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Item 2 of the provisional agenda

Census methodology

### **Census methodology: Key results the UNECE Survey on National Census Practices, and first proposals about the CES Recommendations for the 2020 census round**

Note by the UNECE Task Force on Census methodology

#### *Summary*

In early 2013, the UNECE conducted an online survey among its member countries on national practices in the 2010 round of population and housing censuses. This document presents an overview of the main results of the survey and some first proposals about the preparation of new Conference of European Statisticians Recommendations for the 2020 Round of Population and Housing Censuses, with regard to census methodology and related issues.

## **I. Question on conducting a Census**

1. Most of the 51 UNECE countries that participated in the online survey have conducted a census during the 2010 round. Four countries (Bosnia-Herzegovina, Georgia, Republic of Moldova and Ukraine) have not yet done so, but are still planning to conduct a (traditional) census during this round. The (traditional) census in the Former Yugoslav Republic of Macedonia was cancelled in 2011 and there are as yet no firm plans to take another one. This country has therefore been excluded from the following analyses. The response on the questionnaire was high and the results of 50 countries are being compared.

## II. Main Census methodology

2. As expected different countries have used different methodologies. Some countries reported differences in the methodology applied between the population and the housing censuses. In many cases this has something to do with the availability of registers for the different domains. Costs can be reduced if registers are available for producing official statistics. Another driver for using registers is the declining response rates in surveys. In Table 1 an overview is given of the countries in the UNECE region by type of census methodology in the 2010 round.

Table 1

### Country by type of census methodology

<i>census methodology</i>	<i>countries</i>
<b>Traditional Census</b>	
Full field enumeration, no use of registers:	Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Canada, Croatia, Cyprus*, Georgia, Greece*, Kazakhstan, Kyrgyzstan, Luxembourg*, Montenegro, Portugal*, Republic of Moldova, Russian Federation, Serbia, Tajikistan, Ukraine
Full field enumeration, supported by registers as frame or control only:	Bulgaria*, Czech Republic*, Hungary*, Ireland*, Italy*, Malta*, Romania*, Slovakia*, United Kingdom*
Full field enumeration, with annual sample updates:	United States
Rolling census:	France*
<b>Combined Census</b>	
Register plus full field enumeration for selected variables:	Estonia*, Latvia*, Liechtenstein*, Lithuania*
Register plus sample field data for selected variables:	Germany*, Israel, Poland*, Spain*, Switzerland, Turkey
<b>Register-based Census</b>	
Register-based census using data from existing sample survey for selected variables:	Belgium*, Iceland*, Netherlands*
Fully register-based census:	Austria*, Denmark*, Finland*, Norway*, Slovenia*, Sweden*

Note: \*Country in the European Economic Area

### A. Traditional Census

3. The traditional census approach collects basic characteristics from all individuals and housing units (full enumeration) at a specific point in time. More detailed characteristics can be collected either from the whole population or on a sample basis. Collection modes may include personal interviews (canvasser approach), self-completed

paper questionnaires, telephone (computer-assisted or not) and Internet. The traditional census approach is still the most common approach used for census-taking in the world.

4. Most of the countries with a traditional census have personal face-to-face interviews using paper questionnaires as their main approach. However, personal face-to-face interviews using electronic questionnaires ('computer-assisted personal interviewing' abbreviated as CAPI) is the main approach in Cyprus, self-completion of paper questionnaire by respondents is the main approach in Czech Republic, France, Ireland, Italy, Luxembourg, Slovakia, the United Kingdom and the USA and Internet response option (CAWI) on-line is the main approach in Canada. In Portugal self-completion of paper questionnaire by respondents and Internet response option ('computer-assisted web interviewing' abbreviated as CAWI) on-line had the same popularity.

5. Full field enumeration without using register information (traditional census) is still (as in the last census round of 2000) the most popular method in the UNECE region. Almost two thirds of countries collected data using 'traditional' methods. This is the most common general methodological approach throughout the region, but is less so than in the 2000 round in which four fifths of countries adopted this approach.

6. A substantial minority (33 per cent) of the full field enumeration countries supported the information collected by register information used only as frame or control. However, here we find a difference between EEA and non-EEA countries. For the EEA countries with a traditional census the clear majority (69 per cent) has full field enumeration supported by register information used only as frame or control. For the non-EEA countries with a traditional census the vast majority (94 per cent) reported to have full field enumeration without using register information.

