# Assessing the Quality of Fieldwork in a Census

*Select Topics in International Censuses*[1]

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## INTRODUCTION

The quality of fieldwork in a census varies significantly depending on a range of factors, including the training and supervision of enumerators, the quality of the instruments used to collect data, and the accuracy of the data entry process. It is essential to assess the quality of fieldwork to ensure that the data are accurate and reliable.

During the 2020 round of censuses, technology played a central role in data collection. Many countries switched to computer-assisted personal interviewing for the first time and used geographic information systems (GIS) for mapping. While these technological advances have certainly improved the efficiency of collection and quality of data, many of the traditional quality assurance (QA) measures used in the field remain relevant and important.[2] Human behavior and errors still play a role in delineation of enumeration area boundaries, development of electronic instruments, coverage, interviewing, and data entry. In addition, while electronic dashboards help with monitoring the fieldwork in real time, some issues are not discoverable without field supervision and monitoring. Therefore, it is essential to combine the benefits of technology with proven quality assurance methods to ensure the accuracy and reliability of census data.

[1] This technical note is part of a series on Select Topics in International Censuses (STIC) that explores matters of interest to the international statistical community. The U.S. Census Bureau helps countries improve their national statistical systems by engaging in capacity building to enhance statistical competencies in sustainable ways. Any views expressed are those of the author(s) and not necessarily those of the Census Bureau.

[2] In the field of quality management, the terms quality control (QC) and QA are frequently used. QC is the process of monitoring and testing a product or service to ensure that it meets desired quality standards. Meanwhile, QA is a proactive approach that involves creating a system to ensure that the product or service meets desired standards from the beginning.

The United Nations Statistics Division (2021) provided guidelines for field enumeration to ensure the data collected in censuses are of high quality. These guidelines are designed to help national statistical offices (NSOs) collect accurate and reliable data that is essential for making informed decisions and developing evidence-based policies. This STIC technical note provides NSOs with information on internationally recognized standards on QA for field enumeration.

## QUALITY ASSURANCE FOR FIELD ENUMERATION

The United Nations Statistics Division (2017) recommends that countries develop a QA and improvement program for their censuses. These programs should include guidelines to help measure the quality of each stage of the census. Due to the magnitude and unrepeatable process of conducting any one census, ensuring quality during field enumeration is one of the most important and difficult tasks for an NSO. Difficulty arises when a QA and improvement system is not developed as part of the overall census program and integrated with other census plans, schedules, and procedures (United Nations Statistics Division, 2017).

During field enumeration, QA tends to identify problems with enumerators rather than systemic or process errors due to the brief duration of the enumeration period.

However, if NSOs want to improve the enumeration process once it has commenced and for subsequent censuses, systemic errors must be identified and addressed. Nevertheless, deficiencies in quality are usually the result

U.S. Department of Commerce
U.S. CENSUS BUREAU
census.gov

United States Agency for International Development
www.usaid.gov

United Nations Population Fund
www.unfpa.org

of deficiencies in process rather than the actions of individuals working in that process. All census processes should be based on:

- Methodological soundness and adherence to professional methods and international standards.
- Efficiency, the degree to which statistics are compiled in such a way that the cost and the respondent burden are minimized relative to output (United Nations Statistics Division, 2017).

The strategies outlined by the United Nations Statistics Division (2021) allow for the identification of problem enumerators and systemic or process errors so that the evaluation of enumeration helps to improve future censuses. The following sections summarize specific QA strategies for face-to-face and, to a lesser extent, self-enumeration methods.

## ROLE OF SUPERVISORS

The field supervisor plays a crucial role in evaluating the performance of enumerators and ensuring the quality of the census. By conducting QA checks and analyzing quantitative information, corrective action can be taken before census forms/data are sent to headquarters, and census management can have information about the enumeration quality. Supervisors need to be trained in QA procedures and have a thorough knowledge of enumeration procedures. Supervisors also provide crucial information in the evaluation of procedures, documentation, and training.

