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Population and social conditions **3/2004/F/n 02**

Documentation of the 2000 Round of Population and Housing Censuses in the EU, EFTA and Candidate Countries Part III and Annexes

University of Thessaly

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DOCUMENTATION OF THE 2000 ROUND OF POPULATION AND HOUSING CENSUSES IN THE EU, EFTA AND CANDIDATE COUNTRIES

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by

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(available only on CD-Rom – Request to be addressed to: estat-census@cec.eu.int)*

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Introduction

The first Belgian census was organised in 1846 on the initiative of Adolphe Quetelet. This was not an ordinary count of inhabitants as it also included a complete section on agriculture and industry. Since then there have been 14 population censuses in Belgium. The different censuses occurred at intervals of approximately ten years (1856, 1866, 1876, 1880, 1890, 1900, 1910, 1920, 1930, 1947, 1961, 1970, 1981 and 1991). According to the basic legal texts censuses were purely for administrative purposes. Since 1856 all censuses have requested information concerning demographic, social and economic data.

In recent years, as the *Central Population Register*[1] (CPR) seemed to be a reliable source of determining population figures, it was recognised as the centralising database of municipal registers in 1985. Since 1991 the official population figure has been determined using this register meaning that the census was no longer purely for administrative purposes.

With the introduction of the **General Socio-Economic Survey,** which began on 1 October 2001, the days of classic censuses in Belgium are long gone. On 4 May 2000 the Council of Ministers made note of a proposition of the Minister of Economy on a general socio-economic survey to be held on the population in 2001. The Council of Ministers ratified the guidelines and charged the Minister of Economy with implementation of the survey. Therefore we no longer speak of the 'General Population and Housing Census', but of the 'General Socio-economic Survey' (or simply 'Survey 2001' in the following text). The change of name indicates that it no longer relates only to a pure count of the population but to a general socio-economic survey.

Legislation

Under international law the General Socio-Economic Survey 2001 is the subject of an *'Agreement on the guidelines for the programming of population and housing censuses in 2001'*. From a judicial viewpoint this agreement is not obligatory but is an official and combined recommendation of the Community and national authorities.

The Statistics Law of 4 July 1962 and Art. 21 of the 2 January 2001 law on social and budgetary dispositions and others constitute the legal basis of 'Survey 2001', organised by the Institute Nationale de la Statistique (INS) under the Ministry of Economic Affairs. The organisation, management and the compulsory nature of the survey is fixed by the Royal Act of 1 October 2001 published in the Official Journal of 5 October 2001.

[1] National Register of Natural Persons.

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Preparatory phases and organisation of data collection

In April 1996, as the advisory institute that supervises INS activities, the High Council for Statistics set up the working group 'Census 2001'. Its mission was to find alternative methods as satisfactory as those of a classical population and housing censuses yet having additional advantages, such as lower cost and a more frequent updating of data. In particular, this related to use of administrative registers, carrying out a survey linked to the renewal of identity cards and conducting a sample survey. The results of this study are fully presented in the *'Report of the High Council for Statistics on Census 2001'*.

Moreover in April-May 1999 a test survey was held to examine closer co-operation with the postal services. At the time of the latest census INS disseminated questionnaires by post and collected them through enumerators designated by the municipalities. This test survey was to evaluate a new method, involving postal services and postal workers in the collection of the questionnaires.

Finally, with regard to the future and in addition to developments related to the census in other European countries, the High Council for Statistics recommended the organisation of a **classical census** in 2001. Thanks to the collected data INS can now create its own databases for data that are not obtainable from existing and accessible registers.

Based on results of the test survey, INS and the High Council for Statistics decided to use the following three phase method to dispatch and collect survey questionnaires:

PHASE 1, in two steps

- dispatching questionnaires via post to all households registered in the National Register
- sending a non-addressed reminder card via post to all households

PHASE 2

- sending a registered letter to those who did not return the questionnaires (estimated at 40% of households). Depending on the response-rate and technological possibilities this phase could be preceded by sending a reminder letter and personalised new forms to non-respondents

PHASE 3

- sending an interviewer to the addresses of households that had not responded (estimated at ± 20% of households). Respondents must fill in their forms and return them to the INS by:
  - depositing them in any public post office box in the country
  - giving them to postal workers on their daily rounds
  - leaving them at any post office in the country

As a precaution, the response rate of 60%, after sending a reminder card and of 80% after sending a registered letter, were based on percentages arising from the 1999 test survey, and were calculated to a specific margin. The collection phase using

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interviewers – Phase 3 – concerned difficult cases: often absent individuals, people living on modest means, those who were unaware of the usefulness of the survey, etc. As a result, in many cases interviewers helped respondents fill in their forms or provided information on the usefulness of the survey, the reason for its organisation, etc.

Coverage and contents of the Survey

The interviewed population was composed of all people registered in the population or foreign registers held by the municipalities on the reference date. All persons, Belgian or foreign, having their main residence in Belgium on 1 October 2001 had to be interviewed. An exception was made only for foreign diplomats, foreigners related to diplomats, members of their household as foreign servants living with them, and members of the armed forces who were staying in Belgium on mission.

No individual form was sent to children born after 31/12/1995, so as not to needlessly overburden households and to restrict the number of forms to be printed, sent and processed. However, a specific question was provided on the household form for these children.

The greater part of data collected during the Survey 2001 met United Nations and European Union recommendations.

Demographic data were retrieved from the CPR. Some data (basic information such as name, first name and date of birth) were pre-printed on the forms as identification. **Other individual characteristics** (on the level of training after school or education followed) were obtained via questions on individual forms, and included a question on activity. The following data were collected from those with an occupation: sector of activity, industry of employer, employment status, exact occupation and weekly working hours. People with an occupation and those pursuing an education had to answer questions, among others, on their daily movement: workplace and residence, frequency of movement, kilometres travelled, and length of haul and means of transport. Furthermore each woman of 14 years or older was asked the year of her first marriage, year of first cohabitation and year of birth of each of her live-born children.

For the first time a short health form was included in the questionnaire, this had been requested by international (United Nations) and national (Ministry of Social Affairs, Health and Environment) organisations. Questions covered general health, long-term illness resulting in disabilities and help (outside the field of work) given voluntarily to other persons.

The Survey 2001 made it possible to collect data on occupied dwellings and buildings. Data on **occupied dwellings** concerned:

- the type (open, half-open or closely built single-family dwelling, flat, studio or other)
- title of ownership (owner-occupied, rented or put at disposal free of charge)
- area, number and kind of living rooms

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- principal heating system, energy used for heating, the isolation of the dwelling, drainage system, sanitary facilities (bathroom, toilets)

Concerning the building:
- the purpose
- the building period
- the number of apartments in the building

The Survey 2001 requested information on the ownership of facilities such as garage, garden, fixed telephone, GSM, computer, Internet connection and number of vehicles at the disposal of the household per kind (automobile, motorcycle, moped, and bicycle).

Finally there were a few questions on the state of the dwelling, immediate environment around the dwelling and facilities provided in the neighbourhood.

Publicity campaign

For administrative reasons a publicity campaign was not undertaken.

Field operations

The General Socio-Economic Survey took place on 1 October 2001. This corresponds to a changing of the quarter, which was an advantage as much social security data are registered per quarter.

The forms were distributed the week before the official date of the survey, between 24 and 28 September 2001. The forms were personalised based on the CPR situation on 1 July 2001. The households filled in the forms completely and truthfully according to their situation on 1 October 2001 and returned them to the INS within three weeks.

In the period from 22 to 26 October a reminder card was delivered to all letterboxes. In this way people who returned their forms were thanked. Furthermore non-respondents were reminded to return their questionnaires and warned that subsequent procedures would begin if the deadline was not respected.

In a following phase a registered letter was sent to households that had not responded. This letter was sent to the address recorded in the CPR on 1 October 2001. Dependent on the response-rate and technical capabilities this phase was preceded by the dispatch of another reminder letter and new personalised questionnaires to the non-respondents.

Finally, interviewers went to the legal residence of non-respondents to collect the questionnaires.

Following all these steps, the final questionnaires were returned to the INS in July 2002.

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Data processing

The five INS centres, located in Bruxelles, Anvers, Charleroi, Gand and Liege were in charge of data processing.

As soon as the stamped addressed envelopes arrived at the INS processing centres, the envelopes were opened, contents checked and forms separated based on type. Then they were scanned.

Data processing was divided into three parts. The first phase (from October 2001) covered reception, opening and sorting of envelopes. Forms were then scanned and at the same time the entered questionnaires were registered. Globally, 14 million questionnaires were processed. The scanner processed 60 to 80 forms (A3 recto verso) a minute. The second phase (from February 2002) involved processing of around 4.3 million scanned forms (named 'your dwelling'). The forms were almost entirely processed by optical character recognition (OCR) with automatic extraction and data correction system. The third phase (from July 2002) was the entire data-entry phase, which lasted around two years. During this phase about ten million scanned forms (named 'your person') were processed, using OCR with automatic extraction and data correction system.

No coding was necessary for the dwelling/household forms, although processing of individual forms was more complex. The coding of four broad variables was necessary, in particular for workplace or school, occupation, sector of activity and level of training or type of education. Self-developed software FORMIRIS and INFORMIX were used for data entry, while coding of data was based on computer-assistance and automatic coding.

A **database 'Dwellings'** will be created using data collected during the socio-economic survey. Several characteristics of occupied dwellings will be entered, such as area, energy used, drainage method, etc. The following procedure was suggested to keep this database up-to-date. On the 1 January 2003 a dwelling form was sent to everybody who had changed residence between the 1 October 2001 and 31 December 2002. From the 1 January 2003 on, a dwelling form will be given to each person registering a change of residence at the municipal administration. This form will then be sent to INS, where it will be processed using OCR. It was ensured that the form only contained closed questions to be answered by ticking a box. A list can be drawn up of those who have moved the previous year by using the database the INS receives annually from the CPR. This list will then be compared to that of people who have sent in a housing form. The housing form will then be sent to individuals on the first but not on the second list. Answers INS receives by mail will be integrated into the database. All changes will be included in the database allowing an overview of the situation on 1 January of each year.

The database 'Dwellings' may be completed using information from the cadastre (for the building year). Data collected by INS for construction statistics, in particular data on started buildings may be used. The service 'Construction statistics' will provide a list with the addresses of buildings where alterations have already been started. As the number of dwellings per building is known and each dwelling is identified by its

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address, INS can send a form to each dwelling where alterations are being made and, in this way complete its database 'Dwellings'.

The **database 'Level of Education'** is based on data collected during the general socio-economic survey. The information entered in this register concerns the year of graduation and degrees obtained in Belgium or abroad. To keep the database up-to-date relevant information will be requested from the ministries in the communities, universities and colleges from 2002 on. Obtaining a copy of these files will only be possible with an official request. This procedure is possible because of administrative simplification. For those who come to live in Belgium after the date of the survey, the information on their diploma(s) will be requested when they are entered in the population registers. The procedure may the same as that selected for updating the database 'dwellings'.

The **Demographic database,** composed using information kept at the CPR is annually updated and consists of a copy of the CPR on 1 January of the current year. This database contains:

- National Register Number
- date and place of birth
- sex
- civil state
- citizenship
- address
- relationship to the household reference person

The annual production of demographic statistics using this procedure is simple. Since 1991 the CPR has sent a copy of its database to the INS each year on the 1 January. The current strategy will be continued.

The **Socio-economic database** composed using information centralised at the *Crossroads Bank for Social Security* (CBSS) and concerning the main socio-economic characteristics of the population is also drawn up. The following data will be entered:

- occupational status
- denomination/industry of the employer
- sector of activity
- weekly working hours

The above-mentioned information is entered on different databases retained by the social security institutes and centralised by the CBSS. The INS would request the CBSS for a copy of necessary data when there is need to publish updated results. This implies that the INS would have permanent access to the CBSS data through the National Register Number as the identification unit.

In addition, it is impossible to set up permanently updated databases for two other socio-economic variables collected during the census, namely the **occupation** and the mainly used **means of transport** to travel between the workplace and the residence.

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This information is subject to great variations. These will be updated using **sample surveys** and/or by **specific surveys on request.**

Data dissemination

Preliminary results will be available at the beginning of 2003. The tabulation program will be published on paper CD-ROM. The analysis of results on specific themes will be provided only on paper. Databases and standard files will be also provided upon request on electronic mean.

Costs

The total cost of Survey 2001 in Belgium was € 24 million (i.e. € 2.3 per person), which was completely covered by the national budget. The greatest element of this cost was for expenses related to data processing, checking and coding, corresponding to 36% of the total. The postal cost, 21% of the total, was the second most important item.

Expenses linked to the general preparation, services and logistics (including enumeration, training, pilot micro-census, cartography/mapping) represent 20% of the total cost while 10% are linked to publications, dissemination and documentation. A total of 4% of the cost was used by the INS for equipment while the remaining 9% was linked to the processing and analysis of data (5%) and post-enumeration evaluation (4%).

Conclusion and future plans

The Survey 2001 is the final exhaustive traditional census. In the future socio-economic data on the population residing in Belgium, which should provide relevant statistics, will be collected through:

- existing administrative registers
- databases under development at INS, for information not available from the administrative registers, namely (i) dwelling characteristics, for which up to date no reliable information is available, and (ii) level of education.

The use of an exhaustive census as base material for a new database at INS after 2001 has two main advantages. First, it is possible to regularly publish updated results on the level of the statistical sectors (or neighbourhoods). Second, in the future it will no longer be necessary to organise new censuses. In fact, only a purposive survey on two or three specific themes would be necessary. In the short term this procedure would mean an additional investment but in the long term it should ensure greater savings.

DENMARK

Introduction

There has been a long tradition of census taking in Denmark, the first being carried out in 1769. After other counts, and since 1840, twenty-five censuses have been regularly undertaken every five or ten years.

Denmark may be considered the pioneer country worldwide for taking and developing register-based censuses. The main reason for changing was to attempt to reduce the costs of the traditional survey, avoid over-burdening respondents, reduce the work load at the planning, administrative, methodological and processing level, and create the possibility of obtaining results quicker and more frequently, allowing for longitudinal analysis.

Following development of the administrative registers and their adaptation to statistical purposes, even the final traditional census, conducted in 1970, was taken using a short questionnaire on the basis of the possibility - never applied - of integrating results with additional data (such as country of birth, citizenship, residence at the previous census) from the Central Population Register (CPR).

After conducting the first population census based on registers in 1976, Statistics Denmark (SD) quickly took its first entirely register-based population and housing census in 1981. This followed the construction and extension of additional registers for buildings and dwellings, pupils and students, enterprises and establishments, and taxation.

Since 1981 the registers, used as the source for the 1981 Census, have been used for annual statistics in different areas, such as the labour market, education, household and dwellings. The concept of the *population and housing census* had not been used for these statistics, even if the information compiled is more or less the same. The census concept has only been used in connection with tables agreed on by Eurostat for 1990 and 2001.

The administrative division in Denmark is based on 14 counties plus København and Frederiksberg as municipalities that have the responsibilities of a county. These units constitute the NUTS3 level. After this level there are 276 municipalities (NUTS5) and 2 125 parishes.

Registers

In Denmark local population registers were set-up using the 1924 Census results and since then maintained by the municipalities for administrative purposes. The use of information from the local population registers for statistical purposes had been introduced at the beginning of the thirties. In 1966 the *Act on Statistics Denmark*, was adopted by Parliament. This Act gave an independent Board of Governors the responsibility for determining the institutions work program. One important provision in the act is that it allows Statistics Denmark access to data from all public administrative

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registers in Denmark. It also provides the legal basis for participating in the setting-up of these registers. In order to respect the principles of cost-efficiency, information needed for statistical use can be collected from other administrations on behalf of SD. At the beginning the *Act on Statistics Denmark* had a special section on censuses; however this was deleted in the eighties.

At the end of the sixties the personal reference number (PIN) was introduced. This was mainly in support of a system of taxation at source as a unique and common tool for different administrations, which at that time used different identification codes. Based on the PIN the CPR was set up on magnetic tapes to mirror local registers, the legal base for this was the Population Registration Act (June 1968). In addition to the PIN several standards and codes for municipalities, addresses, nationalities, and occupations were created and widely used by different national administrations and private firms. This was a fundamental step towards computerisation of the work.

Since that time CPR is the source register for almost all public and many private systems (such as tax authorities, radio and TV license agencies or banks) as well as the source for the annual population and vital statistics at any level. Since the seventies many authorities and agencies working in the many fields related to individual citizens have based their information on the PIN and basic data from CPR. This intense use of the CPR provides plenty of opportunities to identify and correct errors that may appear in the register.

Actually over 70 statistical registers of personal data have been established within SD from administrative registers. All these may be linked by the unique personal identification code, which is common to the administrative and statistical level. All these registers contribute to the census as with other statistics, including those once based on sample surveys.

During the seventies the use of registers increased debate over matters of confidentiality. This ended in 1978 with the setting-up of the Public Authorities' Registers Act, a tool to regulate data processing of individual data; it also gives consideration to international principles. Basically, it states there are no limits to the linking of administrative or statistical registers when carried out for statistical purposes only. The 2000 Act on Processing of Personal Data substituted the old act, but did not imply changes in the possibility of Statistics Denmark's using administrative data for statistics.

Data collection and data processing for the 2001 Census

According to the role of the country registers, census preparation falls under the wider regular production of annual statistics from different sectors of SD. The census project is only now processing tables agreed upon in the EU census tabulation plan, with no need to set-up ad hoc structures and prepare any special legislative act or public awareness campaign. Tables are processed when the necessary registers are ready for annual production. There is no dissemination plan other than that for deliveries to Eurostat and other international institutions.

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The main administrative and statistical registers used for the 2001 Population and Housing Census were:

- the CPR, for all demographic characteristics of the resident population;
- the Central Register of Buildings and Dwellings (BBR), a register built in 1977 regularly used for housing or construction statistics, with data on property, buildings on the property and housing (or other units) within each building;
- the Registers of Wages and Salaries paid to each employee as returned by employers to the tax authorities, also used to derive data on the workplace, occupation and industry;
- the Register of Income based on administrative forms by individuals to the tax authorities;
- the Registers of Employment Insurance and Unemployment Benefits;
- the Central Register of Enterprises and Establishments;
- the Education Classification Module (SD register), based on annual reporting from institutions on educational attainment and education level.

Data are considered with reference to the 1st January of the year or, for some topics, to the year 2000. The linkage or the combined use of the above-mentioned registers and other sources facilitates collection of census data.

Among other examples, data on specific housing (from BBR) are linked to data on resident persons (from CPR) by a code derived from the exact address – i.e. municipality, street, number of building, floor, location on floor – which is part of both CPR and BBR.

Information on *workplace, occupation, industry, commuting* or *income* of a person is obtained by using different registers, depending on the type of worker (employer, state employee, employee of a private firm with only one establishment, employee of firms with more than one establishment, self-employed).

The register allows derivation of variables such as *income*, which is normally unavailable (or at least unreliable) from the conventional census. On the other hand other variables, such as *means of travel to work or school*, which are also unavailable from registers, still remain outside the Danish Census coverage.

Data processing mainly corresponds to the processing of tables agreed on by the EU tabulation program. The tables are processed when the necessary registers are ready for the annual production. In fact, different population characteristics may be available from registers at different times, having as a result the generation of delays and lags in production and dissemination of statistics by SD. Based on census-taking experience, topics such as the labour force, occupation or income may result in delays.

Quality issues

In the past sample surveys were used to complement the register system by providing additional detail and data referring to a specific date rather than a 12-month period (as for some registers) and by providing the means to check the quality of register data.

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Currently even surveys are based on registers. Surveys are still used to collect information in different areas, but not for the census

Two decades after implementation of the first register-based census, with the Danish statistical systems strongly founded on administrative registers, the risk of low quality census statistics might first arise from variables for which collection is required only for statistical purposes (e.g.: *workplace*).

The frequent and heavy administrative use of registers and intensive inter-register communication should continuously allow for the detection and correction of errors: the good maintenance of registers depends on the intensity of use. Nevertheless there are still limitations, such as the fact that people living in the country might not provide information to the CPR, or there may be problems in terms of timeliness of data.

Apart from the census, quality reviews on the products are based on existing information connected to data from different statistical registers.

Data dissemination

SD made available annual statistics for many topics up to the level of the municipality and often for small areas. Statistics are disseminated through publications, electronic database (for free) and individual order to public authorities as well as, on repayment, researchers and other users. Publication of the 2001 Census results has been carried out as stated above, however, no dissemination plan exists other than that for deliveries to Eurostat. All tables are available from Summer 2002.

Costs

There is no budget for the census. SD estimates use of staff for six-months to prepare the tables for Eurostat.

Conclusion

The transition from conventional to a register-based census was completed in Denmark in just over a decade, and followed development of the register system, there are no reasons to foresee a change. The need remains to further improve the quality and timeliness of some census data, which are mostly used for statistical purposes depending on the effectiveness of national administrative agencies. In Denmark, in the current situation, census will be maintained only because is conducted in connection with other full coverage a survey carried out in other countries.

GERMANY

Introduction

The most recent full census in the Federal Republic of Germany was conducted in 1987, in the former German Democratic Republic still six years earlier. No census has been conducted since unification on 3 October 1990. A large-scale test of a so-called register-supported census has taken place at the end of 2001 (5 December 2001: test census night). This delay and change of policy is related to the experience of the 1987 Census and the prolonged discussion that followed afterwards. There was considerable opposition and lack of public co-operation in the 1987 Census. Also, the cost was considered high. The new concept aims at using existing registers to the maximum extent, reducing the response load on the population, and diminishing cost, thus making the operation more acceptable to all concerned.

The census in Germany plays an important role in representative democracy at national and regional levels. It decides the number of seats the Länder have in the Federal Council, the official count of German citizens determines the number of Bundestag constituencies for each Land (Federal State) and the boundaries of each constituency.

As in other countries, the census in Germany also forms the basis for a large number of other decisions and budget allocations. The 1987 Census resulted immediately in re-allocating funds to Länder and municipalities. The total of corrections for the first year that new population numbers were available was already close to € 450 million. So the census is an obvious tool for greater justice in sharing national wealth.

Legislation

Official statistics in Germany are predominantly federal. The **Federal Statistical Office** is entrusted with the methodology, the technical preparation of individual statistical operations, and the compilation and presentation of federal statistics. The **Land Statistical Offices** are generally responsible for implementing federal surveys and compiling results at the Länder level, which are then sent to the Federal Statistical Office. Regional statistics to a large extent are decentralised.

The Law on Federal Statistics of 1987 bases official statistics on principles resulting from the 1983 decision of the Federal Constitutional Court on the population census. These principles have been derived by the Court from the right to "informational self-determination", which follows from the relevant rights enshrined in the Basic Law (constitution) of the country. The 1987 Census was legislated by a separate law, the 1987 Census of Population Act.

The new situation again requires legislation. The Test Census Act of 27 July 2001 provided the legal foundation for the test operation for a register-supported census. It will eventually be followed by a law underlying a complete nationwide register-supported census.

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The concept for the new census methodology proposes to retrieve demographic basic data from the population registers ("*Einwohnermelderegistern*") maintained by the municipalities, of which there are about 13 400 in Germany. This concerns variables such as age, sex and the marital status. Other useful central registers are those about unemployed persons and employed workers subject to compulsory social insurance. These registers are maintained by the Federal Labour Office. There also exist a number of useful decentralised registers (payroll and service offices for public servants, pension plans, and so forth). These can be used to collect information about the economic activity of salaried persons.

It has to be noted that for many practical reasons registers can not be up-to-date. Sometimes information about mutations is received much later than the actual change occurred.

Organisation of the Test Census

The Test Census is meant to provide solid information about the feasibility and potential quality of a register-supported census. Therefore there are traditional interviews of (a sample of) households, the results of which are compared with the population registers.

The data processing tasks associated with the proposed register-based census (see below) are undertaken, and the results then compared with outcomes of the interviews. This provides the opportunity to evaluate the quality of the register-derived data. The use of a combination of registers will sometimes give raise to inconsistencies. The Test Census will help in assessing to which extent such inconsistencies can be resolved through follow-up household interviews in the applicable cases.

A further test is undertaken in all municipalities. The population registers will provide data for persons born on 3 particular days of the year (January 1, May 15 and September 1), as well as for persons with incomplete information for the date of birth. Where the same person appears to reside in two or more dwellings (identical first name, surname, and date of birth), the statistical authorities will ask those individuals for clarification. This will show the existence of either two or more persons, or register error. The size of this sample is about 1.2% of the population, about 1 million records. The number of resulting in-person inquiries will be less than 10% of the selected number of persons, so about 10 000.

Even with register-owning authorities providing all possible co-operation, the phenomenon of register contents lagging reality is inevitable. For the purpose of the test, census register contents will be retrieved first one month after census date, and then again three months later. The registers of the Federal Labour Office can provide final information only seven months after census date. Due to this and other reasons the Test Census will be concluded only 18 months after the reference date.

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Public information

In contrast to the 1987 Census, the large majority of the population will not be contacted for a register-supported census. Only owners of buildings and dwellings, and those who are interviewed in the 10% sample survey (see below), will have direct contact with the census authorities. This requires a much more focussed information campaign, and is likely to remove many public concerns.
Responding to the census questions is obligatory in Germany. The statistical authorities apply complete measures to protect individual information, as required by law.

Field operations

The new model of a register-supported census will greatly reduce the response burden, but it still requires a number of field operations. Information about buildings and dwellings is to be collected by mail from the owners. As of yet there is no register in Germany that can provide this necessary information. To obtain economic information about the self-employed and family workers, there is planned to carry out an additional 10% sample survey of all persons between ages 15 and 65 that have not been encountered in the employment and pension registers mentioned above. This sample survey will expand the basic information about these individuals already extracted from the population registers.

Quality issues

The register-based census as well as the preceding Test Census are likely to reveal some errors in publicly-held registers. These errors will not be communicated to the owners of the registers, as this would violate confidentiality rules for information gathered by interview.

Data processing

The particular nature of the register-supported census will require a number of specific data processing tasks. First of all, the information from the population register and that collected about buildings and dwellings is merged and combined on the basis of street addresses. Using a routine of "automatic household generation", persons are combined into households, and households assigned to dwellings. Various other registers, as well as the sample survey, are used to add occupation and economic activity information to individual records.

After removing temporary attributes (name, address), a data file results that is comparable to those assembled through classic censuses. It can be used to generate tables at various geographic levels, to prepare thematic maps, and with geographic information systems.

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Data dissemination

It is too early to discuss dissemination plans for the register-based census. The 2001 Test Census has generated great interest. Conclusion can not be expected before the year 2003. By that time Germany will also reach a conclusion about whether and when a full register-supported census will be conducted. However the Federal Statistical Office has agreed to meet the data requirements of the 2000/2001 census round by providing substitute data taken, where possible, from available statistics.

Costs

The 1987 Census costed about € 500 million; about 500 000 enumerators were involved. Today a similar nationwide census using traditional methods would probably require twice as much, also taking into account that the national territory, following the 1990 unification, is now considerably larger, A complete register-supported census is expected to be possible for only about 25% of that amount.

An estimate for the 2001 Test Census is about € 50 million. These costs are incurred by the Federal Governmentand the Länder. Thereby one has to consider that most of the expensive face-to-face interviews that the test requires will not be necessary in a full census. Also much of the software development that the test requires will not need to be repeated for the census proper.

GREECE

Introduction

The first population census in newer Greece was held in 1828, immediately afterwards the constitution of Greek State (1821). During this first census, efforts have been deployed in order to evaluate ex-post, population data for the year 1821. Starting with this experience 26 full censuses have been held, normally every 10 years from 1940 on[2]. At international level, Greece is one of the first countries having realised population census.

The 2001 Population and Housing Census has been undertaken under the responsibility of the National Statistical Service of Greece (NSSG) as all the further ones in one day, on 18 March 2001, and covered all the country. During the immediately previous period December 2000 – January 2001 a Building Census was carried out. Through the two surveys, the following units have been enumerated:

1. individuals
2. private households
3. family nuclei
4. dwellings and housing facilities
5. collective residences
6. buildings

The Census has been carried out on the basis of UNECE recommendations and according to the directives of EUROSTAT. With the inventory it is sought:

- the simultaneous enumeration of all the residents of the country, at region, prefecture, municipality or villages levels, municipal or community sector and at self-existent settlement (city, town or village), aiming at the verification of the country's *real population*, that is the number of individuals present at census day in each settlement and this, whatever the cause of presence, even they are permanent residents even they are temporarily or accidentally present;
- the verification of the *legal population*, i.e. the number of burghers in each municipality or community;
- the verification of *permanent population*, i.e. the number of individuals that have permanent residence in each municipality or community and self-existent settlement;
- the collection of data on the distribution of population by sex, age, familial situation, citizenship, level of education and other socio-economic characteristics. The different results will be used for many statistical purposes including the inter-census population estimates.

[2] Censuses were held in the following years: 1828, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1848, 1853, 1856, 1861, 1870, 1879, 1889, 1896, 1907, 1920, 1928, 1940, 1951, 1961, 1971, 1981, 1991 and 2001.

GREECE

Legislation

The Census in Greece is carried out under the 1956 Statistics Law and the 1996 Data Protection Law. For the 2001 Census, the No 70/2000 Presidential Decree *"Execution of General Censuses of a) Buildings and b) Population – Dwellings – Cottage Industry"* gives the legal basis.

More specifically, the realisation of general census was determined diachronically, according to the No 2613/C-347/5-9-2000 Common Decision of the Ministers of National Defence, Foreign Affairs, National Economy, Public Order and Environment, Planning and Public Works as well as the Vice-Minister of Interior, Public Administration and Decentralisation and the Vice-Minister of Economy and Finance.

Organisational structure and preparatory phases

The Project has been organised through a decentralised system while Departmental Units constituted the basic organisational units. The management and administration of the whole system was under the responsibility of the Central Administration.

Working groups were established in each department of Greece in order to supervise all the phases of the Census. Each department constituted one **Departmental Nucleus**. Nevertheless, due to the high concentration of population in Attica and Thessalonica, these two departments have been divided in 37 and 5 nuclei respectively. On the basis of inhabitants' number, each Departmental Nucleus has been divided in **Sector Nuclei**. Each sector was subdivided in 14 until 18 **Census Sections**. Each Census Section included 30 until 35 dwellings in order the enumerators can in one day complete all the interviews relating to the residences and the individuals.

The basic preliminary work included the following phases:

- finalisation of administrative limits of municipalities and communities
- determination of self-existent settlements
- denomination of roads and squares as well as the numeration of buildings
- cartographic work (briefing of maps)
- pro-numeration of residences and inhabited places in settlements with population more than 1 000 residents
- definition of inventory sectors and sections
- organisation and conduction of a Pilot Census (on 31 October 1999)
-

The enumeration staff has been distinguished and selected as follows:

- National Co-ordinators (directors of the NSSG)
- Supervisors (superior executives of the NSSG services)
- Assistant Supervisors (experienced NSSG staff)
- Departmental Inspectors (employees of other public services, institutions, organisms and private sector)
- Enumerators (employees of other public services, institutions, organisms and private sector)
- Translators – Interpreters

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Globally about 180 000 people (including the reservists) were engaged: 9 National Co-ordinators, 91 Supervisors, 475 Assistant Supervisors, 11 224 Departmental Inspectors (regular, special or reservists) and 166 501 Enumerators (regular, experts for collective residences that offer accommodation for 30 and more individuals, or reservists). Finally 1 420 translators and interpreters have been employed to deal with the cases of respondents not speaking Greek.

The census questionnaires had the form of bulletins with special structure and numeration while special printing has been used, in order to be readable from scanners with system of recognition of points (OMR).

The questionnaire for private households and the questionnaire for collective residences were translated in 5 different languages: English, French, German, Russian and Albanian.

Population definition and coverage

The *real population* includes all the individuals that were found in the limits of Greek territory (Greeks and foreigners), while the *legal population* includes only individuals having Greek citizenship or Greek and foreign citizenship, and at the same time, they are burghers of a municipality or community, also including the Greeks temporarily absent abroad.

The 2001 Population Census enumerated the foreigners and the economic immigrants that constitute a difficult population group. This was achieved through the continuous information of the census bodies and the special communication program with the help of translators. The effort of the NSSG was facilitated by the more general political willingness to support, legalise and incorporate the immigrants.

As general rule, were included in the Census, all individuals of each age and sex, whatever their citizenship, nationality and religion, who were present in the limits of Greek Territory (land, marine or airspace) at midnight between Saturday and Sunday, 17 to 18 March 2001. According to the above rule were included in the Census:

- the children born before midnight between 17 and 18 March 2001. Were not included, however, infants born afterwards midnight during the same night;
- the persons died afterwards midnight between 17 and 18 March 2001. Were not included, however, the persons that died before that moment;
- the individuals that left with any means (boat, plane, train, automotive) the country because of foreign travel, before the same midnight, so they were not anymore present in the Greek Territory after the hour zero;
- all the travellers that reached Greece from abroad, that is to say present in the Greek space, before that midnight, even if they remained in the place of entry in the country (ports, airports and other border points) for the control of their passports. Travellers that had not reached in time their accommodation during the day of census, have been registered by enumerators especially appointed for the airports, the ports and the other points of entry in the country;

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- the foreign diplomats and the members of foreign missions with their families and the relative personnel, even if they were Greek or foreigners. These persons have been registered in collaboration with the Foreign Ministry.

Publicity and information

A communication program was drawn and carried out in collaboration with experts. This program included the following actions:

- television and radio spots, some of them were especially addressed to foreigners living in the country;
- posters, leaflets and other printed material delivered to all the public institutions, the transport infrastructure (stations, airports, etc), the banks and other public locations;
- messages diffused through the screens of automatic banking machines,
- informative letters sent to all the embassies, associations of foreigners living in Greece, and other bodies,
- informative material available on the NSSG Internet site.

Data processing

Afterwards the field operations, enumerators sent back the questionnaires to the Departmental Inspectors that later on delivered the questionnaires to their Supervisors. The questionnaires of each nucleus remained for a programmed time interval in the Nucleus Office in order to realise a first logic control as well as a control of completeness.

An OMR system was adopted for data capture of questionnaires in combination with data entry of certain questions. Visual Basic, MS Access and SQL were associated in the data entry system. All the data capture process was performed in some 5 months.
After the intermediate creation of ASCII files and the creation, for security reasons, of backup files, the material led to daily tables and finally was unified in the central database created with ORACLE version 8.1.3. The database is managed through the Oracle Developer version 6.0.

A manual codification of roughly 40% of the total census material was realised by the NSSG employees. The remaining material (roughly 60%) was imported and codified with the help of specific software. The product used for automatic optical reading and codification is considered as very efficient due to the fact that, until now, all the geographical fields as well as the fields of citizenship and titles of study have been already recognised and automatically codified. With regard to the codification of the profession and the sector of economic activity, this work is in development and up to today, more than 60% of data - percentage that is increasing day by day - have already been recognised and codified. It has to be noted that this software which is property of the NSSG will be used for all research and studies implemented by the Institute and for which the same type of codification will be absolutely necessary.

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Following the data capture and codification phase, the data have been submitted to a three phases data control in order to check and analyse the quality of data. The control also included the connection of information between them:

- residence, individuals and immigrants
- identity of residence (geographic code, Census Section and Sector Nucleus as well as serial number of residence in the nucleus)
- verification code
- automatic corrections of connected fields
- corrections and completions of missing fields

After this control the final primary database was created and then a secondary one in which the primary analytic data was brought together at building square level.

Data dissemination

Preliminary results were published on the basis of the enumeration control lists. Final tables of results will be produced directly from the census database starting from 18 months after the census.

For the needs of data dissemination (hard copy, Internet, CDs) to final users, a special database with information at municipal and community level for each department of the country will be created. For the main urban centres of Athens and Thessalonica, the information will be added up in major layers that is areas of building square.

Comparison of results

Main conclusion from the census results on the real population

During the period 1991-2001, the country is characterised by serious demographic changes. The population of the country has increased about 704 180 persons, that is 6.9% against 5.3% during the previous decade.

The most important increase is observed in the department of Eastern Attica with 36.3% and follows the departments of Evritania (31.9%), Kephallinia (21.8%), Zakinthos (19.8%), Kyklades (19.8%) and Dodekanissos (16.3%). The most important increases observed in Eastern Attica (36.3%) and Western Attica (21.1%) are owed not only to permanent but also to temporary movement of population to these regions.

It is pointed out that the islander regions present expected increase due to tourist growth and permanent installation of population employed in the tourist sector. The highest diminution of population is observed in the departments of Arkadia (-3.1%), Viotia (-2.2%) and Etoilia-Akarnania (-1.5%).

Main conclusion from the census results on the legal population

The legal population of 10 206 595 is about 757 485 persons lower than the real one, i.e. 6.9%, while in 1991 the legal population (10 134 534) was only about 125 266 lower than the real one (10 259 900), i.e. 1.2%.

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This difference between legal and real population is due to the fact that, during the 2001 Population Census, 797 093 persons with foreign nationality or without nationality were registered, against just 167 276 in 1991.

The highest increase is observed in the departments of Thessalonika (12.7%), Dodekanissos (8.7%), Pierias (4.5%) and Rodopi (3.0%). At the contrary, the biggest diminution of legal population appears in the departments of Arkadia (-10.8%), Evritania (-10.8%), Grevana (-9.7%), Arta (-8.2%) and Karditsa (-8.1%), and this is mainly owed in the supremacy of deaths against births (department of Arkadia 4 453, Evritania 1 026, Grevena 1 372, Arta 2 161 and Karditsa 3 173) as well as changes of the municipal identification number.

Costs

The final cost of the 2001 Census would be about € 49.7 million – an average of € 4.5 per person enumerated. The most important element of total cost (about 71%) concerns the enumeration process (including training). Expenses linked to the general preparation, services and logistics represent 11.2% of the total cost while about 10% are linked to data processing, checking and coding.

Conclusion

The 2001 Population and Housing Census has been regularly realised according to the planning schedule, without main organisational, administrative or methodological problems, considering the extent and complexity of such a work. The data processing has been achieved in a very short time in comparison with the previous census and this, because of the combination of manual and computer methods.

Despite the fact that new technologies for questionnaire design, data processing and production of results have been used for the first time by the NSSG, all the process was finally successful and gave the possibility to execute full controls of the whole census material and to publish quite quickly the results. These results do not present not acceptable divergences and "extreme" values. All the combined controls using data from natural population movement and other NSSG's researches do not give inconsistent and incompatible results.

To sum up, it is possible to say that the Project was a successful operation mostly due to the following elements:

- evident definitions and explicit directives for completion of questionnaires contributing to minimise errors not due to sampling but frequent during the census operations (errors of correspondence, errors due to the researchers etc.)
- possibility to select, organise and train at every necessary level, all the human potential involved in the Census

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- a well-focused communication programme informing and motivating the population, especially all the "difficult" groups such as the immigrants
- the continuous briefing and support through material and information offered to the census bodies
- the implementation of all foreseen controls during the data processing phase, including centralised controls and comparison between results.

This country report is mainly based on a document prepared by Mrs Ioanna Tsaoussi, Head of Division of Population and Labour Market Statistics, NSSG, for the purposes of this project.

SPAIN

Introduction

There has been a long history of the census in Spain. The first counts were already being taken for fiscal purposes in the 16th century. However the beginning of the census dates to the second half of the 18th century, with the Census of Conde de Aranda (1768) seeing the collection of basic demographic information through a common questionnaire. After this, more successful initiatives were promoted by the Conde de Floridablanca (1787) and Manuel Godoy (1797).

Following a period of war and instability, a new and official population census was undertaken in 1857. This was based on the administrative division of provinces established in 1833 (the same as for today) as well as on population classification. After, as a result of the unreliable results, a new enumeration was immediately organised for 1860, with data on population, education, more detailed age groups and already including a calculation of the *de jure* population. Despite the stated frequency of a census every five years, the next enumeration dates were in 1887 and 1897.

During the last century a census of the population resident in the country and dwellings was undertaken regularly by law every ten years, from 1900 to 1970 and then in March 1981 and March 1991. At this time the building census was undertaken one year before and used to carry out those for population and dwellings.

For budgetary reasons, the 2001 Population and Housing Census was postponed from 1 May to 1 November. This was an extensive survey where around 45 000 staff participated, specifically enumerators who visited 21 million addresses. The project was organised and conducted by the Instituto Nacional de Estadística (INE), with the co-operation of the *Ayuntamientos* (municipalities) and in some respects the Statistical Institutes of the *Comunidades Autónomas* (autonomous communities).

Ten years after the last census, many innovations have been introduced during the long period of preparation. These innovations include integration of the enumeration of the population, dwellings and buildings, use of personalised questionnaires using data from administrative registers, a new relationship to the population register (*Padrón Municipal de Habitantes*), use of the Internet, use of scanners and other features in the data-editing phase.

Legislation

Two types of legislation were considered for the 2001 Census having the following main elements:

General legislation

- Law of 8 June 1957, establishing the responsibility of general censuses supervised by INE;
- Law 70/1980, of 16 December, establishing the organisation of a population and housing census in the years ending with 1, with reference to a date between 1 March and 31 May;

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- Law 4/1996, of 10 January, modifying Law 7/1985 regulating the Padrón;
- Royal Decree 2612/1996, of 20 December, developing the previous Law and establishing a new framework for relation between the Padrón and the Population Census[3];
- Royal Decree 1126/2000, of 15 October, passing the 2001-2004 National Statistical Plan, which includes Population and Housing census to be executed in 2001.

Specific legislation

- Royal Decree 1336/1999, of 31 July, establishing the conduction of the census on buildings, dwellings and population;
- Order of 8 October 1999, providing guidelines for preparatory work;
- Order of 9 August 2000, providing guidelines for processing;
- Royal Decree 347/2001, of 4 April, modifying the Royal Decree 1336/1999 in the Art. 2.2 (date of reference of the census);
- Order of 23 April 2001, which derogates the Order of 9 August and provides new guidelines for processing of the 2001 Census of Population and Housing.

In addition, there are further low-level norms oriented towards clarification of the participation of the municipalities in the census and in post-census work for the improvement of the Padrón.

All census results are covered by laws governing statistical secrecy. Results are to be published only as aggregations. No private firms or public administration will have access to individual data, with the exclusion of modifications that must be communicated by law to each Padrón for updating.

Padrón and Census

The Padrón is the population register, legally established in each municipality to establish an individual's residence. Information is limited to name, identifier, residence, sex, date and place of birth, citizenship, and educational attainment. It is regularly updated in case of birth, death, change of residence or other event on communication from residents.

The Census covers the same population with reference to its usual residence, i.e. the main residence for one year in the case of multiple residences, but having the basic objective of simultaneously collecting fresh and broader information useful for statistical purposes.

In the 2001 Census the questionnaires were pre-printed with the Padrón data for confirmation or updating by respondents; the latter directly reported from INE to the municipalities. This facilitated a more fruitful data collection method based on the new relationship between Padrón and Census arising from the above-mentioned 1996 new general regulation and granting of the right of access to the municipalities for the modification of personal data[4].

[3] The new version of the Reglamento de Población y Demarcación Territorial de Entidades Locales.

[4] It is based on the Ley Orgánica de Protección de Datos de Carácter Personal (1999).

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Main features of the project

The main methodological characteristics of the 2001 Spanish Census were:

- A carefully evaluation of the questions to be presented in the questionnaires, with the objective of providing comparable information for the entire country and each autonomous community.

- Preparatory work based on administrative registers, the Padrón to locate buildings, including main residences (i.e. dwellings resulting as the habitual residence of registered persons), and the Cadraste to identify remaining buildings having dwellings not used as habitual residence.

- Two pilot surveys undertaken in the summer of 1999 and in the autumn of 2000 involving respectively 0.08% and 0.09% of the population.

- Personalised questionnaires that already include key information extracted from registers, with most variables pre-coded, delivered to each address by the enumerators. The return of amended information was then made available to the Padrón with no further burden to respondents.

- Questionnaires composed on separate A4 sheets with:
  a. project's presentation and dwelling sheet;
  b. padronal pre-compiled sheet;
  c. general individual data (marital status, occupation, residence at the time of the previous census, year of arrival in the municipality, autonomous community, Spain, etc.);
  d. individual's current job and educational characteristics (only for people 16 or over who are working or studying).

- Use of two-language forms chosen from Castilian, Catalan, Galician, Majorcan, Valencian and Basque depending on the autonomous community, including provision of the possibility of completing and returning questionnaires over the Internet.

- Hierarchical structure of data collection. First there was one Census Office in charge of co-ordinating 52 Provincial Offices. Each provincial office was managed by the INE provincial director, assisted by several *comarcal inspectors*. Every province was divided into several zones called *Comarcas*, which aggregate up to 72 *Sections* (enumeration units). For each *Comarca*, a *Comarcal Office*, staffed with two supervisors and two clerks and equipped with two PCs, one of which connected to a census network based on mobile technology (GRPS). Each *comarca* co-ordinated the work of about 12 *Zones*, each with an office where material and instructions were delivered to enumerators by the zone responsible and where enumerators returned the questionnaires. Each zone usually had six enumerators, each usually collected data from a section. There were over 42 000 staff for the entire country, 283 *comarcal* inspectors, 946 *comarcal* supervisors, 5 619 zone managers and 35 480 enumerators.

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- Census data were complemented by existing padronal data in cases where questionnaires were uncollected. In particular, determination of the population figures took into account results of field work, and existing padronal data and other auxiliary information, i.e. matching the Police Database of personal identification numbers. Very detailed automatic searches for duplicates were also applied. This way, main sources of under-enumeration and over-enumeration were controlled and population figures are 'final', consolidated, figures, that already take into account all the available information, so they are not affected by any a posteriori evaluation.

- Data processing was carried out after data capture by scanning, OCR, video-keying and video-validation, automatic and assisted coding, automatic imputation of missing and erroneous values. There were open answers for geographical variables, nationality, occupation and activity, for the latter two there was a pre-coded alternative. The open answer only had to be used (and, therefore, codified), if the occupation (or activity) had not been found in the list.

- Open answers were coded in several steps. First, in the process associated to data capture, using dictionaries and validating the entries. Second, in a batch process, against dictionaries. The remaining unencoded entries (very few, as a result of using pre-coded variables) passed to a process of coding where teams of experts (sometimes in the statistical institutes of the autonomous communities) selected the suitable code for the most frequent entries.

- All self-developed IT applications to manage forms and the OCR process were based on the Bellview Scan system from Pulse Train. Data capture was concentrated in a unique centre outside Madrid, where about 800 workers were employed for five months.

- A Post-Census Quality Survey was based on about 65 000 households (200 000 individuals). As it was explained before, this survey deals only with *contents* errors, but not with *coverage* errors, that are already included, as far as possible, in the published population figures.

Publicity and information

Posters and many other methods were used during the information campaign, including a specific website where respondents were able to access census information and fill in and return their questionnaires. This website was in several languages, all Spain's official languages plus Arabic, English, French and German.

The information published on the site was very detailed, especially regarding the electronic treatment of data and method of data capture. The campaign was also supported by well-known personalities from universities, finance, politics and culture, who gave their recollections in connection with the statistical information of their place of birth.

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An information line was inserted on the site. Overall, there were about 400 000 calls mainly concerning the compilation and collection of the questionnaires (79% of total cases) were concentrated mostly in November and December 2001 (70%).

The compilation of the questionnaires on the Internet

Spain is among the few countries where for this census round data collection was carried out over the Internet. Different from other countries, such as Singapore, Switzerland and the United States, only Spain provided this possibility to the larger group of respondents, i.e. all those resulting in their respective dwelling at the level of population register. This was facilitated by the following:

- access to a census-dedicated Internet address;
- use of different national and international languages;
- methods to facilitate compilation for persons with difficulties using the PC, such as for the blind or other disabled persons;
- use of pre-printed data in the questionnaires and other additional identifiers;
- application of an electronic signature-based method in case of modifications to the pre-printed data;
- editing rules and procedures for validation of the entered questionnaires in web format;
- data protection measures;
- reporting system of responses to the *Comarcal Offices* (to avoid enumerators requesting return of questionnaires from respondents who had already used the Internet).

The number of answers by this mean was lower than expected: only 13 768 households filled in the questionnaires using the Internet, i.e. around 0.06% of respondents. There are several plausible explanations, under investigation; perhaps, the most important one is that the paper questionnaires were quicker and easier to fulfill than the electronic form, so there was no clear advantage for answering by internet.

Data dissemination

Based on available sources census results are considered to be the most accurate population measure the country can obtain. However, it is only a statistical consideration, as the **official population figures** are obtained from the municipal Padrónes and published each year, with reference to 1st January, on the basis of a Royal Decree proposed by the INE Presidency and approved by national committees.

In short, the dissemination plan of the 2001 Census is as follows:

- **July 2002**: publication of population figures for the entire country, each province and each municipality;
- **December 2002- February 2003: preliminary results**
- **October 2003**: the final census database will be produced, begin loading the census data-warehouse and disseminate electronic and paper publications.

Most census information can be obtained over the Internet cost free.

SPAIN

Costs

The total cost of the project was carried by INE. The overall cost of a statistical survey first depends on the number of units covered for data collection. This makes the total amount of the last census operation in Spain equal to about € 167 million, of which about 70% was for staff who were responsible for the various phases. The following main budget lines represent preparatory tools and services (about 15%), data processing and equipment (7%), publicity and information (4.5%).

Conclusion

For many years INE has carried out in-depth statistical surveys on individuals and households based on sampling. At the same time, the census follows providing a picture of many socio-economic aspects and elements requiring revision and updating of data (Padrón, population figures and forecasts, calculations, survey samples) at different geographical and administrative levels. Moreover the conduction of this type of project facilitates the updating and harmonisation of data on buildings and dwellings and the connected cartographic tools. The certain high costs still provided immeasurable advantages to the country.

In line with the innovations arising out of this census round, future plans will go deep in this trend of using administrative registers, although a 2011 census based exclusively in them is rather unlikely.

FRANCE

Introduction

The National Institute of Statistics and Economic Studies (INSEE, Ministry of Economy, Finance and Industry), on application of Decree No. 98-403 of 22 May 1998, was placed in charge of the preparation and execution of the 1999 Population Census in France. As communes were involved in the French censuses, it was therefore closely co-ordinated with the Home Office, which is in charge of them. Initially planned for 1997, it was postponed to 1999 for budgetary reasons.

Modern censuses began in 1801, since then they have taken place regularly every five years until 1936 and excluded the war years. The Census in 1999 was the 33rd, following those of 1946, 1954, 1962, 1968, 1975, 1982 and 1990 for metropolitan France[5]. For the first time, this Census simultaneously covered the metropolitan France, the overseas departments (*départements d'outre-mer* or *DOM*, i.e. Guyane, Guadeloupe, Martinique and Reunion, already included in the censuses of 1961, 1967, 1974, 1982 and 1990) as well as the overseas territorial collective *(collectivité territoriale)* of Saint Pierre and Miquelon [6].

The Census covered all usual residents – French or aliens living or intending to live in the metropolitan area and overseas departments for more than six months – as at midnight of 8 March 1999. Two surveys were associated with the Census, one on family history (*Enquête Histoire Familiale)*, the other on daily life and health *(Vie Quotidienne et Santé).*

Since there are no municipal registers in France, the Census first established the **legal (official) resident population** in the communes[7] and facilitated estimation of the annual population structure between two censuses. The Census aimed to provide basic statistics on population, households and housing and to set-up a sample framework for further surveys.

Beginning with the next census round, the traditional census methods will be replaced by a rolling census that will rely on the collection of data in a given area every five years. Obtaining an accurate evaluation of the population living in France at a specific time is no longer possible. This had been the main advantage of the classical census methods.

The basis of a statistical project in France

In France, statistical projects are the subject of systematic discussions between data producer and users. Consultations are lead by the CNIS (*Conseil National pour l'Information Statistique*). When appropriate, CNIS evaluates the justification and

[5] Metropolitan France includes 22 regions and 96 departments.

[6] The second overseas territorial collective (Mayotte) and French overseas territorial communities (French Polynesia, New Caledonia, Wallis and Futuna) were recently enumerated respectively in 1997 and 1996.

[7] France has more than 36 600 communes, half of which have fewer than 400 inhabitants. Larger cities, such as Paris are split into "*arrondissements*", which are themselves considered to be communes.

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utility of the surveys. The Council also discusses the modalities of dissemination of census results. Another committee provides analysis of methods for production of the expected results. Finally, in compliance with the laws governing the public's right to privacy, statistical projects are referred to the CNIL (the national commission in charge of the protection of privacy and freedom); the agency assesses the questionnaires, data processing and dissemination, while maintaining data confidentiality.

Today, the decision to conduct a census is made by decree: the proposal is therefore not debated in Parliament or publicly. There is no constitutional or legal requirement to take a population census, and it is conducted according to budgetary possibilities based on an administrative act. The Parliament is involved in voting the budget.

Preparatory phases

In addition, because it had originally been planned to conduct the census in 1997, the preparatory work had already started in 1993. From that time until 1998, consultations, working groups, field trials, and a "dress rehearsal" facilitated redefinition and experimentation on methods of data collection and use, as well as testing of the questionnaires.

During the fourth quarter of 1993, the INSEE Department of Demography and the Regional Directorates led a series of consultations with main users on the questionnaires for the future census. The information obtained was useful to the CNIS Plenary Session held in December 1993. From 1993 to 1998 the CNIL received successive reviews on the contents of questionnaires (including the expected checking methods, associated surveys, conditions of data transfer and dissemination).

Finally the introduction of new questions, which had been submitted by different organisations, was made under specific conditions. Simple rules (easy to understand, consistent questions, in a coherent sequence, etc.) were applied to the selection of questions to be asked in the building form (DIC), housing form (FL) and individual form (BI).

In the past cartography was considered a production tool used to prepare maps (manually and on the basis of material supplied by the property tax services) useful to facilitate the field work. Following the advent of geographic data systems and new software, INSEE turned to digitised maps, at least for larger communes (having more than 10 000 inhabitants, representing half the population of France). These tools were used in the previous census for the organisation and dissemination of results.

Several pilot surveys were organised to:

- verify that collection of the census could be achieved using digitised plans arising from the application of CICN (Cartography Digitised Municipal Infra) (autumn 1993, including 110 000 households in 1 100 Enumeration Areas);
- test the new questions or changes in formulation proposed in questionnaires (spring 1994, on 30 000 persons living in eight regions);

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- measure the contribution of the property tax file on the control of enumeration coverage and evaluate confidentiality (autumn 1995, on 70 000 people living in ten regions);
- test respondents' reaction to questionnaires prepared from the viewpoint of optical character recognition (OCR) (autumn 1996, on about 10 000 people living in Lille and Paris);
- test a massive collection and computer-linked use of census forms (March 1997, a trial that involved 300 000 individuals living in eight regions).

Finally, a "dress rehearsal" mobilising around 100 000 persons was carried out in October 1997, principally to test training, use of the property tax file and definitive data collection procedures for the family survey.

