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## Development of the use of administrative data in population and housing censuses in Europe<sup>1</sup>

### Introduction

There are big differences between European countries in respect of their census experience and plans concerning the use of administrative data or other approaches, alternative to the traditional census taking.

When the present EEA countries are looked at from the point of view of their plans on the 2000 round of censuses and beyond, they fall roughly in the following four groups:

The first group is *Countries with traditional census*, which use administrative data and registers mostly only as supporting tools in organising the field work and in data collection, and have no specific plans to replace the traditional model by a new one. Countries belonging to this group are the southern European countries Greece, Italy, Portugal and Spain and Ireland and United Kingdom from the middle of Europe. The second group is *Countries with entirely or largely register based census*; Nordic countries, Denmark, Finland, Iceland, Norway and Sweden belong to this group. The third group of countries is *Countries in transition from traditional to register-based census*; these countries are Austria, Belgium, Luxembourg and Switzerland. They are either planning a register-based, or largely register-based census around 2000 or building up their capabilities for a totally register-based census after 2000. The fourth group is *Countries seeking for another solution*. This may involve a lot of using of administrative data, but the aim is not to rely entirely on administrative data sources of around 100% coverage of population. Countries belonging to this group are France, Germany and Netherlands.

Most of the central and eastern European countries are planning to take traditional censuses.

### Countries with traditional census

Greece will carry out a traditional census in Spring 2001. A full scale census test will be made in 9 of March 1999. OCR and IR techniques will be used first time in census. The use of administrative data is restricted to census cartography and preparation of the field work.

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Italy will carry out a traditional census in 2001. Italy will also carry out the first census on buildings in connection with the population census. Administrative data will be used mainly for census cartography and preparation of the field work. However, the local population registers will be updated in the census and their extensive use in the future censuses has been discussed.

Portugal will carry out a traditional population census in April 2001. A census test was carried out last October. E.g. use of optical reading techniques will be tested. Administrative data will be used mostly for census cartography and support of the field work. A special law will be given for census cartography in order to facilitate co-operation with the postal service and other actors in the field of cartographic data.

Spain will carry out a largely traditional census in Spring 2001. However, due to a recent change in legislation concerning civil registration, the local population registers will be updated at continuous basis, instead of every five-year renovations. This will make it possible to combine data from local registers (date and place of birth, sex and nationality) with information collected by census forms. Optical reading and image recognition, as well as pre-printing of enumerator's route note-books, will be tested in census tests.

Ireland has been taking traditional censuses every 5 years and the next one will be in 29 April 2001 (provisional). The five year period has made it possible for Ireland to develop and maintain a well-going traditional census engine. Even if the cost pressures are there, the variations are not overly big and the "core of the infrastructure can be maintained between censuses. Because of the cost and time pressures process automation is planned to be used extensively in data capturing, checking and coding. On the other hand, the use of administrative data is minimal.

The United Kingdom has a markedly similar census to that of Ireland, albeit decennial. Even the next census date is the same 29 April 2001. Because of cost and timeliness pressures, the ONS has invested a lot to develop the processes of data capture, coding, checking, editing and imputation as effective as possible with extensive quality controls in every phase. Through scanning the whole census form and using extensive OCR and IR techniques, the paper census forms will be made obsolete early in the process. "Manual" processing will be minimised through extensive use of automatic coding, editing and imputation. The use of administrative data is minimal and only for field work support.

### **Countries with entirely or largely register-based census**

The Nordic countries, Denmark, Finland, Iceland, Norway and Sweden all introduced central population registers and unique person numbers around 1960s on the basis of local civil registration systems. This created a situation where almost all the basic data needed to compile standard demographic statistics was available in one single source. That is the reason why use of register data for the demographic part of the census became feasible in these countries around 1970 censuses. Since then the share of administrative data as data source for census variables has been increasing. The development of the use of administrative data in the censuses in Denmark, Finland, Norway and Sweden from 1950 to 1990/91 for different census topics is shown in the Annex.

