

TECHNICAL STANDARD FOR THE QUALITY OF THE STATISTICAL PROCESS

QUALITY REQUIREMENTS
FOR THE GENERATION
OF STATISTICS



PREFACE

The Colombian Institute of Technical Standards and Certification (ICONTEC, *for its acronym in Spanish*) is the national standardization body, according to Decree 1595 of 2015.

ICONTEC is a private, not-for-profit organization whose mission is to contribute to the generation of trust in society and to sustainable development in organizations; through innovation in standardization, education, conformity assessment and metrology.

The National Administrative Department of Statistics (DANE) requested technical support from ICONTEC to prepare this National Technical Corporate Standard.

DANE developed face-to-face sessions and facilitated an application on its website for the members of the National Statistical System (NSS) to contribute to the document by means of comments and proposals to the Draft Technical Standard. The public consultation was carried out on the DANE website between May 02 and 31, 2017. Also, socialization processes were carried out through face-to-face sessions on May 9, 16 and 23, 2017.

In a like manner, this Technical Standard includes the main recommendations made by the National Statistical Advisory Council (CANE *for its acronym in Spanish*). The Advisors reviewed this document on June 16, 2017.

TECHNICAL STANDARD FOR THE QUALITY OF THE STATISTICAL PROCESS

NTC PE 1000



DANE
Para tomar decisiones

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QUALITY REQUIREMENTS FOR THE GENERATION
OF STATISTICS

DANE

Contents

0. INTRODUCTION.....	5
0.1 GENERALITIES	5
0.2 FOCUS OF THE STATISTICAL PROCESS	6
1. PURPOSE AND FIELD OF APPLICATION.....	7
2. NORMATIVE BENCHMARKS.....	7
3. TERMS AND DEFINITIONS.....	8
3.1 TERMS PERTAINING TO THE NATIONAL STATISTICAL SYSTEM	8
3.2 TERMS PERTAINING TO STATISTICAL QUALITY ATTRIBUTES	8
3.3 TERMS PERTAINING TO THE ENTITY.....	9
3.4 TERMS PERTAINING TO THE STATISTICAL PROCESS.....	9
3.5 TERMS PERTAINING TO THE TYPES OF STATISTICAL OPERATIONS	10
3.6 TERMS PERTAINING TO THE OPERATION	10
3.7 TERMS PERTAINING TO THE RESULT	12
4. GENERAL REQUIREMENTS	¡Error! Marcador no definido.
4.1 RESPONSIBILITIES OF SENIOR MANAGEMENT.....	12
4.2 REQUIREMENTS OF THE ENTITY	13
4.3 CONFIDENTIALITY OF THE INFORMATION COLLECTED	13
4.4 DOCUMENTED INFORMATION OF THE STATISTICAL PROCESS.....	¡Error! Marcador no definido.
4.5 PERSONNEL OF THE STATISTICAL PROCESS	¡Error! Marcador no definido.
4.6 USE AND APPLICATION OF STATISTICAL GUIDELINES	¡Error! Marcador no definido.
4.7 RISK MANAGEMENT	¡Error! Marcador no definido.
4.8 STATISTICAL PROCESS	¡Error! Marcador no definido.
4.9 MONITORING AND FOLLOW-UP	¡Error! Marcador no definido.
5. DETECTION AND ANALYSIS OF REQUIREMENTS	16
5.1 IDENTIFICATION OF INFORMATION USERS	16
5.2 FORMULATION OF THE COLLECTION MECHANISMS BASED ON THE STAKEHOLDERS'	

INFORMATION NEEDS..... ¡Error! Marcador no definido.

