

Regional Training on Using Population Census Data for Planning
and Decision Making; *Thematic Analysis on Youth*
22 July – 6 September 2013

e-learning module: Basic statistical background
22 July – 2 August 2013

**Census of population and housing: *objectives,
contents and data outputs***

Reading materials

Reference:

United Nations manual on

[Principles and Recommendations for Population and Housing Censuses](#)

Complementary readings:

[Virtual Statistical System: World Bank e-learning on quality of Censuses](#)

[ECE: Recommendations for the 2010 Censuses](#)

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The most important capital a society can have is human capital. Assessing the quantity and quality of this capital at small area, regional and national levels is an essential component of modern government. Some nations are capable of generating this numerical profile for small areas from administrative records or through a combination of data sources. The vast majority of countries, however, produce these data on population and housing by conducting a traditional census, which in principle entails canvassing the entire country, reaching every single household and collecting information on all individuals within a brief stipulated period. This lesson is on the roles, uses, basic operational aspects and topics covered in a traditional population and housing census (PHC).

Objective and essential uses of census

Generating relevant, accurate and timely statistics is essential for informed decision making.



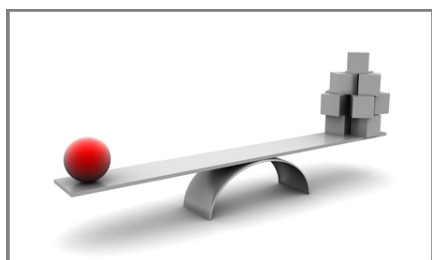
The main objective of PHC is to “*collect, process and disseminate such detailed statistics on population, its composition, characteristics, spatial distribution and organization (families and households) in small areas and small population groups*”.

While the roles of the population and housing census are many, several of the essential roles are listed below:



Legislated uses:

- In many countries, census data underpins the redrawing of electoral boundaries (or other administrative regions), and is enshrined in the country’s constitution and provides a legal basis for the running of the census.
- Distribution of the country’s population is used to assign the number of elected officials who will represent them in Government.



National Statistical Office (NSO) uses:

- Today, the national statistical system of almost every country relies on sample surveys for efficient and reliable data collection. Without the **sampling frame** derived from the PHC, the national statistical system would face difficulties in providing reliable official statistics for use by the Government and the general public.
- Census is a benchmark for research, analysis, and production of other statistics as well as intercensal population estimates which allows for a wide range of per

capita measures. It also provides population projections and adjustment factors for survey weights/estimates.

- The basic feature of the census is to generate statistics on small areas and small population groups with no or minimum sampling errors. While small area statistics from census play very important role in decision making, they can only be produced in one in ten or minimum five years period. During intercensal period, census micro-data may be combined with data from other surveys to produce more reliable statistics in small areas.



Uses for Government planning and administration:

- The PHC plays an essential role in public administration. The census data will help government planners in:
 - o Identifying the need for government action and the extent and location of the need
 - o Informing planning process
 - o Reviewing effect of ongoing or new policy or programme
 - o Risk/emergency management planning
 - o Budget distribution planning, and ensuring equity in distribution of wealth and government services.
- While the census statistics on the small areas are useful in their own right, they are important for public administration because they can be used to produce statistics on any geographical unit with arbitrary boundaries which may not necessarily be equal to the administrative area units. For instance, school area and natural regions (such as watersheds or vegetation zones).

Other uses:

In addition to three important uses of census data, the PHC data may be used for commercial purposes (e.g. understanding the size of the market in new growing areas), community uses (e. g. to assess effectiveness of governance, or provide cultural/religious support to the society), and research purposes.

Basic definitions

Population census:

A *population census* is the total process of collecting, compiling, evaluating, analysing and publishing or otherwise disseminating demographic, economic and social data pertaining, at a specified time, to all persons in a country or in a well-delimited part of a country.