7. Only one country reported to have traditional enumeration with yearly updates of characteristics on a sample basis (United States) and only one country reported to have a rolling census (France). A rolling census represents a further alternative approach to the traditional model of census taking by means of a cumulative continuous survey, covering the whole country over a period of time, rather than on a particular day.

## **B. Combined Census**

8. Four countries (Estonia, Latvia, Liechtenstein and Lithuania) used a combination of register data with complete field data collection for selected population census variables. Six countries (Germany, Israel, Poland, Spain, Switzerland and Turkey) used a combination of register data with ad-hoc sample data collection for selected population census variables.

## **C. Register-based Census**

9. A growing number of EEA countries have moved to methods without any field data collection. For their population and housing census these countries rely on registers and skipped the census questionnaire completely. For their population census some of these countries have 'recycled' information from their Labour Force Survey in combination with registers (Belgium, Iceland and the Netherlands). Finally, some countries have used registers only in this census round (Austria, Denmark, Finland, Norway, Slovenia and Sweden). All nine register countries collected the census information relating to their housing entirely from registers.

## D. Conclusions

10. On the map (Figure 1) of the UNECE area below interesting East-West and North-South tendencies in census methodology can be found. Three main categories are distinguished on the map: traditional (31 countries), combined (10 countries) and register based (9 countries). Register based censuses are becoming increasingly popular in northern Europe, combined censuses are more often found in central Europe. Traditional censuses continue to be more popular in English speaking and CIS countries. All UNECE countries outside Europe conduct traditional censuses. Only Uzbekistan did not (plan to) conduct a census in this round.

## III. Types of registers used

11. Almost half of the countries responded not to use any register information for their census. In the EEA only 8 out of 30 countries responded not to use any register information for their census. The analysis for the countries with traditional censuses is somewhat hampered by inconsistencies in the given answers. Some countries for instance have reported to take data from a register but do not have a register-based or combined census. Probably this should be interpreted as information from registers as frame or control. More difficult is how to interpret this answer of countries with full field enumeration without using register information.

12. Where registers were used to take information from, the population register is the most popular one to use, in the second place followed by the building or dwelling register and in the third place by the social security register. Many countries mentioned other registers that could not be classified in one of the categories specified in the on-line survey, often because they were country specific (e.g. education, health, income and occupation registers). Table 2 gives the main type of registers used in register-based and combined censuses.

Table 2

### Type of registers used in register-based and combined censuses

<i>Type of register</i>	<i>Used by different countries</i>	
	<i>Register-based census</i>	<i>Combined census</i>
<b>Total countries</b>	<b>9</b>	<b>10</b>
Population register	9	10
Address register	6	5
Building or dwelling register	9	7
Employment/unemployment register	9	3
Social security register	7	7
Education register	6	2
Tax register	6	5
Business register	7	5
Other registers	8	5

Figure 1  
 UNECE member countries by census method – 2010 census round



#### IV. Percentage of census data collected by each method

13. The countries were asked to give their percentages of census data collected by each method. This way an indication is given of the importance of the different sources. The majority of countries have full field enumeration. The most commonly adopted enumeration method was face-to-face interview. In almost all those cases the information was recorded onto paper questionnaires. Countries with a traditional census that did not adopt face-to-face interview most often used a self-completion questionnaire.

14. The most popular data collection methods (in terms of highest proportion of data collected) are:

(a) Personal face-to-face interview, using paper questionnaire (22 countries). It is the only way of response in 18 countries.

(b) Registers and administrative sources (12 countries): all nine register-based countries and three countries with a combined census (Germany, Poland and Switzerland).

(c) Self-completion of paper questionnaire by respondents (10 countries).

15. CAPI is the most popular method in Latvia, Israel and Turkey; internet completion is the most popular method in Canada and Estonia. Finally, Portugal reported that the two self-completion options (paper form and internet) had the same popularity.

16. A remarkable fact is the huge differences in internet response by country. Only two countries came to more than 50 per cent internet response: Canada reported 55 and Estonia 67 per cent, Germany and Slovakia less than 10 per cent. Switzerland reported only 1 per cent internet response, but got 97 per cent of the data from registers. Off-line internet (a form is downloaded from the internet and then a paper copy is filled in and returned physically) was only used in Czech Republic.