Public information

A broad media campaign was organised to inform the population: from mid-February 1999 to the end of collection (3 April of 1999), more than 300 messages were disseminated over the main television channels at prime-time. Starting from 8 March announcements appeared in the regional daily press. In addition documents such as posters and leaflets were distributed to the communes to inform inhabitants. The media campaign, using the logo *"Count on me!"* was supported by a toll-free phone line, a MINITEL service and the INSEE website to answer any questions from the public. Various publicity and information activities were outsourced.

Two specific and targeted activities were conducted:

- 'Educational kits' were sent to all school directors and to all those responsible for school learning resources centres. These kits, were authorised by the Department of Education, and were intended for use by 9 to 13 year old pupils at different educational levels. The Population Census was presented as a civic event within the framework of school programmes.

- Several enumerators were charged to have regular (even daily) contact with certain categories of the population, who were considered sensitive to the Census and therefore hesitant about participating (the elderly, foreigners, the physically challenged, and unemployed). An appropriate message was created and disseminated in various forms (posters, leaflets, articles in their evaluations, etc.) to answer their concerns.

Field operations

During this phase the Census brought two hierarchical institutions together – the Ministry of Economy, Finance and Industry, and the Home Office. The following participated over the four week collection period: the INSEE Head Office, local governments head offices, 96 prefectures, 22 regional directorates, around 36 600 communes. Some 120 000 people performed the job – about 500 INSEE supervisors, 3 600 controllers hired by INSEE, 115 000 enumerators hired by the mayors (mostly in the larger communes).

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The collection was clearly divided into two phases:

- enumeration of people living in communities (the services in barracks, pupils in boarding schools, prisoners, those living in retirement homes, students on university campuses, employees in foyers, etc.), was carried out by INSEE in February, and then
- the enumeration of households and their inhabitants in March - April 1999.

INSEE was responsible for the preparation of the Census and the control of field operations and reliability of results. Each mayor was responsible for the implementation of the Census in his/her commune. There were a total of 320 000 Enumeration Areas, composed on average of 150 persons (maximum 800).

Post-enumeration phase

In the most recent censuses in 1962 and 1990 INSEE conducted a post-census survey to measure omissions and double counting and the quality of responses. In 1990, the rate of omission was 1.8% and 0.7% of individuals were counted twice. However the conduction of the 1990 post-census survey created significant problems resulting from:

- limits to define the sampling frame;
- lack of qualified human resources which were, just after the enumeration, highly involved in completing data compilation;
- changes occurred in the period between the census and the survey (with nearly 0.7% of dwellings changing occupants in one month);
- no assurance of coverage of the total population, even with experienced staff;
- difficult physical access to buildings and to dual residences;
- very different result rates depending on zones, limiting the application of corrections;
- need of relevant additional funds.

This experience motivated the decision to avoid a post-census survey in 1999 and to apply various alternative measures, such as the control of census forms, comparison of results with other sources and application of further checking at the data processing stage.

The exhaustive and detailed control of the forms was partially realised. The selection of the method of control – summary or complete – was based on the analysis of data collection reports and control forms available from field operations for municipalities of more than 10 000 inhabitants. It was essentially carried out for districts that had kept the same identification name between the 1990 and 1999 censuses, to compare the numbers of flats and persons between the two censuses. On the whole, INSEE Regional Directorates completely verified a certain number of communes, i.e. about one-third of all collected forms.

Moreover, the number of households in an enumeration district was systematically compared to the number of records in the occupancy tax file. Because of conceptual differences, those two figures were not necessarily equal; however huge discrepancies

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needed to be investigated. This method had only been used in the 1999 Census for the largest communes, whereas in future censuses, it will be used for smaller communes.

Data processing

Based on the decision taken at the time of the two previous censuses, the INSEE subcontracted the work of data capture for the 1999 Census. This was decided for budgetary reasons, and had the objective of reducing the internal workload and of obtaining results faster. There were risks linked to the application of a new technology that had rarely been used on such a large scale. For this reason, additional measures had to be considered regarding the confidentiality of individual data.

Symbols and numbers were automatically read, while textual expressions [8] were entered using an extensive self-developed computer-assisted coding system (SICORE), a method providing a relevant saving of resources and improvement in quality.

Two different types of controls generating messages on screen and paper where applied during data checking, i.e.:

- *"blocking" control*, making it impossible for the result to be recorded, if it was not checked properly, and
- *"semi-blocking" control*, allowing the recording of data, but marked for errors.

At this stage comparisons were made with results from previous censuses (such as a population growth in the communes outside the range -25% - +65%) to detect errors and eventually apply more rigorous controls.

The first and main statistical operation handled about 80% of data from all questionnaires collected to provide quick results for the whole territory, at all geographic levels. The second operation included detailed information on employment and household composition, and was preceded by a poll on 1/4 that provided significant results in geographic zones having at least 2 000 inhabitants. The operation was however exhaustive in the overseas departments and in certain zones of the larger cities.

Problems, encountered delayed this phase for 14 months.

Data dissemination

Between July 1999 and June 2000, three types of products associated to three periods of distribution were marketed:

- the *First estimations of population 1999* in July 1999 and the temporary results entitled *Demographic Evolutions 1990/1999: temporary results* between July and December 1999;
- the *Legal Population* in January 2000 (September 2000 for the national blue part);

[8] Municipality, country, nationality, occupation, establishment (name and address), industry.

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- the *Demographic Evolutions 1962/1999: definitive result* between June and October 2000.

These outputs were the subject of a progressive enrichment and distinguished by three types of products:

- products of commented results;
- standard products (publications, floppy disks, etc.);
- self-service products on the Internet or MINITEL.

Costs

The cost of the Census is estimated at € 187 million from which about 8.5 million for the overseas departments and Mayotte. The total amount was mainly used to pay enumeration staff (62.9%) and for all the activities related to computer processing of data (20.6%). However, this amount does not include work carried out by permanent employees of INSEE and expenditures incurred by the communes related to the organisation of activities. Inclusion of this component would add at least € 61 million, which would be a total cost of € 248 million, i.e. € 4.1 per person (overseas departments and Mayotte included).

Future plans: the "Recensement Rénové de la Population"

Because of the size of the country the traditional census, as conducted in 1999, represented a large and complex project. This results in various risks and problems, demonstrated by the data processing phase. Despite the importance of following up on the complete demographic count, this experience opened up an alternative solution and new method for census taking to investigation called **"Recensement Rénové de la Population" (RRP)**, which is already under way. Following a period of adaptation the new method will be extended to the DOM, while an overall population census will be undertaken every five years in the territorial communities.

The legislative framework to conduct the RRP and the annual legal population was adopted at the beginning of 2002 (Law No. 2002-276 of 27 February 2002). The traditional, country-wide enumeration will be carried out every seven or nine years, with the support of geographic systems, administrative sources and sampling techniques. The INSEE will implement a five-year rolling census. The project will begin in the field in 2004 and will facilitate release each year, from 2008, of the legal population in each commune as well as comprehensive data on all geographical zones that are on average less than three years old.

The RRP is based on an annual classical enumeration using questionnaires concerning all French communes over a period of five years. A distinction is applied depending on the size of the commune:

- communes with less than 10 000 inhabitants will be enumerated completely, by poll in 1/5 each year;
- larger communes will be enumerated partially, every year for all dwellings in a sampling of addresses belonging to one of the five groups in which the territory has been previously split (with the same street being attributed to

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several groups) and defined in a new building register (RIL, *Répertoire d'Immeubles Localisés*). The overall territory of the commune will be considered after five years, and 40% of its population enumerated.

To establish results, each year for every zone having a rotating enumeration in a given zone every five years, this new census will use and take advantage of available administrative data. However all individual data from the census will be used for statistical purposes only, with no cross-linking of registers or any other type of control.

INSEE will follow-up on the organisation and verification of data collection, strengthening co-operation with the communes. The latter will receive additional funds from the State. Furthermore this method will not require an increase in the average annual budget allocated to the census; only a regular annual budget. However, an initial information campaign and new and continuous publicity activities will be necessary.

Already detailed information concerning the RRP has been issued by INSEE, the media or national and international statistical meetings; much information on RRP is available at a level of the INSEE Internet site entirely devoted to the new project.

This country report is mainly based on a document prepared by Ms Karine Sahli-Majira, Demographer, Strasbourg, for the purposes of this project.

IRELAND

Introduction

The Population Census in Ireland is the largest statistical operation undertaken by the Central Statistics Office (CSO). It is also the most exacting, since the field work must be completed over a relatively short period and a complete count of everybody in the country on census night must be obtained. The 2002 Population Census was conducted with reference to the night of Sunday 28 April. The population covered every person who passed the night of Sunday 28 April in the household, communal establishment or vessel or who arrived on the morning of Monday 29 April not having been enumerated elsewhere.

In England there has been an enumeration of the population every ten years since 1801. In Ireland this undertaking was established somewhat later and was more erratic, starting with an unsuccessful exercise in 1812/13 and two other headcounts in 1821 and 1831 before the 'Great Census' of 1841 promoted by Captain Thomas Larcom. Since that time, the need for information on population and agricultural production became increasingly apparent, giving rise to a series of enumerations and preparation of a legislative basis.

Since 1841, censuses were held every ten years up to and including 1911. The first census following the formation of the State was undertaken in 1926 and was followed by censuses in 1936 and 1946. Starting from 1951, Irish censuses have been held every five years, generally in years ending in '1' and '6'. Mid-decade censuses (i.e. those in years ending in '6') cover questions relating only to individuals, while censuses held in years ending in '1' (including the 2002 Census) cover housing characteristics in addition to personal questions. The five-year periodicity was broken in 1976 with the cancellation of the census planned for that year because of budgetary cutbacks. A census containing six questions was held in 1979. This was followed by a full census in 1981. The five-year periodicity was again broken when the 2001 Census (originally foreseen for April 2001) was postponed until April 2002 because of the foot and mouth disease outbreak at that time.

The 2002 Census has been conducted as usual by the CSO which is an independent Office established in 1949. It operates under the aegis of the Department of the Taoiseach (Head of Irish Government) to guarantee its statistical independence and the confidentiality of the collected data.

Legislation

The legal basis for taking the 2002 Census is the Statistics (Census of Population) Order 2001 (S.I. No 481 of 2001) made under the Statistics Act, 1993. Administrative fines in case a person fails or refuses to provide the information requested on the census form or provides false information are defined in the Statistics Order. Under Section 26 of the Statistics Act, 1993 each householder (or any present adult member of the household) and each person in charge of a communal establishment is obliged by law to complete the census form.

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The importance of censuses appears clearly in the Constitution: more precisely, Article 16.2 of the Constitution establishes total memberships of the House of Representatives (Dail Eireann) – i.e. 1 TD per 20.00 to 30.00 – depend on the population as measured by the census.

The Statistics Act which established the CSO as a statutory body of the Civil Service reinforced its independence and data confidentiality. The public therefore is assured that the information provided will be treated as strictly confidential by the CSO. It is used for statistical purposes, and the results are prepared and disseminated in a fair and impartial manner. The names of individuals are not entered into any computer database and no other Government department or agency has access to identifiable information relating to individuals or households. Furthermore, the 1993 Statistics Act allows census returns to be made available as public records 100 years after the relevant census to ensure confidentiality.

Preparatory phases

A Pilot Test was carried out in September 1999 covering the 0.6% of the population with reference period Sunday 19 September. Based on the findings of this test and following a Government decision a number of new questions were added, including:

- PC ownership and access to the Internet
- nationality
- membership of the Irish Traveller Community
- disability (2 questions)
- time of leaving home for work, school or college and travel time taken
- third level qualifications held
- providing regular unpaid help for a friend or a family member
- labour market participation according to International Labour Office recommendations

As compared to previous censuses the census form was radically altered. The questionnaire used in the 2002 Census was a 24-page booklet catering for up to six persons present in the household on census night (3 pages per person). Where more than six people were present a continuation form catering for a further six persons was used. The household form sought limited information (8 questions) about persons who were temporarily away from the household on census night whether elsewhere in Ireland or abroad. The purpose of these questions was to provide details of the usually resident population and to enable an analysis of the permanent composition of households to be undertaken.

Prior to census day, the following tasks were completed:

- division of the whole country into approximately 4 000 non-overlapping Enumeration Areas (EAs) containing approximately 350 houses each;
- identification of the boundaries of all administrative and geographic areas (i.e. counties, towns, suburbs, Electoral Divisions and town lands);
- provision of a detailed map for each EA with all boundaries marked to ensure the coverage of all households and residential establishments located within the EAs;

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- interviews of approximately 15 000 applicants in some 200 different locations for the temporary field force positions.

Publicity and information

In order to raise the awareness of the population, an intensive public awareness campaign was conducted on TV, radio, in newspapers and outdoors during the month leading up to the census day. Its purpose was to encourage and remind people to fill out their census form. This campaign, which was open to public tender, was handled for CSO by Dimension Marketing Limited.

The advertising campaign was complemented by:
- information leaflets on the census, given to each household with their census form
- widespread display of posters
- education packs for primary and secondary schools

The main target of the publicity campaign was the general public. Other approaches were specifically aimed at the traveller community, ethnic minorities (via the website) and visitors to the country.

The CSO created a specific census website giving guidelines on filling out the forms, allowing the downloading of samples of the census form in seven different languages, answering frequently asked questions and providing a wide range of background information on the project. The website contained extensive material for use in schools. For example, it allowed the user to download lesson plans and activity packages (in PDF format) covering all levels in primary and secondary schools.

The most interesting feature on the census website is the *'Step by Step Guide to the Form'*. This guide covered all questions on the census form relating to individuals and explained why the question was being asked and what the CSO is able to deduce from the answers. Each question is complemented with statistics produced from the previous census and guidelines on how to answer the more complex questions.

Field operations

A temporary field force consisting of five **Census Liaison Officers**, 35 **Regional Supervisors**, 350 **Field Supervisors** and some 4 000 part-time **Enumerators** carried out the enumeration. A small **clerical staff** was employed over four months in the unpacking, receipting and batching of the census forms. A total of 190 CSO **permanent staff** were employed during the census to fulfil a range of duties including recruitment, mapping, distribution, advertising and processing.

All necessary materials (census forms) were packed into 8 000 enumerator storage cases and delivered directly from the CSO office in Swords by a specialised transport company to the 21 Regional Offices and 350 Field Supervisors. Then the blank census questionnaires were distributed by the enumerators to every household and communal establishment in the country during the four weeks immediately before the census night. The collection of completed questionnaires by the same trained enumerators started on

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Monday 29 April and ended four weeks later. It was not possible to return the form electronically because of security and administration concerns.

The form should have taken less than 30 minutes to fill out, depending on the number of people in the household while the enumerators had to provide any assistance, required by the public.

A listing form was provided for communal establishments. Every person present in the communal establishment on the census night was listed on this form and received an individual form for completion.

An Irish language version of the household form, continuation form, listing form and individual form was available for completion by any person who required one. In addition, the main text of the household form was translated into Albanian, French, Polish, Romanian and Russian to assist people who were not familiar with either English or Irish.

Furthermore, special arrangements were made to assist the visually impaired to fill out their census forms. A large print version of the individual form, as well as versions in Braille and on audiotape, were provided in consultation with the National Council for the Blind in Ireland. Assisted by the National Adult Literacy Association the CSO made arrangements for people with literacy difficulties. The enumerators were trained to offer help to anyone having difficulty completing the census form.

Each enumerator was required to prepare a summary for his/her EA. These summaries were returned to the CSO in advance of the main body of the census field records had to be used to establish preliminary results.

No post-census quality survey was implemented.

Data processing

The census form was redesigned to be scanned. When the completed census forms were returned to CSO they were guillotined and scanned and the information on them read using up to date recognition technology. The census forms were converted into computer images and, using OCR, were converted into readable data for checking and coding by computer. This was carried out with the assistance of 80 CSO staff. Data capture was performed using the software Bespoke System built on AFPS-PRO (Top Image Systems Israel). ORACLE was used to store both data and form images during processing. SAS and TPL were used in the data processing phase.

In the design of the questionnaire extensive use was made of tick-boxes, while responses, which required information to be written in (e.g.: occupation, industry), used constrained boxes where the relevant texts were provided.

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A trimmed down version of NACE Rev 1 (131 headings) was used to classify responses to questions on the industry of a person's employer enabling results to be classified by these 131 headings or 2-digit NACE. Occupational responses were classified using the UK Standard Occupational Classification 1990 allowing correlation with ISCO-88.

A mix of automatic and computer assisted coding was used for all questions having written in text responses including occupation (SOC 1990) and industry (NACE based). In all cases texts were directly matched against a text look-up dictionary if no match was found. The record was displayed to the operator for computer-assisted coding. In the case of occupation coding an expert coding package (Precision Data Coder) was used where the direct match look up fails to code.

Data dissemination

The preliminary results of the 2002 Census comprised of population by sex at the small area level were published within three months of census day. The CSO gave top priority to the early publication of the detailed results. Inevitably there was a delay in publishing the census results because the details of over 1.4 million households and 3.8 million people had to be checked for accuracy and consistency, corrected where necessary, and a number of personal characteristics (e.g.: occupation and business) had to be coded in detail. This was a sizeable job, which was completed by over 150 staff temporarily assigned to CSO for a period of about two years.

Output products will consist of tables to be made available in traditional publications as well as on the website using specialised software (Beyond 20/20). This is a new web-based tool providing access to large data tables. All published tables from the 1996 Census are already available in this format.

A number of dedicated volumes will be produced. The main demographic results will contain tables and commentary as well as principal socio-economic results. Within two years of the census the full range of results will be released in the traditional manner in a series of subject-matter volumes (e.g.: areas, age and marital status, household and family, migration and birthplace, etc). In addition increased emphasis will be placed on disseminating the data electronically, i.e. on CD-ROM and via the Internet. A 5% sample of anonymous data will be made available to recognised institutes for consultation.

All publications and output products will be made available within 14-24 months after census day. More precisely, it is foreseen that dissemination of the definitive analyses of the population by such factors as age, marital status, occupation, etc. will begin in mid-2003.

Costs

The total cost of the 2002 Census in Ireland was € 44 million. This amount includes € 8 millions for the cost of the one-year postponement. The greatest portion of these costs was for expenses related to the process of enumeration (including training of enumerators), corresponding to 46.9% of the total cost. Data processing, checking and

coding was 25.4% of the total cost. Included in this amount were the general preparation, cartography and mapping, data processing and analysis and dissemination cost. CSO used 22.3% for equipment and the remaining 5.4% was used for the pilot micro-census (1.7%) and publicity and information campaign (3.7%).

Conclusion and future plans

The field operation was excellent, however it is becoming more difficult to realise 100% enumeration in certain urban areas. Nevertheless, it is foreseen that the next census will be traditional with a classic questionnaire to be completed by individuals.

Based on the Irish statistical system, the census is still the fundamental tool used for the revision of population data in the inter-census years, population projections and other activities, such as the Labour Force Survey.

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Introduction

The first Population Census in Italy was held in 1861. Since that time 14 enumerations have been carried out normally every ten years, jointly with the Housing Census since 1951 and in connection with the Census of Economic Units since 1961. These surveys are carried out as a complete enumeration based on the traditional compilation of questionnaires by respondents.

In 2001, in connection with the **Population and Housing Census**, the first **Building Census** was introduced to set-up a geo-referenced database on stock, location, seismic risk and other characteristics of the buildings. After the Agricultural Census undertaken in 2000, all censuses above were jointly taken that year with midnight between 20 and 21 October as the reference time (22 October for the 8th Census of Economic Units).

All these surveys were organised by the Italian National Institute of Statistics (ISTAT) and carried out with the support of a complex peripheral structure down to 8 101 municipalities (communes).

Apart from the introduction of buildings as an independent enumeration unit, other innovative features characterised the contents of the questionnaire and instruments used, such as the optical reading for data capture or the extensive use of Internet to monitor field work, share information and for dissemination. Questionnaires, organisation of field operations and new tools were tested through a Pre-test (April 1998) and two Pilot Surveys (October 1998 and April 2000).

The determination of the legally resident population remains among the main objectives of the census. Results are also used to revise the population estimates by sex and age at different geographical level for the previous inter-censual period.

Legislation

The provisions giving ISTAT the responsibility to conduct the censuses is provided for under Article 37, Law No. 144/1999 and Operational Regulation (D.P.R. 276/2001). Censuses are also based on the Italian Constitution. Other national acts mainly established (or updated) in 1989 and 1996 regulate the Population Register Law[9], the National Statistical System and ISTAT, the collection and treatment of personal information. All data from censuses or other surveys are only and exclusively for statistical purposes and can be published only in table format so that information cannot be traced to any individual.

Other relevant decrees dated 2000 provide for the 2000-2002 National Statistical Program and the list of statistical surveys and oblige private individuals to respond. Administrative fines in case of refusal by respondents are defined for individuals or corporate bodies.

[9] 'Regolamento Anagrafico della Popolazione Residente'.

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Registers

A local Population Register ('*Anagrafe*') is hosted by each commune (municipality). The *Anagrafe* contains, by law, the usually resident population comprised of people who have their usual residence in the commune and are updated by registration of vital events, migration, change of address, marriage or other event[10]. A central population register does not yet exist, while other administrative registers are available in each commune, such as those for non-nationals resident in that territory and the Italian nationals abroad([11].

Since 1991 each commune has been responsible for updating the *Anagrafe* and the commune's **legally resident population** based on the Census before submission of results to ISTAT. The experience of the 1991 census demonstrated that municipalities performed this duty in almost all even years after the census, apart from 15% that did not perform any comparison.

In the past, census data showed that resident populations were below the expected register data, however following several controls under-enumeration was usually reduced. The main reason for this difference is related to inaccuracy of registration, where those who have died or emigrated have not been deleted. This is related to advantages that may be obtained from particular administrative and economic arrangements (such as allocation of public benefits, elections, local laws), which are connected by law to the size of the commune. The phenomena is more frequent in communes where demographic size nears the threshold connected to the advantage and is more frequent in southern regions.

The quality of the *Anagrafe* is highly variable because of the different level of computerisation and use of different standards. Based on a country wide survey, in 1998 computerisation covered 100% of the large communes (with at least 50 000 inhabitants) but there were still 9.3% mostly small communes (including 4.7% of the total population) which were not computerised.

Other administrative registers on individuals exist at the local and national level, however the degree of efficiency and the possibility of automatic linkage through computerisation remain low and still limit their use for statistical purposes. Recent efforts such as Project SAIA[12] have been devoted to linking registers to each other through the definition of standard classifications and procedures between communes and other national agencies.

[10] Name, relationship with head of household, sex, date of birth, place of birth, marital status, citizenship, educational qualifications, occupation or other activity (housewife, student, retired) are the information recorded for each person in the Registry Office. Some data, such as educational qualification and occupation are however infrequently updated.

[11] 'Anagragfe degli italiani residenti all'estero' (AIRE).

[12] *'Sistema di Accesso ed Interscambio Anagrafico'* ('System to connect and exchange demographic information of population registers').

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More topics, new observation units and definitions

Contents of questionnaires were largely arrived at though consultation with universities, SIS (the Italian Society of Statistics) and international organisations. Apart from the new observation units, relevant to measurement of commuting, questions related to people's migratory background, education, economic status and work activity were modified and extended to meet requirements and other surveys and to respond to recent socio-economic changes. Examples are information on acquisition of citizenship, education attained abroad or interim or training contracts.

The Population Census followed focusing on the legally resident population, i.e. ***persons usually resident*** in the commune, those having their usual residence in that commune whether they are present or absent at the date of the census, whether already enrolled or need to be. Simply, it is the population that resides, works, sleeps in the same commune.

Nevertheless, as a result of the increasing number of workers or students or other people who spend a part of the year, or week, living in another place (or places) and cannot be identified by a single place of usual residence, the project was also used to count the ***temporarily resident persons***, i.e. those who work/study/stay in a commune for more or less prolonged periods although not resident.

Many attempts were made through pilot surveys, to adequately enumerate these people without increasing the burden of the questionnaire on respondents – as it happened some people had to fill in two sections of the form, one for their usual residence and one (or more times) for their temporary residence(s). As a main conclusion, the questions for these respondents were reduced to mobility issues using the reference to the twelve months preceding the census date as a filter.

The questionnaire still provided separately the ***occasionally present persons***, i.e. those who at census time were present, as visitors, in a dwelling different from their usual residence.

Based on enumeration of the population's aggregates above and filters to specific answers it is possible to establish the following for each commune:

- **resident population**
- **present population**

and the increasingly relevant

- **population that 'stands on the territory and uses it'** – the entire count of the resident and non-resident people who live (work, study, ..., and at the same time use public transportation, consume, sleep) in a given commune frequently with regard to a given reference period.

The Building Census aimed to collect a complete set of data on residential buildings and basic data on non-residential buildings. Compared with 1991, when information was provided only for residential buildings by each respondent with often incoherent results, the 2001 ad hoc form was filled in directly by enumerators and covered more units (in short, all buildings in urban areas and residential in non-urban areas) and more variables

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(from the state of conservation to the source of information – owner, renter, other person).

Using this data collection and an unique key-code, linking together building-dwelling-household, it will be possible to provide the broadest picture of living conditions throughout the country, as the existing national register of constructions ('*Catasto*') is not connected at all to people living in each dwelling and lacks data on housing equipment.

In conjunction with the new unit of analysis concerning the population, in the framework of the Housing Census *occupied dwelling* was considered the inhabited dwelling or living-quarters regardless of usual residence of the occupants. The set of topics investigated for each *occupied dwelling* was extended to the presence of a cooking corner, private car parking and the type of work carried out in the dwelling during the past ten years.

Publicity and information

So as to raise the awareness of the population as well as that of companies and institutions ISTAT organised a robust information campaign using various means – from TV messages to SMS – with support from public agencies and private firms (airport firms and airlines, city public transport agencies, electricity and gas providers, associations, etc.). Messages were addressed at ensuring respondents would confidently and actively participate because of the relevancy of the project, and the privacy of their responses was guaranteed.

The material provided through the Internet included questionnaires, leaflets, multi-lingual posters, FAQ, animations, press releases, examples of targeted material directly prepared by communes. Instructions and documentation were there largely provided with support from FORMSTAT. A toll-free number was available during the enumeration phase.

An extensive activity named *'Census at school'* was organised in conjunction with the Ministry of Education, SIS and other partners six-months before the census day in about 2 000 compulsory education schools, with 190 000 students participating in the preparation and conduction of a survey on their daily activities. After implementation, the results and a fable summarised information published on the ISTAT website. This was later performed as theatre. Moreover, material on the meaning and objective of enumeration for secondary education schools was provided on-line.

Enumeration and comparison Census – Anagrafe

The complex organisational structure, not that different from 1991, was based on the 18 ISTAT Regional Offices, Census Provincial Offices at CCIAA[13] and Census Commissions at prefectures at the province level, down to the Census Municipal

[13] Census offices established within the statistical offices of the '*Camere di Commercio, Industria, Artigianato e Agricoltura'* (with the exception of some autonomous provinces and regions, where offices were hosted in the administration's statistical services).

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Offices. Basically municipal offices conducted the field work and revised the Anagrafe, while provincial offices assisted, coordinated and monitored their work. Special procedures and direct contacts were arranged with the 13 larger cities.

Mapping for enumeration was supported by **CENSUS 2000**, the updated version of the ISTAT geographical database, which had already been established for the 1991 Census from remote sensing images, maps from institutions such as the Italian National Mapping Agency([14]) and information from municipalities. Thanks to the help of the municipalities all the enumeration areas in extra-urban areas were redesigned and reduced in size to obtain integration of all national censuses.

Two of the most innovative features of the project were a web application for sharing information and monitoring transmission of material and summary results as well as common software for the management and transmission of auxiliary enumeration forms. However paper models were still used in many cases, primarily by all communes that did not have a computer connection.

To facilitate participation of immigrant groups currently represented in Italy, a consistent sub-group, the census questionnaire was translated into twelve languages. Moreover, it was suggested that communities involve associations and organizations active within the immigrant community in the process of enumeration. This was accomplished by staff experienced in this field and by hiring native speakers from the most representative foreign groups in the particular area.

In total a staff of about 120 000 units, of which 95 000 enumerators who were mostly temporary staff, were activated and provided with detailed maps with the itinerary and list of expected households to dispatch forms and enumerate buildings during their first round (3-21 October). Because of problems encountered the deadline for the collection of forms was officially postponed.

The comparison between Census and *Anagrafe* sorted out some relevant differences that cleared the way to discovering units that were not enumerated during field work. In fact, based on preliminary census data, the resident population was found to be 1.5 million less than the 1.1.2001 population at the *Anagrafe*, i.e. -2.7% (compared with -1.6% and -2.3% for 1981 and 1991 respectively), with picks of -6.1% in Lazio and -4.1% in Sicily. The distance was particularly wide in municipalities where, on more census occasions, the comparison had not been carried out and in larger cities where operations were still incomplete (five months after the census day, questionnaires were sent back to ISTAT by 84% of communes covering only 42% of the population). Past experience allows estimation of a final difference of less than 2.1%.

Data processing and control

For the first time OCR was adopted for data capture for census questionnaires. ISTAT outsourced the whole process of design-printing-transportation-scanning of the forms to only one private supplier (plus a second for tasks of control). In addition, the company was asked to automatically code the main alphabetical strings (commune, country of

[14] Istituto Geografico Militare' (IGM)

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birth, citizenship, level of education). A second stage of automatic coding for economic activity and occupation was planned later within ISTAT using the software Automated Coding by Text Recognition (ACTR) developed by Statistics Canada and the test results from the previous stage regarding the presence of textual answers in correspondence with the target questions.

Following the phase of data capture, data were submitted to a data control system to check and analyse the data quality while processing was ongoing (the different availability over time of census results between smaller and larger communes indirectly facilitated this approach) and then both systematic and probabilistic errors were corrected. This process will allow provision of a larger set of data quality indicators. In a broader view, a data quality management approach has been applied to the main phases of the Census – field work, data capture and data processing – with several areas of detection, analysis, correction and measurement of errors.

As part of the data control, two Post-Enumeration Surveys were taken to evaluate census errors of coverage and measurement respectively based on a sample of enumeration areas. Both these surveys intended as external sources of control were not be used to correct results.

Data dissemination

Provisional results based on auxiliary forms have been published (March 2002) in hard copy and, in more detail up to the level of the communes, in a website called *DaWinci*[15] where users may freely move in accordance with different paths and switch from one dimension to another and vice versa. This tool, which includes an interactive cartographic module for thematic mapping, a user guide, a glossary and a download area, will also be used for the legal population figures. Another system is currently being developed for further dissemination.

Dissemination of further results is scheduled as follows:

- amount of legal population: November 2002
- households and population tables based on a 2% sample: December 2002
- final data: from January 2003 on, until about three years from census date.

Costs

The State allocated around € 300 million to the Census, 78% of which was directly given to the municipalities and other institutions participating in the field work. The remaining 22%, around € 67 million, was used by ISTAT for the communication campaign, printing and delivery of the census forms, data capture and processing. The Pilot Census (was directly supported by the ISTAT budget) and the publication and dissemination of results are outside the costs indicated above. Finally, the overall cost will be between € 5 and 6 per person.

[15] Data Warehouse on Internet of the Italian Census (http://dawinci.istat.it:2001/).

ITALY

Conclusion and future plans

The last census project was characterised by problems with funding, field operations, OCR and respondents' obsession with privacy. New technologies, efforts to improve registers, quality aspects and mostly cost-effect analysis for the population census placed ISTAT in a position to move, in the long term, from direct and complete enumeration to a survey, at least partially based on the use and integration of data from registers. Some decisive steps in this direction were applied in the recent Census of Industry and Service. Clearly, moving in this direction the improvement and computerisation of local population registers (although still far from the ideal situation across the whole territory) and the current setting-up of a *National Index of Anagrafi* represent the key steps.

LUXEMBOURG

Introduction

Since 1855 Luxembourg has organised 28 population censuses, beginning with twice each decade, four times in the forties, then in 1960, 1966, 1970, 1981, 1991 and 2001. The enumeration was normally carried out in December (regularly until 1935 and four times consecutively after the Second World War), in the first months of the year in the three most recent cases.

In Luxembourg, as in other European countries, the population census is still the basic survey used to gather information concerning the demographic and socio-economic characteristics of the population and is the best source of exhaustive data down to the smallest geographical level.

The project had two main objectives:

establishing statistics on population and households (structure by sex, age, citizenship, education, living conditions, profession and economic activity, commuting to school or work), and
setting the usually resident population for the country and its administrative division (communes, electoral sectors, localities).

The second objective arises from a set of national laws obliging the National Statistical Institute (STATEC[16]) to determine the resident population through a census. This resident population is first used to attribute the size of the local administrative authorities; however population figures are also used to attribute taxes and concessions.

The last **Population, Housing and Building Census** was conducted on 15 February 2001. Questionnaires were dispatched and collected by enumerators. After checking and coding was carried out by the offices in the communes and STATEC, the collected information was entered using traditional data entry. Some innovative technologies were applied at the data dissemination phase.

Legislation

The main legal basis of the census is the electoral law. In addition, a regulation for the execution of the specific 2001 survey was issued on 18 January 2001. The inhabitants' participation is compulsory to the relevance and success of the project. The same regulation allows for the setting-up and processing of a nominative database. Individual data collected during a census are confidential and may only be used for statistical purposes. All staff participating in the census are engaged with respect to statistical confidentiality.

Starting from 2001 the communes were able to use census data to update their population registers. At the same time the communes were asked to provide the census

[16] Service Central de la Statistique et Etudes Economiques.

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questionnaires with the basic data on sex, date of birth and citizenship (this agreement was not always respected).

Names and addresses of respondents were requested to technically facilitate enumeration (to avoid over- and under-counts and to modify the resident population of each locality taking into account that some people are enumerated away from their place of usual residence). The sheets presenting these data were separated from the questionnaires immediately prior to the data entry phase. Despite this method, the identification of respondents on the basis of the questionnaires was technically possible using the codes of the communes and the identifiers of enumeration area, building, dwelling and individual.

Registers

The Personal Identification Number (PIN) and several administrative registers are used in Luxembourg. The main and most reliable administrative source is the *'Centre commun de la sécurité sociale'*, where each person is registered as soon as he/she is employed in the country. This source is based on five different files and updated through the employer's monthly report on wages. The population central register *'Répertoire général des personnes phisiques'* (CPR) supplies information to the first register, however, notification of changes from the Social Security Authority, for instance when a person leaves the country may be late in arriving. Some data concerning the employer as the NACE code and the demographic statistics come from STATEC.

There are three main limitations to these sources:

- poor reliability of the CPR, with different methods applied by the communes in the registration of asylum seekers or problems arising from registration of employees at international organisations;
- the NACE code corresponding to the main activity of the employer instead of the activity carried out by each employee;
- the address of the employer always referring to the address of the head office.

Despite the above-mentioned problems, the social security files are the most important sources for employment and unemployment statistics. During planning for the 2001 Census the use of this system was avoided, because little of the information normally collected through a census could be taken from these sources – as they were unreliable, partial or had no information, respectively, on individuals, their profession or place of work.

The situation should however change in the future, first because the *'Centre Informatique de l'Etat'* (CIE), which is responsible for the CPR will reorganise this register in the *'Registre de l'Etat Civil et de la Population'* as the central element of an integrated registers system common to different institutions. In addition, Luxembourg will establish a new register of all localities and streets, under the authority of the *'Administration du Cadastre'* and the support of the CIE, with a common database for

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the entire public sector[17] useful for establishing a national register of buildings and dwellings over the long term.

Publicity and information

A public awareness campaign was undertaken on the census and information was broadcast on national TV and radio, newspapers, magazines and the STATEC Internet site. Brief information and instructions were provided with the questionnaires in four languages: French, German, English and Portuguese[18].

Field operations

Field operations were carried out in 2 826 enumeration areas using the following forms:

- the *Bordereau de maison* (Modèle I) and the control list (Modèle IV) assigned to the enumerators
- the form for households and dwellings (Modèle II) or the form for the institutional households (Modèle III), to be filled in directly by respondents
- summary sheets 'SE' and 'QR' (Modèles V et VI) assigned to the communes.

After enumeration and a first checking of the questionnaires, carried out by around 1 847 temporary contracted workers over three weeks, based on the instructions received from STATEC the communes were responsible for:

- checking complete coverage of the enumeration;
- providing, when missing, data on sex, age and citizenship from their population registers;
- verifying the hierarchical numbering of the different documents regulating the identification of the form during the overall census process.

Later a (mostly manual) editing staff at STATEC carried out the following tasks:

- setting the resident population by commune and electoral section;
- coding of profession (ISO) and economic activity (NACE);
- correction of errors.

Unfortunately many questionnaires and control forms returned to STATEC displayed errors and missing data, causing a delay in providing the material to the external company responsible for data entry.

Another constraint to field work concerns inclusion of asylum seekers in the usually resident population. In fact, based on the advice of the Ministry of Justice, just before the enumeration it was decided to definitively consider, as usually resident in the

[17] There are currently several differences between the addresses used by the local authorities and those used by the post and some boundary lines of localities, which are changed according to the needs of the public services.

[18] Non-nationals represent about one-third the population living in Luxembourg. Among them, the Portuguese community is the most represented as a result of long-term immigration.

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country, only foreigners provided with a provisional permit of stay or an identity card. Later, as several communes did not respect these instructions, so as to treat all communes equally and to avoid supplementary and cumbersome correction, STATEC proposed considering all asylum seekers present in the country at census date as residents. This a posteriori solution is, however, in line with the yearly population evaluations where asylum seekers contribute to both the natural and migration balance.

Data processing

As stated above the data entry phase was outsourced to a private company. At this stage some remaining coding for NACE were automatically applied. The entire data entry phase was carried out by 2001, in about eight months.

Data dissemination

First provisional census results on resident population by communes, electoral sections and localities were published in February 2002 in the national regulation dated 28 January 2002. The technical and methodological aspects and especially the difficulties met in the definition of the resident population are largely represented. Although provisional results (based on control lists), having expected minor differences to the final, these data establish the number of *'conseillers'* to attribute to each commune or electoral section.

Since May 2002 a set of **thematic fiches** of one or two pages in PDF format has been published on the STATEC Internet site presenting the analysis of disparities and similitude between the communes. These fiches, which are prepared in the framework of the Project GER[19] with the support of the Luxembourg University Centre, will be grouped at the end in a census-based atlas of the communes ***'Portrait des communes'***.

Final results displayed as a broad tabulation program were published on the Internet site in autumn 2002, first in an incomplete and preliminary version, later in the definitive and hard copy version.

Apart from standard tables, all census results will be further available in other forms upon request from users.

Costs

The overall cost of the Census will at end amount to around € 4 650 000.

Conclusion and future plans

Under the prevailing organisation of the Census the success of the survey strictly depends on the communes, on their accuracy in respect to instructions provided by STATEC. The latter does not have the means, or the individual records, to carry out checking or improvement of the collected data, this became obvious during the 2001

[19] Grande Etude du Recensement.

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Census. The most recent experience gives support to STATEC in the use of administrative sources for the next census round. This will be after improving the national administrative register system and, before this, the central population register and the implementation of subsequent major changes to census legislation and data protection.

NETHERLANDS

Introduction

The Netherlands carried out its first population census in 1829 as a simultaneous country-wide count with aim to establish local population registers according to a given model. Afterwards the enumeration was organised at intervals of approximately ten years, under the responsibility of the Ministry of Home Affairs first and Statistics Netherlands after, from its establishment on (1899). The 14th and last conventional census was conducted in 1971. Ever since then national census data – population and dwellings – are obtained using a combination of administrative registers and sample surveys. The original reason for leaving the complete enumeration stays in the changed attitude from respondents to participate to the census and the household surveys more in general.

Legislation

The Official Statistics Law of 1996 governs statistics in the Netherlands. Apart from this, the 1999 Law on Protection of Personal Data affects statistics, as it addresses the broader issue of protecting citizens from intrusion upon their rights to information privacy. According to the 1970 Census Law decennial censuses of population and housing should be undertaken using conventional methods. Following the postponement of the 1981 Census and due to the possibility to obtain equivalent data from other sources with lower costs, this law was rescinded in May 1991.

Preparatory phases

Since the census is no longer a one-off operation, there is no preparatory phase as such. Census tabulations are obtained from a socio-economic micro-database that serves census as well as other purposes. However, an effort will be undertaken to optimise the quality of the database immediately before official figures are being generated, such as at the time of the decennial census rounds of the European Union.

The data sources for the Dutch census programme can be grouped into three major categories:

a. *Administrative registers*: Municipal basic administration of person data (Population Register); Employee insurance schemes registration system; Public sector employees disablement benefits administration; Social assistance benefits administration; Employment Service Agencies files; Students at vocational colleges and universities; Income information system (tax related, 1% sample); Register of addresses of institutional households; Dwellings register; Real estate valuation register (tax related); Geographic base file.
b. *Business sample survey*: Survey on Employment and Earnings (50% sample of jobs).
c. *Household sample surveys*: Labour Force Survey (1% sample of persons in private households aged 15 or over); Living Conditions Survey (1% sample of persons in private households).

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All sources are used integrally, unless otherwise indicated. Each of the sources contributes information on topics included in the 2000/2001 EU Community Census Programme, and the final results are in accordance with it. But not all topics are covered equally well. Furthermore, most administrative sources suffer from some form of bias. Also, business and household surveys are inevitably subject to sampling and non-sampling errors. In household surveys in particular, selective non-response and under-reporting are an important concern. The carefully considered combination of the various data sources provides a path to census results of acceptable quality.

Public information

The statistical system that generates "census" results is based on the integration at the micro-level of administrative registers and the results of household and business surveys. This creates integrated micro-data files of persons, families, households, jobs, benefits and living quarters. As part of this programme, a procedure was developed to inform all respondents of surveys about the wider use that will be made of the data provided by them.

This procedure consists of two elements. The first is a clear statement in the letter that invites people to participate in a related inquiry. It states that Statistics Netherlands may link the data provided to other available information, but that the privacy of each respondent is protected.

The second element is a brochure with a more elaborate description of the use of individual data by Statistics Netherlands, and how confidentiality is indeed guaranteed. The document, which is sent to the respondent on request, or handed out by the interviewer, contains a clarification of the purpose of this and other statistical surveys, and explains how the results will always be published without disclosure of individual information. It lists other data sources used by Statistics Netherlands and describes how data from different sources will be linked. The brochure concludes with a more detailed account of the measures adopted for data security and privacy protection.

Data collection

The traditional house-to-house canvassing has been replaced by other "field" activities. Home and business visits are still undertaken for the sample surveys, but their smaller number and on-going character allows professional interviewers to be used. These permanent employees of Statistics Netherlands are equipped with modern tools such as notebook computers with specialised software, and employ CAPI (Computer-Assisted Personal Interview) and CATI (Computer-Assisted Telephone Interview) techniques. For data collection from businesses the Internet is also used.

Its increasing dependence on registers maintained by others requires Statistics Netherlands to monitor the quality of these registers on a continuous basis and – if possible – contribute to improvement of overall quality and suitability for statistical purposes.

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The following steps are undertaken during the process of micro-integration of data from various sources:

- Harmonisation of units: Are the statistical units defined uniformly in all sources (with special reference to comparability in space and time)?
- Harmonisation of reference periods: Do all data refer to the same period or the same point of time?
- Universe: Do all sources cover the same target population?
- Harmonisation of variables: Are corresponding variables defined in the same way?
- Harmonisation of classifications: Are corresponding variables classified in the same way?
- Adjusting for measurement error: After harmonising the definitions, do corresponding variables have identical values?
- Adjusting for missing data: Do all variables have values where this is required?
- Derivation of variables: Are all variables in the micro-integration process derived by using all applicable information from the available sources?
- Checking overall consistency: Do the data meet the requirements imposed by identity relations?

Quality issues

The census programme leans heavily on administrative sources, mainly the population register, which is the municipal basic administration of information on persons registered there. These municipal registers are linked electronically in a nation-wide network, thus establishing a distributed database. The network helps prevent inconsistencies, by ascertaining that a person being included in a new place of residence does not remain on record elsewhere. The network is also designed to inform information users, such as Statistics Netherlands, about mutations important to them.

There are many reasons for most citizens to make sure that they are correctly registered. Nevertheless, there will always be a certain amount of errors, notably residents who are not included, persons who are registered at a place different from where they presently live, and persons in the register who have already emigrated or are deceased. Many government bodies, including the aliens registration office and the municipalities themselves, have an interest in resolving any discrepancies encountered.

Data processing

Data processing consists first and foremost of the various steps to constitute and maintain the **Socio-Economic Micro-Database**, known in Dutch as the SSB. It is an ongoing activity, serving not just census-like goals, but many other purposes. For example, tables of the Social Accounting Matrix (SAM) are also based on the SSB.

Generating census tables or any other format for dissemination can take place any time and with little preparation. The procedures are stored to be re-used when required.

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Subject-matter specialists specify various edit checks to detect errors in constituting registers as well as in the SSB. The information contained in a faulty record is to be adapted in such a way that the errors are reduced in severity, or, preferably, entirely removed. The combined use of administrative registers offers many possibilities to adjust for incorrect data – as well as challenges. It turns out that some variables are more reliable in one place, while others are more reliable elsewhere. Missing units or missing values in a particular register can sometimes be completed from another (perhaps by applying "marginal" imputations). In this way a full coverage of the population in terms of micro-data is eventually maintained.

Some attributes of persons and dwellings are only collected on a sample basis. For the SSB to correctly reflect these variables, they might be imputed over the complete population. Alternatively, a process of weighting could be adopted, assigning to persons (or dwellings) who were part of the sample survey a weight proportional to the fraction of the applicable universe that they represent.

These subjects were intensively researched. It was found that neither imputation nor conventional weighting were valid methods to proceed from the micro-databases to a set of consistent census tables. Mass imputation is too rigorous a solution, leading to a database that becomes inflexible and may turn out to be inadequate for certain estimates of dependent variables not taken into account in the imputation process. The high rates of non-response in the Netherlands invalidate the traditional weighting procedures, unless it is assumed that non-response is (conditionally) non-selective. This assumption is not usually justifiable.

A more flexible approach has to be developed that combines the advantages of both. The method of *sequential weighting* seems a good candidate. A weighting scheme is adapted for each estimation problem (say a particular table). Then the table is generated, but with the added restriction that it has to be consistent with all tables already existing. Thus, each estimation problem is carried out by means of (re)weighting the applicable data. Details can be found in various scientific publications on this topic by the staff of Statistics Netherlands.

Data dissemination

As a rule, micro-data will not be released. Exceptions are possible, and then only to assist statistical or other scientific research.

Costs

The Dutch census is not separately funded, but absorbed by the regular budget of Statistics Netherlands. There is no increased expenditure in census years. The estimates about what a conventional census would presently cost vary around € 110 million (€ 7 per capita). The direct cost of the current census operation is about € 0.5 million.

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Table 28 - Overview of data sources of the 2001 Census Programme in the Netherlands

	Source	Statistical unit	Population	Integral or sample	Reference period
1.	Population Register (Municipal Basic Administration of personal data, POPREG)	Person	Population of the Netherlands	Integral	1st January 2000 and 2001
2.	Vital and migration events (Municipal Basic Administration of personal data, POPREG)	Person	Population of the Netherlands	Integral	Annual file 2000
3.	Employee Insurance Schemes Registration System – Employees (EIS-Employees)	Job	Jobs of employees	Integral	Annual jobs file 2000 and annual payroll file 2000
4.	Employee Insurance Schemes Registration System – Unemployment insurance (EIS-UI)	Benefit	Unemployment benefits private sector	Integral	Annual file 2000
5.	Employee Insurance Schemes Registration System – Disablement insurance (EIS-DI)	Benefit	Disablement benefits private sector	Integral	Annual file 2000
6.	Public sector employees disablement benefits administration (DI-PS)	Benefit	Disablement benefits public sector	Integral	Annual file 2000
7.	Social Assistance Benefits Administration (GSD)	Benefit	Social assistance benefits	Integral	Annual file 2000
8.	Employment Service Agencies Files (ESA)	Person	Persons registered at Employment Service Agencies	Integral	Annual file 2000
9.	Educational registers (EDUREG)	Person	Students enrolled in vocational and university education	Integral	Annual file 2000
10.	Income Information System (IIS)	Person	Population of the Netherlands	Sample (1%)	31st December 2000
11.	Register of Addresses of Institutional Households (AIH)	Address	Institutions and homes in the Netherlands	Integral	31st December 2000
12.	Survey on Employment and Earnings (SEE)	Job	Jobs of employees	Selective sample (50%)(1)	Annual file 2000
13.	Labour Force Survey (LFS)	Person	Population in private households aged 15 years or over	Sample (1%)	Annual file 2000 and 2001

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	Source	Statistical unit	Population	Integral or sample	Reference period
14.	Living Conditions Survey (LCS)	Person	Population in private households	Sample (1%)	Annual file 2000 and 2001
15.	Dwellings Register (DWREG)	Living quarters	Dwelling stock of the Netherlands	Integral	1st January 2001
16.	Valuation of Real Estate Registration System (WOZ)	Real estate	Real estate of the Netherlands	Integral	1st January 2001
17.	Geographic Base File (GBF)	Address	Geographic codes of addresses in the Netherlands	Integral	1st January 2001

1 Including a full count of all jobs of employees in the public sector.

Source: Van der Lan (2000).

AUSTRIA

Introduction

Modern-style population censuses have been conducted in Austria for 140 years, each ten years from 1880 to 1920, more frequently in the two decades before the World War II and again regularly each decade since 1951. Building and dwelling censuses have a history of about 50 years.

On 15 May 2001, a **Population Census**, a **Building and Housing Census** as well as a **Census of Establishments**[20] were carried out at the same census day. The harmonised conduct of these three surveys, which are based on different legal provisions, is called **"Combined Census".** This Project covered about 2.0 million buildings, 3.8 million dwellings, 3.3 million households containing 8.1 million persons, and 0.4 million establishments.

The planning work for the 2001 Census started in 1996. Existing administrative registers were examined as possible source. It was decided that not all conditions were fulfilled for it, so a traditional census based on paper questionnaires was performed, although some information from internal and external - existing and accessible - sources was extracted as far as it was possible from a technical and organisational point of view. The Census was designed taking into account the requirements of the EU Community Census Programme, and the final results are in accordance with it.

Austria is one of the countries were census results are used to distribute funds from the central government to lower administrative levels such as provinces (Länder) and communes. Therefore total population figures are highly important and eagerly awaited. A complication is that second homes are fairly common. It has become necessary to carefully define what is the principal dwelling to a person (or household), and which should be considered secondary. Statistik Austria (SA) is responsible for the preparation and the processing of the survey. The enumeration was carried out by the local authorities (communes) operating as the executive bodies of the Federal Government (FG).

Legislation

The Population Census is based on a law defining its legal frame[21]. This law orders a population census every ten years ("on the turn of each decade"). A separate decree of the FG fixes the census day. By another separate decree the Minister of the Interior fixes the questionnaires. The Building and Housing Census is based on the Statistics Act of 2000. The Minister for Economic Affairs fixes by decree the census day and the enumeration forms. The Census of Establishments is ordered by the FG on the basis of a separate law (latest update in 2001).

[20] Census of workplaces or non-agricultural local units of employment, a mixed census based on the *Register of non-agricultural enterprises* (UBR). The UBR itself is permanently updated by checks with other sources and by returns of different economic surveys.

[21] The *'Population Census Act'*, version of 1994, with latest updating in 2001 to regulate field operations.

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The Census Act makes it obligatory for residents in the country to provide the authorities with the information required and provides that the collected data may only be used for statistical purposes. To prevents any unauthorised access to the data, as already done in 1991, the census forms were organised with the names of the persons and their answers on separate sheets.

Registers

In the preparation for the Census SA concluded that there was as yet no formal basis to combine individual data from different registers. It was anticipated that public opinion would be opposed to such linkage, even if only for statistical purposes. However, in order to reach a high quality in the population registration system which should be the base for population censuses after 2001, the local population registers were checked and corrected through the census results. A procedure parallel to the census was planned aiming to reach the same type of residence in population census and in the registration system.

This procedure was performed by the enumerator comparing the answers on place of residence in the census forms with the registration shown in a list from the population register. Each enumerator entered the differences into the list (either including new persons or deleting persons or changing the type of residence information for the population register). When a correction of the register was necessary the persons concerned were asked to update their registration at the local register office.

People with secondary residences and people whose type of residence was not clear had to fill in an additional form, the so-called **declaration-of-residence form**. But it was up to the commune to decide on whether such a form had to be filled in or not. With the help of this form the mayor was able to check if the official registration (for example "secondary residence") and the actual situation of a person in life coincide. In cases of doubt the mayor is entitled to claim the person as being a main resident of the commune (§17 Registration Law), a procedure which is decided by the provincial governor ("*Landeshauptmann*") or by the Minister of the Interior. The declaration-of-residence form and the procedures of checking and updating the local population registers are regulated by the Registration Law.

The *Building Register* was used to preprint building questionnaires with the available numeric code from that register. Since economically active persons were asked for their workplace, this allowed indirect coding of economic activity and commuting destination. The NACE code and geographic location of the workplace were retrieved from the *Business Register*, which was adapted for the purpose.

Preparatory phases

The topics to be collected, the design of the questionnaires, the variables derived, the classifications and definitions, and the dissemination programme were discussed well in advance by certain advisory bodies and their working groups[22]. In addition, already in

[22] These bodies consisted of the delegates of ministries, of the governments of the Länder, of the boards of commercial and trade unions, of the union of towns and villages as well as of experts and researchers.

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the autumn 1996 a survey on the use of the past census results and the future needs was carried out on 400 data users. The survey noticed a remarkable demand for geographically detailed statistics more than extension of the census topics.

The methodological, organisational and technical aspects of the 2001 Census were worked out in internal workshops considering the international context, as delegates of SA took part in international meetings discussing and developing recommendations, methods and tools.

Two pilot tests were carried out in April 1998 and 1999 in about 20 communes with an area of about 300 households each (0.02%). In May 2000 a **"dress rehearsal"** of about half the range of a pilot test was undertaken. The objectives of all three surveys were the following:

- to evaluate the questions (acceptability, common understanding);
- to check the field organisation in the municipalities;
- to examine the level of acceptance of a census and its procedures by the public;
- to test new technologies in the processing stage; and
- to investigate the nature of inconsistencies between census results and the local population registers.

Two different types of census forms were used, i.e. machine-readable questionnaires for the building, the dwelling, the persons and the local units of employment; in addition, non-machine-readable questionnaires were also used for the household's list, the envelope for an institutional households, the institutional household's lists and the object envelope.

The address and address codes taken from the address register kept by SA were pre-printed on to the object envelopes and building forms. Printing offices organised the physical transport of the enumeration material to communes with 5 000 and more inhabitants and to the authorities of the administrative districts which had to carry out the transport to the smaller communes.

SA paid particular attention to the user-friendliness of the questionnaire. Some of the issues here were:

- use separate questionnaires for buildings, dwellings and persons, easily distinguishable by colour. Most questions answerable by tick boxes (few textual answers required);
- simple questions to be answered by all first, towards the end the blocks for response by population sub-groups only;
- short questions, no detailed instructions;
- in order to differentiate between "non-response" and "does not apply": closed questions providing exhaustive categories.

