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Item 6 of the provisional agenda

Operational aspects of censuses

Census quality and coverage: Key results of the UNECE Survey on National Census Practices

Note by the UNECE Task Force on census coverage and quality

Summary

In early 2013, the UNECE conducted an online survey among its member countries on national practices in the 2010 round of population and housing censuses. This document presents an overview of the main results of the survey on census coverage and quality. Some first proposals by the UNECE Task Force on census coverage and quality about the preparation of new Conference of European Statisticians Recommendations for the 2020 Round of Population and Housing Censuses, with regard to census coverage and quality are presented in ECE/CES/GE.41/2013/9.

Survey Results

A. Question 1. For which of the following dimensions of quality did you (or will you) establish quality management processes, and did you (or will you) publish your findings?

1. Forty seven countries (92 per cent of the total asked) provided responses to this question – either in the question options or comment box. All 30 EEA countries responded (64 per cent of respondents).

Table 1

Count of countries by quality dimension and management category

(percentage is of the dimension total)

	<i>Managed and published (or plan to publish)</i>	<i>Managed only (not published)</i>	<i>Managed total (either published or not)</i>	<i>Not managed and not published</i>
Accuracy	23 (50%)	22 (48%)	45 (98%)	1 (2%)
Timeliness	21 (46%)	23 (50%)	44 (96%)	2 (4%)
Comparability	28 (62%)	14 (31%)	42 (93%)	3 (7%)
Coherence	24 (54%)	17 (39%)	41 (93%)	3 (7%)
Accessibility	19 (43%)	21 (48%)	40 (91%)	4 (9%)
Relevance	17 (38%)	21 (47%)	38 (85%)	7 (15%)

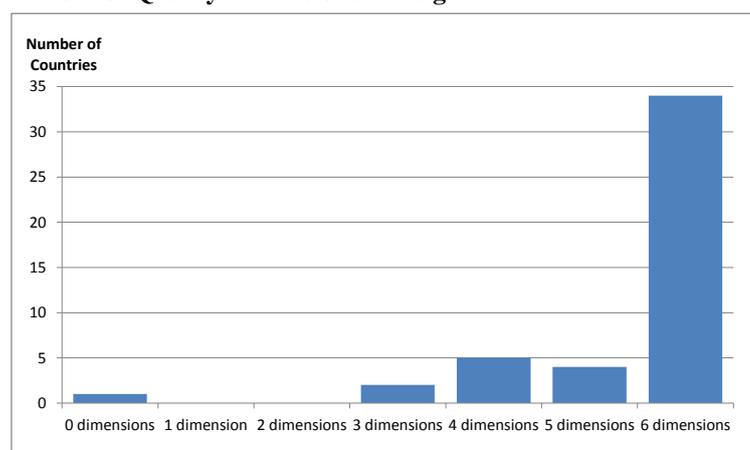
2. The majority of countries (72 per cent) managed all six quality dimensions. Table 1 shows the number of countries that manage each dimension. As can be seen in the table, more countries managed accuracy (98 per cent of respondents) than any other dimension. Only Denmark (with a register based census) reported that it did not manage or publish information about accuracy. Relevance was the quality dimension that was managed by the least number of countries (85 per cent).

3. On the whole, where countries managed a particular dimension it was fairly evenly split as to whether they published the information surrounding it or not. For example for the accuracy dimension 23 countries published information compared to 22 who did not. The largest difference was for the comparability dimension, where of those that managed comparability twice as many published information about it as did not.

4. Figure 1 shows that of those that responded to the question, one country did not manage any quality dimensions whilst the remaining countries managed at least three dimensions. Thirty four countries (72 per cent) managed all six dimensions (and either published the findings or not) and, encouragingly, this was the modal number of dimensions managed.

5. There were six open responses made in the comment field, the main theme being that countries stated that they would be including their findings in the Census Quality Report, as per the legislation.

Figure 1
Number of Quality Dimensions Managed



B. Question 2. Which of the following statistical methods did you use to measure the accuracy of your statistics, and did you use them to measure under-coverage, over-coverage, or variance?

6. Forty nine countries (96 per cent of the total asked) provided responses to this question – either in the question options or comment box. All 30 EEA countries responded (61 per cent of respondents). Table 2 further breaks the response rate down into each section of the question.