It should be mentioned that finding the optimal supervisor-to-enumerator ratio is crucial for QA during fieldwork. The number of enumerators reporting to each supervisor has a direct impact on census cost and the amount of quality control and QA that can be performed on the work of enumerators. Supervisors overseeing too many enumerators may not be able to provide enough attention to each person and may even impact communication with their own managers and their ability to relay messages promptly (United Nations Statistics Division, 2021). Conversely, hiring too many supervisors will increase training and fieldwork costs.

In the field, supervisors need to establish a positive relationship with enumerators and conduct QA by observing interviews, checking households, monitoring coverage of the enumeration area, reviewing census forms, monitoring and evaluating data, and checking the consistency of replies in the questionnaires/census forms. Details of QA processes should be included in the supervisor's guide and enumerators must be advised that QA procedures will be adopted.

Box 1 outlines the overarching role of supervisors. In practical terms, the duties of a supervisor involve several tasks aimed at ensuring the quality of the enumeration process. These include making sure the enumerator has checked the maps and household list before beginning work,

Box 1.
### Overarching Role of Supervisors

- Retrain enumerators following the initial training course, if needed.
- Enhance enumerator performance through practical advice.
- Provide support and encouragement.
- Provide contact, open communication, and feedback.
- Perform quality assurance on enumerator work.
- Ensure recommended improvements are implemented.

Source: United Nations Statistics Division, "Handbook on the Management of Population and Housing Censuses," Revision 2, United Nations Publications, New York, 2021.

Box 2.
### Supervisors' Quality Assurance Activities

- Observe interviews during enumeration.
- Check households already enumerated.
- Check coverage of the enumeration area.
- Review completed census forms.
- Review, monitor, and evaluate data for the area under supervision.
- Check the consistency of questionnaire answers.

Source: United Nations Statistics Division, "Handbook on the Management of Population and Housing Censuses," Revision 2, United Nations Publications, New York, 2021.

observing introductions to a sample of householders, as well as observing the completion of a sample of questionnaires. The supervisor is also responsible for checking on a sample of dwellings to ensure that the enumerators have visited the households and completed the forms. Additionally, supervisors are required to report to managers on the progress of QA checks and emerging issues related to enumeration quality. Some of the ways that supervisors can perform QA on the work of enumerators are presented in Box 2.

## OBSERVING INTERVIEWS

Observing enumerators early during the enumeration process is critical to ensure that they follow the instructions in their handbook and to offer on-the-job training.

During enumeration, it is essential to ensure the quality of the work performed by enumerators. Several methods can be employed to achieve this objective. The first approach

Table 1.

## Features of Interview Observation

| | Feature | Objective |
|---|---|---|
| Preenumeration | Observing interviews during tests | During tests, supervisors observe approximately four interviews before suggesting any changes. During the main census enumeration, improvements are suggested after the initial interview. Errors made during tests are carefully analyzed to determine where improvements need to be made such as in the quality of enumerators, interviewer recruitment, master trainers or training, and instructions. Analyzing errors on completed test forms can provide insights into problems across the interviewing panel, enabling the review of documentation and instruction guides. A disciplined approach to analyzing activities and occurrences is crucial for evaluating census procedures. |
| Enumeration | Preparation | Enumerators should introduce their supervisor to the householder, and the supervisor should intervene to correct any issues that could lead to incorrect or missed questions. The supervisor's aim is to be "seen and not heard." |
| | Interview technique | To ensure a successful census interview, enumerators must identify and interview the head of the household or a responsible member, adhere to customs and etiquette, explain the census and duration of the interview, keep the respondent on topic while being respectful, pace the interview appropriately, assess the household situation before entering, remain flexible enough to return at a more suitable time, maintain a friendly and professional demeanor, and be well-prepared and informed while staying focused. |
| | Scope and coverage | Supervisors must check that enumerators ask the right questions to determine who should be included or excluded from the census. They must ensure that the coverage rules are followed. For example, if the census is based on place of usual residence, supervisors must make sure interviews only include usual residents and not excluded population groups (e.g., visitors). |
| | Completing the census form | Supervisors play an important role in observing how census forms are completed by identifying and recording errors, recording the initial asking of questions, and recording responses to questions. They need to ensure that enumerators ask every respondent the same question in the same way to ensure consistent and accurate data. Enumerators should not rely on their memory, but read the questions as worded. Supervisors need to emphasize this approach and provide specific assessments on this matter in their observed interview report. |
| | Completing the observed interview report | Supervisors need to include specific details in the observed interview report, such as questions where enumerators had difficulty, and comments on their performance. The report should be positive, constructive, and precise in describing errors. The supervisor should discuss the evaluation with the interviewer, prioritize problems, and provide suggestions for improvement. Enumerators should have the chance to ask questions and provide feedback. If an interviewer's performance is extremely poor, the supervisor should consider extra training before deciding on their employment status. If enumerators blatantly ignore instructions, they may need to be dismissed. |

