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USE OF THE INTERNET RESPONSE FOR CENSUSES OF THE 2010 ROUND IN THE UNECE REGION

Prepared by

Mr. Paolo Valente
United Nations Economic Commission for Europe

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1. Introduction

For the 2010 round of population and housing censuses, modern technologies were used to support various stages of their census by many member countries of the United Nations Economic Commission for Europe (UNECE), including countries that adopted a traditional census approach (based on the direct count of all individuals and the collection of their characteristics on census forms), and others that adopted different forms of alternative census methodologies.

Among the various modern technologies used in the UNECE region in the 2010 census round, this papers focuses on the use of the internet response option. This is a relatively recent technology that was widely used in connection with both traditional and alternative census methodologies, when there was a sample or full field data collection.

The next section presents information on which UNECE countries used the internet response option in the 2010 census round, and on the other enumeration methods used in connection with the internet response.

Then some preliminary results are presented on the use of the internet response option, which in some cases show surprisingly high pick-up rates, and on the implications in terms of data quality.

The paper is based on information from various sources, including a worldwide survey conducted in 2009 by the United Nations Statistic Division (in cooperation with UNECE and Eurostat for the European region), a survey conducted in 2011 by the US Census Bureau in preparation for the review of the 2010 World Population and Housing Census Programme (at the February 2012 session of the United Nations Statistical Commission), papers submitted to various meetings organized by UNECE, and information collected for the UNECE wiki page on censuses[1].

2. Use of internet response and other enumeration methods

Internet response is a modern technology for data collection that is increasingly used in population and housing censuses as enumeration method, normally in combination with more traditional method like face-to-face interviews or self-enumeration based on paper questionnaires.

Already in the 2000 census round, the internet response was offered as an option to the respondents in some "pioneer countries" in the UNECE region (Australia, Belgium, Spain, Switzerland, United States, and Norway only for housing data).

The highest pick-up rate (4 per cent) was reported by Switzerland, while in the other countries no more than 1 per cent of the population used the internet response option. In the United States it was used on an experimental basis by about 60,000 respondents (0.02 per cent of the population) (UNECE, 2008)

In the 2010 census round, the internet response was offered as an option by a much higher number of UNECE countries, in some cases in the framework of a traditional census, in others as part of so-called "combined censuses", that are censuses based on data from registers combined with data from other sources, that could be:

[1] http://www1.unece.org/stat/platform/display/censuses/UNECE+Census+Wiki

- full or sample field data collection providing variables not available in registers or information on the accuracy of the data available on the registers;
- data from existing sample surveys (like the Labour Force Survey) with no field data collection.

In most countries where it is used, the internet response is proposed to the respondents as an *optional* enumeration method, alternative to a different "main" enumeration method, which is often self-enumeration based on paper questionnaire. However, in some UNECE countries, the internet response was used for the first time in the 2010 round as the *main* enumeration method. Therefore, it is interesting to look at what enumeration methods where used in the countries together with the internet response.

Table 1a presents the enumeration methods (including internet self-enumeration) used by the 31 UNECE countries that conducted a traditional census in the 2010 round. Face-to-face interviews was the most common enumeration method, used in 26 countries including 20 countries where it was the only enumeration method (all located in East and Southeast Europe, the Caucasus and Central Asia), and 6 countries where it was used in combination with other enumeration methods.

Self-enumeration based on paper questionnaire was used in 11 countries, in general as the main enumeration method. In five of these countries (Canada, Hungary, Malta, Portugal and Ukraine) it was used in combination with face-to-face interviews.

The internet response was offered in seven countries with a traditional census (Bulgaria, Canada, Hungary, Luxembourg, Portugal, Slovakia and the United Kingdom). Bulgaria was the only country offering the internet response in combination with face-to-face interviews (and not self-enumeration based on paper questionnaire). Luxembourg, Slovakia and the United Kingdom offered the internet response in combination with self-enumeration based on paper questionnaire (and not self-enumeration based on paper questionnaire). Canada, Hungary and Portugal, finally, used all three enumeration methods.

More than half of the countries that used self-enumeration with paper questionnaire (6 out of 11) also offered the internet response option.