Table 2
Response rate

	<i>number of respondents</i>	<i>non-respondents</i>
Independent post-enumeration coverage survey	46 (90%)	5 (10%)
Other form of coverage survey	42 (82%)	9 (18%)
Comparison with aggregate administrative datasets	43 (84%)	8 (16%)
Comparison with unit record administrative datasets	43 (84%)	8 (16%)
Comparison with existing surveys (LFS etc.)	43 (84%)	8 (16%)
Analysis of questionnaire return rates	40 (78%)	11 (22%)
Demographic analysis	46 (90%)	5 (10%)
Other approach	24 (47%)	27 (53%)

7. The methods that were used to measure accuracy are shown in Table 3. Demographic analysis was the method used by the greatest number of countries (76 per cent) for the measurement of either under-coverage, over-coverage and/or variance. “Other forms” of coverage survey were used by the least number of countries (24 per cent). In all but one case, where a particular method is used the largest number of countries use the method for the measurement of under-coverage, with variance being the least stated use.

Table 3
Count of countries by method used to measure accuracy and purpose of use
 (percentage is of the method total)

	<i>used for under-coverage</i>	<i>used for over-coverage</i>	<i>used for variance</i>	<i>not used</i>
Independent post-enumeration coverage survey	19 (41%)	18 (39%)	10 (22%)	27 (59%)
Other form of coverage survey	8 (19%)	6 (14%)	2 (5%)	32 (76%)
Comparison with aggregate administrative datasets	17 (40%)	17 (40%)	9 (21%)	21 (49%)
Comparison with unit record administrative datasets	18 (42%)	17 (40%)	7 (16%)	19 (44%)
Comparison with existing surveys (LFS etc.)	16 (37%)	13 (30%)	19 (44%)	12 (28%)
Analysis of questionnaire return rates	11 (28%)	9 (23%)	5 (13%)	28 (70%)
Demographic analysis	26 (57%)	24 (52%)	19 (41%)	11 (24%)
Other approach	5 (21%)	4 (17%)	2 (8%)	17 (71%)

8. We can break these results down further by census type.

9. Tables 4, 5 and 6 show that there is a definite difference in the methods used by countries conducting different types of census:

(a) Traditional Census – a larger proportion of countries used an independent post-enumeration coverage survey and / or demographic analysis than any other method. This applied to the measurement of under-coverage (Table 4), over-coverage (Table 5) and variance (Table 6). In the case of measuring variance, these countries also used comparisons with existing surveys above other methods (second highest response - 46%).

(b) Register Based – more countries used comparisons with aggregate administrative datasets and comparisons with existing surveys than any other method.

(c) Combined Census – Comparison with unit level administrative datasets, analysis of questionnaire return rates and demographic analysis were the most popular methods in the case of measuring under-coverage and over-coverage. However, when measuring variance the most popular methods used were comparisons with unit record administrative datasets, comparisons with existing surveys and analysis of questionnaire return rates.

10. The only common theme amongst countries adopting different census types was that comparisons with existing surveys was the highest or second highest reported method for measuring variance (Table 6).

Table 4

Count of countries by method used to measure under-coverage and data collection method
(percentage is of the data collection method total)

	<i>Traditional</i>	<i>Register based</i>	<i>Combined</i>
Independent post-enumeration coverage survey	16 (56%)	0 (0%)	3 (30%)
Other form of coverage survey	6 (25%)	0 (0%)	2 (22%)
Comparison with aggregate administrative datasets	10 (40%)	3 (33%)	4 (44%)
Comparison with unit record administrative datasets	9 (36%)	2 (22%)	7 (78%)
Comparison with existing surveys (LFS etc.)	7 (29%)	4 (44%)	5 (50%)
Analysis of questionnaire return rates	5 (23%)	0 (0%)	6 (67%)
Demographic analysis	18 (64%)	2 (22%)	6 (67%)
Other approach	2 (15%)	2 (40%)	1 (17%)

Table 5

Count of countries by method used to measure over-coverage and data collection method
(percentage is of the data collection method total)