In questionnaire design the notion of "**household reference person**" was difficult to put into German. Eventually "head of household" was used. It was also found that any hint of personal income should be avoided.

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Publicity and information

In view to implement adequately the Census SA first intensified the contact with the **local authorities**, trough

- information letters and meetings with the communes officials responsible for the enumeration, and
- discussing the topic "Combined Census" at biennial meetings of the statisticians of communes, towns and cities.

Concerning the **media**, a special seminar for journalists and two press conferences were organised respectively before and after the census date and numerous interviews on TV, the radio, and the print media were realised. This time, the representatives of the media were more interested in details of the census than in a justification of the action.

With regards to the **public**, the local authorities were provided with information material and encouraged to do public relations by themselves. A slogan or particular advertising campaigns were not planned by SA. The Vienna City government, however, published an information booklet and sent it out to all Viennese households.

A detailed and complete website (but only in German) was set up in mid-February 2001 to inform respondents. Requests could be addressed to a special e-mail address. The website proved an important information medium: only in the month of May it was visited more than 30 000 times. From the beginning of May until mid-June, the so-called citizens' hotline was open to the public at local rate. About 6 600 callers availed themselves of this institution, much more less than ten years before, when more than three times as many calls had to be attended to[23]. Moreover, a number of local authorities, among them Vienna, had installed separate hotlines.

Field operations

According to Census Law the communes had considerable autonomy in the organisation of field work (anyway using the unique census questionnaires). In the communes under 6 000 inhabitants the enumeration was usually performed by census clerks interviewing the respondents and completing the forms in the town hall. The self-compilation of the census questionnaires by the respondents was however allowed. On the other hand in the big communes the questionnaires were distributed and collected by mail and, mostly, by enumerators. Field operations were completed within 30 days.

To support the enumeration the communes were provided with a special EDP programme called **GSG^{2001}**[24]. The software could be accessed by the communes through the Internet or the public sector Intranet. GSG^{2001} contained all addresses of a commune. The users had to add addresses, modify or delete them if necessary. All modifications were taken over by the address register at SA. Users could group or sort addresses, for example to enumeration areas.

[23] The lower interest was mainly that the telephone number was not printed on to the enumeration forms as well as the hushed debate compared to 1991.

[24] Gemeindesoftware Grosszählung 2001. However, the towns of Vienna, Linz and Klagenfurt used their own EDP solutions.

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To support the checking procedure the local population register datasets were loaded into GSG[2001] and attributed to a building (address register of SA) and, by means of a housing unit number or by a housing unit separator, to a housing unit. Then was the lists of registered persons were printed-out and supplied to the enumerators. If individual forms were missing they were entitled to summon the respondents concerned to complete their forms. After the control step was finished, GSG[2001] was used to transmit the preliminary results of the commune to SA. By using GSG[2001] the communes also controlled the completeness of the census questionnaires.

Data processing

The census material was returned even before the fixed time and data processing could start with the so-called preparation of forms at beginning of July 2001. 120 mostly temporary members of staff prepared the material for data capture. Machine-readable sheets were separated from other forms and checked for completeness and correct sequence(25).

Questionnaires were captured by three high-performance scanners, and the resulting images then interpreted for marks, numbers and texts by recognition software(26). Confidence margins were attached to recognized characters, and if below a certain level, the character(s) would have to be reviewed by human operators.

Compared to the two-phase concept applied in former censuses, this time all answers were captured at once, but the coding process made separate steps still necessary.

The biggest part of the coding step(27) was executed automatically by the now familiar method of cutting the verbal answer up into small strings and then finding equivalents in the dictionary. Text entries that could not be coded automatically were coded by 15 to 20 specialists on personal computers. Except for occupation, coding was finished by mid-February 2002. A second coding procedure based on the ZIP codes and the official SA codes for communes was applied afterward for the place of residence, the workplace etc. Finally the codes for branch of economic activity and commuting destination were derived from a special *register of local units of employment*(28) using name, phone number and address of the employer given by the respondents on the individual form. It turned out that the telephone number of the workplace provided an efficient link into the *Business Register.*

Due to the improved resolution of the high-performance scanners and the improved recognition software the share of automatically coded cases rose to 80 or even 90

[25] The different forms were processed together in the following sequence: first the building, the dwelling of the building, the respective individual forms and again the form for the local unit, etc. The procedure of keeping up the physical link was considered to be less risky than a system of identification numbers.

[26] Intelligent Forms Processing (IBM) and RECO STAR – Recognition Software (OCE).

[27] For field of completed education, occupation, other country of birth, other citizenship, other colloquial language, other religious affiliation.

[28] This register is based on the *Register of non-agricultural enterprises* which is completed by non-profit institutions, by the *Register of agricultural and forestry holdings* and by information from the Census of Establishments.

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percent. On the other hand, some markers and texts of the reverse side were scanned, too, and caused absurd double markings. Therefore, additional members of staff controlled by means of personal computers double markings on whether they were intentional or not. Thanks to this measure, markings caused by pollution were deleted, too.

After coding, the data could still have missing or inconsistent information. There has been a range of measures to resolve these issues. Some of these were:

1. The completeness and order of the data was automatically checked against control lists provided by the municipalities. These show which questionnaires were distributed and thus had to be completed. Some errors could be corrected automatically, others required human intervention, including revisiting households.
2. Next, nuclear households were constructed, using the answer to the question about relationship to the statistical head of household. In most cases the responses were sufficient for a computer program to take care of this. Only about 10% of households contained multiple nuclear households, or provided insufficient information, which required this task to be undertaken by human analysts.
3. The fully-automatic micro-edit first checked every variable for formal validity, then the internal consistency of every record. Finally, the various records within a household were compared for mutual consistency. After this stage missing data were completed, usually through the hot-deck method. Running statistics about corrections applied allowed permanent quality monitoring of the process.
4. Before the microdata were released there still was a quantitative check. What might be correct in some individual cases could sometimes not be a frequently occurring phenomenon. At the stage of macro-edit, variable frequency distributions were compared with earlier censuses and other sources. Outlying values were also looked at. Improbable distributions were verified or corrected.

Quality issues

Later on, a quality control will be performed as traditional part of each census processing. This procedure contains the counter-check of the data gained from the three censuses as well as analytical controls and data comparisons with a number of other sources. The comparison with the information of the population registers during enumeration stage guarantees the coverage of persons as well as the use of GSG^{2001} guarantees the coverage of the buildings. A quality control by case-to-case comparison with other sources (e.g.: a post-enumeration survey) was not planned due to costs and methodological reasons.

Data dissemination

- **Preliminary results**: at beginning of July 2001 first population figures were published on the census website. On the occasion of two press conferences in November, preliminary results on number of persons, age, sex and citizenship,

number and size of households down to the level of communes were presented in the form of a rapid report.

- **Final results** have been published from September 2002 on, starting with demographic variables. Results on education and livelihood, households and families are expected in May and June 2003, building and housing census results from late summer 2003 on, and data on occupation, industry and commuting in late autumn 2003.
- **Statistical files:** from early 2002 the accepted elementary data were used to generate basic files. These are files that are assembled according to fixed and unified rules, and can be processed for storage in the databank.
- **Databank:** Census results are stored as tables in the **ISIS Databank**. There are about 200 tables on population, 120 tables on building and dwellings, and 20 on establishments. These can be retrieved on computer screens, via the Internet, or in batch on paper or diskette.
- **Printed materials**: the usual publications (all together about 60 booklets with some 15 000 pages of census results) will be published together with a CD-ROM.
- **Internet**: As current times demand it, basic census results are available (free of charge) via the Internet also.
- **Special tabulations**: Users requiring cross tabulations not foreseen in the official publications program can order special tables. For this purpose a program generator is available. The 2001 results will also be available on a co-ordinate basis for use in GIS.

Costs

Taking into consideration that the processing steps of the 2001 Census have been transferred to a greater extent from manual to automatic procedures compared to the 1991 Census (electronic coding, use of registers, etc.) significantly less personnel is required this time. The costs for printing the forms and processing are about € 20 million, while the remuneration from the FG to the communes for their workload amounts to € 18 million. As the expenses not reimbursed to the communes are probably further 18 million, the total cost of the 2001 Census will so amount to € 56 million. This leads to an estimate per capita cost € 7.

Future plans

Due to the last experience and to the already large presence and possible improvement of registers (for population, buildings, addresses, business, insurance, tax, and non agricultural enterprises), plans for the next census round foresee the conduction of the whole survey on administrative sources.

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Introduction

The last Population and Housing Census in Portugal conducted on census day 12 March 2001, was the tenth since December 1900. Enumeration has been regularly undertaken every ten to eleven years throughout the last century.

During preparation of the 2001 project, and bearing in mind the events of 1991, the Portuguese National Statistical Institute (INE) selected the following strategic objectives:

- obtain specific legislation approved and officially published at least one year prior to the census;
- maintain the census data sets;
- comply with international recommendations especially for core topics;
- satisfy as far as possible new customer's needs;
- anticipate, as far as possible, the date for the release of final results;
- produce and disseminate consistent quality indicators, which should allow customers to know and fully accept the coverage and content rates.

Legislation

The Portuguese Population and Housing Census usually requires specific legislation to establish specific rules for local management and administrative procedures. This is because of the necessary involvement of local authorities in the census field work and the constitutional statement that only the National Assembly can legislate on the duties of regional and local governments. At the same time INE uses this legislative process to call public attention to this procedure.

Specific legislation was not published one year before the census day, but on 15 July 2000, i.e. about nine months before. In 1991 this legislation was officially published after enumeration.

Preparatory phased and organisational structure

The preparation of the project began in 1998 and was based on intensive work involving a full-time project team. During that period, **three test operations** were undertaken – two tests on the questionnaire, a couple of years before census day and a Pilot Survey exactly one year before. In the preparation of field operations INE was supported by local authorities, and cadastral authorities provided help to update and digitise the cartography. The Pilot micro-census has been implemented on a sample size of 1.5% from 1st March until 30 April 2000.

Customer needs are increasing and their representatives try to dramatically increase the content of statistical surveys. Happily it was possible to limit the content of the 2001 Census to the substantive topics, including all internationally recommended core topics and several new topics (concerning buildings and housing, such as *type of heating*).

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The overall programme for the census was approved by the Higher Statistical Council (HSC), which followed all work phases. This council represents all the major statistical customers. Project organisation was lead by the INE Census Bureau, at the department level immediately below the Institute's Executive Board. The Census Bureau prepared all documents on methodology and assumed national leadership of statistical operations. Regional and local work was organised by the INE Regional Directorates with the support of local authorities.

Portugal has the following composition of administrative and statistical breakdown, combining NUTS and local geography:

- NUTS 1 (3 regions)
- NUTS 2 (7 regions)
- NUTS 3 (30 regions)
- NUTS 4 (308 municipalities)
- NUTS 5 (4 241 parishes)
- Statistical sections (16 094)
- Statistical sub-sections (177 893)

INE Regional Directorates are located at the level NUTS 2 and local administrative units for census organisation are NUTS 4 and 5. NUTS 3 is a level having no importance in terms of census organisation. Statistical sections and sub-sections are only constructed for statistical purposes, at the respective level:

- **Statistical section** is defined as a continuous area belonging to a unique parish and having about 300 dwellings; however each parish must have at least one statistical section irrespective of having less than 300 dwellings.
- **Statistical sub-section** corresponds to a homogeneous and continuous portion of territory belonging to a unique statistical section, which means that one statistical subsection may have from 0 to about 300 dwellings.

The categories and duties of people belonging to regional and local field work were organised based on the following structure:

- 20 Regional Co-ordinators
- 140 Regional Delegates
- 450 Municipality Delegates
- 308 Municipal Advisers
- 5200 Parish Co-ordinators and Assistant Co-ordinators
- 16100 Enumerators

Each municipality had at least one municipality delegate; larger municipalities had more than one.

Publicity and information

Today public co-operation on statistical data collection depends more on people's motivation to participate rather than on any legal obligation supported by existing law. The information campaign for the 2001 Census was scheduled to use all selected means to promote the two main objectives; to inform each person that census data collection was to be carried out, and to encourage people to accept and respond to the questionnaires.

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The main communication campaign, which was prepared, produced and released by a publicity agency, was the subject of two international contests, one dealing with creativity, another dealing with production and the media.

The publicity campaign was organised into the following phases:

- *teaser phase* – the main objective was to create "suspense" to the impending census;
- *pedagogic and behaviourist phase* – to learn about census, acceptance of the questionnaires being delivered and an appeal on the census day;
- *mostly behaviourist phase (1)* – an appeal for the filling out of the questionnaires and response to questions made by the enumerators;
- *mostly behaviourist phase (2)* – an appeal for the filling out and return of the questionnaires to a local settlement when not collected by the enumerator.

INE started early in 1998 with a three times yearly bulletin mainly targeting local authorities and schools. The content gave an easy to understand description of the several census phases. One of the total ten editions of this bulletin was used to release the preliminary results. Apart from this, several media were used: television, radio, newspapers and outdoor publicity. In addition several types of personal publicity items were distributed, such as pencils and rulers for students, different leaflets for specific population groups including students, immigrants and the homeless.

Enumeration

The 2001 Census has followed procedures similar to 1981 and 1991, i.e. exhaustive collection methods and separate moments for distribution and collection of the questionnaires. It had been planned a specific publicity appeal to make it possible for respondents to answer by mail in dwellings that were too difficult to reach someone during the "census working hours". However, this was not implemented as there were so few cases of this nature. These situations were then solved through a direct letter sent to each household.

Data processing

Data processing was performed according to the requirements of the dissemination plan. Editing, coding and imputation were automated to the maximum so as to reduce the elapsed time between data collection and the final results.
The sequence for processing of the Portuguese census data is as follows (some of the steps are briefly described below):

- scanning of four questionnaires plus two auxiliary forms;
- recognition of symbols, numerical and alphabetical fields;
- first editing phase, to solve recognition problems and other questions that needed immediate access to questionnaires;
- coding of data;
- second editing phase, mainly to solve inconsistencies between questions;
- third editing phase;
- final data tabulation.

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At the end of the field work, all collected questionnaires were organised in the hierarchical order of each statistical unit and were collected at the data processing centre in Lisbon. After preparation and checking, the questionnaires were scanned using four high-level scanners. This work was completed in four months, with a scanning productivity of 120 double-sided A4 questionnaires per minute per scanner.

Results of data capture using a scanner are impressive:

- **numeric characters** were immediately recognised or at least easily recognised in matrix in 94.1% and 5.4% of cases; the remaining 0.5% were identified/corrected after checking the respective field and other answers to the respective questionnaire;
- **alphabetic expressions** were fully recognised at a rate of 76.4%, with the following distribution for each piece of information: 84.4% municipality, 70.4% country, 72.2% university field of study, 74.9% occupation, 68.7% branch of economic activity. Remaining alphabetic expressions were recognised with the help of technical staff who had been prepared for this task.

The rates of false positives are being estimated on the basis of a sample, combining the respective confidence levels and methods used especially for alphabetic fields. However, first counts on this subject indicate the respective rates of less than 0.5%.

A coding system was developed based on the experience acquired with the C91 system used in the 1991 Census. This system includes a dictionary with pre-coded alphabetic expressions and also it uses an algorithm to combine letters, words and alphabetical expressions having the purpose of searching the equivalent description of the respective classification (occupation, industry, field of study, country and municipality). New descriptions, when clear ones, they increased this dictionary with the respective code. The attained rates on automatic coding represent reasonable success:

- 13.7% of alphabetic expressions were automatically coded, corresponding to 69.2% of total expressions coded;
- 82.9% of expressions were identified/corrected by operators using a computer assisted system, followed by automated coding;
- the remaining 3.4% mainly included occupations and branches of economic activity were coded manually.

The third editing phase was carried out using automatic deterministic and probability rules. By this editing phase INE foresaw checking counts for each primary variable and possible correction of any missing inconsistency, after processing of automatic rules.

Data specialising concerns the production of a file, for each statistical unit, including primary answers and derived classifications; for example, socio-economic group classification or age of each person. No imputation for missing statistical units was done.

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Data dissemination

The Census Tabulation Plan, approved by HSC, defines each type of product to be released and the respective time. The 2001 Census data were classified into three categories:

- Preliminary results, released in June 2001
- Provisional results, released in January 2002
- Final results, released in October 2002

Because of the different procedures used to produce these types of data, and an increasing quality of the procedures used up to the final, forthcoming results always replace those preceding. The main reason to release several types of census data, as quickly as possible, is related to the high expectations of customers who find these data useful, irrespective of the low level of processing errors.

Preliminary results were produced using the administrative and quality control system of counting during enumeration of the key units – buildings, dwellings, households and population by gender at the lowest level of statistical sub-section. These results were published in a publication for each NUTS 2 region, with parish as the lowest level.

Provisional results have been produced on the basis of an intermediate file derived from the final processing system. These results were released on the Internet grouped into eight different tables containing a significant amount of data for every statistical unit, with a breakdown of each parish. The difference between lowest breakdown of preliminary and provisional results depends on the fact that the latter are produced with an incomplete system of editing and imputation.

Final results were released in the following manner:

- Tabulation Plan with 144 different tables covering population and housing for each administrative breakdown;
- Specific File (*Ficheiro-Síntese*) containing data for every administrative and geographical breakdown;
- Internet platform containing data related to all population and housing censuses made in Portugal up to the present (1864-2001);
- Database for self-tabulation by Internet customers.

Only tables of the final Tabulation Plan are subject to publication in hard copy (all other components of final results should be delivered on electronic support or on specific demand for a hard copy). Final results are being disseminated through several specific publications at the national level (including a publication with results from other "quasi" comparable data sources, and further reporting on data control and evaluation) and a publication for each NUTS 2 region.

Quality aspects

The implemented quality control and evaluation system allowed INE to solve local problems and to release various up-to-date indicators, which can test the quality of the data with the customers' perception of quality. In fact, quality data (coverage rate for

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each statistical unit) released up to now show a "general agreement" in the sense that census data are consistent with the perception of the most important customers.

A post-census quality survey was carried out at the end of the enumeration period (from 1st May to 15 July 2001) on a 2% sample size.

Costs

The final cost of the 2001 Census would be about € 46.5 million – an average of € 4.5 per resident person enumerated. Half of the total budget has been used to pay the enumeration staff while 15% has been affected to cartography and mapping operations. The total cost includes direct and indirect costs supported by INE and other collaborating institutions, namely local authorities and cadastral authorities. Direct cost includes every current cost made specifically for census purposes and the total investment cost irrespective of the 'useful life' of the investment made. Indirect cost is mainly, the hourly working cost for every person belonging to INE and working full or part-time for 2001 Census.

Conclusion and future plans

The methodology remains basically unchanged, substantial improvements were made based on previous experiences characterised by the preparation and conduct of the census in Portugal. Among these should be mentioned the intensive and high-level communication campaign, the timely preparation of legislation, innovations related to data capture and, probably most important, the releasing of all final results, in comparison to the 1991 Census, some 14 months before anticipated.

Some plans are being established for the future, mainly concerning the replacement of the traditional census by the register-based census. However it is expected that another traditional enumeration combined with the introduction of first registers will be carried out for the next census round.

FINLAND

Introduction

In Finland population censuses and the population registration system have been linked for hundreds of years. From 1749 to 1940 censuses were based on the inventories of local population registers kept by the state church – so they were actually register-based censuses.

Statistics Finland has always been responsible for censuses. The Population Census Act (154/1938) decrees that a population census, complete with enumeration of existing dwellings and buildings, shall be carried out in Finland once every ten years. Population censuses complying with this Act have been taken in 1950, 1960, 1970, 1980, 1990 and 2000[29]. In addition, surveys comparable to population censuses were conducted in 1975 and 1985 by virtue of separate statutes and a register-based population census was carried out in 1995 solely on the basis of the Statistics Act (62/1994). A brief account of the evolution of the censuses in Finland is given below.

ID-numbers were given to all people living permanently in Finland in 1964. Since that time the same ID-numbers have been used for all official registers. From 1950 to 1970 annual population statistics were estimated based on the censuses and annual vital statistics. Following the creation of the *Central Population Register* (CPR) in 1968, the annual population is based on this source. The CPR is kept by a special authority entitled Population Register Centre.

The data contents of population censuses have varied slightly between censuses and gradually more data have been obtained from registers (see table in appendix for the main census data categories). Since 1987 almost all the census data have been compiled annually, except for data on occupation and socio economic status. During the census years 1990, 1995 and 2000 more comprehensive combinations and tabulations were compiled than in other years.

All data collected for statistical purposes can never be used for administrative purposes. Because of the registers' data contents some census information is unavailable; however in many cases an alternative with similar characteristics may be obtained (e.g.: mother tongue, citizenship and country of the birth of the persons instead of ethnic group).

The evolution of the population censuses in Finland

Population Census in 1950. The first direct census taken of the whole population in Finland was carried out using an organisation involving over 10 000 enumerators.

Population Census in 1960. For this census the local organisation for population registration was used to provide additional assistance in data collection. The Municipal Census Offices mainly processed the questionnaires.

[29] The census reference day has usually been the last day of the year, with the exception of 1980 (1 November) and 1985 (17 November).

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Population Census in 1970. In this Census, questionnaires were pre-filled with name and address data. Personal identification codes were in use for the first time. For the first time some data (e.g.: income and religion) were obtained from registers. Statistics Finland's *Register of Completed Education and Degrees* was set-up using data from this census. The collection of questionnaires was carried out in connection with population registration.

The **Survey of Dwellings and Economic Activity in 1975** was the first so-called interim Population Census in which demographic data and data on employment, families and household-dwelling units were collected. The questionnaires were sent by post to the recipients who returned them by post via the local organisation for population registration. Data were centrally processed at Statistics Finland.

Population Census in 1980. An extensive local organisation was set-up for enumeration to undertake most data collection and processing. All questionnaires were sent by post and returned by post to the local offices. The questionnaires were pre-filled (with names, addresses, ID-numbers, and level of education of all household members in the dwelling unit and for some large municipalities included dwelling data); an increasing amount of data was extracted from registers. The Population Register Centre's *Register of Buildings and Dwellings* was set-up using data collected in this census.

The **Population Census in 1985** was taken by post without the local enumerating organisation. Most of the data were obtained from registers and only information concerning workplace and occupation was requested in the questionnaire. The questionnaires were pre-filled with workplace and occupation data from the 1980 Census, data processing was limited only to those cases where at least one of the two data had been changed. For more than half there were no changes over the five-year period, by pre-filling the data there was a saving of about one half of the processing costs.

The **Population Census in 1990** was the first ever totally register-based population census in Finland – no questionnaires were used. The following **Population Census in 1995** was taken almost identically to the previous.

The last **Population and Housing Census carried out in 2000** was the third register-based census in Finland. Data from approximately thirty registers were used to produce the final data. No separate statute was required for its implementation.

The organisation of the 2000 Census

As a result of the use of only register data, no questionnaires were drawn up, no test carried out, and no enumerator training was required. There is no longer the need to motivate the population. Only one press release was issued on census day 31 December 2000, in Finnish and Swedish (both are official languages in Finland), under two main headings – *"The Census is happening now, but no questionnaires are used"* and *"No respondent burden to the people anymore"*. There was no public reaction, and the reaction of the media was very acceptable. The use of data collection for administrative

purposes in statistical production and the elimination of the burden on respondents were considered to be very positive.

A specific project group was set up at Statistics Finland to organise and conduct the census, especially to take care of co-ordination tasks between different annual statistics (e.g.: population, employment, dwelling and housing statistics). No other special activities took place, and only three more people were required to co-ordinate and take care of the more comprehensive tabulations and EU tabulations (the 40 tables of the Community Census Program). Joint UNECE/Eurostat recommendations on the census were followed. The whole project took about 3.5 years.

Registration in an inter-linked EDP system of the address of every person, every dwelling, every building and every enterprise and establishment as well as the map co-ordinates for every unit (person, family, household, dwelling, building) allows for the application of different types of GIS tools and the compilation of many kinds of regional statistics through use of administrative boundaries and/or different map squares (1 by 1 km, or 0.25 by 0.25 km, etc.) or sub-areas drawn up by the municipalities themselves. Census statistics were compiled for 448 municipalities and for 15 000 sub-areas within these municipalities

Data processing

All data were taken from about thirty registers in code form, except occupational titles, which had to be coded. Most data (about 80%) were coded automatically and the rest manually. According to Diagram 4, data were extracted mainly from the CPR, several other administrative registers and some statistical registers maintained by Statistics Finland. All the main international classifications were adopted.

Quality issues

The quality of the last census products at Statistics Finland were evaluated in the following ways:

- combining or matching register-based census results with different survey data such as Labour Force Survey or Households Budget Survey at the individual level;
- combining results from different censuses through a longitudinal data file and following each person from Census 1970 to Census 2000. Allowed for the inspection of marginal groups that had been included in one census but then disappeared in other censuses and vice versa.

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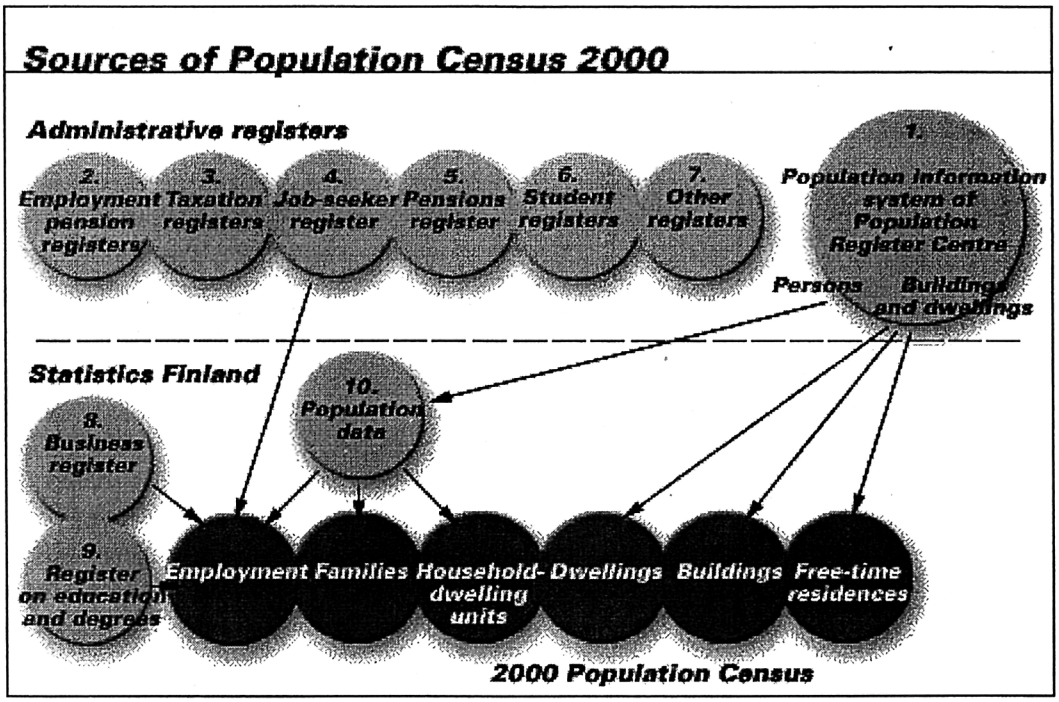
Diagram 4 - Sources used in the Population Census 2000 in Finland



1. The Population Information System of the *Population Register Centre* is the source for demographic data and data on dwellings, buildings and business premises. Co-ordinates for the locations of dwellings and workplaces are also obtained from there.
2. Employment data concerning private sector employees are obtained from the Central Pension Security Institute's *Register of Employment Pension Insurance*. Employment data concerning public sector employees are obtained from the State Treasury and from the Local Government Pension Institution's *Register of Employment Relationships*.
3. Data on income are obtained from registers maintained by the Tax Administration.
4. Data on unemployment are obtained from the *Register of Unemployed Jobseekers* maintained by the Ministry of Labour.
5. Data on pensions are obtained from the Social Insurance Institution and the Central Pension Security Institute.
6. Data on students are obtained from Statistics Finland's student register.
7. Data on conscripts are obtained from the Defence Staff and those on conscientious objectors from the Ministry of Labour.
8. Data on the industry and location of a person's workplace are mainly obtained from Statistics Finland's *Business Register* and from the register of general government.
9. Data on educational attainment are obtained from the *Register of Completed Education and Degrees* maintained by Statistics Finland.
10. Data concerning household-dwelling units and families are compiled from data obtained from the *Population Register Centre*.

Source: Statistics Finland website

Data dissemination

The main products from population censuses are tables and publications produced from the data. The data are available by municipality and by regional divisions based on municipalities, e.g.: different NUTS areas such as provinces and regions. As the data include map co-ordinates, tables may be compiled using areas smaller than the

municipality. Finland's 448 municipalities were divided into 15 000 sub-areas, into the different size map squares and by freely defined areas as required. The data may be supplied in map format. The tables are available in electronic format (Excel, PC-AXIS, and ASCII) or as printouts.

Certain key census data are entered into Statistics Finland's free **StatFin Service**, where some tables from the 1995 Population Census may already be accessed under the topic *'Population Census'*. Chargeable printouts and tables packages may be ordered by e-mail, fax or telephone. Under the subject line *'Population, Education and Housing'* the same StatFin Service displays the following annually produced key census data:

- demographic and educational data by municipality, since the 1970s
- employment statistics from 1987 on
- data on buildings, dwellings and household-dwelling units from 1985 on
- data on families from 1994 on

Census data are entered into the **Longitudinal Population Census File**, which contains comparable data on all topic areas from the censuses in 1950 and 1970–1995. Special compilations may be made upon request from customers. In addition, census data are used to update other **Statistics Finland's databases**, such as SuomiCD, Kuntafakta, TeemaCD and SijoittumisCD[30].

The release of the 2000 Census results will be completely available within two years, based on the following plan:

Data	**Completion**
Demographic data and structural data on families and household-dwelling units	May 2001
Preliminary data on employment	May 2001
Data on free-time residences	June 2001
Data on building and dwelling stock	October 2001
Preliminary data on employment	December 2001
Income data for population, household-dwelling units and families	May 2002
Revised data on employment	December 2002
Data on occupational and socio-economic status	December 2002

All data are collected for statistical purposes only and kept secret at all times – small area tables must be compiled in such a way as to make it impossible to identifying any individual. However it is possible for researchers, etc. to pick out different samples from databases without any identification data and without the possibility of identifying anyone (e.g.: too precise occupations on small areas).

[30] FinlandCD, Municipal facts, TeemaCD, TransitionCD. These producs are available in Finnish only.

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Costs

The overall cost of the last questionnaire-based census was about € 35 million. The cost of the register-based survey in 2000 is currently under € 1 million. Costs include the elaboration, data processing, tabulation, publication, dissemination and documentation. Statistics Finland works under the state budget, from which all funding is derived. The Institute sold census products worth € 0.6 million. This money has been used for tabulation and marketing activities. In addition, some € 0.25 million were spent on the collection of occupational titles from small enterprises. Usually this task is carried out by the Employers' Union which collects and transmits all occupational titles from their member enterprises to Statistics Finland. In Finland however there are about 400 000 employees working for very small enterprises, who are not members of employers' unions and are not included in the data collection system.

Conclusion and future plans

The Finnish register-based system works very well and allows for the compilation of official statistics, with more or fewer steps depending on the kind of information. Data quality is considered at least as good as that collected with questionnaires. All the most relevant statistics may be compiled annually. Statistics Finland will further develop the system and construct one that can annually produce occupations and socio-economic structure for all employees.

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Table 29 - The use of register data in Population and Housing Censuses in Finland, 1950-2000

Item	Census Year								
	1950	1960	1970	1975	1980	1985	1990	1995	2000
Demographic Data									
Age (Date of Birth)	q	q	q	R	R	R	R	R	R
Sex	q	q	q	R	R	R	R	R	R
Marital Status	q	q	q	R	R	R	R	R	R
Mother Tongue	q	q	q	R	R	R	R	R	R
Citizenship	q	q	-	R	R	R	R	R	R
Religion	q	q	R	-	R	R	R	R	R
Usual Place of Residence	q	q	q	q	q	R	R	R	R
Economic Data									
Main Type of Activity	q	q	q	q	q	qr	R	R	R
Status in Employment	q	q	q	q	q	qr	R	R	R
Industry	q	q	q	q	q	qr	R	R	R
Occupation	q	q	q	q	q	qr	R	R	R
Workplace	q	q	q	q	q	qr	R	R	R
Socio-economic Group	q	q	q	q	q	qr	R	R	R
Income	-	-	R	R	R	R	R	R	R
Completed Education									
Degree	q	q	q	R	R	R	R	R	R
Subject	q	q	q	R	R	R	R	R	R
Household and Family Data									
Household Type	q	q	q	q	R	R	R	R	R
Household Size	q	q	q	q	R	R	R	R	R
Family Type	q	q	q	q	R	R	R	R	R
Family Size	q	q	q	q	R	R	R	R	R
Dwelling Data									
Size of Dwelling Unit	-	q	q	q	q	R	R	R	R
Number of Rooms	q	q	q	q	q	R	R	R	R
Kitchen	q	q	q	q	q	R	R	R	R
Water, Sewage, Toilet	q	q	q	q	q	R	R	R	R
Heating System	q	q	q	q	q	R	R	R	R
Tenure Status	q	q	q	q	q	R	R	R	R
Business Premises Data									
Floor Area	-	q	q	-	q	-	R	R	-
Tenure Basis	-	q	q	-	q	-	R	R	-
Use of Floor Area	-	q	q	-	q	-	R	R	-

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Item	Census Year								
	1950	1960	1970	1975	1980	1985	1990	1995	2000
Intended Use	-	q	q	-	q	-	R	R	-
Building Data									
Type of Building	q	q	q	q	q	R	R	R	R
Year of Construction	q	q	q	-	q	R	R	R	R
Construction Material	q	q	q	-	q	R	R	R	R
Main Use of Building	q	q	q	-	q	R	R	R	R
Number of Dwelling Units	q	q	q	-	q	R	R	R	R
Capacity m3	-	-	q	-	-	-	-	-	-
Heating System	-	q	q	-	q	R	R	R	R
Number of Storeys	q	q	q	-	q	R	R	R	R
Summer Cottage Data									
Owned/Rented	-	-	q	-	q	-	-	-	-
Joint Ownership	-		q		q	-	-	-	-
Year of Construction	q	-	q	-	q	-	R	R	R
Floor Area	-	-	q	-	q	-	R	R	R
Suitability for year-round Use	-	-	q	-	q	-	-	-	-
Fuel	-	-	-	-	q	-	-	-	-
Sauna	-	-	q	-	q	-	-	-	-
Original Intended Use	-	-	-	-	q	-	-	-	-
Map Co-ordinates of Building	-	q	R	R	R	R	R	R	R

q = data obtained by census questionnaires
R = data obtained from registers or administrative records
qr = data for non-respondents obtained from registers and administrative records
- = item not included in census

This country report is based on the document prepared by Mr Pekka Myrskyla, Head of Population and Housing Census, Statistics Finland, for the purposes of this project.

SWEDEN

Introduction

Starting with the count from 1850, in its long and strong tradition Sweden undertook population censuses regularly every 10 years, in December, until 1930. Next counts were then organised in 1935, 1940, 1945 and 1950, always at end of the year.

Since 1960 a population and housing census has been carried out normally every fifth year, mostly in November, though the latest Census now took place in 1990. The Parliament took a decision in 1995 to change the method of taking the next Census into a totally register-based method.

Statistics Sweden (SCB) has the task of describing trends in Swedish society by means of statistics and produces the bulk of the official statistics. In this function, the Institute is also responsible of census.

The statistical registers system

Swedish official statistics is based upon a comprehensive use of administrative registers of data. The registers are used for sampling base for traditional surveys, to complement survey data and for pure register statistics, and commonly information is taken from two or more registers. Despite of their wide use in statistics, however the registers have for long time functioned independently.

The **"Registers Project"** which began in 1996 is aiming to integrate the different SCB's statistical registers mostly derived from administrative sources and to develop that into a well-functioning register system, with clear definition of its parts, links, possible extensions, co-operation between responsible bodies. The foundation of the entire registers system consists of four basic registers containing important object types:

- the Population Register
- the Register of Job and other activities
- the Business Register
- the Real Estate Register

Each basic register can be found in four versions:

- current stock
- stock at a given point in time (e.g.: 1st January)
- changes during a given period (calendar year)
- all objects to be found during a given period (annual stock)

In the current situation the various statistics collate the information required by users from the four basic registers and various sources linked to each one, however some relevant exceptions apply to the some topics of the population and housing census (see below).

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Towards totally register-based censuses

In earlier population and housing censuses the general public and property owners have had to provide information by filling in and sending in questionnaires. However the last four Censuses (1975, 1980, 1985 and 1990) have slowly developed into using more and more administrative registers in combination with fewer and fewer questions in the questionnaire.

Future censuses will be based entirely on information from different administrative sources, as already applied in Denmark, which no longer carries out a population and housing census. This means the general public will not be required to fill in questionnaires every fifth years, nor, hopefully, will property owners have to provide information about the buildings and dwellings they own. In order to undertake this kind of census, a register of dwellings and a register of households are needed. All those who live in multi-dwelling buildings will be updated in the population register with a Dwelling Number. Data from this and other register, as SCB's registers of employment, occupation, education, income and wealth, plus the geographical database, will be presented in the form of current statistics on the population, households and dwellings.

These statistics should be available in 2006, depending from the decisions taken by the *Riksdag* (the Swedish Parliament) at end of the discussion in this area under on going since 2001. So it is possible to say that it has taken 30 years to gradually develop the totally register-based system that will be used future censuses in Sweden.

The possible paths

Prior to Christmas 2001, the National Land Survey[31], the National Tax Board[32], and SCB submitted a new proposal to the Swedish Government for the production of dwelling and household statistics. Hopefully, this proposal will be able to gain majority political support in the autumn 2002 session of *Riksdag*.

The previous proposals for a population and housing census in 2005 totally based on registers have not been carried out since the Government has lacked a political majority to ensure their passage in the *Riksdag*. Thus on 13 September 2001, the Government commissioned the National Land Survey, the National Tax Board and SCB to study possibilities to:

- produce dwelling and household statistics without requiring a register-based population and housing census;
- reduce the response burden;
- reduce encroachment of personal integrity; and
- increase the use of the dwelling register.

[31] The National Land Survey (*Lantmäteriet*) is responsible for mapping out and classifying property in Sweden and for basic geographical and property information.

[32] The National Tax Board (*Riksskatteverket)* is the central public authority responsible for local tax authorities and enforcement services. Its activities include taxation, population registration and general elections.

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After consulting with the Swedish Association of Local Authorities[33], these three government authorities submitted their proposal to the Government on 18 December 2001. The proposal recommended that

- municipalities shall have established a location address for all dwelling entrances by 31 December 2003 at the latest;
- during 2004 and 2005, property owners must assign a number to each dwelling in multi-dwelling buildings;
- the National Land Survey shall maintain a dwelling register up to early 2005;
- during 2005, the National Tax Board shall register residents in the dwelling;
- during spring 2006, SCB shall produce dwelling and household statistics as at 31 December 2005.

Compared with previous proposals, this proposal advises that

- certain information for the dwelling register be obtained from the general property tax rolls for 2003 and 2005, rather than directly from property owners;
- no data will be used from the 1990 census;
- property owners shall not submit information on holders of rental contracts to be used for national registration purposes;
- the National Tax Board will send a questionnaire to all residents in a multi-unit dwelling regarding which dwellings are inhabited;
- SCB will not create a comprehensive census register; as a consequence, new census legislation will not be required;
- the dwelling and household statistics will be produced within the statistical products where users have requested them;
- the dwelling register may be used in other contexts; however, this will be regulated in compliance with a special procedure when such a need arises
- no more Population and Housing Censuses need to be taken in Sweden.

Some advantages and disadvantages with using administrative records for census purposes

It is no doubt that it is much cheaper to take a census using administrative records. That is of course if the administrative registers already are introduced in the society and have good quality. If those registers are kept and used for other purposes and financed for that purpose, then the cost for taking the census is less than 10 per cent of taking a traditional census. That is at least the experiences from SCB and Statistics Finland.

It is also much quicker to produce the result from a census by using registers. Publication of the final results can normally start about two months after the census date and ends when the last administrative register is complete. That date depends on the time-schedule for the administrative system that is delivering the register.

The most crucial with keeping an administrative register in good quality is to have well-known and stable identity for each record, through the Personal Identification Number

[33] The Swedish Association of Local Authorities is an association of Sweden's 289 primary local authorities with the aims to support and develop the system of local self-government and assist local authorities through service and expert advice.

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and the Real Estate Name and soon the Dwelling Number. It is of course possible to create registers without these identities, but the problems will increase to keep that register up to date.

Another important rule to have and keep good quality is to establish and keep a register for administrative purposes not for statistical purposes. The register will then be used and updated continuously and that will secure the quality.

A problem when using administrative registers is that the content of the register is normally very stable. That means that it is very difficult to put new variables into the register. SCB should therefore not be able to collect information on heating and means of transport for the next Census. The Statistical Institute must also rely on another Authority for keeping and updating the register. That Authority might have other interests for changing the register that might cause problem for the Institute.

SCB is very strongly trying to reduce the burden for the respondents. The use of administrative records will minimise the number of questions in a survey as well as completely replace the survey.

This country report is an updated and extended version of the paper *"The next Population and Housing Census in Sweden is planned for 2005 - it will be totally register-based"*, Åke Bruhn (Statistics Sweden), UNSD, 2001.

UNITED KINGDOM

Introduction

The UK Census Offices started planning for the 2001 Population and Housing Census in 1993. It was carried out on 29 April 2001. Full censuses have been held every ten years since 1801, with the exception of the year 1941. There are three organisations responsible for taking censuses within the UK, i.e.

- the Office for National Statistics (ONS) in England and Wales,
- the General Register Office for Scotland (GROS), and
- the Northern Ireland Statistical and Research Agency (NISRA).

Whilst the 2001 Census operation is co-ordinated between the parts of the UK, there are some significant differences within the country, particularly after the devolution of administrative functions in 1999.

Legislation

The Census in England and Wales is carried out under the 1920 Census Act and the 1991 Census Confidentiality Act. These acts also apply to the Census in Scotland. Similar legislation applies in Northern Ireland. Separate primary legislation for each census was required for censuses conducted in the UK before 1920.

The Census Acts permit the Government of the day to hold censuses at intervals of not less than five years. For each census, two pieces of secondary legislation are required to be passed by Parliament: a Census Order and Census Regulations. These set out the questions to be asked, who has to answer them, and the arrangements for conducting the Census – permitting a temporary field force of enumerators and field managers to be recruited. For the 2001 Census, Census Order and Regulations were made and approved during 2000. The Census is compulsory with the exception of the question on religion.

The three Registrars General commissioned reviews from independent experts to assess the arrangements to safeguard:

- the physical and IT security of the data collection and processing operations (the *Security Review*); and
- the statistical confidentiality of the published output (the *Statistical Confidentiality Review*).

Registers

Existing registers were used for a number of purposes, including for coding Type of Industry. This was done where possible by reference to the Inter-Departmental Business Register (IDBR) - a list of large employers already classified by type of industry.

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Preparatory phases

In leading up to this process, it was important that all known stakeholders were consulted and their views taken into account. This started in 1995 when a series of working groups were established with key census users in central and local government, and the academic and private sectors. Three working groups were established to consider content of the Census (questions to be asked), population definitions and output. The first two were key to shaping the census proposals, upon which more formal consultation was carried out with ONS' established Census Advisory Groups - one for each census user sector.

During 1997 and 1998 formal 'business cases' were sought from the key census users as to their needs in respect of the questions to be asked in the Census. Other potential census users were also invited to make submissions. This was done so that the final proposals would be based on sound needs - that is the information was:

- vital to the process of resource allocation from central to local government;
- key to the development of government policy at a local as well as national level;
- needed to help plan local services;
- not available from any other source.

Parallel to this was a question-testing programme whereby all new and substantially revised questions were tested with the public. This enabled the most important stakeholder of all to be involved - those who would complete the census questionnaires. A pilot micro-census was realized in 1999 on a sample size of 0.5%. Over 40 question tests were carried out in a variety of ways from cognitive research to a large-scale test of 100 000 households in 1997 and a Census Rehearsal of 150 000 households in 1999.

A key part of the question-testing programme was to assess the burden placed on the public. Despite the fact that the Census is compulsory, the Census Offices need the co-operation of the public. It was vital to this end that questions were seen as acceptable, relevant and were framed in such a way that people could understand them and complete them accurately. One of the key findings from this process was that a question on income was not acceptable, despite an overwhelming requirement for it to be asked from census users. On the other hand, a question on religion was seen as acceptable and a means of inclusivity.

A draft package emerged which was then put to Ministers to make final proposals in the form of a **White Paper** to Parliament in March 1999. This was subsequently approved by Parliament in 2000. Finally The form contained eight pages of questions about the dwelling, the household and each person living there.

Publicity and information

The publicity strategy for the Census was, of course, vital. This raised awareness of the public to the purpose of the Census and reminded them to return their form. While the main messages were just this, more specific targeting towards difficult to enumerate

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groups was undertaken through television spots, posters and information leaflets directed towards students, the ethnic minority population (including translations into 24 different languages) and other difficult to enumerate groups.

Among the many public information activities there was a special effort to assist schools in teaching about the Census. Separate information packs for elementary and secondary schools were prepared.

Media response to the Census was mixed. Tabloid newspapers were - following efforts by the publicity team – supportive. Broadsheet and mainstream newspapers were considerably less so; at times overly and unfairly critical. This was not helped because of the lead up to the General Election. The strategy taken was to respond to issues that were clearly incorrect. Media management was a short term and demanding aspect of the Census.

Field operations

The 2001 Census was conducted by a **delivery - post back method**. For the first time in country's history, respondents were asked to return the form by post. An enumerator was responsible for a unit of work called an Enumeration District (ED) consisting of about 200 addresses. The enumerators who were local employees identified the households in their ED and delivered forms to them. Each household within an ED was uniquely identified by a Record Number (RNO).

After census night, enumerators followed-up where a form had not been posted back for a household. Forms thus manually collected were not physically merged with those posted back. The unit of work throughout most of processing has been the form (or batches of forms), rather than the ED. Data for an ED were merged before the edit and imputation process.

During field operations the foot and mouth disease created unexpected problems. To prevent the spread of the disease the authorities quarantined the farms with infected animals. As consequence, in some rural areas the forms could not be delivered personally but were posted or delivered at an agreed place, such as the edge of the farm. Residents of rural area communities have traditionally accounted for a high response rate in population censuses, which made it easier to come up with flexible ways of counting them.

The 2001 Census was conducted on an entirely resident basis. In previous censuses, people were counted where they were resident on census night, as well as where they were away from their residence, if travelling. People away from home on census night - some 1.5 million in 1991 - thus were required to have information about them supplied twice. There was some evidence that people away on census night felt they had already complied with the Census, and were less co-operative. Furthermore, the information on the number of 'visitors' (that is non-residents) to an area was not extensively used. So the first step was to reduce this burden on the public.

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Pre-paid return envelopes were provided to submit census questionnaires. Tests had shown that some 60% to 70% of households might respond by post. In reality some 90% posted their form back, a very encouraging result. It should be emphasised that enumerators still delivered the census forms and revisited those households that had not returned a form. This follow-up procedure was due to start some four to five days after Census Day but in practice it had to be delayed by about a week because of the considerably higher than expected postal response. By the end of July 2001 the response rate was up to 95%. Only 5 %, i.e. one million forms, were not returned because normally sent to not inhabited addresses.

To assist in identifying households and ensuring enumerators find them all, good maps are essential. Two developments were undertaken for the Census in England and Wales. Firstly, enumerator maps were produced using new GIS technology based on Ordnance Survey's product Address point™. This provided enumerators with a customised map on a single sheet of paper – rather than several maps with hand drawn boundaries of varying scales as in previous censuses.

Secondly, a list of addresses was provided as a starting point for enumerators, but their instructions were still to call at every dwelling in their area to try and make contact to establish how many households and people there were behind the front door. In areas of high levels of multi-occupancy (that is an address with more than one household), enumerator workloads (that is the number of addresses an enumerator was expected to cover) were, on average, half the size of those in other areas.

Quality issues

To improve upon the quality of the 2001 Census, a separate research programme was set up in 1996 to evaluate different methodologies and to plan the approach well in advance. The objective of the **One Number Census programme** (as it is known) is to estimate the level of under-enumeration and to integrate this with the census counts so that all census outputs sum to One Number - the national estimate of the population on Census Day. The methodological research has included looking at administrative records and whether these could be used to aid the estimation of the census undercount. It was clear however that no such records were available to the required quality.

The approach has been therefore to use a post-enumeration survey but one which concentrates exclusively on coverage and which was much bigger than the one in the 1991 Census.

A **Census Coverage Survey** of some 300 000 households was carried out some three to four weeks after the Census. It encompassed an intensive re-enumeration of some 20 000 postcode units (average size 15 households) across the country. The sample was designed to produce direct estimates for some 100 'design groups' - average population size 500 000 people. The sample was stratified by a 'hard to count' index so that estimates can be separately made according to the likely level of under-enumeration. To take account of local conditions, the index was constructed somewhat differently by the three participating Census Offices. The Survey comprised short doorstep interviews of around 10-15 minutes each.

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The information from the survey is combined with that from the Census and estimates of under-enumeration made at the design group level, using a combination of dual system and regression-based estimators. These are then cascaded using synthetic estimation techniques to the local/unitary authority level (average size 120 000 population), to provide the new base of local population estimates by age and sex. The final step of the ONC process is to estimate the probabilities of households and people being missed at the local level by type of household and person. Imputation of households and people according to these probabilities produces a fully adjusted Census Database. Since Religion is of particular interest within Northern Ireland, the estimation and imputation processes have been adapted to include this variable within the undercount models. This final process is constrained to the estimates produced at the local/unitary authority level.

The end result of this innovative census processing stage is a database comprising both individuals and households counted by the Census and synthetic households and people representing those estimated to have been missed. It forms the database to be used to produce the output.

Data processing

Given the need to change following the 1991 Census and developments since, the approach to the Census in the UK was that new technology should be adopted where it was most relevant to meeting needs. This applied particularly in map production, data processing and information output.

The strategy was to use the best available methods and technology where possible. Processing of the Census was identified as a key area where new technology could help, but where expertise and flexible access to resources were not sufficiently available internally in the Census Offices.

An extensive Open Procurement exercise was then conducted and Lockheed Martin were awarded the contract to carry out the printing of census forms, and the basic data capture and coding of data from the completed forms. The procurement process was deliberately set up in such a way that solutions to the basic job were sought that is a service, rather than the supply of systems or software. This enabled the supplier to own the solution and manage it appropriately. The printing of forms was part of the service, to enable Lockheed Martin to ensure they were compatible with their own image recognition technology.

Other service contracts were let in respect of the Payroll for field staff, the public enquiry help-line, distribution and collection of census forms and other material from field staff, and printing of other census material.

Data dissemination

The effort and cost of taking a census is only worthwhile when results meet needs and are delivered effectively. This simple but fundamental point is a cornerstone of UK

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census policy, with a continuing emphasis on responsiveness to users, and a particular commitment in the 2001 Census to an innovatory approach throughout its cycle.

The most radical change will be the unrestricted access to results. The standard area statistics in electronic form will be available free in effect to end users to meet the needs of modernised government and joint working. A user will be able to take whatever is needed from an integrated set of statistics, geography and metadata.

There will also be radical changes in the form of statistical output and the way it is produced, whilst building on the strengths of the Census to provide information at local neighbourhood level, aided by the creation of a highly flexible geographical framework for statistical, not operational, purposes.

The initial main census results were delivered in August 2002, more detailed and regional results are scheduled for release over the next year until the summer of 2003.

Costs

The total budget for the 2001 Census in the UK over the 13 year period 1993-2006 is some £254 million (about € 367.4 million), of which around £207 million (€ 299.4 million) relates to England and Wales. The largest elements of these costs are to pay for the delivery and collection of the forms and for the processing of the data. The budget of the Census Coverage Survey was £6 million (€ 8.7 million).

Conclusion

UK 2001 Census was characterised as always by a large interest and participation of users on the definition of topics and questions to be considered as well as by the introduction of many innovations, mostly the enumeration method and the modern means supporting preparatory phases, field operations and the following data capture and processing. The main problem coming probably from the foot and mouth disease particularly heavy around the Census Day was successfully dealt.

ICELAND

Introduction

As other Nordic countries, Iceland has a strong tradition of population counts and registers. The first census in Iceland was taken in 1703 and was the first nation-wide census in Europe. There were a few partial censuses in the 18th century but the next census covering the whole nation was conducted in 1801. From 1835 to 1860, censuses were conducted every five years but every ten years in the period 1860-1960. A comprehensive population register was developed in the 1950's which greatly reduced the need for full censuses. A census was conducted in 1981 and the present plans foresee a new census in 2005.

Reasons for the new Census in 2005

Iceland did not carry out any population and housing census in 2000/2001. The next population and housing census, in part register-based, is planned around the year 2005. However, no project plan, financing or legal requirements have been defined yet.

Owing to the existence of a comprehensive population register and a register of dwellings, there is little pressure to carry out a full census. The *National Register of Persons* (*Þjóðskrá*) is run by the national statistical institute *Hagstofa Íslands (Statistics Iceland* in English) as an administrative register updated on a daily basis. In the frame of the national statistical system, demographic characteristics of the Icelandic population can easily be deduced from these sources at any given point in time. The *Land Registry of Iceland* (*Fasteignamat ríkisins*) is responsible for the maintenance of the land register which is a comprehensive register of all land, buildings and dwellings in the country. These main administrative registers – *National Register of Persons* and *Land Registry of Iceland* – are operated side by side and with some important linkages. However, there is at present not a linkage between the population register and the land register as regards dwellings in multi-dwelling houses. The existence of such a linkage would allow Iceland to undertake a full register-based population census.

Technically, the system of the *National Register of Persons* could contain an exact reference to any particular dwelling. However, a substantial effort is needed to obtain the basic information on who occupies each dwelling in multi-dwelling houses. The present plans for further development involve the registration of persons in their particular dwellings in order to identify households and undertake complete register-based population censuses. Experimental projects have already been implemented in selected municipalities. The *National Register of Persons* will use the same unique identifiers for dwellings as the *Land Register*. After the information on the exact dwelling of each household has been obtained, it will be possible to link the various statistical population registers to the *Land Register* and produce tables showing the relationship of household size and structure, as well as the type of accommodation available to households.

According to the present plans, the main purpose of conducting a population census in 2005 is to obtain the information of in which dwellings each family or household resides. This process would be very similar to the one undertaken in Norway in 2000

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and 2001 in connection with the 2000 census round. There, a housing census was carried out through enumeration (in connection with a register-based population census) and selected data from it were entered in the registers of population and buildings.