Table 1a.
Enumeration methods used in the 2010 round in UNECE countries conducting a traditional census (31 countries)

		Enumeration methods:		
Country	*Census type*	*Face to face interview*	*Self –enumeration (questionnaire)*	*Self-enumeration (Internet)*
Albania	Traditional	x		
Armenia	Traditional	x		
Azerbaijan	Traditional	x		
Belarus	Traditional	x		
Bosnia-Herzegovina	Traditional	x		
Bulgaria	Traditional	x		x
Canada	Traditional	x	x	x
Croatia	Traditional	x		
Cyprus	Traditional	x		
Georgia	Traditional	x		
Greece	Traditional	x		
Hungary	Traditional	x	x	x
Ireland	Traditional		x	
Kazakhstan	Traditional	x		
Kyrgyzstan	Traditional	x		
Luxembourg	Traditional		x	x
Malta	Traditional	x	x	
Monaco	Traditional		x	
Montenegro	Traditional	x		
Portugal	Traditional	x	x	x
Republic of Moldova	Traditional	x		
Romania	Traditional	x		
Russian Federation	Traditional	x		
San Marino	Traditional		x	
Serbia	Traditional	x		
Slovakia	Traditional		x	x
Tajikistan	Traditional	x		
The former Yugoslav Republic of Macedonia	Traditional	x		
Turkmenistan	Traditional	x		
United Kingdom	Traditional		x	x
Ukraine	Traditional	x	x	

Table 1b presents the enumeration methods used by the 14 UNECE countries that conducted a combined census, based on the use of data from registers and other sources.

Two countries (Iceland and the Netherlands) used only data from registers and from existing sample surveys, but did not collect data in the field.

The other 12 countries with a combined census adopted different combinations of enumeration methods, including two or three methods between face-to-face interviews, self-enumeration with paper questionnaires and internet questionnaires. In the Czech Republic and Germany all these enumeration methods were used.

The internet response was offered as an option in 10 countries (Czech Republic, Estonia, Germany, Italy, Latvia, Liechtenstein, Lithuania, Poland, Spain, and Switzerland). Out of the 12 countries with combined census and field data collection, only Israel and Turkey did not offer the internet response.

Table 1b.
Enumeration methods used in the 2010 round in UNECE countries conducting a combined census (14 countries)

		Enumeration methods:			
Country	*Census type*	*Face to face interview*	*Self – enumeration (questionnaire)*	*Self-enumeration (Internet)*	*Registers*
Czech Republic	Combined	x	x	x	x
Estonia	Combined	x		x	x
Germany	Combined	x	x	x	x
Iceland	Combined				x
Israel	Combined	x	x		x
Italy	Combined		x	x	x
Latvia	Combined	x		x	x
Liechtenstein	Combined		x	x	x
Lithuania	Combined	x		x	x
Netherlands	Combined				x
Poland	Combined	x		x	x
Spain	Combined		x	x	x
Switzerland	Combined		x	x	x
Turkey	Combined	x			x

Considering together the UNECE countries with a traditional census or a combined census, the internet response was offered in the 2010 census round in 17 countries. This is over three times as high compared to the 2000 round, when only five countries offered the internet response option.

The percentage of UNECE countries offering the internet response option out of all those conducting a census in the 2010 round is 31 per cent (17 out of 55). Considering only UNECE countries with census field data collection, the percentage of those offering the internet response option increases to 40 per cent (17 out of 43).

3. Experiences on internet response in selected UNECE countries

Several UNECE countries reported on their experience with the internet response in their 2010 round census at the UNECE-Eurostat Meeting on Population and Housing Censuses[2] (Geneva, 24-25 May 2012) or at the Sixtieth plenary session of the Conference of European Statisticians[3] (Paris, 6-8 June 2012).

From the information reported – which in some cases is provisional - it appears that some UNECE countries obtained very high internet response rates (65% in Estonia, 54% in Canada, 50% in Portugal, 41% in Bulgaria, 34% in Lithuania, 33% in Italy, 30% in Latvia, 27% in the Czech Republic), which were often above the most optimistic expectations.

In this section, general information is presented on the strategies adopted in selected UNECE countries for the internet response. More detailed information on technical and organizational aspects of the solutions developed for the internet response are available in the papers submitted by the various countries (see the references at the end of this paper).