5.3 ANALYSIS OF THE INFORMATION NEEDS ¡Error! Marcador no definido.

5.4 RELEVANCE OF THE RESULTS OF THE STATISTICAL OPERATION FOR PUBLIC POLICIES..... ¡Error! Marcador no definido.

5.5 OBJECTIVE OF THE STATISTICAL OPERATION..... ¡Error! Marcador no definido.

5.6 GENERAL PLAN OF THE STATISTICAL OPERATION..... ¡Error! Marcador no definido.

6. DESIGN AND TESTS..... **17**

6.1 TYPE OF STATISTICAL OPERATION ¡Error! Marcador no definido.

6.2 DOCUMENTATION ¡Error! Marcador no definido.

6.3 THEMATIC DESIGN ¡Error! Marcador no definido.

6.4 STATISTICAL DESIGN **20**

6.5 EXECUTION DESIGN..... ¡Error! Marcador no definido.

6.6 INFORMATION PROCESSING DESIGN..... ¡Error! Marcador no definido.

6.7 ANALYSIS DESIGN ¡Error! Marcador no definido.

6.8 PRODUCTION SYSTEMS AND WORKFLOWS DESIGN..... ¡Error! Marcador no definido.

6.9 DISSEMINATION DESIGN ¡Error! Marcador no definido.

6.10 TESTING TO DESIGN..... **25**

7. EXECUTION ¡Error! Marcador no definido.

7.1 ACTIVITIES PRIOR TO EXECUTION..... **25**

7.2 DATA COLLECTION ¡Error! Marcador no definido.

7.3 CONTROL AND FOLLOW-UP TO COVERAGE..... ¡Error! Marcador no definido.

7.4 PROCESSING ¡Error! Marcador no definido.

7.5 COMPLETION OF DATA FILES..... ¡Error! Marcador no definido.

8. ANALYSIS..... ¡Error! Marcador no definido.

8.1 CONTEXT ANALYSIS **28**

8.2 CONSISTENCY ANALYSIS ¡Error! Marcador no definido.

8.3 COMPARABILITY ANALYSIS **29**

9. DISSEMINATION..... ¡Error! Marcador no definido.

9.1 HISTORICAL SERIES ¡Error! Marcador no definido.

9.2 METADATA..... **30**

9.3 PUNCTUALITY AND TIMELINESS30

9.4 DISSEMINATION MEDIA AND ACCESS..... ¡Error! Marcador no definido.

9.5 PUBLICATION OF QUALITY MEASURES ¡Error! Marcador no definido.

9.6 PUBLICATION OF THE COVERAGE PERCENTAGE31

9.7 CONDITIONS OF USE OF STATISTICAL INFORMATION ¡Error! Marcador no definido.

9.8 AUTHORIZATION OF PUBLICATION OF STATISTICAL INFORMATION¡Error! Marcador no definido.

9.9 CONTINUITY OF THE STATISTICAL OPERATION31

10. PERFORMANCE EVALUATION ¡Error! Marcador no definido.

10.1 ANALYSIS AND EVALUATION31

10.2 INTERNAL AUDIT.....31

11. IMPROVEMENT ¡Error! Marcador no definido.

11.1 GENERALITIES32

11.2 NON-COMPLIANCE AND CORRECTIVE ACTION.....32

11.3 CONTINUOUS IMPROVEMENT33

ANNEX A..... ¡Error! Marcador no definido.

TABLE OF CORRESPONDENCE BETWEEN NTC-ISO 9001: 2008, NTC-ISO 9001: 2015 AND NTC-GP 1000: 2009

ANNEX B.....35

TABLE OF EXCLUSION OF REQUIREMENTS ACCORDING TO THE INFORMATION CAPTURE METHOD

BIBLIOGRAPHY.....39

0. INTRODUCTION

0.1. GENERALITIES

The National Administrative Department of Statistics (DANE), in compliance with the provisions set forth in Article 160 of Law 1753 of 2015, prepared and published the present technical standard in order to ensure the quality of the production and dissemination process of official statistics.

Article 160 was regulated by Decree 1743 of 2016, which states that DANE will establish, upon presentation to the National Statistical Advisory Council (CANE), the evaluation requirements for the quality of statistics, which will be exclusively oriented to the statistical process.

This document aims to comply with this legal mandate and to contribute to the entities and organizations that make up the National Statistical System (NSS) producing official statistics with quality standards.

The NSS consists of entities that produce and disseminate statistics or are responsible for administrative records, as follows:

- a) The entities belonging to the Branches of Public Power, at all levels of the state structure, central or decentralized, by services or regionally; of the national, departmental, municipal and district level.
- b) Independent, or autonomous state control bodies, agencies or entities.
- c) Legal persons, public or private, which provide public services.
- d) Any legal person or dependency of a legal person that performs a public function or that of a public authority.
- e) Legal persons who own, produce or manage administrative records, in the development of their corporate purpose, that are necessary inputs for the production of official statistics.

Thus, DANE, in conjunction with the Colombian Institute of Technical Standards and Certification (ICONTEC), in accordance with the Fundamental Principles of Official Statistics issued by the United Nations (UN), have developed a technical standard aimed at promoting the adoption of a management system for statistical production based on processes that can be implemented by the entities belonging to the NSS, regardless of their size and characteristics.

The following documents were taken into account as references for the preparation of this standard:

- Generic Model of the Statistical Process Version 5.0 (GSBPM, *for its acronym in English*).
- Quality framework and guidelines for OECD statistical activities. Version 2011/1. OECD
- Handbook on data quality assessment methods and tools. European Commission. EUROSTAT.
- Colombian Technical Standard (NTC) ISO 9001: 2015.

- Technical Standard for Quality in Public Management NTCGP 1000: 2009.

The implementation of this standard does not exclude the obligatory nature of entities or organizations of the NSS, to comply with and use other statistical guidelines generated and / or adopted by DANE.

This standard is designed in such a way that it does not represent a limitation to implement the statistical process, in the entities or organizations that have not implemented the management by processes or a management system.

In drafting the requirements of the standard, the following verbal forms were used:

- Shall: Indicates a requirement.
- Should: indicates a recommendation.
- May: indicates a permit, a possibility or a capability.

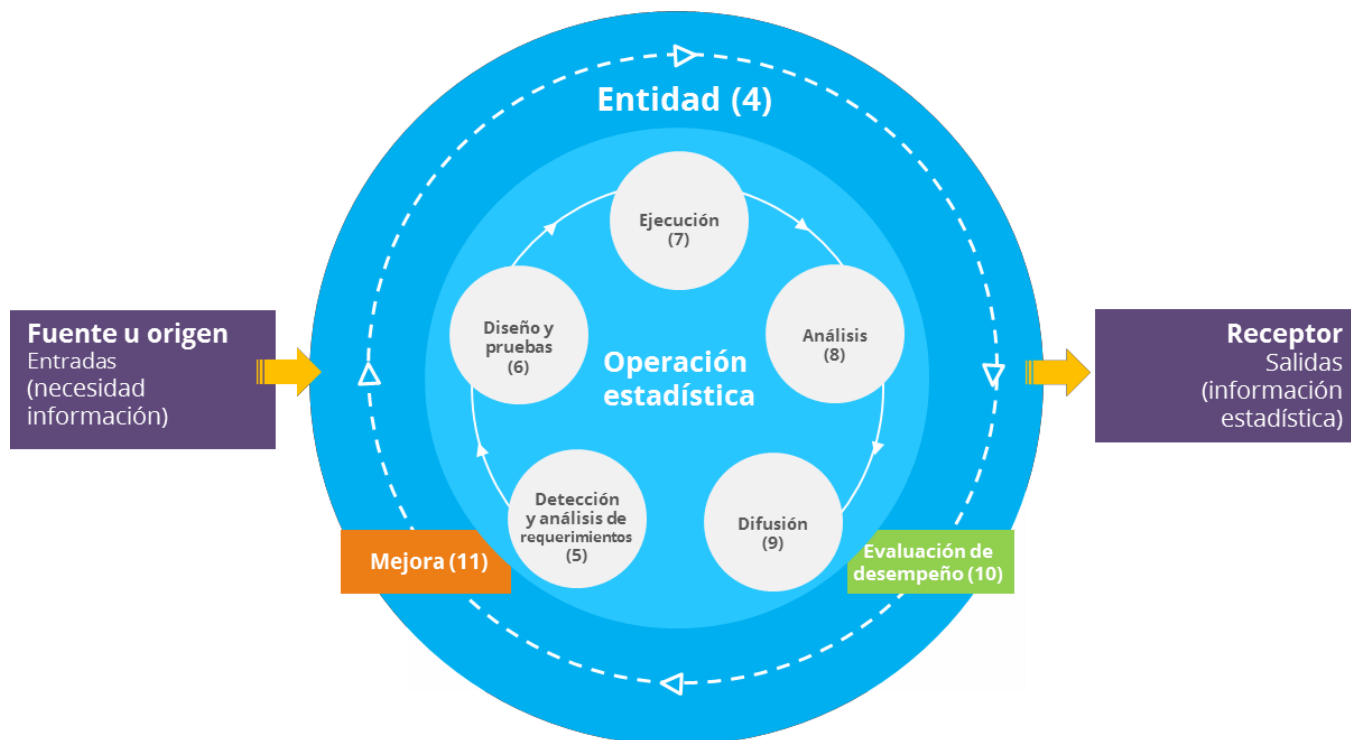
The information identified as "NOTE" is presented as guidance, clarification and / or reference for the understanding or clarity of the corresponding requirement.

