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The population Census 2000: new and future-led

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1. The changing face of the Population Census

The task of population censuses is to collect the fullest possible data (ie without gaps or duplications) about the key basic units of the official statistical system (persons, households, dwellings and places of work) on a specific reference day. The importance of a population census derives from its character as a cross-section and full-scale survey which covers even the smallest spatial units (constituencies or hectares) of a country. And this explains the considerable amount of time and money spent on executing population censuses. In the traditional approach, population censuses are conducted as surveys of households with the questionnaires being completed either by interviewers or by the interviewees themselves. In countries where comprehensive, up-to-date registers with data about basic units are kept and inter-linked (inhabitants' registers, registers of buildings and dwellings, business and company registers), more and more population censuses are conducted using coordinated register analysis on a certain date. The Nordic countries – Finland, Denmark and, more recently, Norway and Sweden – are pioneers in this field.

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 keeping centralized registers. However, the situation is changing, mainly as a result of fast developments in information technology. 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. And this is the point of departure for the Population Census 2000 which features many innovations in respect of register use, creating the preconditions for a sweeping reform of survey methods after 2000. Parliament and the Federal Council created the necessary legal foundation for this with the revised Population Census Act and its Executive Ordinance, both of which came into force on 1 March 1999.

This contribution provides information about important new features of the Population Census 2000:

1. the combining of information from EDP registers with questionnaires;
2. the transition from using enumerators to postal dispatch and return, in conjunction with the development of an electronically controlled monitoring and reminder system;

3. use of the Internet for electronic completion of personal and household questionnaires;

4. centralization of technical survey tasks in a single national Service Centre.

It also outlines the objectives of the interpretation and analysis programme before looking forward to the problems involved in harmonizing federal, cantonal and communal registers.

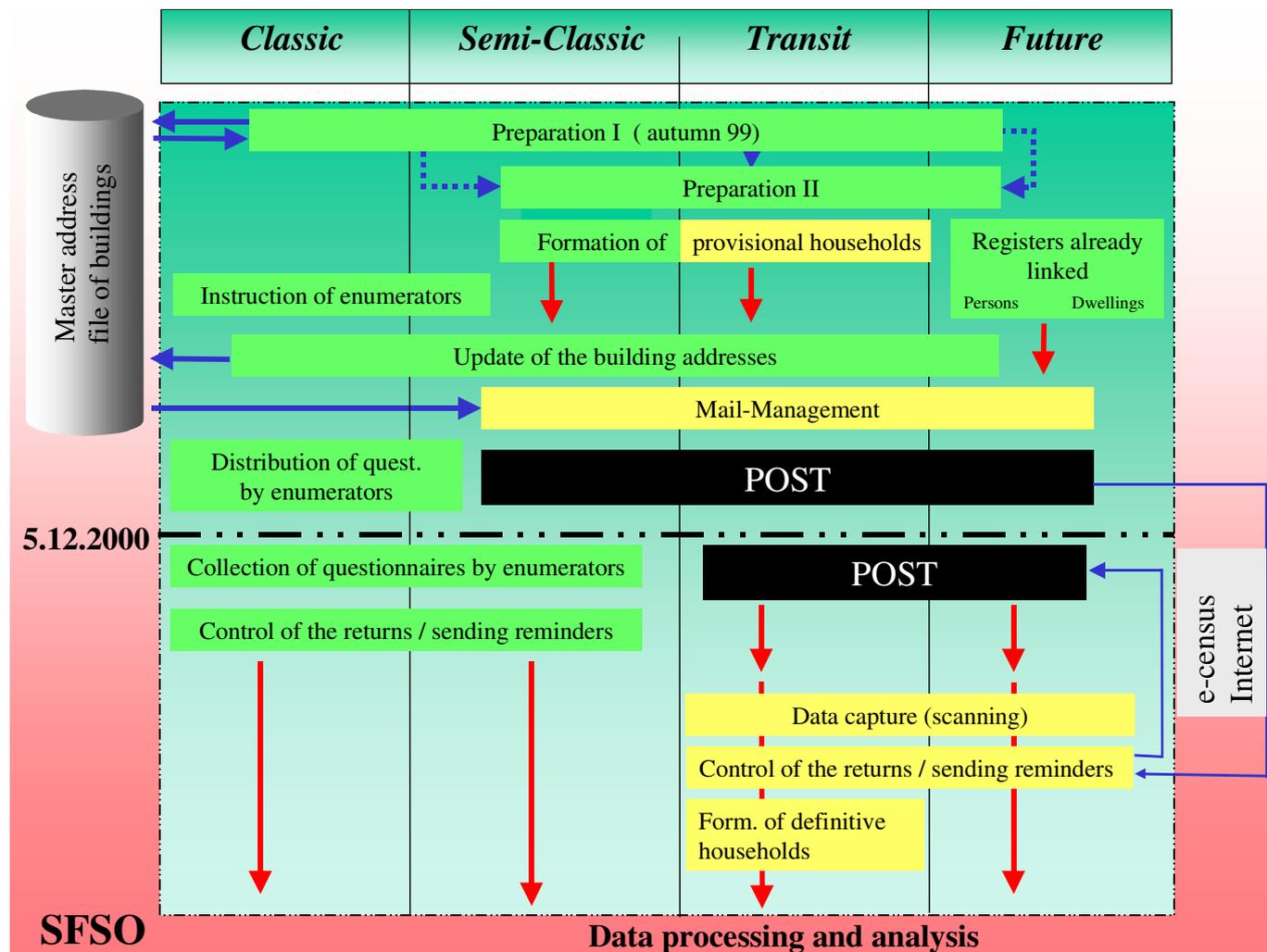
2. Various survey variants: from «Classic» to «Future»