	<i>Traditional</i>	<i>Register based</i>	<i>Combined</i>
Independent post-enumeration coverage survey	15 (56%)	0 (0%)	3 (30%)
Other form of coverage survey	4 (17%)	1 (11%)	1 (11%)
Comparison with aggregate administrative datasets	9 (36%)	4 (44%)	4 (44%)
Comparison with unit record administrative datasets	7 (28%)	3 (33%)	7 (78%)
Comparison with existing surveys (LFS etc.)	5 (21%)	4 (44%)	4 (40%)
Analysis of questionnaire return rates	4 (18%)	0 (0%)	5 (56%)
Demographic analysis	16 (57%)	2 (22%)	6 (67%)
Other approach	2 (15%)	1 (20%)	1 (17%)

Table 6

Count of countries by method used to measure variance and data collection method
(percentage is of the data collection method total)

	<i>Traditional</i>	<i>Register based</i>	<i>Combined</i>
Independent post-enumeration coverage survey	9 (33%)	0 (0%)	1 (10%)
Other form of coverage survey	2 (8%)	0 (0%)	0 (0%)
Comparison with aggregate administrative datasets	6 (24%)	2 (22%)	1 (11%)
Comparison with unit record administrative datasets	4 (16%)	1 (11%)	2 (22%)
Comparison with existing surveys (LFS etc.)	11 (46%)	4 (44%)	4 (40%)
Analysis of questionnaire return rates	3 (14%)	0 (0%)	2 (22%)
Demographic analysis	16 (57%)	2 (22%)	1 (11%)
Other approach	1 (8%)	0 (0%)	1 (17%)

