

# OVERVIEW OF NATIONAL EXPERIENCES FOR POPULATION AND HOUSING CENSUSES OF THE 2010 ROUND<sup>1</sup>

Prepared by the  
United Nations Statistics Division  
New York  
June 2013

---

<sup>1</sup> Based on the results of a 2011/2012 survey on census methods used by countries in the 2010 census round.

Introduction.....	3
Summary of findings.....	4
Census Methodologies .....	5
Experience in use of Alternative Approaches to the Traditional Census .....	10
Enumeration Methods.....	13
Use of Technology in Census Operations.....	17
Data Dissemination Strategies .....	23
Collaboration among Countries During the 2010 Census Round.....	23
Successes and Challenges Experienced by Countries During the 2010 Census Round.....	27
Annex 1: Questionnaire for the 2010 World Population and Housing Census Program Review .....	28

## Introduction

1. For over six decades, the United Nations has supported national census taking worldwide through the World Programmes on Population and Housing Censuses spanning successive 10-year periods. During its thirty-sixth session in March 2005, the United Nations Statistical Commission launched the current 2010 World Population and Housing Census Programme covering the period 2005-2014. The United Nations Economic and Social Council approved the 2010 World Programme through its resolution 2005/13 which urges Member States to carry out a population and housing census at least once in the period 2005-2014 and to disseminate the census results in a timely manner.

2. Under the 2010 World Programme on Population and Housing Census, the United Nations Statistics Division (UNSD) is mandated to support national efforts to carry out population and housing censuses. UNSD works to strengthen national capacity for planning and carrying out population and housing censuses through the provision of international census guidelines and technical assistance. Moreover, as an integral component of its mandated activities, UNSD monitors progress in the implementation of national censuses, facilitates the international exchange and sharing of knowledge and information on census taking, and fosters regional cooperation, including South-South cooperation.

3. Starting in 2009, UNSD carried out two surveys to collect information on how countries are implementing their national censuses for the 2010 round mainly in terms of methodologies used and also use of modern technology during the different phases of the census operation. The first survey was carried out between May 2009 and January 2010<sup>2</sup> and was responded to by 138 countries or areas. UNSD analyzed the information, compiled and published the “Report on the Results of a Survey on Census Methods used by Countries in the 2010 Census Round”.<sup>3</sup>

4. The second survey was undertaken in July 2011 with a follow-up with non-responding countries in mid-2012 and was responded to by 126 countries or areas<sup>4</sup>. As its objective, the first survey was intended to better understand how countries were planning and conducting or otherwise compiling data for the 2010 round of censuses in order to also assessing country’s needs for assistance in implementing the round. The second survey, on the other hand, had the objective of collecting information on the lessons learned from the 2010 round of population and housing censuses from which recommendations would be made to the UN Statistical Commission for the 2020 census round. See Annex 1 for the survey questionnaire.

5. In response to the programme review, the United Nations Statistical Commission, *inter alia*:<sup>5</sup>

---

<sup>2</sup> For the European region, the survey was carried out in collaboration with the Statistics Division of the Economic Commission for Europe.

<sup>3</sup> The report is available at <http://unstats.un.org/unsd/censuskb20/KnowledgebaseArticle10696.aspx>.

<sup>4</sup> The second survey was undertaken as a response to a request by the United Nations Statistical Commission at its 42<sup>nd</sup> session for a program review of the 2010 World Population and Housing Census Programme. The program review was undertaken by the Census Bureau of the United States and presented at the 43<sup>rd</sup> session of the United Nations Statistical Commission (<http://unstats.un.org/unsd/statcom/doc12/2012-2-Censuses-E.pdf>).

<sup>5</sup> Official Records of the Economic and Social Council, 2012, Supplement No. 4 (E/2012/24/ E/CN.3/2012/34).

- (i) Welcomed the suggestion to initiate early enough a programme of work for the third revision of the *Principles and Recommendations for Population and Housing Censuses*, including the core census topics and the list of recommended tabulations; and
- (ii) Requested the United Nations Statistics Division to establish an Expert Group to begin work to assess the challenges faced in the 2010 round, discuss emerging trends, compile lessons learned and address a number of issues, including the desirable data release timelines, the use of information technology, legal provisions for privacy, confidentiality and contracting for outsourced census operations, and the use of administrative records and registers, where possible, to complement census information and reduce costs.

6. This report provides a review of the salient findings from the 2011/2012 survey - supplemented by information from the 2009/2010 survey. The report reviews country practices with regard to the follows topics (i) census methodologies (sources of data), (ii) experience in use of alternative approaches to the traditional census, (iii) enumeration method(s), (iv) use of technology in census operations, (v) data dissemination, (vi) collaboration among countries, and (vii) successes and challenges experienced by countries. The report is intended to provide input into the review and revision of the United Nations *Principles and Recommendations for Population and Housing Censuses, Revision 2*.<sup>6</sup>

## Summary of findings

7. The analysis of country information provided a good opportunity to assess country implementation of the 2010 round of population and housing censuses at the mid point of the decade. It provided a mid-decade snap-shot of country implementation as well as the methods used. Information through the survey shows that countries are becoming more innovative in terms of how they compile their census data and also in the technology that is being used in all phases of the process.

8. The mid-decade assessment also provided an opportunity to see which countries had already conducted their censuses and which ones had postponed them, as well as the challenges that they faced in implementing their censuses. This information was used by UNSD to provide census technical guidance to some countries.

9. In recent years, the use of new methodologies and technologies in conducting censuses has introduced substantial changes in almost all phases of population and housing censuses. An increasing number of countries have adopted some innovations in methodology and technology in the 2010 round of censuses in order to reduce census costs and also to improve the quality and timelessness of census data.

10. A significant number of countries have adopted new methodologies based on administrative registers and combinations of sources to produce census information. Others have used new technologies in all phases of the census in order to increase overall response, quality and timelessness of census data using such innovations as the Internet based census questionnaire, Personal Digital Assistants (PDAs), Short Message Service (SMS), GPS, GIS, and scanning technology. Countries have also become innovative in how they disseminate their census results in order to maximize utilization by

---

<sup>6</sup> United Nations Publication, Sales No. E.07.XVII.8.

mainly using the Internet to display and visualization of the data and also for housing of interactive databases.

11. The review of country experiences also shows strong collaboration among countries in census activities. A substantial proportion of countries reported either receiving or providing assistance to others on different aspects of census taking. This collaboration, mainly through south-south cooperation enhances sharing of good practices among countries. Many countries have identified census cost as a major challenge in the planning and conducting of their censuses for the 2010 round. This was the number one challenge in all regions of the world. On the other hand, countries reported that implementation of new technologies was the most successful aspect of census taking for the current round. It is worth noting that in general, countries reported more successes than challenges in the implementation of their censuses.

12. What follows is a discussion on major on the salient findings of the surveys with regard to national practices for census operations of the 2010 round.

## Census Methodologies

13. In the survey, countries were asked to indicate their main methodology, i.e., the main source of data used for the total population countries. Countries were instructed to choose only one from the following response categories: full enumeration (traditional census), administrative registers, pre-existing administrative records (not part of a register), rolling census, or other. Compared to previous census rounds, the 2010 round has witnessed a sizeable number of countries or areas that have developed and implemented alternative methodologies to the traditional census as the source for compiling comprehensive socio-economic statistics at the small area level. Although the majority of countries or areas are using the traditional census with full enumeration as the main census methodology, many countries have developed alternative methodologies to conduct their censuses as shown in table 1 below.

14. According to the information in table 1, 105 (85 per cent) out of the 123 countries that responded to this question indicated that the traditional census was their main methodology for collecting data for the total population count while 12 (10 per cent) are using administrative registers, and 6 (5 per cent) are using some other methodologies. There are regional variations in the main census methodology for deriving information for the total population count. All responding countries in Africa, North America, South America and Oceania are using the traditional census as their main methodology for deriving total population countries as compared to 87 per cent in Asia and 61 per cent in Europe. On the other hand, 7 per cent and 28 per cent of the countries in Asia and Europe respectively are using registers as the main source of total population count for the comprehensive socio-economic and demographic data. Countries using other methodologies are located only in Asia and Europe and are varied in the details of their methodologies as follows: **Afghanistan** where the Socio-Demographic and Economic Survey (SDES) is being carried out in lieu of the census for the 2010 round using staggered enumerations province by province in the period 2011 to 2015; **Germany** using a combination of register-based census, sample survey and traditional housing census; **Israel** using register based and sample field enumeration; **Italy** based on full field enumeration assisted by population registers; **Lithuania** based on administrative registers combined with enumeration; and **Poland** using administrative sources, Computer Assisted

Internet Interview (CAII), Computer Assisted Telephone Interview (CATI), and Computer Assisted Personal Interview (CAPI).

**Table 1: Main census methodology for the 2010 census round, by geographical region**

Geographical region	Total responding countries	Full field enumeration		Administrative registers		Others	
		No.	%	No.	%	No.	%
Africa	27	27	100				
America North	17	17	100				
America South	7	7	100				
Asia	30	26	87	2	7	2	7
Europe	36	22	61	10	28	4	11
Oceania	6	6	100				
Total	123	105	85	12	10	6	5

Source: 2011/2012 survey for the review of the 2010 World Programme on Population and Housing Censuses, question 4.

