



## **Preparing for the 2020 round of international censuses of population and housing: reflecting socio-demographic, technological and methodological developments**

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### **Abstract**

Despite the increasing availability of a variety of data sources that are potentially accessible to national statistical institutes (NSIs), censuses of population and housing continue to play an essential role in the development both of policy and management of public administration by national governments, and in all elements of national statistical systems. In many countries the census is the only reliable source of multivariate statistical information for small areas and small population groups. As part of the UN's World Census Programme for the next decennial period 2015-2024, both the United Nations Statistical Division (UNSD) in New York, and the United Nations Economic Commission for Europe (UNECE) in Geneva have revised their respective sets of principles and recommendations for conducting the next round of censuses of population and housing. This paper notes the development of these revisions and particularly those issues and topics where consideration has been given to changes to demographic and socio-economic conditions since the 2010 round of censuses. Technological developments and solutions are discussed against the background of continuing moves to outsource elements of the census operation to agencies with more specialised technical expertise.

Keywords: population census, principles and recommendations, outsourcing

### **1. Introduction**

The population and housing census represents one of the pillars for data collection on the number and characteristics of the population of a country, and should form a central part of an integrated national statistical system. It provides, at regular intervals, the benchmark for the country's population estimates programme. For small geographical areas or sub-populations it may represent the only source of information on certain social, demographic and economic characteristics. For many countries the census also provides a unique source from which to develop sampling frames. The particular objectives of a census are, however, specific to individual countries and may differ according to the local circumstances. Its unique role depends on the demand for statistics existing in a country and by the content and structure of its existing statistical system.

As part of the UN's World Census Programme for the next decennial period 2015-2024, both the United Nations Statistical Division (UNSD) in New York, and the United Nations Economic Commission for Europe (UNECE) in Geneva have revised and updated their respective sets of principles and recommendations for conducting the next round of censuses of population and housing. This paper highlights a number of those issues and topics where the new recommendations reflect changes to demographic and socio-economic conditions since the 2010 round of international censuses. The particular focus is on the UNECE's recommendations which were endorsed by the Conference of European Statisticians in June 2015.

### **2. Purpose of the Conference of European Statisticians (CES) Recommendations**

The main objectives of the *CES Recommendations for the 2020 Round of Population and Housing Censuses*<sup>1</sup> are to provide guidance and assistance to countries in the planning and execution of their population and housing censuses, and to facilitate and improve the comparability of census at the UN regional level through the identification of a core set of census topics and the harmonization of concepts, definitions and classifications. The Recommendations are also expected to be used as the



general framework for the European Union programme for the 2021 round of population and housing censuses from which data are to be provided to Eurostat by EU member states under the provisions of Regulation (EC) 763/2008<sup>2</sup>.

### **3. Evolving concepts in some census topics**

#### ***The population base***

The ‘*population base*’ is the population used for the compilation of statistical aggregates in a particular tabulation. This may be a sub-set, or the whole, of the population actually enumerated in a census. A country may, of course, adopt more than one population base (for different statistical purposes), but one of these should always be the population base used for international comparisons purposes - the *usually resident* population (sometimes referred to as the *de jure* population), defined as those persons who have their place of usual residence in the country at the time of the census and who have lived, or intend to live, there for a continuous period of time of at least 12 months. However, the previously well-established concept of ‘usual residence’ is, in many countries, becoming increasingly more difficult to define, as a result of the growing tendency towards weekly commuting and the acquisition of second homes, children living alternatively with divorced or separated parents, and global living patterns, as well as the move towards the use of different administrative registers as data sources (see Valente<sup>3</sup>).

Consequently the CES Recommendations sets out specific guidance on those criteria that determine whether or not people should be counted as usually resident, and also identifies particular population sub-groups for whom it is recognised that there may arise some uncertainty about their inclusion in the usually resident population base. These include: persons to whom the concept of usual residence does not readily apply (such as nomads and the homeless); persons who regularly live in more than one country during a year; absent household members; students studying abroad; national military, naval and diplomatic personnel and their families; foreign persons working within the country for international corporations; merchant seamen and fishermen; short-term, illegal, or undocumented migrants and asylum seekers; and children born in the twelve months before the census.

Alternatively countries may prefer to conduct their censuses on a *de facto* basis, that is to count people where they were actually present on the night of the census regardless of where they consider themselves to be usually resident. This is, in some ways, a less ambiguous concept, but can lead to coverage inconsistencies where the enumeration is carried out over an extended period after census night, and, of course, requires, additionally, the collection of specific information on place of usual residence.

