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**Beyond the 2010 census round: Plans for the 2020 round**

### **Beyond the 2010 census round: plans for the 2020 round**

**Note by the National Institute of Statistics, Italy**

*Summary*

This document presents the perspective for the population and housing census in Italy in 2011 and beyond. For the 2011 Italian population and housing census, important innovations in the survey process are planned, which will characterize the census as a registers supported census. After 2011, Italy may consider moving to a multiple time point register based census.

1. The Bureau of the Conference of European Statisticians (CES), at its meeting held in Washington, D.C. (United States) on 19-20 October 2006, approved the renewed terms of reference for the Steering Group on Population and Housing Censuses and the plan for future CES activities on population and housing censuses. The CES Bureau also agreed that the Steering Group would coordinate the work on the diverse types of meetings.

2. The present document was prepared on request by the Steering Group on Population and Housing Censuses, for presentation and discussion at the Thirteenth Meeting of the Group of Experts on Population and Housing Censuses, in Geneva on 7-9 July 2010.

## I. Introduction

3. A census is, in the common perception and by definition, the count of the population. Counting (or benchmark) should include every person residing in the territory of a country and in its smallest geographical sub-territories. However, if counting continues to be the main scope of a census, more and more importance has been gained by the collection of information on a selected number of demographic, social and economic characteristics of the total population with good geographic detail.<sup>1</sup>

4. The need for a more timely and frequent availability of census data and the need to reduce temporal concentration of too many actions presses censuses to change. In a conventional census, especially the offices of the larger-sized municipalities have to face, in a relatively short period, a huge increase in recruiting human resources, enumerators and additional staff, to be trained and employed in census fieldwork and highly suffers the resulting operative burden. The burden on respondents also increase the risk of operative inefficiencies and deterioration of quality.

5. Mr. Leslie Kish<sup>2</sup> argued that: 'Providing spatially detailed annual statistics for a variety of economic and social variables, not a mere population count of persons, would be the chief aim of rolling samples in many countries.' Following this suggestion in the last decade the United States Census Bureau launched the American Community Survey (ACS), a rolling survey which replaced census long forms. Also France adopted rolling census, even if with a very different strategy. The main advantage of a rolling survey is to permit gains in the efficiency of the estimates by cumulating data over time. These gains can be spent to get cyclically good estimates for predefined levels of geographic detail.

6. A possible answer to face the challenges is therefore to move from a single time point census (STP), a census with a complete enumeration carried out in a single time point, usually every 10 years, towards a multiple time point census (MTP). A MTP census splits data collection in several parts, each associated to a different time points (i.e. years): data are collected covering the whole country over a period of time by a continuous cumulative survey which involves in turn subsets of municipalities and subsets of submunicipal areas or subsets of addresses.

7. But towards which MTP census we have to move? There is not a unique answer to this question, it strongly depends on the context of each country. In this paper, starting from the state of the Italian population registers and from the required interaction of Italian registers with censuses, we try to identify which would be the most appropriate solution applicable to the Italian context.

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<sup>1</sup> UNECE, Recommendations for the 2010 Censuses of Population and Housing

[http://www.unece.org/stats/publications/CES\\_2010\\_Census\\_Recommendations\\_English.pdf](http://www.unece.org/stats/publications/CES_2010_Census_Recommendations_English.pdf)

<sup>2</sup> Kish, L. (1999), "Combining/Cumulating Population Surveys", *Survey Methodology*, 25, pp. 129-138.

## II. The interaction of Italian census with population registers

8. According to Regolamento Anagrafico<sup>3</sup>, each municipality in Italy has to manage a local population register called *anagrafe*. Each person usually resident inside municipality has to be recorded in *anagrafe*, together with the related information on the household membership and on the address of usual residence. Moreover, every life event as birth, marriage, and every migration event either internal to municipality or from/to other municipalities or from/to abroad has to be recorded in *anagrafi*.

9. *Anagrafi* have also the task to maintain: a) the boundaries and codes of census mapping units (enumeration areas and localities) in the latest version validated by the National Institute of Statistics; b) a list of address numbers. It is worthwhile to remark that, among the municipalities, there is an high variability in the contents, format and quality of systems in which addresses data are stored.

10. Till 2001 the Italian Population and Housing Census was carried out in a conventional way, by a complete field data collection not making any explicit use of information available in *anagrafi*. By law, after census conclusion data have to be used in an administrative check to reconcile local population registers with census results. Current demographic statistics uses events recorded in *anagrafi* to get yearly population update in intercensal years statistics starting from census population.

## III. Innovations for the 2011 Italian census round

11. The 2011 Italian population and housing census will maintain the features of a STP census, but relevant innovations in the survey process will deeply change it and will characterize it as a registers supported census. The significance of the change is evident if we look at the quality and quantity of innovations introduced:

- (a) Acquisition of municipality list of households and addresses (LAC) from *anagrafi*;
- (b) Mail out of questionnaires to all households in the LAC;
- (c) Multichannel collection of the “automatic response” (web, mail back, municipal office of collection);
- (d) Recovery of non-response and under-coverage by enumerators;
- (e) Crucial role of a web survey management system (SGR).

