UNITED
NATIONS

E

Economic and Social Council

Distr.
GENERAL

ECE/CES/AC.6/2008/SP/3
5 May 2008

Original: ENGLISH

ECONOMIC COMMISSION FOR EUROPE

CONFERENCE OF EUROPEAN STATISTICIANS

Joint UNECE/Eurostat Meeting on Population and Housing Censuses

Eleventh Meeting
Geneva, 13-15 May 2008
Item 2 of the provisional agenda

CENSUS QUALITY ASSURANCE AND EVALUATION

New method for 2010 population and housing census of Turkey
Considerations about data quality and coverage

Note by Turkish Statistical Institute

Summary

Until 2000, the population census was carried out in Turkey with a traditional method and the enumeration conducted in one day on a "de facto" basis. Therefore, information on usual residence of the population is not available from past censuses. Another problem was population overcount (imaginary population) due to the fact that census results are used to allocate funds to the municipalities, in proportion to their population size.

In view of the 2010 census, the Turkish Statistical Institute aims at changing the method of population census in order to produce more reliable information particularly on population size and distribution. For this purpose, the population registration system has been improved to cover usual residence address of all people living in the country. This system is considered as a base source for the next census. The main purpose of the paper is to present the method developed to increase the coverage of the population registration system, and the planned methodology for the 2010 census.

GE.08-

I.   INTRODUCTION

1.   After the foundation of the Republic, the first population census was carried out in 1927 and the next population censuses were carried out between 1935 and 1990 regularly, in years ending with 0 and 5 in Turkey. After 1990, population censuses have been decided to be carried out in years ending with 0 by the Law. After the adoption of new Statistical Law, it is decided that censuses and surveys will be done on the basis of 5 years Official Statistical Programme. According to the 2007-2011 Official Statistical Programme of Turkey, next census is going to be carried out in 2010.

2.   All population censuses were carried out with traditional method in one day by application of a curfew with "de facto" definition. Information on usual residence (de jure) of population and household structure are not available from past censuses because of listing only present persons of the household on the census day. However main problem in the census was overcounting of population (imaginary population) due to the population based budget share to municipalities. Therefore, Turkish Statistical Institute (TurkStat) aimed to change the method of population census in order to produce more reliable information particularly on population size and distribution.

3.   For this purpose, population registration system has been improved to cover usual residence address of all people living in the country. This system is considered as a base source for the next census.

4.   Main purpose of the paper is to present the method of how to increase coverage of the population registration system and planned method for 2010 census.

II.   ESTABLISHMENT OF ADDRESS BASED POPULATION REGISTRATION SYSTEM

5.   MERNIS (Central Population Registration System) database implemented by the General Directorate of Population and Citizenship Affairs (GDPCA) of the Ministry of Interior keeps population registers of Turkish Citizens with unique 11 digits identification number in the form of family ledgers. The system provides information on vital events and relationship between members of generations. However, no information on address of usual residence of Turkish Citizen is available. Therefore, the system could not be used for census purposes.

6.   The project of Address Based Population Registration System (ABPRS) has been implemented for the period between 2006 and 2007. Main purposes of the project are to establish National Address Database that covers all addresses with unique ID within the boundaries of the country and to improve registration system by collecting information on place of usual residence for Turkish Citizens and foreigners living in Turkey with a field work pairing the citizen's ID with address ID. In addition, administrative purpose of the project is to provide standardized and updated information on residence address of persons living in the country particularly for public services. Thus, bureaucracy issues will be decreased by sharing this information with governmental bodies.

7.   Legal base for the project is the Population Services Law which was approved in April 2006. Turkish Statistical Institute was charged to establish two databases and General Directorate of Population and Citizenship Affairs, Ministry of Interior was charged for updating and maintenance of the system.

8.   The project was realized by application of five stages given in the Population Services Law: i) establishment of the National Address Database, ii) field application for collecting information on usual residence addresses, iii) data processing, iv) checking the usual residence addresses, and v) updating the system.

9.   All works related to the establishment of the system were coordinated by Turkish Statistical Institute and carried out by the executive committees which were headed by governors and members were the head of municipality, the head of district/province registration office, the head of special administration of province, the head of local administration, and supervisor of the district/province.