Apart from international comparison at the date of census, creating an exact linkage between the population register and the dwelling variable of the *Land Register* will also be very useful in the frame of the European program Statistics on Income and Living Conditions (SILC).

Information on the registers used by Statistics Iceland for production of statistics is presented in the following paragraphs. In particular, the report gives indications on sources and methods used to provide counts and characteristics of population, including the population tables with reference to 1 January 2001 that are being released as 'census data' in order to meet the Eurostat tabulation program for the 2000 round of censuses.

The administrative register of population

Currently, *Statistics Iceland* is responsible for maintaining the *Icelandic National Register of Persons* and for all civil registration in the country. The *National Registry* is a department within *Statistics Iceland* and supervises and carries out the registration. The register was established in 1953 on the basis of the 1950 census and a special census taken solely for that purpose in 1952. The purpose of the register is to provide unified, centralised registration of the population for administrative and statistical uses.

The population register is maintained and updated continuously by the *National Registry*. The main variables in the register are: name, ID-number, family number, full residence, sex, marital status, nationality, place of birth, religious affiliation and registration of consensual union.

The variables used to identify persons and individual families are the following:

- ID-numbers, issued at birth to all children born in Iceland and at first registration to all persons taking up residence in the country. The ID-number system is the only universal one used in the country;
- The family number of a person is his or her own ID-number if he or she is a single person 18 years or older, or the older person of a married couple, a couple registered as living in consensual union (also called registered cohabitational union) or in registered partnership (also called recognised union). In one-parent families the family number is the ID-number of the single parent.

Information for updating the register is obtained from various institutions as prescribed in legislation. Those are:

- Maternity institutions and, in case of home deliveries, midwives (for births).
- Ministers of the State Lutheran Church and heads of other religious organizations (for baptisms, marriages and deaths).
- District Commissioners (*sýslumenn*) (deaths, civil marriages, separation certificates and divorces).
- Courts (divorces and changes in the custody of children).

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- The Ministry of Justice (naturalization of foreign nationals and other changes in nationality, adoptions and name changes).

There is furthermore a special law on the Icelandic *National Register of Persons and Civil Registration*, a law on *Domicile* and a law on the *Notification of Change in Residence*. Changes in residence must be reported to the municipality to which a person moves. In the capital these changes may be reported to the nearest police station or directly to the *National Registry*.

The *National Register of Persons* is based on a series of files, with the following two main ancillary sources:

- A file for the registration of all changes that occur to a person *(Breytingaskrá)*, with material from the year 1986 onwards so all changes can be traced back to that date (data on changes back to 1977 exist on film and punch cards are available for the period 1953-1977).
- A file of registered persons who are removed from the *National Register (Horfinnaskrá)*, in most cases because of death.

The *National Register* plays a central role in most administrative systems in Iceland. It is the single register of persons in the country and is therefore used by virtually all relevant public authorities, e.g.: taxation authorities, the social security system, health system, education system and for official mailing purposes. The register is also used extensively by the private sector, e.g.: the banking system, insurance companies and many larger firms, for information on ID-numbers, addresses and address changes, deaths etc.

Within *Statistics Iceland*, the register is used extensively for statistical purposes. It is used as a sampling frame for all kinds of surveys conducted either by *Statistics Iceland* or other public or private agencies, normally taking as survey units either the individuals or the households of the sampled individuals (it is the case of the Household Budget Surveys). Furthermore, the *National Register of Person* forms the basis for population statistics which are published annually and to a limited extent every three months. Thus, the register forms the main source for the *Department of Population Statistics,* where additional variables from various sources (birth-, death- and marriage reports) are entered by the staff of the *Department*.

In the section above, various limitations of the register were briefly discussed. With regard to the census, the most significant shortcoming of the register is the fact that it does not allow the production of statistics on households and families. The residence of a person is recorded with the code of the municipality and the street and a house number. Different units in multi-dwelling houses are not identified. It is therefore impossible to identify individual families and households in such houses. By using the family number it is possible to identify the so called nuclear families, which consist of couples with or without children or a single parent with children.

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Statistical registers on population changes

Several statistical registers also exist at Statistics Iceland. Most of those are initially drawn from the *National Register*, and then completed and maintained by other departments within *Statistics Iceland*. Those registers including individual data are listed below.

- For statistical purposes ***copies of the population register*** are created on given dates every year. Methods have been developed for making the statistical register reflect the situation on those dates as accurately as possible, taking into account the time-lag in the reporting of certain events. In principle, since a copy is created at a given reference date, the registration of events occurring before that date which arrives after a two weeks or longer period is taken into account to definitely establish the 'statistical register' at that reference date. This method is applied to derive statistical registers and population figures for the most conventionally used 1 July (mid-year) and 31 December of a calendar year. Traditionally, the Icelandic reference date for official publications was 1 December and this date is still used as reference date for official population figures by administrative divisions.

In addition to the copies of the population register, *Statistics Iceland* maintains the following registers:

- A ***migration register***, including internal and international migration data since 1986 derived on monthly basis from the register of changes (*Breytingaskrá*, one of the ancillary files of the *National Register*). Machine-readable data is available for the period 1987 onwards.
- A ***register of births*** is compiled by adding data to the information on births (live births and late foetal deaths) derived from the *National Register*. Additional data is taken from the birth reports submitted to *Statistics Iceland* by maternity institutions and midwives. The register contains the following main variables: Name, age, residence, religious affiliation, date of marriage, citizenship, marital and occupational status of parents; place of birth, date and exact time of birth, sex of child, parity (previous life and stillbirths), multiparity, duration of gestation, child's birth-weight and length. On the basis of this register fertility calculations are made. Machine-readable data on births is now available from the year 1987.
- A ***register of changes in marital status*** is based on ecclesiastic marriage, civil marriage, separation and divorce data already available in the *National Register* plus additional data entered explicitly for statistical purposes. Machine-readable data on these events is available from 1987 onwards.
- A ***register on the change of citizenship***, recording additional data to the information on change of citizenship available from the *National Register of Persons*.
- A ***register of adoptions*** with data only kept for statistical purposes.
- A ***register of deaths*** is derived directly from the *National Register of Persons* entered from death reports. Machine-readable data is available for the period after 1970.

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- A ***register of causes of death*** is based on information in the ***register of deaths.*** Information on causes of deaths is then entered from death certificates, with coding according to the International Classification of Diseases (ICD-8 for the years 1971–1980, ICD-9 for 1981–1995 and ICD-10 from 1996 onwards). The register is used to a considerable extent for medical research. Those who obtain permission from the Data Protection Commission to use the register send a list of ID-numbers to Statistics Iceland of those persons they wish to investigate. Statistics Iceland then links these ID-numbers to the register of causes of death.

Production and dissemination of population statistics

The statistical registers include all persons registered in the *National Register of Persons*, whether or not they reside in the country at that time and irrespective of nationality. However, the population statistics only include persons with residence in Iceland on the reference date. On the basis of the registers, distribution by age and sex is produced, by administrative divisions (municipalities, parishes of the State Lutheran Church), by other geographic locations, by marital status, by religious organizations, by citizenship and place (country) of birth. Counts of nuclear families by size, type and residence are also made.

According to various laws, official population counts refer to 1 December of each year. However since 1997, population counts for alternative dates are also produced and published on the basis of statistical register. The 31 December population structure is actually published in February or March each subsequent year.

Traditional statistics on vital events, published by *Statistics Iceland,* include fertility, death rates, marriage and migration. All persons domiciled in Iceland at the time of death are included in the statistics. In the case of births, the mother's domicile at the time of the birth determines whether the child is included in the statistics or not. The criterion for inclusion of marriages and divorce in official statistics is that two out of three possible domiciles must be in Iceland. These domiciles are, in the case of marriage, domicile of the bride, the bridegroom and of the couple after marriage, and in the case of divorce, the domicile of the couple before divorce and of the man and the woman after the divorce.

Reports on population and vital statistics have been published since 1911 on a five- or ten-year basis. Demographic reports are also published in Monthly Statistics, the Statistical Yearbook (from 1991) and in news releases.

This country report is based on internal documents updated by Statistics Iceland for the purposes of this project.

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Introduction

The first population census in Norway was carried out in 1769. Since 1825 these counts, which were based mainly on personal records maintained by the church, were conducted about every ten years. During the sixties, with the introduction of the national Personal Identification Number (PIN), results from the 1960 census were used to establish the Central Population Register (CPR, Act of National Population Registration, 1964) and other administrative registers. Later, the rapid progress of data processing and the move towards register-based statistics assisted in the gathering of increasing data for the next census and improved the set up of new registers. However the 1970 Census had already been carried out using the CPR data, this census provided some decisive checking and updating of the register.

Statistics Norway (SN) had already studied the possibility, for the 1990 Census, of basing the survey on existing registers, but had declined to do so because of the lack or limits to data on dwellings, households and the labour market. A joint use of some registers and questionnaires from a sample survey were then taken, with some negative results (mainly missing information for sufficiently small areas of the sample-based variables and discrepancies with the annual register-based statistics).

Following the decision to establish register-based information on dwellings using the last census, the 21st Norwegian Census was postponed by one year (3 November 2001) and two different sources were jointly used:

- a register-based census for demographic data, income, education, labour market (i.e. the Population Census);
- a traditional countrywide, self-administrating enumeration of every occupied dwelling for household composition and dwellings (i.e. the Housing Census).

Legislation and registers

The Norwegian statistical system is today strongly based on registers which are normally derived and automatically updated (even daily) by one or more administrative registers.

Based on the Statistics Act (the new Act: No. 54 dated 16 June 1989), SN participates in the data exchange flow but also in the construction of new registers. The Institute has the right to use data from administrative registers and link it to produce official statistics. On the other hand, data from SN are normally not transferred to administrative registers, but may in some special cases be transferred after approval from the Data Inspectorate. In the 2001 Census transferring data to administrative registers therefore required the legal basis for the administrative registers involved in addition to the Statistics Act. The institute also controls privacy of personal data, which is regulated by the Personal Data Register Act (1980).

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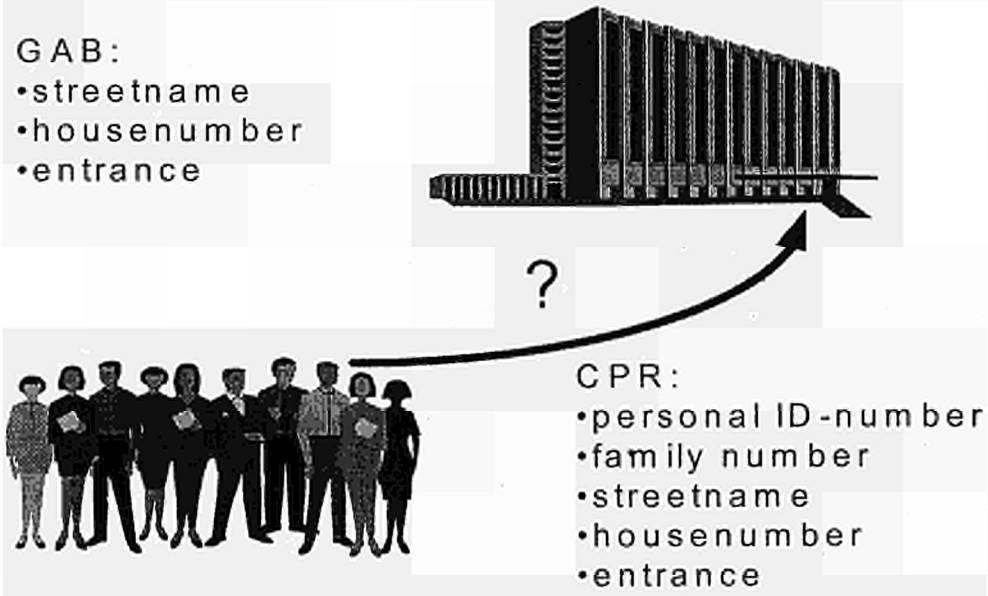
There are local population register offices for individuals in each of the 435 municipalities and the CPR at the Office of the National Register in the Tax Authority. Since 1995 the CPR regularly updates information on-line from the municipalities. For each person who has ever been resident in Norway since 1 October 1964 (now over 6.5 million persons against about 4.5 million population) the CPR provides about 80 variables – from surname to citizenship of spouse, from country of last residence to name of father, also including PIN-code, family-code and address-code. Every newborn, first time long-term immigrant and child of Norwegian citizens abroad receive a PIN and are recorded.

The CPR is the pillar of the administrative registers system for individuals, from this copies ("satellite databases") are generated, at SN and elsewhere, and then mutually updated/corrected through "transactions", according to the exchange method of information between national agencies (data are collected only by one then transmitted to others). In this way the CPR is a main source for the Population Statistics System (*Popsys*) at SN, with other sources, such as the adoption or migration registers directly providing further information. Additional main registers contributing to the census are listed below.

Due to the lack of a register for dwellings in 2001 household and dwelling data was still unable to be provided, this is already possible in Denmark and Finland. In fact, the *Register on Ground properties, Addresses and Buildings* (GAB) included the address, the geographical coordinates and other characteristics of dwellings built after 1983 only and without providing a mutual and unique identification key for linking dwellings with persons in the CPR.

Diagram 5 - The missing link between dwellings and persons according to the previous register data in Norway up to 2001



Who is sharing a dwelling with whom? How to 'construct' each household?

Source: Hendriks (2000)

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Establishing register-based data on dwellings

The first consideration of register-based data on dwellings dates back to 1960. After discussions in the media during the late nineties this kind of information will be integrated in the registers' system of the country only after the 2001 Census.

Following Parliament's decision (December 1999), in 2001-2002 SN, the Tax Authority and the Norwegian Mapping Authority (responsible for GAB) jointly organised and conducted a project with the strong support of the municipalities that included the Housing Census, the so-called **Dwelling Address Project** (DAP) aiming to:

- co-ordinate the existing addresses in CPR and GAB;
- identify, number and label each dwelling with the unique address code;
- establish a link between dwellings and persons;
- collect and transfer this code and other data in the registers.

The relevance of this operation applies in particular to dwellings in multi-dwelling buildings, which are now uniquely identified by a code for the *floor*, a code for its *location on the floor* in addition to the existing codes for *street*, *house number* and *main entrance*. The link between dwellings and persons was established associating in the CPR the precise number of dwelling (i.e. the unique address) to the names of persons living there.

All dwellings in multi-dwelling buildings were labelled before the Census. The new address comprised the old familiar address plus five numbers/letters[34]. The flat's unique address will be used for any administrative procedure and both CPR and GAB will be regularly updated through the declaration to move and application for a building license respectively. In this way it will be possible to provide household and dwelling statistics at any time of the year. Moreover, this kind of register can be used throughout the country for planning purposes, while the unique address will allow for easier location of each dwelling for security matters and other services (fire brigades, ambulances, courier, suppliers, etc.).

Preparatory phases

The 2001 Census was long in preparation, at least considering the decision as to the method of data collection. Since 1994 two working groups of producers and users of census data had already been set up. One dealt with the population part of the census, the other with the housing component. The decision to take two separate censuses was followed by the setting-up of a project team in a new Division of Population and Housing Census within the Department of Social Statistics at SN; starting with one person in 1996 and increasing to 16 persons in 2001. Some 48 persons were employed to serve the help desk, open envelopes, scan and verify incoming forms, while many other SN staff contributed to the upgrading of registers, information campaign, design of the census form, quality assessment, etc. External firms were responsible for printing, packing and dispatch of the forms, and contributed to the design of the electronic form for use on the Internet.

[34] For example, the new address for Blåklokkeveien 13C is Blåklokkeveien 13C H0201, with H standing for main floor, 02 for second floor and 01 for the first dwelling to the left.

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Some advisory groups and users' meetings were organised and many institutions in the country were invited to contribute to the census topics. Finally the Population Census mostly respected the UN/Eurostat recommendations, with the exception of one core variable (*occupation*) and some non-core variables (such as *religion*, *ethnicity* or *journey to work*) which are not (sometimes fully) available from the registers. The Housing Census focused only on inhabited dwellings, so the core variable *occupancy status* of the dwelling was not requested.

Much effort was devoted to upgrading the statistical systems based on registers, especially for labour market variables.

A quality test of the questionnaire and a first pilot survey testing the entire procedure were taken in the spring 1999 for the housing enumeration. However, due to the postponement of the reference date, a second pilot survey based on a new questionnaire was conducted one year before the census after the labelling of the dwellings in the entire municipality of Stange (9 000 respondents).

Publicity and information

Previously, during the period before the decision to organise a dwelling register, SN intervened with press-releases and other means trying to address the heated public debate on privacy matters. Later, with the implementation of the DAP a major campaign was launched with the objective of informing politicians, national and local authorities, media and the population on the finalities and to facilitate their co-operation.

Publicity and information activities for the census were basically integrated with those of the DAP. Two main objectives were considered, to get a response rate of at least 95% and at least 80% correctly completed forms by the official deadline to return the forms (i.e. a week after the census date), by means of a wide and positive (or at least neutral) coverage in the media as well as intensive publicity and open methodological information aimed at families.

Categories of persons with a traditionally higher rate of non-response, such as students, elderly people and immigrants were particularly followed up. Senior citizens' centres and persons working with senior citizens, such as nurses were invited to encourage responses. Co-operation with immigrant organisations, religious communities, local immigrant media and language schools helped to overcome language difficulties and scepticism. After a **study on non-responses**, some posters were displayed on public transportation in the language of the four largest non-response groups as a second reminder to respondents.

The main message focusing on the historical aspect and the relevance of the census was displayed as an advertisement on one of the most used Internet start-up pages, on public transportation, national and local press, teletext, postcards and plastic bags and broadcasted in radio commercials (especially as a first reminder). All these publicity activities were concentrated during the weeks of the Census.

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More detailed information was made available on the folder accompanying the questionnaire and on the SN website, including links where media might obtain information, pictures and news. Continuous contact with press agencies concerning the activities of the Census was also established, and media outreach was organised prior to the Census in eleven cities, where media briefings were held by SN staff for local media. Journalists were provided a press kit, containing – in addition to general information – data about previous censuses in the region.

Questionnaires, guidelines and posters were translated into the eleven foreign languages most spoken in the country. A free phone service was also provided to respondents, including help in a variety of foreign languages.

Data processing for the Population Census

The Population Census, data collection and processing was performed within the regular scheme of link and processing of statistical registers and based on the following registers:

1. CPR
2. GAB register
3. Register on the Level of Education (SN)
4. Register of Employers and Employees
5. Registers on Unemployment and Social Security Benefits
6. Tax register of wages per year
7. Tax register of income (for self-employed persons)
8. Central Register of Establishments and Enterprises (SN)

Once individual or other kinds of data are available at its level, before producing public statistics, SN assesses quality and reliability remaining in close contact with the data provider agencies. This process also applies to the Census contributing to the improvement of the quality of the register system and the statistics based on it.

As many registers include the same data or, more often, partially contribute to each variable (e.g.: the registers 3. to 7. above are used for *current activity status*) some routines were developed to match registers and handle inconsistencies. Further available sources at SN as well as regular and ad hoc surveys (for the *education attained abroad* otherwise missing) added value to the census data.

Final processing of the CPR was performed some two months after the reference date in order to incorporate data from late transactions (e.g.: to record an immigrant who had arrived in the population before, but was legalised after the Census), with the same tools used to produce regular statistics (Oracle, SAS, Excel).

The conduction of the Housing Census

The collection of housing questionnaires was carried out through **mail out/mail back**, sending the questionnaire to a contact person in every family from the CPR. As for the mapping, the printing and mail out of questionnaires were outsourced. Respondents were asked to amend the list of family members and add any other person living in the

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dwelling, put the new dwelling number, respond to the questions and return the form (even respond via the Internet) using the family-code plus the PIN-code pre-printed on the questionnaire.

A separate form requesting names and date of birth for all occupants was sent to all old people's homes and nursing homes in the communities. No information was collected about the dwelling for these occupants (e.g.: *disabled or elderly persons living there who remain registered at their original address*).

Means of data collection is a **family out – dwelling household in method**, with the family based on a *de jure* definition (*place of usual residence*) and the household on a both *de jure* and *de facto* definition (*place at the time of the census*), which is useful in improving data from the Population Census. In fact the Housing Census enumerated the *cohabitations* (otherwise counted by the CPR only when the partners have at least one common child) as well as *unmarried students who had applied for a scholarship granted to students living away from home* in 2001 (otherwise registered at parents' home in the CPR). A dwelling household then consists of all persons registered on the same (formal) address in the CPR and who have stated on the form that they live in the same dwelling. In addition SN have published statistics using the actual (*de facto*) address for students.

Up to two reminders were sent to contact persons who did not return the questionnaire. Finally about 97% of questionnaires were returned, with very few gaps in the dwelling information and linking between persons and dwellings. Furthermore, the survey did not cover unoccupied dwellings. The incoming forms were scanned and read optically, with automatic interpretation for figures written in plain text. The questionnaires where scanned, interpreted and verified using Eyes & Hands software. The system showed to be reliable, once the proper adjustments were done. The questionnaires where processed within 8 months after Census day. PINs of persons listed as living in the households were found manually from the CPR, this was also the case for addresses which were written on the questionnaire.

Respondents were not contacted if errors were found or data were missing, then SN carried out checks and corrections. Data for unanswered questions was estimated either on the basis of other data, by using dwelling data in the GAB-register, or by imputation based on dwelling data in the same neighbourhood. Total non-responses were treated by imputation from another dwelling in the neighbourhood ("nearest neighbour" method), or more sophisticated statistical methods.

Further quality aspects

Apart from the already mentioned quality aspects, another point to report is the strong reliability found concerning variables that are more actively used in administrative procedures.

In terms of measuring the quality of census statistics, SN moved from autonomous post-census surveys to quality control performed through comparing register data with data from existing sample surveys. This method may be used on a current basis and not only

for censuses. In addition a limited Post-Census Survey was carried out in the weeks following the enumeration on the basis of a 0.8% sample (additional questions in the Labour Force Survey). The item was household composition. The results will be published in 2003.

Data Dissemination

Preliminary figures for the 2001 Census, based on a sample of 15 800 forms and mainly at the national level, were published first on the Internet in April 2002. **Final results** are being published from September 2002 in articles, in hard copy and on some web-databases under the SN Internet site. This service provides users the possibility of defining their own tables from a database and then downloading the data.

SN is also producing booklets and separate publications with selected tables and maps for each municipality, as well as a report with census metadata (in Norwegian and English). Statistics for small areas (below municipality level) are being published in respect of the confidentiality issues from the Statistics Act (SN uses three persons as the minimum number for confidential variables). Access to micro data for research purposes will require permission from the Data Inspectorate.

Costs

Excluding the data collection from the Housing Census, the DAP had a cost of about € 9.3 million (about NOK 70 million) – 7.6 for identifying and labelling the dwellings, 1.7 for establishing the link between dwellings and persons.

Apart from these components of the DAP, the overall cost of the whole project is approximately € 14.6 million (about NOK 110 million), of which 18% (i.e. € 2.6 million) was directly devoted to improving the quality of the registers during the last few years. SN estimates the cost of a traditional countrywide enumeration to be three to four times more.

Conclusion and future plans

Despite the time constraints the DAP phases preceding the census were quite successful. Following the implementation of the DAP and the 2001 Housing Census, the Norwegian registers' system will allow the conduction of a population and housing census totally based on registers with reference to any date of the year.

Users have found the consistency of results with the annual statistics derived from registers to be of major importance. The frequent use and continuous quality improvement of registers in the country will progressively further reduce the inevitable inconsistencies.

SWITZERLAND

Introduction

In Switzerland, population censuses have been conducted every ten years since 1850 as household surveys because, unlike the Nordic countries, there is no tradition of centralised population registers. However, the situation is changing, mainly as a result of fast developments in IT. In Switzerland too, citizens rightly expect the State to have modern data and information administration systems and to use information which is already registered before it subjects people to another survey. This was the starting point for the organisation and conduction of the 2000 Population Census, presenting many innovations in respect of register use and creating the preconditions for a sweeping reform of survey methods after 2000.

The 2000 Census, with the reference date of 5 December, was organised by Swiss Federal Statistical Office (SFSO) in close co-operation with the cantons and the communes. It consisted of two interlinked surveys,

- the building and dwelling survey, where house owners and property management agencies had to provide information, and
- the personal and household survey, directed at all residents of Switzerland.

The surveys were based on the following four questionnaires:

- o the combined building and dwelling questionnaire for house owners[35]
- o the personal questionnaire
- o the household questionnaire for private households
- o the household questionnaire for collective households

The main features of the project were:

- the pre-printing of data from registers on the first page of the personal questionnaire and on the first and fourth page of the household questionnaire;
- the transition from using enumerators to postal dispatch and return, in conjunction with the development of an electronically controlled monitoring and reminder system;
- the use of the Internet for electronic completion of the questionnaires;
- the centralisation of technical survey tasks in a single national Service Centre, with however the possibility for cantons and communes to choose their preferred method.

The introduction of each innovation was carefully discussed and evaluated. Finally, the method was applied following a trial census held in 1998 and the "dress rehearsal" in the Winter 1999/2000. Due to the change of method, efforts to communicate with and inform the general public become even more important, as respondents had to be 'walked through' the process of completing and returning the questionnaires and 'defaulters' had to be gently reminded of their obligations. In fact, in the mailing process the communication campaign takes on the role of the enumerators who call at the door for the completed questionnaires in the traditional census. The massive campaign strongly used the media and the SFSO Internet site.

[35] 'Bordereau de maison'.

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Legislation

In 1998 the Parliament and the Federal Council created the necessary legal foundation for the survey with the revised Population Census Act and its Executive Ordinance, both of which came into force on 1 March 1999. The Act encourages the utilisation and harmonisation of registers and allows the communes to use, within 6 month time, the individual data from the personal questionnaire[36] to correct the inhabitants' registers. Answering to the questionnaire was compulsory.

Data confidentiality was regulated by both the federal law on data protection and the Census Act, with the ordinance providing the practical details. Among the main principles/aspects:

- data had to make anonymous at data processing stage;
- work secrecy for all staff participating to the survey;
- designation of data protection bodies by the Federal Council and the cantons;
- use of data for statistical purposes only (with the exception of the possible correction or creation of registers, see below).

According to the Population Census Act, the individual communes are responsible for conducting and financing the survey.

Building and Dwelling Census

The conduction of the building and dwelling part of the Census was standardized throughout Switzerland, with centralised dispatch of the material by the SFSO using the *Building Address Directory*[37]. For large property management agencies, some of which manage up to 20 000 apartments, the SFSO developed the special **GERIM**[38] software which lets the agencies use building and dwelling data from their administrative registers, complement them as necessary and submit the whole dataset to the SFSO electronically, thus eliminating the need to complete questionnaires. Thanks to GERIM, roughly 20% of buildings and 50% of apartments could be surveyed directly by electronic means. In contrast, owners with single buildings had to complete the questionnaire.

Population Census: four survey variants, from "Classic" to "Future"

For the personal and household survey, the SFSO provided four different variants for communes to choose from – an approach which uses data from the inhabitants' registers in communes and cantons throughout Switzerland taking account their very different IT structures and capacities.

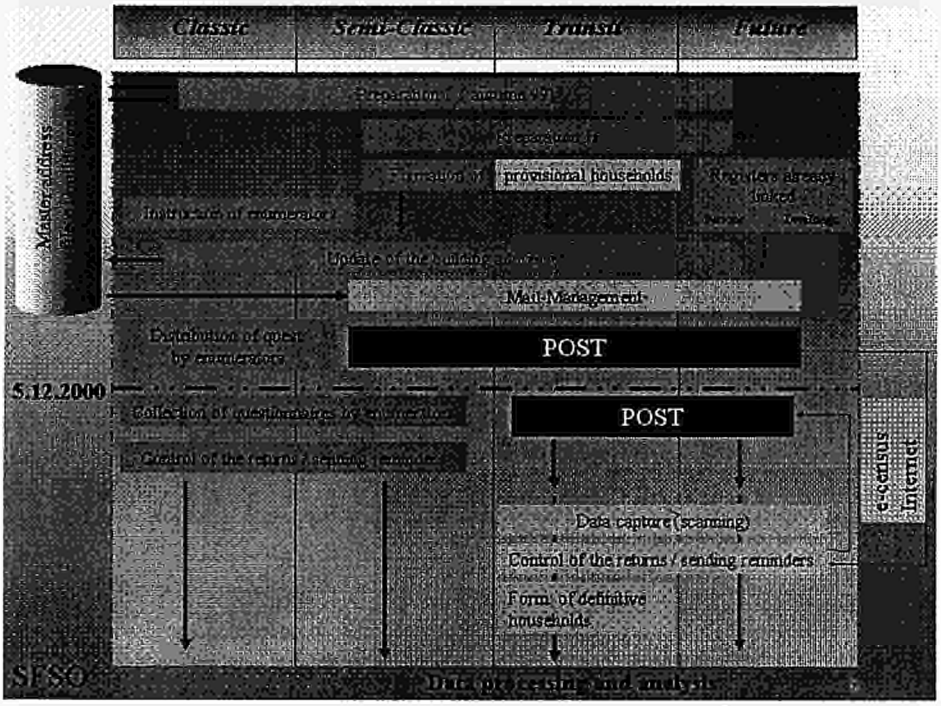
[36] I.e. the data extracted from their same registers after the eventual correction from respondents.

[37] This SFSO system is mainly constituted from data derived from the Population Census 1990 and the Business Census 1995.

[38] 'Gérances Immobilières'.

- **"Classic"**: as for the 1990 Census, traditional method with distribution and collection of the questionnaires by enumerators.
- **"Semi-Classic"**: questionnaires pre-printed with data from communal inhabitants' registers, mailed to the households, then collected by enumerators.
- **"Transit"**: questionnaires pre-printed using the inhabitants' registers and sent and collected by post. No enumerators were necessary.
- **"Future"**: this approach differs from the Transit one mainly in that the commune has both an inhabitants' and a dwellings' register. This greatly simplifies the survey because the so-called **"household construction"** - i.e. the link between persons, households and dwellings - already exists. In this variant the household questionnaire which becomes un-necessary was however used in order to validate the method. After the Population Census 2000, this variant is to become the general rule.

Diagram 6 - Survey for variant approach in Switzerland



Source: Haug (2000)

In addition, the SFSO offered respondents in "Transit" and "Future" communes the **E-Census**, i.e. the option to fill in the questionnaires and reply via the Internet. The questionnaire completion process was controlled by a powerful central server and was subject to stringent data security and data protection requirements (e.g.: in the controlled issue of passwords). This is the reason why this option was not made available to people living in the communes applying the "Classic" and "Semi-Classic" variants.

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Apart from Canton Ticino, the majority of the larger and smaller communes (64.4%) and mostly the population (92.4%) participated in the Population Census on the "Transit" variant (Table 1). The survey documentation was sent to them and returned by post. In the smallest communes, the Census was conducted in the traditional way. In overall, less than 7% of population was reached someway by enumerators under the first two variants, while about 1% participated in the "Future" variant. Concerning the E-Census, it was very well accepted and implemented according to the expectations. This solution to answer was adopted by 120 000 households or 280 000 people, i.e. 4.2% of who could use it (the 90% of population, all those with the possibility to reply by mail).

Table 30 - Distribution of communes and population by survey variants in Switzerland

Variant	Number of communes	Number of communes in %	Population	Population in %
Classic	674	25.4	255 291	3.7
Semi-classic	247	9.3	201 199	3.0
Transit	1 711	64.4	6 294 463	92.4
Future	25	0.9	63 865	0.9
Total[(1)]	2 657	100.0	6 814 818	100.0

1 All figures exclude 245 communes in Canton Ticino (about 8.5% of the total country's communes and 4.3% of population) which organised the Census using a special system based on interlinked inhabitants', building and dwelling registers.

Quality problems with register data and addresses

Some difficulties in the implementation of the new method arrived from the need to produce standardised extracts from decentralised registers, and the available address lists used to ensure the correct dispatch of the pre-printed questionnaires.

Because of Switzerland's federal structure, there are many different cantonal – and even communal – approaches to keeping inhabitants' registers, resulting in an incredible variety of systems and software, as well as very different contents and codifications. However, for pre-printing the questionnaires, it is of prime importance for the characteristics on the inhabitants' registers to match those of the SFSO. To standardise the register extracts, the SFSO had to develop a special software (**LOCO 2000**) which was distributed free to the communes. In addition, this software makes possible to supplement and coordinate the building addresses centrally supplied by the SFSO with the locally available inhabitants' addresses. This coordination is necessary to guarantee the link between the building and dwelling survey and the personal and household survey.

The 1999/2000 dress rehearsal showed that there were problems with address quality, both in the SFSO's *Building Address Directory* and the inhabitants' registers. These are due to the lack of a harmonised terminology, missing or unclear addresses in individual communes and addresses that are out of date. Consequently, major efforts had to be made to produce current, complete and correct lists of addresses for postal dispatch. If there was no apartment or household number, as is the case in most registers, correct

assignment of individual inhabitants to the household required special procedures. The solution of these problems was provided from the close co-operation of SFSO with Swiss Post, which has considerable experience in the field of address management and updating.

The national Service Centre

With the introduction of the new methods the communes were risking to reach their technical limits (e.g.: needs of specific infrastructure to pre-print A3 format questionnaires or to manage the mailing of the questionnaires). Moreover, certain IT investments at communal level make no sense. That is why the SFSO set up a central **Service Centre** which took over many of the survey tasks on behalf of the communes and the cantons.

Depending from the variant, communes had the possibility to outsource to the Service Centre the following activities:

- the mail management only, i.e. pre-printing of questionnaires, automated enveloping, automated sorting by postal delivery round (for "Semi-Classic" variant);
- In a so-called **"Global Package"**, the questionnaire return monitoring, reminders and checking that the questionnaires have been fully completed, in addition to mail management (for "Transit" or "Future" variants).

The "Global Package" effectively relieved communes of manual checking work after the reference day. 1 600 of the 1 736 communes adopting the two variants opted for this outsourcing. Considering the return, 85% of all the questionnaires sent by post and expected back were spontaneously returned by post or the Internet by the first three weeks, 91.5% by the first two months. This percentage increased to 95.8% and 97.3 by March and mid-June 2001 – i.e. by the end of the first and second vague of reminders undertaken through letter and phone calling respectively. The remaining cases which the Service Centre could not clarify were returned to the communes for solution – carrying out another reminder or filling in the questionnaires for some basic data only, depending from the commune. The collection of the questionnaires was definitively ended in September 2001. Communes had the right to ask reimbursement from non-respondents for the supplementary reminder work.

For the tasks assigned to it, the SFSO commissioned the Service Centre with data input as well as with developing and plausibilising the questionnaires. With aim to quickly obtain results, data capture and processing were optimised and constantly monitored. For the first time in Switzerland, hot and cold deck editing procedures were applied to the census data.

The Service Centre operated by a Consortium leaded by Data Care AG Luzern (a company controlled by Swiss Post). The different partners took care of specific tasks such the optical reading technology (Interact AG), the hotline and call centre set up by in both French and German (BEE Company) or the contracts with the communes (Federas Beratung SA).

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Data dissemination

The 200 Census provided some 30 to 40 information components about each and every individual in various areas (demography, education, work, culture and transport), 15 components about dwellings and 10 about the building the respondent lives in. All data which are largely comparable with those of the three previous censuses (1970, 1980 and 1990) are being 'packaged' for specific target groups in terms of access, scope and presentation. The basic programme of tables is considerably reduced and structurally simplified. Priority is given to electronic data media with user-friendly interfaces over traditional hard-copy dissemination methods, with more products based on visual and cartographic presentations, the Internet, online databases.

The dissemination plan is the following:

End 2001: First results including the population structure for the country, cantons and communes

Summer 2002 Final results including the population structure for the country, cantons and communes

Provisional results of buildings and dwellings to be integrated in the SFSO's new Building and Dwelling Register

Autumn 2002: Final and complete results

Since 2003: Scientific analysis on selected topics such as households structure, gender issues, evolution of renting, urbanisation and the development of urban agglomerations, the professional and spatial mobility[39]

As in 1990, anonymous individual data are stored for the whole of the country, the individual cantons and cities. For selected customers, there is the possibility to provide individual datasets in the form of public-use microdata files on a random sample basis. For comparative historical analysis, a harmonised dataset of anonymous individual data will be prepared towards the mid of 2003 which links information from the last four censuses.

Costs

The Swiss Parliament approved a disbursement for the 2000 Census of about 108 million CHF. In addition, some 45 million CHF are estimated for local expenditures by cantons and communes. This makes a total amount of some, 153 million CHF - i.e. around € 100 million - in the 8 years period 1998-2005. This figure makes an average cost of 16 CHF (€ 10.5) per person, i.e. 2 CHF (€ 1.3) per year and per person.

[39] Apart from the international comparisons at European and worldwide level, the SFSO also makes every effort to intensify the co-operation with the NSI of neighbouring countries, e.g.:for the definition of border-straddling conurbations or the interpretation of data about cross-border commuters.

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Conclusion and future plans

Considering all the technical and methodological innovations, the positive reaction and wide participation of people, the respect of deadlines and the quality of data, the Census 2000 may certainly be considered successfully implemented. The centralised treatment of the registers' data has however showed some problems for which the SFSO is looking for a solution through the so-called **E-administration initiative**. With an eye to the future, and on the SFSO's input, a change has been made to the Swiss Constitution to give the Government general powers to regulate and harmonise registers for statistical purposes. In fact, with regard to the use of registers, some of the solutions adopted will merely be temporary stopgaps. A sustainable change in survey methods calls for long-term measures and investments in the harmonization of addresses, register content and links between registers.

Harmonization covers four aspects:

- The registers must refer to the same basic units (persons, households, buildings, dwellings, etc.) and – a factor of vital importance – it must be possible to link these basic units by means of unified nationwide keys and identifiers.
- They must use the same definitions (What is a household? How is a building defined? How is the place of residence defined?).
- Coding of the characteristics has to be based on standardized methods (e.g.: codes for foreign countries, marital status or professions).
- The registers must be based on identical quality standards and be updated at similar intervals.

The SFSO has used the data from the 2000 Population Census to develop a *Federal Building and Dwelling Register*. It contains basic information about building and housing stocks as well as appropriate identifiers and is continually updated after the Population Census 2000 on the basis of information, especially from construction statistics. For that reason, this Register will also replace the current Building Address Directory. Cantons and communes are now able to hook up to it and use it for performing their statutory functions. The key aspect of the harmonization is that building and dwelling identifiers are to be built into communal inhabitants' registers.

In addition to the *Federal Building and Dwelling Register*, the SFSO will have the communal and cantonal population registers harmonization embodied in legislation on the basis of article 65 of the new Federal Constitution. The plan (with a time horizon of 2005/2006) is for a Federal Law on Registers of Persons to come into force, regulating nationwide coordination and harmonization of such registers, registration and changes of address as well as the provision of data for statistics. This would lay the foundation for a new, consolidated survey methodology which links register censuses and direct surveys, thus concluding the transitional phase initiated with the 2000 Population Census. The information requested direct from the general public in future will depend on the development and interlinking of Swiss registers as well as on the information mandate of future population censuses.

This country report is mainly an updated and extended version of the paper *'The Population Census 2000: new and future-led'* (Werner Haug and Marco Buscher, SFSO website, 2000).

BULGARIA

Introduction

Population census has a long tradition in Bulgaria, with the first enumeration conducted already on 31.12.1880 at time of the establishment of the new statistical institution following the liberation from Turkish Empire. Since that time censuses were conducted regularly at 5 and 10-year intervals with exception of the periods of wars. The 2001 Population and Housing Census undertaken as of 1 March 2001 was the 16-th in the history of the country. The dates of the last censuses are as follows: 1.12.1956, 1.12.1965, 2.12.1975, 4.12.1985 and 4.12.1992.

The 2001 Population and Housing Census in Bulgaria, as well as all the previous censuses, was a responsibility of the National Statistical Institute (NSI). The census was financed entirely by the Government of Bulgaria. Some post census activities such as GIS implementation, census results analysis and others will be partly financed by an overall PHARE statistical project.

The Census was carried out in the traditional way - enumerators interviewed the population and filled in the questionnaires. Previous pilot surveys and tests showed that the population is still not ready to fill in the forms by themselves. Local population registers were used in the preparation of the enumerator's list and in the phase of data checking. No data from the register is used instead of census data.

The Census covered also all residential buildings and dwellings as well as the institutional households. The use of trained enumerators allowed for the census programme to be more complicated and also allowed a number of large sample surveys to be carried out simultaneously with the Census. The latter constitutes an usual practise since 1965. For the 2001 exercise five surveys were carried out on census based samples with a volume between 20 and 40 thousand persons, as follows:

- the regular Labour Force Survey,
- a Fertility Survey,
- a Migration Survey, and
- a Population Health Status Survey,
- a Time Use Survey – whole year survey, covering the period 15.10.2001-15.10.2002. First results will be produced in June 2003.

Simultaneously with the 2001 Population and Housing Census, an Agricultural Census was also carried out. It covered the whole population of the country and had its separate questionnaire.

Legislation

A census law governs the conducting of the Census and the use of its results. It defines in detail the contents of the census, the organisation and the confidentiality issues. It is applied in conjunction with the Statistical Law of the country.

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The three questions concerning the minorities - ethnic group, mother tongue and religion are the only ones that are not obligatory to answer. The population is obliged to take part in the census and there is a fine for those who reject to participate. Luckily there were not major offences in this respect and even the minority questions were answered by nearly everybody.

Registers and demographic information systems

A project aiming to the use of administrative sources for statistics on persons and business statistics is currently being implemented in the NSI with support from Denmark.

As an exception among the Central and Eastern European countries, an advanced integrated information system for demographic statistics exists in Bulgaria. It is based on two components, the unified system for population registration and administrative service to the population (**ESGRAON**, set-up already in 1978 and resulting of a National Demographic Database) and the vital statistics (**TDS**) separately administrated by the Ministry of Regional Development and Public Work and by the NSI respectively. The ESGRAON-TDS strictly depends from the structure of 28 administrative districts ('*oblast*') and 263 municipalities, the connection between the two national services and the unique Civil Registration Number (PIN[40]) largely used in the country.

Nevertheless, population register is used only in the preparation of the enumerator's list and also in the phase of data processing to double check some civil PINs which have been found to have errors. No data from the register is used instead of census data. This is because the information in the registers is not updated regularly (see below).

Preparatory phases

The preparatory phase covered one and a half years. Questionnaires were designed entirely on the basis of UNECE/Eurostat recommendations. Even the traditional December date was changed to March so as to achieve full correspondence with the common European practice.

A **Pilot Census** was conducted in a small town and a number of villages during the spring of 2000. It tried to resemble completely the real census so as to show the deficiencies of both methodology and organisation. Corrections were made on the basis of the conclusion from the pilot census.

The 2001 Census was based on a series of **preliminary population census lists** (of buildings, dwellings, households with names of household heads and number of household members). They were prepared in the months preceding the census. The district and municipal authorities took important part in this process and special census commissions were formed at all levels of administration. Main sources for the list preparation were the lists from the previous census, data from the Population Register and on site checks and visits. The preparation of these lists was paid from the census

[40] EGN in Bulgarian

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budget. The result of this process was a detailed list of addresses and household head names for each of the 39 000 enumeration sections.

Enumeration units

The Population Census enumerated the following categories of persons:

- all Bulgarian citizens living permanently in the country regardless of whether they were in their permanent residence or in a difference place at census day;
- all Bulgarian citizens who left the country in the year preceding the census (by proxi interviews);
- all the Bulgarian citizens and their family members with a permanent residence in Bulgaria staying as country's representatives;
- Bulgarian citizens and those with a dual citizenship who lived permanently abroad but were in Bulgaria at census day;
- Foreign citizens who have received a permanent residence before 1 March 2000 or an official residence permission after 28 February 2000;
- Foreign citizens and their family members who were granted an official status as refugees in Bulgaria before 1 March 2000 or had an open procedure for granting that status after 28 February 2000.

In terms of definitions, although since 1965 the population refers to the permanent population the census enumeration distinguished the following four categories:

- *permanent population*
- *present population*
- *temporarily absent population*
- *temporarily present population*

Regarding the Housing Census, it covered residential buildings (including that not used for living at census day) and all the dwellings (inhabited, not-inhabited, excluding those used for non-housing purposes).

Publicity and information

A special PR team was formed at the NSI, which had the task to carry out the awareness campaign for the census. The team consisted of four persons - all of them former journalists and printed media editors.

The campaign started long before the Pilot Census. The representatives of the media were invited to participate in a three-day seminar organized and paid for by NSI where the journalists were educated in respect of population statistics and population and housing censuses.

The real publicity campaign began three months before the census date. All means were used extensively for this purpose. Each household got into their post box a leaflet explaining the census and the benefits from it for society. Spots on TV and radio were regular. Almost each day in some of the newspapers there was a material connected with the census. Extensive interviews with census officials and NSI management were conducted in the capital as well as in all the administrative districts.

ıpaign became very active during the last days before the census, as well as he days of the census itself. The attention of the public was kept alert by y news about the census preparation and conducting. The total cooperation of ılation in respect of the census was the evidence for the success of the publicity gn.

ɔperations

nsus started on 1 March 2001 and the field work lasted for two weeks. About enumerators and 6 400 controllers took part in it. No major problems were ered except for the complaints of some of the enumerators because of the heavy ıd, especially in the enumeration sections where sample surveys were being ted. Some of these enumerators were allowed an additional day or two to te their work. Generally census staff was eager to work since the payment was ntirely on the volume of work done, i.e. paid per person, building and dwelling ated.

rators, controllers and chiefs of municipal and district commission were obliged ecutively fill in summary forms with data on the number of the population, sex tion, age distribution (three main groups) and also data on dwellings (type and ɔace). These data became the first preliminary results from the census and were ced and published some 20 days after the end of the enumeration. These data ıvailable for all the administrative divisions of the country - districts, ɔalities, cities, towns and villages.

ɔrocessing and population database

as imputed manually since it was decided that the social effect (employment) is nportant than the use of new technologies (e.g.: OCR). All of the data coding and the data correction and editing is being done at the moment of imputing. At the umber of software programmes are to be run so as to auto correct and ensure that ı is in conformity with the rules set. Despite their over-counting (see below), ion registers, in the phase of data processing population registers were used to check some PINs which have been found to have errors.

e questionnaires that constituted a 2.5 % sample were imputed so as to get the preliminary results. These results were published in September and were very ı. The final results are expected around the end of February 2002.

onal Demographic Database (NDB) containing census data and annual vital s exists at the NSI. It is a distributed one based on an INFORMIX platform. kept at three different level, each one with its own confidentiality rules and ɔd access:

- **Level One – Microdata**, where are stored the individual records from the 1992 Census and actually all the demographic events occurred in 1995-1999 for the entire Bulgarian population. Each personal record can be identified by its unique PIN, this way interesting comparisons can be made by matching census individual records with vital statistics individual records. Its is for example used by a team from the Max Plank Demographic Institute in Rostock, Germany, to study mortality in Bulgaria by different causes and factors. This is done by linking and matching individual death certificate records with individual census records of the deceased persons;
- **Level Two – Macrodata**, with aggregated data on the number and structure of the Bulgarian population at lowest geographical level compiled from Level One records;
- **Level Three – Metadata**, including descriptions on data processing and storage data, structure of the database, methodologies and studies, different possible outputs, legislative principles regulating the database.

Now the new census records will also be introduced into the NDB. As a result, in the NDB there will be the individual records from two censuses and of some 12 years of vital statistics. This will allow for some very interesting population analysis to be performed. It is planned in the future to introduce into the NDB the individual records of all the large population sample surveys, including the ones carried out simultaneously with the 2001 Census. This is possible because all their records also contain the unique PIN.

Data dissemination

55 publications arc planned to be produced. At national level, there will be 8 publications containing population data, 3 - information on dwellings, 1 - on agricultural holdings and 7 - data from sample surveys. There will be 28 publications at district level and 6 at regions for planning level. 15 of them are already published. Each one will contain a short commentary of the data. The number of the paper publications will be considerably increased in comparison with previous censuses. Increased will be the volume of the data published on electronic media and on the Internet. A tradition of quick responding to ad hoc queries will be kept. This is made an easy task by the availability of the NDB.

Quality aspects

As tradition from the 1956 Census on, two Post-Enumeration Surveys were carried out immediately after the Census to estimate double and missing counting and to calculate errors in the inclusion of people in the population categories (coverage survey) and to detect errors from erroneous recording of selected characteristics for individuals and dwellings (quality survey). The two surveys based on a two-level stratified sample (geographical location and households in the order) included respectively about 9500 and 3000 households (or 26500 and 8500 persons).

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Information from these surveys which were undertaken only used to measure the results however not revealed major deficiencies of the census. On the other hand, census results demonstrated that population registers are not correct - according to the register the population of the country is 8.75 mil. while the Census found 7.929.901 people.

Costs

The total cost of the Census was planned to be somewhere around € 11.5 mil i.e. a cost per capita around € 1.5. A total of 45% of the census budget was used for enumeration and training, around 24% for general preparation, services and logistics. The three other main items of the budget concern the data processing operations (13.2%), the equipment (10%) and the publication and dissemination of all census results (7%).

Conclusion

Future census plans could gain from the more systematically use of the still existing population register and integrated information system for demographic statistics. It is effectively foreseen to implement, during the next census, a mixed system of traditional enumeration and extraction from registers. The question whether the data collection will be again carried out through classic questionnaire by interview or not, is not solved yet.

This country report is mainly based on a document prepared by Mr Jordan Totev, Statistician, National Statistical Institute of Bulgaria for the purposes of this project.

CZECH REPUBLIC

Introduction

In the Czech Republic, as in many other countries, a population census is carried out once every ten years. The most recent Population and Housing Census, which was organised, managed and co-ordinated by the Czech Statistical Office (CSU), took place in the first half of March 2001. Midnight between 28 February and 1 March was selected as the reference moment.

Different ministries and national institutions, such as the Czech Office for Surveying, Mapping and Cadastre as well as district authorities and municipalities, took part in preparation for and implementation of the project. Traditionally, the self-enumeration method was used. However, the preparation of the enumeration units and the data processing stage was characterised by several innovations. In order to test the whole census process a Pilot Census was conducted in September-October 1999. It was based on a sample of 16 000 households, in districts of the Czech Republic.

Legislative basis and regulations

Several acts and regulations were adopted in connection with the previous census, among them:

- Act No. 158/1999 on the 2001 Population and Housing Census (Collection of Laws, Volume 53, of 23 July 1999);
- CSU decree establishing the specimen for enumeration questionnaires for the 2001 Census and specimen ID cards for enumerators and supervisors (Collection of Laws, Volume 95, of 13 October 2000);
- CSU Instruction of 9 August 2000, Ref. No. 927/2000-2210, regulating the activities of district authorities and municipalities in the preparation and execution of the 2001 Census (Official Journal of the Government of the Czech Republic for districts and municipal authorities, Volume 5, of 21 August 2000).

Preparatory phases

Discussions had begun about four years earlier with the main data users on areas and contents to be included in the 2001 Census. All methodological and organisational documents were prepared in advance. This included enumeration questionnaires, selection, appointment and training of enumerators and supervisors, and the necessary local arrangements across the country. A major role was played by the **Commission for the Population and Housing Census** set up by Government Resolution No. 3/1999 as the top inter-ministerial coordinating and advisory body.

Based on results from the previous census a *Register of Census Districts* was created, and work on its update was started three years before the Census. The Register represents the most complete set of records on structures designed for housing, and contains all structures – buildings and number of dwellings in each building including

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full addresses. This tool was used to draw digitalised cadastre maps provided for field operations.

Publicity and information

The CSU communication strategy was to provide sufficient explanation in the media of the importance of the Census and the methods to be used. The objective was to persuade the public that the activity was useful and to dispel possible doubts through a campaign based on classic advertising and public relations. Promotional activities were to raise awareness, familiarise citizens with the questions and stimulate their interest in further information.

The philosophy of the **advertising campaign** was based on essential unifying elements – a standard logo (resulting from a public competition), the slogan (*"We count ourselves for the third millennium"*) and a unique tune. The following types of broad media coverage were chosen to best address various social groups:

- alternating application of two television spots at television stations having the highest viewing rates;
- advertising spots on public radio (*Cesky radiozurnal*, a census partner) and commercial radio stations and on regional stations for Polish and Roma minorities
- press campaign in several newspapers;
- census logo designed as a stamp for all certified mail;
- advertising banners accompanied by a contest on the best known Internet servers.

From 1 February 2000 on,

- the census logo was displayed on public transport in Prague, regional and district capitals and on Czech Railway tickets;
- leaflets were distributed and posters displayed in railway stations, administrative and students' premises;
- slides were shown at cinemas;
- TV programmes and documentary;
- specimens of enumerator ID cards and enumeration related information was published in newspapers;
- a pencil with the logo and an information booklet containing the main results of previous censuses was provided to each household together with the questionnaires.

In the field of **public relations**, CSU organised frequent communications with the media on various census topics (such as the compulsory nature of enumeration and citizens rights) and on the work to be conducted; the public was informed almost daily. Both the Czech and all minority media were provided with the same information. Explanatory notes to the questionnaires were produced in ten languages: Polish, English, Arabic, Chinese, French, German, Roma, Russian, Ukrainian and Vietnamese. Interactive communication was established to provide information via a toll-free

telephone line, available from 15 February to 20 March 2001, where citizens were able to receive basic information and more specific answers from CSU specialists.

CSU largely communicated through the website, providing information on the history, progress and results of the censuses, preparation and progress of the 2001 Census and entertainment, games and contests to acquaint young people with the survey.

Data confidentiality and protection

Even before the Census began, a hostile media campaign was mounted. In particular, representatives of the newly established Office for Personal Data Protection placed doubt, both on the use of personal identification by the Census and on the ability of the CSU to protect citizens from abuse of data collected. Therefore, CSU asked the Ombudsperson and the Government to approve that the Census was in accordance with the Personal Data Protection Act. Both institutions made an agreement, stating that the guarantees of personal data protection laid down by the Census Act were sufficient. Furthermore, to ensure definitive clarification, the CSU took legal action against the Office for Personal Data Protection. The dispute has not yet been resolved.

Immediately after enumeration the CSU being well aware of its accountability to citizens who, despite doubts cast on the Census by the media, supported it with their high participation. A flash opinion poll on privacy and data protection was carried out in connection with the census. The results of the poll, over the period citizens' distrust of the Census was constantly being provoked, showed that more than two-thirds of Czech citizens did not consider the questions in the questionnaires to be a major interference in their privacy. Apart from this, over 50% of the public (against 33% in a previous poll taken less than two months before by the same agency for *Ceska televize* [Czech Television] and *Cesky rozhlas* [Czech Radio]) trusted the CSU to be able to protect their personal data.

In consultation with outside and recognised experts CSU prepared a set of safety measures to ensure personal data protection. First, enumeration staff were sworn to secrecy by the institute that appointed them, later electronic data processing was centralised and conducted under strict safety precautions. For the first time in the Czech Republic all questionnaires were shredded after data processing. The Office for Personal Data Protection supervised these steps and found no errors were made on the part of the CSU during implementation and processing of census data. At the same time, the CSU offered guarantees that census data would be used solely for statistical purposes and under no circumstances would information be provided to anyone, including any authority of the public or state administration.