17. Another remarkable fact is the minor role of existing surveys to replace census questions (the vast majority of census variables in Belgium, Iceland and the Netherlands come from registers). In the last census round existing surveys played a much more important role in the census of the Netherlands.

18. Table 3 presents information by type of census and enumeration method used. Some countries adopted more than one data collection method. Accordingly, in such cases, the percentage of data collected by each method is presented. These percentages add up to 100 per cent. Percentages are as much as possible calculated in terms of census variables. If percentages would have been calculated based on number of records completely different results could have been reached. The Netherlands would then have reported 99.9 per cent registers and Spain 58.8 per cent. These percentages are higher than reported in Table 3 as for variables from registers full information is obtained. This explains why in Spain the five census topics from registers dominate the 40 topics from sample field data in terms of number of records.

Table 3  
**Census year and proportion of data collected by type of census and enumeration method**

Type of census methodology	Census year	Proportion of data collected by data collection method						Registers	Existing surveys
		Interview			Self-completion		Registers		
		Paper form	CAPI	Tele-phone	Paper form	Internet			
<b>Traditional Census</b>									
<i>Full field enumeration, no use of registers</i>									
Albania	2011	100	-	-	-	-	-	-	-
Armenia	2011	100	-	-	-	-	-	-	-
Azerbaijan	2009	100	-	-	-	-	-	-	-
Belarus	2009	100	-	-	-	-	-	-	-
Bosnia-Herzegovina <sup>†</sup>	2013	100	-	-	-	-	-	-	-
Canada	2011	12	-	2	30	55	-	-	-
Croatia	2011	100	-	-	-	-	-	-	-
Cyprus*	2011	-	100	-	-	-	-	-	-
Georgia <sup>†</sup>	2014	100	-	-	-	-	-	-	-
Greece*	2011	100	-	-	-	-	-	-	-
Kazakhstan	2009	100	-	-	-	-	-	-	-
Kyrgyzstan	2009	100	-	-	-	-	-	-	-
Luxembourg*	2011	-	-	-	100	-	-	-	-
Montenegro	2011	100	-	-	-	-	-	-	-
Portugal*	2011	-	-	-	50	50	-	-	-
Republic of Moldova <sup>†</sup>	2014	100	-	-	-	-	-	-	-
Russian federation	2010	100	-	-	-	-	-	-	-
Serbia	2011	100	-	-	-	-	-	-	-
Tajikistan	2010	100	-	-	-	-	-	-	-
Ukraine <sup>†</sup>	2013	100	-	-	-	-	-	-	-
<i>Full field enumeration, supported by registers as frame or control only</i>									
Bulgaria*	2011	59	-	-	-	41	-	-	-
Czech republic*	2011	-	-	-	73	27	-	-	-
Hungary*	2011	65	-	-	16	19	-	-	-
Ireland*	2011	-	-	-	100	-	-	-	-
Italy*	2011	-	-	-	67	33	-	-	-
Malta*	2010	99	-	1	-	-	-	-	-
Romania*	2011	100	-	-	-	-	-	-	-
Slovakia*	2011	-	-	-	93	7	-	-	-
United kingdom*	2011	-	-	-	84	16	-	-	-
<i>Full field enumeration, with annual sample updates</i>									
United States	2010	33	-	-	63	-	-	-	-
<i>Rolling census</i>									
France	2010	1	-	-	99	-	-	-	-

(table continues on next page)

Type of census methodology	Census year	Proportion of data collected by data collection method						Registers	Existing surveys
		Interview			Self-completion				
		Paper form	CAPI	Tele-phone	Paper form	Internet			
<i>(table continues from previous page)</i>									
<b>Combined Census</b>									
<i>Register plus full field enumeration for selected variables</i>									
Estonia*	2011	-	32	-	-	67	1	-	
Latvia*	2011	-	59	-	-	32	9	-	
Liechtenstein*	2010	-	-	-	65	25	10	-	
Lithuania*	2011	61	-	-	-	34	5	-	
<i>Register plus sample field data for selected variables</i>									
Germany*	2011	15	-	-	30	5	50	-	
Israel	2008	-	60	20	10	-	10	-	
Poland*	2011	-	22	3	-	12	63	-	
Spain*	2011	-	10	-	48	37	-	-	
Switzerland	2012	-	-	-	2	1	97	-	
Turkey	2011	32	48	-	-	-	20	-	
<b>Register-based Census</b>									
<i>Register-based census using data from existing sample survey for selected variables</i>									
Belgium*	2011	-	-	-	-	-	98	2	
Iceland*	2011	-	-	-	-	-	97	3	
Netherlands*	2011	-	-	-	-	-	95	5	
<i>Fully register-based census</i>									
Austria*	2011	-	-	-	-	-	100	-	
Denmark*	2010	-	-	-	-	-	100	-	
Finland*	2010	-	-	-	-	-	100	-	
Norway*	2011	-	-	-	-	-	100	-	
Slovenia*	2011	-	-	-	-	-	100	-	
Sweden*	2011	-	-	-	-	-	100	-	