Housing census:

A *housing census* is the total process of collecting, compiling, evaluating, analysing and publishing or otherwise disseminating statistical data pertaining, at a specified time, to all **living quarters** and occupants thereof in a country or in a well-delimited part of a country.

Living quarters:

The principal units of enumeration in a census of housing are living quarters. Only by precise recognition of these identities, data that will provide a meaningful description of the housing situation and a suitable basis for the formulation of housing programmes and policies can be obtained.

Living quarters are structurally separate and independent places of abode. They may (a) have been *constructed, built, converted or arranged for human habitation*, provided that they are not at the time of the census used wholly for other purposes and that, in the case of improvised housing units and collective living quarters, they are occupied or (b) *although not intended for habitation, actually be in use* for such a purpose at the time of the census.

Note: *The two **population** and **housing** censuses may constitute one statistical operation or they may be two separate but well-coordinated activities, but in either case they should never be considered completely independently of each other because essential elements of each*

census are common to both. For example, an essential feature of a population census is the identification of each occupied set of living quarters and of the persons living therein, and an essential feature of a housing census is the collection of information on the characteristics of each set of living quarters in association with the number and characteristics of its occupants.

Household

The concept of household is based on the arrangements made by persons, individually or in groups, for providing themselves with food and other essentials for living. A household may be either (a) a ***one-person household***, that is to say, a person who makes provision for his or her own food and other essentials for living without combining with any other person to form a multi-person household or (b) a ***multi-person household***, that is to say, a group of two or more persons living together who make common provision for food and other essentials for living. The persons in the group may pool their resources and may have a common budget; they may be related or unrelated persons or constitute a combination of persons both related and unrelated.

Usual residence:

Usual residence is defined for census purposes as the place at which the person lives at the time of the census, and has been there for some time or intends to stay there for some time.

Essential features:

The essential features of population and housing censuses are (1) ***individual enumeration***, (2) ***universality*** within a defined territory, (3) ***simultaneity*** and (4) defined ***periodicity***.

Individual enumeration:

The term “census” implies that each individual and each set of living quarters is enumerated separately and that the characteristics thereof are separately recorded. Only by this procedure can the data on the various characteristics be cross-classified. The requirement of individual enumeration can be met by the collection of information in the field, by the use

of information contained in an appropriate administrative register or set of registers, or by a combination of these methods.

Universality within a defined territory:

The census should cover a precisely defined territory (for example, the entire country or a well-delimited part of it). The population census should include every person present and/or residing within its scope, depending upon the type of population count required. The housing census should include every set of living quarters irrespective of type. This does not preclude the use of sampling techniques for obtaining data on specified characteristics, provided that the sample design is consistent with the size of the areas for which the data are to be tabulated and the degree of detail in the cross-tabulations to be made.

Simultaneity:

Each person and each set of living quarters should be enumerated as of the same well-defined point in time and the data collected should refer to a well-defined reference period. The time-reference period need not, however, be identical for all of the data collected. For most of the data, it will be the day of the census; in some instances, it may be a period prior to the census.

Defined periodicity:

Censuses should be taken at regular intervals so that comparable information is made available in a fixed sequence. A series of censuses makes it possible to appraise the past, accurately describe the present and estimate the future. It is recommended that a national census be taken at least every 10 years (recommended in years ending in “0” or at a time as near to those years as possible). Some countries may find it necessary to carry out censuses more frequently because of the rapidity of major changes in their population and/or its housing circumstances.

Note: *Although international comparability of census data is very important, legal, administrative, financial and other considerations often make it inadvisable for a country to adhere to a standard international pattern in the timing of its censuses.*

Methodological approaches to census taking:

While several developed statistical systems have already departed from a traditional approach, for the 2010 round of censuses, some of the less developed NSOs tested/implemented alternative methods for collecting, processing and disseminating key statistics that used to be generated by the traditional approach to PHC.