Conduction of enumeration

The 2001 Census was carried out using three questionnaires (for individuals, buildings and housing units) that applied to:

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- each person having a permanent residence or long-term stay in the territory of the Czech Republic at the reference moment;
- each person in the territory of the Czech Republic at the time of the reference moment excluding those under the previous point;
- each building, either occupied or not;
- each dwelling, either occupied or not.

As in the past, the questionnaires were completed by respondents or through enumerators. According to the law, each person had the duty to supply all requested data stated completely, correctly, truthfully and in a timely manner. Information on ethnicity and religion was optional. Another person from the household supplied the data for persons with permanent residence in, but temporarily absent from, that place. In case no such person was available, it was up to the enumerator to find out the requested data – from the municipal register, the police or other source.

Owners or caretakers provided building data, while inhabitants provided dwelling data. In the case of a vacant dwelling, the duty passed to the owner of the building or dwelling; if there was a caretaker of the dwelling, it was up to him/her to provide the data.

Enumeration was based on about 50 000 Census Districts (CDs) set by CSU in co-operation with the municipalities. The CD is the territory of the basic settlement unit, or its part including about 80 dwellings where data were collected by one enumerator. Establishments of collective accommodation for members of the armed forces, members of the Czech Republic Police, prisons and refugee camps made up independent CDs.

Data collection in individual CDs was conducted by enumerators and supervisors – 54 000 persons in overall – appointed in the municipalities by the CSU. Enumerators organised the Census in their CDs, which in particular included distributing necessary information, checking and collecting questionnaires and compiling overviews facilitating the release of preliminary results. Supervisors were responsible for the census in their assigned CDs. They primarily managed enumerators' work, checked the enumeration for completeness, summarised preliminary results, and delivered the completed enumeration materials to CSU.

Individual dwelling households, custodians of accommodation establishments and owners or caretakers of buildings and, as the case may be, individual persons having reporting duty for the Census, received the questionnaires at least six hours before the reference moment. The enumerator in charge collected the completed questionnaires after the reference moment, or the completed questionnaires could be handed over to the supervisor or municipality within the following 12 days.

Only 261 people refused to complete the enumeration questionnaires for themselves or for their families, 76 refused to complete the missing data and 28 refused to correct pieces of information that were obviously wrong. These cases were handed over to district authorities for offence proceedings.

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Data processing

For the first time in the country data capture was performed by scanning the questionnaires. Before optical scanning, text responses on nationality, religion, educational attainment, occupation, place of birth and other territorial identifiers were coded (all other questions were answered using a cross). After optical scanning, checking was applied to entries and plausibility of answers. Data was processed and databases constructed, using Oracle products and applications.

Data quality

The overall evaluation of the completeness of the 2001 Census may be based on preliminary results, i.e. population figures at municipality level in comparison with demographic statistics and with the *Population Register* maintained by the Ministry of the Interior. The following discrepancies were found:

- compared with demographic statistics, the Census counted only 41.6 thousand persons, i.e. 0.4%, fewer, and
- compared with the register 21.6 thousand, i.e. 0.2%, fewer, as against the *Population Register*.

In addition good local arrangements for the Population Census across the Czech Republic and the creation of the Register of Census Districts contributed to the success of the project. The relatively accurate descriptions of the CDs guaranteed that no structure, subject to the census could be left out, which is proved by data on the number of counted buildings and dwellings.

Data dissemination

Preliminary Results (derived from manual summarisation of selected data from the enumeration phase), and **Intermediate Results** (basic data from the three questionnaires excluding combination or derived figures) in the breakdown by municipality were respectively issued in July and November 2001. CSU will begin publishing the **Final Results** from the end of 2002 in hard copy, CD-ROM and on the Internet.

Costs

The budget for the Census amounted to CZK 2.4 billion (about € 80 million) spans seven years (1997 to 2003) and includes costs incurred by the CSU and central and local governments. This total value contains:

- CZK 142.6 million (6%) for capital expenditure;
- CZK 893.5 million (37%) for remuneration to enumeration staff;
- CZK 1 374 million (57%) for other current expenditures (direct expenditures for census preparation and conduction, up front expenditures for questionnaires, material, information services and promotion).

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The minimum of resources for preparation, execution and processing of the Census were allocated, use must be recorded and each year's surplus returned to the State budget. The budget was approved at the same time the Act was passed. Its economy is governed by special regulations and is closely monitored.

Conclusion

The Czech Republic did not have administrative registers that could substitute, even partially, the population census. Data collection for demographic statistics is based on full coverage of all demographic events providing an annual balance of population estimates in each municipality. The population census still provides a basis for a correction of the size and structure of the population as well as other statistics and data for registers or sampling frame.

There had been a requirement to limit the number of questions so as to reduce the complexity of the questionnaire. Despite this, and considering the organisation, and cost, the implementation of the 2001 Census proved to be successful. As a result of great effort, the CSU succeeded in overcoming the negative media campaign during the period of enumeration. Thus an overwhelming majority of the Czech population accepted the survey as necessary and completed questionnaires truthfully and willingly.

ESTONIA

Introduction

The first Population and Housing Census was conducted in 2000 in the newly-independent Estonia, implementing as far as possible the UN recommendations for population and housing censuses and EU statistical principles. This census directly followed on from past enumerations carried out within the former Soviet Union in 1959, 1970, 1979 and 1989.

The Census was conducted as a traditional enumeration based on interviews (with some information from registers used as support) using 31 March 2000 as the reference day. The Statistical Office of Estonia (SOE) was the responsible organisation. Results will be used for the revision of population series, preparation of demographic projections and as a frame for further statistical surveys.

Legislation

A Government Census Committee had already been set up by 28 February 1995 and in 1996 legislative work began. The Census Act was passed by the Parliament in May 1998 and established a legal basis for conducting the census. Other relevant legislative acts were drafted and adopted before the Census in 1999 and in January 2000.

In February 1999, the reference date was postponed, at the request of local authorities and in consideration of experiences gained during the Pilot Census in March 1998, from 11 January to 31 March 2000. Reasons for postponement were the elections of local authorities that would have caused difficulties in organising the project in municipalities during the last quarter of 1999. Moreover field operations would bc much easier in March because hours of daylight are longer than in January.

The reference was the national Statistics Act and the Data Protection Law dates from 1997 (amendments were made in 1996 and 2000). The Census Act states that data collected in the census are confidential and shall not be subject to disclosure or transfer to third parties including registers.

Registers

Estonia has many registers and databases that exist at different quality levels. Preparing for the 2000 Census the country faced serious problems as the registration of inhabitants using their place of residence was not regulated by law. Because of this fact registers do not show actual population figures, and locations or population compositions of administrative units and settlements. After using two registers as a support to the last census, the survey to test the quality of the basic registers (*Population Register, Building or Construction Register, Business Register, Tax Register*) will begin in the year following.

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Preparatory phases

In 1994, the plan, schedule and estimated budget for the Census were agreed and formed the basis for the annual budget allocations. Several projects and development of technical work also were initiated in relation to the Census. At the same time, studies were made of the experiences and census methodologies in different countries; then co-operation was established and followed up on between various countries.

The census questionnaire, forms and regulations of the Republic Regulation were approved by Government on 5 March 1999. There were two questionnaires – the Personal Questionnaire containing 31 questions and the Housing Questionnaire with 12 questions.

A user poll was carried out to discover the kind of census data required to design the main output tabulations and to order the software necessary for processing census data.

SOE launched the mapping program for the Census in 1995. After completing the test areas the specification of the digital census maps was compiled: 1:50 000 maps in rural areas and 1:5 000 maps in urban areas were drawn. Specification was optimised to create a cartographic basis for census planning and the census itself (maps for enumerators, maps for supervisors, etc.).

The census mapping process was outsourced by SOE to two companies – one for urban, another for rural areas – and were based on different methods. In rural areas, paper maps of the 1989 Census were used as source material, digitised by the company and updated by local governments. In urban areas, existing maps and orthophotos were used as a source and the company updated the maps. In addition, for both rural and urban areas the municipalities compiled household lists including the number of inhabitants in each building or apartment. The purpose of household lists was to provide information on the number of inhabitants for delineation of Enumerator Areas (EAs).

The EA borders were marked on digital maps, which were printed for census purposes. SOE stored digital maps in urban areas in Mapinfo, in rural areas in ArcView and household lists in Foxpro. Maps were ready in December 1999 and were printed out in the 1st quarter of 2000. Three types of maps were printed: census district, supervisor area and enumerator maps. These digital maps of the registered borders of administrative and settlement units are the basis for presenting the census results in a cartographically and for development of the census GIS.

The preparatory work for data processing covered designing questionnaires based on Optical Character Recognition (OCR) requirements, testing data capture, extracting data from registers (Population and Building Registers), compiling dictionaries of automatic coding, developing of software applications for security requirements, storage and electronic handling of data and creation of standard dissemination output.

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Publicity and information

The special poster and census logo were introduced on different census documents, TV clips and leaflets. Posters were displayed at main bus stops in large cities two weeks before the census day and the Estonian Post Department published a special commemorating stamp. Radio, TV channels and newspapers were the main sources of information on activities.

Field operations

The Census was preceded by a preliminary visit by the enumerators on 26-29 March 2000. This meant that each enumerator became acquainted with his/her EA and the people living there, delivered the leaflet introducing the Census, and agreed on the time for enumeration suitable for the respondents. Data collection started on 31 March and lasted through 9 April, with 5 400 enumerators visiting people throughout Estonia, each enumerator covering on average 285 persons. The project was managed by 161 census area managers and 1 050 supervisors supervised the enumerators.

Enumerators were provided with helpful data from the Population Register and Building Register on characteristics of addresses, PIN, names, living quarters that had been compiled to guarantee truth of information on type and year of construction of the building, number of dwellings in the building, owner of the building, etc. This data was produced in an enumerator notebook. The enumerator was able to allow a person providing data to review that provided on the building and dwelling, as well as personal data, provided by State and local government databases before entering them on the questionnaire. Enumerators entered responses to ensure quality of the filled census questionnaire, as imperfect questionnaire entries would have raised problems when scanning.

Based on the Census Act the units of enumeration were individual persons, households, dwellings, and buildings containing dwellings. Persons were enumerated both on a *de facto* basis according to their place of residence at the time of the Census and de jure as usual residents based on their permanent place of residence in Estonia.

Data processing

Data processing began in the middle of May 2000 in a room of the main SOE premises specifically prepared for this purpose. Scanning and verification was completed in 4.5 months instead of the planned 7 to 8 months and full data processing was completed in the first half of 2001.

Data were entered through the Eyes & Hands software – a commercial tool used for scanning, interpreting and correcting letters, numbers, and signs – and coded by 135 temporarily employed computer operators. The work was done on working days, in two shifts, using two powerful scanners. A total of 15 employees were engaged in OCR and 50 in data coding. In addition to the administration, other people involved included a security officer, shift managers, record clerks, data and system managers, specialists in methodology and advisers, and the contract partners' support staff.

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Coding and setting-up of the Census Database were performed in co-operation with AboBase Systems Ltd. through means provided by Oracle (automatic coding, logical checks, etc.). Answers were coded into categories either by automatic systems, which recognise terms given in response to questions, or by manual coding. Automatic coding was implemented in processing data on questions about place of residence, place of birth (EHAK - Estonian Administrative Units Classification - and ISO-3166), citizenship (ISO-3166), nationality (national classification), language (ISO-63), , industry (eMTAK based on a NACE), occupation (ISCO-88) and religion (classification composed by Ministry of Internal Affairs). Those questionnaires/answers that did not pass the automatic phase were checked manually using an interactive coding process. For reasons of confidentiality those who did the manual coding were unable to see anyone's complete record.

Confidentiality issues

SOE allocated considerable funds to work out security policy and apply security measures related to project organisation and implementation. For this purpose, contracts were made in Estonia with the best known specialists in the field. Data processing rooms underwent repair, and strict organisational, physical and info-technological security measures were applied. Stringent internal rules observance, which was the task of shift managers and the census security officer, were applied in data processing rooms. In addition, by-laws of the Population Census Division and security requirements for job descriptions of the SOE officials and computer operators were approved and security requirements were added to contracts concluded with partners.

The security policy was worked out proceeding from the requirements for the EVS ISO/IEC 13335 standard, on the basis of which general aims and planned activities were specified. The final version of the main rules and means of guaranteeing security for the entire census process was worked out while taking into account the requirements of the Personal Data Protection Act, Database Act and Census Law.

To ensure an individual's confidentiality, and protect their anonymity, individual records on micro data are not released except for scientific research. In addition the conventions of international experts are followed in publishing census results. Disclosure control is achieved through several simple mechanisms in published output, e.g.: publishing tables do not count for individual records, some aggregation of variable categories, population and household thresholds for small areas, etc.

Post-Enumeration Survey

To verify the quality of the Estonian Census, a Post-Enumeration Survey (PES) which covered a sample of about 1% of the population was carried out in the period 14-19 April. This was a verification survey, meaning that in certain regions people were visited by supervisors who requested a repeat response to part (20) of the questionnaire. This was to verify that enumerators had correctly accomplished their task. All questionnaires were returned before the PES started, therefore, supervisors had no preliminary knowledge of census results.

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A sample of 50 of the 4 917 enumeration districts in the sampling frame (excluding those covering institutions) was selected dividing the population into two strata: urban (3 069 districts) and rural (1 848 districts). Based on available data approximately 1 017 000 persons live in urban areas and the average population size in an urban district is 332. A total of 448 000 persons live in rural areas and the average population size in a rural district is 242.

Based on the estimates under-coverage of the census on average is 1.2%, higher in urban areas and lower in rural areas.

Data dissemination

The **preliminary results** of the Census were published by the SOE in September 2000, and the **first final results** in September 2001([41]). Later ten thematic volumes were or will be completed within three years following the census date. These publications present the results for Estonia as a whole and by administrative unit, including comparisons with the 1989 Census and a short description on methodology. The information is provided in an overview, tables, coloured diagrams and maps.

The core national Tabulation Plan including 176 tables was provided in the first half of 2002 through the Internet. Paper publications will be available also on a diskettes and through the Internet. The link between GIS and the anonymous database processing software was implemented.

Based on census results the usually resident population in Estonia is 1 370 100, i.e. 195 600 people or 12.5% less when compared to the 1989 Census. The total of the usually resident population decreased both because of negative natural increase and out-migration from the country. In addition the population of every town and rural municipality has been affected by internal migration. As a rule, internal migration is directed towards larger towns and the rural municipalities around them.

Estonia's usually resident population fell by about 42 000 persons in the period between censuses as a result of negative natural increase. According to registered data for international migration the population decreased at the same time by 85 500 persons. The departure of the former Soviet army is well reflected in this sharp decrease in the population size of towns and rural municipalities where the armed forces were located.

The census population differs from the population registered by local governments as these registers do not reflect the actual place of residence for all persons.

Costs

The Census budget was centralised at the Statistical Office and covered all costs carried including those of other authorities. Since 1995-2000 the total costs of the census have

[41] 'Population de facto and usual resident population, location of the population, population sex and age structure'.

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been €'10.2 million, that is about € 7.5 per person enumerated. The largest elements of these costs are the expenses for the enumeration process (including the enumerators' training), corresponding to 40.2% of the total cost. The following main budget lines represent the preparatory tools and services (20.8%), cartography/mapping (15.5%) and equipment (13.1%).

Conclusion and future plans

The lessons learned and experiences gained during the Census were the following:

- A too detailed and very specific Census Act may cause problems at different stages of census activities and may lead to misinterpretations.
- Changes to the questionnaire and census procedures after the Pilot Census must be carefully handled and tested considering all stages of data processing.
- Using administrative records and databases as a source for delineation of enumeration areas may cause unfair workload on enumerators, especially in the cities, because of differences between *de jure* and *de facto* place of residence.
- Producing census outputs and access of users to the results must be as flexible as possible.
- Finally, a well-known problem related to traditional censuses remains – it is difficult to enumerate certain groups of the population, such as single young mobile people, students, etc.

It is proposed to analyse and improve the quality of basic registers planned in the near future; SOE is looking into the possibility of taking a register-supported census in the next round of censuses.

This country report is an updated and extended version of the paper: *"The 2000 Population and Housing Census in Estonia"*, Mati Sundja (Statistical Office of Estonia), UNSD, 2001.

HUNGARY

Introduction

In Hungary, as in other European and developed countries, significant importance is attached to successfully implementing full-scale decennial population and housing censuses. Long and thorough preparatory work comprising legislation, field activities, and data processing are required for the implementation of a census including vast personal, technical, and material resources. On the eve of the new millennium, the importance of preparation was highlighted by well-defined, up-to-date data needs, traditions, aspects of temporal and international comparison, and the need to find solutions to financial, human resources, and legal limitations. Suitable preparation was important resulting from basic socio-economic and political changes in recent years, expected data needs in the post-censual period, and new challenges of technical development.

Since 1870 population censuses have been undertaken regularly every ten years in those years ending with '0'; the only exception being 1941 and 1949. The 14th Population and Housing Census of Hungary was carried out in February 2001. The reference date was midnight between 31 January and 1 February. As a result of the country's experience and legal limitation in the use of administrative data sources, this was a traditional data collection based on direct (door-to-door) interviews with questionnaires and enumerators. The project's preparation and implementation was led by the Central Statistical Office (HCSO), and took into account the experience of about 130 years practices, new data requirements and possibilities and international recommendations.

Similarly to the preparatory phase of the preceding census round, HCSO took an active part in the compilation of the year 2000 set of United Nations and European Union recommendations. New occupational and industrial classifications were adopted in the 1990s, in conformity with relevant international standards (ISCO-88, NACE and ISCED) to ensure provision of internationally comparable data.

Legislation

According to Hungarian legislation, a specific act must govern the implementation of a population census. The relevant CVIII Act of 1999 on the 2001 Census was adopted by Parliament on 7 December 1999. This act also generated changes in the XLVI Act of 1993 on statistics.

The act defined the census day, duration and scope, as well as the main topics of the Census. At the same time, it declared that all individuals should answer the questions, and specified the topics (nationality, mother tongue, religion, and disability) where there was the right of no response. The ensuing government decree defined the co-operation of the different central and local authorities during the different phases of the population census. Moreover, the act takes into account legal requirements concerning personal data protection(42) as well as that for ethnic minorities(43) providing for the anonymity of the questionnaires.

[42] In line with the relevant law of 1992.

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Registers

HCSO may access many administrative registers throughout the country, however these registers are still in an initial stage in terms of their use for a census (not yet harmonised for this purpose) or not yet in existence (e.g.: registers for buildings and dwellings). In some cases such as the population register, where a regulation applies, the data content is limited. For this reason, since their creation in 1975, population registers, apart from their administrative use, have been used for census preparation only. In addition, the use of the business register was implemented in the data processing phase of the 2001 census, as supplemental information source.

Generally, apart from the technical conditions of the relevant registers (missing registers, lack of harmonisation and updating, difficulties of personal identification and matching of sources), limits to the use of registers for statistical purposes arose from the current legal environment and the public's mistrust. The relationship of trust between citizens and state is somewhat evolving in transitional countries.

The address list of the census

Since the 1960, in all Censuses a detailed list of addresses was collected in the preparatory phase to ensure completeness and to define enumeration districts. The 2001 address lists contain both the addresses of all of the housing units and the addresses in the inner areas that do not belong within the scope of the census. The database contains nearly 5 million addresses, including actual, independent estates, other addresses with specific properties and , a smaller portion, technical addresses to facilitate organisation of the data collection and processing . Actually 4 316 00 housing units and their characteristics were enumerated in the census. This stock of addresses assures the connection between the census, the digitized maps and the Gazetteer of localities and, furthermore is the starting point to its continuous updating for further statistical purposes.

Scope and topics of the census

The Census enumerated all individuals living in Hungary, i.e. Hungarian citizens as well as foreigners – except diplomats and their families – staying for more than three months in the country. The Census included the enumeration of dwellings, other housing units and institutional households. In conformity with the above-mentioned law, the 2001 Census covered the most relevant topics:

- natural persons (sex, date of birth, place of residence, marital status, family status, number of live born children, school attendance, educational attainment, source of livelihood, occupation, employer and place of work, daily travel time, household and family characteristics (derived topics), citizenship, (ethnic) nationality, religion, mother tongue, knowledge of languages, tenure status in the dwelling, disability),

[43] LXXVII Act on ethnic minorities, of 1993 § 8.

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- housing units, residential buildings and holiday houses (type, ownership, number of rooms, floor space, communal facilities, level of comfort, kind and material of heating, year of construction, walls, characteristics of living environment), and
- institutions for collective accommodation.

This means that all the basic and substantial developments occurring in Hungarian society could be taken into account. Such issues were changes in family life/cohabitation of individuals; modifications in ownership structure and use of housing stock; development of the educational system, trends in the working environment, etc. At the same time, it was imperative to ensure the possibility of comparing past and present results, and with data from the international community, given that a millennium census round was in progress all over the world.

In the preparatory phase a regular dialogue took place between HCSO and the main users: government agencies, representatives of scientific and business circles, institutions representing different special-interest groups (organisations of ethnic minorities, religions, disabled, etc.). Similarly, a detailed dialogue and harmonisation was needed with the parliamentary ombudsman of data protection, and that of national and ethnic minorities.

Main features of the Project

Important modifications were implemented in geographic preparation, on the census forms both from the viewpoint of structure and content, in PR activities preceding and accompanying the Census itself, and in data processing and dissemination technology. Some are listed below.

- For the first time the Census was carried out anonymously, i.e. without names and exact addresses on the questionnaires. After input of the coded census data into the optical character recognition (OCR) and electronic data processing system all questionnaires were destroyed.

- Besides the traditional and compulsory sets of demographic, educational, occupational, family, household and housing topics, the question of legal nationality (citizenship) and that of religion were reinstated on the questionnaire, as well as a block on disabilities. According to Hungarian legislation on gathering statistics, these latter topics, and those on ethnic nationality and mother tongue, are sensitive issues, and their inclusion in the questionnaire required careful legal consideration (e.g.: the anonymity of the questionnaires and the option not to answer these questions). The completeness of the free expression of national identity was provided by the pre-printed answers containing Hungarian nationality and all 13 national minorities specified by the relevant law, as well as by the open possibility to enter any other answer. The questionnaire allowed for the respondent to belong to several national groups. This is an issue that had been raised by interested minority representatives. The questionnaire, therefore, made it possible to provide more than one answer to the question on mother tongue and nationality.

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- The structure of the census questionnaires was adapted to the new data entry system using optical reading devices. In the course of preparing the forms for this process, HCSO was inspired by the way other countries had handled this task. For this process to take place, the Office had to contract with an outside firm to scan several million multisided questionnaires. Data entry from the completed and pre-coded questionnaires was carried out with optical reading technology, processed in co-operation with the Bull Company.

- The updating of the address lists had been computerised and checked during a Pilot Census between September and October 1999. The test covering about 20 000 housing units and 50 000 persons allowed testing of the questionnaire and the data capture method. At that time it was impossible to implement the OCR system; however HCSO gained significant experience in developing the final version of the questionnaire. It was decided to considerably reduce the number of pages to decrease the burden on respondents and to shorten the time taken for data processing.

- A communication campaign preceded and accompanied enumeration. The advertising campaign and other information was broadcast on national and regional television and radio, as well as presented in the written media, and aimed at reaching the total population. However the large population group living in cities was easier to reach with information placed in streets and on public transportation. Information on census activities was also broadcast over the media in the course of the enumeration phase.

- Data collection was implemented using questionnaires filled in by trained interviewers and co-ordinated by supervisors (respondents sometimes personally completed the forms). The exact formulation of the questions and the method of response were based on statistical considerations. In both the urban and rural areas enumerators were provided with maps made available through national and local authorities or private firms.

- Despite the professionally managed preparations and training procedure, it was difficult to clarify all details to the interviewers. Efforts were made to enter responses in the same form returned to the interviewers by the respondents. Before the six month data entry phase, a specially trained staff was in charge of coding written answers using detailed instruction manuals and code books.

- The enumeration of institutions and institutional households in connection with the Census is an old process. However, the 1970 Census was the first one to consider the special characteristics of institutions and institutional households. For the first time in 1980 a separate questionnaire was used for this purpose. For the 2001 Census, with about 250 000 people living in students' halls, workers' hostels, social homes, etc. the institutions and institutional households and their living conditions required more attention. Following transition the number of specific types, such as workers' hostels decreased, while other institutions such as social homes increased, with the church and private sector as the economically sustaining institution.

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Enumeration

HCSO has been professionally responsible for the overall census, including implementation of field work, i.e. recruitment of interviewers and information gathering through door-to-door interviews. HCSO trained the interviewers and directly contracted with those experts in charge of controlling and supervising the work performance of the interviewers.

The HCSO county directorates carried out local supervision, HCSO staff members undertook training of interviewers, and a relatively small number of professional trainers were contracted. Aside from strictly professional issues, training was provided on behaviour and communication. In the preparation process emphasis was placed on the importance of collecting correct and reliable information on the issues concerned.

The enumeration districts contained 80-100 housing units with on average 200-300 people. Data collection (for the Census) was carried out between 1 and 21 February 2001, a supplementary data collection period of one week was added to reach individuals who had been omitted during the normal enumeration period.

After the enumeration phase, a PES based on a specific sample selection aimed to provide confidence measures on both the coverage of the Census and the quality of the collected results.

A total of 4 326 000 out of the 4 753 000 on the census address list were targeted. At a preliminary stage, the difference between the census target addresses and those counted by the census, resulted in a difference of only 0.2%. This value is expected to be further reduced at the end of the process.

Data dissemination

National, regional and locality level preliminary housing and population counts, based on a simple count first made by the interviewers and then by the supervisors in the localities, were published in mid-2001 in a volume and on CD. More detailed data of the most important census characteristics were based on a representative sample at the county and electoral district levels, and were released as a series of booklets in December 2001. The geographically detailed dissemination of full-scope data began in the second half of 2002. General interest information will be made available to users in hard copy, on CD and on the Internet. In addition to standard publications, practically optional geographic and thematic details will be distributed on a cost recovery basis with strict restrictions based on the law on data protection.

Costs

As stated above, population censuses are expensive from the viewpoint of both workload and finances. The 2001 Hungarian Census required 50 thousand well-trained interviewers and about ten thousand supervisors, and nearly 15 million four-sided questionnaires. Moreover, the processing and publication of the data, even if using the most recently developed tools, requires several months or years.

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The cost of the central and territorial preparatory work, collection, processing and dissemination of data have amounted to 10.5 billion Hungarian Forints (about € 40 million), slightly more than 1 000 HUF (€ 3.8) per person enumerated. Main budget lines referred to the entire preparatory phase (36% of total costs), enumeration (28%) and outsourced data entry (17%).

Conclusion and future plans

Following the indication of the significant cost of the Census it should be stressed that as far as national, regional and lower level data are concerned, for the time being, no equivalent alternative exists to a full-scope census. No evaluation exists to establish the consequences and costs implied by a lack of census data.

The processed data on individual topics already highly valuable, while the complexity of the subjects provides a unique possibility for a modulated description of Hungarian society, useful in providing decision-makers at the central and local authorities, researchers, analysts and the broader public with relevant information. By combining the different subjects, such as social groups, categories may be formed with differences based on demographic, educational, household, professional, , housing, geographic etc. characteristics.

The Census will serve as a source of substantial information for further studies and will be used to set-up a national address register, re-design samples for future, in-depth surveys and revise the inter-censual population estimates.

The implementation of the 2001 Census presented elements that took on characteristics of a future register-based census, especially in the handling of a census address list as part of a uniform address register, use in the development of a standard, authentic address register making the geographical identification of addresses possible and meeting EU norms. HCSO is already studying other countries' methods and experiences with the view to introduce useful changes, or even, more in-depth developments into the next census round.

LATVIA

Introduction

In Latvia population censuses have a rich history and famous traditions. The first census was conducted in one part of Latvia - Kurzeme in 1863, and in 1867 in the towns of Vidzeme. The most complete population census was conducted during the 19th century, 1881, and covered Kurzeme and Vidzeme. The first population census covering the entire territory within its current boundaries was carried out in 1897.

Since the proclamation of the Republic of Latvia in the period, between the First and Second World War, four population censuses were conducted in 1920, 1925, 1930 and 1935. At that time considerable attention was paid to the quality and accuracy of data.

After the Second World War, as in other Baltic states that had been incorporated into the USSR, four population censuses took place in 1959, 1970, 1979 and 1989. The programme and methodology of these censuses were formed and worked out by the Statistical Committee of the former USSR. The questionnaire for the 1989 Census, which was different from all previous censuses, contained seven questions concerning the living conditions of the resident population. Data from these censuses were used mainly for government planning, i.e. working out five-year plans for economic and social development. These results were unavailable to citizens and open publications, especially data from the 1979 Census.

Soviet period population censuses contained most of the questions recommended by the United Nations and other international organisations and authorities. Data from these censuses were very important for statisticians and researchers. They helped show the dynamics of the demographic and socio-economic processes, and were used for international comparisons and publications. Unfortunately it is not possible to reach complete compatibility on this basis.

The conception of the household was not applied in previous censuses. Instead the concept of the family was used (different from the internationally used family concept). In addition researchers encounter problems related to data comparisons in the fields of economic characteristics of the population – main sources of livelihood, social groups, employment, occupation, etc.

Since regaining independence the 2000 Census was the first population census in Latvia. The objective was to obtain all-round and unbiased information on the number, composition, occupation, sources of income of the population. Information was also to be collected on dwellings and other indicators included in the Census Programme in each city and '*pagasts*' (the smallest administrative unit in the rural area) under circumstances where the economic situation, population structure and demographic processes had drastically changed. The need to carry out the Census was also provoked by the fact that 11 years had elapsed since the previous one. The project represented traditional method of enumeration combined with data from administrative and statistical registers.

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Legislation

Preparatory work on the recent census was started immediately after the Cabinet of Ministers issued Regulation No 31 *'On Preparatory Work for the Regular Population Census'*, in compliance with this the Central Statistical Bureau (CSB) was commissioned to prepare and conduct the regular population census. Regulations No. 165 of 11 May 1999, of the Cabinet of Ministers specified the census date indicating that all information was to be collected and compiled pursuant to the situation on 31 March 2000.

On 16 December 1999, the Parliament of the Republic of Latvia adopted the Law on the Population Census. This law provided for a strong legal basis for the 2000 Population Census. Pursuant to the recommendations of international organisations and the experience of other European countries, the law foresaw that all resident populations were to be recorded by the census – natural persons registered in the Residents' Register, as well as those natural persons who are not, but should be registered in the Residents' Register. The law indicates that information characterising the mentioned person's dwellings must be collected and compiled by the census.

Registers

CBS maintains the statistical Business register and agricultural farm register. All other administrative registers, under the responsibility of ministries or other institutions, are available for statistical purposes. A personal identifying code was introduced in 1992 when the Law on the *Residents' Register* was adopted. It is used for both administrative and statistical purposes.

Preparatory phases

In compliance with the task set by the Cabinet of Ministers, a **Government Commission** was developed to administer the preparatory work for the 2000 Census. It contributed much in solving different issues as to the preparation of the Census and gave much support to the CSB in organising and conducting the most important statistical activity in 2000.

The census methodology and range of questions were developed in compliance with the recommendations of international organisations – UNECE and Eurostat – as well as requirements of the State, local government and other data users. The Census Programme was submitted to the respective Eurostat Unit before finalisation and the CSB obtained its acceptance.

Two pilot censuses were carried out in 1997 in two towns Līgatne and Sabile and in two pagasts (Dobele pagasts in the district of Dobele and Leimaņi pagasts in the district of Jēkabpils), and in 1999 in Rīga. Each of these pilot surveys involved around five thousand people and verified different methods of data collection, comprehensibility of the census questions, responsiveness of the population, and also tested data processing equipment, machinery and software for potential census data.

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Before the start of the Census on 31 March 2000, the machinery necessary for data collection and processing was gathered together and the corresponding software was purchased. This involved scanners for questionnaires, computers, and other equipment. Census mapping for both rural and urban areas were entirely based on maps originally provided by the State Land Service and the company Map Publishers Jana Seta. These maps were used to delineate enumeration districts and during the field work stage of the Census.

Publicity and information

Publicity was addressed to all population groups in Latvia. Special attention was devoted to the young and people living in rural areas. Newspapers and national radio and television were the means mostly used for publicity and informative communication. A toll-free phone centre was established at the CSB and the institute's Internet site was involved. Information was provided through CSB press releases on the implementation of the project's different phases.

Field operations and data collection

Information was collected by specially chosen and trained enumerators who visited and interviewed the population at their place of residence from 31 March to 29 April 2000 (Friday 31 March, at 00.00 o'clock was set as the critical census moment). If for some reason the enumerator did not meet with any of the inhabitants, people were able to visit statistical offices or 34 additional enumeration sections in Rīga and answer the census questions. Enumerators and their supervisors were all temporarily contracted for the job.

The Census enumerated persons registered in the *Residents' Register* of the Republic of Latvia, and those who were not but had to be. In addition, inhabitants of Latvia were enumerated who by the census date had not exchanged passports for the new ones; and these contained no identity code stamp from the Department of Citizenship and Migration Affairs. Children who had not yet been registered in the Residents' Register and persons who had died after the critical date were also enumerated. People were not recorded if they had no identity code, were without a registered residential address in Latvia, were registered in the Residents' Register but had lived abroad for more than a year, persons who had arrived in the country and intended to stay for less than a year, children born after the census date and persons who had died before the critical date.

Over 5 000 people were involved in the project, 38 of whom worked as assistant managers of regional statistical offices on census issues, 430 as enumeration supervisors, 4 260 as field enumerators.

A part of the information pursuant to the Census Programme – answers to 10 of 33 questions – were obtained from the *Residents' Register* and from the information system of the State Revenue Service (tax register). A total of 14 questions were requested on each person residing in the dwelling and nine questions were asked on characteristics of the dwelling. Individual questionnaires were completed for each person aged 7 years and over. Finally, the branch of economic activity was checked with data from the *Business Register* available at CSB.

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The use of the personal identity code allowed information to be combined on the person existing in different registers, to increase the accuracy of the census data, decrease the number of questions asked and the census costs.

Post-Enumeration Survey

A post-enumeration evaluation survey was conducted, from 11 May to 10 June 2000, to ensure the quality of the population census – in selected territories people were repeatedly visited at their dwellings to check data accuracy on census questionnaires. The requirement of organising a sample survey on quality of the census data was included in the recommendations of UNECE and Eurostat. Using mathematical methods, 1% of all census enumeration areas was selected, i.e. 42 enumeration areas, where this work was carried out.

Data processing

In order to accelerate processing of census data as compared with traditional methods (as carried out during the previous population censuses), an up-to-date data entry and processing system and software were developed thanks to the support of the Latvian and Swedish governments, which was based on optical character recognition technology. In order to ensure the operation of this system at the foreseen speed and with the minimum amount of errors, enumerators were expected to write the letters and figures in the household and personal questionnaires to a previously specified high standard.

Using high-capacity, fast-acting scanners, information from 820 000 household forms and over 2.1 million personal questionnaires were entered into the computing system over three months. At the same time, using the most recent developments in information technology and the corresponding provision of software, an electronic archive was developed for the images of the basic census documents.

Data dissemination

First provisional results of the 2000 Census were published in November 2000. Afterwards, in April 2001 a special statistical bulletin containing **provisional results** was printed and distributed to all public libraries, municipalities, governmental and other institutes.

All 578 municipalities of Latvia have received a standardised set of more than 40 tables each containing the census data from their municipality. Most opted for electronic transmission of the data in EXCEL format.

CSB published the **final results** in April 2002. They included the most important and exhaustive publications – Census data collection including analysis, maps, statistical tables and methodology in paper format and CD-ROM with more detailed data and additional tools for users. Preparation of the census summary data tables according to UNECE and Eurostat Census Tabulation Programme will be completed during the first half of 2003.

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Population figures and demographic indicators have to be revised back to 1989 based on the final results of the Census. The same results will be used widely by other departments and subdivisions of the CSB for calculation per capita indicators, as a sampling base for Household Budget Survey, Labour Force Survey and other surveys.

Costs

Throughout the world, population censuses are highly necessary but expensive activities. The costs of the last census came to Latvian Lats (LVL) 2 900 000 (€ 5 095 000). Census costs per capita were LVL 1.22 (€ 2.14). A total of 41% of the total census budget was used for enumeration and training, 30% for equipment and 19% for general preparation as main items. About 11% of total expenses were external funding for equipment and publication/dissemination

The 'net' costs, i.e. costs after subtraction of the sum of income tax and compulsory contributions of social insurance from the total sum of expenditure used, were less LVL 556 thousand, i.e. LVL 2 344 000 (€ 977 and € 4 118 166 respectively).

The data processing system developed within the framework of the 2000 Census was used also to process data from other statistical surveys, and shall therefore be regarded as a lasting, secure investment. In the short term it will be useful for the entry and processing of other large-scale data arrays. This system was developed with the financial assistance of the Government of Sweden. In addition, the Government and the Statistical Office of Finland contributed to the successful implementation of the project.

Conclusion and future plans

Following the positive experience and in accordance with the development of the use of registers in the country it is expected that the following population and housing census, planned for 2011, will be carried out as a fully register-based census as currently performed in a number of countries, including the Nordic European countries such as Finland, Denmark, Sweden, which have made an essential contribution to the development of population statistics in Latvia.

This country report is mainly an updated version of the description presented in *'Results of the 2000 Population and Housing Census in Latvia'* (Uldis Usackis Editor in Chief, April 2002, CSB).

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Table 31 - Programme of the 2000 Population and Housing Census in Latvia

	Topics	Source of data
I	**Geographic characteristics of persons**	
1*	Place of usual residence	Residents' Register (RR)
2*	Place of usual residence one year prior to the census	RR or person
II	**Demographic characteristics of persons**	
3*	Sex	RR
4*	Age	RR
5*	Legal marital status	RR
6*	Country/place of birth	RR
7*	Country of citizenship	RR
8	Ethnic group	RR and person
9	Language	Person
10	Total number of children born alive	Person
11	Date of current marriage of ever-married women	RR
III	**Economic characteristics of persons**	
12*	Current activity status	Person
13*	Time usually worked	Person
14*	Occupation	Person
15*	Industry (branch of economic activity)	Person (or Tax Register and Business Register of the CSB)
16*	Status in employment	Person
17	Main source of livelihood	Person
18*	Place of work	Person (or Tax Register)
IV	**Educational characteristics of persons**	
19*	Educational attainment	Person
V	**Household and family characteristics of persons**	
20*	Relationship to reference person of private household	Person
VI	**Characteristics of private households**	
21*	Tenure status of households	Person
VII	**Characteristics of housing units and other living quarters**	
22*	Type of living quarters	Person
23*	Type of ownership	Person
24*	Location of living quarters	Person
25*	Occupancy status	Person

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	Topic	Source of data
26*	Number of occupants	Person or RR
27*	Number of rooms	Person
28*	Kitchen	Person
29	Equipment of living quarters	Person
*	- Water supply system	Person
*	- Toilet facilities	Person
*	- Bathing facilities	Person
*	- Type of heating	Person
	- Electricity	Person
	- Piped gas	Person
	- Hot water	Person
	- Type of sewage disposal system	Person
30	Useful and living floor space	Person
VIII	**Characteristics of buildings containing dwellings**	
31*	Type of building	Person
32*	Period of construction	Person
33	Material of which outer walls of the building are constructed	Person

* Core topics according to the ECE and Eurostat Recommendations
Source: Central Statistical Bureau of Latvia

LITHUANIA

Introduction

In Lithuania, the first population data were collected in the 13th century. After this period historical sources mention counts based on "smokes", i.e. farmsteads with fireplaces. These were held from the beginning of the 16th to the middle of the 17th century. More precise data were attempted during the 1789 census, therefore only the 1790 census, which enumerated all existing social groups, should be considered the first overall population census in the Grand Duchy of Lithuania.

The first population census under the Russian Empire was organised in 1897. Following independence, proclaimed in 1918, a new census was conducted only in 1923 when the state borders were established. During the Soviet period four censuses took place, the last being organised in 1989, based on the programme and processing order prepared by the Central Committee of Statistics of the former Soviet Union. These censuses were held in January, when migration of the population was at its lowest, residents were interviewed where they were living.

After restoration of Lithuania's independence, the first Population and Housing Census was carried out in 2001 having midnight of the 5 April as the enumeration reference moment. The Agricultural Census planned for 2003 will be the second in the recent history of the Country. The Project was organised and implemented by the Lithuanian Department of Statistics (Statistics Lithuania), the central statistical office of the Government of Lithuania.

The census methodology was prepared taking into account international recommendations, experience of neighbouring countries, advice from experts, and national peculiarities. Population enumeration was conducted by visiting the households for face-to-face interviews of family members and people residing in the dwellings. This traditional solution was selected owing to the limited possibility of using population registers (still under implementation and not containing information on *nationality*, *languages spoken*, *religion*, *work place* and *occupation*)[44] as well as other register data for household composition and housing characteristics.

Every citizen in the Republic of Lithuania, usually resident in the territory or absent abroad for a period of a year, was enumerated as well as non-nationals and persons without citizenship with permission to reside in Lithuania temporarily or permanently, and who at the census moment had been living in the country for more than one year. Final results of the Census will facilitate revision of the structural data of the Lithuanian population during the inter-censual period.

[44] The register system in Lithuania presents around 50 registers including the *Population Register*. Concerning individual data the personal identification number serves as identifier and link key between registers.

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Legislation and registers

The Census Law, passed as a Decree of the Parliament of the Government of the Republic of Lithuania on 10 July 1999, and the additional *'Resolution on basic operations concerning the Republic of Lithuania Overall Population and Housing Census 2001'* are based on the recently developed broader legislation, and realised as the following:

- Law on Statistics (23 December 1999), provides for the definition of confidential statistical data and principles of data protection. According to this law all data collected for official statistics must be used only for statistical purposes and disseminated as aggregates;
- Law on Legal Protection of Personal Data (17 July 1999), regulates the protection of personal data in governmental authorities;
- Code of Administrative Offences (13 December 1984, 15 June 2000), is in addition to the article defining responsibility and fines for revealing confidential statistical data.

Statistics Lithuania has three levels of security and confidentiality – physical, legal and technological – each with the means and internal documents to ensure individual data protection. Regulations define principles of confidentiality, i.e. minimum number of respondents in the surveys, micro-aggregation, geographical thresholds, coding and re-coding, sampling, treatment of sensitive records. Data protection measures were largely applied to the Census. All census workers signed a deed of covenant stating that they would not reveal confidential data, and premises for census operations were prepared with a secure lock and seal mechanism. The IT equipment used for the Census was logically separated from other staff. Preparing databases for processing, name, surname and personal number were removed from micro data to avoid direct identification of persons.

Preparatory aspects and conduction of enumeration

Preparation for the Census foresaw the strategy and main objectives, as follows:

- correct census method and questionnaire contents;
- assurance of data confidentiality and security;
- timely production and release of reliable results;
- sufficient and timely financial support and economical approach taken.

The census questionnaire contained questions to which the population had to reply, it was prepared following UN and Eurostat recommendations for the 2000 census based on censuses in the ECE Region. These recommendations were analysed and adjusted to national needs in co-operation with many other Lithuanian institutions, demographers and other specialists.

In addition to this classical set of questions, useful in obtaining demographic and socio-economic characteristics of the population and households, respondents were asked specific questions on their command of foreign languages, religious beliefs and

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disability. Information was collected on buildings and housing and their quality for the housing component of the Project.

The 2001 Lithuanian Census did not aim to collect all information on agriculture, leaving it to a specific enumeration. However, Statistics Lithuania took the opportunity and collected data on land tenure, owned or rented, by households. It will facilitate grouping of households by land area owned, social and demographic characteristics of land users and their distribution by administrative territorial division.

To ensure the exhaustiveness of the Census urban and rural areas were divided, based on schematic plans and maps prepared by the State Land and Real Estate Cadastre and Register and other similar institutions. Lists of residential buildings and dwellings used for habitation were worked out and cartographic material repeatedly revised prior to the census day. Leaflets, newspapers and magazines as well as television and radio spots and programmes were used to raise the awareness of the public and inform respondents.

The work was organised by Statistics Lithuania, local statistical offices and census commissions established in each municipality. In rural areas much was contributed to by local administrative officers. Testing had been undertaken since the end of 1997. At the final stage, about 15 thousand people were selected and trained to carry out field operations as census managers (600 persons), supervisors (1 900) and enumerators (12 000).

Enumeration was completed between 8 and 10 days, depending on the census district. Persons who were unable to be enumerated were given the possibility to do so later. All possibilities for self-enumeration were offered to respondents, who in general welcomed enumerators and willingly replied to census questions. However, some problems were experienced related to the visiting of city dwellings. No sound signals had been installed in several individual private dwellings, and others had businesses set up on the premises. Overall, people who were not enumerated were able to be if they contacted the census divisions or regional statistical offices.

The census questionnaires were compared with the *Population Register* and lists of students. Distribution was made to conscripts and inmates in hospitals and prisons and other institutional homes based on their place of residence. The census data were received on Lithuanian citizens, as well as on family members working in Lithuania's embassies, various institutions and international organisations abroad.

Data processing

Processing of census data began after all questionnaires were collected at the central office of Statistics Lithuania. Optical character recognition technology was used for data entry, i.e. the census questionnaires were scanned, later data recognition and correction of unrecognised symbols was conducted. Data correction and editing was performed by operators.

In order to transfer information precisely from the questionnaires into the database data correction covered entry of unrecognised characters and some logical control (full

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logical control was done in an Oracle environment). When an error was detected the operator updated the recognised information using data from the questionnaire. After loading data into the Oracle environment and setting the relationship between pages, logical control and adjustment was carried out. The main objective at this stage was to remove logical data errors. Special software was developed on the basis of logical control rules prepared in advance, which helped in the detection of logical data errors.
Data were coded automatically using prepared coding manuals and dictionaries (including ISCED, NACE and ISCO). Automatic procedures coded data that agreed with information available in manuals and dictionaries. If, during this process, information had no equivalent in the dictionary, it was saved into temporary storage where only unique non-coded information was stored. Operators then coded this information.

During the mixed coding stage, i.e. when the operators coded unique non-coded information, coded information was saved in the respective dictionaries, based on which all remaining information was later coded automatically. Coding software was developed for mixed data with a special user-friendly system of supply and search, i.e. the software proposed possible (similar) variants. If the proposal was correct, operators pressed a button to approve the selection. If the program had nothing to propose operators could create their requests and code information based on the results of requests.

Organised, i.e. coded and logically error-free data were transferred into the final database, eventually after comparison of various individual data, such as personal identification number, name, surname, date of birth and address, with data from the *Population Register*.

Post-Enumeration Survey

To measure the coverage and data quality of the census, a post-enumeration survey (PES) was carried out one week after enumeration of the population. The main objectives of the PES were to measure

- census coverage error, and
- content error in the main socio-demographic data

The cluster sample was used in the Lithuanian PES. The smallest areas for which verifiable boundaries existed on maps were the Enumeration Areas (EAs). Therefore a total of 11 481 EAs were selected as a sampling frame. At this stage, EAs including institutions (hospitals, prisons, etc.) were excluded from the frame. Before selecting a sample of EAs the population was divided into three strata: large urban (4 158 areas), urban (2 596 areas) and rural (4 727 areas). Available resources allowed questioning of approximately 1% of the entire population, that is 84 EAs were selected for the sample. The simple random sample of areas was carried out in each stratum. Allocation of the sample into strata was proportionate to the estimated population size. Thus, 24 large urban, 20 urban and 40 rural areas were selected into the sample. All people living in selected areas were asked to respond to some of the questions from the census questionnaire.

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Data dissemination

Statistics Lithuania announced first provisional results on 30 October 2001, reporting a usually resident population of 3.5 million on 6 April 2001 – 2.3 million in urban areas and 1.1 million in rural areas – less than previously as a result of the negative natural population increase, emigration and temporary out migration of the permanent population.

Final, more detailed results will be released between 2002 and 2003. Publications will cover the following topics:

- population by sex and age
- ethno-cultural conditions (nationality, education attainment, command of foreign languages, religion, etc.)
- population by economic status, activity, occupation and source of livelihood
- households and families
- buildings, dwellings and their conditions
- disabled persons and their living conditions
- demographic behaviour (migration trends, family formation, fertility, etc.)

Data will be presented as a total for the country, by territorial administrative area (county, municipality), cities and other settlements. According to the user requests, data may also be released by certain districts, settlements, and small administrative areas to form multiple groups.

In addition to printed publications, Statistics Lithuania will release a full range of specific census products and services designed to satisfy the needs of the majority of users. Data will be provided via Internet and on CD-ROM in an appropriate format so that it may be presented in combination with other statistical data. To achieve this objective an applied system ***'Census data dissemination and analyses'*** was developed. The main purpose of this system is to connect the operational data sources, staging area, data warehouse, GIS technology and OLAP Client programs. Diagram 7 shows the system's organisational structure. The data warehouse is being created as a virtual union of several data marts with integrated information being shared between them. The basic structure is developed in the SQL Server environment and MS Analysis Services will be used to produce aggregated cubes for fast access via LAN. The cubes produced by the MS Analysis Services can be browsed and processed in third-party software packages.As a tool for data dissemination via Internet and on CDs, Statistics Lithuania will use PC-Axis – the family of software packages originally developed by Statistics Sweden for data dissemination.

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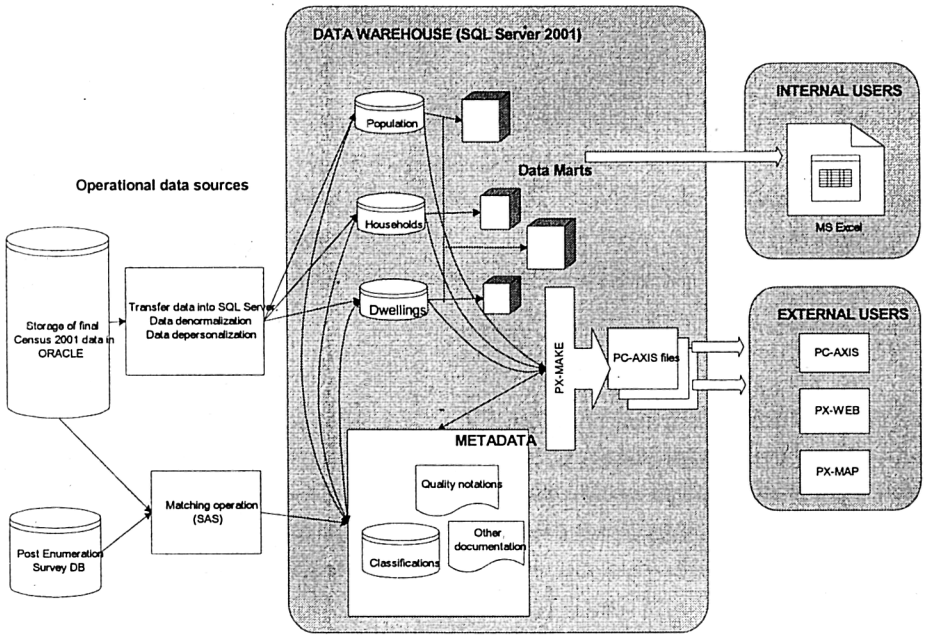
Diagram 7 - Information systems architecture for data dissemination in Lithuania



Source: Statistics Lithuania

Costs

The Lithuanian Census was based on national funding plus about 4.4% external contributions from the PHARE programme (for equipment) and the UNPFA project (support for data dissemination and analysis). In total, about € 9.5 million will be used in the period 1997-2003, which is € 2.7 per capita. This comes to just under two-thirds of the total. The major cost was for enumeration staff.

Conclusion

The material collected through the census provides source material for population structure and family status, structure of households, number of employed and unemployed, economic activity and occupation of population, and many other more specific topics. It will be used for many different purposes, including inter-censual revisions, annual population estimates and demographic projections. Future census plans could gain from the improvement of registers and be based on a mixed use of traditional enumeration and extraction from registers.

POLAND

Introduction

Even due to the historical events the series of modern population censuses in Poland is not so long when compared with other countries. In fact, censuses were undertaken only from 1921 on, in 1931, 1946, 1950, 1960, 1970, 1978 and 1988, in prevalence in the month of December. A micro-census was taken in 1995 in 562 000 housing units (5% of the total) covering over 2 million population.

For the 2000 census round, the Population and Housing Census of Poland originally planned in April 2001 has been conducted only in May 2002. Anyway this means that it follows well over ten years the previous one and represents the first country-wide enumeration since the major socio-economic changes of the beginning of nineties and a new internationally agreed approach on census. This operation is also based on the new administrative division of the county established in 1999.

The project has been conducted together with the National Agricultural Census. It is based on interviews of population taken from 21 May to 8 June 2002 using Monday 20 May, at 24:00 as reference day for the providing of information. As main units, this traditional enumeration will provide information about 40 million people, 12 million households, 2 million private farms and 1 million private farming plots. At end, results will allow to:

- supply a most comprehensive set of demographic, housing and agricultural data,
- enable to describe various social units such as households, families and farms,
- supply data for all levels of administrative division,
- undertake long-term surveys and analysis,
- make possible comparisons with other countries.

The Population and Housing Census also includes two surveys on Fertility and Long-Term Migration. The Central Statistical Office of Poland (GUS) is the agency responsible of carrying out the census in co-operation with local authorities.

Legislative and data protection aspects

Data collected in the course of both censuses are confidential and strictly protected according to the Public Statistics Act (1995) and the National Census Act of December 1999.

Data confidentiality and protection are among the basic principles of statistics and census. As consequence, all staff involved in preparation of the census proceedings, gathering or processing of data are bound by confidentiality rules. All census enumeration signed up a declaration of confidentiality. In view of dissemination census results will be aggregated in order to prevent identification of individual persons.

POLAND

Organisation and conduction of the survey

Poland started the census preparation in 1995 participating to the international works mainly by the UNECE, OECD, and the European Union towards of convergence of dates and definitions of national censuses. In fact, besides the needs of each single country, Poland considered fundamental to fulfill the international requirements adapting the topics and methodology of the survey.

The definition of census topics has been however reached through a large consultation of Polish data users - a total of 261 bodies including the central government, local administrations and authorities, scientific institutions, universities, minority groups, churches and religious groups. As result of the final discussion at Census Program Commission appointed by the GUS President in 1997, the enumeration has covered the classical characteristics of permanent and temporary residents and several new topics like hidden labour, homelessness, immigration and emigration of Poles and foreign citizens, foster families, illegitimate births, poverty, reading books and newspapers, educational development, computer literacy, other skills. In addition to that the households, buildings, dwellings and residential houses, collective lodgings, inhabited places not classified as dwellings has also been considered.