When the expression "where applicable" is used, it refers to the statistical operations of censuses and / or sampling.

0.2. FOCUS OF THE STATISTICAL PROCESS

The operation of the statistical process in the context of the entity is presented in Figure 1 below, which shows that from the information needs (external or internal), a set of phases is generated that include the detection and analysis of requirements, the design and testing, the implementation, analysis and dissemination of statistical information in a systematic manner. The statistical process operates within the entity with an approach based on process management and with a sequence associated with the continuous improvement cycle.

The phases described in Figure 1 are explained in the document *Guidelines for the Statistical Process in the National Statistical System* and the numbers that accompany them in the figure correspond to the chapters of this standard, where the requirements for each one of them are established.



Source: DANE - Adaptation of model GSBPM version 5, United Nations Economic Commission for Europe (UNECE).

Figure 1. Statistical process within the organizational context

1. PURPOSE AND FIELD OF APPLICATION

This standard establishes minimum quality requirements in the statistical process for the entities belonging to the NSS that produce and disseminate statistics in accordance with paragraph 1 of Article 160 of Law 1753 of 2015. The requirements of this standard should be applied in conjunction with the provisions applicable to each entity.

This standard applies for statistical operations:

- By census
- By sampling (probabilistic and non-probabilistic)
- From administrative records

2. NORMATIVE BENCHMARKS

The following documents are indispensable for the understanding of this technical standard. For dated references only the listed edition applies, whereas for non-dated references the last edition of the referenced normative document (including any correction) applies.

NTC-ISO 9000, Quality management systems. Fundamentals and vocabulary.

NTC-ISO 9001: 2015, Quality management systems. Requirements.

NTC GP 1000, Quality Management System. For the executive branch of the public power and other entities that provide services. Requirements.

3. TERMS AND DEFINITIONS

For the purposes of this document, the terms and definitions used in NTC-ISO 9000, NTC-GP 1000, and those specified below are applied:

3.1 TERMS PERTAINING TO THE NATIONAL STATISTICAL SYSTEM

3.1.1 National Code of Good Practice for Official Statistics. Technical and regulatory instrument, whose purpose is to contribute to the improvement of the production and dissemination of official statistics.

3.1.2 National Statistical System (NSS). Coordinated set of components that, in an organized and systematic manner, ensures the production and dissemination of official statistics at the national and regional level required by the country. Its components are the entities or organizations that integrate it, users, processes and technical instruments for the coordination, policies, principles, information sources, technological infrastructure and human talent.

3.1.3 Official statistics. Statistics produced and disseminated by the entities that belong to the National Statistical System, which provide information on the economic, demographic, environmental and social situation at the national and regional levels for decision-making and that meet the conditions and characteristics set forth in Article 2.2.3.2.1 of Decree 1743 of 2016.

3.1.4 Statistical quality. It is the fulfillment of the properties that the process and the statistical product shall have in order to meet the users' information needs.

3.2 TERMS PERTAINING TO STATISTICAL QUALITY ATTRIBUTES

3.2.1 Accessibility. Ease with which the statistical information can be located and obtained by the users. It considers how it is provided, the dissemination media, as well as the availability of metadata and support services for its enquiry.

3.2.2 Accuracy. Degree in which the results of the statistical operation approximate and correctly describe the quantities or characteristics that they aim to measure.

3.2.3 Comparability. It is the characteristic that allows the results of different statistical operations to be related, aggregated and interpreted among themselves or with respect to some common parameter.

3.2.4 Consistency. It refers to the degree to which the concepts used, the methodologies applied and the results produced by the operation are logically connected.

3.2.5 Continuity. It refers to the assurance of permanent production of the statistical operation, based on the adequacy of resources as well as normative support.

3.2.6 Credibility. It is the trust that users place on statistical products, based on the perception that they are produced in a professional manner according to adequate statistical standards, and that policies and practices are transparent.

3.2.7 Interpretability. Ease with which the user can understand, use and analyze the data; taking into account the scope thereof.

3.2.8 Precision. The property of estimating the reality of the phenomenon under study with a minimum random error.

3.2.9 Punctuality. It is the fulfillment of the established schedule for the publication of the results of the statistical operation.

3.2.10 Relevance. It refers to the degree to which the statistics meet the information needs of users.

3.2.11 Timeliness. It refers to the time elapsed between the occurrence of the phenomenon under study and the publication of statistical information, so that it is useful for decision-making.

3.2.12 Transparency. Condition under which the producer of statistics makes available to the users the metadata that allow knowing the development of the statistical operation.