The Population Census 2000, with the reference date of 5 December, consists of two inter-linked surveys: the personal and household survey, directed at all residents of Switzerland, and the building and dwelling survey, where house owners and property management agencies have to provide information. Four questionnaires are used for both surveys: the personal questionnaire, the household questionnaire for private households, the household questionnaire for collective households and the combined building and dwelling questionnaire for house-owners.

Conduct of the building and dwelling survey is to be standardized throughout Switzerland, with centralized dispatch of the material by the SFSO (using the Master address file of buildings). For large property management agencies, some of which manage up to 20 000 apartments, the SFSO has developed special GERIM («gérances immobilières») 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 can be surveyed direct by electronic means. In contrast, owners with just one directly building will still have to complete a questionnaire.

For both the personal and household surveys, the SFSO has provided four different methods for communes to choose from – an approach which takes account of the very different information technology structures and capacities of inhabitants' registers in communes and cantons throughout Switzerland. It should be noted that according to the Population Census Act, the individual communes are responsible for conducting and financing the survey.

Diagram 1: The four survey variants



While, in the «Classic» variant, enumerators will continue to distribute and collect the questionnaires, new procedures are used to varying extents in the «Semi-Classic», «Transit» and «Future» approaches.

In the «Semi-Classic» approach, questionnaires are preprinted with information from communal inhabitants' registers and mailed to the households. However, they are collected by enumerators.

In the «Transit» variant also, the questionnaires are preprinted and sent by post. However, they are also returned by post, obviating the need to recruit, train and monitor enumerators.

The «Future» 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 ie the link between persons, households and dwellings already exists. After the Population Census 2000, this approach is to become the general rule.

In December 2000, the various survey variants will be distributed over the communes and the population as follows:

Table: Distribution of survey variants over the communes and the population

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	1711	64,4	6 294 463	92,4
Future	25	0,9	63 865	0,9
Total*	2657	100,0	6 814 818	100,0

* All figures without Canton Ticino which will organize the Population Census using a special system based on interlinked inhabitants, building and dwelling registers.

The great majority of the Swiss population (6.3 million) living in larger and smaller communes will participate in the Population Census on the «Transit» variant line. The survey documentation is sent to them by post and returned the same way. For the inhabitants of most smaller communes, the Census will be conducted in the traditional way.