15. In addition to the main census methodology, countries were asked in the survey to indicate whether other sources were or would be used to provide data on specific census topics. Unlike for the main census methodology, countries could choose more than one additional source from the following: administrative registers, pre-existing administrative records (not part of a register), annual or other regularly conducted sample survey(s), ad hoc sample survey(s) specifically conducted for the census, or other source.

16. Table 2 presents the number and percentage of countries by geographical region that used other data sources to provide data on specific census topics. Percentages by additional source of data are calculated based on the total number of countries by geographical region that participated in the survey as the nominator. It should be noted that because countries could indicate more than one additional source of data, the numbers and percentages by geographical region do not add up to the totals across rows.

**Table 2: Use of other sources of data, by geographical region<sup>7</sup>**

Geographical region	Total countries	Administrative registers	Pre-existing administrative records	Annual or other regular surveys	Ad hoc sample surveys	Other
<i>Number</i>						
Africa	27	3	2	7	5	4
North America	18	2	3	3	2	0
South America	7	3	0	1	1	0
Asia	31	6	1	6	7	1
Europe	36	17	4	5	4	4
Oceania	7	2	1	0	0	2
Total	126	33	11	22	19	11
<i>Percentage</i>						
Africa		11.1	7.4	25.9	18.2	14.8
North America		11.1	16.7	16.7	11.1	0
South America		42.9	0	14.3	14.3	0
Asia		19.4	3.2	19.4	22.6	3.2
Europe		47.2	11.1	13.9	11.1	11.1
Oceania		28.6	14.3	0	0	28.6
Total		26.2	8.7	17.5	15.1	8.7

Source: 2011/2012 survey for the review of the 2010 World Programme on Population and Housing Censuses, question 5.

17. Information in table 2 shows that a sizeable number of the countries that participated in the survey use other sources of data to supplement data collected through the main source for the census count. In this connection, 33 countries representing 26 per cent of the survey respondents used administrative registers to provide data on specific census topics. This was the case mainly in Europe and in South America for 47 and 43 per cent of the countries respectively, but for only 11 per cent each for Africa and for North America. Similarly, close to 18 per cent of the survey countries used annual or regular surveys to get data on some census topics. This source was more popular in the Africa region where it was used by slightly more than ¼ of the survey responding countries, as did close to 20 per cent of the countries in Asia and in North America. Ad hoc sample surveys (specifically conducted for the census) were used as a source of supplementary census data in 15 per cent of the survey countries mainly in Asia (23 per cent) and Africa (18 per cent) and not very much in the other regions.

18. To better understand use of multiple sources of data for the census, information by additional source is, as presented in table 2, is shown by main methodology used for the census (i.e., the main source of data used for the total population count), presented in table 1. The cross-classification of the main source by additional sources is presented in table 3. It should be noted that while the numbers represent only those countries which used a combination of the indicated sources, the denominator for

<sup>7</sup> Numbers and percentages do not add up to total as some countries may have indicated more than one additional source of data.



the percentages is the total number of countries for each main census methodology (main source of data for the total population count). It should also be kept in mind that the combinations are not mutually exclusive as some countries may have indicated more than one additional source of data.

19. Of the 105 countries that used full field enumeration as the main census methodology, 26 of them, representing 25 per cent, also used administrative registers to get data on some census topic(s). Similarly, 16 per cent and 11 per cent used annual and ad hoc surveys, respectively as sources for additional data. Proportions of countries that used additional sources are higher for countries that used administrative registers as the main census methodology as well as for those that used other sources as the main methodology. For example, 42 per cent of countries that used administrative registers as the main source also used annual surveys while 33 per cent each used other administrative registers and also ad hoc surveys as additional sources. Of the six countries that used other sources of data as main methodology, a half each used administrative registers and also ad hoc sample surveys for additional information, while 33 per cent also used pre-existing administrative records as supplementary sources. This seems to suggest that administrative registers as well as the other sources (which in five of the six countries include use of administrative registers) are generally not exhaustive in terms of generating comprehensive census-like data. This is not a criticism of use of these methods, but rather a statement of fact particularly given that by their nature, administrative registers are generally set up for other uses other than for statistical purposes. As a result, they may therefore not contain all the required information.

**Table 3: Use of other sources of data by main methodology of the census**

Additional data sources	Main census methodology					
	Full field enumeration		Administrative registers		Other	
	Number	Percentage	Number	Percentage	Number	Percentage
Administrative registers	26	24.8	4	33.3	3	50.0
Pre-existing administrative records	7	6.7	2	16.7	2	33.3
Annual or other regularly conducted sample survey	17	16.2	5	41.7	0	0.0
Ad hoc sample survey	12	11.4	4	33.3	3	50.0
Other	9	8.6	2	16.7	0	0.0
None	49	46.7	3	25.0	2	33.3
Total by main methodology	105		12		6	

Source: 2011/2012 survey for the review of the 2010 World Programme on Population and Housing Censuses, questions 4 and 5.

20. It should be noted that not all countries indicated use of additional sources of data. For example, among those that are using full field enumeration as the main census methodology, about half (47%) are not using additional sources for their census data. This is the case for 25% of those using administrative registers as well as 33% of those relying on the residual “other” category for their methodology. In total, therefore, about 43% of the responding countries are using only one methodology as the source for their census data.

21. From the foregoing, it can be concluded that for the 2010 round, countries are using a variety of methods to collect or otherwise compile their census data. For a sizeable number of countries, data for the census are derived from multiple sources. It can further be deduced that national practices in the use of alternatives to the traditional census are very varied and call for more careful documentation and study in order to establish elements for inclusion in the revised *Principles and Recommendations for Population and Housing Censuses*.

## **Experience in use of Alternative Approaches to the Traditional Census**

22. As part of the survey, countries were asked if for their 2010 census they used alternative approaches to a traditional census with full field enumeration, through use administrative registers, other administrative records (not part of a register), rolling census, or survey supplements. If they used alternative methodologies to a traditional census, they were to indicate if they used it for the first time during the 2010 census round or if they used it during the current as well as the 2000 round. Of the 121 countries that responded to this question, 90 (74%) indicated that they had not use alternatives to the traditional census during either the 2000 or the 2010 round. Thirteen countries (11%) reported using alternative methodologies during the 2000 and 2010 census rounds while 18 (15%) have used these methodologies for the first time during the current round.

23. Information in table 4 indicates a trend towards use of alternative approaches from the 2000 to the 2010 census rounds. This is the case at the international level and also in Asia and Europe. For those countries that had used alternative methodologies, there was a follow-up question as to whether or not they would do so again during the 2020 round. Of the 32 countries that responded, 30 (94%) responded in the affirmative. All responding countries in Africa, North America, South America and Oceania also indicated that they would use alternatives during the next round, as did 91% in Asia and 92% in Europe.

24. For the countries that implemented alternative methodologies, questions were asked as to whether there was a cost or time savings predicted and also whether a cost or time savings was realized by use of these methodologies (see Table 5). Around 81% of the countries that responded to this question indicated that they anticipated cost and time savings by using alternative methodologies. There are regional differences with Asia having the lowest percentage (64%) of countries that answered in the affirmative followed by Europe (87%). In terms of whether the cost and time savings were realized, it is interesting to note that the proportion of countries answering in the affirmative (73%) is lower than of those that had expected these outcomes. This difference is more pronounced in Asia than in Europe and requires more follow-up with the countries concerned to understand why this was the case. This is important as lessons learnt particularly given that more countries are likely to use alternative methodologies for their 2020 round censuses.

**Table 4: Use of alternative methodologies during 2000 and 2010 census rounds**

Use of alternative methodologies	Total		Africa		Asia		Europe		Oceania		North America		South America	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Used alternative methodologies in 2000 and 2010 rounds	13	10.7	1	3.7	4	13.3	6	17.1	0	0.0	1	6.3	1	14.1
Used alternative methodologies the first time in 2010 round	18	14.9	1	3.7	7	23.3	8	22.9	1	16.7	1	6.3	0	0.0
Not used alternatives	90	74.4	25	92.6	19	63.3	21	60.0	5	83.3	14	87.5	6	85.7
Total countries	121	100.0	27	100.0	30	100.0	35	100.0	6	100.0	16	100.0	7	100.0

Source: 2011/2012 survey for the review of the 2010 World Programme on Population and Housing Censuses, question 10.

**Table 5: Anticipated and realized cost and time savings by using alternative methodologies**

	Total		Africa		Asia		Europe		Oceania		North America		South America	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<i>If cost or time savings predicted by using alternative methodology</i>														
Yes	29	80.6	5	100.0	7	63.6	13	86.7	0	0.0	3	100.0	1	100.0
No	7	19.4	0	0.0	4	36.4	2	13.3	1	100.0	0	0.0	0	0.0
Total countries	36	100.0	5	100.0	11	100.0	15	100.0	1	100.0	3	100.0	1	100.0
<i>If cost or time savings were realized by using alternative methodology</i>														
Yes	16	72.7	1	100.0	5	55.6	7	87.5	0	0.0	2	100.0	1	100.0
No	6	27.3	0	0.0	4	44.4	1	12.5	1	100.0	0	0.0	0	0.0
Total countries	22	100.0	1	100.0	9	100.0	8	100.0	1	100.0	2	100.0	1	100.0

Source: 2011/2012 survey for the review of the 2010 World Programme on Population and Housing Censuses, questions 11 and 12.