3.3 TERMS PERTAINING TO THE ENTITY

3.3.1 Entity. It refers to legal persons, public or private, bodies, or organizations belonging to the NSS, which produce and disseminate statistical information.

3.3.2 Legal framework. It is the summary of the regulations in which the statistical operation is circumscribed, compiling the legal aspects that characterize, contextualize and delimit the phenomenon under study.

3.3.3 Senior management. The person or group of persons who manage and control the entity and who have the power to delegate authority and provide resources.

3.4 TERMS PERTAINING TO THE STATISTICAL PROCESS

3.4.1 Analysis. Phase of the statistical process where the consistency and coherence of the consolidated information is examined and the products defined in the design are generated.

3.4.2 Design and testing. The phase of the statistical process where the instruments and procedures for the execution, analysis and dissemination are defined, tested and documented.

3.4.3 Detection and analysis of requirements. The stage of the statistical process where statistical information needs are determined and validated, the objectives of the statistical operation are established and the overall work plan is prepared.

3.4.4 Dissemination. The phase of the statistical process where statistical information is made available to users, through the means of dissemination established.

3.4.5 Execution. The phase of the statistical process where the data collection and processing are performed.

3.4.6 Statistical process. The systematic set of activities aimed toward the production of statistics, including, among others, the detection of needs, the design, collection, processing, analysis and dissemination.

3.5 TERMS PERTAINING TO THE TYPES OF STATISTICAL OPERATIONS

3.5.1 Statistical operation. The application of a statistical process on an object of study that leads to the production of statistical information.

3.5.2 Statistical operation from administrative records. The application of a statistical process that uses in the statistical methodology a set of variables contained in one or more administrative records.

3.5.3 Derived statistical operation. The application of a statistical process that uses in the statistical methodology the estimation or the modeling, based on the use of statistical information or its combination with databases from one or several sources, based on conceptualizations or methodologies other than those of the sources of data used.

3.5.4 Statistical operation by census. The application of a statistical process that uses in statistical methodology the collection of information on the complete set of observation units belonging to a given population or universe under study.

3.5.5 Statistical operation by probabilistic sampling. The application of a statistical process that uses in the statistical methodology the selection of a sample based on a sample frame and on the selection probabilities previously known, in order to obtain estimates of a target population.

3.5.6 Statistical operation by non-probabilistic sampling. The application of a statistical process that uses in the statistical methodology the selection of a non-random sample to characterize a set of observed units.

3.6 TERMS PERTAINING TO THE OPERATION

3.6.1 Collection period. It indicates the time interval or the date on which the data is collected.

3.6.2 Conceptual framework. The theoretical and illustrative support that specifies the main terms and concepts used to understand the thematic of the statistical operation and the results that it generates.

3.6.3 Domain of study. The segment of the population from which specific estimates are required in order to measure a phenomenon.

3.6.4 Framework (census or sample). An instrument that allows identifying and locating the elements of the target population. It is called the sampling framework or census framework according

to the type of statistical operation, by sampling or by census, respectively.

3.6.5 Geographic coverage. It is the territorial extension on which a statistical operation is executed. Examples include national, regional or departmental coverage.

3.6.6 Methodological document. The document that presents to the users the methods and the activities developed in the statistical process in a clear and precise manner.

3.6.7 Methodological sheet. The technical document that allows compiling in a summarized manner the explanatory information of a statistical operation.

3.6.8 Observation unit. The element or set of elements on which the measurement of the different variables is performed in a statistical operation.

3.6.9 Percentage of coverage. The ratio between the observation units actually included during the data collection with respect to the total number of expected observation units.

3.6.10 Percentage of non-response. The ratio between the observation units of which no information was obtained, with respect to the expected observation units. The purpose of this indicator is to identify the study's degree of effectiveness with respect to the operational process of the collection.

3.6.11 Sampling unit. The element or set of elements defined or set to be selected in the sample.

3.6.12 Source. The elements, individuals or institutions that provide information.

3.6.13 Statistical information. The set of results and documentation that support them, which are obtained from statistical operations and which describe or express characteristics about an element, phenomenon or object of study.

3.6.14 Statistical methodology. The statistical procedures and techniques used in the treatment of the information that characterize the statistical operation.

3.6.15 Statistical unit. It corresponds to the observation units, the units of analysis and, when applicable, the sampling units.

3.6.16 Target population. The set of elements defined in a space and in a time on which information is wanted.

3.6.17 Thematic scope. It delimits the thematic aspects studied in the statistical operation.

3.6.18 Theoretical framework. The summary of the review with respect to the literature on the subject of study, describing the state of the art in the thematic and statistical field to give conceptual foundation to the statistical operation.

3.6.19 Unit of analysis. The element of study on which the results or conclusions of the statistical operation are presented.

3.6.20 Universe of study. It describes the set of units or individuals referred to in the study that

meet a common definition. It reflects the objectives of the study, as it describes them in terms of content, units, space and time.

3.6.21 Variable. The characteristic of statistical units that can assume a set of values, which can be quantitative or qualitative.

3.7 TERMS PERTAINING TO THE RESULT

3.7.1 Anonymization of microdata. A technical process that consists of transforming the individual data of the observation units, so that it is not possible to identify subjects or individual characteristics of the source of information, thus preserving the statistical properties in the results.

3.7.2 Historical series. The succession of data on one or more characteristics that are the object of study, which are consolidated in equal intervals of time (daily, weekly, semiannual and annual, among others) and organized chronologically in order to allow its temporal analysis taking into account the methodological changes that they can present.

3.7.3 Metadata. Information necessary for the use and interpretation of statistics. The metadata describes the conceptualization, quality, generation, calculation and characteristics of a set of statistical data.

3.7.4 Microdata. Each one of the data elements with respect to the characteristics of the units of study of a population (individuals, households and establishments, among others) that are consolidated in a database.

3.7.5 Reference period. The specific time period (day, week, month, year) or point in time corresponding to the observation made, or the variable of interest).