The SFSO offers people in «Transit» (and «Future») communes a further reply option: if they want, and if they have an Internet connection at home or at work, they can complete their personal and household questionnaires via the Internet. The E-Census – an SFSO European «first» – is currently being tested. The questionnaire completion process is controlled by a powerful central server and is subject to stringent data security and data protection requirements (eg in the controlled issue of passwords), and that is why this option will not yet be available to people living in «Classic» and «Semi-Classic» communes in December 2000.

3. Quality problems with register data and addresses

One of the fundamental innovations of the Population Census 2000 is the possibility of preprinting data on questionnaires and sending them through the Post. Data obtained from communal and cantonal inhabitants' registers will be preprinted on the first page of the personal questionnaire and on the first and fourth page of the household questionnaire. The trial census held in 1998 and the «general trial run» in Winter 1999/2000 showed that people appreciated their task being simplified in this way. What is more, citizens find out what (little!) data of relevance to the Population Census communes keep about them on their registers.

However, the prerequisites for these innovations are:

1. the possibility of producing standardized extracts from decentralized registers and

2. the availability of a high-quality address list to ensure the correct dispatch of the preprinted documentation to households.

In actual practice, both these prerequisites cause considerable difficulties.

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 register contents and characteristic codes. However, for preprinting the questionnaires, it is of prime importance for the characteristics on the inhabitants' registers to match those of the SFSO. To standardize the register extracts, the SFSO had to develop special software (LOCO'2000) which was distributed free to the communes. In addition, this software makes it 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 general trial run showed that there were problems with address quality, both in the SFSO's Master address file of buildings (mainly constituted from data derived from the 1990 Population Census and the 1995 Business Census) and the inhabitants' registers. These are due to the lack of a harmonized terminology, missing or unclear addresses in individual communes and addresses that are out of date. Consequently, major efforts have to be made to produce current, complete and correct lists of addresses for postal dispatch. The mailing of the survey documents per household presents a special challenge. If there is no apartment or household number, as is the case in most registers, correct assignment of individual inhabitants to a household requires special procedures. The SFSO is cooperating closely with Swiss Post which has considerable experience in the field of address management and updating.

4. A national Service Centre

With the new Population Census procedures, the communes very soon reach their technical limits. For instance, only very few communes have the infrastructure needed to preprint A3 format questionnaires. What is more, certain investments at communal level make no sense. By way of an example, computer-assisted return monitoring and reminders for mailed questionnaires require substantial information technology investments. In fact, the E-Census can only be conducted as a centrally controlled operation. That is why the SF SO has set up a central Service Centre which takes over many of the survey tasks on behalf of the communes and the cantons. The following diagram distinguishes between two task packages:

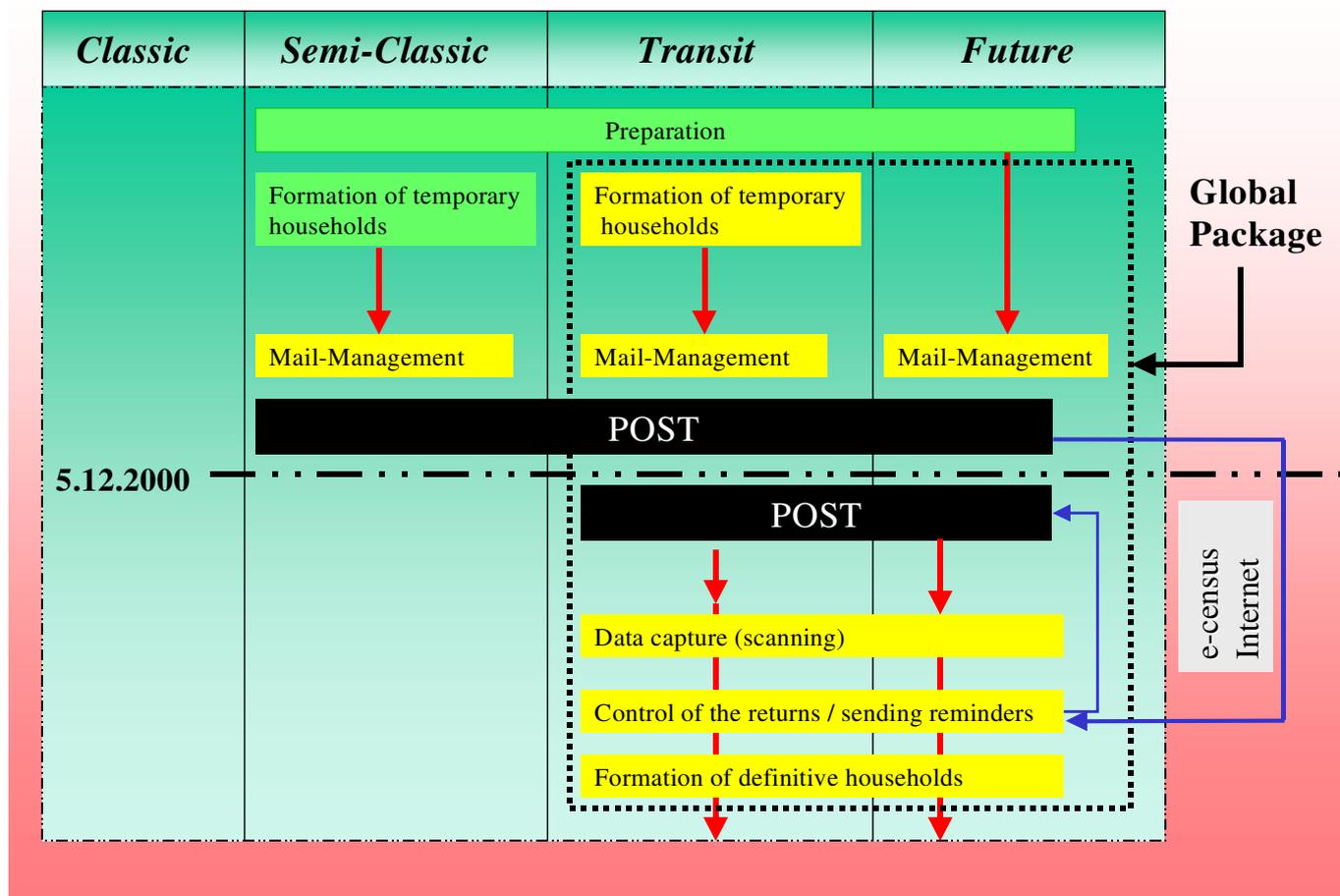
1. Only mail management is outsourced (preprinting of questionnaires, automated enveloping, automated sorting by postal delivery round).
2. In the so-called «Global Package», questionnaires' return monitoring, reminders and checking that the questionnaires have been completed in full are

outsourced, in addition to mail management. This «Global Package» effectively relieves communes of manual checking work after the reference day. Only problem cases which the Service Centre cannot clarify are returned to the communes for clarification (2–5% of inhabitants).

When they adopted the «Transit» or «Future» variants, 1600 communes opted for this outsourcing. For the tasks assigned to it, the SF SO commissioned the Service Centre with data input as well as with developing and plausibilizing the questionnaires. The Service Centre is operated by Data Care Lucerne (a company controlled by Swiss Post). State-of-the art scanner technology (developed by Interact AG) is used to enter the questionnaires' data in Lucerne. A Hotline and a Call Centre have been set up by the Service Centre in both French- and German-speaking Switzerland to provide the general public with information and to answer any questions.

In tandem with changing the survey method, efforts to communicate with and inform the general public be-

Diagram 2: Offer of the Service Centre



come even more important. People have to be «walked through» the process of completing and returning the questionnaires and «defaulters» have to be gently reminded of their obligations. 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 «Classic» survey variant.

5. The Population Census 2000 interpretation and analysis programme

The Population Census 2000 will provide some 30 to 40 information components about each and every individual (in the areas of demography, education, work, culture and transport), 15 components about dwellings and 10 about the building he/she lives in. The data are then largely comparable and harmonized with those of the three preceding Population Censuses (1970, 1980 and 1990). The SFSO has defined a series of objectives for interpretation of the Population Census 2000:

The results are to be available faster than in 1990. This objective can only be attained by optimizing data input and processing. Consequently, the status of work is to be constantly monitored using statistical procedures and the work in hand adapted to time and resource planning. For the first time, statistical procedures (hot and cold deck) will be used in Switzerland in the final adjustments.