#### ***Geographic characteristics***

One of the distinguishing features of a census is the extent to which a comprehensive classification of geographic characteristics can be undertaken. Once the population base has been determined it is then possible to examine how this population is geographically located.

In addition to the usual geographical identifiers that are widely recognised in most censuses – location of place of residence (at various levels of administrative geography), urban and rural characteristic (based on whatever definition is nationally adopted), and location of workplace and place of education – countries in the UNECE region, and particularly those in the European Union, are being encouraged in the 2020 recommendations to use 1 km grid squares as a common basis for a small area geography. If adopted each grid cell would contain the aggregated number of persons for whom the location of place of usual residence is geo-referenced to a point located within the grid cell. But in addition to assigning usual residents to a location in this way, the same grid can be used to assign people to their place of work or location of school, college or university. The same grid net could also be used for assigning households, families and dwellings. A grid of cells of 1km<sup>2</sup> is encouraged to ensure cross-

border interoperability, but in order to meet national requirements countries may wish to create other grid cell sizes in addition.

Census statistics are traditionally reported on administrative areas or specifically-created census output areas. Population grids provide very useful complementary output systems offering several advantages. Grid cells are all of the same size, making them perfect for area- or distance-based comparisons. Grids are stable over time and hence independent of changes in the boundaries of civil divisions. Furthermore, grids may integrate more easily with other data (such as climate data and energy usage) obtained from other sources. Moreover, in a census context it is important to notice that grids are very powerful for spatial analysis in an international and cross-border context as they are not affected by variation in municipality size between countries. However, grid statistics may give rise to concerns over confidentiality in thinly populated areas. Therefore the topics for which grid statistics are to be produced should be carefully selected, and the choice should always represent a compromise between the demand for detailed and flexible statistics and data protection concerns.

### **Migration**

There are two different aspects relevant to migration that can be identified through the census:

- (a). the measurement of stocks and in-flows (and characteristics) of *international migrants* together with information on the timing and geographical patterns of their international migrations; and
- (b). the collection of corresponding information relating to *internal migrants* and the patterns of internal migration flows within a prescribed period.

However, migratory movements, both international and internal, are generally increasing in both complexity and volume. Particularly in the case of international migration, the measurement of the stocks and flows of migrants may need to take account of multiple movements between the countries of origin and destination, or of circular movements involving more than one foreign country. But, because of its longitudinal nature, collecting comprehensive information on migration in a census at any one point in time is often difficult. Thus the 2020 recommendations continue to focus only on a limited number of specific relevant topics with the aim of distinguishing the characteristics of the foreign-born population from the native born. These include (among others):

*Country of birth*, defined as the country in which the place of birth of a person is located, being either to the country where the physical birth occurred or to the country in which the mother was usually resident at the time of the birth if this is different. However, as an indicator of internal migration *place of birth* provides a better measure of ever-migrants.

In order to measure trends in international migration and duration of residence, information on *year of most recent arrival* in the country should be collected for all those people who have ever resided abroad, regardless of their country of birth or citizenship and of any other changes of usual residence that may have occurred within the country since arrival. Information collected on *country of previous usual residence* enables origin-destination flows to be produced for international migrants. Comparable data on internal migration can be derived from information collected on *place of previous usual residence* within the country and *date of arrival* at the place of usual residence at the time of the census. However, rather than collecting information on precise date of arrival, countries may instead prefer to enquire into place of usual residence at a specific date before the census (usually one year).

In recognition of the fact that international migration is, for many people, no longer a one-off event, and that such people may move regularly between two or more countries, the UNECE recommends that information may be collected on the *total duration of residence* in the country of residence, though it is recognised that this will provide no clear information on the patterns of movement or on the separate periods of residency. However, further light on the type of migration undertaken (whether

international or internal) can be derived from information collected on the *reason for the migration*. If so, it is recommended that, in particular, moves associated with employment, education and training, marriage and other family-related activities, housing, and humanitarian or political reasons should be separately identified.