A.   Stages of Establishment of the System

10.   The five consecutive stages of establishment of the system are given below:

1.   Establishment of the National Address Database

11.   According to the Address and Numbering Regulation, name of streets and building number are given by municipalities in localities having municipal organizations, and by special provincial administrations in villages. In order to eliminate the problems related with changes of name of streets, unique code is given to each street. This study constituted the source for the National Address Database (NAD). During this stage, around 40 millions addresses were entered in the NAD from all over the country by secure web based applications.

12.   After establishment of NAD, 10 percent of the addresses in each municipality (in total there are 3200 municipalities) was selected and controlled. After controlling, problems related to addresses (wrong or not found in the field or were not present in the NAD) were solved and corrections were done in the database. In this manner, the NAD and addresses in the field became identical.

2.   Field application for collecting information on usual residence addresses

13.   The field application was carried out by TurkStat in order to collect information on the unique ID, place of residence, age, sex, relationship between household members and completed level of education of Turkish Citizens and foreigners living in Turkey. Two different forms were used to collect information for households and institutional places. Also, separate form was used for persons who were not registered in MERNIS and did not have ID number. These forms were given to the district registration offices to register them in the system. It was found that there were around 50 thousand persons who did not have ID number mainly children age less than 1 year old.

14.   Field application and interview were made by enumerators who were employed temporary for several months in cities. In villages, mostly teachers and imam (religious officer) were worked as enumerators and controllers. Around 60 000 enumerators/controllers and operators were worked during the field work.

15.   During field application, address labels containing all components of addresses and a unique code for each address were printed and stickled on the forms. By visiting the addresses written on the labels, the forms were filled by enumerators by face-to-face interviewing technique with the reference person of the household. In the case of absence of reference person, the enumerators interviewed with one of the adult household members. Otherwise, leaving the forms in the households and then getting back the filled forms (drop off, pick-up) method was used by the enumerators.

16.   Persons living in households, persons residing in institutional places, foreigners living in Turkey, nomads and homeless people were covered in the field application. Turkish Citizens residing abroad were not included.

3. Data processing

17.   Data entry offices were established regionally and forms which were collected in the registration offices were transferred to these offices regularly. Data entry was done by using web-based programmes developed by TurkStat. In the programme, there was no manual data entry; every field has multiple selections or checking the field and value consistency. Operators were employed temporary for this work. During data entry, firstly, unique address code of the form was entered into the system and operator checked the information on the form with information appeared on the screen. Secondly, household information was entered into the system. Thereafter, for each household member on the form, identification number was entered by the operator and personal information written in the form and information came from MERNIS through identification number was checked before matching individual information with addresses. In case of unmatched information with MERNIS, all individual information was entered to the system manually by the operator. Information for these individuals was sent to the registration office to check and correct information by enumerators. For foreign citizens, passport numbers and personal information was entered to the system by the operator manually. Data entry for each member was finalized by entering information on educational status and relationship to the household responsible.

18.   During data entry period, a consistency particularly between age and educational level, relationship with household members are provided automatically. For instance, a person could not be school graduate if he/she is under age 6. Similar age criteria were used for reference person of the household; a person could not be the reference person of the household if he/she is under age 14. The system also controlled the number of persons written on the cover page of the form and written in the individual form. Forms which were not entered to the system because of the automatically restrictions (in case of address not available in NAD, missing members of household, no sign on the form) were sent to the field in order to check the related fields.

4. Checking the usual residence addresses

19.   After the finishing data entry including checking information in the field, according to the Law, all personal information by address of usual residence on the basis of household were listed at the offices of the heads of the quarters (muhtars)/head of the villages for 60 days. During this stage, reference person or any adult from the household visited the office and confirmed the address of usual residence of each household member on the list. In addition to that, controlling the usual residence addresses was also possible from the web site of TurkStat. The applications for correcting and updating information were made during this period and evaluated in the local registration offices.

5. Updating the system

20.   After establishment of the system by TurkStat, it was transferred to the General Directorate of Population and Citizenship Affairs. The system is going to be maintained by General Directorate of Population and Citizenship Affairs according to the Law. When people change the place of residence, they have to apply to district directorates of population registration office or any other government organization given public service for updating information in the system. For institutional places, authority of the places has to declare the registration offices about persons who left or come to the institutional places. District registration offices are able to reach only addresses within the boundaries of districts.