11. We can also look at how many methods countries used for measuring under-coverage, over-coverage and variance.

Figure 2
Number of Methods used to Measure Undercoverage

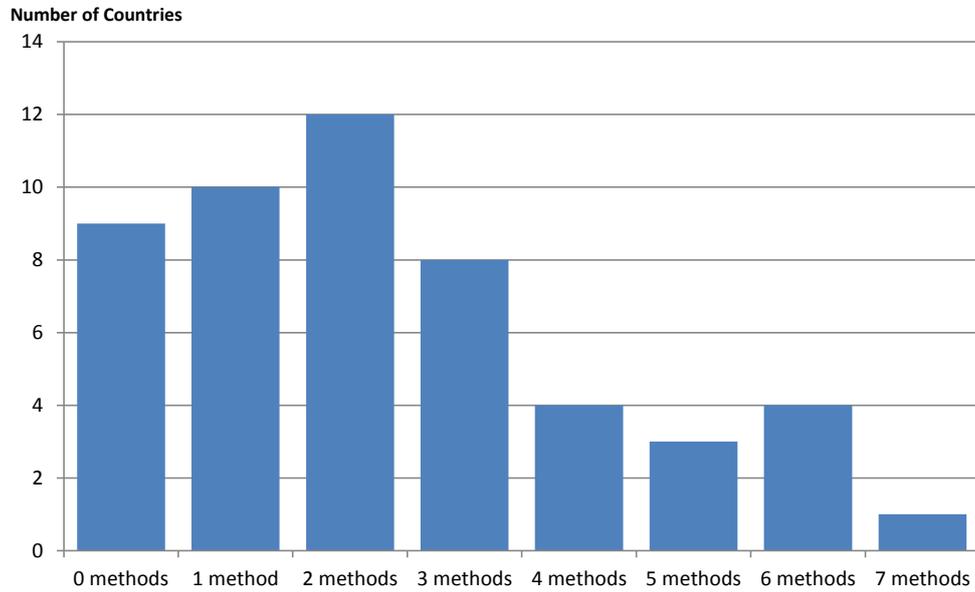


Figure 3
Number of Methods used to Measure Overcoverage

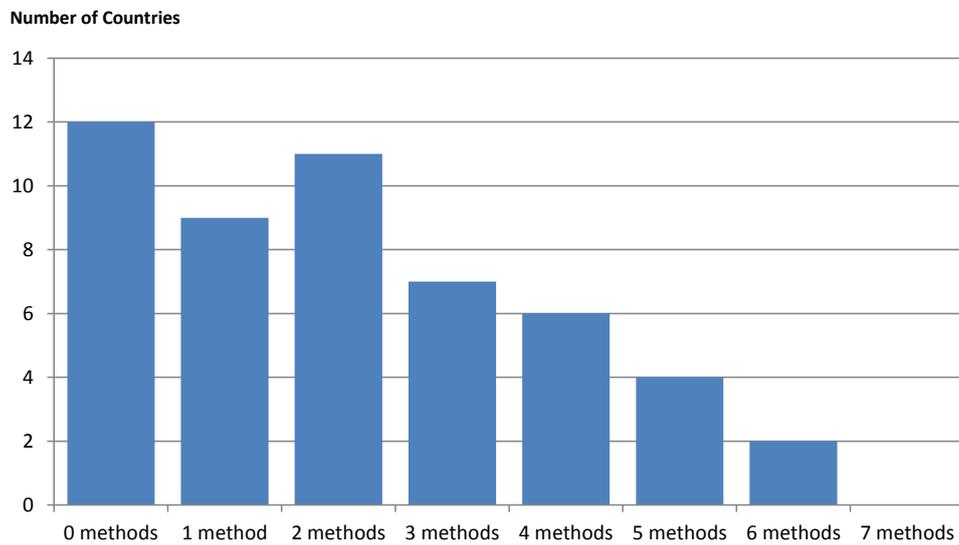
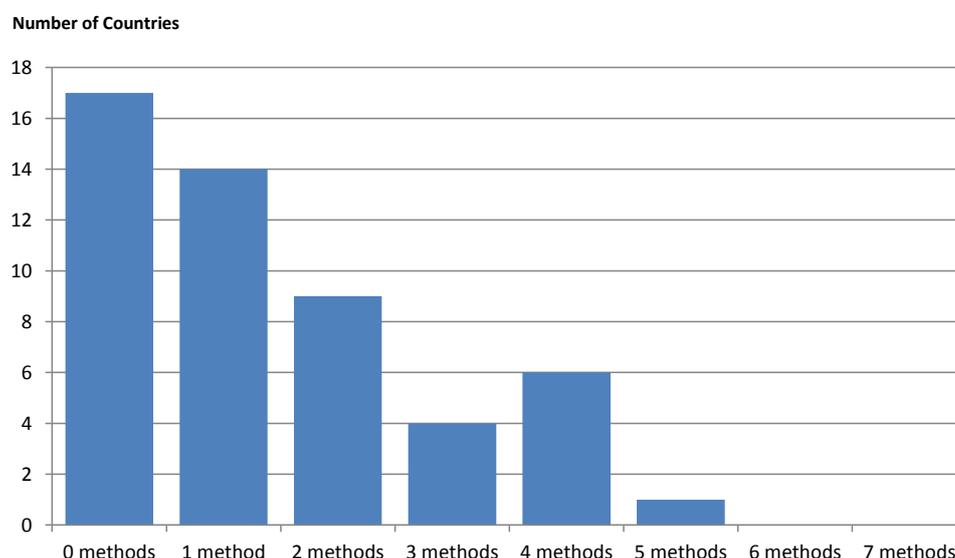


Figure 4

Number of Methods used to Measure Variance

12. Most countries used two or fewer methods in each case (Figure 2, 3 and 4). A summary of the average number of methods used can be seen in Table 7 below.

Table 7

Summary statistics for number of methods used

	<i>Mean</i>	<i>Mode</i>
Under-coverage	2.4	2
Over-coverage	2.1	0
Variance	1.4	0

13. There were nine open responses that elaborated on the methods used.

C. Question 3. After measuring the accuracy of your statistics, did you (or will you) make adjustments before publication?

14. Forty nine countries (96 per cent of the total asked) provided responses to this question – either in the question options or comment box. All 30 EEA countries responded (61 per cent of respondents).

15. For those that managed accuracy, it was fairly evenly split as to whether countries subsequently made adjustments to their statistics (53 per cent did not, whilst 47 per cent did and either published them or did not – Table 8). As well as this applying to the total values, it also applies to the breakdown of EEA / non-EEA countries (Table8) and data collection method (Table9). Only one country (an EEA based country, adopting a traditional census approach) published both adjusted and unadjusted statistics, in comparison to the rest who all only published the adjusted results.

16. A larger proportion of register based census countries did not make adjustments to their statistics – 67 per cent compared to 50 per cent of traditional census countries.

17. There were six open responses made in the comment field, with a couple of respondents saying that they had not yet made a decision on this matter.

