagerly await the 2011 census results and contribute to Scotland's developing Beyond 2011 agenda.

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