

New Census Methodology

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The Sampling Research Project of the German Register-Based Census 2011

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On 29 August 2006 the German Cabinet decided that the Census 2011 will be performed as a registerbased Census. In addition to the register data, a sample will be drawn. This will allow to estimate over- and undercounts of the local population register as well as to conduct additional variables not covered by register data.

In addition to the classical estimators, small area estimation methods will be considered. Within the first phase of the project, the small area GREG estimator as well as standard unit and area-level small area estimators were investigated. The estimators of interest are the EURAREA standard estimators (detailed information on these estimators can be found in Münnich et al., 2004).

The simulation environment is based on data of the DACSEIS project restricted to the Federal States of Saarland and Rheinland-Pfalz (see Münnich et al. 2003, or <http://rpm.dacseis.de>). In addition to information on individuals and households, which include employment status, regional indicators like districts, communities and addresses were synthetically added. Furthermore, based on the Census Test models for over- and undercounts, appropriate models were developed and implemented in the universe. The population of the first phase finally consists of NSAL = 1.057.915 and NRLP = 4.151.674 individuals and contains NOC overcounts and NUC undercounts (model-dependent).

A very simple sampling procedure serves as a baseline. In this sampling scheme, 550 addresses are selected in each community with more than 10,000 inhabitants. In communities with less than 10,000 inhabitants, 550 times the proportion of inhabitants in the community to the sum of inhabitants in the same district are selected. A set of more than 20 additional sampling procedures is defined and tested under the restriction of cost neutrality. Among these are variants of systematic sampling, stratified sampling, balanced sampling and others. As expected, the performance of the small area estimators is much better than that of the classical estimators when considering variance (Särndal et al., 1992). However, the bias of the synthetic estimators is not negligible in some communities. Due to the fact that the register variable of the population register is used, the results of the estimation of the number of persons yields much better results for all estimators than in the case of estimating the number of unemployed. Hence, the necessity of an adequate model for applying small area estimation methods seems evident. Furthermore, solely applying the relative RMSE as a measure of precision may be insufficient when considering the financial equalisation scheme between the Federal Government and the Federal States which requires true disparity of communities to be estimated properly.

Neither classical nor small area-based methods will be the first choice per se. Rather the Census sampling project will provide guidelines which help to choose among these methods. These guidelines can, then, help to plan and conduct an

optimal sample for the Census 2011 under very narrowly defined restrictions of cost and precision.

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References

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Coverage Assessment and Adjustment in the 2011 UK Census

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It is traditional that census coverage is measured and the outcome disseminated to users. Most census taking countries undertake this, usually using some form of post-enumeration survey (PES) to estimate the extent of the missing population. For the 2001 UK Census, the Office for National Statistics (ONS) undertook the One Number Census (ONC) project which aimed to not only measure the undercount, but to also provide a fully adjusted set of census outputs – thereby increasing the quality of the output. The key to this was a large, focused survey, specifically designed to measure census coverage. For the 2011 Census the strategy is to significantly improve upon the success of the ONC, and use it as a platform to develop improved coverage measurement and adjustment. This paper outlines the proposed methodology for measuring coverage in the 2011 Census. This includes the survey design, the use of dual system estimation, small area estimation, measurement of overcoverage, the production of a fully adjusted census database and the provision of quality indicators.

CENSUS * UNDERCOUNT * POST-
ENUMERATION SURVEY

Innovations on Methods and Survey Process for the 2011 Italian Population Census

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The 2001 Italian census evaluation program showed satisfactory accuracy and adequate timeliness for data dissemination purposes. Instead, organizational difficulties met by the municipalities during the field work were highlighted, in connection with the great differences among the Italian municipalities both in terms of their populations and their work efficiency.

Taken also into account the time restrictions that the Eurostat regulation is introducing for the census dissemination results, the main goal of the next Italian census round is to simplify the municipalities activity by two major innovations:

- ▶ a smaller workload on the field so as to decrease the number of enumerators;
- ▶ a greater use of administrative data in supporting the data collection phase.

These key points affect the planning of census methods and process workflow,

with important effects on quality issue. As an example, a workload reduction for municipalities is being obtained through a mail out of census forms, with a mixed mode of data collection based on mail and web. A final recover of non respondents will finally be performed by enumerators in order to identify those who actually are not resident on the field.

This approach requires a simplified census form for both increasing the response rates and reducing as much as possible the response time delay. As a consequence, an approach involving a long form to be sent to a sample and a short form sent to the rest of population has been considered in order to preserve the richness of the census information. This approach results in the need to control and evaluate sampling variances. On the other hand an increase of response accuracy could also be expected from both the simplification of the short form and a better review and follow up activities that municipalities can carry out on fewer long forms.

Names and addresses of people and households to be sent either a short or a long form will be taken from municipal administrative register of residents, which imply dealing with a number of new quality challenges. An extensive use of record linkage techniques will be needed in order to assure the purge of duplicates and non eligible units from the survey. As a consequence, the issue of privacy become prominent as far as the need of an extensive use of personal identification variables such names and surnames is concerned. In this context, over and undercoverage errors in registers are the main quality issues to be considered. Overcoverage errors can be detected by enumerators during the data collection through a field search for not eligible units. To measure the extent of undercoverage errors a different survey has to be carried out either by a complete search for the missed units on the field or by a sample survey based on capture recapture approach.

A description of the next Italian census design and its relationship with the various quality topics is described in this paper. Special emphasis is given to modeling issues such as small area estimation and undercount detection.