Table 8

Count of countries that made adjustments to their statistics, by geography

(percentage is of the total in the geographic category)

	<i>EEA countries</i>	<i>non-EEA countries</i>	<i>All</i>
No	16 (53%)	9 (53%)	25 (53%)
Yes – only adjusted statistics were (or will be) published	13 (43%)	8 (47%)	21 (45%)
Yes – both adjusted and unadjusted statistics were (or will be) published	1 (3%)	0 (0%)	1 (2%)
Total	30 (100%)	17 (100%)	47 (100%)

Table 9

Count of countries that made adjustments to their statistics, by data collection method

(percentage is of the total in the data collection method category)

	<i>Traditional</i>	<i>Register based</i>	<i>Combined</i>	<i>All</i>
No	14 (50%)	6 (67%)	5 (50%)	25 (53%)
Yes – only adjusted statistics were (or will be) published	13 (46%)	3 (33%)	5 (50%)	21 (45%)
Yes – both adjusted and unadjusted statistics were (or will be) published	1 (4%)	0 (0%)	0 (0%)	1 (2%)
Total	28 (100%)	9 (100%)	10 (100%)	47 (100%)

D. Question 4. Did you set and publish targets for the accuracy of your statistics?

18. Forty seven countries (92 per cent of the total asked) provided responses to this question– either in the question options or comment box – 29 of which were from EEA countries (62 per cent of respondents).

Table 10

Count of countries that set and published targets for accuracy, by geography

(percentage is of the total in the geographic category)

	<i>EEA countries</i>	<i>Non-EEA countries</i>	<i>All</i>
No	22 (76%)	13 (69%)	33 (73%)
Yes – set targets but did not publish	4 (14%)	3 (19%)	7 (16%)
Yes – set and published targets	3 (10%)	2 (13%)	5 (11%)
Total	29 (100%)	16 (100%)	45 (100%)

19. Seventy three per cent of countries did not set targets (Table 10). Of those that did set targets, slightly more did not publish their targets than did, although it was quite evenly split (seven did not and five did – Table 10).

Table 11
Count of countries that set and published targets for accuracy, by data collection method

(percentage is of the total in the data collection method category)

	<i>Traditional</i>	<i>Register based</i>	<i>Combined</i>	<i>All</i>
No	20 (71%)	8 (100%)	5 (56%)	33 (73%)
Yes – set targets but did not publish	4 (14%)	0 (0%)	3 (33%)	7 (16%)
Yes – set and published targets	4 (14%)	0 (0%)	1 (11%)	5 (11%)
Total	28 (100%)	8 (100%)	9 (100%)	45 (100%)

20. For those countries conducting a traditional census there was the greatest difference in the number of countries setting targets and not setting them. For those that set targets there was an even split as to whether the targets were published or not. No countries adopting register based censuses set targets. Countries who adopted a combined census approach had the largest proportion of countries setting targets (44 per cent - Table 11), although only one country (11 per cent) chose to publish these targets. (Table 11)

21. There were 11 open responses made in the comment field. Two countries stated that they had not yet decided (Georgia and the Republic of Moldova), whereas two (Ireland and the United States) stated that they aimed for 100 per cent coverage of the population. Others elaborated on their answer, although there were no recurring themes.

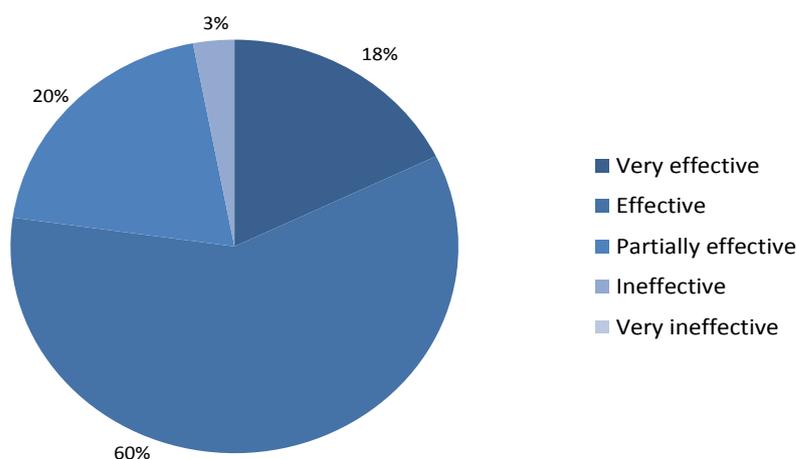
E. Question 5. Please score the overall effectiveness of the methods you used to measure accuracy.