25. Questions were also asked regarding the benefits and risks that countries perceived to be associated with the alternative methodologies that they used compared to the traditional census. Results are presented in Table 6. In terms of benefits for using alternative methodologies, cost savings is the most cited by the countries (68%) followed by improvement in data quality (58%). This ranking also hold true for Europe (80% and 60% respectively) and Asia (64% each). In Asia, time savings came in third (55%) as did improved coverage at 53% for Europe. It can be inferred from this that countries are implementing alternative methodologies in order to mainly reduce the cost of the census, improve coverage and the quality of the data and also timeliness of the results.

**Table 6: Benefits and risks of using alternative methodologies compared to the traditional census**

	Total		Africa		Asia		Europe		Oceania		North America		South America	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<i>Benefits of Alternative Methodology to Traditional Census Method</i>														
Cost savings	26	68.4	3	60.0	7	63.6	12	80.0	1	50.0	3	75.0	0	0.0
Time savings	17	44.7	2	40.0	6	54.6	6	40.0	0	0.0	2	50.0	1	100.0
Improved coverage	14	36.8	0	0.0	3	27.3	8	53.3	1	50.0	1	25.0	1	100.0
Improved data quality	22	57.9	2	40.0	7	63.6	9	60.0	1	50.0	2	50.0	1	100.0
Increased participation or response rates	8	21.1	0	0.0	3	27.3	3	20.0	0	0.0	1	25.0	1	100.0
Decreased item non-response	8	21.1	0	0.0	3	27.3	4	26.7	1	50.0	0	0.0	0	0.0
Use of standardized census topic concepts and definitions	11	29.0	0	0.0	3	27.3	6	40.0	1	50.0	0	0.0	1	100.0
Other benefits	4	10.5	0	0.0	2	18.2	2	13.3	0	0.0	0	0.0	0	0.0
Total Countries	38	100	5	100	11	100	15	100	2	100	4	100	1	100
<i>Risks of Alternative Methodology to Traditional Census Method</i>														
Increased cost	5	13.2	0	0.0	3	27.3	0	0.0	1	50.0	0	0.0	1	100.0
Increased time	3	7.9	0	0.0	1	9.1	2	13.3	0	0.0	0	0.0	0	0.0
Decreased coverage	4	10.5	0	0.0	1	9.1	2	13.3	0	0.0	1	25.0	0	0.0
Decreased data quality	3	7.9	0	0.0	1	9.1	1	6.7	0	0.0	1	25.0	0	0.0
Negative public perception	2	5.3	0	0.0	0	0.0	2	13.3	0	0.0	0	0.0	0	0.0
Reduced topics	16	42.1	3	60.0	3	27.3	7	46.7	1	50.0	2	50.0	0	0.0
Use of data source definition instead of census definition	8	21.1	0	0.0	2	18.2	6	40.0	0	0.0	0	0.0	0	0.0
Other risks	7	18.4	1	20.0	1	9.1	5	33.3	0	0.0	0	0.0	0	0.0
Total countries	38	100	5	100	11	100	15	100	2	100	4	100	1	100

Source: Source: 2011/2012 survey for the review of the 2010 World Programme on Population and Housing Censuses, question 13.

26. On the other hand, countries indicated the reduction in available topics as a risk for using alternative methodologies. This was the case at the global level and also mainly in Europe and Asia. Use of data source definitions instead of census definitions was also cited as a risk in Europe. These two risks are already well known and documented as constraints of using, for example, registers for statistical purposes given that they are initially established for administrative and not for statistical purposes.

27. The survey also asked countries to indicate obstacles that they faced during the planning and implementation of alternative methodologies (see Table 7 for the results). The obstacles most cited are staff resources (42%) and process reengineering/infrastructure (42%), followed by financial resources (27%) and stakeholder acceptance (27%). Results by geographical region, although based on few observations also show these three as obstacles particularly in Asia and Europe. In addition, public perception of the alternative methodologies was an obstacle for Asia. In Europe, public privacy and confidentiality was an additional obstacle faced. All in all, it is important to note from information in Tables 6 and 7 that the benefits of using alternative methodologies seem to outweigh the obstacles faced. It is, therefore, not surprising that according to the survey, 94% of the countries that used alternative methodologies for the 2010 round responded that they would use these methodologies again for the next round of censuses.

## **Enumeration Methods**

28. Countries were asked to indicate what method(s) they used or planned to use for enumeration for their censuses of the 2010 round. For this question, countries could choose multiple responses from a list of nine choices provided. Face-to-face interviews with the use of paper questionnaires are the most common mode of enumeration used by the countries during their censuses for the 2010 round. This was the case for 94 countries representing 75% of the countries that participated in the survey (see Table 8). There are marked regional variations, however, with over 90% of the responding countries in Africa and North America relying mostly on enumerators to interview the population and fill in responses on paper questionnaires. In Europe, on the other hand, only 42% of the responding countries are using paper questionnaires with an interviewer as a mode of data collection for their censuses. It should be noted that 21% of the countries using paper questionnaires with an interviewer also used self-enumeration with questionnaires collected by enumerators while 19% also used the Internet for self-enumeration.

29. The second most common mode of enumeration among the survey responding countries is the use of Internet for self-enumeration. Use of advanced technology for self-enumeration via the Internet results in automatic capture of the data and was reported by 26% of the countries. There are, however, observed wide regional variations. While 44% of the countries in Europe reported providing this option as a means of enumeration, none of the countries in Africa and South America reported use of this mode. It can be observed from the information in Table 8 that for Europe, more countries are using the Internet as a mode of census enumeration than any other mode. In Asia, about  $\frac{1}{3}$  of the responding countries reported use of self-enumeration using the Internet, followed by Oceania and North America with around 28% each. To date, no country has used self-enumeration via the Internet as the only mode of enumeration. It is always used in combination with other methods. Of the 33 countries that reported of the Internet for enumeration, 55% each combined it with use of paper questionnaires through face-to-face

interviews and self-enumeration with paper questionnaires collected by an enumerator respectively, while in 42% of the cases it was used in combination with self-enumeration by paper questionnaires that were returned by mail.

30. A substantial number of countries are also using self-enumeration with paper questionnaires (either collected by an enumerator or mailed back). Close to a quarter of the responding countries in all regions except South America and Africa used self-enumeration with paper questionnaires. It should be mentioned that this mode of enumeration is more ideal where populations are literate enough to fill in the questionnaires without the aid of an enumerator.

31. Applications of advanced technology for enumeration also include use of portable computers and other hand-held devices through face-to-face interviews to automatically capture the data. This was reported by slightly more than 10% of the responding countries, except in Oceania where there was no reported use. Also, in a survey conducted by UNSD in 2009-2010, 9% of the countries reported using or planning to use personal digital assistants (PDAs) for data collection. The PDA was used for the first time during the 2000 round, but only by very few countries and on a limited basis. For the 2010 round, however, a few countries have used this technology for enumeration of the whole country although it is still a secondary mode of enumeration for most countries that are using it. Interest in use of hand-held devices lies in the possibility of integrating consistence and validity checks during the interview of the household, to transmit the data instantaneously, and to facilitate the control of the enumerators' work, for example by checking that GPS coordinates collected correspond to the enumeration area assigned.

32. In addition to the innovative modes just described, some countries are using other methods as supplements including telephone interviewing. In the survey, 11% of the countries reported use of telephone interviewing for enumeration. Of the countries that used telephone interviewing, 64% also used face-to-face interviews with paper questionnaires, 57% each used self-enumeration using paper questionnaires collected by enumerators and self-enumeration using the Internet respectively, while 43% used self-enumeration using paper questionnaires returned by mail and 36% used also face-to-face interviews using electronic questionnaires.

33. Close to 15% of the countries reported using register-based enumeration. Of the 18 countries that reported generating their data from registers, 28% each also used paper based personal interviews and self-enumeration through the Internet, respectively, while 22% each used telephone interviews and self-enumeration with return mail questionnaires respectively, and 17% each used face-to-face interviews with electronic questionnaire and pre-existing administrative records, respectively.