The basic programme of tables will be considerably reduced, structurally simplified and geared more to user needs. Priority is to be given to electronic data media over traditional hard-copy dissemination methods. More products with standardized visual presentations and cartographic products are to replace volumes of tables. Besides the provision of data on EDP media, the appropriate user-friendly interpretation tools will be built in as «shareware».

The statistical findings of the Population Census will be «packaged» for specific target groups in terms of access opportunities, scope and presentation. The focus is on the Internet, online databases, electronic data media with user-friendly interfaces, written publications providing an overview, potted editions, analyses and made-to-measure special interpretations on both new and conventional media.

As in 1990, anonymous individual data will be stored with the SFSO for the whole of Switzerland, and with the individual cantons and cities for their respective areas. These data are the basis for processing specific questions and customized interpretations which can be prepared both by statistical offices and by third parties. For new customer categories, there are also plans to

offer individual datasets in the form of public use microdata files on a random sample basis. While these will no longer allow conclusions to be drawn about individual communes, they will allow fast, simple access to data at a higher-aggregated geographical level.

For comparative historical analysis, a dataset will be prepared towards the end of 2002 which links information from the last four Population Censuses (1970, 1980, 1990, 2000). The constitution of an SFSO Data Warehouse should also be seen in this context. Besides providing access to historical data, it will also make it possible to establish links to other statistical fields and to enrich Population Census results with the findings of other surveys.

A scientific research programme will link back to the 1990 analysis programme, whereby the promotion of studies directed at a broad general public is to be emphasized even more than in 1990.

Lastly, the findings of the Swiss Federal Population Census will continue to be available for international comparisons at European and worldwide level. The SFSO also makes every effort to intensify the cooperation initiated with the statistical offices of neighbouring countries, eg for the definition of border-straddling conurbations or the interpretation of data about cross-border commuters.

6. Preparing the future

With regard to the use of registers, some of the solutions adopted in the Population Census 2000 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. The Population Census 2000 will make a contribution at two levels:

Harmonization and coordination of register contents

Harmonization covers four aspects:

1. 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.
2. The registers must use the same definitions of characteristics (What is a household? How is a building defined? How is the place of residence defined?).
3. Coding of the characteristics has to be based on standardized classifications (eg codes for foreign countries, civil status or professions).

4. The registers must be based on identical quality standards and be updated at similar intervals.

Only registers harmonized in this way are of lasting use for statistics and suitable for replacing direct surveys. At present, harmonization of registers in cantons and communes cannot be made mandatory by the Confederation because there is no legal basis for this. However, the Population Census Act and its Ordinance allow the SFSO to return certain characteristics, keys and identifiers surveyed through the Population Census to the communes. The key aspect of this harmonization is that building and dwelling identifiers are to be built into communal inhabitants' registers.

Shortly after data input, the SFSO is planning to provide communes wishing to harmonize their registers with a raw data file comprising the major keys and identifiers. In a second phase (in Winter 2001), these communes will be supplied with the definitive, validated harmonization data file which can be incorporated into their inhabitants' register. This distribution of Population Census data is a first step towards harmonizing administrative registers.

Following register harmonization on a voluntary basis, the SFSO will in the end have register harmonization embodied in legislation on the basis of article 65 of the

new Federal Constitution. The plan (with a time horizon of 2004/2005) is for a Federal Law on Registers of Persons to come into force, regulating nationwide coordination and harmonization of such registers, registrations 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 Population Census 2000. The information requested directly from the general public in future will depend on the development and inter-linking of Swiss registers as well as on the information mandate of future population censuses.

Developing a building and dwelling register

The SFSO will use the data from the Population Census 2000 to develop a Federal Building and Dwelling Register. It is to contain basic information about building and housing stocks as well as appropriate identifiers and will be 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 Master address file of buildings. Cantons and communes will be able to hook up to it and use it for performing their statutory functions.