\*Country in the European Economic Area

†Figures for Bosnia-Herzegovina, Georgia, Republic of Moldova and Ukraine have been estimated.

## V. Some thoughts and proposals for the ‘Recommendations for the 2020 Censuses of Population and Housing’ regarding census methodology

19. In this second half of the paper the Task Force on Methodology proposes a number of changes in the CES Census Recommendations regarding census methodology. The changes are based on the experience of the 2010 census round and the results presented in the first half of this paper. With these changes the ‘Recommendations for the 2020 Censuses of Population and Housing’ regarding census methodology could be drafted. The changes relate to Chapter I (20 pages) and Appendices II -VII (44 pages) to which the reader is referred in Chapter I. Almost a third of the pages of the CES Census Recommendations relate to methodology. Also other Task Forces (e.g. the one on Quality and Coverage) may have thoughts on the pages discussed below. Ideally, the proposals for the different Task Forces are combined before the new recommendations are drafted.

## A. Thoughts and proposals for Chapter I

Section 17: the link to the Fundamental Principles should be reviewed.

Section 24b: “no other means than the census to collect data on the topic” seems questionable for register-based and combined censuses.

Section 31: the text on sampling should be updated.

Section 44: the reference made to FAO work on the Agricultural Census must be renewed.

Section 49: the described division in four approaches is a bit outdated.

- a) The traditional census seems to be correctly described.
- b) The yearly updates happen to be in the USA only. That is not a problem, but then also the rolling census of France deserves a separate category.
- c) The described register-based census category excludes countries that supplement with existing survey information.
- d) The described combined census category should only include combinations with fieldwork.

This implies reworking all of sections 49-58.

Section 52: it is unclear what other approaches are meant.

Section 54: from the UNECE survey of this year it is learnt that there is a further move to use more registers and conduct less or even no fieldwork.

Section 58: from the UNECE survey of this year it is learnt that there is more use made of mail-back and Internet (although in the 2010 round not many countries had more than 50 per cent Internet Census data collection).

Appendix II should be moved to after section 58 and included in this chapter as it contains crucial aspects of census methodology.

Section 66: years should be adapted reflecting the new round.

Sections 69-88: should be placed (together with appendices IV and V) in a separate chapter on Quality and evaluation to reflect to growing interest in these topics. This chapter could contain two major subchapters. First would be one on quality assurance and quality management. In the text on quality management the notion of risk needs to be more visible than in the current document. The second subchapter would be quality evaluation. Major elements to be addressed include: evaluating the quality of results from the perspectives of the variables; coverage error; quality evaluation with a view to lessons for the future.

## B. Thoughts on the Appendices II-VII

Appendix II-section 1: reference is outdated.

Appendix II-section 6: reference is missing.

Appendix II-section 11: reference should be updated.

Appendix II-sections 19-32: apply only to the USA.

Appendix II-sections 33-48: should become register-based, possibly supplemented by recycling already existing survey information.

Appendix II-sections 49-54: should become combined census (registers and census fieldwork partial enumeration).

Appendix II-sections 55-68: should become combined census (registers and census fieldwork complete enumeration).

Appendix II-sections 69-74: apply only to France.

Appendix III: do we have more recent principles?

Appendix IV-section 28: contains very old references.

Appendix VII-section 15: slogans need to be updated to recent ones.

### **C. Final remarks**

20. The thoughts above are a bit in staccato style. The Task Force on Census methodology has tried to indicate why they are of the opinion that some of the recommendations regarding methodology have to be revised. If possible it is also tried to make clear how they should be changed in the view of the Task Force. Sections not mentioned could keep the text of the current recommendations without any change.

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