If the retained topics reduce the large set of proposals from users (due to the need to don't extend too much the questionnaire, for matters of costs and respondents' burden, and the possibility to obtain some information from existing sample surveys like the Households Budget Survey), the collection of some more in deep information was proposed and obtained with the opening to the two sample surveys:

- the **Fertility Survey** focusing on marriage history, fertility by order of child and expected births of women aged 16 years or over (in the previous censuses a similar attention was paid to women aged at least 18 years who married at least once in their life), with voluntary respondents from sampled housing units;
- the **Long-Term Migration Survey** planned to measure the internal migration in the inter-censual period 1988-2002, by covering all persons who changed in that period their place of residence for permanent stay of at least 12 months.

In the few years preceding the census some preliminary projects have been undertaken by governmental territorial administrations and local authorities, for the following:

- review of the of statistical and administrative divisions;
- verification of census cartography developed by the statistical service responsible of census for the enumeration phase;
- verification and organization of names of towns and villages, addresses, condition of the population register, updating of the housing unit registers.

The latter is the fundamental task for supplement the NOBC 47 system - a tool for the identification of street names, immovable property and temporary and mobile living quarters, as well as institutional households - towards the preparation of enumeration lists.

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A couple of years before the census also a Pilot Census has been conducted on about 50 000 housing units selected in a way in include locations with different demographic and socio-economic characteristics. Among various testing, the survey also included an attempt of self-enumeration of the respondents carried out on voluntary basis.

After the one year postponement, the project has been scheduled following this calendar:

June 2001 - February 2002	Preparation of enumeration lists of flats and buildings in census districts
April – May 2002	Training (approx. 7 000 persons)
21 May - 8 June 2002	Enumeration
July - December 2002	Data entry, control and preparation of census data
2003 - 2004	Data processing and publication of results

Enumeration through face to face interview with population has been commissioned to temporary staff appointed by the heads of local statistical offices, i.e. to trustworthy adults recruited mainly from local population, with at least secondary education and recommended by a local Census Commissioner. Enumeration of individuals in institutional households was solved with the existing population registration systems. On the other hand, for families living in institutional households enumeration was through interview. Homeless were enumerated by a shorter questionnaire.

Both tenants and landlords were informed about terms of interviews. Some days before the enumerators contacted citizens in order to set up an appointment. Despite the requirement to interview population it has been allowed to respondents to fill in the forms themselves. Enumerators carried IDs with photos, personal data, stamp of the local statistical office, personal stamp and signature of the office's director.

In case of population inhabiting institutional households, the census used the existing population register system. In the event of families living in institutional households, enumerators collected data on household and family by mean of face to face interviews with the inhabitants.

Three separate questionnaires have been used for the Population and Housing Census (Form A) and the surveys on long-term migration (Form M) and fertility of women (Form D). Form A contains the most important data including addresses and features of surveyed housings, i.e.

Section I population, household, families
Section II economic activity
Section III nationality
Section IV source of living and type of tenure
Section V housing characteristics
Section VI building characteristics

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In terms of human resources, apart from permanent staff the conduction of the census will have at end involved some

- 180 000 enumerators,
- 33 000 officers in 3 000 census offices,
- 2 500 statisticians at data processing phase,

Publicity and information

Many materials have been published in the GUS website including the census questionnaires in Polish, English, French and Russian.

Data entry and processing

In order to accelerate data capture, GUS has procured several instruments for the optical recognition of the pre-coded questionnaires. The same staff of equipment will be used for other major surveys. Compared with previous experiences, also the number of stations for data verification and correction has been increased. At time of the preparation of this report census is at middle of the data entry phase.

Data Dissemination

Results of the Population and Housing Census will mostly be provided as aggregated data in publication and databases. GUS intends to offer and disseminate some products (basically with data or analysis of results) as paper publication, CD-ROM, floppy disk, e-mail and network. Most of the data will be sold to users.

Publication of preliminary results has been not planned. As already said, publication will be prepared starting from next year. It is confirmed that data on basic demographic and socio-economic characteristics of population and housing conditions will be progressively ready by smaller territorial units.

Costs

The overall cost of the Census is estimated around € 154 000, of which about half necessary for the field work.

Conclusion

Within the public statistics in Poland population census results will be used to calculate demographic and housing indicators, prepare estimates and forecasts, establish a framework for sampling, define and launch government policies, as well as update the registry of population, housings and buildings also useful as basis for further censuses.

ROMANIA

Introduction

The last population census in Romania was carried out in March 2002, ten years after the previous census (January 1992). The most recent censuses were conducted in 1912, 1930, 1941, 1948, 1956, 1966, 1977 and 1992.

The 2002 Census was co-ordinated by a **Central Commission** having legal authority. The Commission included the National Institute of Statistics (INS), representatives from the ministries involved, as well as a representative from the Romanian Academy. The main tasks of the Central Commission, supported by a Technical Secretariat from INS, consisted of discussion and approval of the following:

- general programme for implementation of the census;
- methodology, share of tasks and programme for the different phases;
- questionnaires, control forms and instructions;
- classifications and nomenclatures for data registration and processing;
- organisation of staff recruitment and training;
- actions for census advertising;
- presentation by the Government of the results.

The 2002 Census of Population and Housing was conducted by classical method, and no use was made of population registers, personal numerical code or other administrative registers. A **Census of Buildings** was carried out at the same time. In addition, the Central Commission decided to conduct research connected to the census, namely the **micro-census of children under the protection of residential institutions and alternative families.**

Legislation

According to Romanian Statistical Law, statistical research and surveys such as the censuses are conducted on the basis of special decisions. Two decisions were made: one on the conduction of the population and housing census, the other on the organisation and conduction of the Census in 2002 (Government Decision No. 680/2001).

According to the present Statistical Law, individual data and information registered in the census questionnaires are confidential and can be used for statistical purposes only. Otherwise, penalties are foreseen in the penal code. During data entry, no identification of individuals is made. There is only the number of the questionnaire within the enumeration sector as part of a locality.

Coverage of the survey and new topics

During the Census, all Romanian citizens were registered who had legal residence in the country (whether they were in the country or abroad at the time of the census). This included foreigners or stateless persons with temporary residence at the time of the census. Excluded were foreigners who were acting as diplomatic, consular

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representatives and those from international organisations. Also excluded from registration were buildings located on Romanian territory but owned by other countries.

The UN and EUROSTAT recommendations for the 2000 Census Round were taken into account when designing the questionnaire. In addition, consultation was made of census documentation from various European countries, and experience gained from the 1992 Census proved useful. The number of characteristics for the part of the questionnaire on buildings and dwellings were 20 and 27 for persons in the household.

The following characteristics were included for 2002:

For the non-national population:
- reason and date of establishing residence in the country
- education level and current school attendance
- time for work activity and location of work place
- duration of unemployment

For households:
- rent
- agricultural areas used by the household, by size classes

For dwellings:
- state of dwelling
- number and area of rooms of the dwelling used for other purposes
- endowment of dwelling with air-conditioner

Moreover, in 1992 the concept of *usual economic activity* was used (with reference period equal to the year before the census date), in 2002 the concept of *current economic activity* was used (with the week before the census date as reference period) and focused on:
- the economic circumstances of the individual;
- occupation in the main activity and the time effectively worked;
- professional status;
- work place and branch of industry.

The following indicators had broad coverage:
- civil status (*de jure* and *de facto*);
- citizenship (dual).

Preparatory phases

The phases regarding the practical organisation of the Census started one year before the census date and saw the active role of prefectures and other local authorities concerned with public administration[45].
The main activities comprised the following.

- Checking and updating of the denomination of traffic thoroughfares and of buildings; a total of 52 600 traffic thoroughfares were checked.

[45] Counties, municipalities, towns, communes and villages. As statistical division, eight regions at level 2, judet plus Bucharest (42 units) al level 3, communes, municipalities and orajse (2 948 units) at level 5

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- Designing of cartographic materials for delimitation of the territory – i.e. 12 100 maps at 1:5000 scale, 1 900 maps at 1:25000 scale and 1 700 simple outlines of localities.
- Establishing the lists of traffic thoroughfares for purposes of enumeration, each including:
  - number of buildings, of which buildings with dwellings
  - number of dwellings
  - number of households
  - number of persons living permanently at that address
- Delimitation of the territory into: **Census Districts** – each under the responsibility of a supervisor and divided into ten departments (in localities with over 15 000 persons);**Census Departments** – each one under the responsibility of a chief enumerator and including 5 sectors; **Census Sectors** – each one assigned to an enumerator and including on average about 90 dwellings and 300 persons. At country level, there were 790 districts, 18 129 departments and 97 698 sectors. These values are very close to those estimated after delimitation was completed.
- Recruitment of census staff. For this activity, the city hall in each locality organised recruitment of staff from different fields of activity (131 670 persons who were at least high school graduates and had passed the test, out of a total of 149 200 individuals). Training was undertaken over two weeks, at the local and central level, in 350 centres (200 participants/2 days).

Public information

To inform the population of the Census, the Technical Secretariat created a programme of activities and means, which was submitted to the Central Commission.

The programme comprised of:

- designing, printing and dissemination of brochures, posters, appeals, calendars, logo;
- activities two months before or during the census, such as conferences and official statements to the press, interviews on TV, daily statements on radio stations, diffusion of TV and radio spots, designing and updating of a web page;
- two toll-free phone lines within the Technical Secretariat (people requested free information on the census).

Similar activities were carried out in each county.

Field operations

From 14 to 17 March 2002 each enumerator made preliminary visits to the field to identify the Census Sector, with the support of cartographic materials, and to establish dates and hours for interviews with the respondents. On this occasion, it was possible to identify any omitted zones.

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Enumeration was carried out from 18 to 27 March; the reference moment was 00:00 of 18 March. Registration of answers to questionnaires was done based on the declaration of the head of household and on identification cards. It was forbidden to request additional documents of identification. Registration of housing data was based on the declaration of the landlord or other responsible person from the household. Collaboration of the population was considered good throughout the country.

Immediately after field operations, further activities included:

- the codification of questionnaires and the filling in of control forms with provisional data by the enumerator (28-30 March);
- checking of questionnaires and control forms by the chief enumerators and by supervisors (1-8 April);
- validation and transmission of questionnaires and control forms from the local administrations to the various commissions (9-20 April).

Post-Enumeration Survey

During the period from 1 to 10 April 2002, a post-census survey (PES) was carried out. The main objective of the survey was to check the quality of information collected during the Census – both for individuals and housing – without correcting data.

Through comparison of responses obtained during the Census and the PES, the frequency and extent of errors could be established, the tendency to accumulate errors and the causes generating them. At the same time, the processing of survey data before those of the census facilitated the study of methods to eliminate any inconsistencies through logical and numerical checking. The codification of the errors permitted grouping them by cause (e.g.: due to the interviewed persons, enumerators or other sources).

The PES was carried out randomly using a representative sample of dwellings, individuals and households in all counties. The sample was established through probabilistic selection (cluster samples) in two steps: selection of Census Sectors (504) and dwellings (14 279 dwellings and 14 units for living in common for a total of 38 396 persons).
After data processing, important characteristics were revealed:

- omissions, duplications or wrong inclusion of individuals in a household;
- total number of errors taking into account the data source;
- number of errors and their type, for persons and dwellings registered during the census and at PES, in order to analyse the causes in detail;
- number of persons and dwellings for which errors occurred and their grouping taking into account the number of errors;
- the gross and net errors for each of the characteristics, in order to reveal how the enumerators' errors are reflected in the census data;
- the tendency to concentrate errors towards responding variants.

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The main conclusion drawn after the PES and the comparison with the Census was the coverage of 99.83% of the number of persons registered at the time of the census. The omission was greater in urban areas (99.77%) than in rural (99.40%). The coverage for dwellings was 99.89%, results were not significantly better for the urban area. A total of 98.0% of responses were correct.

Data processing

Processing of census data was carried out in two steps – entering and processing of preliminary data and final data.

To obtain results within four months of the entering and checking of the **preliminary data** – a few indicators from the base questionnaire – and to obtain control tables the work was carried out at the county level. These results were validated by comparison with the 1992 census results and data from current statistics.

The preliminary data will be used as control figures for the validation of the **final data**. The automatic correction of these data, as well as data editing and validation will also be done at county level. The databases from the county level will be transmitted to INS for a new logical check and for calculation of secondary indicators.

In order to obtain the files with 2002 Census data in an electronic format (numeric indicators only) about 20 applications were designed using Visual FoxPro and distributed to the counties. Finally, data will be processed using programs written in Visual FoxPro and IMPS[46] to obtain the final tables.

All programs and applications used to process the census data were designed within the INS Census Division, Informatic System Unit.

Data dissemination

After validation, **a publication with the preliminary results** will be published comprising data by territorial level referring to:

- the number and structure of population by sex, ethnic group, religion and mother tongue;
- the number of buildings and dwellings, as well as other information on housing.

In addition, the final tables, both those published and those at the disposal of users will ensure total transparency of results. The following **final census volumes** will provide information for preparation of in depth analyses:

- *Population – demographic structure* includes information regarding the number and structure of the population by demographic, educational, ethnic and confessional characteristics;
- *Population – social and economic structure* includes information on the number and structure of active and inactive population by demographic and

[46] Integrated Microcomputer Processing System.

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socio-economic characteristics (sex, age group, professional status, occupation, branch, training level);

- *Population – ethnic and confessional structure* includes information on the number of population by nationalities, mother tongue and religion, in complex correlation, by some demographic, social and economic characteristics;
- *Buildings, dwellings, households* includes information regarding the number and the structure of buildings, dwellings and households, as well as the living conditions;
- *Population, buildings, dwellings*, in English, focusing on population characteristics, households and families, buildings and dwellings at different geographical levels.

In addition, final data will be disseminated on CD-ROM, and on a website.

Costs

The census budget was € 26.6 million. To carry out the work on the Census, the budgets for the NSI, Ministry of Public Administration and local councils were increased by extra payments from the State Budget.

The expense budget was as follows:

- 82.3% for staff expenses direct costs (all enumeration and PES staff, data-entry workers at county level, additional personnel hired at local level, fees, transport, accommodation);
- 15.9% for material expenses (delimitation of enumeration sections, cartographic materials, questionnaire printing and diffusion, advertising, renting locations for training sessions, data transmission, fuel and local expenses);
- 1.8% for capital expenses, i.e. IT equipment.

Conclusion

The results of the census will be used to increase knowledge of population and housing in Romania by administrative structures, i.e. distribution of human resources in the territory by demographic characteristics and socio-economic activities and use of housing resources. This represents the basis for substantiation of the socio-economic policies of the Government Programme, the national strategy for development of the country.

In addition, census results will facilitate the set-up of the sampling base for socio-economic surveys conducted by the INS or other agencies and to revise and forecast the population data series.

This country report is mainly based on a document prepared by Mr Stefan Trica, Director, Direction of Censuses, National Institute of Statistics of Romania, for the purposes of this project.

SLOVAK REPUBLIC

Introduction

A population, housing and apartments census was conducted in 2001 on the territory of the Slovak Republic. Midnight of the 26 May – between Friday 25 and Saturday 26 – was taken as the enumeration reference moment. This was the first census taken after the foundation of the Slovak Republic on the 1 January 1993.

The Statistical Office of the Slovak Republic (SOSR) was responsible for the survey, and also established and chaired the Census Commission. In addition the SOSR supervised the overall process, ensured preparation of methodology and promotion activities, data processing and publication. Several ministries – the Ministry of Interior, Ministry of Justice, Ministry of Transport, Post and Telecommunications and the Ministry of Foreign Affairs – and other local authorities participated in the project.

The survey covered:

- the population (both citizens of the Slovak Republic and non-nationals, with the exception of those enjoying diplomatic immunity);
- housing (buildings) used for living, at least during the enumeration period, excluding those owned by representatives of foreign states;
- apartments.

The Slovak Republic uses population registers and personal identification numbers; however a traditional census method was applied. Data collection was based on self-enumeration of respondents, and upon request, enumerators were allowed to fill in census questionnaires. No pilot surveys were carried out before and no post-census surveys were conducted on quality following. A fairly extensive publicity and information campaign was undertaken, linking most modern methods, such as the Internet, a call centre and press conferences to the more classical. Innovative data capture by optical reading was used with classical data entry. Only the final results were produced beginning from October 2001. International recommendations were respected resulting in internationally comparable results.

Legislation and data protection measures

In May 1998 the National Council of the Slovak Republic ratified Act No. 165 covering the 2001 Population, Housing and Apartment Census. The Act describes the content, scope and methods to conduct the project, the role of all those involved, including organisations, and the obligations of all stakeholders. The Act revoked the following provisions:

- Governmental Decree No. 85/1960 Coll. on the Execution of the Population, Housing and Apartment Census as of 1 March 1961;
- Decree of the Federal Statistical Office No. 55/1970 Coll. covering the Population, Housing and Apartment Census as of 1 December 1970.

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The characteristics, basic features and structure of the questionnaire were listed previously in an annex to the Act, announced by the SOSR in its Measure No. 4 published in the Collection of Laws of the Slovak Republic on 16 December 1999. The list was amended slightly later by subsequent Measure No. 127 published in March 2001.

According to the Census Act any data collected through the census should be used for statistical purposes only. The entire population was obliged to provide data on his/her own behalf, including foreigners residing in the territory for less than 30 days (they only had to respond to a few basic questions). The act detailed provisions for cases where individuals were unable to provide data for health reasons or other, (minors, persons in social service housing, etc.). Owners, administrators or tenants of houses had to provide building data; tenants, and/or sub-tenants, or owners or administrators were obliged to provide data on apartments.

Data referring to the name and residence of respondents in items on residence, and questions 1 and 2 of the list, were not recorded in any form. After checking for completeness these data were physically destroyed by the SOSR. Protection of data of a personal or of an individual nature was applied based on specific existing regulations – respectively Act No. 52/1998 and Act No. 322/1992.

Preparatory phases and enumeration structure

A Census Central Commission was established as an advisory body to the SOSR. The President of the SOSR chaired the Commission, which included representatives from selected ministries and other State administration bodies and by self-governing organisations in the municipalities. The President of the Office issued several by-laws to guide the work of the Commission.

The Slovak Republic is divided into several administrative areas, such as regions, districts, municipalities and the city wards of Bratislava and Košice, therefore the Census was structured as follows:

- **Regional Offices** were mostly involved in coordination activities and the promotion and information campaign;
- **District Offices** were responsible for the establishment of the territorial enumeration units (*Enumeration Areas*), set-up of staff training, transmission of census material;
- **Municipalities** were responsible, through local Census Commissions, for the drafting and submission of the proposal to the District Offices for the establishment of Enumeration Areas, ensured reception and handing over of the questionnaires to enumerators, collection and the return of the forms after field work.

Enumeration Areas were assigned proportional to population number and/or size of each municipality. One single municipality was normally divided into several Enumeration Areas, as applied to the city wards of Bratislava and Košice. Enumerators were selected from the population among those aged 18 and over, who were both legally capable and without a criminal record. The enumerators were appointed by a

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municipality principal or mayor and provided with the authorisation pursuant to maintaining data secrecy.

Special Enumeration Areas were set up based on the mass accommodation of the Slovak Army, Army of the Ministry of Interior, Police Force, Slovak Railway Force and prison or court settings where prison or custodial sentences are executed. The different authorities were responsible for enumeration of their Enumeration Areas.

The national **Office of Geodesy, Cartography and Cadastre**, in co-operation with District Offices, ensured the updating of maps necessary for the revision of the *basic settlement units* and the drawing up of the final census maps. Urban areas and rural areas were covered by maps of scale 1:10 000 and 1:50 000 respectively.

Questionnaires

There were 39 questions in the three questionnaires:

- 25 on individuals
- 7 on buildings
- 7 on apartments.

All questionnaires were largely pre-coded and there were only few requirements for a written answer. Apart from Slovak, the questionnaires were made available in Hungarian, Romany, Ruthenian and Ukrainian, having the highest representation out of the numerous minorities living in the country.

Among the most relevant aspects of enumeration, the population was counted based on the *address of permanent residence* (registration, i.e. *de jure* definition) in Question 1. Other questions were on the *type of stay* ('permanent – present' or 'permanent – absent temporarily', Question 3) and the *first permanent residence* (as the mother's permanent residence at the individual's birth, Question 15).

Several codes for the *relationship with the apartment user* (Question 4) and the *date of wedding* could be used to establish families within the same household. The *order of marriage* was also recorded.

Questions regarding *citizenship*, *nationality*, *mother tongue* and *religion* were all included. With the second legal measure the categories for *nationality* and *mother tongue* were reduced from 13 to 7 (Slovak, Hungarian, Roma, Czech, Ruthenian, Ukrainian plus another to be specified by respondents). However, 17 response options remained referring to religion (15 categories plus 'other' and 'no religion'). A few other questions on economic activity (such as the *locality of workplace* and *daily commuting*), building and apartments were slightly amended.

Field operations

Enumeration was carried out over three weeks and ended two weeks following the census date.

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The enumeration itself was conducted by about 20 thousand specially-trained enumerators. Their main task was to visit the households in their Enumeration Areas, request the filling out of the questionnaires, collect the completed forms and summarise the results. The importance of the enumerators' role meant that great attention was placed on the selection process because of their contact with the individual data on population.

There was a time lapse of only three weeks between the end of the field work and the beginning of data entry.

Data processing

Data capture was carried out through optical reading and manual entry. About 25% of data were entered twice to ensure accurate verification. Further checking, such as consistency rules between data were applied to both methods applied. Data capture was performed in AFPS-Pro, a commercial product. The computer-assisted data coding that followed was based on routines developed within the SOSR.

Data processing work (the first phase – controls and corrections) was decentralised in several locations – in Regional Offices of the SOSR. The next phase (the census data processing itself) was centralised at the SOSR. Standard outputs were processed in accordance with a pre-defined publishing program. Data in the database were prepared to provide specific outputs required by census data users. Data processing was conducted as part of an automatic statistical information system implemented for the processing of every other statistical survey at the SOSR.

Data dissemination

First basic final data were published in October 2002 in the principal national publications, in hard copy, CD-ROM and on the Internet. Geographically detailed publications were issued later. Thematic analysis is continuing on demographic development, socio-economic structure, housing conditions, households, nationality, religion and electronic products.

Costs

The overall cost of the Slovak Census was SKK 683 million (i.e. about € 16.3 million). Any costs for the preparation and execution of the survey were compensated from the State budget. Each municipality and other organisations were provided with a portion of the greater amount of financial resources devoted to field work.

The main budget lines were:

- 28.0% of the total amount was used for general preparation and logistics;
- 24.5% for equipment;
- 21.4% for enumeration field work;
- 19.8% for data processing.

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Conclusion

Preparation and implementation of the survey was characterised by some funding problems. However the difficulties experienced during the data collection phase did not affect the satisfactory outcome.

The 2001 Census results will provide the Slovak Republic with data on population, the demographic and socio-economic characteristics and living conditions, as well as data on the structure of the supply of housing and apartments. This broad information will allow for better understanding of the country, revision of the historical series, forecast of population figures, and improve and facilitate several statistical works, such as surveys.

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Introduction

The first reliable data on the population of Slovenia date back to 1857, when the then Austria carried out the first 'modern' population enumeration. According to this survey, 1 101 854 people lived on the present-day territory of the Republic of Slovenia. All enumerations since 1921 have included a census on population, households and, at first only for the larger towns, a census on dwellings.

The Republic of Slovenia regularly took censuses every ten years, from 1961 to 1991, as part of the former Socialist Federal Republic of Yugoslavia and prepared the project together with the other Yugoslav republics. Although the census consistently respected all instructions from the Federal Statistical Office in Belgrade, in 1991 Slovenia introduced innovations regarding content and methods. These changes differed from those jointly planned for the Census, and thus drew closer to procedures used by Western European countries for the same census round.

Among other aspects, the 1991 Census was the most extensive regarding enumeration units: besides population, households and dwellings Slovenia carried out a census of agricultural holdings, which were covered last in 1969. The project was conducted on the basis of interviews; optical reading technology had already been adopted for data capture.

The development of the nationwide register system for the 2000 Census Round was facilitated by the wide use of the Personal Identification Number (PIN). This allowed for the planning and implementation of the 2002 Population, Households and Dwellings Census using the **'combined method'**. In fact, the available registers do not yet allow for the implementation of a census solely on this basis. More precisely, the survey was organised as follows:

- traditional census for dwellings and households;
- mixed census for buildings and population.

The Census reference moment was midnight of the 31 March 2002; field operations were carried out from 1 to 15 April. The *de facto* data on census units were collected. Because of the use of different registers, most data refer to the above-mentioned reference date[47].The Census was prepared and organised by the Statistical Office of the Republic of Slovenia (SORS) and implemented in co-operation with census participants (State Census Supervisors, members of the Census District Boards, Supervisors, and Enumerators). International recommendations were considered to define census methodology for the 2000 Census Round in the ECE Region.

Registers

For a number of years the SORS has been striving to develop more rational and less expensive statistics. Mainly this has been accomplished through the use of existing

[47] Data refer to specific data or time period depending on the type of information register.

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registers and databases and data collected using statistical surveys as the basis for setting-up new registers. The utilisation of register data in the statistical surveys facilitates:

- achievement of considerable rationalisation of data collection;
- solving of problems of non-responses in statistics, especially in a census;
- preventing the enumerator's influence on results of specific statistical inquiries.

The SORS is in agreement with other statistical offices regarding the usefulness of the *Central Population Register* (CPR) for the improvement of the demographic statistics system. During the years between censuses it is possible to compile population averages, estimate the total population and population structure. Apart from the CPR, there are registers for business, territorial units and employment statistics.

Legislation and data protection

The 1991 Census Law defined the multipurpose use of specific data collected by the survey and its use to set-up two new registers, i.e. the *Register for Dwellings* and the *Farm Register*. Besides the basic tasks of providing data to users, these registers were expected to be used to prepare and carry out the Census. Since those two registers weren't established there was no basis for the 2002 Census to be conducted solely out of register data.

The 2002 Census was conducted on the basis of a special Census Act (OJ RS, Nos. 66/00 and 26/01). This law regulated the preparation, organisation, content and realisation of the census as well as the security of individual data. Census Act once again defined among collected data the data which will be used to set-up registers: this time the Register of Households and the Register of Dwelling. Just before the Census the Constitutional Court of the Republic of Slovenia has decided that the Census Act in the parts relating to the establishing of those two registers does not comply with the Constitution of the Republic of Slovenia.

A special law defines and regulates the amount and means of spending the necessary funds. Relevance for the Census is provided by the National Statistics Act (OJ RS, Nos. 45/95 and 9/01).

According to Article 10, respondents were obliged to give complete and correct answers to all questions in the census questionnaires. Only answers to questions on *ethnicity* and *religion* were not compulsory. An ad hoc census questionnaire was available for these two questions for all persons temporarily absent from the household or who did not wish to respond in the presence of other members of the household or the interviewer. This form was sent later to the SORS in a prepaid envelope left by the enumerator together with the form. In accordance with the Slovene Constitution, answers to questions on ethnicity and religion for persons younger than 14 years were given by their parents, adopter or guardian.

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All census actors were required to sign a statement on the protection of personal data and received authorisation for their work from the Head of the SORS. Enumerators were obliged to show this authorisation to the respondent without being asked.

Census units

Census units covered by the 2002 Census were:

1. **persons:**
- citizens of the Republic of Slovenia with permanent or temporary residence in the country;
- foreigners with permits for permanent or temporary residence in Slovenia who had registered their permanent or temporary residence in the country;
- persons under temporary protection in Slovenia;
- other persons who were present in Slovenia at the critical moment of the census (e.g.: persons without a regulated status in Slovenia, asylum seekers, illegal immigrants, etc.);
2. **households**;
3. **dwellings and other inhabited premises**;
4. **buildings** where dwellings or other inhabited premises are located.

Preparatory phases

Well before the census moment, in the first half of April 1998, the SORS carried out the Pilot Census as of midnight 31 March 1998. The survey was carried out on 3 300 households and dwellings and just under 10 000 inhabitants (i.e.: the 0.5% of the Slovene population) selected through a simple random sampling in 64 Census Districts. Data were collected in two ways:

- face-to-face interviews in all 64 census districts;
- postal method in 21 census districts.

Data entry was performed interactively with Blaise software. Data entry and editing applications were prepared using the program system Blaise III, Version 1.18, which was installed on the SORS local area network. Data entry and editing were carried out successfully using available resources. At the time the Pilot Census showed that less-expensive methods, such as self-enumeration and use of the mail, could not be applied in Slovenia as the results obtained were not completely reliable. Final plans foresaw the interview method for collecting data that was unavailable from registers.

The smallest territorial unit at Census 2002 was the Census District. The SORS outsourced some cartographic work useful for the definition of enumeration units. Paper maps of different scales depending on the zone and digital maps were prepared for enumerators, their supervisors and Census District Boards.

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The Census was based on the existing official and other administrative records from the public and private sector in Slovenia. The data collected, using questionnaires had been impossible to obtain from existing official administrative records or were not up to date. PIN and personal data – related to permanent residence for citizens and to temporary residence for foreigners – were mainly obtained from the CPR, collected in a **Pre-Census Database** and then pre-printed in the individual questionnaire.

In order to allow their recognition during the data processing phase, all questionnaires were provided with bar codes that included information on the type of census form, identification of the Census District, identification of the census form and the control number. Reserves of questionnaires with and without pre-printed codes, for each Census District and the whole country respectively, were prepared and used when enumerators found un-expected buildings, dwellings, households and/or persons.

The staff structure for field operations was organised as follows:

- **9 Census Experts** prepared training of the State Census Instructors, controlled and supervised the census participants and provided methodological support;
- **61 State Census Instructors** provided supervision and control of census activities at the national level and necessary explanations on the work of enumerators and their supervisors;
- **322 members of Census District Boards in 64 central Census Centres** organised and conducted field work, controlled census implementation, prepared payments for staff and services (such as transport of materials), training, supervision and support to census staff;
- **970 supervisors** checked the work of enumerators, received and checked questionnaires and other forms from the enumerators;
- **8 698 enumerators** carried out interviews and prepared the first results for each Census District. Each enumerator worked on one or more Census District covering from 200 to 240 persons.

Publicity and information

A few weeks before enumeration every household received a leaflet containing all the necessary information about the Census. In the case of problems related to self-enumeration and for any question on the Census, respondents could call the SORS on a free telephone number. Information was provided on the SORS website and on another devoted to the Census. In addition, posters were placed in public institutions, and announcements were made on the radio and in TV spots and programmes. Press conferences were used to inform respondents of the survey.

Enumeration

For the first time in Slovenia the SORS provided self-enumeration during the census. Normally the data were provided by individuals – by their parents, adopter or a guardian for persons younger than 15 years. Information on other persons could also be provided

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by another adult member of the household knowing the required data concerning households, dwellings and buildings.

Data were collected through three **basic census questionnaires**:

- Census questionnaire for buildings (P-1);
- Census questionnaire for dwellings (P-2), and
- Census questionnaire for individuals (P-3).

The following **auxiliary census questionnaires** were used:

- list of household members (POM/GO), useful in recording the relationships between persons, families in the household, absence of members, temporarily present persons and the reason for their presence in the household;
- statement on nationality/ethnicity and religion (P-3/NV);
- first results for Census District (PRVI/REZ).

Enumerators also had **auxiliary lists**:

- list of buildings and dwellings in the Census District (ST/PO);
- list of persons in the census district (OS/PO), to organise work and prepare first results.

In municipalities, where members of the Italian or Hungarian ethnic communities live, an appropriate number of Census District board members, supervisors and enumerators were appointed from amongst representatives of these two self-governing ethnic communities. People who had been proposed and selected by the ethnic community were required to speak Slovene and Italian or Hungarian. In these areas the census questionnaires were provided in the second official language.

Immediately, at the end of the Census from 23 to 26 April, statistical control of the coverage and quality of the data collected was carried out in 100 Census Districts, located in the area of 47 Census Centres. The sample covered 0·7% of Slovene population. For this purpose census controllers were selected from among the best enumerators who had already been working on the Census from 1 to 15 April.

In addition to the post-enumeration control, a sample processing of 20% of the individual questionnaires were carried out to check data accuracy, as the total population resulted as 3.8% less of the pre-printed questionnaires. According to this analysis, 89.6% of people were found at the pre-printed addresses, 6.6% were found living elsewhere in Slovenia, and 3.8% did not belong in the enumerated population (because people were currently living abroad, had died before the reference day, or were unknown at the pre-printed address). For these reasons final results should differ slightly from the preliminary.

Data processing

Data capture and coding activities were outsourced. Optical character reading of census questionnaires was carried out in the census data processing centre using the commercial product Read Soft. The results of data capture were stored on an ORACLE database. Images were created from census questionnaires and used for editing.

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A self-developed system for automatic coding was applied. Computer-assisted coding was used only when machine coding was not possible. Manual intervention was implemented when required to repair unrecognisable characters and for data relating to territory, households and families. Figures were imputed for missing or incorrect data. The classification server used for coding includes all classifications used for the census. International classifications such as NACE Rev.1, ISCO-88, ISCED and NUTS were adopted. The connection with this classification server provides machine and computer assisted coding.

Main results and data dissemination

First (preliminary) census data – i.e. data on buildings, dwellings, persons in dwellings, households and household members by sex, based on the auxiliary census questionnaire PRVI/REZ, were published two months after the end of enumeration. Because of the application of the internationally recommended definition for the population the 1 948 250 inhabitants enumerated in the country resulted as less than for 1991 (-0.9%). However, when the 1991 Census data is adapted to the current definition, the total population results increase by 1.8%. Preliminary data, by different geographical level, together with extensive methodological notes and comments, were published in the Rapid Report No. 159 (on the SORS's website) and on the census website. In addition, the same data are published in the Statistical Databank at www.gov.si/bsp.

Basic final results will be disseminated one year following the Census in April 2003, complete and detailed results from two to three years from the same census date. All standard tables will be prepared for Eurostat.

Costs

Financial resources for preparing and conducting the Census are provided to the SORS within the State budgets over four years. Total financial resources amounting to € 14.9 million are allocated by individual years and based on the original plans:

- € 1.3 million in 2001
- € 10.3 million in 2002
- € 1.1 million in 2003
- € 0.7 million in 2004

Financial resources from the previous paragraph shall be revalue in accordance with consumer price increases in the Republic of Slovenia.

Finally, over 60% of financial resources should be spent to cover expenses relating to field work, less than 15% for software and hardware and finally about 25% for the printing and distribution of questionnaires, processing data and other supplementary materials and services.

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Conclusion and future plans

In the Republic of Slovenia problems related to funding sources, staff and extensive outsourcing of activities characterised the preparation and conduction of the 2002 Census. However the SORS managed to carry out the survey with many technical and methodological improvements to the previous. A census based only on administrative and statistical sources is planned for the future.

CYPRUS

Introduction

Censuses have been held in Cyprus every ten years since 1881 and up to 1931. Thereafter they were held at irregular intervals, in 1946 at the end of World War II, in 1960 upon the Independence of Cyprus, and in 1973. After 1974 censuses covered only the Government controlled area of Cyprus, because of the inaccessibility of the Turkish occupied area. Censuses in the Government controlled area were held in 1976, 1982, 1992 and 2001.

The 2001 Census of Population and Housing has been conducted with 1 October as reference date after a six month postponement. The traditional method with enumerators completing the census questionnaires during a face-to-face interview was used. Each enumerator was provided with map of the Enumeration Block he/she had to cover visiting one by one all living quarters within that territory.

The units of enumeration were:

- housings
- households
- persons in households, i.e. all members of the household having their usual residence at the place, with persons temporarily absent such as students and workers abroad, sailors, etc., also to be included
- institutions
- persons in institutions

The census aimed to enumerate both Cypriots and non-Cypriots who lived or intended to live in Cyprus for more than one year at census moment. It was therefore intended to enumerate in addition to the foreigners permanently residing in Cyprus and all other non-Cypriots (students, workers etc.) whose duration of stay in the country exceeded or will exceed one year.

The Statistical Service of Cyprus (CYSTAT) is in charge for census taking as the competent authority responsible for the compilation and the publication of most of the official statistical data in the country. CYSTAT (until January 2000 under the name Department of Statistics and Research) functions under the Ministry of Finance. It was set-up in 1950 as a small administrative unit while its real function started after Cyprus became independent, in 1960.

Legislation, registers

There was no separate census legislation. Census taking is provided in the Statistics Law (No. 15(1) of 2000). There was no need for any secondary legislation or regulation to be passed for census taking. Answering to census was compulsory. All data and information collected during the census were safeguarded as confidential; nobody had access to personal data which are used only for statistical purposes. A national data protection law has been just approved in 2002.

CYPRUS

Some registers (such as Population, Enterprises and Local Units, Social Insurance) exist on the country but had non relevance for census. The existing Personal Identification Number is just used for administrative matters.

Preparatory phases

Work on census preparations started in January 1999 with the establishment of a census working team to carry out a study comparing the traditional data entry method with optical data capture method and make recommendations as to which method should be used in the 2001 Census. Following the Government's decision to adopt optical data capture a working group was set up to prepare the documents for the invitation of tenders for the supply, installation and commissioning of an optical reading turnkey solution. Tenders were invited and NCR (Cyprus) Ltd was awarded the contract in April 2001. The tender procedure took longer than originally anticipated and the census date had to be postponed to October 2001.

The content and wording of the questionnaire was finalized after testing it in the field during December 2000. In parallel, the time required for its completion was tested. The printing of the questionnaires was part of contract of the optical data capture system in order to ensure compatibility with the image recognition technology.

The census Enumeration Blocks used in the previous Census of 1992 were examined and new Enumeration Blocks were formed where needed. In particular those Enumeration Blocks, where the population was estimated to have increased considerably, were divided into smaller ones, so that the size of each one was such that the estimated collection time would not exceed 30 days. The relevant maps provided by the Land and Survey Department were corrected accordingly. The urban areas were completely covered by maps, while the rural areas only for 15% of its territory.

Information campaign

Statements in the media were made months before the census date, when it became known that the year 2001 was a Census of population year in Europe.

A press conference was held few days before the commencement of the field work. There were various appearances of the Director of CYSTAT and senior census staff on television and radio channels during the enumeration period and when the preliminary results were out. Also there were press releases and articles in the local press. There were no leaflets or posters, since it was felt that they were not necessary.

Organisational structure and field operations

Census district offices were set-up and 4 census district officers were appointed as responsible for the organization and supervision of the enumeration in the district. They were assisted by 4 deputy census district officers and 57 regional supervisors. Each regional supervisor was responsible for the work of 10-12 enumerators.

CYPRUS

Census district officers and their deputies were permanent staff of CYSTAT, while regional supervisors and enumerators were mainly temporary employees recruited only for the census. Due to shortage of unemployed persons interested in working as enumerators in certain areas civil servants were employed working overtime as enumerators. The enumerator's workload comprised of one or more Enumeration Blocks covering on average 350 housing units or 1 000 persons.

The authorized employees visited the households in convenient hours with no need for anybody to change daily habits and schedules. Repeated calls were made to absent households to ensure that a convenient time is arranged for the completion of the questionnaire. Despite the good intensity of enumeration at the beginning, with about 8 000 housing units covering about 20 000 inhabitants enumerated each day, the data collection lasted longer than expected (60 against 30 days).

A next Post-Enumeration Survey only considering the coverage of the census was undertaken shortly after the enumeration.

Data processing

Data capture was effected by an optical reading tool called AFPSPRO developed by a private company. Validation and consistency checks were built in the system. Various problems with OCR recognition were faced. In overall, the duration of the data capture was of 5.5 months.

Automatic coding was used for all geographic variables (municipality/community and district in Cyprus, country and citizenship) complemented by computer-assisted coding where the automatic process failed. For economic variables (occupation and economic activity) only computer-assisted coding based on ISCO-88 and NACE-Rev.1 was used. Coding for occupation and economic activity is detailed to the level that the data permit it. As for the data capture, also the data coding was outsourced to a private company.

Additional editing of the data was performed, correcting the information from the image in order to improve number recognition and the consistency of the data.

Census database was set-up in SQL Server. Tabulation is being produced using SAS.

Data dissemination

Census results will be made available both in printed and electronic format.

The preliminary counts by district, urban/rural, municipality and community based on enumeration's control lists were issued and made available on the web page of CYSTAT in February 2002.

During 2002 first final tabulation results were issued, with the inclusion of the following selected data on the CYSTAT website:

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- Main Results
- Population and Households by District
- Population by Age and Sex
- Population by Municipality/Community

Several paper publications by topics (thematic analysis) and an atlas with census results are foreseen from 2003 onwards. Standard files will be also prepared accordingly to users' requirements.

Costs

The total cost of the Census is estimated at € 2.6 million. About half of the cost (49.8%) relates to field work and about one third of the cost covers hardware (7.4%), software and processing of the data (23.3%). The remaining main item (12.3%) is then represented by expenditures for the general preparation. No money was disbursed for publicity and information.

Conclusion and future plans

CYSTAT has reached the expected results, although of some difficulties, problems and delays coming from:

- the lack of GIS;
- the shortage of experienced staff and the recruitment of temporary workers;
- the outsourcing of activities (from the tenders' preparation more than the execution of tasks);
- the enumeration.

The availability of fresh and reliable population data will now first allow to revise the inter-censual population estimates, to forecast future demographic structure and to update the samples useful for more in-deep surveys.

Again a traditional census with enumeration based on interviews is at moment considered for next census round, with innovation provided by the application of GIS techniques in the phases of preparation and publication.

MALTA

Introduction

It has been recorded that the first known count of the population in Malta was carried out by the Emir Yusuf–al-Futah in the year 991 for the purposes of securing certain privileges for the inhabitants. The number of inhabitants was then put at about 21.000. In the year 1530, the Knights Hospitallers of St John of Jerusalem took possession of the islands and censuses were held from time to time.

On March 21, 1842, the first regular census in a series of decennial censuses - interrupted during the Second World War and in 1977 - was carried out. The enumeration was made on a *de facto* basis and included British servicemen and their families. Permanent legislation for the taking of censuses was introduced in Malta in 1948.

What follows is an account of the 1995 Population and Housing Census. It was taken on 26th November 1995 and was the fifteenth since 1842. In the course of the Census, the opportunity was also taken to carry out a sample survey on the incidence of diabetes among the population.

Legislation

A Census Order was made by the Hon. Prime Minister in terms of section 3 of the Census Act, 1948, and was published by Legal Notice No. 134 of 1995. Prior to the issue of that Order, a Government Notice No. 660 was published on the 19th October 1995, appointing the A/Director of Statistics, to be Census Officer for the purpose of taking a Census relating mainly to population and housing.

The Census Order provided for the taking of the census on the 26th November 1995 and for the broad types of particulars and other information to be collected for that purpose in respect of persons and housing accommodation. Two schedules to the Census Order specified the persons who were required to give information and the detailed particulars required to be stated in the census questionnaire.

The Census Regulations were published by Legal Notice No. 166 of 1995 and gave details of the census questionnaire, besides defining the duties and functions of the Census Officer, Supervisors and Enumerators. The Census Regulations also defined the responsibility of those persons who were required to furnish information.

Preparatory phases

Before the stage of door-to-door enumeration of the population could be reached, it was necessary to plan in detail the various phases of the preparatory work required to be done to equip enumerators with maps, documents and instructions to enable them to carry out their duties efficiently. The Census Officer was assisted in this task by the staff of the Central Office of Statistics and by other officers recruited for the census.

MALTA

Census questionnaire

The draft census questionnaire was thoroughly discussed within a Working Group that was set up by the Central Office of Statistics. The questionnaire was prepared after a lengthy series of consultation meetings with interested parties and entities. Although it was desired to meet most of the requirements, actual and potential, of all authorities concerned with demographic, social, housing, manpower or economic aspects of the country, it was not possible to extend the questionnaire any further without sacrificing a high standard of accuracy.

A careful selection of questions was made. This was done in such a way as to omit the least important, while maintaining continuity with past censuses and conforming with the Census Recommendations of the UNECE.

The questionnaire was tested on 400 households during September 1995. The difficulties encountered during this pre-test as well as the suggestions and recommendations received in the course of this test proved to be extremely useful in drawing up its final version. The questionnaire was divided in two parts. Part I of the questionnaire covered demographic and other socio-economic topics while part II dealt with the housing aspect of the Census. The same census questionnaire was used in the case of both private and institutional households.

The census questionnaire itself contained extensive explanatory notes for its completion. However, these notes were supplemented by additional information that was contained in a census manual which was distributed to all the staff. In addition to specific questionnaire-related explanatory material, the census manual contained extensive notes on all the relevant aspects of the methodology.

For administrative control purposes, it was also necessary to create a number of other forms for recording progress, abstracting of statistical information, summarising or aggregating of data as required. The printing of the questionnaires, manuals, and other census-related forms was mainly carried out at the Government Printing Press.

Software Development

All the required census software was developed by staff members of the Malta Information Technology and Training Services (MITTS). The relative team from the MITTS worked very closely with the Census Officer and his staff throughout the development process of the questionnaire and the other forms, and the data entry and report processing stages of the project.

A 20-terminal LAN, complete with fully tested software, was installed at the Census Office in order to cater for the data processing requirements arising from the census. A number of small software applications was also developed in order to assist the staff at the Census Office in controlling and monitoring the process.

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Cartographic Work

All maps and survey sheets, used in the course of the Census, were prepared by the Mapping Unit of the Planning Authority. This unit divided each locality into a number of Census Enumeration Areas and delineated the boundaries of each such area. During the Census operation itself, staff members of the Mapping Unit assisted the Census staff in resolving any difficulties that arose in the course of the enumeration.

Enumerators and Supervisors

Over one thousand supervisors and enumerators were appointed by the Census Officer to assist in the enumeration process. The enumerators were selected on the basis of suitability for the job or on the strength of previous experience in this or related field-work from among those employees of Government and other parastatal organisations who had applied to perform these duties. The names, private addresses and respective assignments of staff were published in the Government Gazette.

All personnel performing duties connected with the census were sworn in by the Census Officer in terms of the Census Act to ensure the complete maintenance of secrecy in relation to information furnished for the purposes of the census.

Two intensive briefing and training sessions on all aspects related to the Census were held both in Malta and in Gozo between the 1st and the 17th November 1995. All supervisors and enumerators were required to attend each briefing session.

During the first briefing session, a comprehensive set of instructions on all aspects of enumeration covering the questionnaire and forms, method of completion, definitions, practical advice on difficulties likely to be encountered, procedures, relations with the public, codes and the preliminary summarisation of data, was distributed to enumerators and supervisors. The material provided, was also thoroughly explained by the Census Officer and other officials. Then supervisors and enumerators were asked to familiarize themselves with the census methodology, their locality and enumeration areas and to bring up any problems for discussion during the second briefing session.

The second briefing session was devoted to a review of the census methodology and enumeration process and to the difficulties that were raised by both the supervisors and the enumerators. During this second meeting, staff members of the Mapping Unit of the Planning Authority helped those supervisors and enumerators resolve the difficulties which they encountered during their reconnaissance visit of the localities and enumeration areas.

Publicity and information

The project was supported by an extensive publicity and information campaign. Television, radio and the print media were used for the purpose. Information material, in both Maltese and English was addressed to all households in Malta and Gozo. The campaign was supported by a number of press briefings and television and radio interviews with the Census Officer and other officials.

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During the three-week census period, a free phone service was operated for 13 hours daily. This help-line service proved very popular with the members of the public. It is estimated that during the period during which this service was operated about 15.000 calls from the public were attended to.

Data collection

Door-to-door enumeration started at 16:00 hours on Monday the 20th November 1995 simultaneously in all localities and proceeded smoothly right up to the last day in the census period, namely the 10th December 1995. The following enumeration approach was adopted.

- The census questionnaire was mailed to all households in Malta and Gozo before the 20th November 1995. Households were encouraged to fill in the questionnaire themselves and to provide the required information as at midnight of the 26th November 1995.
- Enumerators paid their first visit to the households in their enumeration area in the week between the 20th and the 26th November 1995 with task to discuss the questionnaire with the households and to determine the kind of assistance, if any, that households required in filling in the questionnaire. Whenever respondents were unable to fill in the questionnaire themselves, enumerators were required to fill in the form.
- Enumerators were required to pay households a second visit in the two weeks following census day in order to either finalise the filling in of the questionnaire, to check and collect the questionnaire or else to ascertain that the circumstances of the household remained unchanged.
- The census was taken in accordance with the *de jure* method of enumeration. Briefly, this means that the enumerated persons were counted at their permanent place of residence.

A total of 902 enumerators carried out the required field work across the whole country. Another 45 stand-by enumerators were engaged to act as support staff as and when required. In the course of the census, a number of these stand-by enumerators were called upon to carry out actual enumeration duties.

The enumeration process within each locality and within each enumeration area was under the supervision of 81 supervisors. Each supervisor was assigned a number of enumerators who, in turn, were instructed to liaise with and report progress to him/her on a regular basis. The supervisors' role was to assist the enumerators in resolving any difficulties that could arise during the enumeration process and to ensure as complete and proper a coverage of all the parts of each locality as possible.

During this phase, the response of the public was most satisfactory in all localities. In the course of the census, it was not found necessary to use legal powers to compel reluctant respondents to furnish information. There were, however, cases of households requiring a certain degree of persuasion on the part of enumerators and their supervisors before accepting to cooperate fully.

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Most of the households were enumerated at their usual residence. However, a substantial number of households was found to be either living temporarily at an address that is not their usual address or else to be temporarily overseas. Most of the households reported to be living elsewhere on the island were actually enumerated at their temporary residence. However, some others and notably those that were reported to be temporarily overseas had to be followed up after the close of the census.
All enumerators were also asked to keep a proper record of all those instances where they failed to establish a contact with the tenants of a housing unit. The information thus collected was afterwards investigated in order to ensure as complete a coverage as possible of all the households in these islands.

Data processing

All follow-up action subsequent to the field-work was carried out by the staff of the Central Office of Statistics. A number of households had to be followed up in order to reduce as much as is reasonably possible the under-enumeration factor. Moreover, the completed records were compared to other available administrative records and benchmarks in order to ascertain as complete a coverage as possible.

Data dissemination

The census findings were published in six volumes. Each volume contained a brief analysis of the main areas e.g.: population, fertility, nuptiality and households, socio-economic characteristics, migration and dwellings were covered in the publication as well as the relevant tables. Products were ready some 18 months after the census data. Summaries of the findings were also published in the form of a report sent to Parliament within three months of the holding of the census. Press conferences on the main census results were held as soon as the preliminary results were known.

Costs

The 1985 census was costed at around € 240.000. The 1995 census cost five times as much i.e. around € 1.200.000. Considering the main phases, 32% of cost was devoted to the preparation, 40% enumeration phases, 22% data entry and processing, 6% publication, analysis and dissemination.

Future plans

Plans for are under discussions for the conduction of next population and housing census. The survey will be always based on the traditional method with enumerators interviewing respondents through a questionnaire.

This country report is mainly based on a document prepared by Mr Reno Camilleri, Chairman, Malta Statistics Authority, for the purposes of this project.

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Introduction

The first population census in Turkey was carried out in 1927. The next population censuses were carried out between 1935 and 1990 regularly, in years ending with "0" and "5". After 1990, population censuses have been decided to be organised in years ending with "0" by a law. In this regard, the 14th **Population Census** was carried out on 22 October 2000. As for the previous censuses, the enumeration was carried out in one day by application of a curfew. The enumerators have visited all the places that constitute a household, and that do not constitute a household and filled in the questionnaires by face-to-face interviews. In overall, approximately one million people took place to field operations.

Implementing the population censuses is the legal duty of the Presidency of the State Institute of Statistics (SIS). The field application of this survey as it was determined by regulations, is done in cooperation with the Ministry of Interior.

Population census is a group of interrelated processes which coincide and go parallel in schedule. These processes are outlined below.

The activities implemented by SIS are

- fixing the census method and date
- preparation and oublication of the questionnaire
- planning the field organisation
- publicity of the census
- training the census staff
- planning and esecuting the census evaluation studies
- completion of the data analysis
- publication of the results

The activities implemented by The Ministry of Interior

- the studies for determining the address source of the census
- establishment of the census committees
- selection of the census staff
- application of the census

A correct and proper execution of the census requires the activities outside the body of the SIS also be running properly. Where most of the process took place in the field, the duty of the SIS was correctly making the staging and timing of the studies and informing related units about this. The studies in this content started on 21 February 2000 with a circular of Prime Ministry. Later, with a circular of Ministry of the State on 25 February 2000 and a regulation of the Ministry of the Interior on 23 March 2000 and 30 circulars of SIS, the field work of the population census has been tried to be organised and controlled.

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Population definition and coverage

Aim of the Project is to determine completely and correctly the size, the distribution by administrative division and the demographic and socio-economic characteristics of the population within the boundaries of the country on the census date, i.e. the *de facto* population. This definition, which was also used in the previous censuses, requires persons being enumerated at localities where they are physically present on the census day. Thus all the persons present at places that constitute a housing units (first the dwellings), that do not constitute a housing units (like dormitories, military quarters, prisons, hospitals, hotels, etc.), and the nomadic population were counted, and thus all the population within the boundaries of Turkey on the census day were totally covered.

In accordance with the definition above, persons who reside in the country but who were abroad on the census day were excluded from the enumeration, on the other hand persons who reside abroad but who were in the country were included.

The unit of the enumeration was the person, and the information obtained was taken from each person separately.

Preparatory phases

Planning and execution of all the processes beginning from the preparation studies to the publishing of the results, require an intense and long term study. In order to execute these studies, a **Population Census Committee**, chaired by the President of SIS and consisting of scientists in the field of population, representatives of SIS and related institutions started its mandate in June 1998.

It is very important to built a system to follow the updates of address lists for surveys aiming to draw the social and economic structure of a population, and for the delivery of the services by the local governments. The address frame is main source for the complete enumeration of the population. Ijn Turkey, all the buildings within the boundaries of the country constituted the address frame of the 2000 enumeration. The Enumeration Areas were set by using this frame.

In order to establish the address frame, a **Numbering Study** had been implemented, which covers all the streets being named, and all the buildings where persons are living in or are likely to be living in being numbered, like it had been done for the previous censuses. This study, which was executed by the SIS in co-operation with the municipalities and the village administrations (muhtarl›k) was implemented in April - July 2000.

After the Numbering Study, the **Building Census** was implemented in June - August 2000, thus the Address Frame of the enumeration had once more been checked for all localities in the municipal areas. The nomadic and tent population within the boundaries of settlements had been determined just before the Census in order not to leave it out of enumeration, and this population was also enumerated on the census day.

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Census Committees in the provinces and districts of Turkey had been constituted for organising and executing the Census in accordance with the principles of the SIS and for taking the measures when necessary. The *Census Committee of Provinces*, lead by the Governor or the Deputy Governor of the Provinces, have been constituted of 4 people who are, Director of Population and Citizenship Affairs, Director of the Local Administration, Director of Technical Department of Municipality or an authorised member of the municipality. The Regional Director of the SIS was also a member of that Committee in provinces where the Regional Directorate of the SIS exists. The *Census Committee of Districts*, lead by the Districts Governors, constitutes of 3 people: Civil Registration Director of the District, Mayor or an authorised member of the municipality. A Census Bureau has been constituted of people who were selected by the Head of the Committee, in order to implement the duties of a secretariat.