Even more incisive the changes introduced in municipalities with a population of at least 20.000 inhabitants<sup>4</sup>:

- (f) Carrying out of a precensal survey (RNC) aimed at producing a field-checked geocoded lists of addresses and related number of housing units in each address;
- (g) Delineation of census areas of 15.000 inhabitants;
- (h) Collection of socio economic data by long form only from a sample of households.

<sup>3</sup> The Italian law on population registers. (D.P.R. n.223 del 30 maggio 1989), Istat, Metodi e Norme serie B – n.29 1992.

<sup>4</sup> Including municipalities which are capital of provinces even if with fewer than 20.000 inhabitants.

12. These innovations are designed to reduce, already in this round and as possible, most of the problems of a conventional census, as the operative burden of large municipalities, and the burden on respondents. But in the incoming years many further evolutions are expected and the choices made for this round, strictly related to the current context, cannot be regarded as choices necessarily suitable also for the following rounds. Firstly, without losing the opportunity given by the census to control the quality of the local administrative sources, conditions for a more effective use of administrative data to census purposes can be created. Secondly, the need, already greatly grown, to have more frequently socio economic data which are traditionally provided on decennial bases could become more pressing.

13. Defining the census mapping is a crucial pre-enumeration work having big consequences on census management and enumerators fieldwork<sup>5</sup>. Main objective of this work are: to define lists of territorial units included in the census geographic hierarchy, to delineate their borders, to define the coding schemes, to code each unit. Usually the census geographic hierarchy includes three level: 1) Administrative borders (Country, Regions, Provinces, Municipalities); Localities (Morphological Areas); 3) Enumeration Areas (EAs)<sup>6</sup>. The EAs are designed to allow easy identification of areas assigned to each enumerator and to reduce the risk of double counting. Natural boundaries for EAs are streets, railway lines, hydrological features such as rivers and lakes.

14. The delineation of Census Areas (CA)<sup>7</sup> in the larger sized municipalities is one of the greatest innovations for the 2011 round. CA are new units in the hierarchy between the localities of the municipality and the EAs, delineated in partnership with municipalities offices<sup>8</sup>. CA are built with the purpose to be employed as reference output areas for sample estimates of variables collected only by long forms.

15. The innovations designed for 2011 are sufficient to achieve a stable and enduring balance between costs and benefits of a census? The answer is no, because costs remain high and too concentrated in time and the use of administrative data remains below the potential use offered by the Italian context. Census data continues to become old quickly, and the supply of highly detailed geographic data remains limited to rare occasions.

16. 2011 choices represent a good trade-off between immediate applicability and best preparation of the transition towards a more stable equilibrium. In the next section we investigate on which further developments may be pursued after 2011 and on what should be the pillars of the census after 2011.

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<sup>5</sup> United Nations (2000) Handbook on geographic information systems and digital mapping. United Nations Publication, ST/ESA/STAT/SER.f/79. Printed in United Nations, New York, 2000.  
United Nations (2008) Handbook on geographic databases and census mapping United Nations Expert Group Meeting on Measuring the Economically Active Population in Censuses 7-10 April 2008, New York  
[http://unstats.un.org/unsd/demographic/meetings/egm/CensusMapping\\_Handbook\\_EGM08/docs/Handbook\\_draft.pdf](http://unstats.un.org/unsd/demographic/meetings/egm/CensusMapping_Handbook_EGM08/docs/Handbook_draft.pdf)

<sup>6</sup> EAs (Sezioni di censimento)

<sup>7</sup> Bianchi G., Di Pede F. et al. (2007) Processi per la definizione di aree di censimento sub comunali da utilizzare per il Censimento della popolazione e delle abitazioni del 2011, Paper submitted to the XXVIII Conferenza Italiana di Scienze Regionali, Bozen, 2007.

<sup>8</sup> The CA target population is 15.000 inhabitants and will be as possible compatible with areas defined at municipality level as wards, functional zones, etc.

#### **IV. Possible pillars for the transition of Italy toward a MTP census after 2011**

17. Also in the Italian context, as in the US and France, it will be possible to relax the STP requirements. The idea is to move towards a MTP, register based, census which uses the waves of two sample surveys (the C-sample and the D-sample survey) in crucial stages of a continuous process designed to achieve separately the two main goals of census operations:

- (a) Counting usual residents and producing key data on demographic structure of population and households;
- (b) Producing hypercubes of socio economic census data.

18. The two surveys are very different for scope and requirements: the C-sample survey would be specifically designed to make usable enumeration and the key structural data contained in registers; the D-sample survey would be designed to estimate hypercubes of socio economic data of households and individuals to be released at national and European level.