Source: United Nations Statistics Division, "Handbook on the Management of Population and Housing Censuses," Revision 2, United Nations Publications, New York, 2021.

is to observe interviews while they are being conducted, which can help to identify any issues or inconsistencies in the process. Another way to evaluate the quality of work is to check households that have already been enumerated to ensure that they have been accurately recorded. It is also important to check the coverage of the enumeration area to ensure that all households have been included. Reviewing completed census forms can also help to identify any inconsistencies or errors in the data collected. Additionally, monitoring and evaluating data for the area under supervision can be reviewed to ensure that the work is being conducted effectively. Finally, it is crucial to check the consistency of the replies in the questionnaires to ensure the data are accurate and reliable. By utilizing these methods, QA during the enumeration process can be effectively managed, ensuring that accurate data are collected.

Table 1 summarizes the basic features that a supervisor should observe during a census or census test interview. The purpose of the observation is to evaluate if enumerators follow instructions on how to complete forms, understand basic definitions, ask the questions in the right way, establish rapport with respondents, and accurately record answers.

## CHECKING HOUSEHOLDS ALREADY ENUMERATED

A probity check is a method of QA where a supervisor returns to a sample of households already enumerated to ensure that the enumerator made contact and completed the census forms correctly. The probity report provides evidence of whether enumerators are doing their job and managing the interpersonal aspects of their work. Probity checking is a positive aspect that assists the monitoring of enumeration and is also a public relations exercise with the community. Probity checks should be done early enough in the enumeration period to improve poor performance. The approach for checking households that have already been enumerated is simple and involves introducing oneself, explaining the purpose of the visit, and asking the respondent if the enumeration was completed to their satisfaction. The probity process records comments by the householder regarding whether the enumerator made contact, established rapport, completed all questions, and

whether there were any problems. If significant problems continue, supervisors will need to discuss the matter with their regional manager. Overall, probity checking is an integral and necessary component of the QA strategy that helps to improve data quality.

## CHECKING COVERAGE OF THE ENUMERATION AREA

Supervisors should check that enumerators have covered all households in the allocated enumeration area and ensure that no households from adjoining areas have been included. The supervisor can reconcile the forms or cases in the enumerator record with the household listing maps to assess coverage. The map and household list can also be checked for any additions or deletions by asking enumerators, checking the changes they have made, using local knowledge, and completing spot checks. In some countries, enumerators are required to place a visual sign on the outside of households (e.g., chalk or adhesive label) they have enumerated to help supervisors quickly ascertain whether all households have been enumerated. Other methods to verify coverage of the enumeration area can be done soon after, or during the last stage of census enumeration. Box 3 contains an example from Mexico's 2020 Census.