22. Forty seven countries provided responses to this question (92 per cent of the total asked), 29 of which were from EEA countries (62 per cent of respondents).

23. Over three quarters of countries found the methods they used to measure accuracy effective or very effective (Figure 5). Only one country classed the effectiveness as ineffective or very ineffective.

Figure 5

Overall Effectiveness of Methods used to Measure Accuracy



24. There were 11 open responses made in the comment field, the majority of which (five countries) were highlighting that it was too early to assess the effectiveness. However, the United Kingdom elaborated on its answer by responding: “Users have commented that this was the most successful census of recent decades”.

F. Question 6. Did you apply any editing procedures to adjust the data for errors or inconsistent values?

25. Forty eight countries (94 per cent of the total asked) provided responses to this question – either in the question options or comment box – 29 of which were from EEA countries (60 per cent of respondents).

Table 12

Count of countries that applied editing procedures, by geography (percentage is of the total in the geographic category)

	<i>EEA countries</i>	<i>Non-EEA countries</i>	<i>All</i>
Yes	24 (83%)	15 (94%)	39 (87%)
No	5 (17%)	1 (6%)	6 (13%)
Total	29 (100%)	16 (100%)	45 (100%)

26. Therefore, the majority of countries applied editing procedures to adjust for errors or inconsistencies (Table 12) and this was the case for EEA / non-EAA countries and census types (Table 13).

Table 13

Count of countries that applied editing procedures, by data collection method (percentage is of the total in the data collection method category)

	Traditional	Register based	Combined	All
Yes	23 (85%)	6 (75%)	10 (100%)	39 (87%)
No	4 (14%)	2 (25%)	0 (0%)	6 (13%)
Total	27 (100%)	8 (100%)	10 (100%)	45 (100%)

27. There were nine open responses made in the comment field.

G. Question 7. Which types of methods are used to adjust for missing values?

28. Forty nine countries (96 per cent of the total asked) provided responses to this question – either in the question options or comment box. All 30 EEA countries responded (59 per cent of respondents).

29. Imputation was the method that was mentioned by the highest number of countries (82 per cent - Table 14) in both the EEA (79 per cent) and non-EEA (88 per cent) groups. The fewest number of countries made no adjustments for missing values.

Table 14

Count of countries that applied each method to adjust for missing values, by geography

(percentage is of the total number of countries in the geographic category)

	<i>EEA countries</i>	<i>Non-EEA countries</i>	<i>All</i>
Imputation (filling in values for missing scores)	23 (79%)	14 (88%)	37 (82%)
Weighting (adding a variable to weight the possible selective sample to the population)	4 (14%)	3 (19%)	7 (16%)
Other methods	6 (21%)	1 (6%)	7 (16%)
No adjustments for any missing values	3 (10%)	1 (6%)	4 (9%)

Table 15

Count of countries that applied each method to adjust for missing values, by data collection method

(percentage is of the total of countries in the data collection method category)

	<i>Traditional</i>	<i>Register based</i>	<i>Combined</i>	<i>All</i>
Imputation (filling in values for missing scores)	23 (85%)	7 (88%)	7 (70%)	37 (82%)
Weighting (adding a variable to weight the possible selective sample to the population)	2 (7%)	1 (13%)	4 (40%)	7 (16%)
Other methods	1 (4%)	1 (13%)	5 (50%)	7 (16%)
No adjustments for any missing values	4 (15%)	0 (0%)	0 (0%)	4 (9%)

30. Imputation was again the method mentioned by the highest number of countries in each data collection method category (Table 15). However, all countries that conducted either a register based or a combined census made adjustments for missing values, whilst in the case of those conducting a traditional census there were four countries (15 per cent) that did not.

31. There were 13 open responses made in the comment field, the main themes being that the decision was yet to be made (four respondents) or missing values were taken from administrative sources (four respondents – three of which were countries adopting a combined census method and one conducting a traditional census).