**Table 7: Obstacles faced during the planning and implementation of alternative methodologies**

Obstacle	Total		Africa		Asia		Europe		Oceania		North America		South America	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Financial resources	7	26.9	0	0.0	3	37.5	2	16.7	1	50.0	0	0.0	1	100
Staff resources	11	42.3	1	100	5	62.5	4	33.3	1	50.0	0	0.0	0	0.0
Public perception	5	19.2	0	0.0	4	50.0	1	8.3	0	0.0	0	0.0	0	0.0
Public privacy and confidentiality concerns	6	23.1	0	0.0	2	25.0	4	33.3	0	0.0	0	0.0	0	0.0
Stakeholder acceptance	7	26.9	0	0.0	1	12.5	5	41.7	0	0.0	1	50.0	0	0.0
Stakeholder privacy and confidentiality concerns	3	11.5	0	0.0	1	12.5	1	8.3	0	0.0	0	0.0	1	100
Legal authority/governmental support	5	19.2	0	0.0	2	25.0	2	16.7	1	50.0	0	0.0	0	0.0
Process reengineering/infrastructure	11	42.3	1	100	3	37.5	6	50.0	0	0.0	0	0.0	1	100
Data processing/tabulation	4	15.4	0	0.0	2	25.0	2	16.7	0	0.0	0	0.0	0	0.0
Data dissemination	2	7.7	0	0.0	2	25.0	0	0.0	0	0.0	0	0.0	0	0.0
Culture	3	11.5	0	0.0	2	25.0	0	0.0	0	0.0	0	0.0	1	100
Geography	5	19.2	0	0.0	3	37.5	0	0.0	0	0.0	1	50.0	1	100
Climate	4	15.4	0	0.0	3	37.5	0	0.0	1	50.0	0	0.0	0	0.0
Other	3	11.4	0	0.0	2	25.0	1	8.3	0	0.0	0	0.0	0	0.0
Total countries	26	100	1	100	8	100	12	100	2	100	2	100	1	100

Source: Source: 2011/2012 survey for the review of the 2010 World Programme on Population and Housing Censuses, question 16.

**Table 8: Enumeration methods for the 2010 census round**

Mode of Enumeration	Total Countries	Africa	North America	South America	Asia	Europe	Oceania
<i>Numbers</i>							
	126	27	18	7	31	36	7
Face-to-face interviewer, paper questionnaire	94	26	17	6	25	15	5
Face-to-face interviewer, electronic questionnaire	14	1	1	2	6	4	0
Telephone interview	14	0	6	1	4	2	1
Self-enumeration, Paper questionnaire, collected by enumerators	30	3	6	0	9	9	3
Self-enumeration, paper questionnaire, return by mail	18	1	3	0	4	8	2
Self-enumeration, Internet	33	0	5	0	10	16	2
Register-based enumeration	18	2	0	0	3	12	1
Pre-existing administrative records	8	1	1	0	2	3	1
Other	2	0	0	0	0	2	0
<i>Percentages</i>							
Face-to-face interviewer, paper questionnaire	74.6	96.3	94.4	85.7	80.7	41.7	71.4
Face-to-face interviewer, electronic questionnaire	11.1	3.7	5.6	28.6	19.4	11.1	0.0
Telephone interview	11.1	0.0	33.3	14.3	12.9	5.6	14.3
Self-enumeration, Paper questionnaire, collected by enumerators	23.8	11.1	33.3	0.0	29.0	25.0	42.9
Self-enumeration, paper questionnaire, return by mail	14.3	3.7	16.7	0.0	12.9	22.2	28.6
Self-enumeration, Internet	26.2	0.0	27.8	0.0	32.3	44.4	28.6
Register-based enumeration	14.3	7.4	0.0	0.0	9.7	33.3	14.3
Pre-existing administrative records	6.4	3.7	5.6	0.0	6.5	8.3	14.3
Other	1.6	0.0	0.0	0.0	0.0	5.6	0.0

Source: Source: 2011/2012 survey for the review of the 2010 World Programme on Population and Housing Censuses, question 6.

34. From the discussion above, it shows that although the majority of countries are still using face-to-face interviews with paper questionnaires, there is a tendency towards use of multi-mode



enumeration methods. To better understand country practices, mode of enumeration is assessed against main methodology for the census. The results are presented in Table 9.

35. Information in Table 9 shows that for each main census methodology, countries are using multiple modes of enumeration or of collecting the information. For examples, although 90 (86%) of the 105 countries conducting full field enumeration are doing so with face-to-face interviews using paper questionnaires, only 53, representing about 51% are using it as the only mode of enumeration. About 27% of those conducting their censuses by full field enumeration methodology are employing self-enumeration with paper questionnaires that are collected by enumerators while around 25% are implementing self-enumeration via the Internet. Although the majority of countries (83%) that are conducting register-based censuses are generating the data through register enumeration, a substantial number (25%) are also conducting face-to-face interviews with electronic questionnaires and also through Internet-based self-enumeration. In 8 of the 12 countries (67%), which are conducting register-based censuses, registers are indicated as the only enumeration method. The picture for those relying on “other” category, as main census methodology is even more mixed indicating multi-mode enumeration.

**Table 9: Mode of enumeration by main census methodology**

Enumeration Method	Main Census Methodology					
	Full Field Enumeration		Administrative Registers		Other	
	No.	%	No.	%	No.	%
Face-to-face interviewer, paper questionnaire	90	85.7	1	8.3	3	50.0
Face-to-face interviewer, electronic questionnaire	9	8.6	3	25.0	2	33.3
Telephone	10	9.5	2	16.7	2	33.3
Self-enumeration, paper questionnaire, collected by enumerators	28	26.7	0	0.0	2	33.3
Self-enumeration, paper questionnaire, return by mail	13	12.4	2	16.7	3	50.0
Self-enumeration, Internet	26	24.8	3	25.0	4	66.7
Register-based enumeration	5	4.8	10	83.3	3	50.0
Pre-existing administrative records	4	3.8	1	8.3	3	50.0
Other	2	1.9	0	0.0	0	0.0
Total	105		12		6	

Source: Source: 2011/2012 survey for the review of the 2010 World Programme on Population and Housing Censuses, questions 4 & 6

## Use of Technology in Census Operations

36. While use of technology in censuses is not new, the 2010 census has evidenced unprecedented use of improved technology in all aspects of the census operation. Applications

have been through either improvement in existing technology or by adopting new ones. Countries are investing in and using advanced technology mainly to improve the efficiency of census operations and also to enhance the quality and timeliness of the data. Use of new technologies is also driven by a need to improve coverage, to provide advanced tools for data dissemination to meet users' needs, as well as to meet public demand related to new life styles and privacy concerns.

37. Use of technology applies to all phases of the census operation and ranges from use of cartographic tools (GPS, GIS, satellite imagery, aerial photography, digitization) at the planning stage phase, to use of PDAs and other hand-held computers, the Internet, GIS, and cellular telephones at the enumeration stage. Other examples of application of advanced technology include use of scanning and other technology for data capture, coding and editing, as well as tools for data presentation and visualization at the data dissemination stage. The survey asked countries to indicate types of technology they have used for the 2010 round of censuses. The results are presented in Table 10.

38. Cartography is one of the census domains that have benefited the most from technological innovations. The fast growing capabilities of GIS and the easier access to satellite images and aerial photography, and associated coordinates obtained by GPS, and use of digitized maps have considerably improved the quality of the maps produced for census purposes. The survey results show that 75 countries (64%) are using GIS in their 2010 census round. This is the most used type of technology especially in Africa, North America and Asia. In a 2009-2010 survey conducted by UNSD, 58% of the 138 responding countries reported using digitized maps while 74% were using GPS/GIS in the creation of their maps. In addition, 25% and 24% of the responding countries indicated using aerial photography and satellite imagery respectively.

39. Computer-assisted coding is the second most used type of technology among the participating countries (48%) especially in North America (63%) and in Asia and Europe (60%). Use of this technology is very low in Africa and in Oceania (17%). At 43%, less than half of the responding countries indicated using the Internet as part of their 2010 census. Application of this technology, however, differs greatly by region with South America (14%) and Africa (26%) showing the lowest levels. A substantial number of countries are relying on scanning technology for data capture. Perhaps building on lessons learnt from previous census round, countries are now using either optical character reading (OCR) – 42% - or intelligent character reading (ICR) – 38% - or optical mark reading (OMR) – 33%. There are observed differences by region with Africa having fewer countries using scanning technology than is the case for the other regions.

40. Slightly over 25% of the responding countries, particularly in Oceania, North America and Africa are using lap tops for data collection but not many are using are using hand-held/pocket computers except in North America

**Table 10: Use of technology in census operations for the 2010 round**

Type of Technology	Total		Africa		Asia		Europe		Oceania		North America		South America	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total responding countries	117		23		30		35		6		16		7	
Internet	50	42.7	6	26.1	15	50.0	16	45.7	4	66.7	8	50.0	1	14.3
Laptop computers	31	26.5	7	30.4	7	23.3	6	17.1	4	66.7	6	37.5	1	14.3
Hand-held/pocket computers	10	8.6	0	0.0	4	13.3	1	2.9	0	0.0	4	25.0	1	14.3
Tablet computers	4	3.4	0	0.0	3	10.0	1	2.9	0	0.0	0	0.0	0	0.0
Geographical information systems (GIS)	75	64.1	20	87.0	19	63.3	18	51.4	4	66.7	12	75.0	2	28.6
Computer-assisted coding	57	48.7	4	17.4	18	60.0	21	60.0	1	16.7	10	62.5	3	42.9
Optical mark reading/recognition (OMR)	38	32.5	7	30.4	5	16.7	14	40.0	1	16.7	8	50.0	3	42.9
Optical character reading/recognition (OCR)	49	41.9	6	26.1	9	30.0	19	54.3	1	16.7	10	62.5	4	57.1
Other imaging techniques and scanner devices	44	37.6	7	30.4	14	46.7	9	25.7	3	50.0	8	50.0	3	42.9
Other	25	21.4	5	21.7	7	23.3	4	11.4	4	66.7	5	31.2	0	0.0
None of the above	6	5.1	1	4.4	1	3.3	4	11.4	0	0.0	0	0.0	0	0.0

Source: Source: 2011/2012 survey for the review of the 2010 World Programme on Population and Housing Censuses, question 17.

