

## Management Plan for a successful qualitative Census implementation

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### Abstract

This paper aims to give a framework of the Quality Management Plan for a successful implementation of a Census. Given that the Census is the most exhaustive survey that a country can carry out, this framework could serve as a framework in the implementation of all the surveys in general. This paper aims moreover to provide a data quality strategy for institutional researchers on how quality dimensions should and could be taken into account during the management plan of a survey. A specific proposed strategy framework will be carried out, with an added value since it takes into account all the quality dimensions that a Census in particular and a survey in general, must meet to be considered reliable and of good quality. The set of all quality dimensions used in this paper is in line with Eurostat's recommendation about quality which makes all the data comparable among the countries that follow and apply them.

**Keywords:** Census, Quality, Management.

### Introduction

The Population and Housing Census (PHC) is the biggest and the most expensive statistical operation that a country may carry out. Census results allow creating a picture on time and space about the structure and characteristics of the entire population of the country and about the housing units, whose relevancy largely exceeds the simple knowledge of the demographic reality of a country. Indeed, the planning of the future deeply depends on the availability of accurate information about what we are, who we are, and how we live.

Due to the size of the operation, its complexity, and the number of people involved, a census is subject to many sources of errors. Indeed, in the Census operation, the risk of error is sparse at various levels and different stages. Therefore, a comprehensive system of quality assurance has to be designed and implemented together with the Census operation itself.

Therefore, a Quality Management Plan is needed to provide a comprehensive overview of the quality methodologies and standards to be adopted in managing the project and in the production of the outputs. The Quality Management Plan documents the necessary information required to effectively manage census quality from planning to the dissemination of results. It defines the census quality policies, procedures, criteria for and areas of application, as well as roles and responsibilities. The Quality Management Plan is created during the planning phase of the census and is considered a component of the census planning. Its intended audience is the project manager, project team, project sponsor, and any senior leaders whose support is needed to carry out the plan.

## 1 Quality management approach

### 1.1 Dimensions of quality

Quality is defined in general in terms of 10 dimensions; other statistical agencies and organizations have defined similar frameworks. While these definitions may differ slightly, they all recognize that there is no one single measure of data quality. Institute of Statistics of Albania defines the dimensions of quality as follows:

Figure 1. Quality dimensions



These dimensions of quality are overlapping and interrelated. However, there is no effective model for bringing together all of these characteristics of quality into a single indicator. Every dimension has to be adequately managed if the information is to be fit for use; a failure in any one dimension will impair or destroy the usefulness of the information.

Also, the dimension of **confidentiality** will be considered. Confidentiality is of high importance in a census: firstly, as the whole population is covered, the risk of disclosure is higher, and secondly, public mistrust in the confidentiality safeguard can lead to non-participation of the population in the census.

Achieving an acceptable level of quality is the result of addressing, managing, and balancing over time the various dimensions of quality, with the major uses of the information, costs, respondent burden, and other factors that may affect information quality or user expectations. Actions taken to address one dimension of quality may affect other dimensions, often in ways that cannot be fully predicted. Decisions and actions aimed at achieving an appropriate balance of quality dimensions and other factors are based on knowledge, experience, reviews, feedback, consultation, and, inevitably, judgment.

### 1.2 Census Quality Assurance Management Plan

Census data quality assurance strategy outlines how the institute of statistics ensures key census data needs are met and outputs are fit to purpose.

This strategy aims to ensure quality is:

- clearly understood and communicated
- designed and built into every census process

➤ directed by the needs of internal and external customers.

For the Census, it is important to place the right emphasis and priority on each of the dimensions of quality with the ultimate goal of ensuring output data that is fit for purpose' and has value to the user's perspective. All quality goals and under this strategy have the guidelines and actions for achieving the goals.

### 1.2.1 Relevance

The relevance of statistical information reflects the degree to which it meets the current and potential needs of users. It is concerned with whether the available information sheds light on the issues of most importance to users. Assessing relevance is a subjective matter dependent upon the varying needs of users. INSTAT challenge is to weigh and balance the conflicting needs of current and potential users to produce a program that goes as far as possible in satisfying the most important needs within given resource constraints.

To identify user needs, and to assess if they are met, the user-producer dialogue should be regular and ongoing, and the information collected by such dialogues should be reflected in statistical activities.

The objective is to meet the major needs of the users, and the acceptance criteria will be the approval of Census questionnaire contents by the group of stakeholders.

The strategy to meet the relevance of the census results include:

- Procedures to identify and consult the key users of Census statistics, to identify new or emerging requirements, and to monitor the relevance and usefulness of existing statistics;
- Compliance with international recommendations concerning the inclusion of Census core topics;

### 1.2.2 Accuracy

INSTAT aim is to develop, produce and disseminate information that presents its data users and stakeholders with a true reflection of reality. The accuracy of statistical information refers to the degree to which it correctly describes the phenomena it was designed to measure. The accuracy of statistical estimates is usually quantified by the evaluation of different sources of error, where the magnitude of an error represents the degree of difference between the estimate and the true value. Common sources of error include coverage, nonresponse, measurement, and processing.