1. The traditional approach

During the 2000 round of censuses, over 190 countries conducted a population census and an overwhelming majority utilized the traditional approach to a census. The traditional approach comprises a complex operation of actively collecting information from individuals and households on a range of topics at a specified time, accompanied by the compilation, evaluation, analysis and dissemination of demographic, economic, and social data pertaining to a country or a well-delimited part of the country. Members of the public respond to a census questionnaire, or interviewers are deployed to collect information from respondents.

Because various methods can be used for collecting the data, including a *mailed* or *dropped-off questionnaire*, the *telephone*, the *Internet*, personal visit follow-up, or a combination of such methods, countries employing the traditional design may utilize very different methodologies in doing so.

2. The register-based approach

The philosophy underlying this concept is to take advantage of the existing administrative sources, namely, different kinds of registers, of which the following are of primary importance: households, dwellings and individuals. In the next iteration these are linked at the individual level with information on business, tax, education, employment and other relevant registers. While it is theoretically possible to link the records on the basis of the name of the individuals, the *existence of a unique identification number for each individual, household and dwelling is of crucial importance*, as it allows much more effective and reliable linking of records from different registers.

One of the essential preconditions of this approach is that the country should have an established central population register of high quality and good coverage linked with a system of continuous updating.

The primary advantages of a register approach are reduced cost for the census process and greater frequency of data. However, establishing and conducting administrative registers involve higher costs than the census alone. It is a more useful and effective administration that must prove the need of a register, not the statistics alone. Related approaches, such as the combination of traditional and register-based designs, and register-based censuses combined with sample surveys, are other possible approaches that are out of scope of this lesson.

3. The rolling census approach

Another alternative to the traditional model is “rolling census” which is a continuous cumulative survey covering the whole country over a long period of time (generally years). The two main parameters of a rolling census are the length of the period of enumeration (which is linked to the frequency of updates required) and the sampling rate (which depends on the available budget and the geographic levels required for dissemination purposes). This approach requires *highly complex sampling design and modeling techniques*. However, the main advantage of this model *higher frequency of updating data*.

4. Traditional enumeration with yearly updates of characteristics

This design is a variation on the traditional census design and focuses on counting the population and collecting only the basic demographic data in the census year. A very large household survey collects and tabulates detailed demographic, social, economic, and housing data every year throughout the decade, replacing a census-year long form to collect these detailed data from a sample of the population.

The primary impetus for this approach is twofold: to provide more frequent and relevant data on the population than are available when a census is conducted only once a decade and to reduce the operational risks associated with the census. However, this approach requires multi-year programme of comprehensive planning, development and testing

Note: *in countries with legal requirements for complete counts of the population at intervals, the complete count component of the census design is crucial and implementation of alternative approaches such as rolling census or updating the full enumeration may not be legally possible.*

Planning, organization and administration of population and housing census

A population and housing census (or a population census by itself) is perhaps the single most extensive, complicated and expensive statistical operation, consisting of a complex series of interrelated steps that a country undertakes. This section aims to review some major steps involved in planning, organization and administration of population and housing census and should not be taken as a comprehensive treatment of the subject.

All censuses do not follow a uniform pattern but there are certain major elements that must be taken into account in every one of them. In general, census operations can be divided into six phases, by order of implementation:

- (a) preparatory work
- (b) enumeration
- (c) data processing
- (d) building of needed databases and dissemination of the results
- (e) evaluation of the results, and
- (f) analysis of the results.