42. Countries were asked in the survey to indicate the perceived benefits as well as the risks and obstacles faced in using new technology (see Table 11). Time savings (61%) and improved data quality (57%) were the two top choices for benefits of using new technology, followed by improvement in coverage (37%) and cost savings (36%). In Africa, benefits from improved coverage (59%) outweighed those from improved data quality (33%), while in North America more countries reported improved data quality (67%) than those that did so for time savings (56%). In terms of risks associated with using new technology, increased cost was the most cited (29%) and this applied to all regions except South America where it was decreased data quality (29%).

43. Table 12 shows reported obstacles faced by countries in implementation of new technology by region. At the global level, more than half of the countries (52%) indicated that limited staff resources or expertise was the most obstacle faced with the use of new technology. This was mainly the case in Asia (68%) and North America (67%). Financial resources was the second most reported obstacle (33%) followed by process reengineering (26%). In South America, the main obstacle faced was process reengineering (57%) followed by financial resources and staff resources both with 43% of the responding countries.

44. Countries were asked in the survey if they contracted out/outsourced any type of technology for their 2010 round of censuses. If they did, they were asked what the successes and challenges there were about contracting out technology. About 41% of all countries indicated that they contracted out some aspects of technology for their census. This proportion was higher in Europe (62%) compared to Africa (36%), North America (40%), Oceania (40%), South America (41%) and Asia (52%). In terms of what aspects of the contracting out were successful, the most cited were adhering to schedule (55%), adhering to budget (53%) and staying within scope (51%). Challenges faced included (in order of rank) contract management (29%), adhering to schedule (26%), and adhering to budget (24%). Although some successes were also identified as challenges, this reported experience shows that the former far outweigh the latter. This shows that, overall, countries faced challenges with contract management than with any other aspect of contracting out of technology.

45. Based on the results of the survey, it can be deduced that use of information technology in census operations is not uniform among countries and across regions. This may be saying the obvious given the diversity of countries in terms of both economic and statistical development. That said, there is a need to document what has worked and also how these success stories can be replicated in other countries during future censuses given the benefits of using advanced technology that many countries aspire for. National good practices on use of different types of technologies should also be assessed for inclusion in the revised census recommendations for the 2020 round.

**Table 11: Benefits and risks of using new technology in census operations**

Benefits	Total		Africa		Asia		Europe		Oceania		North America		South America	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total countries	126		27		31		36		7		18	27.8	7	100.0
Cost savings	45	35.7	7	25.9	15	48.4	14	38.9	2	28.6	5	44.4	2	28.6
Time savings	78	61.9	16	59.3	25	80.7	19	52.8	4	57.1	10	66.7	4	57.1
Improved coverage	47	37.3	11	40.7	15	48.4	6	16.7	4	57.1	8	27.0	3	42.9
Improved data quality	72	57.1	9	33.3	25	80.7	18	50.0	4	57.1	12	11.1	4	57.1
Increased participation/response rates	29	23.0	1	3.7	14	45.2	7	19.4	2	6	5	27.8	0	0.0
Other	6	4.8	0	0.0	2	6.5	0	0.0	2	28.6	2	11.1	0	0.0
<b>Risks</b>														
Increased cost	37	29.4	8	29.6	12	38.7	6	16.7	3	42.9	7	38.9	1	14.3
Increased time	8	6.4	2	7.4	2	6.5	1	2.8	1	14.3	2	11.1	0	0.0
Decreased coverage	1	0.8	0	0.0	0	0.0	1	2.8	0	0.0	0	0.0	0	0.0
Decreased data quality	4	3.2	0	0.0	1	3.2	0	0.0	0	0.0	1	5.6	2	28.6
Negative public perception	2	1.6	0	0.0	1	3.2	1	2.8	0	0.0	0	0.0	0	0.0
Other	11	8.7	3	11.1	2	6.5	3	8.3	2	28.6	1	5.6	0	0.0

Source: Source: 2011/2012 survey for the review of the 2010 World Programme on Population and Housing Censuses, question 20.

**Table 12: Obstacles faced in the use of new technology during the 2010 census round**

Obstacles	Total		Africa		Asia		Europe		Oceania		North America		South America	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total countries	126		27		31		36		7		18		7	
Financial resources	42	33.3	10	37.0	12	38.7	9	25.0	3	42.9	5	27.8	3	42.9
Staff resources/expertise	65	51.6	13	48.2	21	67.7	13	36.1	3	42.9	12	66.7	3	42.9
Public perception	7	5.6	0	0.0	2	6.5	3	8.3	1	14.3	1	5.6	0	0.0
Public privacy and confidentiality concerns	17	13.5	0	0.0	7	22.6	7	19.4	1	14.3	2	11.1	0	0.0
Stakeholder acceptance	6	4.8	1	3.7	2	6.5	0	0.0	1	14.3	1	5.6	1	14.3
Stakeholder privacy and confidentiality concerns	2	1.6	0	0.0	1	3.2	0	0.0	1	14.3	0	0.0	0	0.0
Legal authority/government support	10	7.9	0	0.0	4	12.9	4	11.1	1	14.3	0	0.0	1	14.3
Process reengineering/infrastructure	33	26.2	7	25.9	5	16.1	13	36.1	1	14.3	3	16.7	4	57.1
Data processing/tabulation	17	13.5	3	11.1	7	22.6	2	5.6	1	14.3	3	16.7	1	14.3
Data dissemination	3	2.4	0	0.0	2	6.5	0	0.0	1	14.3	0	0.0	0	0.0
Culture	7	5.6	2	7.4	2	6.5	0	0.0	2	28.6	1	5.6	0	0.0
Geography	7	5.6	1	3.7	2	6.5	1	2.8	0	0.0	2	11.1	1	14.3
Climate	8	6.4	2	7.4	3	9.7	0	0.0	0	0.0	3	16.7	0	0.0
Other	17	13.5	5	18.5	2	6.5	2	5.6%	4	57.1	3	16.7	1	14.3

Source: Source: 2011/2012 survey for the review of the 2010 World Programme on Population and Housing Censuses, question 22.

## **Data Dissemination Strategies**

46. Dissemination was the weakest point of the censuses of the 2000 round. Many developing countries could not fully disseminate their census results to the public. In the survey, countries were asked to indicate the primary method of data dissemination for their census results from a list of choices.

47. The results of the survey which are presented in Table 13 show that the main method for the dissemination of census results for all countries combined is paper publications (52%), followed by static web pages (28%), and interactive databases (14%). As expected, there are big differences by region. In the African region paper publications are the method used by the majority of countries (89%) followed by static web pages at 8%. Although paper publications and static web pages are also the top two methods of dissemination for countries in Asia and Oceania, the two have a sizeable number that are relying on static web pages compared to the African region. North America that 44% of the countries are using static web pages, while 31% are using paper publications and 19% reported use of CD-ROMs/DVDs. In Europe static web pages (39%) and interactive databases (36%) are the top two, followed by paper publications (22%). South America has the highest percentage of countries using interactive databases (43%) for census data dissemination. This is followed by static web pages (29%), and paper publication and CD-ROMs/DVDs both with 14%.

48. From the foregoing, we can conclude that improvements in technology are making it possible for countries to respond to demands of data users by providing census products in electronic media. Due to ever increasing use of the micro computer, more users prefer data in electronic format instead of in print. Consequently, the 2010 census round is witnessing more use of the Internet for census data dissemination either as web pages or as on-line interactive databases which provide freedom for users to specify and design outputs in a format of their choice.

## **Collaboration among Countries During the 2010 Census Round**

49. It is recognized that collaboration facilitates countries to draw on each others strengths and achievements. Collaboration allows countries to learn from other countries' experiences and acquire knowledge and examples of good practices in census taking. In this connection, the survey requested countries to indicate topics on which they collaborated with, provided assistance to, or received assistance from other countries as part of the preparation for the 2010 census.

50. Table 14 presents the results of countries responses grouped by major geographical region. Slightly over half (52%) of the countries that participated in the survey indicated that they collaborated with other countries for the preparations of the 2010 round of censuses. The proportions differ by region with Asia (42%) and South America (43%) having the lowest percentage of countries that collaborated with others. Regarding areas on which they collaborated, the most reported are data dissemination (27%), questionnaire design (21%) and alternative census methodologies (21%). In Africa, collaboration related mostly to PES

(30%), cartography (26%), data dissemination (22%), and data analysis (22%). In Asia the most cited areas are data dissemination (26%), data capture (23%), questionnaire design (23%), and new technologies (23%). In Europe most collaboration is in data dissemination (31%) and alternative methodologies (28%). In North America data capture (39%), data processing (33%) and questionnaire design (33) were areas on which collaboration most took place. The results for Oceania were alternative census methodologies, questionnaire design, and data collection all with 57%. For South America, the most reported areas of collaboration were questionnaire design, and data processing both with 29%.