19. Good maintenance of geo-databases (census mapping including census areas, geocoded lists of streets and addresses) should be ensured to support the new census strategy. The first implementation of a geocoded list of street and addresses, which in the 2011 round will be confined to municipalities of at least 20.000 inhabitants, should be quickly extended to all municipalities. Street list and addresses list should be continuously kept updated in accordance with national standards together with the geocoding to enumeration areas by address matching. The vigilance action should be extended to guarantee a good keeping of this list.

20. Another crucial prerequisite is that Istat and Ministry of Interior launch a joint effort to develop a more compelling vigilance system of *anagrafi*, on the basis of what already required by *Regolamento Anagrafico*, but using new methods to be applied continuously. Signals should come from an ad hoc screening system of quality and good keeping of population and households registers.

21. Continuous operations would bring significant growth of fieldwork efficiency and many benefits in terms of increased quality. A local permanent fieldwork would allow expertise to be retained and developed over time. A smaller but continuous operation would allow continual methodological improvement and gains in experience. Positive are also the effects on financing; in fact the demand of public financial resources will be diluted over time and continuous operations might make service contracts more attractive and possibly cheaper than is possible in a "one shot" operation. The constant production of data would allow much more significant and approachable dealings with users.

#### **V. Counting and production of key data on demographic structure: the C-sample survey**

22. The objective of producing a good counting and good key data on demographic structure of population and households can be pursued through a C-sample survey, a area sample survey explicitly designed to measure under and over coverage of LAC of each municipality, and provide correction factors. Estimates will be produced employing the dual system (capture-recapture) method.

23. The C-sample survey will have to provide a complete repetition of the counting by an exhaustive field collection of short forms in selected enumeration areas or lists of

addresses. The survey has to be kept strictly independent by any administrative activities and carried out by a non municipal fieldforce. Good maintenance of geocoded lists is crucial, because households residing in addresses of each enumeration area selected have to be correctly extracted from LAC and correctly linked to the households found in C-sample survey. The C-sample survey will be designed to give good municipal (LAU2) and sub municipal (census areas) estimates every 5 years (first occasion 2016). A special wave of the C-sample survey will produce the *de jure* population in the census year (first occasion 2021).

24. Current demographic statistics could benefit of more restarting point after each correction produced by a C-sample wave, using events recorded in *anagrafi* to get yearly population update in the following years.

25. Any wave of the C-sample survey will produce, at least for the sampled municipalities, signals to drive vigilance action to be cumulated in an *ad hoc* screening system of good keeping of registers. After some waves and a good vigilance action it should be possible to have continuous access to good data directly from *anagrafi* and counting of usually resident population and households, demographic structure of population may become progressively a fully register based enumeration, following a rigorous road map.

## VI. Hypercubes of socio economic data: the D-sample survey

26. The aim of the D-sample survey is analogous to the aim of US American Community Survey, where a rolling sample survey was designed to replace census long forms. The gain in efficiency of estimates obtained by cumulating data over time will make possible to predefine to get cyclically good estimates for different level of geographical detail.

27. The socio economic data would be collected by long forms. The rolling D-sample survey would be designed to give good yearly estimates at regional (NUTS2) and provincial (NUTS3) level (first occasion 2017), and good municipal (LAU2) and submunicipal (Census Areas) estimates every 5 years (first occasion 2021). The D-sample survey will work conditionally by the counting which will be taken as given. Counting and key data on demographic structure of population and households will be obtained by registers corrected by the waves of the C-sample survey.

28. The two stage sample will have the municipalities as first stage unit, and the enumeration areas or addresses as second stage unit. The municipalities with less than 20.000 inhabitants will be not auto-representative and will be splitted in 5 groups to be surveyed in 5 yearly waves. The 509 municipalities with at least 20.000 inhabitants will be auto-representative, in this case will be the Census Area to be splitted in 5 groups each to be assigned to one group. The first wave will be in 2017. Each wave will survey about 600.000-900.000 Italian households (an alternative option is to concentrate the data collection in only two waves to be held in 2017 and 2021 each covering about 1.500.000-2.200.000 households). The sample estimates would be subject to predefined sampling errors associated to each cell of the output tables to be produced.

29. Also for the D-sample survey, households residing in addresses of each enumeration area selected have to be correctly extracted from LAC (and hence also in this case a good maintenance of geocoded lists is crucial). In fact after having extracted and listed all households to be surveyed it will be possible to exploit some of the options adopted for the 2011 round with the purpose to reduce the operative burden:

- (a) Mail out questionnaires;

- (b) Collect the “automatic response” in a multichannel way (web, mail back, municipal office of collection);
  - (c) Recover non-response by enumerators;
  - (d) Employ a web survey management system (SGR) of the same kind of the one adopted in 2011 census.
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