## REVIEWING COMPLETED CENSUS INSTRUMENTS

Supervisors should review all completed census instruments before they are sent to the processing center to ensure that enumerators have completed their work correctly and with sufficient quality. In a paper-based census, this includes checking that all fields are completed, all forms are accounted for, and summary information is correct. These checks should be implemented as soon as possible after the enumerators finish their workload and can be conducted daily. For digital censuses, QA can be automated to a great extent through edit specifications. However, interviews with errors can prompt updated responses in-person or a call center-based follow-up.

## REVIEWING OF MONITORING AND EVALUATION DATA FOR THE AREA UNDER SUPERVISION

Supervisors are responsible for monitoring the progress in their assigned enumeration areas. In a digital census, instantaneous QA can be provided using real-time data. QA metrics may include the percentage of households visited, time taken to complete each question, number of cases completed per day, and percentage of housing units not interviewed (e.g., because of refusal, noncontact, or unoccupied premises). However, if an enumerator has intentionally listed a limited number of people on the household roster to reduce interview time, digital monitoring is not sufficient to detect the problem. Supervisors should report any abnormalities to the statistical office or take appropriate actions to remedy the situation. Procedures for responding to enumeration abnormalities should be determined during the planning phase to minimize the need for ad-hoc decisions. The appendix contains an example from the U.S. 2020 Census.

Box 3.

### Post-Enumeration Verification Operation: Population and Housing Census 2020, Mexico

A verification operation is a crucial component of quality assurance in any data collection process. It helps ensure the accuracy and completeness of the data collected during the enumeration or survey process. In this context, the verification operation had a significant role in the Mexican Population and Housing Census of 2020, conducted by the Instituto Nacional de Estadística y Geografía (INEGI) where its objectives included confirming the information of unoccupied and temporarily used homes, visiting the homes classified as pending for interviews, and verifying the coverage in the areas subject to verification.

Due to delays caused by the COVID-19 pandemic, the verification period started on the fourth week of the enumeration operation. The verification personnel depended directly on the regional offices of the INEGI. Both the verification operation and the Post-Enumeration Survey were independent from the enumeration operation. The areas visited during verification were selected once field supervisors reported that they had visited all pending homes left by interviewers (after three visits were completed). The verification personnel were trained in the use of the "Listing of Structures" and only applied the "Basic Questionnaire." Similar to the enumeration operation, the means to capture population information were direct face-to-face interviews on mobile devices or paper questionnaires, as well as telephone interviews or invitations to be enumerated through the internet. It is worth mentioning that INEGI utilized QR codes, printed on a label attached to each home after enumeration, in order to enable the full identification of all homes subject to verification.

Source: Instituto Nacional de Estadística y Geografía, Censo de Población y Vivienda 2020: síntesis metodológica y conceptual, México, 2021.

## QUALITY IMPROVEMENT AND THE CENSUS

Quality improvement is an essential aspect of census management. Quality improvement ensures that lessons learned are applied to the next round of censuses to enable continuous improvement. One critical step in this process is conducting a fieldwork debriefing, where the

field staff evaluate their performance and identify areas for improvement. This debriefing allows the team to reflect on their experiences and challenges faced during data collection. The lessons learned from this debriefing can then be documented in a report to make improvements in future census operations. The fieldwork debriefing and lessons learned document are essential tools to prime and maintain a continuous quality improvement cycle.

In addition to conducting a fieldwork debriefing and documenting lessons learned, it is important to evaluate the performance of the previous phase of the census system. This evaluation should include a ranking of problems in order of importance. Once these problems have been identified, the root causes should be determined and corrective action should be implemented to address them. This approach helps to ensure that the census system is continuously improved and the data collected are of the highest quality possible (United Nations Statistics Division, 2017).

It is difficult to implement a quality improvement cycle during fieldwork due to time constraints. However, this can be achieved by following the guidelines in Box 4.