### ***De facto marital status***

In order to investigate household and family composition structures, censuses usually collect information on *legal* marital status (that is, whether a person is single (never married), married, widowed or divorced). However, the increasing trend in many countries for unmarried couples to live together has led to equal emphasis being given in the 2020 recommendations to the collection information on *de facto* marital status – defined as the status of each individual in terms of his or her actual living arrangements within the household being enumerated regardless of that person’s legal marital status. Persons living with a spouse or partner (whether that partnership is formally registered or is a consensual union) should thus be distinguished from those persons not living in such an arrangement.

### ***Economic characteristics***

Statistics on the economic characteristics of persons are needed from population censuses for many reasons. Information on the productive activities of persons is vital to establish a comprehensive picture of the economic structure of a country, and the work patterns, labour market participation, and extent of labour underutilization of its population. This information, when combined with other personal, household and dwelling characteristics collected in the census, enable assessments of the socio-economic situation of persons and households, which are essential to inform the formulation and planning of a wide range of economic and social policies. It is important however, that statistics on economic characteristics derived from a decennial census should be internationally consistent with those that are more frequently produced from other sources such as Labour Force Surveys. To this end the 2020 recommendations on this topic were significantly redrafted in order to be compliant with the international resolutions and guidelines adopted by the 19<sup>th</sup> International Conference of Labour Statisticians (ICLS)<sup>4</sup> that replaced the previous international recommendations relating to the measurement of the economically active population, employment, unemployment and underemployment dating from 1982.

Many of the fundamental principles underlying the new ICLS resolution are unchanged, but in order to provide a consistent conceptual framework there are changes in some definitions and terminology that will have an impact on the way information on economic characteristics should be collected in the 2020 round of censuses. It is not the within the scope of this paper to describe these in any detail, but readers should note a number key changes to the CES recommendations. These include a more targeted definition of ‘*employment*’ as ‘*work for pay or profit*’, and expanding the range of measures of labour underutilization beyond the traditional unemployment. Previous terminology that is now considered to be out-of-date has been replaced, in particular the ‘*economically active/inactive population*’ is now referred to as ‘*labour force/outside the labour force*’.

## **4. Technological innovations and outsourcing**

Census programmes in many countries have been fertile grounds for the introduction of innovations, and the use of technology has often been the principal enabler of such innovations. In contemplating the numerous challenges facing the taking of a census NSIs should consider how technological innovations can be applied to any steps of their process to increase efficiencies, improve quality, and possibly reduce costs. The 2020 recommendations focus on some of the developing technologies that can be used in the collection and processing of census data. These include, in particular, the adoption of the Internet as the medium for online data collection complementing, or even replacing, the

traditional paper questionnaire, and the use of geographic information systems for mapping both the enumeration areas and output geographies.

But whatever technologies are used in the various stages of the census operation, the increasing complexity of much of the necessary software and infrastructure required for many of the new and emerging technologies may go beyond the current technical capabilities of many census agencies to manage. It is likely, therefore, that some countries will want to consider whether or not significant components of any technical solutions to the census operation (but also some non-technical activities like large scale recruitment of field staff and the delivery of a publicity campaign) could be outsourced. The value of doing so is that external suppliers bring with them considerable technical experience and expertise which would otherwise be unavailable to census takers, and allows NSIs to focus on their main task of carrying out the census rather than developing in-house procedures and skills that are not part of their core competencies. Furthermore, outsourcing can provide the opportunity for increasing efficiencies and providing better value for money.

#### **Developments in methodological approaches to data collection**

A summary of the changes in the methodological approaches being adopted by some countries in carrying out their census enumerations is given by Valente in an accompanying paper<sup>3</sup>. Here it will be sufficient just to note that there are three basic approaches to conducting a census, based on the method of data collection:

- (a). The traditional method of full enumeration (whether or not supported by registers as frame or control only) based (generally) on a field operation at a given moment, with an exhaustive collection of either all characteristics, or of some basic characteristics with a collection of other characteristics on a sample basis (long form/short form). This approach also includes alternative enumeration methods applied specifically in two countries with long-standing census traditions:
  - a traditional (short form) enumeration with annual updates of characteristics on a sample basis (United States), and
  - a rolling census where information is collected by a continuous cumulative survey covering the whole country over an extended period of time (years) rather than on a particular day or short period of enumeration (France);
- (b). A method of using registers and/or other administrative sources (either exclusively or supported by data from existing sample surveys for selected variables); and
- (c). A ‘combined’ approach with data collected from either a full field enumeration or from sample field data for some variables, supported by, and linked to, data on other variables taken from registers.

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