In managing accuracy, investment in a strong statistical methods research program increases the capacity to improve accuracy without increasing cost or impacting timeliness, through the incorporation of state-of-the-art statistical techniques.

The strategy regarding the accuracy of the census results include:

- Consultations with Census experts on Census questionnaire design to ensure correct conceptualization of the data to be collected;
- Thorough development of enumerator manual to improve understanding of information to be collected and to adequately respond to data-collection challenges;
- Development and use of detailed and advanced training materials for enumerator-, controller- and supervisor training as to improve understanding of information to be collected and to adequately respond to data-collection challenges;
- Thorough testing of questionnaires, forms, and procedures in a field test and pilot

Census;

- Observation and checking by Census field staff;
- A development application for monitoring and managing operation fieldwork;
- Conduct a post-enumeration survey to check the coverage of the Census;
- Development and application of a large set of editing and imputation rules to identify and solve inconsistencies;

### 1.2.3 Timeliness

Timeliness is part of the design decisions that are made in the planning stages. Our processes have to be constructed to meet timeliness constraints and deadlines that have been set. The tension between timeliness and accuracy is a key one for the census. By definition, timeliness is the speed of dissemination of statistical outputs - i.e., the delay of time between the end of a reference period (or a reference date) and the dissemination of the statistical outputs.

Timeliness of response and operational data will allow the census to be responsive and adaptive during operations to make continuous, adaptive improvements.

Automation is a key design principle of the high-level processing strategy to achieve timeliness and accuracy goals. However, some manual intervention may be required. Ensuring the right balance between automation and manual intervention to maximize the quality of processed data will be crucial. This balance can be achieved by using effective statistical methods and tools, and by setting thresholds and priorities for coding and editing.

The desired timeliness of information derives from considerations of relevance – for what period does the information remain useful for its main purposes? The answer to this question varies with the rate of change of the phenomena being measured, with the frequency of measurement, and with the immediacy of response that users might make to the latest data.

Planned timeliness is a design decision, often based on trade-offs with accuracy - are later but more accurate data preferable to earlier less accurate data? – and cost. Improved timeliness is not, therefore, an unconditional objective. However, timeliness is an important characteristic that should be monitored over time to warn of deterioration. It should be monitored across programs, to recognize extremes of tardiness, and to identify good practices. User expectations of timeliness are likely to heighten as they become accustomed to immediacy in all forms of service delivery thanks to the pervasive impact of technology. Unlike accuracy, timeliness can be directly observed by users who, one can be sure, will be monitoring it.

The strategy related to timeliness of the dissemination of census results include:

- Thorough planning of the census project and implementation
- Training of a pool of reserve field staff to avoid delays in enumeration due to drop-out;
- Use of modern technology to collect data in electronic format
- Testing the Census procedures with all interconnected components in a comprehensive pilot operation;
- Application of effective monitoring procedures and applications for enumeration progress;

#### **1.2.4 Punctuality**

Punctuality refers to the possible time lag existing between the actual delivery date of statistical outputs and the target date when they should have been delivered, for instance, concerning dates announced in an official release calendar or previously agreed among partners.

Major information releases should have release dates announced well in advance. This not only helps users plan, but it also provides internal discipline and, importantly, undermines any potential effort by interested parties to influence or delay any particular release for their benefit. The achievement of planned release dates should be monitored.

The strategy related to the punctuality of the dissemination of census results include:

- Publish a reasonable census release calendar;

#### **1.2.5 Accessibility and Clarity**

Census statistics are easily accessible to all users on an impartial basis, are presented in a clear and understandable format, and are accompanied by relevant supporting metadata.

Ensuring that users can easily access statistics is a fundamental part of the statistical process. INSTAT works to continuously improve the accessibility of its statistics, taking into account new possibilities offered by IT developments. Metadata accompanying data dissemination improve the clarity and interpretability of statistics

The objectives for accessibility and clarity are the following:

- All users have equal and simultaneous access to statistical releases. Key statistics are freely available for users;
- Users are informed about the procedures of the Census and dissemination of results;

The strategy related to accessibility and clarity of the census outputs include:

- Dedicated Census section on INSTAT website providing timeless dissemination of Census results and information;
- Census statistics and corresponding metadata are presented in a format that facilitates proper interpretation, meaningful comparisons, and machine-processing;
- Concepts, definitions, and classifications, as well as data collection and processing procedures used, and the quality assessments carried out, will be properly documented.