4. GENERAL REQUIREMENTS

4.1. RESPONSIBILITIES OF SENIOR MANAGEMENT

The senior management of the entity in accordance with its legal framework, activities and / or functions, shall:

- a) Provide the necessary resources in order to implement what is established in this standard,
- b) Implement what is established in this standard,
- c) Maintain and improve the statistical process,
- d) Maintain the commitment to the transparency and continuity of the statistical operation, and
- e) Ensure compliance with the requirements established in this standard, when the entity contracts external personnel, infrastructure or technological tools (by means of contract, alliance and agreement, among others).

4.1.1 Roles, responsibilities and authority

Senior management shall assign and communicate the responsibilities of all the roles required in the statistical process, in order to ensure compliance with the requirements of this standard

4.2 REQUIREMENTS OF THE ENTITY

4.2.1 Generalities

The entity shall have:

- a) A documented organic structure,
- b) Procedures and methodologies required to develop the different activities in accordance with the requirements of this standard. They should be documented, implemented and updated,
- c) Evidences of the controls carried out in order to ensure the quality of the statistical process. These controls shall be documented, implemented and updated, and
- d) The necessary infrastructure for the statistical process.

NOTE: Infrastructure may include:

- a) *Associated buildings and services;*
- b) *Equipment, including hardware and software;*
- c) *Transportation resources;*
- d) *Information and communication technologies, and*
- e) *Financial, human resources, among others.*

4.2.2 Determination of the scope

4.2.2.1 The entity shall identify the thematic scope of the statistical operation according to the type of statistical operation to be developed.

NOTE: The type of statistical operation to which the present standard applies to them is listed under Section 1 herein.

4.2.2.2 Once the statistical operation has been designed, the entity shall allocate the resources, personnel, infrastructure and the person (s) responsible for each phase of the statistical process.

4.3 CONFIDENTIALITY OF THE INFORMATION COLLECTED

4.3.1 The entity shall implement mechanisms to ensure that the information collected from the sources is maintained in a confidential manner in accordance with current regulations on the protection of personal data.

4.3.2 The entity shall securely maintain the information collected in order to prevent access or unwanted use, damage or accidental loss thereof.

4.4 DOCUMENTED INFORMATION OF THE STATISTICAL PROCESS

4.4.1 The entity shall establish, implement, maintain and update:

- Technical and methodological documents and

NOTE 1: The documents can be procedures, methodologies, technical sheets and guides among others.

- Documentary evidence.

NOTE 2: Evidence can be formats, records, minutes, video recordings, databases, validation and consistency specifications, data dictionary, and historical or time series, among others.

4.4.2 Identification and description of documented information

The entity shall ensure that when establishing, implementing, maintaining and updating the documented information, its identification and description is appropriate, taking into account the procedures established in the entity's management system. In the case where the entity does not have a management system implemented, it shall define the format and means of support of the documented information.

4.4.3 Control of documented information

The entity shall ensure that the documented information:

- Is available and suitable for use, where and when it may be needed, and
- Is adequately protected (in cases such as: loss of confidentiality, inappropriate use or loss of integrity, among others).

4.5 PERSONNEL OF THE STATISTICAL PROCESS

4.5.1 Generalities

The entity shall determine and provide the persons necessary to fulfill the scope of the statistical operation, and for the implementation, maintenance and continuous improvement of the statistical process.

4.5.2 Competence

The entity shall:

- Establish the profiles of the persons necessary for the statistical process,

- Keep records showing that staff meets those profiles, and
- Document and implement a training program in thematic, logistical, operational and technological aspects, according to its statistical operation.

4.6 USE AND APPLICATION OF STATISTICAL GUIDELINES

The entity shall ensure that the concepts, standards and statistical guidelines issued by DANE or international benchmarks with high recognition in the subject matter of the statistical operation are implemented in the statistical process. Statistical concepts, standards and guidelines shall be controlled (see sub-section 4.4.3).

4.7 RISK MANAGEMENT

The entity shall identify and analyze the risks, implement the controls in order to minimize them and take action when they arise.

4.8 STATISTICAL PROCESS

The phases of the statistical process shall be:

- Detection and analysis of requirements (see Section 5),
- Design and testing (see Section 6),
- Execution (see Section 7),
- Analysis (see Section 8), and
- Dissemination (see Section 9).

4.8.1 When the entity contracts the development of one or more phases with an operator, it shall ensure that the operator complies with the requirements of this standard.

4.9 MONITORING AND FOLLOW-UP

The entity shall establish monitoring and follow-up mechanisms in each of the phases of the statistical process in order to ensure that the statistical operation:

- Fulfills the established objectives,
- Fulfills the general plan (see sub-section 5.6), and
- Is timely in generating information.

4.9.1 The entity shall maintain evidence of the monitoring and follow-up mechanisms.

4.9.2 The entity shall determine:

- The need for monitoring that the statistical process requires in all its phases,
- When to perform the monitoring and measurement, and
- When to analyze and evaluate the results of the monitoring and measurement.

5. DETECTION AND ANALYSIS OF REQUIREMENTS

The entity shall identify and analyze the requirements and / or needs for the statistical operation.

5.1. IDENTIFICATION OF INFORMATION USERS

5.1.1. The entity shall identify and characterize the users (internal and / or external) of the statistical information generated by the statistical operation.

5.1.2. The entity shall maintain and document the identification and characterization of users (internal and / or external).

5.2 FORMULATION OF THE COLLECTION MECHANISMS BASED ON THE STAKEHOLDERS' INFORMATION NEEDS

The entity shall establish, implement, maintain and update enquiry mechanisms with the stakeholders of statistical information that allow obtaining and analyzing information needs.

NOTE: The mechanisms may be:

- *Satisfaction measurement surveys,*
- *Meetings with experts on the subject of the statistical operation, and*
- *Work meetings with specialized stakeholders.*

5.3 ANALYSIS OF THE INFORMATION NEEDS

The entity shall document the methodology and / or procedure used for the analysis of needs.