51. Only about 25% of the survey participating countries reported providing assistance to others during preparations for the 2010 round of censuses. Most of the assistance provided was in the area of questionnaire design (15%) followed by data collection (14%), cartography (12%), data capture (11%) and, new technologies and data processing both with 10%. In Africa, only 22% of the countries reported providing assistance to others mainly in questionnaire design (19%) and data collection (15%). In Asia, 16% of the countries provided assistance mainly in alternative methodologies and cartography both with 13%. Areas in which countries in Europe provided assistance to others were mainly data collection (19%) and questionnaire design (14%).

52. According to the survey results, about half of the countries (51%) reported receiving assistance from others compared to the 25% that indicated that they provided the assistance. Most reported areas in which countries received assistance are data processing (28%) followed in decreasing order by cartography (25%), new technologies and questionnaire design (22% each), and data dissemination (21%). There are regional differences in reported areas where assistance was received, as follows: Africa – data processing (44%), data capture (41%); Asia – new technologies (32%), questionnaire design and data processing (29%); Europe – questionnaire design (19%); North America – cartography and data dissemination (28% each).



**Table 13: Primary method of data dissemination for 2010 round of censuses**

Primary method of data dissemination	Total		Africa		Asia		Europe		Oceania		North America		South America	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Paper publication(s)	63	52.1	23	88.5	22	73.3	8	22.2	4	66.7	5	31.3	1	14.3
CD-ROM/DVD	5	4.1	0	0.0	1	3.3	0	0.0	0	0.0	3	18.8	1	14.3
Static web pages (html, pdf, Excel)	34	28.1	2	7.7	7	23.3	14	38.9	2	33.3	7	43.8	2	28.6
Interactive online databases(s)	17	14.1	1	3.9	0	0.0	13	36.1	0	0.0	0	0.0	3	42.9
Other	2	1.7	0	0.0	0	0.0	1	2.8	0	0.0	1	6.3	0	0.0
Total countries that responded	121	100	26	100	30	100	36	100	6	100	16	100	7	100

Source: Source: 2011/2012 survey for the review of the 2010 World Programme on Population and Housing Censuses, question 25.

**Table 14: Collaboration, provision and receipt of assistance, among countries for preparation of census for the 2010 round**

Collaborated with other countries on:	Total		Africa		Asia		Europe		Oceania		North America		South America	
	No.	% <sup>1</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>
Alternative census methodologies	27	21.4	4	14.8	6	19.4	10	27.8	4	57.1	2	11.1	1	14.3
New technologies	23	18.3	5	18.5	7	22.6	4	11.1	2	28.6	5	27.8	0	0.0
Questionnaire design	27	21.4	5	18.5	7	22.6	3	8.3	4	57.1	6	33.3	2	28.6
Cartography/mapping	20	15.9	7	25.9	4	12.9	3	8.3	3	42.9	3	16.7	0	0.0
Data collection	15	11.9	3	11.1	5	16.1	2	5.6	4	57.1	1	5.6	0	0.0
Data capture	21	16.7	3	11.1	7	22.6	2	5.6	2	28.6	7	38.9	0	0.0
Data processing	21	16.7	5	18.5	4	12.9	1	2.8	3	42.9	6	33.3	2	28.6
Data analysis	16	12.7	6	22.2	4	12.9	0	0.0	2	28.6	2	11.1	2	28.6
Post-enumeration survey	14	11.1	8	29.6	3	9.7	2	5.6	0	0.0	0	0.0	1	14.3
Data dissemination	34	27.0	6	22.2	8	25.8	11	30.6	3	42.9	5	27.8	1	14.3
Other	5	4.0	1	3.7	0	0.0	2	5.6	1	14.3	1	5.6	0	0.0
Total countries responding	66	52.4	14	51.9	13	41.9	20	55.6	6	85.7	10	55.6	3	42.9

Provided assistance to other countries on:	Total		Africa		Asia		Europe		Oceania		North America		South America	
	No.	% <sup>1</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>
Alternative census methodologies	11	8.7	1	3.7	4	12.9	3	8.3	1	14.3	2	11.1	0	0.0
New technologies	13	10.3	3	11.1	3	9.7	3	8.3	2	28.6	1	5.6	1	14.3
Questionnaire design	19	15.0	5	18.5	3	9.7	5	13.9	2	28.6	4	22.2	0	0.0
Cartography/mapping	15	11.9	3	11.1	4	12.9	4	11.1	2	28.6	2	11.1	0	0.0
Data collection	18	14.3	4	14.8	3	9.7	7	19.4	2	28.6	2	11.1	0	0.0
Data capture	14	11.1	3	11.1	3	9.7	3	8.3	2	28.6	2	11.1	1	14.3
Data processing	13	10.3	1	3.7	3	9.7	4	11.1	1	14.3	2	11.1	2	28.6
Data analysis	8	6.4	2	7.4	2	6.5	3	8.3	1	14.3	0	0.0	0	0.0
Post-enumeration survey	7	5.6	1	3.7	1	3.2	2	5.6	1	14.3	1	5.6	1	14.3
Data dissemination	10	7.9	1	3.7	3	9.7	3	8.3	1	14.3	2	11.1	0	0.0
Other	3	2.4	0	0.0	0	0.0	0	0.0	1	14.3	2	11.1	0	0.0
Total countries responding	32	25.4	6	22.2	5	16.1	10	27.8	3	42.9	6	33.3	2	28.6

Received assistance from other countries on:	Total		Africa		Asia		Europe		Oceania		North America		South America	
	No.	% <sup>1</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>
Alternative census methodologies	13	10.3	2	7.4	7	22.6	0	0.0	2	28.6	1	5.6	1	14.3
New technologies	28	22.2	9	33.3	10	32.3	4	11.1	2	28.6	2	11.1	1	14.3
Questionnaire design	28	22.2	7	25.9	9	29.0	7	19.4	2	28.6	2	11.1	1	14.3
Cartography/mapping	32	25.4	14	51.9	7	22.6	2	5.6	3	42.9	5	27.8	1	14.3
Data collection	14	11.1	3	11.1	7	22.6	2	5.6	0	0.0	2	11.1	0	0.0
Data capture	24	19.1	11	40.7	8	25.8	1	2.8	1	14.3	3	16.7	0	0.0
Data processing	35	27.8	12	44.4	9	29.0	4	11.1	3	42.9	4	22.2	3	42.9
Data analysis	23	18.3	9	33.3	7	22.6	1	2.8	3	42.9	3	16.7	0	0.0
Post-enumeration survey	19	15.1	8	29.6	4	12.9	5	13.9	0	0.0	0	0.0	2	28.6
Data dissemination	27	21.4	8	29.6	8	25.8	1	2.8	3	42.9	5	27.8	2	28.6
Other	5	4.0	0	0.0	1	3.2	0	0.0	2	28.6	2	11.1	0	0.0
Total countries responding	64	50.8	20	74.1	17	54.8	11	30.6	3	42.9	8	44.4	5	71.4

Source: Source: 2011/2012 survey for the review of the 2010 World Programme on Population and Housing Censuses, question 34.

<sup>1</sup>Percent is out of all countries overall; <sup>2</sup>Percent is out of all countries within region.

## Successes and Challenges Experienced by Countries During the 2010 Census Round

53. The survey for the review of the 2010 World Programme on Population and Housing Censuses also collected information on successes and challenges that countries have faced in planning and conducting their censuses for the 2010 round. Table 15 presents countries' responses.

54. At the global level, the successes in order of importance are: implementation of new technologies (56%), meeting deadlines (49%), keeping within budget (47%), improved or maintained data quality (46%), and improved logistics and coordination (44%). The most reported successes for Africa are implementation of new technologies (56%), improved logistics and coordination (44%), and improved or maintained data quality (37%). The most significant successes for Asia are meeting deadlines (65%), improved data dissemination (61%), implementation of new technologies (61%), improved logistics and coordination (58%), improved or maintained data quality (58%), implementation of new methodologies (52%), and kept within budget (52%). Keeping within budget (58%), meeting deadlines (53%) and implementing new technologies were the most reported successes for Europe, while for the majority of countries in Oceania it was improving or maintaining data quality (71%). In North America successes included implementing new technologies (67%), improving or maintaining data quality (56%), and improved logistics and coordination (56%). Asia seems to have more reported significant successes than the other regions.

55. The challenge most reported by countries related to cost which was mentioned by 70% of the survey participants. This, which is also the number one concern across all regions (Africa - 81%, Asia - 61%, Europe - 67%, Oceania - 71%, North America - 67%, and South America - 86%), far outweighs all the others. Cost has been recognized as the reason why many countries have postponed their censuses while others have adapted alternative methodologies to the traditional census as sources of data. Other challenges that countries faced include timeliness of results (44%), data quality (42%), public perception (37%), and low response rates (36%).

56. At the regional level, challenges are: Africa - cost (81%) and timeliness (44%); Asia - cost (61%), response rates (45%) and data quality (45%); Europe - cost (67%), data quality (50%), privacy (50%) and public perception (50%); Oceania - cost (71%), response rates (57%) and data quality (57%); North America - cost (67%), response rates (50%) and public perception (50%); and South America (cost (86%), response rates (43%) and data quality (43%).