#### **1.2.6 Comparability**

The concepts of comparability refer to the measurement of the impact of differences in applied statistical concepts, measurement instruments, and procedures, where statistics are compared between geographical regions, sectorial domain fields, or periods. Consistency is determined during the design phase, is applied in processes, and needs to be monitored and evaluated throughout the census cycle. For the census, the tension between relevance and consistency in time needs to be managed.

The objective related to comparability is that census data and information are consistent with previous census and with international standards to ensure time and

spatial comparability.

The strategy related to the comparability of the census outputs include:

- Compliance with international recommendations on definitions, classifications and procedures applied in the Census;
- Maintaining overall comparability with the previous Census-es;
- Maintaining comparability in the conceptualization of specific statistics with other surveys conducted by INSTAT;

### 1.2.7 Coherence

The coherence of statistical data includes coherence between different data items about the same point in time, coherence between the same data items for different points in time, and international coherence. Three complementary approaches are used for managing coherence in INSTAT.

The first approach element is the development and use of standard frameworks, concepts, variables, and classifications for all the subject-matter topics that are measured. This aims to ensure that the target of measurement is consistent across programs, that consistent terminology is used across programs (so that, for example, “educational level” means the same thing whether measured in a Census of population or from school records), and that the quantities being estimated bear known relationships to each other. The realization of this element is normally through the adoption and use of frameworks such as the System of National Accounts and standard classification systems for all major variables. The issue of international comparability is addressed by considering the adherence of the standards adapted to international standards where these exist.

The second approach aims to ensure that the process of measurement does not introduce inconsistency between data sources even when the quantities being measured are defined consistently. The development and use of common methodologies and systems for data collection and processing contribute to this aim. The third approach analyses the data themselves and focuses on the comparison and integration of data from different sources or over time. This kind of analysis attempts to recognize situations where variation or inconsistency exceeds levels implied by the expected accuracy of the data. Such situations need to be explained by other factors and, where possible, corrected. Conceptual frameworks covering particular subject-matter areas play an important role by providing a basis for establishing coherence or recognizing incoherence. Some integration activities are regular and routine, e.g., the integration of data in the national accounts, benchmarking or calibration of sub-annual and annual estimates, reconciliation of survey data with administrative sources. Other activities are more exploratory or ad hoc. The confrontation of data from different sources, and their subsequent reconciliation or explanation of differences, is an activity that is often needed as part of pre-release review or certification of data to be published. Feedback from external users and analysts of data that point out coherence problems with current data is also an important component of coherence analysis. Some incoherence issues only become apparent with time and may lead to historical revisions of data.

The objective in terms of coherence is that census data is coherent within census

datasets and metadata, it can be successfully brought together with other statistical data and information within a broad analytical framework and in time series. The use of standard concepts, definitions, and classifications promotes consistency.

The strategy related to coherence of the census outputs include:

- the use of commonly formulated questions when the same variables are being collected in different surveys by INSTAT;
- Reference to international codes of best practice;

### 1.2.8 Completeness

Completeness refers to the degree to which data cope with the needs of data users as completely as possible, taking restricted resources into account. In the census, it refers to the extent to which users' needs of information are taken into account in the questionnaire and the extent to which the dissemination program meets the users' expectations.

The objective is to meet Eurostat completely in the context of the EU accession and most of the national users' needs.

The strategy related to completeness of the census outputs include:

- Organize users' consultations to assess their needs
- Develop the possibility for self-tabulation
- Offer access to microdata files to researchers

### 1.2.9 Transparency

Transparency is the right of respondents to have information on a legal basis, the purpose for which the data is required, and the protective measures adopted.

Good working practices including transparency, particularly in data-analytic work, will support continuity in the context of staff departures. The objective is to make accessible all census documentation to the public and be transparent on the conduct of the census in all its phases.

The strategy related to transparency of the census outputs include:

- Use new technologies and innovative methods of e-learning to share knowledge between producers and users of statistics;
- Publish all relevant metadata to accompany dissemination
- All phases of the statistical production cycle are documented and the cycle is easily available to the public;

## Conclusions

One of the main objectives of this paper has been to put quality concern into a broader context during a Census implementation. Accuracy is important, but without attention to other dimensions such as timeliness, comparability etc., it alone will not satisfy users and will not bring the research institution to make the difference. Each of the quality dimensions is explained by a set of steps that might be taken into consideration for a good quality process which inevitably will ensure data of good quality.

This paper based on desk researches and experience, proposes some specific actions

to be considered while implementing a census in regard to quality improvements, and of course this framework might be used by all surveys as a subset of Census. These actions inevitably will increase the quality of data and the user's satisfaction, making them participative since the beginning will not only educate them to increase their demand for quality but will improve the research institution to disseminate good data for their clients and users.

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