5.4 RELEVANCE OF THE RESULTS OF THE STATISTICAL OPERATION FOR PUBLIC POLICIES

The entity shall document the relevance of the statistical operation and its relationship with public policy. This can be evidenced in documents such as laws, decrees, resolutions, the National Development Plan, documents of the National Council of Economic and Social Policy (CONPES), and Territorial Development Plans, among others.

5.5 OBJECTIVE OF THE STATISTICAL OPERATION

5.5.1 The entity shall establish and document an objective for the statistical operation that is consistent with the information requirements that it is intended to meet (see sub-section 5.2)

5.5.2 The objective shall:

- Enable monitoring and evaluation (see sub-section 4.9),
- Communicate to the actors (internal and external) involved in the statistical operation,
- Be updated, as appropriate, and
- Be measurable (see sub-section 4.9)

5.6 GENERAL PLAN OF THE STATISTICAL OPERATION

5.6.1 The entity shall establish and document the work plan, for the phases of the statistical operation, in which the following needs to be defined:

- Execution times,
- Roles and responsibilities,
- Activities and resources in each of the phases,
- Products for each of the phases of the statistical process,

5.6.2 Updates to the work plan should be documented (see sub-section 4.4.2).

6. DESIGN AND TESTS

6.1. TYPE OF STATISTICAL OPERATION

The entity shall establish the type of statistical operation that allows the objective to be fulfilled (see sub-section 5.5).

6.2. DOCUMENTATION

The entity shall document the activities and instruments defined for the development of each of the phases of the statistical process according to the type of statistical operation (see sub-sections 4.4.2 and 4.4.6).

6.3. THEMATIC DESIGN

6.3.1. Conceptual framework

The entity shall establish and document a conceptual framework according to the purpose and type of statistical operation and in which the following is specified:

- International and national benchmarks,
- Main terms and concepts of the statistical operation,

- Universe of study,
- Target population,
- Statistical units,
- Main variables,
- Nomenclatures and classifications to be used,
- Reference period, and
- Administrative records to be used (if applicable).

6.3.2. Output tables

6.3.2.1. The entity shall establish and document the structure and content of the output tables to be disseminated.

6.3.2.2. The entity shall ensure that the results contained in the output tables are consistent with the proposed objective.

6.3.3. Standardized concepts

The entity shall ensure that the standardized concepts, issued by DANE or the international benchmarks with high recognition in the subject of the statistical operation are identified, applied and used.

6.3.4. Nomenclatures and classifications

6.3.4.1. The entity shall ensure that the nomenclatures and classifications adapted and / or adopted or prepared in their latest version available are applied and used in the statistical operation.

6.3.4.2. The entity shall document the benchmark (issuing body, version and date) of the nomenclatures and / or classifications used in the statistical operation.

6.3.5. Relevance of the variables

6.3.5.1. The entity shall ensure the relevance of the variables collected, with respect to:

- The phenomenon of study, and
- The objectives of the statistical operation.

6.3.5.2. The entity shall document, when there is a total or partial redesign of the collection instrument (thematic, variables and thematic flows, among others), the impact on the proposed objective and its comparability.

6.3.6. Relevance of the source

The entity shall ensure that the sources are relevant for measuring the phenomenon of study.

6.3.7. Burden of respondents

It is applicable for statistical operations by census, probabilistic and non-probabilistic sampling.

6.3.7.1. The entity shall document, implement, maintain and improve mechanisms that minimize the wearing down of the source.

6.3.7.2. Among the mechanisms that minimize the wearing down of the source, some of the following may be considered:

- To decrease the length of the collection instrument,
- To establish methods of information capture that allow reducing the time in the completion of the collection instrument,
- To measure the efficiency of the information capture process by means of indicators,
- To provide training to the interviewers in order to create the required skills,
- To follow the development of the interviews during the field operation and take the necessary actions that minimize the wearing down of the source, and
- To establish a report on the development of the information collection operation, specifying, among other things, the lessons learned.

6.3.8. Thematic scope

The entity shall establish and document the thematic scope according to the objective of the statistical operation.

6.3.9. Geographic coverage

The entity shall establish and document the geographic coverage in accordance with the objective of the statistical operation (see sub-section 5.5).

6.3.10. Collection instrument

6.3.10.1. The entity shall document, implement and maintain one or more procedures for the construction, review and redesign of collection instruments.

NOTE: The collection instruments may be hard copy or digital forms or electronic equipment for automatic collection (e.g. Meteorological stations), or manual (e.g. sound level meters).

6.3.10.2. The entity shall have available for the interested parties the traceability with respect to the updates of the collection instrument.

NOTE: The redesign of the instruments may involve: Inclusion, exclusion, reformulation or reorganization of the questions, among others.

6.3.10.3. Structure of the collection instrument

The entity shall ensure that the collection instrument:

- a) Is consistent with the objective of the statistical operation, and
- b) Is structured in thematic blocks and the questions have a logical sequence that facilitates the completion thereof and minimizes the wearing down of the source.

6.4 STATISTICAL DESIGN

6.4.1 Framework (sample or census)

The entity shall establish and document a framework (sample or census) that allows identifying and locating the units of observation with respect to the universe of study; and that has the following characteristics:

- Completeness,
- Updated,
- Geographic coverage,
- Free from omission or duplication,
- Existence of auxiliary information, and
- Consistency of information.

6.4.2 Sample design

It is applicable for statistical operations by probabilistic or non-probabilistic sampling.

The entity shall document, implement, maintain and improve a sample design that is consistent with the thematic design (see sub-section 6.3.1) and the purpose of the statistical operation and that considers the:

- Precision and significance level, (applies only to operations by probabilistic sampling)
- Sampling method,
- Sampling frame (applies only to operations by probabilistic sampling),
- Sample size,

- Estimation parameters (applies only for operations by probabilistic sampling),
- Quality measures, and
- Maintenance of the sample.