Estonia

In Estonia, internet response was used as the main enumeration method for the 2011 census, which was conducted in two stages. In the first stage, the internet census was conducted for one month (from 31 Dec 2011 to 31 Jan 2012), during which all permanent residents of Estonia had the possibility to complete the census questionnaires online. In the second stage, from 16 Feb to 31 Mar 2012, enumerators visited the households that did not complete the questionnaires during the e-census.

This approach was very successful and resulted in a very high 66 per cent rate of internet response (far above the target set at 25 per cent), the highest ever recorded in a population census. This exceptional result was due to the very high penetration of e-services in the country (99% of banking transactions are done online and 94% of all tax declarations are submitted digitally) and to the fact that Estonians are used to giving their private information to government institutions.[4]

Canada

Canada is one of the pioneer countries that conducted their first experiences with the internet response already in the 2001 census. Since then, Canada accumulated lot of experience in the 2006 and 2011 census (in Canada censuses are carried out every five years).

In the 2006 census, central mail-out was introduced with the use of an address register. The internet response option was used by 20 per cent of the households, which was considered as a big success.

In 2011 many changes were made to promote a higher rate of return via the internet while reducing risk of higher non-response. The main element of the approach was a wave methodology. The methodology consisted of repeated mail, telephone and face to face

[2] Documents are available at: http://www.unece.org/stats/documents/2012.05.census2.html
[3] Documents are available at: http://www.unece.org/stats/documents/2012.06.census.html.html
[4] News article "Estonian e-census: winning trust and breaking world records" (http://e-estonia.com/news/12-06-05/estonian-e-census-winning-trust-and-breaking-world-records)

reminders to non-respondents, to encourage them to primarily self-enumerate, and to do it by internet as a preferred mode. This method was tested successfully in 2009 before introduction in 2011. The implementation of this system in the 2011 census was very successful, as the internet collection response rate was over 54 per cent, well above the target that was set at 40 per cent (Statistics Canada, 2012).

Portugal

In Portugal, the internet response was offered to the respondents in alternative to self-enumeration using paper questionnaires. In the two weeks before census day (21 March 2011), all households received the questionnaires and a closed envelope with the identification codes necessary for the internet data collection. The data collection was organized in the following phases:

(i) In the week from 21 to 27 March only online responses were allowed, and enumerators sought to collect questionnaires in those living quarters where such responses were not possible;

(ii) In the period from 28 March to 12 April simultaneous online and paper-based responses were allowed; however, preference was given for online responses whenever that intention was expressed;

(iii) As of 12 April only paper-based responses were allowed.

The results were very successful, with an internet response rate around 50 per cent (Statistics Portugal, 2012).

Lithuania

In Lithuania the Census was conducted in March–May 2011. The e-Census, with a special portal available for the population, lasted for two weeks, from 1 to 16 March 2011. On 17 March–4 April, the preparation for the population enumeration was carried out. On 5 April–9 May 2011, the second stage of the Census took place: those who had not participated in the e-Census at all were visited by enumerators and asked to answer the questions of the questionnaire.

According to provisional data, about 34 per cent of the population was enumerated electronically through the e-Census (Statistics Lithuania, 2012)

Italy

In Italy, the 2011 census was conducted in a completely new way compared to the past. Lists of households were created on the basis of the municipality records, and received the questionnaires by mail. Households could choose the way in which they preferred to complete and return the questionnaire:

(a) Online, using the password provided with the questionnaire;

(b) At any post office in Italy;

(c) At one of the municipality census collection centres, at which specialist assistance for the completion of questionnaires was also available;

(d) Directly to a municipality enumerator.

The online participation was highly successful and better than predicted. According to provisional data, 33 per cent of respondents chose the Internet. In the pilot survey, the internet response rate had been only 9 per cent (Istat - Italian National Institute of Statistics, 2012).

Latvia

The Central Statistical Bureau of Latvia allowed completion of the census questionnaire via Internet for the whole population of Latvia. Two versions of the electronic questionnaire were worked out – one for the Internet (to be filled in by residents themselves), and the second one for computer-assisted interviews at residents' homes.

Three authorization methods were developed for the Internet-based Census questionnaire – PIN code and passport number, authorization via 5 commercial banks' Internet banking authorization, and electronic signature. Due to some technical problems, one identification method (PIN code and passport number) was closed on the third day of the Internet Census to ensure the security of personal data.