## Annex 1: Questionnaire for the 2010 World Population and Housing Census Program Review

### 2010 Census Experience and Lessons Learned

1. Have you conducted a census during the 2010 round (covers the time period 2005 to 2014) of population and housing censuses?  
<sup>1</sup>  Yes, in what year was your most recent census conducted? \_\_\_\_\_ – Go to Question 3.  
<sup>2</sup>  No. – Go to Question 2.
2. Do you have a census planned for this round?  
<sup>1</sup>  Yes, in what year is your census planned? \_\_\_\_\_ – Go to Question 3.  
<sup>2</sup>  No, we do not plan to conduct a census in the 2010 round. – Go to Section IV.
3. Have you postponed your census at least once for the 2010 round?  
<sup>1</sup>  Yes, please specify how many times it was postponed and why:  
\_\_\_\_\_  
<sup>2</sup>  No
4. What was (or will be) the **main** methodology used for your census (the main source of data used for the total population count)? (Mark only one box):  
<sup>1</sup>  Full field enumeration (Traditional Census)  
<sup>2</sup>  Administrative register(s), specify: \_\_\_\_\_  
<sup>3</sup>  Pre-existing administrative records (not part of a register), specify:  
\_\_\_\_\_  
<sup>4</sup>  Rolling census  
<sup>5</sup>  Other, specify: \_\_\_\_\_
5. In addition to the main source of data specified above, indicate whether **other** sources were (or will be) used to provide data on specific census topics (Mark all that apply):  
<sup>1</sup>  Administrative register(s), specify: \_\_\_\_\_  
<sup>2</sup>  Pre-existing administrative records (not part of a register), specify:  
\_\_\_\_\_  
<sup>3</sup>  Annual or other regularly conducted sample survey(s), specify: \_\_\_\_\_  
<sup>4</sup>  Ad hoc sample survey(s) specifically conducted for the census  
<sup>5</sup>  Other, specify: \_\_\_\_\_
6. What enumeration methods did you (or will you) use? (Mark all that apply):  
<sup>1</sup>  Face-to-face interviewer, paper questionnaire  
<sup>2</sup>  Face-to-face interviewer, electronic questionnaire  
<sup>3</sup>  Telephone (interviewer or automated)

- <sup>4</sup>  Self-enumeration, paper questionnaire, collected by enumerators
- <sup>5</sup>  Self-enumeration, paper questionnaire, returned by mail
- <sup>6</sup>  Self-enumeration, Internet
- <sup>7</sup>  Register-based enumeration
- <sup>8</sup>  Pre-existing administrative records (not part of a register)
- <sup>9</sup>  Other, specify: \_\_\_\_\_

7. What type of residency rules did (or will) you use for your census? (Mark all that apply):

- <sup>1</sup>  Usual resident count (i.e., *de jure*, the place a person spends most of his/her daily night-rest)
- <sup>2</sup>  Population present count (i.e., *de facto*, the place a person is at the time of the census)
- <sup>3</sup>  Legal/permanent address count (i.e., the place a person lives for legal purposes)
- <sup>4</sup>  Other, specify: \_\_\_\_\_

8. What are the challenges that you faced (or will face) in planning and conducting your census for the 2010 round of censuses? (Mark all that apply):

- <sup>1</sup>  Cost
- <sup>2</sup>  Timeliness
- <sup>3</sup>  Response rates
- <sup>4</sup>  Data quality
- <sup>5</sup>  Public perception
- <sup>6</sup>  Privacy issues
- <sup>7</sup>  Other, specify: \_\_\_\_\_

9. What were your successes in the 2010 round of censuses? (Mark all that apply):

- <sup>1</sup>  Kept within budget
- <sup>2</sup>  Met deadlines
- <sup>3</sup>  Improved logistics and coordination
- <sup>4</sup>  Improved/maintained response/participation rates
- <sup>5</sup>  Improved/maintained data quality
- <sup>6</sup>  Improved data dissemination
- <sup>7</sup>  Implemented new technologies
- <sup>8</sup>  Implemented new methodologies
- <sup>9</sup>  Other, specify: \_\_\_\_\_

**A. Census Methodologies:** *When answering questions 10-17, please refer to any census methodologies you may have used for your census as an alternative to a traditional census (full field enumeration), such as the use of an administrative register, other administrative records (not part of a register), rolling census, survey supplements, etc.*

10. Did you (or will you) use an alternative census methodology for the 2010 census round?
- <sup>1</sup>  Yes, used alternative methodologies this round and previous rounds, go to Question 11.
  - <sup>2</sup>  Yes, used methodologies for the first time this round, go to Question 11.
  - <sup>3</sup>  No, go to Question 17.

11. Was there a cost or time savings **predicted** by using the alternative methodology?
- <sup>1</sup>  Yes, please describe the savings: \_\_\_\_\_
  - <sup>2</sup>  No

12. Was a cost or time savings **realized** by using the alternative methodology?
- <sup>1</sup>  Yes, please describe the savings: \_\_\_\_\_
  - <sup>2</sup>  No

13. What are the benefits and risks of the alternative methodology that you used compared to a traditional census? (Mark all that apply):

<b>a. Benefits</b>	<b>b. Risks</b>
<sup>1</sup> <input type="checkbox"/> Cost savings	<sup>9</sup> <input type="checkbox"/> Increased cost
<sup>2</sup> <input type="checkbox"/> Time savings	<sup>10</sup> <input type="checkbox"/> Increased time
<sup>3</sup> <input type="checkbox"/> Improved coverage	<sup>11</sup> <input type="checkbox"/> Decreased coverage
<sup>4</sup> <input type="checkbox"/> Improved data quality	<sup>12</sup> <input type="checkbox"/> Decreased data quality
<sup>5</sup> <input type="checkbox"/> Increased participation/response rates	<sup>13</sup> <input type="checkbox"/> Negative public perception
<sup>6</sup> <input type="checkbox"/> Decreased item non-response	<sup>14</sup> <input type="checkbox"/> Reduced topics (content)
<sup>7</sup> <input type="checkbox"/> Use of standardized census topic concepts and definitions	<sup>15</sup> <input type="checkbox"/> Use of data source definition instead of census definition
<sup>8</sup> <input type="checkbox"/> Other, specify:	<sup>16</sup> <input type="checkbox"/> Other, specify:

14. What was the impact of the alternative methodology on participation in the census or on response rates?
- <sup>1</sup>  Increase in participation or response rates
  - <sup>2</sup>  Decrease in participation or response rates
  - <sup>3</sup>  No change in participation or response rates
  - <sup>4</sup>  Not applicable

15. What obstacles did you face planning or implementing the alternative methodology? (Mark all that apply):
- <sup>1</sup>  Financial resources
  - <sup>2</sup>  Staff resources/expertise
  - <sup>3</sup>  Public perception

- 4  Public privacy and confidentiality concerns
- 5  Stakeholder acceptance
- 6  Stakeholder privacy and confidentiality concerns
- 7  Legal authority/Governmental support
- 8  Process reengineering/Infrastructure
- 9  Data processing/tabulation
- 10  Data dissemination
- 11  Culture
- 12  Geography (Terrain)
- 13  Climate
- 14  Other, specify: \_\_\_\_\_

16. For the next round of censuses, will you repeat the alternative methodologies that you used during this round?

- 1  Yes
- 2  No, why not? \_\_\_\_\_

**B. (Information)Technology:** *When answering questions 17-24, please keep in mind technology you used for your 2010 round of censuses.*

17. Did you use any of the following types of technology during your 2010 round census? (Mark all that apply):

- 1  Internet
- 2  Laptop Computers
- 3  Hand-held/Pocket Computers
- 4  Tablet Computers
- 5  Geographical Information Systems (GIS)
- 6  Computer-assisted coding
- 7  Optical mark reading/recognition (OMR)
- 8  Optical character reading/recognition (OCR)
- 9  Other imaging techniques and scanner devices (including key from image or intelligent character readers)
- 10  Other, specify: \_\_\_\_\_
- 11  None of the above.