H. Question 8. In preparing for the next (2020) census round, would you support an international recommendation that sets targets for the accuracy of statistics?

32. Fifty countries (98 per cent of the total asked) provided responses to this question – either in the question options or comment box. All 30 EEA countries responded (60 per cent of respondents).

33. The support for accuracy targets was stronger in non-EEA countries than in the EEA countries (Table 16). However, overall two thirds of those are in favour, with only 8 per cent against targets. Overall, nearly a quarter (24 per cent) were undecided.

Table 16
Count of countries that would support an international recommendation that sets targets for accuracy, by geography
 (percentage is of the total in the geographic category)

	<i>EEA countries</i>	<i>Non-EEA countries</i>	<i>All</i>
Yes	17 (57%)	17 (85%)	34 (68%)
No	4 (13%)	0 (0%)	4 (8%)
Don't know	9 (30%)	3 (15%)	12 (24%)
Total	30 (100%)	20 (100%)	50 (100%)

Table 17
Count of countries that would support an international recommendation that sets targets for accuracy, by data collection method
 (percentage is of the total in the data collection method category)

	<i>Traditional</i>	<i>Register based</i>	<i>Combined</i>	<i>All</i>
Yes	26 (84%)	2 (22%)	6 (60%)	34 (68%)
No	1 (3%)	3 (33%)	0 (0%)	4 (8%)
Don't know	4 (13%)	4 (44%)	4 (40%)	12 (24%)
Total	31 (100%)	9 (100.0%)	10 (100%)	50 (100%)

34. There were five open responses made in the comment field. One of these was against the setting of targets, saying that “this kind of approach is not suitable for the register-based census”. Three were neither positive nor negative, but felt it depended on what work was involved. One respondent was positive about setting targets, saying that “it is currently not possible to know what level of accuracy is required by Eurostat, or how the accuracy of statistics compares across countries. This is of fundamental importance.”

I. Question 9. In preparing for the next (2020) census round, would you support an international recommendation that information about the accuracy of statistics, and the methods used to measure accuracy, should be published by each country?

35. Fifty countries (98 per cent of the total asked) provided responses to this question – either in the question options or comment box. All 30 EEA countries responded (60 per cent).

36. 62 per cent of respondents were in favour of information about accuracy being published (Table 18). Similar proportions of EEA and non-EEA countries were supportive of it (60 per cent and 65 per cent respectively). All non-EEA countries that expressed a view said that both the information about accuracy and the measurement methods should be published, whilst only 62 per cent of EEA countries who expressed a view (13 out of 21) were in favour of publishing both.

Table 18
Count of countries that would support an international recommendation, by geography
 (percentage is of the total in the geographic category)

	<i>EEA countries</i>	<i>Non-EEA countries</i>	<i>All</i>
Yes, information about accuracy and measurement methods should be published	13 (43%)	13 (65%)	26 (52%)
Yes, but only information about accuracy should be published	5 (17%)	0 (0%)	5 (10%)
No	3 (10%)	0 (0%)	3 (6%)
Don't know	9 (30%)	7 (35%)	16 (32%)
Total	30 (100%)	20 (100%)	50 (100%)

Table 19
Count of countries that would support an international recommendation, by data collection method
 (percentage is of the total in the data collection method category)

	<i>Traditional</i>	<i>Register based</i>	<i>Combined</i>	<i>All</i>
Yes, information about accuracy and measurement methods should be published	17 (55%)	3 (33%)	6 (60%)	26 (52%)
Yes, but only information about accuracy should be published	3 (10%)	2 (22%)	0 (0%)	5 (10%)
No	1 (3%)	2 (22%)	0 (0%)	3 (6%)
Don't know	10 (32%)	2 (22%)	4 (40%)	16 (32%)
Total	31 (100%)	9 (100%)	10 (100%)	50 (100%)

37. There were three open responses made in the comment field, demonstrating mixed opinion, as follows:

- Response from Finland (EEA, register based method):

This kind of approach is not suitable for the register-based census.

- Response from Georgia (non-EEA, traditional method):

will be identified after conducting of census

- Response from the United Kingdom (EEA, traditional method):

It is important to understand the accuracy of statistics across countries, as EU policy decisions are made based on the statistics provided.