Completing of the central population register with dwelling and building data and introduction of register-based employment statistics led to entirely register-based censuses in Denmark in 1981 and in Finland in 1990. Sweden introduced a register-based employment statistics in 1985, but building and dwelling register remained lacking. The traditional part of the 1990 census in Sweden was mainly the housing part. Development in Norway has been quite similar to Sweden. However, Norway experimented in 1990 with a sample census, which in fact postponed the increase in the use of administrative data. Iceland has both demographic data and housing data in their register system but data on economic activity of the population is lacking.

The 2001 censuses in *Denmark*, *Finland* and *Iceland* will be entirely register-based censuses. Iceland will build up a system of register-based employment statistics before the census. The census date in Denmark is 1.1.2001. Finland has not yet decided between 31.12.2000 and 1.1.2001. Iceland has not yet specified the date within the year 2001.

2001 censuses in *Norway* and *Sweden* will be based on registers for the part of demographic characteristics and economic activity of the population and on census questionnaires for the part of housing, buildings and dwellings. Sweden had as a goal to establish a register on buildings and dwellings before 2001 census, but did not succeed in it. Norway is planning to establish a register on buildings and dwellings in connection with the census. The census date in Norway will be 3.11.2000 and in Sweden 1.1.2001.

### **Countries in transition from traditional to register-based census**

*Austria* will carry out a largely traditional census in May 2001. OCR and image recognition techniques, as well as automatic coding will be used in processing of census data. However, also registers will be used in several ways. E. g. the register of buildings will be used in field work preparations. Business register and agricultural register will be used in object recognition and in coding and also they will replace the direct data collection on legal status and size of firm. The quality of central registers has been improving and the 2001 census is expected to be the last traditional census in Austria.

*Belgium* will carry out a partly register-based and partly traditional census in Mars 2001. Most of the demographic and social data can be derived from the population register and the social security files. For collecting the lacking data, there are two alternatives: either a total count or using a 25% sample. The choice has not yet been made.

*Luxembourg* is going to carry out a 'semi-traditional' census probably in March 2001. The quality of the central population register is not yet good enough to rely entirely on it. However, the central population register will be used to preprint the census forms. The use of the register will be tested in autumn 1999.

The census in the 5th of December in *Switzerland* will be carried out through a questionnaire but registers and administrative records are used to support the census operations. Legislation has been changed (including confidentiality regulations) so that the municipalities can establish a dwelling register in the context of the census. There are 4 data collection variants which are to be tested. The census costs are a critical factor and a number of means, like OCR and automatic coding are being applied in order to reduce them. This will probably be the last traditional census in Switzerland.

### **Countries seeking for another solution**

*France* is going to take the next census as early as the 8<sup>th</sup> of March 1999. It is a traditional census with enumerators. In order to reduce processing costs and to improve timelines automatic procedures in data capture, checking, editing and coding are being extensively used. Also some register data will be used to support the census operations (e.g. data on dwellings in data collection control and business register in coding the branch of industry). Also in France the total costs of a traditional census are heavily felt. Therefore there are plans to aim at a kind of continuous census after the 1999 census, which would involve a rotating total count with 5 year periods for most of the population and estimates to cover the gaps.

In *Germany*, where the census has a particularly negative image, the official plan to produce year 2001 census data is to base population estimates on the local Registers of Population, to derive employment data for small areas from registers of employment, and otherwise to rely on the 1 per cent micro-census and other statistical sources. Some Länder have proposed an alternative or complementary model, which would add to

Bundesmodell" a postal housing census and a sample survey to complement register-based employment data.

The Netherlands has developed a distinctive approach of its own. Their census will be a combination of extensive information from administrative sources and of results from sample surveys. The data gathered will be used to build up, through imputation, micro-files covering the whole population. The number of registers used is almost as extensive as in the Nordic countries but the distinctive additional feature is the integration of survey data and register-based data.

### **Central and Eastern European countries**

Most of the central and eastern European countries are planning to hold traditional censuses around 2001. Only Latvia and Slovenia are planning extensive use of registers (population register and building and dwelling register) in addition to census forms. Because of insufficient international donor support, some of the countries, especially among the Newly Independent States, possibly do not have enough capacities to carry out censuses effectively in the next few years.