Note: *It will be readily apparent that these phases are not entirely separate chronologically or mutually exclusive.*

Note: *In addition to the major steps, distinct sets of operations related to the systematic recording of census experience and the quality assurance and improvement programme must accompany and support the main census operations.*

(a) Preparatory work

The preparatory work for the census is necessarily long in duration and involves many quite distinct activities. It should be noted, however, that many of these activities may be interrelated but they also overlap to a large extent. When planning these preparatory activities, techniques for project management should be employed. For purposes of presentation, these preparatory activities are divided into 18 somewhat arbitrary elements:

1. Legal basis for a census
2. Financial basis for a census
3. Budget and cost control

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4. Census calendar
 5. Administrative organization
 6. Census communication activities: user consultations, census publicity and promotion of census products
 7. Plans for the quality assurance and improvement programme
 8. Mapping
 9. Small-area identification
 10. Living quarters and household listing
 - Tabulation programme and database design
 12. Questionnaire preparation
 13. Census tests
 14. Plan of enumeration
 15. Plans for data processing
 16. Plans for census outputs and dissemination
 17. Staff recruitment and training
 18. Avoiding gender biases and biases affecting data on minority populations

(b) Enumeration

There are two major methods of enumeration:

In the *enumerator method*, information for each individual (in a population census) and for each set of living quarters and the occupants thereof (in a housing census) is collected and entered in the questionnaire by a census official designated to perform this operation in a specified area.

In the *householder method*, the major responsibility for entering the information is given to a person in the unit being enumerated (usually the head of the household), although the questionnaire is usually distributed, collected and checked by a census official.

Note: *In some countries, postal distribution of the questionnaire, with or without postal return, is used in conjunction with the householder method.*

Note: It is recommended that countries apply a threshold of 12 months when considering place of usual residence according to one of the following two criteria:

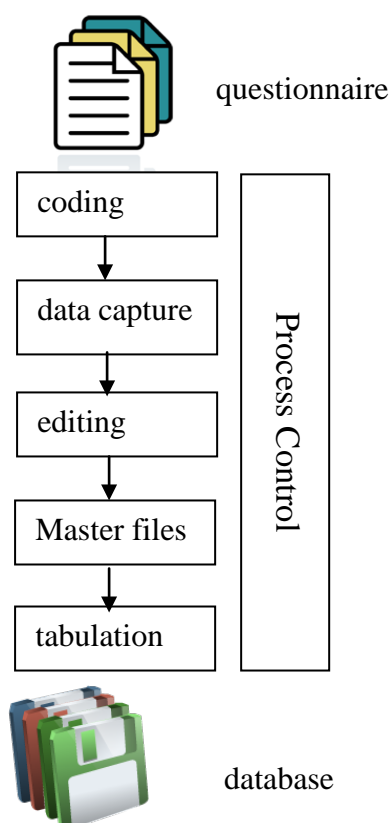
- a) The place at which the person has lived continuously for most of the last 12 months (that is, for at least six months and one day), not including temporary absences for holidays or work assignments, or intends to live for at least six months;
- b) The place at which the person has lived continuously for at least the last 12 months, not including temporary absences for holidays or work assignments, or intends to live for at least 12 months.

Note: Persons who move frequently and do not have a place of usual residence should be enumerated at the place where they are found at the time of the census.

(c) Data processing

No matter how thorough and accurate the census enumeration is, the usefulness, quality and timeliness of the census tabulations will suffer unless the collected data are properly processed.

The major activities involved in data processing are; coding, data capturing, data editing, processing control, creating master files and tabulation. For more detailed explanation of each activity, interested reader may refer to the UN manual on PHC.



(d) Building of needed databases and dissemination of the results

In order to expand the life and usability of the data, and as a complement to the standard production of tables, national statistical offices are encouraged to store the census data in various computerized database forms so as to better satisfy the full range of needs of internal and external data users. Census databases assist data users by providing easy access to a wide range of census data.

Census is not complete until the information collected is made available to potential users in a form suited to their needs. The information may be included in published tables and reports for general distribution, produced as tables in unpublished form for limited distribution or stored in a database and supplied upon request, or disseminated online.

(e) Evaluation of the results

The quality of population and housing census data is very important for many reasons, building public trust and understanding in the national statistical system. The purpose of census evaluation is to provide users with a level of confidence when utilizing the data, and to explain errors in the census result. It is therefore important to choose an appropriate way of sending out these messages to the right group of people.