## CONCLUSION

Assessing the quality of fieldwork in a census is of critical importance to ensure the accuracy and reliability of the resulting data. Quality assessments can be internal—at the NSO level—or independent—by engaging external organizations and respected members of the scientific and statistical community (U.S. Census Bureau, 2023). The United Nations Statistics Division provides guidelines for fieldwork QA (United Nations Statistics Division 2017, 2021). Good QA during field enumeration not only identifies problems with enumerators, but also systemic or process errors. The ultimate goal of conducting QA during field enumeration is to ensure that accurate data are collected in current and future censuses.

Box 4.

### Guidelines for Improved Quality Monitoring

- Clearly establishing the aims of the field operations phase.
- Applying thoroughly documented procedures.
- Ensuring the enumerators understand their role through appropriate training and providing inspection of corrupted forms.
- Providing opportunities for field staff to be observed operating on the job so feedback can be given and retraining undertaken.
- Establishing communication and feedback loops with the general public through helplines, online forums, social media, etc., so problems in the field can be detected and corrected in real time.

Source: United Nations Statistics Division, "Handbook on the Management of Population and Housing Censuses," Revision 2, United Nations Publications, New York, 2021.

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## APPENDIX

### U.S. 2020 Census: Ensuring Quality During Data Collection

The U.S. 2020 Census was designed to achieve the most complete and accurate count possible, with measures to ensure quality included at every stage of the process. The design was informed by research, testing, and lessons learned from the previous census.

To ensure quality during data collection, efforts such as a Fusion Center, a Decennial Field Quality Monitoring (DFQM) program, and Real-Time Analysis of Data were used.

#### *2020 Census Fusion Center*

The 2020 Census Fusion Center aimed to facilitate information sharing among groups engaged in census production operations to ensure situational awareness of cross-cutting issues and to identify issues for problem-solving in a timely manner. The center used data from various sources, such as the National Weather Service, the Center for Disease Control and Prevention, and local and tribal governments, to make decisions based on the deployment of field staff amidst the COVID-19 pandemic. This monitoring effort ensured the health of the public and census staff was not compromised and maintained the quality of the data collection during the census.