B.   Monitoring the fieldwork

21.   In order to monitor the fieldwork, two types of information were used; a) information given by controllers, "Controller follow-up form", which is used to control the work of the enumerators and supervisors, and b) information derived from data entry, which is mainly used to evaluate field application.

a) *Controller follow-up:* For each enumerator (enumeration area), "Controller follow-up" form was filled by controller and entered to the system by a web-based program regularly. Controllers were able to reach outputs to see number of dwelling enumerated, number of dwelling not visited, type of data collection (face to face, drop-off, pick-up), result of each interview, reason for not completed forms (empty dwelling, address not dwelling, no one found in the dwelling during field work), number of forms given data entry office and number of forms given back for controlling in the field. Through this form, field work of each enumerator was evaluated by controllers and supervisor of the district.

This information was also used to check field work of enumerators and controllers. For example, if the percentage of empty dwellings or not interviewed dwelling, missing information is higher in certain enumeration area than the average of that district, the staff of regional office (supervisor) alerted to check quality of field work.

b) *Information derived from data entry:* Field works were monitored by daily and weekly reports by staff of central organization, regional organizations and supervisors. In these reports following topics were presented:

- Number of dwellings in the NAD and the number of visited dwellings by the enumerators, unoccupied dwellings (or vacant), secondary dwellings, dwellings in which no one was found were evaluated. While analyzing the above item, the situation of the locality was also taken into consideration. For instance, we expected higher percentages of unoccupied or secondary dwellings for coastal localities than that of other localities. After the completion of the study, the percentage of unoccupied and secondary dwellings differs from 15 to 40 per cent among provinces.
- Number of individual records which were not matched with MERNIS database according to ID number of individuals was evaluated. If this information is relatively high compared to the average, regional offices and supervisor of the district alerted to control the field.

22.   These reports were also used to monitor duration of field work on the level of enumeration area. If duration of enumeration significantly was more or less than expected duration, supervisors of districts checked the reason and solved the problems.

C.   Evaluation of the system

23.   During data entry period, data was analyzed for content error and after data processing coverage of the system was analyzed based on administrative records and previous censuses results.

1.   Checking data for content error

24.   Data quality was checked during data entry process. And inconsistent information was listed weekly and sent to the regional office to be corrected. In the weekly analysis following topics were examined:

- Individuals who not matched with MERNIS database,
- Persons registered in more than one household with different addresses,
- Households in which all members are under age 14: These households was reported because of possibility of omitting other members of the household,
- Individuals registered at addresses except dwellings (office, depot, building under construction, summary house / seasonal house): The system allowed registering people in those places. Since it is very rare case, these types of registers were evaluated in order to check quality of address information,
- Size of the household which is more than 7 persons: This information was used to check the reliability of information on definition of members of household.

25.   In order to correct the inaccurate information, records with type of error, address and list of the people registered in the address were sent to the regional offices by electronic mails every week.

2. Checking data for coverage error

26. After completed all stages of the ABPRS including the last stage (checking information on address of usual residence by persons themselves at the locality), mainly two methods had been used in order to estimate coverage error.

27. First of all result of ABPRS was compared with previous censuses results and population projections. For the localities where the data entry completed, population of the localities and age and sex structure of this population was compared to the results of 1990 and 2000 Population Censuses and population projections. According to analytical studies with previous censuses and projections, it was estimated that around 4 percent of population was not covered during field application.

28. After that, individual records of ABPRS were matched with other administrative records. According to the Statistical Law, all government and private sectors are compulsory to provide individual information to TurkStat for use of statistical purpose. Therefore, around 50 organizations including universities, government organizations (Ministry of Education, Ministry of Finance, Social Security Institution, High Board Election, Social Services and Child Protection Agency, General Directorate of Social Assistance and Solidarity, etc.) banks, GSM operators, associations were asked to provide identification number of Turkish Citizen and their addresses if available.