Among the central European countries a traditional census will be taken in spring 2001 in Bulgaria, 1.3.2001 in Czech Republic, 31.3.2000 in Estonia, 1.1.2001 or in early spring in Hungary, in December 1999 in Lithuania, 31.3.2001 in Former Yugoslav Republic of Macedonia, 21.5.2001 in Poland, in March 2001 in Romania and in May 2001 in Slovak Republic. Optical reading and automatic coding is planned to be used in several of these countries. Some of the countries also use population register and real estate register to support the field work.

Latvia is going to carry out partly traditional and partly register-based census in 1 of January 2000. About 10 population items out of 33 will be taken from the population register also the use of building and dwelling register is being considered.

Slovenia is also going to carry out partly traditional and partly register-based census in 31.3.2001. Central population register, business register and real estate register are going to be used both to replace direct data collection and to support the field work, data checking and coding. The use of OCR techniques is being considered.

Development of the use of registers and administrative records in the population and housing censuses of Finland, Denmark, Norway and Sweden since 1950

Table 1: Use of registers and administrative records in population and housing censuses in Finland

Items:	1950	1960	1970	1975	1980	1985	1990
Demographic data							
Sex, day of birth	q	q	q	R	R	R	R
Marital status	q	q	q	R	R	R	R
Mother tongue	q	q	q	R	R	R	R
Citizenship	q	q	-	R	R	R	R
Religion	q	q	R	-	R	R	R
Economic data							
Main type of activity	q	q	q	q	q	(q)1R	
Occupational status	q	q	q	q	q	(q)1R	
Branch of industry	q	q	q	q	q	(q)1	R
Occupation	q	q	q	q	q	(q)1	R
Employer, place of work	q	q	q	q	q	(q)1	R
Socio-economic status	q	q	q	q	q	(q)1	R
Income		-	-	R	R	R	R
Education							
Completed education	q	q	q	R	R	R	R
Household and family data							
Type and size of household	q	q	q	q	R	R	R
Type and size of family	q	q	q	q	R	R	R
Housing							
Size of dwelling unit	-	q	q	q	q	R	R
Number of rooms	q	q	q	q	q	R	R
Amenities	q	q	q	q	q	R	R
Tenure status	q	q	q	q	q	R	R
Buildings							
Year of construction	q	q	q	q	q	R	R
Construction material	q	q	q	-	q	R	R
Main use of building	q	q	q	-	q	R	R
Number of dwelling units	q	q	q	-	q	R	R
Heating system	-	q	q	-	q	R	R
Co-ordinates of building	-	-	q	R	R	R	R
Floor area of building	-	q	q	-	q	R	R
Number of stories	q	q	q	-	q	R	R

q = data obtained by census form

R = data obtained from registers or administrative records

() = data partly from forms and partly from registers/administrative records

- = item not included in the census

1) data of non-respondents obtained from registers and administrative records

Table 2: Use of registers administrative records in population and housing censuses in Denmark

Items:	1950	1960	1970	1976	1981	1991
Demographic data						
Sex, day of birth	q	q	(q)	R	R	R
Marital statusq	q	q	R	R	R	
Mother tongue -	-	-	-	-	-	
Citizenshipq a) -	-	R	R	R		
Religion-	-	-	-	-	-	
Economic data						
Main type of activity	q	q	q	R	R	R
Occupational status	q	q	q	R	R	R
Branch of industry	q	q	q	Rd)	R	R
Occupationq	q	q	R	R	R	
Employer, place of work	q a)-	q a)Rd)	R	R		
Socio-economic status	q	q	q	R	R	R
Income-	-	-	-	R	R	
Education						
Completed education	-	-	-	Rd)	R d) R	
Household and family data						
Type and size of householdq	q	q	-	R	R	
Type and size of family	q	q	q	R	R	R
Housing						
Size of dwelling unit	-	-	-	-	R	R
Number of rooms	q c)	q b) q	-	R	R	
Amenitiesq c) q b) q	-	R	R			
Tenure statusq c) q b) q	-	R	R			
Buildings						
Year of construction	q c)	q b)	q	-	R	R
Construction material	-	-	-	-	-	-
Main use of building	-	-	-	-	R	R
Number of dwelling unitsq c) q b)	q	-	R	R		
Heating systemq c) q b) q	-	R d)R d)				
Co-ordinates of building-	-	-	-	-	-	
Floor area of building-	-	-	-	-	-	
Number of stories	-	-	-	-	-	-