6.4.2.1 Selection and formation of the sample

The entity shall document and implement the procedures for the selection and formation of the sample.

6.4.2.2 Maintenance of the sample

It is applicable for statistical operations by sampling.

The entity shall document, implement, maintain and improve the sample design, with rotation sampling methods (where applicable) and maintenance of the sample in consecutive periods.

6.4.3 Bias control

6.4.3.1 The entity shall document, implement, maintain and improve one or more mechanisms to reduce bias, ensuring the completeness and veracity of the information in each of the variables of interest of the statistical operation. For this, it shall:

- Identify and control situations (internal or external) that affect the collection process,
- Manage non-response,
- Ensure the training of the personnel involved in the production of the statistical operation,
- Perform the monitoring and correction of defective collection instruments.

6.4.3.2 Actions shall be taken in order to verify the control of sample bias (for probabilistic sampling), checking that the estimators used are not biased.

6.4.3.3 Calculation of Indicators (results)

The entity shall ensure that the results of the statistical operation are consistent with the proposed objective (see sub-section 5.5).

6.4.3.4 Quality measures

The entity shall ensure the consistency of the results by implementing quality measures, and warn the users of the limitations thereof.

6.5 EXECUTION DESIGN

6.5.1 Design of the collection of information

The entity shall document, implement and maintain the collection method (s) and the most appropriate instrument (s). The collection should consider the following aspects:

- Organizational scheme,
- Profiles of the personnel operating the statistical process,
- Collection workloads (where applicable),
- Typing, transmission or digitalization of information,
- Validations,
- Transport necessary for journeys (where necessary),
- Training of personnel involved in the statistical process,
- Definition of roles of the operation personnel,
- Updated cartography, and
- Control and monitoring mechanisms.

NOTE: The collection can be performed by means of telephone interview, self-completion, direct interview, measurement equipment or direct observation, among others.

6.5.2 The entity shall establish, document and implement the validation and consistency rules.

6.5.3 The entity shall establish and document awareness raising channels, which may be:

- Brochures,
- Circular letters,
- Letters,
- Billboards,
- Flyers,
- Spoken or written press,
- Television, and
- Websites.

6.6 INFORMATION PROCESSING DESIGN

The entity shall document and implement the information processing methodology that includes the following activities:

- Routine specifications for coding,
- Edition (where applicable),
- Imputation (where applicable),
- Estimation (where applicable),
- Integration,
- Validation of consistency and completeness of results,
- Consolidation of databases, and
- Validation and consistency of alphanumeric and geographical information (where applicable).

6.6.1 In accordance with the characteristics of the statistical operation, the entity shall determine the technological infrastructure necessary in order to carry out the statistical operation and to define the application (software) required for the development of the following activities:

- The capture, digitalization, transmission and consolidation of information;
- Storage and reading of databases;
- The application of statistical processes with respect to analysis, the detection of inconsistencies, the estimation, the validation, the correction and the debugging of data, and
- The generation of results, reports, output tables, graphs and other inputs used in the analyses that support the statistical operation.

6.6.2 The entity shall document, implement, maintain and update, the documentation generated for the use and maintenance of the application (software) that it requires in the development of the statistical operation, this documentation shall include:

- Entity-relationship model or data model,
- Data dictionary,
- Validation and consistency manual,
- Capture manual,
- User manual,
- System manual, and

- Mechanisms to ensure security, maintenance and the backup of information.

6.6.3 Computer development of the sample design

The entity shall design, formulate and apply computer developments consistent with the established sample design.

6.7 ANALYSIS DESIGN

6.7.1 The entity shall determine the technological tools required for the analysis of the statistical information obtained.

6.7.2 The entity shall define and document the methodology, procedures for comparing historical results, with other similar data sources and with the events that occurred in the universe of study, with respect to the subject studied that give an explanation of the statistical information obtained (context analysis).

6.7.3 The entity shall determine and document the methods of analysis of consistency or coherence pertaining to the statistical information obtained regarding the series and historical indicators thereof, and with respect to other similar topics.

6.8 PRODUCTION SYSTEMS AND WORKFLOWS DESIGN

The entity shall design, document, implement, maintain and improve one or more procedures that describe the workflow required from the data collection to the dissemination of statistical information, so that it is consistent with the type of statistical operation.

6.9 DISSEMINATION DESIGN

The entity shall determine the strategy, method and media of dissemination of the results taking into account the following aspects:

- Output tables and other products to be disseminated according to the information requirements identified and the objective of the statistical operation,
- Dissemination calendar,
- Procedures for the dissemination,
- Method of presentation of statistical information,
- Instructions for the reading, interpretation and use of information,
- Dissemination media, and
- Dissemination of metadata of the statistical operation.

Note: Products may be reports, bulletins or thematic maps.

6.10. TESTING TO DESIGN

The entity shall document, implement, maintain and improve one or more procedures for the development of evidence; when methodological or operational aspects are formulated, amended or updated.

6.10.1 The tests shall:

- Allow identifying the effects in the development of the statistical operation,
- Maintain the traceability of the tests carried out with respect to the methods and instruments designed,
- Documenting both the results and the conclusions thereof, and
- Keep documented information as the evidence of the process.

6.10.2 The entity shall document and implement the necessary adjustments based on the conclusions of the tests.

7. EXECUTION

7.1. ACTIVITIES PRIOR TO EXECUTION

7.1.1. Training

The entity shall document and implement a training program for the personnel involved, that is consistent with the statistical operation.

The training program shall contain at least the following aspects:

- Statistical confidentiality,
- Theoretical and conceptual framework of the statistical operation,
- The handling of tools, equipment or handheld capture devices (where applicable),
- Contextualization on the entity producing information,
- Procedures for monitoring and oversight of the collection (where applicable),
- Awareness raising processes applied to the source (where applicable), and
- Criteria for performance evaluation and quality of work associated with the process.