29. At the end of collecting related administrative records, approximately 320 millions records were used to check individual records with ABPRS database. After analyzing data, people who were not covered in the system were defined and following methods had been applied to increase the coverage of the system:

   a) By using the identification numbers of the staff of the institutions and companies, who were not covered in the system, were listed and sent to the related organizations. These organizations were requested to inform their personnel or customers about that they have to be registered in the system by Population Services Law.
   b) Computer Assisted Telephone Interview System was used to increase coverage. People, who are registered in MERNIS but not covered in ABPRS, are tried to reach by using the Computer Assisted Telephone Interviewing (CATI) technology of TurkStat. In this study, firstly, any relative of unregistered person who is included in ABPRS was determined. After getting the relative's telephone number from ABPRS database, the information (telephone number or address) of unregistered person is obtained by calling relatives. Finally, information of unregistered person is collected through relatives mainly mother/father, sister/brother, wife/husband or children. And after finishing CATI application, unregistered people were informed through SMS message that they have to go to the registration office to be registered in the system according to the Law. This operation was realized in the corporation with GSM companies.
   c) Advertising film, brochure, poster and press release were prepared to advocate people about the new system and duties of people living in the country. Also the penalty for not registering in the system and not declaring new address on time according to the Law was mentioned in the advertisement activities.

30.   At the end of this process, around 99% of persons registered in other administrative records were covered by ABPRS and population size of Turkey reached 70 586 256 referring to the end of the year 2007.

D.   Results of the Address Based Population Registration System

31.   Results of population registration system referring December 31, 2007, were announced to the public on January 21, 2008 by the press conference. Results were announced based on the following detail:
- Population by localities (province, district, sub-district and village),
- City and village population,
- Age and sex structure,
- Nationality of persons living in Turkey.

32.   All information is available on the web site of TurkStat (www.turkstat.gov.tr). According to the Law, governmental organizations and establishments will use this system in all their administrative works. In addition, updated information on population size and the basic characteristics of population will be obtained from the system by TurkStat. Information on population size, age and sex structure of the population by localities based on ABPRS will be disseminated annually.

III.   Plans for 2010 Population and Housing Census

33.   According to the Official Statistics Programme of Turkey, next population census will be carried out in 2010. The method will be developed based on Address Based Population Registration System. In order to avoid problems related to arbitrary population faced in previous censuses, next census will be carried out by using household and individual lists in the population registration.

34.   After establishment of ABPRS, TurkStat has been working with other organizations very closely to improve the information in ABPRS. First attempt is to build National Education Statistics Database. ABPRS has already information on the completed level of education for all people living in the country. Individual records for currently students and graduate students from all universities and Ministry of Education were collected at the beginning of this year and matched with the records of ABPRS. This information will be updated yearly and basic education statistics will be produces from this database for the next census. TurkStat has also plan to work on administrative records related to labor force and characteristics of buildings and dwellings to decide which census variables might be produce from administrative records for next census.

35.   Another attempt is related to updating information on place of residence. According to the Law, all national institutions and offices have to use ID number and usual residence address of persons for their administrative work starting from 29 April 2008. For this purposes, General Directorate of Population and Citizenship Affairs will provide required information to the related organizations by having a special contract with organizations. This approach will affect people behavior to declare their place of residence on time.

36.   In this context, it is planned to apply two questionnaires in the next census:

- Short Questionnaire: Household lists in the ABPRS will be checked by using short form in order to improve accuracy of population counts and basic information like age, sex, relationship between household members and completed level of education. All information is already available in ABPRS.
- Long Questionnaire: It will be applied to the sample of the households to collect detail information on characteristics of population and housing.

37.   Before 2010 census application, TurkStat plans to carry out field work to test data quality and coverage of ABPRS. Particularly data quality of updating place of usual residence and completeness of household list will be tested through household surveys. In autumn 2009 (one year ago from the census date), pilot census will be carried out to test all stages of census including questionnaires.

38.   National Address Database which has been updated by municipalities for municipal area and Special Administration of Provinces for villages by the Law. NAD will be used as census frame. However, in order to evaluate accuracy of NAD before using in the census, selected address list will be control in the field through sample surveys carried out by TurkStat.

39.   In 2010 census, TurkStat plans to improve particularly data on de jure population, migration both national and international, household and family structure and housing characteristics by taking into account Eurostat recommendations.

*****