- q = data obtained by census form  
R = data obtained from registers or administrative records  
( ) = data partly from forms and partly from registers/administrative records  
- = item not included in the census  
a) = data included in the form but not processed  
b) = only sample of data processed  
c) = data only from urban areas and only sample processed  
d) = insufficient data

1)period of construction on the form, sample data in earlier censuses

Table 3: Use of registers and administrative records in population and housing censuses in Norway

Items:	1950	1960	1970	1980	1990
Demographic data					
Sex, day of birth	q	q	q	R	R
Marital statusq	q	q	R	R	
Mother tongue-	-	-	-	-	
Citizenship/country of birthq	q	-	R	R	
Religionq	q	q	q	s	
Economic data					
Main type of activity	q	q	q	q	s
Occupational status	q	q	q	q	s
Branch of industry	q	q	q	q	s
Occupationq	q	q	q	s	
Employer, place of work	q	q	q	q 1)	s
Socio-economic status	-	-	-	(q)	s
Income-	-	R	R	R	
Education					
Completed education	q	q	q	(R) 2)(R) 2)	
Household and family data					
Type and size of householdq	q	q	q	s	
Type and size of family	q	q	q	R	s
Housing					
Size of dwelling unit	-	-	-	q	s
Number of rooms	q	q	q	q	s
Amenitiesq	q	q	q	s	
Tenure statusq	q	q	q	s	
Buildings					
Year of construction	q	q	q	q	s
Construction material	-	q	q	-	s
Main use of building	-	-	-	-	s
Number of dwelling units-	q	q	q	s	
Heating systemq	-	-	q 3)	s	
Co-ordinates of building	-	-	-	-	-
Floor area of building	-	-	-	-	-
Number of stories	-	q	q	-	-

q = data obtained by census form

R = data obtained from registers or administrative records

s = data obtained from census sample survey

( ) = data partly from forms and partly from registers/administrative records

- = item not included in the census

1) data from administrative records used in coding

2) education completed abroad asked on census form

3) residential buildings

Table 4: Use of registers and administrative records in population and housing censuses in Sweden

Items:	1950	1960	1970	1975	1980	1985	1990
Demographic data							
Sex, day of birth		R	R	R	R	R	R
Marital status	q	q	q	R	R	R	R
Mother tongue	-	-	-	-	-	-	-
Citizenship	R	R	R	R	R	R	R
Religion	-	-	-	-	-	-	-
Economic data							
Main type of activity	-		q	q	q	q	R R
Occupational status	-		q	q	q	-	-
Branch of industry	-		q	q	q	q	R R
Occupation	q	q	q	q	q	q	
Employer, place of work-			q	q	q	q	R R
Socio-economic status	q	q	q	q	-	q	(q)1 (q)1
Income	R	R 2)	R	R	-	R	R
Education							
Completed education	-		q	q	-	-	q
Household and family data							
Type and size of household-			q	q	q	R	q q
Type and size of family	q	q	q	q	q	(-)	R R
Housing							
Size of dwelling unit	-	-	-	-	-	-	-
Number of rooms	-	q	q	q	q	q	q
Amenities-	q	q	q	(R)	q	q	
Tenure status-	q	q	q	q	q	q	
Buildings							
Year of construction	-	q	q	q	q	R 3)	q q
Construction material	-	-	-	-	-	R 3)	-
Main use of building	-	q	q	q	q	R 3)	q q
Number of dwelling units-			q	q	q	R 3)	q q
Heating system-	q	q	q	R 3)	q	q	
Co-ordinates of building	-	-	-	-	-	R 3)	R R
Floor area of building	-	-	-	-	-	-	-
Number of stories	-	q	-	-	-	-	-

q = data obtained by census form  
R = data obtained from registers or administrative records  
( ) = data partly from forms and partly from registers/administrative records  
- = item not included in the census

1) classification derived from other census items  
2) sample  
3) Data was collected by tax authorities, not of good enough quality