

Distr.: General
10 August 2023

English

Economic Commission for Europe

Conference of European Statisticians

Group of Experts on Population and Housing Censuses

Twenty-fourth Meeting

Geneva, Switzerland, 20-22 September 2023

Item 4(b) of the provisional agenda

Revising the Conference of European Statisticians Recommendations for Population and Housing Censuses for the 2030 round:

Quality assessment and quality management

Preliminary progress report of the Conference of European Statisticians Census Task Force on Quality Assessment and Quality Management

Note by the Conference of European Statisticians Task Force on Quality Assessment and Quality Management*

Summary

The Quality Task Force has been working since late 2022, initially focusing on modifications to the questionnaire that will capture the practices implemented by member countries during the 2020 round. The task force has specifically focused on collecting critical information that will inform the updates to the Quality Management chapter and the Quality Management Programme Implementation annex of the Recommendations for the 2030 Censuses of Population and Housing. Several topics have been discussed thus far, for example (1) measuring quality and how metrics might differ for traditional censuses, register-based censuses and those censuses that are a combination of both; (2) which methods are effective for measuring quality; (3) the use of record linkage; and (4) the impact of the use of editing and imputation on census results. The task force will provide more detail on these topics and provide questions for feedback to the meeting attendees.

*Prepared by Jacco Daalmans, Deborah Stempowski and Donatella Zindato

NOTE: The designations employed in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

I. Introduction

1. The Task Force on Quality Assessment and Quality Management has members from Italy, Argentina, Germany, Mexico, Netherlands, Serbia, United Kingdom, United States of America, and the United Nations Statistics Division. Donatella Zindato (Italy) serves as the task force lead. The task force has engaged in a number of meetings since its creation in November 2022.
2. As per its mandate, the Task Force is responsible for updating the parts of the United Nations Economic Commission for Europe (UNECE) Recommendations for Population and Housing Censuses pertaining to the topics of quality assessment and quality management in population censuses, namely Chapter IV (Quality Management) and Annex III (Quality Management Programme Implementation). The work will focus on relevant and necessary updates and additions in the areas of quality dimensions and the main components of the quality management framework. The Task Force will work in coordination with the *Task Force on Emergency Preparedness and Contingency Planning* for the review of the section on operational quality control of Annex III.
3. The first part of the Task Force's work has been devoted to the review of the relevant parts of the questionnaire of the UNECE Survey on Country Practices, whose results will inform the revision of the Recommendations. As the interest in quality continues to grow, the Task Force discussions have been focusing on the quality issues related to the increasing use of administrative sources.
4. The necessary quality metrics will continue to evolve as many countries move from the traditional field enumeration of all individuals to a census that is based on data coming from statistical registers, whether in a combined or in a fully register-based approach. The meetings thus far have focused on what modifications needed to be made to the above-mentioned questionnaire in order to collect the critical information on the evolving quality metric needs.

II. An increasing demand for data quality methods and metrics

5. As the Task Force discussed the changing future of our work, the members agreed that the demand for data quality-related methods, processes and metrics will just continue to increase. Data quality became a major concern regarding censuses conducted during the Covid-19 pandemic. Countries made modifications to census procedures and operations, such as introducing data collection approaches that would limit direct contact with respondents or extending the enumeration period to mitigate the risk of under-coverage. Stakeholders required an increased understanding and additional access to information about the methods, approaches and metrics that were being used to assess data quality.
6. The next round of censuses will need to build on the 2020 round's experiences and lessons learned around quality in order to improve the approach and measures. The quality management programme for National Statistical Offices (NSOs) must become more robust as we move ahead. Stakeholders will continue to request more transparency about the quality of census data. Thus agencies must plan to provide larger insights into it for them.