Using the building lists (Population Form 1 and Population Form 2) sent them, Province and District Committees have established the Enumeration Areas (EA) covering approximately 22 houses (a maximum of 100 population) for province and district centers, and 25 houses (a maximum of 130 population) for sub-districts and villages. Enumeration Area Building Lists (Form C) had been prepared for each EA. After the EAs have been established, an enumerator had been appointed for each one.

In 2000 Population Census enumerators, reserve enumerators, supervisors, SIS technical staff and trainers responsible for training these staff have been involved.

750 **technical staff from the SIS** (Consultants) had been charged to provide technical support and counseling to all the Census Committees in the provinces and districts. These consultants started their work on 27 March 2000 in the localities where they were appointed, with the responsibility of executing the different activities (Numbering Study, building and population enumeration) in accordance with the principles set by the Institute, providing the required controls and fixing the problems encountered. They had also been asked to inform the Institute at the time about the problems that could not be fixed by the Census Committees. They left the field one week after the population census day.

Enumerators had implemented the enumeration of the population in the previously set EAs. The **Supervisors** who would be responsible for 10 enumerators had been charged in the province and district centers and in the sub-districts and villages where a municipal organisation exists, in order to assist the enumerators and fix the problems about the enumeration. In overall, 987 907 enumerators and supervisors had taken place in the Census.

9 741 **Trainers** had been appointed for training the enumerators and the supervisors. While constituting this group audits and school managers of the Ministry of National Education and, in places where there is a university, academicians had been preferred.

In order to provide the performing of the enumeration in compliance with the previously set criterions all over Turkey, and that the questionnaire was understood completely and clearly, great importance had been attached to the training of all staff. For this reason, a **special training kit** had been prepared. This kit included a Manual for Enumerators and Supervisors, with information on the organisation of the Census, the duties of

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consultants, trainers, enumerators and supervisors, and information on how to fill in the questionnaires as well as a filled in model questionnaire.

The training had been implemented in three stages:

- Training of the SIS Consultants, through a 2 days training at the headquarters of SIS
- Training of Trainers responsible for training the enumerators and supervisors, had been given by the SIS technical staff in the province centers, through 2 days training in groups of 50 people
- Training of Enumerators and Supervisors, by the trainers at the province and district centers, through a 1 day training given to groups of 30 people

The census questionnaire

The census questionnaire had been determined by taking into consideration the UN recommendations on population censuses for the 2000 Census Round as well as the previous censuses carried out in Turkey. All the relevant institutions, organisations and universities have been also consulted.

Three pre-tests had been applied in the field for testing the applicability of the content and design of the questionnaire of the Census and its applicability of the data evaluation processes. After each, test evaluations have been made, and the questionnaire had been improved and had taken its final content and shape.

An optical based data entry system had been planned to transfer the census data from the questionnaire to electronic format. In order to increase the applicability of this system, the questionnaire of the previous censuses, which was in overall bulletin structure, was replaced with the questionnaire which represents the housing units and persons in different pages.

The questionnaire of the 2000 Population Census was prepared in household questionnaire form. Each household questionnaire contains a section on personal qualifications for 7 people. In overall, it consists of the four following sections:

1. *Section I*: Address of the Housing Unit
   including information about the address of the place where the person to be enumerated was present. This information is in accordance with the previously prepared address frame.
2. *Section II*: Type of the Place Census Takes Place
   defining the characteristics of the types of places as housing units, or institutional places like hotel, hospital, prison, dormitory, military quarter, etc.
3. *Section III*: Questions on the Household and Housing Unit
   used in for places that were detected to be a household in the previous section. In this section, questions about the household and the housing unit inhabited in take place.
4. *Section IV*: Questions on Personal Qualifications
   containing questions on personal qualifications, which should be filled in for each person in households or in places that do not constitute a household.

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Out of a total of 43 questions that take place on the questionnaire of 2000 Census, 12 of them were about households and housing units and 31 about personal qualifications.

Questions on age, sex, place of birth, nationality, disability, migration, educational status, fertility, mortality, labor force, and main features of the housing unit take place on the questionnaire.

Three types of questionnaire books had been prepared considering the average population that was possible to be interviewed by one enumerator within a day in province and district centers, and sub-districts and villages. The questionnaire books to be used in province and district centers consisted of 25 household questionnaires and the ones for sub-districts and villages of 30 household questionnaires. Extra questionnaire books consisting of 10 household questionnaires were prepared in order to be used when necessary. Two questionnaires, one for the enumerator and one for the supervisor, take place at the beginning of each questionnaire book.

Publicity and information

A series of publicity activities had been implemented in order to inform the public about the importance of the Census, create consciousness on the importance of the statistical information, and provide support by effective informing.

A **logo** for publicising the Census had been used in all publicity activities carried out by SIS for a one year period. This logo had taken place on the publications and news bulletins of SIS. A slogan and composition about the Census had taken place on the National Lottery tickets of 19 October 2000. The census logo clichés had been used on mails for a period of one month.

A **publicity kit for media** had been prepared and sent to more than 1 000 organisations. Besides, **television spots** had been prepared and sent to TV organisations.

With the studies executed together with Turkish Radio and Television Organisation, **census slogans** had been recorded and broadcast by 7 local radio stations for a one month period. Besides, a 20 minutes **SIS introduction film** and **census spot films** approximately in 25 different contents had been broadcast.

Two **posters** had been prepared and 150 000 copies of them had been published and distributed to all provinces, districts, and villages of Turkey. Besides, 1 500 **billboard posters** had been sent to the Head Office of Municipalities in the province centers where there is a possibility of displaying them.

Lastly, with **press conferences**, interviews on radios and televisions had been held just before the Census information had been given in order to illuminate the public.

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Field operations

The 2000 Census had been completed in one day by declaring a national curfew on 22 October 2000, between hours 08:00 and 17:00. Only the members of the Census Committees and the census bureau staff, enumerators, supervisors and transportation, health, security workers, and the staff of other organisations, and the staff of private sector which had to give public service were allowed to go out on that interval.

Enumerators had visited each housing unit they were assigned to and filled in the questionnaires. Places like hospitals, dormitories, military quarters, prisons, transportation vehicles on the road during the enumeration, etc. had been considered as **Special Enumeration Areas** and special enumerators had been sent there. And thus, it was provided that the population had totally been enumerated.

Post-enumeration phases

The data processing phase of the Census started after the field application had finished and the questionnaire books had been received by the Institute. The 2000 Population Census appears as a survey that made more use of the information technologies in structure and methodology when compared with the other censuses organised by the SIS. In this regard optical data entry, databases and web technologies had been used more effectively. The census evaluation processes which were implemented as workflow band, consists of four main steps.

Optical Data Entry
The census forms which had been designed to be compatible with the optical reading technology had been checked and arranged according to province and district Enumeration Areas before being transferred to the electronic environment. Afterwards the forms had been transferred to the computer platform at the SIS's Optical Data Entry Center. Work preparation, scanning, automatic character recognition, operator control and completion, integration and final control steps had been implemented during the data entry process. The data entry system used[48] has the characteristic of recognition of marks (OMR), printed characters (OCR) and handwritten numbers and alphabetic characters (ICR) entered on the census forms. Despite the application of this method the entire data capture phase had been performed in 22 months.

The text has been transferred into characters (data) with the character sensible software that can input as images. More intensive data entry had been possible with the help of labour force benefits of the system, when compared with the previous censuses. High quality information could be provided because of the integration of automatic recognition and operator correction/completion processes. This process was completed with transforming and archiving of two different data sets, produced in image and text structures on province basis, to the next data processing step.

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Automatic Coding
The house and personal qualification fields on the electronic environment, which require being coded, had been automatically coded with the help of the developed application software and coding dictionaries. In this step, coding processes had been implemented on the macro basis with character decomposition techniques.

Providing Integration of Data and Electronic Editing and Coding
After the automatic coding process, the data which came on province basis, had been transformed into databases and the integration and consistency of questionnaire books and housing units had been provided. Then, a specially trained control team had logically corrected and coded the data fields on the basis of book cover, and information about housing units and persons with the usage of interactive correction interface. Here, the micro studies had enabled the data to be examined at the most detailed level. Using the data dictionaries along with databases had increased the speed and correctness of the process.

In this study, files containing information in text format and forms in image format had been provided to be monitored by the control team. Each correction and coding made on the information in text format, and performance of the staff and the reports on the whole of the process could be followed online on the Intranet over a web based software. This work environment provided serious management advantages. The province data of which correction and coding steps had finished, are sent to tabulation and analysis step.

Tabulation, Analysis and Preparation for Publication
In this stage, the macro level correction, control and analysis activities had been executed and tabulation and preparation to publishing steps had been implemented.

In the evaluation steps of the data processing of the Population Census, there is considerable added value. Especially with the contemporary technological means, the real images of the census forms and the numeric and character based data has been provided to be kept in electronic environment. Besides the process being monitored in real time and the electronic reports being taken dynamically the synchronisation between the processes and the internal and external automatic control of the processes and effective decision support infrastructure had been provided. Keeping monitoring system data in databases has generated a strong infrastructure for the data processing steps of the subsequent censuses.

Preliminary results had been published shortly after the Census on the basis of the enumerators reports. Final results will be available according to the following timetable:

☐ two years after the census date (autumn 2002):	**Tabulation plan** and **Documentation products**
☐ from three to four years after the census date:	**Analysis of results**, i.e. thematic volumes on topics like migration, fertility, or population projections (mostly on paper and CD-ROM)
☐ four years after the census date:	**Census Database** (individual records, on CD-ROM)

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Costs

The costs of the Census is estimated around € 18.8 million, i.e. some € 3.6 per person. The amount for enumeration should reach about 50% of the total. The remaining 50% should be approximately shared as follows: 5% for general preparation, 5% for equipment, 1% for cartography, 2% for publicity and information, 12% for data processing, 15% for publication and dissemination.

Conclusion and future plans

Among other uses, the 2000 Census results will be used for the revision of inter-census population estimates and as basis for demographic previsions.

Next population census is panned to be conducted on the basis of the same traditional method.

Annex 1

List of abbreviations and acronyms

BBR	CENTRAL REGISTER OF BUILDINGS AND DWELLINGS (DENMARK)
CASI	COMPUTER-ASSISTED SELF-INTERVIEWING
CATI	COMPUTER ASSISTED TELEPHONE INTERVIEWING
CBSS	CROSSROADS BANK FOR SOCIAL SECURITY
CICN	COLOR ICON RESOURCES (CARTOGRAPHY DIGITISED MUNICIPAL INFRA)
CNIL	COMMISSION NATIONALE DE L'INFORMATIQUE ET DES LIBERTÉS (NATIONAL COMMISSION IN CHARGE OF THE PROTECTION OF PRIVACY AND FREEDOM)
CNIS	CONSEIL NATIONAL DE L'INFORMATION STATISTIQUE (NATIONAL COUNCIL FOR STATISTICAL INFORMATION)
CPR	CENTRAL POPULATION REGISTER
EAPS	EUROPEAN ASSOCIATION FOR POPULATION STUDIES
ECLAC	ECONOMIC COMMISSION FOR LATIN AMERICA AND THE CARIBBEAN
ECU	EUROPEAN CURRENCY UNIT
ED	ENUMERATION DISTRICT
EDP	ELECTRONIC DATA PROCESSING
ESCAP	ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC
FSO	FEDERAL STATISTICAL OFFICE (SERBIA-MONTENEGRO)
GIS	GEOGRAPHIC INFORMATION SYSTEM
GPS	GLOBAL POSITIONING SYSTEMS
GRPS	GENERAL PACKET RADIO SERVICE
GSM	GLOBAL SYSTEM FOR MOBILE COMMUNICATION STANDARD
HCSO	HUNGARIAN CENTRAL STATISTICAL OFFICE
IDP	INTERNALLY DISPLACED PERSONS
ICOM	INTERNATIONAL CENSUS OBSERVATION AND MISSION
ICR	INTELLIGENT CHARACTER RECOGNITION
ICT	INFORMATION AND COMMUNICATION TECHNOLOGY
IFP	INTELLIGENT FORMS PROCESSING
INE	INSTITUTO NACIONAL DE ESTADÍSTICA (SPAIN) / INSTITUTO NACIONAL DE ESTATÍSTICA (PORTUGAL)
INS	INSTITUT NATIONALE DE LA STATISTIQUE (BELGIUM)
INSEE	INSTITUT NATIONAL DE LA STATISTIQUE ET DES ETUDES ECONOMIQUES (FRANCE)
ISCO	INTERNATIONAL STANDARD CLASSIFICATION OF OCCUPATIONS
ISIC	INTERNATIONAL STANDARD CLASSIFICATION OF ALL ECONOMIC ACTIVITIES
ISCO-88	INTERNATIONAL STANDAR CLASSSIFICATION OF OCCUPATIONS – REVISION 1988
ISTAT	ISTITUTO NAZIONALE DI STATISTICA
IT	INFORMATION TECHNOLOGY
IUSSP	INTERNATIONAL UNION FOR SCIENTIFIC STUDY OF POPULATION
LDSA	LABORATORY OF DEMOGRAPHIC AND SOCIAL ANALYSIS
NACE	NOMENCLATURE GENERALE DES ACTIVITES ÉCONOMIQUES DANS LES COMMUNAUTÉS EUROPÉENNES (STATISTICAL CLASSIFICATION OF ECONOMIC ACTIVITIES WITHIN THE EUROPEAN UNION)

NACE-REV.1	NOMENCLATURE GÉNÉRALE DES ACTIVITÉS ECONOMIQUES - REVISION 1 (FIRST REVISION OF THE GENERAL INDUSTRIAL CLASSIFICATION OF ECONOMIC ACTIVITIES WITHIN THE EUROPEAN COMMUNITIES)
NIDI	NETHERLANDS INTERDISCIPLINARY DEMOGRAPHIC INSTITUTE
NUTS	NOMENCLATURE OF TERRITORIAL UNITS FOR STATISTICS
OCR	OPTICAL CHARACTER READING
ONS	OFFICE FOR NATIONAL STATISTICS
OPCS	OFFICE OF POPULATION, CENSUSES &SURVEYS (UK)
OSCE	ORGANIZATION FOR SECURITY AND CO-OPERATION IN EUROPE
PARIS21	PARTNERSHIPS IN STATISTICS FOR DEVELOPMENT IN THE 21ST CENTURY
PIN	PERSONAL IDENTIFICATION NUMBER
RRP	RECENSEMENT RENOVE DE LA POPULATION
SCB	STATISTISKA CENTRALBYRAN (STATISTICS SWEDEN)
SCC	STATE CENSUS COMMISSION
SICORE	SYSTEME INFORMATIQUE DE CODAGE DES REPONSES AUX ENQUETES (THE INSEE AUTOMATIC CODING SYSTEM)
SORS	STATISTICAL OFFICE OF THE REPUBLIC OF SERBIA
SORM	STATISTICAL OFFICE OF THE REPUBLIC OF MONTENEGRO
SSO	STATE STATISTICAL OFFICE (THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA)
STATEC	SERVICE CENTRAL DE LA STATISTIQUE ET ETUDES ECONOMIQUES
TPL	TABLE PRODUCING LANGUAGE
UN	UNITED NATIONS
UNECE	UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE
UNFPA	UNITED NATIONS FOUND FOR POPULATION ACTIVITIES
UNSD	UNITED NATIONS STATISTICS DIVISION
USAID	US AGENCY FOR INTERNATIONAL DEVELOPMENT

Annex 2

Population and Housing Census dates in the world at 1990 and 2000 Rounds

This annex presents a document from the UNSD Internet site (see source below). Information for the European countries covered by this study has been updated by the authors of the publication.

ST/ESA/STAT/POPCENSUSDATES/WWW

Population and Housing Census Dates
1990 and 2000 rounds of censuses

Containing data available as of 6 January 2003

The 1990 and 2000 World Population and Housing Census Rounds cover the ten year periods 1985-1994 and 1995-2004, pursuant to Economic and Social Council Resolution 1985/8 and Resolution 1995/7.

The completed and anticipated census dates given here refer to complete enumeration (100 per cent) unless otherwise noted, though some topics may be investigated on a sample basis.

Symbols

[ ]	A census was planned for that year but there is no information available to the United Nations Statistics Division that it was carried out.
(...)	It is expected that a census will be held during the decade.
-	No census taken or planned in the period indicated.

Countries or areas	1990 Round of censuses 1985-1994	2000 Round of censuses 1995-1999	2000 Round of censuses 2000-2004
AFRICA			
Algeria	20 March 1987	25 Jun.-9 Jul. 1998	-
Angola	-	-	2004
Benin	15 February 1992	-	February 2002
Botswana	21 August 1991	-	August 2001
Burkina Faso	10-20 December 1985 (P)	10-20 December 1996	-
Burundi	16-30 August 1990	-	2002
Cameroon	10 April 1987	-	December 2002
Cape Verde	23 June 1990	-	16-30 June 2000
Central African Republic	8 December 1988	1998	March 2003
Chad	8 April 1993	-	2005
Comoros	15 September 1991	-	September 2002
Congo	20 Nov.-5 Dec. 1994 (1)	6 Jun.-30 Jul. 1996	(...)
Côte d'Ivoire	1 March 1988	21 Nov.-20 Dec. 1998	-
Dem. Rep. of Congo	-	-	2003
Djibouti	-	-	2003
Egypt	17-18 November 1986	19 November 1996	-

Countries or areas	1990 Round of censuses 1985-1994	2000 Round of censuses	
		1995-1999	2000-2004
Equatorial Guinea	4 July 1994 (P)	-	2002
Eritrea	-	-	March 2003
Ethiopia	11 October 1994	-	2005
Gabon	3 July 1993 (P)	-	2003
Gambia	15 April 1993 (P)	-	15 April 2003
Ghana	-	-	26 March 2000
Guinea	-	1-15 December 1996	2006
Guinea Bissau	1 December 1991	-	(...)
Kenya	24 August 1989 (P)	24 August 1999	-
Lesotho	12 April 1986 (P)	14 April 1996	8 April 2001
Liberia	-	-	-
Libya Arab Jamahiriya		August 1995	-
Madagascar	1 August 1993	-	September 2003
Malawi	1-21 September 1987	12 September 1998	-
Mali	1-30 April 1987	1-15 April 1998	-
Mauritania	5-20 April 1988		1-15 November 2000
Mauritius	1 July 1990 (P)	-	2 July 2000(P)
Mauritius	5 Feb.-17 Jun. 1990 (H)		2000(H)
Morocco	2 September 1994	-	2002
Mozambique	-	1-15 August 1997(P)	-
Namibia	21 October 1991	-	27 August 2001
Niger	20 May-3 June 1988	-	20 May 2001
Nigeria	26 November 1991 (P)	-	2004
Réunion	15 March 1990	-	-
Rwanda	15 August 1991	-	15-16 August 2002
Saint Helena	22 February 1987	8 March 1998	-
Sao Tomé and Principé	4 August 1991	-	25 August 2001
Senegal	27 May 1988	-	8-22 December 2001
Seychelles	17 August 1987 (P)	29 August 1997	22-26 August 2002
Seychelles	26-28 August 1994		
Sierra Leone	15 December 1985	-	December 2003
Somalia	15 February 1987 (2)	-	-
South Africa	5 March 1985	9-31 October 1996	10 October 2001
South Africa	7 March 1991		
Sudan	15 April 1993 (P)	-	2003

Countries or areas	1990 Round of censuses 1985-1994	2000 Round of censuses 1995-1999	2000-2004
Swaziland	25 August 1986	11-12 May 1997	-
Togo	November 1993	-	November 2002
Tunisia	20 April 1994	-	2004
Uganda	12-19 January 1991	-	September 2002
United Republic of Tanzania	28 August 1988	-	August 2002
Western Sahara (3)	-	-	-
Zambia	20 August 1990	-	25 October 2000
Zimbabwe	18 August 1992	-	18 August 2002
AMERICA, NORTH			
Anguilla	13 April 1992	-	9 May 2001
Antigua and Barbuda	28 May 1991 (P)	-	28 May 2001
Aruba	6 October 1991	-	October 2000
Bahamas	1 May 1990	-	1 May 2000
Barbados	2 May 1990	-	1 May 2000
Belize	12 May 1991	-	13 May 2000
Bermuda	20 May 1991	-	May 2000
British Virgin Is.	12 May 1991	-	21 May 2001
Canada	3 June 1986	14 May 1996	15 May 2001
Canada	4 June 1991		
Cayman Islands	15 October 1989	October 1999	-
Costa Rica	-	-	26 June 2000
Cuba	-	-	-
Dominica	12 May 1991	-	12 May 2001
Dominican Republic	24-25 September 1993	-	November 2001
El Salvador	27 Sep.-6 Oct. 1992	-	2002
Greenland (4)	-	-	-
Grenada	12 May 1991	-	25 May 2001
Guadeloupe	15 March 1990	[1997]	-
Guatemala	17-30 April 1994	-	2003
Haiti	-	-	September 2001
Honduras	29 May 1988	-	28 July 2000
Jamaica	7 April 1991	-	10 September 2001
Martinique	15 March 1990	[1997]	-
Mexico	12-16 March 1990	-	14 February 2000
Montserrat	12 May 1991	-	12 May 2001

Countries or areas	1990 Round of censuses 1985-1994	2000 Round of censuses	
		1995-1999	2000-2004
Netherlands Antilles	27 January 1992	-	1 January 2001
Nicaragua	-	25 April 1995	-
Panama	13 May 1990	-	14 May 2000
Puerto Rico	1 April 1990	-	April 2000
St. Kitts and Nevis	12 May 1991	-	13 May 2001
Saint Lucia	12 May 1991	-	22 May 2001
St. Pierre and Miquelon	5 March 1990	[1997]	-
St. Vincent and the Grenadines	12 May 1991	-	14 May 2001
Trinidad and Tobago	2 May 1990	-	15 May 2000
Turks and Caicos Islands	31 May 1990	-	20 August 2001
United States of America	1 April 1990	-	1 April 2000
United States Virgin Islands	1 April 1990	-	1 April 2000
AMERICA, SOUTH			
Argentina	15 May 1991	-	17-18 November 2001
Bolivia	3 June 1992	-	5 September 2001
Brazil	1 September 1991	August 1996	1 August 2000
Chile	22 April 1992	-	24 April 2002
Colombia	15 October 1985	-	October 2003
Colombia	24 October 1993		
Ecuador	25 November 1990	-	25 November 2001
Falkland Islands (Malvinas)	16 November 1986	24 April 1996	8 April 2001
Falkland Islands (Malvinas)	5 March 1991		
French Guiana	15 March 1990	8 March 1999	-
Guyana	12 May 1991	-	May 2002
Paraguay	26 August 1992	-	28 August 2002
Peru	11 July 1993	-	2000
Suriname	-	-	January 2003
Uruguay	23 October 1985	22 May 1996	-
Venezuela	21 October 1990	-	21 October 2001
ASIA			
Afghanistan	-	-	-

Countries or areas	1990 Round of censuses 1985-1994	2000 Round of censuses	
		1995-1999	2000-2004
Armenia	12 January 1989	-	10-19 October 2001
Azerbaijan	12 January 1989	27 January 1999	-
Bahrain	16 November 1991	-	6 April 2001
Bangladesh	11 March 1991	-	27 January 2001
Bhutan	-	-	-
Brunei Darussalam	7 August 1991	-	May 2001
Cambodia	-	3 March 1998(P)	-
China	1 July 1990	-	1 November 2000(P)
China, Hong Kong SAR	11 March 1986 (5)	16 March 1996(5)	March 2001
China, Hong Kong SAR	15 March 1991		
China, Macao SAR	30 August 1991	-	2001
Cyprus	1 October 1992	-	1 October 2001
Georgia	12 January 1989	-	17 January 2002
India	1 March 1991	-	1 March 2001
Indonesia	31 October 1990	-	30 June 2000
Iran (Islamic Republic of)	22 September 1986	Sep.-Oct. 1996	2001
Iran (Islamic Republic of)	11 December 1991		
Iraq	17 October 1987	16 October 1997	-
Israel	-	4 November 1995	-
Japan	1 October 1985 (P)	1 October 1995(P)	1 October 2000(P)
Japan	1 October 1988 (H)	October 1998(H)	March 2003(H)
Jordan	10 December 1994	-	2004
Kazakhstan	12 January 1989	26 February 1999	-
Korea, Democratic People's Republic	31 December 1993 (P)	-	(...)
Korea, Republic of	1 November 1985	1 November 1995	1 November 2000
Korea, Republic of	1 November 1990		
Kuwait	20 April 1985	20 April 1995	-
Kyrgyzstan	12 January 1989	25 March 1999	-
Lao People's Dem. Rep.	1 March 1985 (P)	1 March 1995	-
Lebanon	-	-	(...)
Malaysia	14 August 1991	-	5 July 2000
Maldives	25-28 March 1985	25 March 1995	31 Mar.-7 Apr. 2000

Countries or areas	1990 Round of censuses 1985-1994	2000 Round of censuses	
		1995-1999	2000-2004
Maldives	8 March 1990		
Mongolia	5 January 1989	-	5-11 January 2000
Myanmar	-	-	2004
Nepal	22 June 1991	-	22 June 2001
Occupied Palestinian Territory	-	9 December 1997	-
Oman	1 December 1993	-	December 2003(P)
Pakistan	-	2-18 March 1998	-
Philippines	1 May 1990	1 September 1995	1 May 2000
Qatar	16 March 1986	March 1997	-
Saudi Arabia	27 September 1992	-	2004
Singapore	30 June 1990	-	30 June 2000
Sri Lanka	-	-	17 July 2001
Syrian Arab Rep.	3-9 September 1994	-	2004
Tajikistan	12 January 1989	-	January 2000
Thailand	1 April 1990	-	1 April 2000
Timor-East	31 October 1990 (P)	-	2000
Turkey	20 October 1985	October 1997(H)	20 October 2000(P)
Turkey	21 October 1990		
Turkmenistan	12 January 1989	10 January 1995	January 2004
United Arab Emirates	17-23 December 1985	17 December 1995	2005
Uzbekistan	12 January 1989	-	2001
Viet Nam	1 April 1989	1 April 1999	-
Yemen	1-18 February 1986 (6)	-	2004
Yemen	29-30 March 1988 (7)		
Yemen	16-17 December 1994		
EUROPE			
Albania	12 April 1989	-	1 April 2001
Andorra (4)	-	-	-
Austria	15 May 1991	-	15 May 2001
Belarus	12 January 1989	14 February 1999	-
Belgium	1 March 1991	-	1 October 2001
Bosnia Herzegovina	31 March 1991	-	-
Bulgaria	4 December 1985	4 December 1992	1 March 2001
Channel Islands	23 March 1986 (P)	10 March 1996	29 April 2001
Channel Islands	10 March 1991		

Countries or areas	1990 Round of censuses	2000 Round of censuses	
	1985-1994	1995-1999	2000-2004
Croatia	31 March 1991	-	31 March 2001
Czech Republic	3 March 1991	-	1 March 2001
Denmark (4)	1 January 1991	-	1 January 2001
Estonia	12 January 1989	-	31 March 2000
Faeroe Islands (4)	-	-	-
Finland	17 November 1985	31 December 1995	31 December 2000
Finland	31 December 1990		
France	5 March 1990	8 March 1999	-
Germany (8)	25 May 1987 (9)	30 September 1995(H)	5 December 2000 (test)
Gibraltar	14 October 1991	-	(...)
Greece	17 March 1991	-	18 March 2001
Hungary	1 January 1990	-	1 February 2001
Iceland (4)	-	-	-
Ireland	13 April 1986 (P)	28 April 1996	28 April 2002
Ireland	21 April 1991		
Isle of Man	6-7 April 1986	14 April 1996	2001
Isle of Man	14 April 1991	-	
Italy	20 October 1991	-	21 October 2001
Latvia	12 January 1989		31 March 2000
Liechtenstein	4 December 1990	-	5 December 2000
Lithuania	12 January 1989	-	6 April 2001
Luxembourg	1 March 1991	-	15 February 2001
Malta	16 November 1985	26 November 1995	-
Monaco (4)	23 July 1990	-	2000
Netherlands	1 January 1991	-	January 2001
Norway	3 November 1990	-	3 November 2001
Poland	6 December 1988	-	21 May 2002
Portugal	15 April 1991	-	12 March 2001
Republic of Moldova	12 January 1989	-	October 2002
Romania	7 January 1992	-	18 March 2002
Russian Federation	12 January 1989	-	October 2002
San Marino (4)	-	-	-
Slovakia	3 March 1991	-	26 May 2001
Slovenia	31 March 1991	-	31 March 2002
Spain	1 March 1991	-	1 October 2001

Countries or areas	1990 Round of censuses 1985-1994	2000 Round of censuses	
		1995-1999	2000-2004
Svalbard and Jan Mayen Islands	-	-	-
Sweden	1 November 1985	-	-
Sweden	1 November 1990	-	-
Switzerland	4 December 1990	-	5 December 2000
Former Yugoslav Rep. of Macedonia	31 March 1991	-	31 October 2002
Former Yugoslav Rep. of Macedonia	20 June 1994		
Ukraine	12 January 1989	-	5 December 2001
United Kingdom	21 April 1991	-	29 April 2001
Serbia*-Montenegro**	31 March 1991	-	*31 March 2002/ **31 October 2003
OCEANIA			
American Samoa	1 April 1990	-	April 2000
Australia	30 June 1986	9 August 1996	7 August 2001
Australia	30 June 1991		
Cook Islands	1 December 1986	1 December 1996	December 2001
Cook Islands	1 December 1991		
Fiji	31 August 1986	25 August 1996	-
French Polynesia	6 September 1988	3 September 1996	(...)
Guam	1 April 1990	-	1 April 2000
Kiribati	10 May 1985	7 November 1995	November 2000
Kiribati	7 November 1990		
Marshall Islands	13 November 1988	1 June 1999	-
Micronesia, Federated States of	1985 -1989	-	1 April 2000
Micronesia, Federated States of	18 September 1994		
Nauru	17 April 1992	-	2001
New Caledonia	4 April 1989	16 April 1996	2003
New Zealand	4 March 1986	5 March 1996	6 March 2001
New Zealand	5 March 1991		
Niue	29 September 1986	17 August 1997(10)	(...)
Niue	3 November 1991		
Norfolk Island	30 June 1986	30 June 1996	2001
Norfolk Island	2 August 1991		
Northern Marianas	1 April 1990	9 September 1995	1 April 2000

Countries or areas	1990 Round of censuses 1985-1994	2000 Round of censuses 1995-1999	2000 Round of censuses 2000-2004
Islands			
Palau	Jan.-Mar. 1986	9 September 1995	15 April 2000
Palau	1 April 1990		
Papua New Guinea	11 July 1990	-	9 July 2000
Pitcairn (11)	1991 (P)	-	-
Samoa	3-4 November 1986	-	November 2001
Samoa	5 November 1991		
Solomon Islands	23 November 1986	November 1999	-
Tokelau	1986	-	(...)
Tokelau	11 December 1991		
Tonga	28 November 1986	30 November 1996	-
Tuvalu	June 1985 (P)	-	November 2002
Tuvalu	17 November 1991		
Vanuatu	20 January 1986 (P)	16-30 November 1999	-
Vanuatu	16 May 1989		
Wallis and Futuna Islands	11 December 1990 (P)	3 October 1996	2003

Foot notes	
(P)	Population census only.
(H)	Housing census only.
(1)	Urban census only.
(2)	Enumeration of settled population was in November 1986 and of nomads in February 1987.
(3)	Based on administrative records.
(4)	Population figures were compiled from population registers.
(5)	The population By-Census was based on one-in-seven sample of the population.
(6)	Enumeration of former Yemen Arab Republic.
(7)	Enumeration of former Democratic Yemen.
(8)	Through accession of the German Democratic Republic with effect from 3 October 1990, the two German States have united to form one sovereign State. As from the date of unification, the Federal Republic of Germany acts in the United Nations under the designation 'Germany'.
(9)	Enumeration of former Federal Republic of Germany.
(10)	Combined with agricultural census.
(11)	No formal census conducted. A count of numbers of each family group by name, sex, age and whether permanent or expatriate resident is made on 30 or 31 December each year.
Note	The designations used and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or its authorities, or

	concerning the delimitation of its frontiers or boundaries. The term country as used in this publication also refers, as appropriate, to territories or areas.
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Source: **http://unstats.un.org/unsd/demographic/census/cendate/index.htm**

Annex 3

Country reports for the Western Balkans

ALBANIA

Introduction

Population censuses were being taken in Albania at the time of the Ottoman Empire in the 15th century. Following the country's independence, ten censuses were conducted between 1923 and 1989, most being conducted after the Second World War; the latter was taken with UNFPA support. The 2001 Population and Housing Census is the first carried out in the new political and social context of Albania in the nineties, where many un-recorded people are moving from rural areas to cities and from the country abroad, resulting in the consequent lack of reliable statistics. No modern and up-to date registers are available in the country. Civil registration of live births and deaths is not completely applied. Recent annual population estimates were based on the latest UN population projections.

In this situation only a country-wide survey, taken as a census, could provide a satisfactory view of the size, structure, spatial distribution and socio-economic profile of the Albanian population, which is fundamental to further statistical activities (such as sample surveys) and for implementing development policies. At the end of 1998, with this objective, INSTAT[49] concentrated support from several donors – the European Commission, the Council of Europe and the governments of Greece, Italy and Switzerland - towards this aim. A **multi-donor project** was so launched, with the objective of the conducting a population and housing census, the wider objective being that of enabling INSTAT to handle all phases of future population censuses and other statistical surveys, ensuring the development of a master sampling frame and the basic infrastructure of the whole statistical system. An *Advisory and Co-ordination Committee of Donors* (ACCD) was also established having full responsibility for the timely provision of financial and technical assistance needed at the different phases of implementation.

Legislation

Preparation for the legislative basis of the Census started in 1999. This was accomplished in connection with the existing Statistical Law dated 16 March 1993 (No. 7687) and largely used internal and external consultations. The Census Law (No. 8669) was adopted by Parliament on 26 October 2000.

The Census Law made provisions for planning the instruments and means to conduct the census, including organisational structure, central and local commissions, reference date, duration of field survey, and related bylaws, it also aims to contribute to the institutional building of the country. In fact the law states that census results may be used to modernise the national administrative system, such as the establishment of electoral lists and the improvement of the civil registration system. This objective is also reflected in the set of census questionnaires.

[49] The National Statistical Institute of Albania founded in 1993.

ALBANIA

Preparatory phases

Apart from legislative aspects, preparatory phases effectively began at the beginning of 2000. As the operative unit coordinating the project, INSTAT set up and established a Census Implementation Unit (CIU) in separate premises, with a Census Manager and four dependent departments.

A **Pre-test** and a **Pilot Survey** were conducted on samples of 300 and 3 000 households respectively about one year and 6 months before the census date. These surveys were used to assess the questionnaires and instruction book. Questions considered optional under the international requirements – such as income, ethnicity and religion of respondents – were excluded after careful evaluation. Enumeration Areas for the Pilot Survey were selected in such a way as to duly represent the application of different enumeration methods and regions that suffered from departure of the population or massive settlement of newcomers.

As a particular objective of data collection, in order to (partially) evaluate emigration out of the country, basic information was requested of each household on members who were abroad for more than one year. This was part of a *household member's summary questionnaire*, purposely designed for possible further use of data.

Determination of the **Enumeration Areas** (EA), one of the crucial pre-census activities, was challenging. This was because of the unavailability of documentation from the previous census, lack of maps, new administrative boundaries and denominations, and mostly the recent population movements and uncontrolled settlement around the main cities. Finally, after evaluation of different options, budget and time constraints, activities were based on:

- maps and lists of households for city blocks in the urban areas;
- lists of heads of households for rural areas.

More than 3 500 persons worked at the central and local level, for periods from three to nine months depending on the task, so as to elaborate tools for the cities and update the household lists made available from the 1998 Agricultural Census. Among other aspects, it was extremely complicated to deal with the hundreds of names of heads of household in urban areas as well as determine the borders between the cities and nearby villages in the recently urbanised areas. Finally the EAs amounted to approximately 10 000, each including from 80 to 120 households.

Considerable effort was made to address procurement and equipment (including the means of dealing with the winter electricity shortage) for the premises to store questionnaires and carry out data entry. The premises for data entry were found rather late and required significant reconstruction, causing delays between the end of data collection and the start of data entry.

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Publicity and information

Preparation of public awareness and the information campaign began only a few months before the Census, thus activities were mostly concentrated in the last month and during enumeration. Campaign was based on advertising (TV and radio spots, posters and leaflets in public institutions and main streets) and information events on the objectives and methods of the Census (TV broadcasts, a videotape, which also was used for training purposes, press conferences and articles). The younger student population was reached through specific publicity material including gadgets. Finally the budget share devoted to publicity should amount to just over 1% of total project cost.

The Census took place many years after the preceding, in a totally changed environment, and obtaining population consent was essential. As indicated by the positive reaction from respondents to the enumeration, it seems this objective has been adequately achieved. Special credit for this should be given to the TV messages.

The census related publicity campaign also helped promote the presence and duties of INSTAT throughout the country.

Field operations

Despite difficulties with census geography and delays encountered in printing and dispatching census material within the country, it was feasible to respect the planned date. Starting from 1st April 2001 some 12 500 people - supervisors, controllers and enumerators - conducted the field work. Data collection was carried out by enumerators through interviews and *control lists*, the auxiliary forms intended to monitor work, summarise results and later issue preliminary results.

INSTAT permanently monitored the work through the CIU and its 36 regional offices and sent personnel from headquarters to each district. This allowed for a better understanding of the ongoing process and the sharing of experience. Difficulties at this phase arose out of the country's poor infrastructure and from refusals of enumerators to perform the work, especially in some areas surrounding the city of Tirana.

However the main problem arose from part of the Greek minority in the south who temporarily refused to participate in the Census because the question regarding ethnicity was not asked. This was a limited phenomenon, and there was more often a delay in providing questionnaires to local authorities. Anyway, in the end the organisation leading the boycott accepted the Census.

At the beginning of field operations INSTAT benefited from the support of international specialists sent by the ACCD. The experts recognised difficulties related to the preparation and implementation phases, but gave a positive overall impression on conduction of the project.

Data collection was completed after a maximum of three weeks in about 90% of the country, and ended a few days later in the remaining areas – Tirana, some rural areas in the south and the district of Kukes.

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Quality issues

To ensure quality, methods used included the way the questionnaire was designed (with easy to understand clearly stated questions), consistency checks were made of the data entry software and field visits were conducted by INSTAT experts a few weeks after enumeration, especially in the most delicate EAs on the Tirana's border. In fact, post-enumeration surveys were not planned because of budget constraints.

Final data quality was evaluated as fairly good despite the finding of some classical effects. In general, a positive sign was the satisfactory agreement between preliminary and final results. The good coverage of Tirana was more recently confirmed by the establishment of a GIS for the city. About 3.1 million inhabitants enumerated by the Census is, however, less than that for all population estimates worked out for Albania for that time. Reasons for this difference may be related more to data used for estimates (live births, deaths, migration) than to an undercount of the population by the Census.

Data processing

Advanced software for assisted data entry was developed in Visual Basic. The system, which resulted in a SQL Server database, was based on the following main features:

- set of masks reproducing the census questionnaires on screen (*building, dwelling, household, household members summary, individual sheets*);
- checking the respecting of consistency rules, such as out of range values;
- linkages and cross-checking between questionnaires, with the possibility of re-entering data in case of inconsistencies between answers;
- automatic coding for selected variables (with the exclusion of classifications ISCO and NACE which were developed "a posteriori");
- follow-up of the operational flow of data entry organisation and evaluation of the operators' performance.

While data entry of *control lists* was carried out at INSTAT headquarters, final data entry was executed in more adequate premises definitively set-up for this purpose only seven months after enumeration. Equipment included UPS and generators used to support the system during power cuts, that occur often during the winter. About 300 operators, supervisors and archivists were organised into two shifts. Entering the questionnaires and solving of any resulting quantitative and qualitative differences (such as, individual records temporarily unassigned to a household because of the mismatching of identifier keys or inconsistencies between data from different sheets of the same questionnaire) took about six months - until the end of April 2002.

Checking and correction of data entry results occurred in May and June 2002. The most delicate point was correction of household composition, which mostly resulted from misunderstanding of the relationship code for each member and the household's reference person or from missing data. Many errors/limits were progressively solved deterministically, however the most complex cases (about 13 000 out of 727 000) required more time-consuming manual editing. Errors in individual records were afterwards detected and edited through the application of CONCORD, a product

developed by ISTAT (Italy) for the deterministic correction of systematic errors and the probabilistic correction of casual errors in survey results. Building and dwelling data were checked and corrected using deterministic rules.

Data dissemination

Preliminary data from the Census were issued three months after enumeration (July 2001) through a paper publication and a press release. About one year later a draft version of the tabulation program, containing results at the district level and further tables for Tirana's 11 mini-municipalities were prepared for the first publication, a descriptive analysis of results published for the end of 2002. The publication with the main tabulation program is expected soon after; further publications including detailed analysis on selected topics will follow in 2003 and 2004.

At the beginning of 2002 a specific **post-census cartographic module** was launched for the dissemination of data: the digitalisation of Albania (at level of prefectures, districts, communes and villages) and the EAs for the city of Tirana, the creation of a WGS84 (GPS coordinate system) GIS-georeferenced environment and the linkage to census results were achieved.

Proposals are under discussion to set-up a database, starting with the census database, to facilitate the production and management of population and social statistics at INSTAT.

Costs

Costs may only be estimated as the project is still ongoing. Basing indications mainly on the provisional budget, the planned total amount of about € 7 million, mostly from international donors, may be split as follows:

- 32% for preparation, overall management and all international expertise,
- 46% for enumeration (mainly temporary workers, census material and logistics),
- 14% for data entry and processing, and
- 8% for publication, analysis and dissemination of results.

The share of costs for material, equipment and facilities should represent overall about 33% of the total budget. While for preparation, census management and enumeration this portion represents about 1/4, for data processing and dissemination it should come to 53 and 72% respectively. For a correct evaluation of this information, it serves to note that labour costs in Albania are relatively much lower than material or equipment, which are often bought abroad.

Conclusion and future plans

Despite some difficulties in the preparatory phase and some burdensome procedures in the disbursement of funds from donors, the Census started on time and seems not to have been unduly influenced by poor infrastructure, the boycott, the delay in starting data entry, etc.

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However, the role of the international contribution was fundamental. In this context, the success of the project depended more on human resources and their firm engagement. After the Agricultural Census, taken three year before, INSTAT and Albania may now build on this experience and its results and move towards further development and new goals. For the present, the conduction of another traditional census in ten years time seems the most appropriate course of action.

This country report is a revised version of the description presented in 'The implementation of the 2001 Population and Housing Census in Albania. Main lessons from a international co-operation experience' (Milva Ekonomi, Giambattista Cantisani and Michelle Jouvenal, Joint UNECE-Eurostat Work Session on Population and Housing Censuses. Ohrid, The former Yugoslav Republic of Macedonia, 21-23 May 2003).

CROATIA

Introduction

Population censuses in Croatia were undertaken in 1921, 1931 and, following the constitution of RSF of Yugoslavia, in 1948, 1953, 1961, 1971, 1981 and 1991, with 31 March as reference date from 1953 on.

Midnight of the same 31 March was afterwards considered as reference date for the 2001 Census of Population, Households and Dwellings, which was the first for the Republic of Croatia established after the Yugoslavian crisis. The census was based on a traditional method of enumeration through interviews based on a personal questionnaire and a questionnaire for dwellings and households. Based on previous experience, several changes were introduced mostly related to the content of questionnaires for enumeration and the data capture process. Administrative population registers were not used, however, as in the 1991 Census, an individual's personal identification number[50] was recorded. In line with international recommendations, the 2001 Census also covered institutional households.

The Central Bureau of Statistics (CBS) organised the Census. The project was also supported by the Ministry of the Interior, the Ministry of Defence, the Ministry of Justice, Public Administration and Local Self-Government and the Ministry of Foreign Affairs, each enumerated selected persons in institutions or facilities under their control (prisons, barracks, embassies, etc.).

Legislation

The *Law on Territories of Counties, Towns and Municipalities* (*Narodne novine*, official gazette of the Republic of Croatia, No. 90/92) established 21 counties, 70 towns and 419 municipalities, with the City of Zagreb as a separate territorial and administrative unit. Since 1992 the number of territorial units has changed frequently. During the 2001 Census there were 20 counties, the City of Zagreb, 122 towns and 423 municipalities. All census results refer to this territorial constitution.

The 2001 Census was carried out on the basis of the *Law on the Census of Population, Households and Dwellings 2001* adopted by the House of Representatives of the Croatian National Parliament in July 2000 (No. 64/2000). In addition, the Act on Amendments to that law (No. 22/2001) had to be considered.

Based on the Census Law, the following enumeration units were:
citizens of the Republic of Croatia, foreign citizens and persons without citizenship who were usual residents in the country, irrespective of whether, at reference date, they were present or were abroad as well as persons who, at reference date, were temporarily present;
households of persons;
dwellings and other uninhabited premises.

[50] JMBG in Croatian.

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The Law stated the obligation of respondents was to "give accurate and full answers to all the questions in the census questionnaires". Exceptions were to questions on national and religious affiliation, which respondents were not obliged to answer. The legal regulation on this right was printed on the individual questionnaire. In addition, the enumerators were obliged to indicate this right and to record the exact answers as provided by the respondents, putting down "The person did not want to answer" if the person did not want to answer any or both of these questions.

The questionnaire was not available in minority languages but the enumerator was obliged to advise representatives of national minorities on their right to review specimens of the basic questionnaires in the language and script of his/her minority.

Confidentiality issues

Enumerators were obliged by the census law to respect the secrecy of all data collected from individuals regarding their personal, family and property conditions.

Census results should be used for statistical purposes only. Exceptionally, particular data on individuals (name and surname, identification number, place of birth and address) may be used to enter or update existing registers of inhabitants in the counties and the City of Zagreb. On the other hand, individual data on households having land and/or livestock at their disposal or engaged in agricultural production in the reference period[51] shall be used to establish an address list of agricultural households, which will be useful in undertaking an agricultural census. The Government of the Republic of Croatia shall make a decision on making selected census data available for other purposes based on the judgment of the CBS.

The law established the destruction of enumeration material following data capture and control and the CBS responsibility to define and apply measures for data protection during the work and access to the census database.

Topics of enumeration

In previous censuses the count referred to the **permanent population**, that is, the population having its usual residence in the territory of the Republic of Croatia, irrespective of whether persons were present or, for one reason or another, absent at the census moment. Starting from 2001 the new definition of **usual resident population** was applied, based on the most recent UN recommendations and its criterion of the *'place of usual residence'* with the time limit of absence up to 12 months. This means that the total population will exclude:

- persons absent from the country for a year or longer, although their usual place of residence is in the country;
- persons temporarily present in the country for less than a year.

[51] Name and surname of a reference person of the household, address, total and agricultural surface area of available land, agricultural production by types of cultivated products, data on livestock, poultry and beehives.

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New questions or alternative possibilities for responses were included in the 2001 Census. As a consequence of the events of war, the reasons for absence/presence were extended from two to four categories (the former 'in the country' and 'abroad' plus 'displaced person' and 'refugee'[52]). The first (preliminary) results presented displaced persons as residents of the place of the Census, while final results included them in the total usual resident population of the place of usual residence.

Apart from the concept of usual residence many other new questions were inserted, such as the time of absence/presence (up to one month, month, year), the place of usual residence of mother at the time of the individual's birth, reason for immigration, usual weekly working hours, information on unemployment as well as information on disability, cause of disability[53] and physical state of a person[54].

In addition, the available area of the household's land, type of heating and type of energy used for heating were added to the dwelling and household questionnaire.

In comparison to the 1991 Census, when a whole page of the household questionnaire was devoted to the agricultural situation, the last survey included only three questions (see above) because of plans to organise an agricultural census.

Preparatory phases

The CBS issued the methodology, defined the contents and designed the basic census questionnaires as well as accompanying control forms and the publishing programme for the results. The questionnaires were based on the UN recommendations on census aiming to facilitate the international comparability of data.

The census questionnaires were printed in Croatian and using Latin script using a technique adjusted for optical reading on a computer medium. Responses were, in fact, to be provided in the Croatian language, using Latin script.

The enumeration structure was based on counties, towns and enumeration centres, and Enumeration Districts (ED). The following staff were appointed to ensure correct implementation of the methodology:

- **Co-ordinators**, engaged in the work of county commissions and the Commission of the City of Zagreb;
- **Instructors**, engaged in the work of branch offices of commissions in towns;

[52] The answer 'displaced person' referred to every person who was absent from his/her place of usual residence, but was present, at the census moment, in another settlement in the Republic of Croatia. The reason for absence or temporary presence of those persons from the place of usual residence was exiled due to the war, that is, such a person had the status of displaced person. The answer 'refugee' as a reason of presence referred to all persons who, due to the war, left their places of usual residence outside the Republic of Croatia and were temporarily present at the census moment in the place of the census, providing that they had refugee status in the Republic of Croatia.

[53] 'From birth, Second World War and its consequences', 'war for independence and its consequences', 'work-disabled', 'sickness', 'traffic accident', 'other'.

[54] 'Completely mobile', 'permanently limited mobility aided by a walking stick, crutches or walking frame', 'permanently limited mobility aided by a wheelchair', 'permanently immobile'.

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- **Controllers**, who operated in enumeration centres, on the proposal of the Commission and by the consent of the co-ordinator competent for that area;
- **Enumerators**, responsible for the interviews.

The technical documentation for the field work consisting of plans of ED (forms PK). ED data and review maps were prepared by the State Geodetic Directorate through its cadastral branch offices and cadastral management body of the City of Zagreb. The technical documentation was prepared for land units based on the situation as of 31 December 2000. The State Geodetic Directorate was obliged by the Census Law to submit review maps to the CBS by 15 January 2001.

Publicity

CBS informed people (by means of TV, newspapers, radio, and the Internet) of the aim, significance and contents of the Census. However, the information was released only one month before the census date because the Government decided at the last moment that the Census would take place in 2001. Most attention was given in newspapers and on television to questions concerning religion and ethnicity. Though in TV commercials on the census the population was informed frequently that it was not necessary to respond to these questions.

Field operations

Branch offices of the county commissions organised training of controllers and enumerators for its area, supervised the work of the enumeration centres, supervised the control of the census material received from enumerators in the enumeration centres and returned them, if necessary, to enumerators for supplement and correction.

Enumeration was carried out from 1 until 15 April 2001. Immediately following a Post-Enumeration Survey was conducted on a representative sample of EDs to evaluate both coverage and quality of data.

Data processing

The data was red by IBM system for optical reading and recognised by IFP (Intelligent Forms Processing). The main enumeration questionnaires were scanned using KODAK 3520DP scanners.

German CGK Recostar software was used for sign recognition (Croatian Latin script). After the sign identification the forms were made in ASCII format. Some descriptive answers (for example questions about language, nationality, religion, activity...) had to be coded and for that is used the Canadian statistical software ACTR ("automated coding by character recognition").

After that the data was exported in Microsoft SQL database and then there was some additional processing that included control of contingents, corrections etc. using the SQL and applications created in Visual Basics.

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When the data was ready for publishing, tables were made by using the SAS programme. In the same time, using the same programme (SAS), the graphical presentation was made, all the tables were created in English and Croatian.

Data dissemination

First (i.e. preliminary) results on the total number of population, households and dwellings based on the enumeration control forms) were published a couple of months after the enumeration, final results about one year later. The main difference with these results is related to displaced persons. In the first results they were considered resident in the place of enumeration, and in the final results in the place of their usual residence.

A large set of tables, by territorial unit, were published on the CBS Internet site. The broader data are in Croatian and English, and include methodological information, questionnaires and the Census Law.

Costs

Funds for the preparation, organisation and conduction of the Census and for processing and publishing of data were covered by the State Budget for the years 2000, 2001 and 2002. Total funds shall amount to 192 million Kuna (€ 2 630 thousand).

Conclusion

As stated above in the 2001 Census most attention was placed on questions concerning ethnicity and religion. Although it was clearly stated in the census forms that individuals did not have to respond to these questions. However it may be concluded that Croatian laws are contradictory because, at the same time, the number of minority representatives in Parliament depends on their relative proportion to the total population.

The main complaint came from the Serbian minority, and was related to the new definition of usual resident population. This was because a large number of this minority were absent from Croatia as refugees during the 1991-1995 war and were not included in the total population. Based on the final data, Serbs were 4% of the total population compared to 12% for the 1991 Census. This result provoked suspicion of reliability. Serbian representatives stated that the Census should be repeated in the presence of international observers.

In the accompanying census form on households of married women and widows, it was required that the name of the husband be entered – which caused protests to be made by feminist associations.

This country report is mainly based on a document prepared by Ms Snjezana Mrdjen, Department of Geography, Faculty of Philosophy, Zadar, for the purposes of this project.

SERBIA-MONTENEGRO*

Introduction

In the present-day Serbia-Montenegro the taking of a population census goes back to 1834, when the first census was taken in the Principality of Serbia. In the period up to the outbreak of the First World War 16 censuses were taken[55]. After the formation of the new, common state (the Kingdom of Serbs, Croats and Slovenes, later the Kingdom of Yugoslavia), during the inter-war period, two censuses were taken in 1921 and 1931, while the 1941 census was not conducted because of the outbreak of the Second World War. After the end of the war an extraordinary census was organised in 1948, followed by another in 1953, which had the character of a regular census. Since 1961 a census has been taken regularly every ten years until 1991.

After the collapse of the former Yugoslavia, the first census was planned for April 2001 in the Federal Republic of Yugoslavia, today Serbia-Montenegro. However, it was postponed for financial reasons for one year. There was another postponement of one year, for other reasons, in Montenegro which meant that for the first time the survey was not taken simultaneously throughout the entire territory, but as follows:

- only in Central Serbia and Vojvodina the census was taken as of 31 March 2002 at 24:00;
- in Kosovo and Metohija, the census was postponed for the period following the temporary administration of the United Nations Mission in Kosovo (UNMIK), as stipulated by Article 15 of the Republic of Serbia Census Law;
- in Montenegro, the census date is set for the 31 March 2003.

Despite the similar methodology applied and because of the different survey timetables for the national entities the following description refers to Central Serbia and Vojvodina (hereinafter called Serbia or Republic of Serbia) where the Census has been conducted[56]. In addition specific information is provided on Montenegro.

As a result of the country's federal structure, three different statistical entities should be introduced:

- the Federal Statistical Office of Yugoslavia (FSOY)
- the Statistical Office of the Republic of Serbia (SORS)
- the Statistical Office of the Republic of Montenegro (SORM)

* This report concerns only Serbia, Montenegro plans to carry out the census in 2003 applying the same questionnaire as well as methodology.

[55] In this period a census was undertaken in the following years: in 1834, 1841, 1843, 1846, 1850, 1854, 1859, 1863, 1866, 1874, 1884, 1890, 1895, 1900, 1905 and 1910.