Initially, the Internet Census was planned for just 10 days, but due to the high interest - especially during the last day - it was prolonged for two days.

Taking into account the results of the Pilot Census, a response rate via Internet of at least 10 per cent of the population was forecast. Nevertheless, the result was very good – during the 12 days the Census ran, about 30 per cent of the total population's responses were received via Internet. Considering the high interest of the population and their willingness to complete the questionnaires via Internet, and the approval of the Census Commission, the CSB offered an additional opportunity to complete the Census questionnaires via Internet 10 days after the field work (Central Statistical Bureau of Latvia, 2012).

Czech Republic

In the 2011 census of the Czech Republic, the internet response option was offered for the first time. All inhabitants and owners of houses and dwellings could decide if they would use paper or electronic questionnaires. Census enumerators distributed to every household paper questionnaires bearing special identification codes for filling of the electronic questionnaires over the Internet.

All users could use both paper and electronic questionnaires in the same period for four weeks. The electronic questionnaires were used by 27 per cent of inhabitants (Czech Statistical Office, 2012).

United Kingdom

The internet response option was offered to respondents to the 2011 census in England and Wales for the first time.

All households received paper questionnaires and the identification codes required for the internet data collection. Households had the choice to fill either the paper questionnaires or the internet form. Internet response was not specifically encouraged in the census media strategy, as its main objective was maximising overall response.

The final internet response rate was 15 per cent, lower than the target which was set at 25 per cent. The relatively low internet response could be explained by various facts including the following (Office for National Statistics, 2012):

• All households were given their unique IDC code printed on their paper questionnaire, and this could have increased paper response, as it would have been perceived to be ‘easier’ than turning a computer on.

• The Census media strategy was focused on maximising overall response, rather than specifically encouraging on-line responses.

• The IDC questionnaire could only be easily completed using a broadband connection, which is available only in 50 – 80 per cent of households in each region of the UK.

4. Benefits of the internet response

In general, offering the internet response option in a census may lead to a number of potential benefits including (Moore et al., 2008):

(a) Improving/maintaining census participation (coverage) in an environment where response rates are dropping;

(b) Improving data quality;

(c) Long term reduction in costs and/or opportunities to redirect resource efficiencies;

(d) Responding to social/public expectations.

Unfortunately, information is still very limited on the benefits actually derived from the use of internet response in the census of the 2010 round.

Canada (2012) and the United Kingdom (2012) reported that the internet census provided better data quality and lower item non-response compared to the paper questionnaire, due to the use of filters, controls and warnings in the electronic questionnaires.

Among other advantages of the internet census, Canada reported the limited amount of paper used, and the positive impact on the environment.

In the United Kingdom, foreign-born respondents were reported to be more likely to use the online system. This may suggest that they were able to use the internet to translate some questions when completing their census returns, and this could have contributed to the better quality of the data collected online.

More information on the benefits of the internet response, but also on problems experienced and on cost/benefit analyses will be available in early 2013, as part of an online survey on national practices in the 2010 census round planned by UNECE.

5. Conclusions

The internet census is emerging as an important enumeration method that can be proposed as an alternative to the traditional filling of paper questionnaires, in the framework of a traditional census (based exclusively on field data collection) or of a combined census (based on data from registers and field data collection).

In the UNECE region, 17 countries offered the internet response option in the 2010 round census, including seven countries with a traditional census and ten countries with a combined census. About 40 per cent of the UNECE countries that collected field data for their census used internet response, making this an established enumeration method in the region.

Many of the countries that used the internet response reported very high take-up rates (over 30 per cent and up to 66 per cent in Estonia). In most cases the targets set before the census in terms of internet take-up were reached, and often the results were well above the most optimistic expectations, or the results of pilot tests.

Preliminary results available in selected UNECE countries seem to suggest that the internet response provided better data quality and lower item non-response compared to the paper questionnaire, due to the use of filters, controls and warnings in the electronic questionnaires. However, evidences are still limited on this, as well as data on other benefits of the internet response, on its costs, and on problems encountered.

A more complete assessment of the impact of the adoption of the internet response in the 2010 census round in the UNECE region will be possible once countries will have concluded the census operations, and more complete information will be made available.

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