III. The changing approach to census-taking and the use of administrative sources

7. Given the evolving approaches to conducting censuses, the Task Force took into consideration the expanding use of administrative sources in countries around the world. With such a significant shift that will be implemented much more frequently in the 2030 Round of Population and Housing Censuses, there was much discussion about measuring quality and how metrics might differ for traditional censuses, register-based or administrative-based censuses, and those censuses that are a combination of both methods.
8. More specifically, the Task Force discussed modifications to the UNECE Survey on Country Practices that would provide insights into any editing procedures that were applied to adjust the data for errors, missing or inconsistent values. To ensure all approaches to census data are covered, it is important that we consider responses for collected data, register data or data from administrative records, and the integration of several sources in a census.

IV. Methods used for measuring quality

9. Members of the Task Force also discussed methods of measuring quality. While there are some methods that have been in use for a very long time, for example a post enumeration survey, the greater use of administrative data sources provides additional opportunities to provide quality measures without any data collection operations. The members discussed whether methods were used to measure under-coverage, over-coverage or both, as well as variance. The quality measures for administrative sources can be the same or different from the traditional ones. For instance, over-coverage seems to be more important for administrative data than for data that have been purely collected for census purposes. Responses to the survey will enable the Task Force to develop recommendations that are more tailored towards the methods and what they are most commonly used to measure.
10. The data sources used for the computation of the population count can be different from the ones for other census variables. The same applies to the methods for measuring quality. The use of administrative data might be limited to other census variables than the count. The opposite is also possible. Hence, an explicit distinction has been proposed between quality measurement methods for the population count and for 'other' census information. For the same reason, the Task Force proposed to change the title of the relevant section of the questionnaire to 'Quality, coverage and content', to account for the inclusion of questions on the measurement of content error.
11. Not all countries approach the use of their quality measures in the same way, with some countries making adjustments to the census counts and others not doing so. If a country knows that the census numbers will be adjusted based on the quality measures, there may be additional needs for what measures are collected. Similarly, if countries set targets for the measures, and potentially share them with stakeholders, the requirements around the development and production of those measures may have to be more rigorous. Both areas of quality are covered in the revision to the Survey of Country Practices, to provide broad input for the revision of the Recommendations.

V. Measuring the quality of data linkage, editing and imputation

12. The increasing number of data sources used for census compilation requires methodology to combine these data sources. Data linkage can be done at micro, meso or macro level though

often the integration of information from all the available sources (administrative data, data from previous censuses, data from sample surveys and from longitudinal databases) is done at the record level, in order to determine individuals or households that are resident in a country and their characteristics. Linkage is also needed when some census variables are not present in available registers so that microdata from existing sample surveys are being used. Deterministic or rule-based methods are the most straightforward approach and typically make use of a set of rules for record linkage. Probabilistic methods are also used to maximize the percentage of linked records. Linkage error might produce inaccurate census results, especially when administrative data used for statistical purposes are lacking a unique identifier, thus making it challenging to be linked to other data. Thus, the increasing diversification of population census methodology and sources increases the need for quality measures of data linkage.

13. Data editing is the process of checking data for logical inconsistencies, e.g. when the respondent is apparently born after the census reference date or the respondent's age is inconsistent with their declared educational attainment. Imputation is the process of replacing erroneous or missing information with new values. The need for data editing and imputation does not decrease when administrative sources are used, as the existence of multiple data sources can be in itself a source of inconsistencies (when several register sources are used simultaneously to define, for each statistical unit, the value of the relevant variable, it becomes necessary to include rules for prioritization between different sources in the event of contradictory data). Under-coverage of data sources, data linkage problems and the use of sample data can lead to missing values that might require specific solutions. Improper imputation methods can lead to erroneous results. Therefore, an increasing need arises to assess the quality of data editing and imputation procedures.

VI. Conclusion

14. The Task Force on Quality Assessment and Quality Management has discussed and made changes to the Survey of Country Practices in order to accurately capture the current practices in quality assessment and management in use today. As the demand and focus on quality continues to grow, the survey responses will inform an updated set of recommendations that reflect a changing Population and Housing Census world.

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