#### *Decennial Field Quality Monitoring*

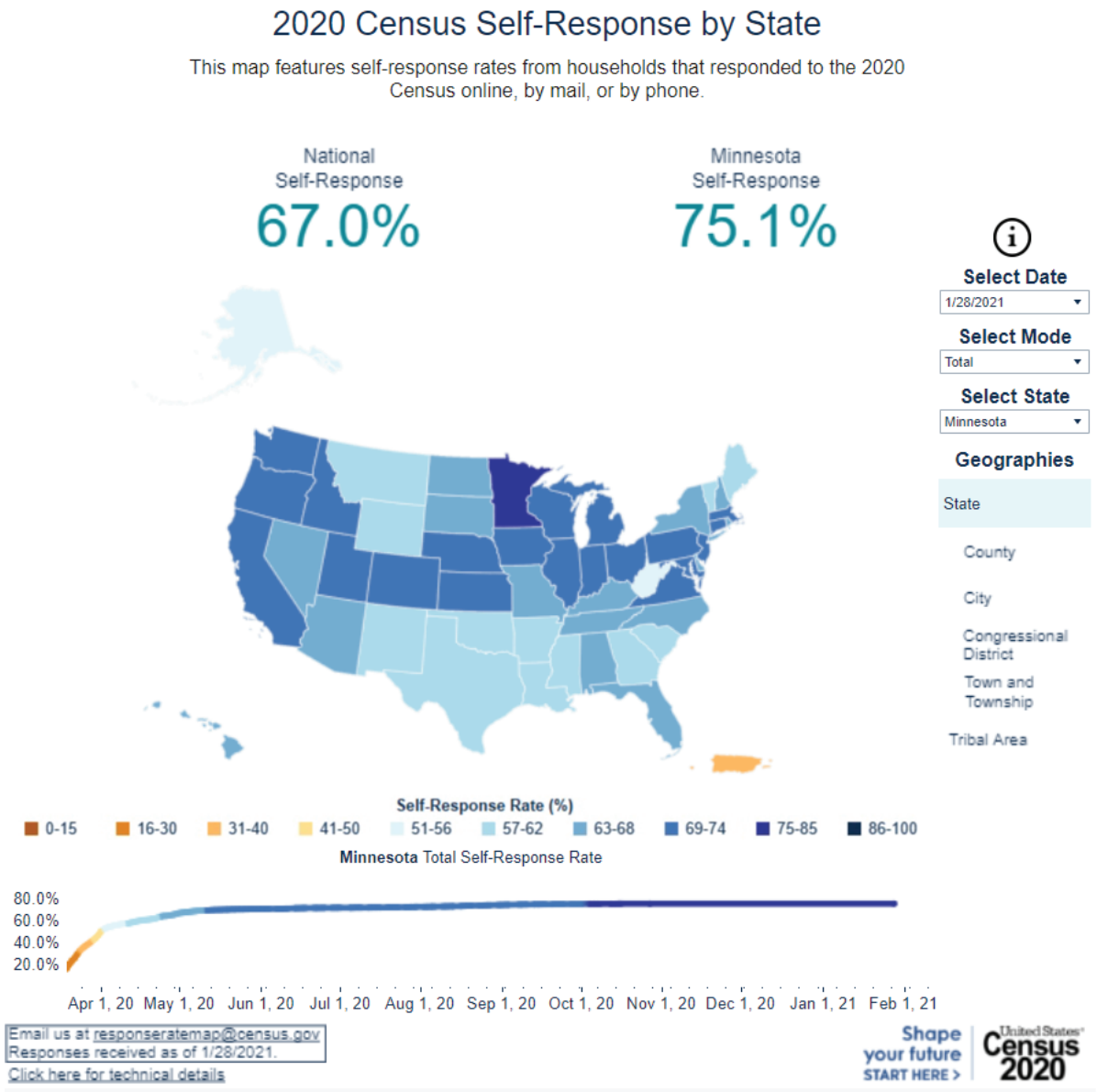
The DFQM program was designed to identify and resolve potential issues in field data collection operations through regular monitoring and analysis. The program was monitored by staff at various census offices, and potential issues were identified early and communicated to field management to enable quick remediation. DFQM used outlier analysis, dashboards, operational control system reports, and other reports daily to verify that data were collected appropriately and that field staff followed procedures. The overall goal of DFQM was to ensure more accurate and efficient operations by reporting, investigating, and resolving potential field data quality problems in a timely manner.

#### *Real-Time Analysis of Data*

Real-Time Analysis of Data (RTAD) monitored select indicators throughout the data collection process to provide insights into progress and potential data quality issues. The metrics produced were communicated to Census Bureau leadership, operational teams, or other data monitoring teams such as DFQM. RTAD was crucial in providing early insights and promoting transparency. It established self-response rate projections, compared realized rates to projections, and released daily self-response rates publicly. It also monitored mail delivery dates, areas with no response, break-off rates of self-respondents, and compared demographic distributions to population benchmarks. RTAD staff responded to external inquiries to ensure accurate understanding of self-response patterns. Figure 1 is a capture of the 2020 Census RTAD public dashboard from January 28, 2021, after all census operations had ended. This image contrasts the National Self-Response rate with that of Minnesota, a state with one of the highest response rates in the United States in 2020.

The 2020 Census: Tracking Self-Response Rates Map is located at <www.census.gov/library/visualizations/interactive/2020-census-self-response-rates-map.html>.

Figure 1.




Source: U.S. Census Bureau, "2020 Census: Tracking Self-Response Rates Map," Washington, DC, 2023, <www.census.gov/library/visualizations/interactive/2020-census-self-response-rates-map.html>.

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