Demographic analysis and **post enumeration** surveys are two very important methods for evaluating census data.

(f) Analysis of the results

In order to ensure the fullest possible utilization of census results by national and local governmental authorities, by academic researchers and by others, it is advisable to draw up a comprehensive and coordinated programme of analytical studies, phased over a period of several years.

The analytical studies to be included in such a programme will vary according to the needs and circumstances of the country. The programme may include descriptive summaries of results, policy-oriented analyses of census results and detailed analytical studies of one or more aspects of the demographic and social situation of the country.

Note: *Some of these studies may be undertaken by the census organization itself, but others, particularly the more time-consuming studies, can most effectively be carried out in cooperation with other research organizations.*

Topics for population and housing census

The selection of census topics is based on outputs expected to be produced by the census. Thus, the first step involves clear identification of expected outputs, and then the **core** and **additional** topics are decided on that basis. The topics to be covered in the census should, be determined upon balanced consideration of:

- (a) the needs of the data users in the country
- (b) achievement of the maximum degree of international comparability
- (c) the probable willingness and ability of the public to give adequate information on the topics, and
- (d) the total national resources available for conducting the census.

Based on the past several decades of experience in conducting PHCs, global recommendations are available to assist countries in deciding on core and additional topics in their population census. These global recommendations can be grouped under nine headings:

- 1) Geographical and internal migration characteristics
- 2) International migration characteristics
- 3) Household and family characteristics
- 4) Demographic and social characteristics
- 5) Fertility and mortality
- 6) Educational characteristics
- 7) Economic characteristics
- 8) Disability characteristics, and
- 9) Agriculture

Some important specifications (related to fertility, employment and education)

Time-reference: The time-reference period *need not be* the same for all of the data collected. For most of the data, it will be the census moment or the census day; in some instances (as is the case for current economic characteristics and rental arrangements), however, it may be a brief period just prior to the census or (as is the case for fertility questions, usual economic activity and information on the period of construction of the building in which living quarters are located) a longer period of time.

Age: Difficulties may arise in the reporting or in the recording of the information for children under one year of age, which may be given erroneously as “one year of age” rather than “zero years of age”.

Fertility:

The investigation of fertility and mortality in population censuses is particularly important in countries lacking a timely and reliable system of vital statistics because of the opportunity the data provide for estimating vital rates that would not otherwise be available.

The fertility questions are posed on “children ever born”, “date of last child born alive” and “age of mother at birth of first child born alive”. In addition, questions on age, date or duration of marriage/union may improve fertility estimates based on children ever born.

Education:

- It is preferable that data on literacy be collected for *all persons 10 years of age and over*.
- Where countries collect the data for younger persons, the tabulations on literacy should at least distinguish between persons under 15 years of age and those 15 years of age and over.
- Information on *school attendance* should, in principle, be collected for persons of all ages. It relates in particular to the population of official school age, which ranges in general from 5 to 29 years of age but can vary from country to country depending on the national education structure.
- Information on *educational attainment* should preferably be collected for all persons *5 years of age and over*.

Labour and employment

- The unemployed population comprises all persons above the minimum age specified for measurement of the economically active population who during the reference period were: (a) Without work, (b) Currently available for work, and (c) Seeking work.
- To collect information on activity status, countries in which, normally, many children participate in agriculture or other types of economic activity will need to *select a lower minimum* age than that in countries where employment of young children is uncommon.
- Tabulations of economic characteristics should at least *distinguish* persons under *15 years of age and those 15 years of age and over*; and countries where the minimum school-leaving age is higher than 15 years and where there are economically active children below this age should endeavour to collect data on the *economic characteristics of these children* with a view to achieving international comparability at least for persons 15 years of age and over.
- A *maximum age* limit for measurement of the economically active population is *not recommended*.