[56] Because of the exclusion of Kosovo and Metohija, the 2002 Census in the Republic of Serbia covered about 88% of territory, 76% of localities and about 80% of the 1991 Census total population.

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Legislation

As a rule, a census is taken every ten years (in the first year of each new decade). Census taking is governed by the relevant federal and republican laws.

Under the Federal Law on the Census of Population, Households and Dwellings (Sluzbeni list SR Jugoslavije, No. 74/1999 and No. 21/2001), FSOY prescribes the census methods and contents of the tables and coordinates and supervises census taking. According to the two republican laws – the Law No. 12/2000 for the Republic of Serbia and the Law No. 01-2915/2 and its two amendments for the Republic of Montenegro – the project is prepared, organised and conducted by the republics' statistical offices in the respective territories.

According to the law, census data can be used exclusively for statistical purposes. Neither enumerators nor other participants in the survey are allowed to disclose data gathered from persons and households.

The completion of the project is linked to 31 December 2004, when the publication of the last tables containing the final census results is expected or, in other words, to March 2005, when the final census report must be submitted to the Parliaments (of the Republic of Serbia and the FR of Yugoslavia) by SORS and FSOY. The same applies to Montenegro one year later.

Registers

There are no centralised population and administrative registers in Serbia-Montenegro. During the 1980s, the system of unique personal identification numbers (PIN) was introduced. However, in some parts of the country (i.e. regions where ethnic Albanians constitute the majority population), a large number of inhabitants have no identity papers and, thus, no PIN.

Preparatory phases and questionnaires

Preparations for the Census began in 1998 and were linked to the conference entitled 'Population, Household and Housing Census 2001', which was attended by statistical offices' experts and researchers from the universities and research institutes (demographers, sociologists, geographers, etc.).

Four questionnaires (P-1 to P-4) and two ancillary forms (P-1/IN and PL) were prepared and used:

- Form P-1 was the basic individual questionnaire for the enumeration of citizens, foreign citizens and stateless permanently residing in the country, regardless of their presence at census date, as well as all refugees from former Yugoslavia and internally displaced persons (IDP) from Kosovo and Metohija, regardless of whether they had acquired the citizenship or not;
- Form P-1/IN was an ancillary form designed for citizens temporarily employed abroad and their family members;

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- Form PL designed for persons employed in the country;
- Form P-2 for households and housing units;
- Form P-3 for collective households;
- Form P-4 served as a control form for enumeration districts.

Different to previous experiences, many adjustments were made to UNECE/Eurostat international recommendations for the censuses to be taken around the year 2000. This refers specifically to the concept of resident population (as opposed to earlier censuses, when the de jure concept was adopted; the total population obtained by the 2002 Census is based on the *de facto* concept). Questions on religion and ethnic affiliation were not compulsory, based on Article 45 of the Constitution.

The greatest departure from the recommendations was made concerning the enumeration of households in possession of land or those engaged in agricultural production; not stipulated by international recommendations. However, in contrast to earlier censuses, the number of questions on agricultural holdings and production were significantly reduced.

Since 1991, there has been extensive (re)construction throughout the territory. However, the process of updating statistical area boundaries based on the Cadastre of Communes was slow and incomplete. Later the FSOY Information Technology Centre used the settlement database derived from the 1981 and 1991 censuses. The new census provided an impetus to the efforts to revise the entire census territory and establish continuous settlement statistics. FSOY established a Census Working Group and GIS specialist post and in co-operation with other national authorities and private companies proceeded to update the address register (streets and building numbers), to verify the existing statistical area boundaries and their descriptions, to divide each statistical area into enumeration districts and to produce relative maps[57]. Finally boundaries were allocated to 7 393 settlements and 210 communes were established with a detailed mapping system at the city level. The maps were prepared in a digital format linked to settlement codes. For specified regions (e.g.: Belgrade Urban Area), GIS tools were applied to enumeration districts.

Staff training began in 1999. Otherwise, the training of census enumerators, trainers and inspectors directly involved in the census process lasted three days each. The 2000 Pilot Survey was not based on a representative sample.

Preparatory work in Montenegro is proceeding well. Thanks to the implementation of a PHARE project, started in April 2002, SORM is receiving technical assistance from international experts. This opportunity is mainly targeting census geography and data processing.

[57] In the Republic of Serbia, the Geode Office is responsible for updating mapping, while in the Republic of Montenegro the Land Use Office is preparing to adopt remote sensing techniques for this purpose.

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Publicity and information

Just before the census, as well as during, messages were placed in the media TV and newspapers, concerning the census. The importance of the census was stressed and the population was invited to take an active part. Modern advertising methods were used, including billboards in five languages, and press conferences were held at statistical offices (SORS and FSOY) where representatives from the media were supplied with more detailed information. The same information was provided over the Internet on the FSOY website, in Serbian and English. Generally, the public was well informed of the organisation and relevance of the census. The public displayed a significant interest in this major statistical undertaking.

In Montenegro, publicity activities are being prepared under broader procedures to increase visibility of the SORM and its activities. Design of a logo and the creation of the Internet site are part of this objective.

Field operations

The census questionnaires were completed by the enumerators through interviews based on the response of each inhabitant or other member of the household in the name of those absent. Only persons temporarily employed abroad, soldiers and prisoners were exempted, as they were able to personally fill in the form and return it via mail (or the Internet for persons temporarily abroad). In addition, ancillary forms for employed respondents were completed at their work place and collected by enumerators visiting their households.

Field operations were undertaken from 1 to 15 April 2002, except for the communes of Bujanovac, Presevo and Medvedja where they continued until 25 April (only for IDPs from these communes located in Kosovo and Metohija). A large number of ethnic Albanians (about 90%) in the three above-mentioned communes had no PIN, thus making checking more difficult.

Data quality control was performed on the basis of 0.5% of the sample.

Data processing

Data entry was carried out manually. Because of the lack of financial resources, optical reading was not possible (in contrast to the 1991 Census). Logical control and coding were applied. SORS and FSOY used their own software programs, and no other software program currently available on the market was used.

The exploitation of data will be total. One result of the census means a database exists covering the entire population to the settlement level. At the communal level, databases exist covering occupation, activity and education. Only partial use of GIS applications is planned. Results will be disseminated in printed format, in almost 20 books containing the relevant regulations. The final results will be available on CD-ROM, as well as on the SORS and FSOY websites. All final results will be available by December 2004.

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In accordance with data protection measures individual data, such as name and surname of an individual, were not used but became anonymous data, absolutely protected from possible abuse.

Costs

The census in Serbia is financed solely from domestic financial sources, without any foreign aid. It was anticipated that the total costs should amount to about € 18 million – about 95% from the budget of the Republic of Serbia and the rest from the federal budget.

Of the total amount of these resources:

- 92% was earmarked for the SORS;
- 4.5% for the FSOY (for the costs of census taking as stipulated by the Federal Census Law), and
- 3.5% for the Republican Surveying Institute (for the costs of delimiting enumeration districts).

The Law stipulates that the funds for covering census costs should be allocated out of budgetary resources over four years (2001, 2002, 2003 and 2004). The breakdown of costs by main/special budget lines is not anticipated. However the responsible offices are obliged to submit the financial report to the Parliaments on budgetary resources and their use and on the task performed within the programme for that year by the end of next March.

The original amount of funds for Montenegro (as under the Census Law) is around € 2.7 million, 77% of which is to be disbursed in the calendar year and will include enumeration.

Conclusion and future plans

The 2002 census encountered numerous problems in the preliminary phases. This was a result of international sanctions against the country (lack of communication with international institutions and non-participation at international conferences organised for the 2000 census round under the auspices of UNECE and Eurostat). Because of the difficult economic situation, and the unavailability of international grants, available financial resources to cover census costs were relatively small, thus preventing the use of new technology.

Frequent political crises had an unfavourable effect on preparations for census taking and on the process itself. As mentioned above, the 2002 Census was the first census that was not taken throughout the entire territory. Moreover, it was not known if the census would be boycotted by the Albanian minority in southern Serbia until about ten days before enumeration. Some political parties used the census to promote their political views, which was in contravention of the law (i.e. direct political pressure relating to reporting of one's ethnic nationality, religion and mother tongue).

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Despite these limitations the first results showed that the census, where it was taken, achieved almost total success. A successful result is expected for the survey in Montenegro next year.

There is wide scope for direct application of census results because of their abundance. The results used for statistical purposes provide a basis for annual population estimates (there is no subsequent revision of earlier annual population estimates for the inter-censual period), as well as for population sampling for further surveys.

At the time it is not contemplated that census taking will be abandoned. Most likely the next regular census will be taken in 2011. In view of the fact that the country's international isolation is over, conditions have been created for a more intensive adjustment to international statistical standards. It is anticipated that there will be an increase in financial resources for statistical purposes. It is planned that a more intensive introduction of the population register and the application of new technology on a larger scale – especially GIS –will be implemented.

This country report is mainly based on a document prepared by Mr Goran Penev, Researcher, Demographic Research Centre, Belgrade, for the purposes of this project.

THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

Introduction

The first population counts in today's territory of the 'The former Yugoslav Republic of Macedonia' were carried out in the 15th century, when Turkish authorities only counted tax payers and the male population. There are Russian, French, Greek and other sources of data on population censuses in the 19th century. The first contemporary population census was conducted in 1921, and the next in 1931. After the Second World War, eight censuses were conducted in 1948 (15 March), 1953, 1961, 1971, 1981 and 1991 (31 March), 1994 (20 June) and 2002 (31 October).

Until 1991, the Federal Statistical Office of the Former Republic of Yugoslavia was in charge of preparing and carrying out the project. The statistical offices of the former Yugoslav republics took active part in the preparation of methodological census tools and each republic statistical office was responsible for carrying out the census in their own territories. The 1991 Census began within this framework; however, because of the country's dissolution and breaking apart, the republic statistical offices took over the completion of the project independently. As the 1991 Census coverage was incomplete another census was undertaken in 1994. This project was prepared within an extremely short period and was conducted with international financial and technical assistance and broad range monitoring [58].

All the most recent censuses were based on self-enumeration (1948 and 1953) or face-to-face interviews carried out by trained enumerators (from 1961 on). The 1948 Census aimed to count only the population, and data relating to only a few topics were gathered. The 1953 Census was broader, the enumeration paid more attention to biological, fertility and economic topics concerning the population in order to meet future development planning requirements. Since 1961 the contents of the census have been similar although their basic topics are being regularly extended.

The censuses in 1991 and 1994 comprised the enumeration of population, households (individual and collective), dwellings and individual agricultural holdings. The 2002 Census covered population, households (including some agricultural topics) and dwellings [59].

[58] The European Commission and the Council of Europe provided 1.6 million and 300 thousand ECU respectively. The Council of Europe appointed an Experts' Group including demographers and specialists in personal data protection. Forty observers from 19 European states were finally engaged throughout the country during field activities.

[59] Censuses of individual agricultural holdings, as a separate statistical survey, were already conducted in 1951, 1960 and 1969. Though, mostly for financial reasons, since 1981 basic data on agriculture have been gathered through the population censuses. Another separate survey is planned in 2003.

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The evolution of the population concept

The 1921 and 1931 surveys were based on the *de facto* population definition. All eight censuses carried out since 1948 used the *de jure* definition, with some differences.

In the censuses taken from 1948 to 1991 population data referred to the concept of *'permanent population'*, i.e. to all persons having their 'place of permanent residence' in the country irrespective of whether or not they were present in the country at the time of the census and, if not, of the length of their stay abroad.

In the 1994 and 2002 censuses population data referred to the concept of *'usually resident population'*: population included all persons with official (legal) place of residence (1994) respectively with usual place of residence (2002[60]) in 'The Former Yugoslav Republic of Macedonia', present in the country or absent abroad for less than one year, as well as persons granted residence permits staying in the country for more than one year. Persons having official (legal) place of residence in the country, but were absent abroad for more than one year, were enumerated in the 1994 Census but not included in the population count[61]. For the first time, since the 1971 Census, these individuals were not enumerated at all in the 2002 Census.

The organisation of the 2002 Census

The last census in 'The former Yugoslav Republic of Macedonia' was planned to be conducted on 31 March 2001, so as to return to a ten year periodicity. With adoption of the Law on the 2001 Census of Population, Households and Dwellings (cf. *'The Official Gazette of the Republic of Macedonia'* No. 16/2001), the Census was scheduled on the 14 of May 2001. Because of the political and security situation in certain parts of the country, started in March 2001, it was impossible to respect the legally scheduled date. Since then, the Census was postponed three times: to October 2001, to April 2002 and to November 2002. Finally, the survey was conducted from the 1 to the 15 of November 2002, with the reference date fixed at 24:00 hours on 31 October.

The preparation and conduction of the Census was under the responsibility of the State Statistical Office [62] (SSO) and the State Census Commission (SCC). The (Republic) SCC was created by the Census Law as the special body for organisational purposes and from the viewpoint of the importance of the project to the state.

[60] In the last census the official (legal) place of residence was also collected.
[61] The enumeration of these persons in 1994 was important, because their number explains the discrepancy between the 1994 total population and the previous census figures. This data was relevant to the analyses of international migrations, which had been based on low quality information arising from surveys based on administrative sources.
[62] The SSO was established on 1 June 1945. Among administration bodies, the Office is an expert and independent organisation in charge of carrying out some 290 (i.e. more than 70%) of all statistical surveys in the country. Its activity is based on the Law on State Statistics and a five year program.

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The project was carried out in the presence of an **International Census Observation and Mission** (ICOM [63]) organised by the European Union and the Council of Europe. Its objective, structure and principles are set out in the Memorandum of Understanding between the Government of 'The Former Yugoslav Republic of Macedonia' and international organisations. The general objective of the mission is to verify the fair and impartial enumeration and post-enumeration in accordance with international census and data protection standards. The mission aimed to evaluate the census methodology and advised on appropriate modifications that would contribute to the building of confidence in the Census, encourage the population's participation and lead to an accurate picture of the country's population and results that could be widely accepted.

Legislation

The first draft of the Census Law was prepared in the second half of 2000 and then sent for comments to all relevant national and international agencies and institutions. The procedure for adopting the Law began fairly late, instead of April; the start of the census was scheduled for May 2001. After the adoption on 20 February 2001, the law was changed three times – twice for the date, the third time for the date and methodological aspects[64]. The definitive law is very detailed, covering all relevant aspects: reference date and duration, enumeration units, topics of data collection, organisation and method of enumeration, selection of staff, necessary documents for enumeration, signature of respondents, use of data, data protection, funding, and international monitoring, etc.

Personal data collected through the census are confidential and are subject to protection based on the provisions of the Census Law, the Law of Personal Data Protection *('The Official Gazette of the Republic of Macedonia'* No. 12/1994) and the Law for State Statistics (No. 54/1997). Responsibilities regarding personal data protection apply to all persons taking part on any basis whatsoever in any census activities. Data collected in the census shall not be used to make decisions related to individuals and shall be used for statistical purposes only.

The same data may not be used to establish, maintain or update administrative registers. However, the Law foresees the use of census data to establish and update the statistical register. The *Unique Personal Number of the Citizens* was collected for this purpose.

Preparatory phases

Since 1995 SSO representatives have taken an active part in updating the UN Census Recommendation for the ECE Region. Initial preparations for the next census started after completion of the 1994 Census data processing in the second half of 1996.

Intensive preparations on census methodology and questionnaires began in 1998. Drafts were completed in accordance with international recommendations taking care to satisfy

[63] The ICOM is lead by a Steering Committee including representatives of Eurostat, the Council of Europe, UNECE and OSCE and made up of a high level expert group, some 50 observers from 26 European countries and IT-experts in charge of monitoring and assessing the various stages of the Census.
[64] cf. 'The Official Gazette of the Republic of Macedonia' No. 37/2001, 70/2001 and 43/2002.

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users' needs and to ensure comparability with previous censuses. Consultations with national and international counterparts provided a few minor suggestions on the formulation of the questions and questionnaire design.

The draft census methodology and the questionnaires were successfully tested in **two Census Tests** carried out in October 1999 and April 2000 on a random sample of respectively 420 and 1 550 households. Later, in June 2001 (with the third postponement of the census) methodological changes referring to the persons covered by the enumeration and the definition of total population were introduced.

Preparation of data processing took place at the beginning of 1999 after the definition of draft questionnaires. Programs for data capture and coding were self-developed by the SSO. During the Census Tests data were collected on paper questionnaires and on handheld computers. Despite the good results of data entry and simultaneous coding during field operations, the second solution was finally not implemented as the financial, organisational and logistical preconditions did not exist.

At the start of 2000 the updating of the statistical cadastre was started and the definition of the **7 712 Enumeration Districts (EDs)** – each one covering on average between 50 and 100 households, depending on the settlement type – **within the 39 Census Regions** – each one included one to nine municipalities, depending on the 1994 Census population and the geographical and infrastructure communications. Field activities and the necessary documentation (paper maps and descriptions) were completed by March 2001. Further updating and digital maps were completed only for two towns.

The Regional Census Commissions were set up in 2001. Because of parliamentarian elections, which took place on 15 September 2002, all other preparations for field organisation were carried out in the two months before the census date. The selection of the census participants took place in the first half of October, and their training took place over 3-5 days[65] in the second half.

A global plan of activities and the estimation of the necessary budget were completed in the summer of 2000. Later, the official plans and budget of the SCC were adopted in 2001 under the authorisation provided by the Census Law. These plans were updated with each postponement of the project.

Publicity and information

The SSO organised information activities and, for the first, time a paid publicity campaign to inform the entire population of the census and to encourage them to provide correct and complete answers to the enumerators. The motto of the campaign was: *'CONFIRM YOURSELF! FOR THE FUTURE OF YOUR COUNTRY'.*

[65] The duration of training was planned for five days. In some regions this was for three or four days because of the delay in selection of candidates. In these regions there was a second testing which prolonged the overall selection time.

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The public relations campaign included the following basic steps:

- dissemination of basic information material (pamphlets, brochures, placards, and billboards) in Macedonian and in the languages of the Albanian, Turkish, Vlach, Roma and Serbian community (pamphlets and brochures were also printed only in English); pamphlets were distributed to households through daily newspapers twice, to public places and by the enumerators;
- creation and updating of a Census page on the SSO website;
- telephone information and help line;
- journalist's training (paid and organised by USAID) on the aims and importance of the Census and essential distinction from electing activities;
- regular press conferences;
- regular information in national and local written and electronic mediums issuing programs in Macedonian and/or the language of other communities [(66)].

Field operations

One enumerator was appointed per ED; however, in districts having a multi-ethnic composition of the population, two or more enumerators were appointed, depending on the number of represented communities. Within the Census Regions, the overall staff responsible for the field work were as follows:

- **State Instructors (120)**
- **Regional Instructors (778)**
- **Enumerators (9 012)**

In addition, the enumeration was also carried out by:

- the Ministry of Defence, for enumeration of persons doing their military service in the Army,
- the Ministry of Justice, for enumeration of persons in pre-trial confinement or serving a sentence in a prison or reformatory, and
- the Ministry of Foreign Affairs, for enumeration of persons absent abroad.

The enumeration was based on the following questionnaires:

- **P-1 - Individual Form**
- **P-2 - Household and Dwelling Form**
- **P-3/STR - Individual Form for persons enumerated abroad**
- **PD-1 – Supplementary Form (on additional documents)**

Enumeration was based on identification using documents. Because of the relatively recent establishment of independent countries out of the Former Republic of Yugoslavia, subsequent migration and forced migration flows resulting from the 1999 Kosovo War and the internal crisis of the previous three years, a broad set of solutions were foreseen and established. Persons without one of the legal documents proving their identity and place of residence were able to identify themselves using other documents

[66] A first agency prepared the main TV and radio spot launched in the first half of October. Six additional TV spots started immediately before field operations and information pamphlets were distributed twice through daily newspapers was paid, organised and carried out by IOM-SBI.

such as paid electricity bills. People without identification were enumerated anyway but not counted as part of the population afterwards.

The enumeration was carried out in the field during the planned two weeks. Five days before the census (27 to 31 October) and five days after (16 to 20 November) the population could be enumerated at Regional Census Commissions premises. A **Post-Enumeration Survey** on coverage and quality was carried out from 16 to 22 November in about 80 EDs.

The reception and controlling of the filled census material and counting of the first results from control forms (for each ED, settlement and municipality in the region) was performed within ten days after the legal time for enumeration. Following this the census material was handed to the SSO for further checking and processing of data at the national level.

The language of the enumeration

The enumeration throughout the territory of the Republic of Macedonia was completed in the language selected by the person enumerated: Macedonian, Albanian, Turkish, Vlach, Roman, and Serbian. When the enumeration was carried out in Albanian, Turkish, Vlach, Roman or Serbian, data were recorded also in the Macedonian language. The following types of census forms were used:

- forms in the official Macedonian language in Cyrillic script;
- bi-lingual forms in Albanian language and its alphabet, and in the Macedonian language and its Cyrillic script;
- multi-lingual forms in Turkish, Vlach, Roma and Serbian languages and their letters, and in the Macedonian language and its Cyrillic script.

Difficulties during field operations

All censuses having questions on ethnic affiliation and religion are subject to politicisation and there is sometimes a tendency to 'enumerate' specific ethnic communities more than usual. Thus, the 2002 Census was no exception, and there were some instances of the following:

- enumeration of persons absent abroad for more than one year based on photocopied documents;
- information of existing pressure on the population of certain communities in some places with multiethnic structure of the population to declare themselves to belong another community;
- enumeration of people in a language they neither understand or speak;
- information related to the photocopying of filled census forms, in some places having a multiethnic structure of the population, with the aim of intimidating individuals in the population by stating their declaration could be used against them.

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Data processing

Data entry and processing differ from census to census, depending on available equipment and technology. Data entry and coding for the 2002 Census was conducted manually using a self-developed program, i.e. an MS Access 97 based application. The entry application contains on-line controls. A control of entered data with sample double keying and batch controls is foreseen. The initial entered data and aggregations will be stored in DB2 6000. The database was processed with Access 97 and SQL for simple tables, SAS for complicated tables.

Data dissemination

Preliminary results on total population, households and dwellings were to be published by the end of January 2003, while **definitive results** are expected 1-1.5 years after completion of field work. All provisions of the Census Law on data confidentiality were respected during the preparation of data for publishing and dissemination.

The SSO planned to apply data publishing and dissemination to allow simple access and use for all users' categories and increase information awareness of the 2002 Census results. The defined tabulation plan is in accordance with the Eurostat Census Tabulation Program. Census results will be published in printed and electronic (CD-ROM) form, with about 20 volumes on the different territorial levels for all census units and topics. Selected data will be available at the SSO website. As always, ad hoc tables will be prepared upon user request.

Costs

According to the first estimations made in 2000, the 2002 Census should cost about € 6.7 million, mainly for the preparatory phase (18.4%), field operations (49.3%), additional and temporary human resources and technical assistance (10.9%). The finances required were approved under the Census Law and the commitment of the Government of 'The Former Yugoslav Republic of Macedonia' to provide this from the budget. International donors covered some additional expenses: European Commission donated € 0.66 million and the United States Government through USAID € 0.5 million.

Conclusion

The date of the 2002 Census was accepted by the census authorities as recommended by the Government and the international community, despite the fact that the scheduled period was inconvenient for the following reasons:

- the last methodological changes in the Census Law were adopted only on 28 June 2002 causing many changes to the already prepared census material, and
- it came too soon after parliamentarian elections, reducing the time required for field preparation (selection of census participants and training).

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Nevertheless, despite these difficulties the preparations and field operations were completed successfully. The preliminary conclusion of the ICOM report on the generally favourable conditions and good field work. Difficulties or uncertainties (with identification documents, distribution of enumerators by ethnicity and language, or enumeration of people abroad) did not have a negative affect on the collected data.

The definitive census data will be used as a foundation for the annual population estimates in the coming years and for population sampling. Aggregated data obtained from census data are used for different purposes, such as analysis and evaluation of the status and trends in the economic and social development, planning and monitoring the implementation of programs, scientific research and statistical activities.

This country report is mainly based on the document prepared by Mrs Katerina Kostadinova-Daskalovska, Head of Department for Population Censuses, Statistical Office of Republic of Macedonia, for the purposes of this project.

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Spain	www.ine.es/censo2001
Francia	www.recensement.insee.fr, www.insee.fr/fr/rrp
Ireland	www.cso.ie/census.html
Italia	www.censimenti.it
Luxembourg	http://statec.gouvernement.lu/html_fr/RP_2001
Austria	www.volkszaehlung.at

Portugal	www.ine.pt/censos2001/censos.asp
Finland	http://tilastokeskus.fi/tk/he/vaestolaskenta/vaestolask_en.html
United Kingdom	www.statistics.gov.uk/census2001
Norway	www.ssb.no/english/subjects/02/01/fob2001_en
Switzerland	www.census.ch
Bulgaria	www.nsi.bg
Czech Republic	http://www.czso.cz/eng/census
Estonia	http://www.stat.ee/index.aw/section=585
Hungary	http://www.ksh.hu/eng/nepszaml.html
Latvia	www.csb.lv/Satr/atsk.htm
Lithuania	http://senna1.std.lt/Census
Romania	www.recensamant.ro
Slovak Republic	http://www.statistics.sk/webdata/english/index2_a.htm
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Albania	www.instat.gov.al
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Serbia-Montenegro	www.szs.sv.gov.yu/Popis/Census.htm
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* Survey questionnaire sent, but not concerned
** Survey questionnaire sent, concerned, but not answer
*** Survey questionnaire never sent

Annex 6

LDSA survey questionnaire (including the Eurostat Table Programme)

QUESTIONNAIRE

Population and Housing Census Round 2000/2001

COUNTRY:.....

1. Organization .....

Responsible Person (Respondent) :
Full name .....
Position .....
Address.....
Tel/ Fax.....
Email.....

2. Type of census

	Traditional census	Census based on registers	Mixed census	Sampling use
Census of buildings	☐	☐	☐	☐
Census of dwellings	☐	☐	☐	☐
Census of households	☐	☐	☐	☐
Census of population	☐	☐	☐	☐
Other topics / associated survey (e.g. agricultural census) (to be specified)	☐	☐	☐	☐

In case of traditional census, by:
- Enumerators, self-compiled form ☐
- Enumerators, based on interviews ☐
- Mail-out collection ☐
- Hand-out, mail-back ☐
- Mail-out, mail-back ☐
- Use of new technologies ☐

3. Period of the census

Reference day of the census └┘└┘└┘└┘└┘└┘└┘└┘ **(e.g.18032001)**

Enumeration period of census (in days) └┘└┘

4. Legislation
- Census act (year) └┘└┘└┘└┘
- Statistics act (year) └┘└┘└┘└┘
- Data protection law (year) └┘└┘└┘└┘

5. National Identification Number (personal)

Does it exist? Yes ☐ No ☐

If yes it is used for:
- Census ☐
- Surveys (e.g. vital statistics) ☐
- Administrative sources ☐

6. Registers

Do they exist in your country? Yes ☐ No ☐

If yes, which registers?
- Population ☐
- Business ☐
- Dwellings ☐
- Insurance ☐
- Others ☐

(to be specified).....
.....
.....

7. Pilot micro-census

Is a pilot micro-census organized before the population census?
Yes ☐ No ☐

If yes, give the sample size in %.....
Reference period: From ⌊⌊⌊⌊⌊⌊ To ⌊⌊⌊⌊⌊⌊

8. Publicity and information campaign

Publicity (i.e. any type of announce to the public) during the census by means and **order of relevance:**
- National TV ☐
- National radio ☐
- Local TV ☐
- Local radio ☐
- Internet ☐
- Newspapers and magazines ☐
- Posters ☐
- Leaflets ☐
- Billboards ☐
- Gadgets (to be specified) ☐
- Press conferences, other events ☐
- Other (e.g. SMS, to be specified) ☐

.....
- No publicity ☐

Main location of instruments like posters and leaflets:
- Schools ☐
- Libraries ☐
- Public institutions ☐
- Stations, airports, etc ☐
- Post offices, pharmacies ☐
- Banks ☐
- Other (to be specified) ☐

Selected/main target of the publicity campaign:

- Young and students ☐
- People in rural areas ☐
- Foreigners living in the country ☐
- Companies ☐
- Farms ☐
- Other (to be specified) ☐

Main slogan used for the publicity:

.....
.....
.....

Information campaign (i.e. diffusion of information as well as support) during the census by means **and order of relevance**:

- TV programmes ☐
- Radio programmes ☐
- Newpapers and magazines ☐
- Booklets ☐
- CD-ROM ☐
- Call center ☐
- Internet ☐
- Events (e.g. forum, to be specified) ☐
- Other (to be specified) ☐

Main aims of the information campaign:

- Explain the instruments ☐
- Explain the legal frame ☐
- Make respondent confident ☐
- Make answering correct and easier ☐
- Other (to be specified) ☐

9. Classification that is used:

NACE Rev1 ☐
ISCO '88 ☐
ISCED ☐
Nationality (List of citizenships) ☐
Geographical Codes / NUTS ☐
Other (to be specified) ☐

Automatic coding Yes ☐ No ☐

If yes, for what? (to be described e.g. for ISCO '88).....

10. Cartography/ Mapping

General questions

Is there a cartographic unit within the National Statistical Office?
Yes ☐ No ☐

If yes, give the number of the permanent staff .....

Did you create on your own the necessary maps? Yes ☐ No ☐

Did you use GIS technology? Yes ☐ No ☐

If no, where did you find the necessary maps?
- Private firms ☐
- National Geographic Organizations ☐
- Other National Organizations ☐
- Other (to be specified) ☐.....

Did you obtain digital maps? Yes ☐ No ☐

Did you use cartographic data to support the census process?
Yes ☐ No ☐

Do you have a national cadastre? Yes ☐ No ☐

If yes, did you find it helpful? Yes ☐ No ☐

If you used cartographic data to support the census process:

Mapping Urban Areas

What was the map scale for the urban areas? .....

Estimate the map cover percentage of the census urban areas ..... %
Estimate the digital map cover percentage of the census urban areas ..... %

Estimate the GIS map cover percentage of the census urban areas %

For GIS maps, if using

- What was the minimum referential map unit (record spatial entity)? .....

- Did you create the relevant GIS attribute table (containing census data) for the above map units? Yes ☐ No ☐
  If yes, estimate the relevant cover percentage..... %

Did you use the above GIS cartographic structures in the data dissemination process?
Yes ☐ No ☐

- Did you develop a Web-GIS application for the census data? Yes ☐ No ☐
  If yes, give the relevant URL .....

Mapping Non-Urban Areas

What was the map scale for the non-urban areas?.....

Estimate the map cover percentage of the census non-urban areas..... %

Estimate the digital map cover percentage of the census non-urban areas..... %

Estimate the GIS map cover percentage of the census non-urban areas %

For GIS maps, if using
- What was the minimum referential map unit (record spatial entity)?.....

- Did you create the relevant GIS attribute table (containing census data) for the above map units? Yes ☐ No ☐
  If yes, estimate the relevant cover percentage..... %

- Did you use the above GIS cartographic structures in the data dissemination process?
Yes ☐ No ☐

- Did you develop a Web-GIS application for the census data? Yes ☐ No ☐
  If yes, give the relevant URL .....

11. Participating staff by organizational structure

	Permanent staff	Contractual staff	Seasonal staff
Administrative staff	☐	☐	☐
Supervisors	☐	☐	☐
Deputy supervisors	☐	☐	☐
Supervisors of the enumeration sector	☐	☐	☐
Enumerators	☐	☐	☐
Interpreters	☐	☐	☐

12. Census of housings-households

	Variables	Core or Optional or National **	Respect of Recommendations		Respect of Concepts		Remarks
			Yes	No*	Yes	No*	
1	Type of building						
2	Number of floors						
3	Number of dwellings in the building						
4	Lift						
5	Period of construction						
6	Material of which specific parts of the building are constructed						
7	State of repair						
8	Type of living quarters						
9	Type of ownership						
10	Location of living quarters						
11	Occupancy status						
12	Type of vacancy						
13	Occupancy by one or more households						
14	Number of occupants						
15	Number of rooms						
16	Useful and/or living floorspace						
17	Kitchen						
18	Cooking facilities						
19	Water supply system						
20	Hot water						
21	Toilet facilities						
22	Type of sewage disposal system						
23	Bathing facilities						
24	Type of heating						
25	Main type of energy used for heating						
26	Electricity						
27	Piped gas						
28	Position of dwelling in the building						
29	Other national variables						

*Note: If not, please describe the difference, maintaining the relative number of variables.....

** **C** for Core, **O** for Optional and **N** for National

13. Census of population

	Variables	Core or Optional or National **	Respect of Recommendations		Respect of Concepts		Remarks
			Yes	No*	Yes	No*	
1	Type of private household						
2	Size of household						
3	Tenure status of household						
4	Single or shared occupancy						
5	Rent						
6	Durable consumer goods possessed by the household						
7	Number of cars available for the use of the household						
8	Telephone						
9	Relationship to reference person of private household						
10	Type of institutional or other communal establishment in which a person lives						
11	Whether living as inmate of an institutional household or other communal establishment or not						
12	Place of usual residence						
13	Place where found at time of census						
14	Farm or non-farm residence						
15	Total population						

* Note: If not, please describe the difference, maintaining the relative number of variables

.....

.....

** **C** for Core, **O** for Optional and **N** for National

	Variables	Core or Optional or National **	Respect of Recommendations		Respect of Concepts		Remarks
			Yes	No*	Yes	No*	
16	Locality						
17	Place of usual residence on year prior to the census						
18	Duration of residence						
	Previous place of usual residence						
19	Year (or period) of immigration in to the country						
20	Sex						
21	Age						
22	Legal marital status						
23	De facto marital status						
24	Country/place of birth						
25	Place of birth of parents						
26	Place of birth of parents						
27	Country of citizenship						
28	Citizenship acquisition						
29	Ethnic group						
30	Language						
31	Religion						
32	Total number of children born alive						
33	Date of first marriage						
34	Current marriage of ever-married women						
35	Internal migration						
36	International migration						
37	Current activity status						
38	Usual activity status						

*Note: If not, please describe the difference, maintaining the relative number of variables

.....

.....

.....

** **C** for Core, **O** for Optional and **N** for National

	Variables	Core or Optional or National **	Respect of Recommendations		Respect of Concepts		Remarks
			Yes	No*	Yes	No*	
39	Time usually worked						
40	Providers of non-paid social and personal services						
41	Duration of unemployment						
42	Occupation						
43	Secondary occupation						
44	Industry (branch of economic activity)						
45	Type of sector (institutional unit)						
46	Status in employment						
47	Number of persons working in the local unit of establishment						
48	Main source of livelihood						
49	Dependency relationship						
50	Income						
51	Place of work						
52	Location of school, university etc						
53	Mode of transport to work						
54	Length and frequency of journey to work						
55	Educational attainment						
56	Educational qualifications						
57	Field of study						
58	School attendance						
59	Literacy						
60	Other variables						

*Note: If not, please describe the difference, maintaining the relative number of variables

.....

** **C** for Core, **O** for Optional and **N** for National

14. Data processing

Use of a project management software Yes ☐ No ☐
If yes, please indicate which software package, or whether this was a self-developed system

Use of a computer system for the monitoring of the quality of all census operations (this would allow reassigning resources from areas where the quality is better than necessary, to those where the quality is sub-standard) Yes ☐ No ☐

Use of a computer system for the monitoring of the quality of all census operations
Yes ☐ No ☐

Method of data entry?
- Keyboard ☐
- Mark sensing ☐
- OCR/ICR ☐
- Internet ☐
- Administrative census ☐
- Other (to be specified) ☐ .....
- Mixed (to be specified) ☐ .....

If keyboard data entry has been applied:
- Where did it take place?
  Single site ☐
  Decentralized to several sites ☐
  Other (to be specified) ☐ .....

- Was there any use of verification (double entry)? Yes ☐ No ☐
  If so, which percentage of the data was keyed twice: ..... %

Use of real-time error control during the data capture (e.g.: variable range checks, or check on the internal consistency of household composition)
Yes ☐ No ☐

Duration of the entire data-entry phase:..... months

Software used for the data entry (to be specified)
Commercial product (e.g.: MS Access) ☐ .....
Non-commercial or free package (e.g. US Census Bureau CSPro or IMPS Centry, or United Nations PC-Entry) ☐ .....
Self-developed application (specify the language in which it has been prepared, e.g. Visual Basic) ☐ .....

Coding of data based on classifications
- Manual coding using code books ☐
- Computer-assisted coding ☐
- Automatic coding ☐
- Other (to be specified) ☐.....

If automatic or computer-assisted coding was applied, which software was used?
- Self-developed ☐
- Obtained from elsewhere (to be specified) ☐.....
- Computer package (which one?) ☐.....

Was there any computer-supported editing of the raw data files?

Yes ☐ **No** ☐

If Yes: Was there a cut-off percentage above which the batches generating high error rates would have to be reviewed/redone?

Yes ☐ **No** ☐

Did any computer-supported editing include automatic imputation?
- Yes (please specify the software used) ☐.....
- Editing, but no automatic imputation ☐

In case of automatic imputation, were statistics about imputation rate by variable generated?
- Yes, such statistics were generated ☐
- Automatic imputation, but no statistics by variable ☐
- No automatic imputation used ☐

Setting-up of a database of census microdata (to be specified)
- High-level (Oracle, SQL Server, etc) ☐.....
- Desktop (MS Access, Paradox, etc) ☐.....
- Statistical (SPSS system file, etc) ☐.....
- Demographic (REDATAM, etc) ☐.....
- None or other ☐.....

15. Use of census data

- Revision of intercensal population estimates ☐
- As base for population projections ☐
- Revision of population registers or electoral lists ☐
- Framework for surveys ☐
- Migration surveys ☐
- Fertility surveys ☐
- Other demographic surveys ☐
- Labour force surveys ☐
- Estimations and forecasting, in relation with surveys and administrative data ☐

16. Publication and dissemination

Publication of preliminary data: Yes ☐ No ☐

If yes, the information sources were: (e.g. checklists, to be described)

.....

.....

Availability of census results according to the Table Programme of the Community Census Programme of the Population and Housing Censuses established by Eurostat (see Appendix)

Answer: No / Yes / Partially.
If yes or partially please specify how long after the census date

Table	Availability in your census			Time after the census date (in months)
1	No ☐	Yes ☐	Partially ☐	
2	No ☐	Yes ☐	Partially ☐	
3	No ☐	Yes ☐	Partially ☐	
4	No ☐	Yes ☐	Partially ☐	
5	No ☐	Yes ☐	Partially ☐	
6	No ☐	Yes ☐	Partially ☐	
7	No ☐	Yes ☐	Partially ☐	
8	No ☐	Yes ☐	Partially ☐	
9	No ☐	Yes ☐	Partially ☐	
10	No ☐	Yes ☐	Partially ☐	
11	No ☐	Yes ☐	Partially ☐	
12	No ☐	Yes ☐	Partially ☐	
13	No ☐	Yes ☐	Partially ☐	
14	No ☐	Yes ☐	Partially ☐	
15	No ☐	Yes ☐	Partially ☐	
16	No ☐	Yes ☐	Partially ☐	
17	No ☐	Yes ☐	Partially ☐	
18	No ☐	Yes ☐	Partially ☐	
19	No ☐	Yes ☐	Partially ☐	
20	No ☐	Yes ☐	Partially ☐	
21	No ☐	Yes ☐	Partially ☐	
22	No ☐	Yes ☐	Partially ☐	
23	No ☐	Yes ☐	Partially ☐	
24	No ☐	Yes ☐	Partially ☐	
25	No ☐	Yes ☐	Partially ☐	
26	No ☐	Yes ☐	Partially ☐	
27	No ☐	Yes ☐	Partially ☐	
28	No ☐	Yes ☐	Partially ☐	
29	No ☐	Yes ☐	Partially ☐	
30	No ☐	Yes ☐	Partially ☐	
31	No ☐	Yes ☐	Partially ☐	
32	No ☐	Yes ☐	Partially ☐	

33	No ☐	Yes ☐	Partially ☐	
34	No ☐	Yes ☐	Partially ☐	
35	No ☐	Yes ☐	Partially ☐	
36	No ☐	Yes ☐	Partially ☐	
37	No ☐	Yes ☐	Partially ☐	
38	No ☐	Yes ☐	Partially ☐	
39	No ☐	Yes ☐	Partially ☐	
40	No ☐	Yes ☐	Partially ☐	
41	No ☐	Yes ☐	Partially ☐	
42	No ☐	Yes ☐	Partially ☐	

Publication and dissemination program of the final census results:

Publication / output / events *(please list each one)*	**Format of products** e.g.: paper, electronic products like CD-ROM, Internet etc	**Period of time after the census date**
TABULATION PLAN (including short comments on /analysis of data, e.g.: bulletins, main national publication(s), publications at regional level, publications on (main) cities etc)		
ANALYSIS OF RESULTS (e.g.: thematic volumes (specify topics), other mostly analytical documents, atlas etc)		
ELECTRONIC PRODUCTS (e.g.: census database, individual records, standard files etc)		

PUBLICATIONS OF DOCUMENTATION (e.g.: census forms and instructions, legislation norms, information campaign, mapping etc)		

17. Main census results

Number of buildings.....
Number of dwellings.....
Number of households.....
Number of population.....

18. Cost of traditional census. Breakdown by main lines/ phases (in %)

Total cost in € .....

Cost	(%)
General preparation, services, logistics	
Pilot micro-census	
Cartography/Mapping	
Publicity and information	
Enumeration (including training)	
Post-enumeration evaluation	
Data processing, checking, coding	
Elaboration and analysis	
Equipment	
Publication, dissemination and documentation	
Other*	
Total	100%
*To be specified	

International financial support (if any) % of the total census cost	

Activities not carried out by the Statistical Office/ Institute

- Publicity and information ☐
- Cartography/Mapping ☐
- Checking, controlling, coding ☐
- Data entry ☐
- Services (e.g. transport, specify) ☐ .....
- Other (specify) ☐ .....

19. Post-census quality survey

Does it exist? Yes ☐ No ☐

If yes, give the sample size in %.....

Reference period: From ⌊⌊⌊⌊⌊⌊ To ⌊⌊⌊⌊⌊⌊

20. Main problems and difficulties that you faced: (multiple answers)

		Please specify :
Design of questionnaires	☐	
Conformity of contents according to the Recommendations and Concepts	☐	
Cartography/Mapping	☐	
Use of new technologies	☐	
Regional and local structure	☐	
Funding sources	☐	
Staff	☐	
Publicity	☐	
Data collection	☐	
Evaluation	☐	
Checking-controlling-coding	☐	
Data processing	☐	
Other (to be specified)	☐	

21. Future prospects and plans for the next census

A. Sources of data collection

- Traditional census ☐
- Administrative sources ☐
- Mixed ☐
- No census, alternative survey (to be specified) ☐

B. Data collection

- Classic questionnaire by interview ☐
- Classic questionnaire by mail ☐
- Classic questionnaire mixed ☐
- Electronic questionnaire ☐

C. Use of GIS Yes ☐ No ☐

D. Classification

- Codification by hand ☐
- Automatic coding ☐

Date: ..... Signature:.....

Appendix

Table Programme of the Community Census Programme of the population and housing censuses (as from '*Guidelines and Table Programme for the Community Programme of Population and Housing Censuses in 2001*', 1999, volume 2, Working Paper 3/1999/*/n 10), including two further tables on urban statistics that Eurostat is recently proposing (n. 41 and 42)

TABLE 1 (National level)	Usual resident population by sex, age, type of household and household status
TABLE 2 (National level)	Usual resident population by sex, age, marital and cohabitational status and selected social indicators
TABLE 3 (National level)	Usual resident population by sex, country of citizenship and age group
TABLE 4 (National level)	Usual resident population by sex, country of birth, indicator of citizenship and age group
TABLE 5 (National level)	Usual resident population by sex, place of residence one year prior to the census, indicator of citizenship and age group
TABLE 6 (National level)	Usual resident population by sex, age, and economic activity (current activity and employment status)
TABLE 7 (National level)	Usual resident population by sex, of citizenship and economical activity
TABLE 8 (National level)	Usual resident population aged 15 and over (living in private households) by sex, age group, family and non-family status, and indicator of current activity
TABLE 9 (National level)	Female resident population aged 15 and over by age group, family situation, and current activity status
TABLE 10 (National level)	Usual Resident population by sex, indicator of citizenship, age and highest level of educational attainment
TABLE 11 (National level)	Resident population aged 15-74 by sex, age group, highest level of educational attainment, current economic activity and occupation
TABLE 12 (National level)	Population in private households by sex, age group, indicator of citizenship and household size
TABLE 13 (National level)	Usual resident population by sex, age group, and family situation
TABLE 14 (National level)	Usual resident population by sex, indicator of citizenship, family status and housing situation
TABLE 15 (National level)	Employed persons aged 15 and over by sex, age group, indicator of citizenship and occupation
TABLE 16 (National level)	Employed persons aged 15 and over by sex, age group, and detailed occupation
TABLE 17 (National level)	Employed persons aged 15 and over by sex, age group, indicator of citizenship and industry (branch of economic activity)
TABLE 18 (National level)	Employed persons aged 15 and over by sex, age group, and detailed industry (branch of economic activity)
TABLE 19 (National level)	Employed persons aged 15 and over by sex, industry (branch of economic activity), status of employment and time usually worked indicator
TABLE 20 (National level)	Employed persons aged 15 and over by sex, age group and place of work
TABLE 21 (National level)	Family nuclei by type, number of resident children in the family, current economic activity of parents, and presence of other persons in the household

TABLE 22 (National level)	Private households by type and size, number of economically active members and number of aged members
TABLE 23 (National level)	Private households by type and number and other characteristics of members
TABLE 24 (National level)	Private households by type of household, tenure status, and type of living quarters
TABLE 25 (National level)	Number of living quarters, dwellings, private households and occupants by type of living quarters
TABLE 26 (National level)	Occupied conventional dwellings by number of rooms and occupants and type of ownership
TABLE 27 (National level)	Occupied* conventional dwellings by presence of comfort characteristics
TABLE 28 (National level)	Dwellings by type of ownership, type of building and period of construction of the building
TABLE 29 (Regional level NUTS 3)	Usual resident population and economically active population by sex, age and indicator of internal or international migration
TABLE 30 (Regional level NUTS 3)	Usual resident population by sex, group of age, type of household and household status
TABLE 31 (Regional level NUTS 3)	Usual resident population by sex, group of age and economical status (current activity and status of employment)
TABLE 32 (Regional level NUTS 3)	Usual resident population by sex, age group, marital and cohabitational status, size of household and selected social indicators
TABLE 33 (Regional level NUTS 3)	Usual resident population by sex, country of citizenship and indicator of birth
TABLE 34 (Regional level NUTS 3)	Usual resident population by sex, age group, highest educational attainment, current activity and occupation
TABLE 35 (Regional level NUTS 3)	Usual resident population by sex, major branch of economic activity, indicator of citizenship and status of employment
TABLE 36 (Regional level NUTS 3)	Private households by type and number of members and population by age group and economic activity
TABLE 37 (Regional level NUTS 3)	Dwellings by indicator of conventional character, occupancy status, type of ownership and type of building
TABLE 38 (Local level NUTS 5)	Main population characteristics
TABLE 39 (Local level NUTS 5)	Main characteristics of private households and dwellings
TABLE 40 (Local level NUTS 5)	Employed persons with residence in the area by place of work at a local level (NUTS 5) and sex
TABLE 41 (Urban area)	Main population characteristics
TABLE 42 (Urban area)	Main characteristics of private households and dwellings

Annex 7
Census questionnaires

This annex presents all the census questionnaires used in the different countries as far as available and collected in electronic format in the frame of the project. The material includes facsimiles in English, French or original language as well as versions with English translation. The following table summarises all the available documentation.

List of census questionnaires

Country	Available documentation
Belgium	• Questionnaires de l'Enquete Socio-Economique 2001 (*feuille individuelle et feuille de logement*)
Denmark	No questionnaire (register method)
Germany	No census
Greece	• Form P-1.1 Housing data and households' list • Form P-1.2 Household data • Form P-1.3 Immigration data *EN translation*
France	• Modèle 1 Feuille de logement • Modèle 2 Bulletin individuel • Modèle 2bis Bulletin étudiant • Modèle 4 Dossier d'immeuble collectif • Modèle 5 Bulletin individuel pour les élèves internes et les militaries
Ireland	• Census form (for housing and population)
Italy	• English guide to the completion of the census form
Luxembourg	• Modèle I Bordereau de maison • Modèle II Feuille de ménage et de logement • Modèle III Feuille de ménage collectif
Netherlands	No questionnaire (mixed method)
Austria	• Building data form • Housing unit data form • Census list for a household • Personal data form • Local unit questionnaire *EN version*
Portugal	• Living quarter questionnaire • Building questionnaire • Private household questionnaire • Individual questionnaire *EN translation*
Finland	No questionnaire (register method)
Sweden	No census
United Kingdom	• Household form for England • Household form for Scotland
Iceland	No census

Country	Available documentation
Liechtenstein	Not available
Norway	• Population and housing census form *(questionnaire for the household and housing component of the census)* *EN translation*
Switzerland	• Bordereau de maison • Questionnaire individual
Bulgaria	• Census questionnaire for buildings, dwellings and population *(Building, Dwelling, List "Temporary present persons", List "Household and family members, Population)* *EN translation*
Czech Republic	• Census Questionnaire Buildings • Census Questionnaire Housing Units • Census Questionnaire Persons • Detailed explanatory notes to several questions in the census questionnaire *EN translation*
Estonia	• Census Questionnaire Buildings • Census Questionnaire Housing Units • Census Questionnaire Persons • Detailed explanatory notes to several questions in the census questionnaire *EN translation*
Hungary	• Dwelling questionnaire • Personal questionnaire *EN translation*
Latvia	• Household members' list and dwelling form • Individual form *EN translation*
Lithuania	• Census Questionnaire *(Address, Type of institution, Data on building, Data on dwellings, List of residents of the dwellings by household, Duration and cause of temporarily departure/arrival of persons, Data on household, Data on person, The address of usual residence of temporarily present person)* *En version*
Poland	• Questionnaire A - Population and housing form • Questionnaire D - Female fertility form • Questionnaire M - Long-term migration form *EN translation*
Romania	• Housing and population form *EN translation*
Slovak Republic	• Personal form • Building form • Dwelling form • General explanations on the questionnaires *EN translation*
Slovenia	• P-1 Census questionnaire for buildings • P-2 Census questionnaire for dwellings

Country	Available documentation
	• P-3 Census questionnaire for persons • P-3/NV Statement on the nationality/ethnicity and religion *EN version*
Cyprus	• A - Questionnaire for the housing unit • B - Questionnaire for the household • C - List of household members • D - Personal questionnaire *EN translation*
Malta	Not available
Turkey	Not available
Albania	• Building, dwelling and household form • Individual form *EN version*
Croatia	• P-1 Census form for individual • P-2 Questionnaire for place of residence and household *EN version*
Serbia	• P-1 Census form for individual • P-1/IN Accessory questionnaire for Yugoslav citizens temporarily working abroad and for their family members living with them • P-2 Questionnaire for household and dwelling • P-3 Questionnaire for collective dwelling *EN translation*
The former Yugoslav Republic of Macedonia	• P-1 Enumeration form • PD-1 Additional form *(for identification of respondents)* • P-2 Questionnaire for household and dwelling • P-3 Questionnaire for people abroad • P-4 Control form *(including key codifications)* *EN version*

Annex 8

Documentation on legal framework

This annex presents all the national documents on the legal framework for the conduct of the population and housing census in each country (census laws, statistical laws, other regulations) as far as collected in electronic format in the frame of the project. The material mostly includes documents available or translated in English and French; however several documents in original language are also presented. The following table summarises all the available documents.

List of documentats on census and statistics framework

Country	Available documents
Belgium	• Survey 2001 Act *(in national language)* • Survey 2001 Regulation *(in national language)*
Denmark	• Act on Statistics Denmark
Germany	• Law on Statistics for Federal Purposes
Greece	• The Greek legal framework for administrative sources
Spain	• Legislative framework for the conduction of the census *(in national language)*
France	• Legal provision for the creation of an automatic data processing at 1999 Census *(in national language)* • Act providing date and conditions for the conduction of the census *(in national language)* • Act on the creation of an automatic system for the collection and dissemination of the census results *(in national language)* • Act on the creation of an automatic system for the optical reading of census forms *(in national language)*
Ireland	• Statistics (Census of Population) Order, 2001
Italy	• Regulation for the conduction of the census *(in national language)* • Regulation on resident population registration *(in national language)*
Luxembourg	• Regulation providing the conduction of the 2001 Census *(in national language)*
Netherlands	• Law of 18 April 1996 establishing the Central Bureau of Statistics and the Central Commission for Statistics
Austria	• Census Law – Act
Portugal	• Act for the 2001 Census
Finland	• Act of Parliament concerning the Population Census
Sweden	• Statistics Act
United Kingdom	England and Wales • Census Order 2000 • Census Amendment Order 2000 • Census Regulations 2000 • Census Amendment Regulations 2000 Northern Ireland

Country	Available documents
	• Census Order 2000 • Census Regulations 2000 Scotalnd • Census Order 2000 • Census Regulations 2000
Iceland	Not available
Liechtenstein	Not available
Norway	• Census Regulation 2001 *(in national language)*
Switzerland	• Census Law *(in national language)* • Census Order *(in national language)*
Bulgaria	• Census Law on Population, Housing and Agricultural Farms in the Republic of Bulgaria – 2001
Czech Republic	• 2001 Population and Housing Census Act
Estonia	• Population and Housing Census Act • Population and Census Act Amendment Act
Hungary	• Act CVIII of 1999 on Population Census 2001 and on the amendment of Act XLVI 1993 on statistics (Extract) • Governmental regulation No. 76/2000. on the tasks related to Census 2001
Latvia	• Law on Population Census
Lithuania	• Law on the Population and Housing Census 2001 • Resolution on basic operations concerning the Population and Housing Census 2001
Poland	• Law on Official Statistics
Romania	• Organisation of the Official Statistics
Slovak Republic	• Act on Census of Population, Houses and Apartments in the Year 2001 • Measure announcing Characteristics, Basic Features and Data Structure Surveyed in the Census of Population, Houses and Apartments in 2001 • Amendment Measure
Slovenia	• Census of Population, Households and Dwellings 2002 Act
Cyprus	• Statistics Law
Malta	• Act n. 11 of 1948 for the conduction of population censuses
Turkey	Not available
Albania	• The Law on Statistics
Croatia	• Law on the Census of Population, Households and Dwellings 2001
Federal Republic of Yugoslavia	• Federal law on Population Census and Survey of Households and residential units in 2001
The former Yugoslav Republic of Macedonia	• Law on the 2002 Census on population, households and dwellings in the Republic of Macedonia

Working Papers*

E4/1997-1	Comparing data sources for measuring international migration in Central and Eastern Europe Michel Poulain - Université Catholique de Louvain
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