18. Was there a cost or time savings **predicted** by using the new technology?

- 1  Yes, please describe the savings for each technology: \_\_\_\_\_
- 2  No

19. Was a cost or time savings **realized** by using the new technology?

- 1  Yes, please describe the savings for each technology: \_\_\_\_\_
- 2  No

20. What are the benefits and risks of the new technology that you used? (Mark all that apply):

a. Benefits	b. Risks
-------------	----------

<sup>1</sup> <input type="checkbox"/> Cost savings	<sup>7</sup> <input type="checkbox"/> Increased cost
<sup>2</sup> <input type="checkbox"/> Time savings	<sup>8</sup> <input type="checkbox"/> Increased time
<sup>3</sup> <input type="checkbox"/> Improved coverage	<sup>9</sup> <input type="checkbox"/> Decreased coverage
<sup>4</sup> <input type="checkbox"/> Improved data quality	<sup>10</sup> <input type="checkbox"/> Decreased data quality
<sup>5</sup> <input type="checkbox"/> Increased participation/response rates	<sup>11</sup> <input type="checkbox"/> Negative public perception
<sup>6</sup> <input type="checkbox"/> Other, specify:	<sup>12</sup> <input type="checkbox"/> Other, specify:

21. What was the impact of the new technology on participation in the census or on response rates?

- <sup>1</sup>  Increase in participation or response rates
- <sup>2</sup>  Decrease in participation or response rates
- <sup>3</sup>  No change in participation or response rates
- <sup>4</sup>  Not applicable

22. What obstacles did you face using the new technology? (Mark all that apply):

- <sup>1</sup>  Financial resources
- <sup>2</sup>  Staff resources/expertise
- <sup>3</sup>  Public perception
- <sup>4</sup>  Public privacy and confidentiality concerns
- <sup>5</sup>  Stakeholder acceptance
- <sup>6</sup>  Stakeholder privacy and confidentiality concerns
- <sup>7</sup>  Legal authority/Governmental support
- <sup>8</sup>  Process reengineering/Infrastructure
- <sup>9</sup>  Data processing/tabulation
- <sup>10</sup>  Data dissemination
- <sup>11</sup>  Culture
- <sup>12</sup>  Geography (Terrain)
- <sup>13</sup>  Climate
- <sup>14</sup>  Other, specify: \_\_\_\_\_

23. Did you contract out (outsource) any type of technology for the 2010 round of censuses?

- <sup>1</sup>  Yes, go to Question 24.
- <sup>2</sup>  No, go to Question 25.

24. What were the successes and challenges about contracting out technology?

	a. Success	b. Challenge
(1) Contract management	<sup>1</sup> <input type="checkbox"/>	<sup>7</sup> <input type="checkbox"/>
(2) Staying within scope	<sup>2</sup> <input type="checkbox"/>	<sup>8</sup> <input type="checkbox"/>
(3) Adhering to budget	<sup>3</sup> <input type="checkbox"/>	<sup>9</sup> <input type="checkbox"/>
(4) Adhering to schedule	<sup>4</sup> <input type="checkbox"/>	<sup>10</sup> <input type="checkbox"/>



(5) Improved census integration	5 <input type="checkbox"/>	11 <input type="checkbox"/>
(6) Other, specify:	6 <input type="checkbox"/>	12 <input type="checkbox"/>

**C. Data Dissemination:** *In this section, respond based on how your country distributed data from the 2010 round of censuses.*

25. What is (will be) the **primary** method of data dissemination for your census results? (Mark **ONLY** one):

- 1  Paper publication(s)
- 2  CD-ROM/DVD
- 3  Static web pages (html, pdf, Excel)
- 4  Interactive online database(s)
- 5  Other, please specify: \_\_\_\_\_

26. What **other** methods of data dissemination do you use? (Mark all that apply):

- 1  Paper publication(s)
- 2  CD-ROM/DVD
- 3  Static web pages (html, pdf, Excel)
- 4  Interactive online database(s)
- 5  GIS web-based mapping tools
- 6  Other, please specify: \_\_\_\_\_

27. Did you (or will you) consult with data users and stakeholders about your data dissemination plans?

- 1  Yes
- 2  No

**I. 2020 World Program on Population and Housing Census – Looking Forward:** *In this section, your responses should refer to lessons learned from the 2010 round of censuses and your plans for the 2020 round.*

28. What **worked well** for you in the 2010 round and will be repeated in the 2020 round?

Please describe: \_\_\_\_\_

29. What **did not work** well for you in the 2010 round and will **not** be repeated in the 2020 round?

Please describe: \_\_\_\_\_

30. What innovations are you planning to look into for in the 2020 round?

Please describe: \_\_\_\_\_

**A. New Topics:** *In this section, respond based on new topics that your country may introduce for the 2020 round of censuses.*

31. What, if any, emerging issues may require new topics be added to your 2020 round census questionnaire to fulfill data needs for your country? Please describe: \_\_\_\_\_

32. How do you determine which new topics are added to your census? (Mark all that apply):

- 1  Legislation
- 2  Request by data users
- 3  Pertinent/evolving issues in country
- 4  Trends in society
- 5  Requests from other statistical agencies in your country
- 6  Consultations with other international statistical agencies
- 7  Other, specify: \_\_\_\_\_

**B. International Cooperation:** *This section asks both about international assistance in the 2010 round as well as assistance in the 2020 round.*

33. Did you utilize UN census guidelines/publications to prepare for your 2010 round census?

- 1  Yes, which materials? (Mark all that apply):
- 2  *Principles and Recommendations for Population and Housing Censuses, Revision 2*
- 3  *Conference of European Statisticians Recommendations for the 2010 Censuses of Population and Housing*
- 4  *Handbook on Census Management for Population and Housing Censuses*
- 5  *Handbook on Population and Housing Census Editing*
- 6  *Census Data Capture Methods*
- 7  *Post Enumeration Surveys: operational guidelines*
- 8  Other, specify: \_\_\_\_\_
- 9  No

34. In preparation for the 2010 round of censuses, please indicate topics on which you collaborated with, provided assistance to, or received assistance from other countries. (Mark all that apply):

	a. <b>Collaborated</b> on:	b. <b>Provided</b> assistance on:	c. <b>Received</b> assistance in:	d. Please describe <b>with</b> <b>whom, to whom or from</b> <b>whom:</b>
(1) Alternative census methodologies	<sup>1</sup> <input type="checkbox"/>	<sup>12</sup> <input type="checkbox"/>	<sup>23</sup> <input type="checkbox"/>	
(2) New technologies	<sup>2</sup> <input type="checkbox"/>	<sup>13</sup> <input type="checkbox"/>	<sup>24</sup> <input type="checkbox"/>	
(3) Questionnaire design	<sup>3</sup> <input type="checkbox"/>	<sup>14</sup> <input type="checkbox"/>	<sup>25</sup> <input type="checkbox"/>	
(4) Cartography/mapping	<sup>4</sup> <input type="checkbox"/>	<sup>15</sup> <input type="checkbox"/>	<sup>26</sup> <input type="checkbox"/>	
(5) Data collection	<sup>5</sup> <input type="checkbox"/>	<sup>16</sup> <input type="checkbox"/>	<sup>27</sup> <input type="checkbox"/>	
(6) Data capture	<sup>6</sup> <input type="checkbox"/>	<sup>17</sup> <input type="checkbox"/>	<sup>28</sup> <input type="checkbox"/>	
(7) Data processing	<sup>7</sup> <input type="checkbox"/>	<sup>18</sup> <input type="checkbox"/>	<sup>29</sup> <input type="checkbox"/>	
(8) Data analysis	<sup>8</sup> <input type="checkbox"/>	<sup>19</sup> <input type="checkbox"/>	<sup>30</sup> <input type="checkbox"/>	
(9) Post-Enumeration Survey	<sup>9</sup> <input type="checkbox"/>	<sup>20</sup> <input type="checkbox"/>	<sup>31</sup> <input type="checkbox"/>	
(10) Data dissemination	<sup>10</sup> <input type="checkbox"/>	<sup>21</sup> <input type="checkbox"/>	<sup>32</sup> <input type="checkbox"/>	
(11) Other, please specify:	<sup>11</sup> <input type="checkbox"/>	<sup>22</sup> <input type="checkbox"/>	<sup>33</sup> <input type="checkbox"/>	

35. Preparing for the 2020 round of censuses, will the use of UN standard concepts and definitions, as found in the UN Principles and Recommendations for Population and Housing Censuses, aid you in the development of new topics for your census (if they exist currently)?

- <sup>1</sup>  Yes  
<sup>2</sup>  No

36. Preparing for the 2020 round of censuses, for new topics that do not have UN standard definitions, would it be useful to have new UN standard definitions to aid in comparability across countries?

- <sup>1</sup>  Yes  
<sup>2</sup>  No

37. Preparing for the 2020 round of censuses, how should the UN facilitate an exchange of experiences and promote the use of best practices in census taking? (Mark all that apply):

- <sup>1</sup>  Update UN *Principles and Recommendations for Population and Housing Censuses, Revised for the 2020 Census Round*
- <sup>2</sup>  Working papers, technical manuals, or technical reports
- <sup>3</sup>  Training
- <sup>4</sup>  Workshops or meetings
- <sup>5</sup>  Conferences
- <sup>6</sup>  Social media
- <sup>7</sup>  Website repository
- <sup>8</sup>  Collaboration with other countries
- <sup>9</sup>  Other, specify: \_\_\_\_\_

38. What types of assistance and materials will you need from the UN Statistics Division to prepare for the 2020 round of censuses? (Mark all that apply):

- <sup>1</sup>  Updated UN *Principles and Recommendations for Population and Housing Censuses, Revised for the 2020 Census Round*
- <sup>2</sup>  Working papers, technical manuals, and/or technical reports
- <sup>3</sup>  Training
- <sup>4</sup>  Workshops
- <sup>5</sup>  Collaboration with other countries, specify: \_\_\_\_\_
- <sup>6</sup>  Consultation with other countries, specify: \_\_\_\_\_
- <sup>7</sup>  Other, specify: \_\_\_\_\_
- <sup>8</sup>  None