7.1.1.1. In the case of statistical operations based on administrative records, the entity shall ensure that the personnel who register the information have the competence and knowledge to capture the information prior to its consolidation.

7.1.1.2. The training activities shall have records evidencing the training activities, before and throughout the development of the statistical operation.

7.1.2 Awareness raising

The entity shall carry out rapprochement activities in order to inform the source about the operation of data collection.

7.1.2.1 The entity shall implement and maintain mechanisms to inform the following aspects to the source:

- The objectives of the statistical operation and the data capture,
- The instrument used for the collection of data,
- The protection of personal data, and
- The importance of providing true and complete data.

It is applicable for statistical operations by census, probabilistic and non-probabilistic sampling.

NOTE: The awareness raising may also be conducted with the sources producing administrative records

7.2 DATA COLLECTION

7.2.1 Capture and control of the information flow

The entity shall collect the data or information required in accordance with the design and testing (see sub-section 6.10).

7.2.1.1 The collection shall be developed, according to the general plan (see sub-section 5.6).

7.2.1.2 The entity shall consolidate in a database the information collected by carrying out:

- Validations to review the consistency of the data, and
- Controls on the possible loss of information.

7.2.2 Completeness of the information collected

The entity shall implement controls that ensure the completeness of data collection, both in the collection and in the processing of information.

7.3 CONTROL AND FOLLOW-UP TO COVERAGE

The entity shall have procedures that allow carrying out the control and monitoring of the coverage of the data collected.

7.3.1 Oversight of the collection process and operational scheme

The entity shall implement and maintain one or more oversight and follow-up procedures for the collection of information, in accordance with the provisions set forth in sub-section 6.5.

7.3.2 The entity shall calculate the coverage percentage (Applies for statistical operations by census and probabilistic sampling).

7.3.3 The entity shall calculate the percentage of non-response, with respect to all the variables of the collection instrument; or compared to the total quantity of forms that were expected to be collected respectively.

7.4 PROCESSING

The entity shall document the activities developed for data processing.

7.4.1 Data integration

The entity shall document, implement and maintain activities for data integration.

7.4.2 Classification and coding

The entity shall document, implement and ensure that the classification and coding of data in accordance with sub-section 6.3.4.

7.4.3 Validation of the information collected

The entity shall implement and ensure the application of the validation and consistency rules with respect to the information collected.

7.4.4 Editing and imputation

The entity shall determine if the need exists to use methods of editing and imputation and if so it shall establish and document:

- The imputation methods and editing processes used, and
- The imputation indicators and their impact on the results of the statistical operation.

7.4.5 Derivation of new variables and units

The entity shall document and implement the creation of new variables, when required.

7.4.6 Calculation of weights

The entity shall document and implement one or more procedures for the calculation of weights so that:

- Expansion factors are implemented (where applicable),
- In case of non-response, the corresponding adjustments are made (when applicable),
- Estimation errors are calculated, (where applicable), and
- Output tables are drawn up with aggregate data.

7.5 COMPLETION OF DATA FILES

The entity shall document all the activities carried out during the consolidation of the databases and the procedures performed during its processing.

7.5.1 The information collected shall be stored with measures to ensure, at least:

- Confidentiality,
- Availability,
- Access control,
- Backup,
- Protection of loss of information, and
- The protection of modification or alteration of access.

8. ANALYSIS

8.1 CONTEXT ANALYSIS

The entity shall perform and document the context analysis of the information obtained, before its diffusion. This should ensure:

- The consistency of estimates (where applicable),
- The correspondence between the behavior of the phenomenon of study and the results obtained,
- The contrast of the results obtained with the expected results, and
- The knowledge of the phenomena (internal and / or external) that influenced the information.

8.2. CONSISTENCY ANALYSIS

The entity shall perform and document the analysis on the information obtained in order to validate the internal consistency between variables and with respect to the historical series. This should ensure that:

- a) The internal consistency of the variables is verified.
- b) The updates and / or methodological changes are documented so as to allow the splicing of the historical series.
- c) The methods with respect to the splicing of the historical series are documented.
- d) The atypical data are identified, explained and documented, in order to allow the correct interpretation of the results.

8.3. COMPARABILITY ANALYSIS

The entity shall determine if the information is comparable to the results of other statistical operations pertaining to similar subjects, produced nationally or internationally.

For the comparability of the results of the operation, the nomenclatures, classifications and concepts as well as other methodological aspects defined for the statistical operation should be taken into account.

The entity shall establish, document and implement meetings with experts (they may be internal or external to the entity, as well as national or international, among others) in order to contextualize, analyze and validate the statistical information obtained.

9. DISSEMINATION

The entity shall disseminate statistical information including, among others:

- Output tables,
- Anonymised microdata,
- Historical series,
- Historical macro-data and metadata,
- Reference documents, and
- Coverage information.

NOTE: See sub-section 6.9.

9.1. HISTORICAL SERIES

The entity shall disseminate and maintain the historical series of statistical information produced and, when required, produce explanatory notes on the differences that may arise.

9.1.1. The explanatory notes should be presented in a manner that is:

- Clear,

- Understandable,
- With the appropriate guidelines, and
- Of easy interpretation of the results in relation to the subject of the phenomenon of study.

NOTE: The explanatory notes are made in accordance with the provisions set forth in sub-section 8.2 of this standard.

9.2. METADATA

9.2.1. The entity shall disseminate and maintain the metadata containing detailed information on the characteristics of the statistical operation, data structure, reference documents and information on the coverage.

9.3. PUNCTUALITY AND TIMELINESS

9.3.1. The statistical information produced should be disseminated in a timely manner, on the dates established in the dissemination calendar (see sub-section 6.9).

9.3.2. The statistics produced shall be disseminated in a timely manner, with respect to the phenomenon of study.

9.4. DISSEMINATION MEDIA AND ACCESS

The dissemination of statistical information on the statistical operation shall be available to the interested parties in a timely manner and may be published by different channels.

These channels may be:

- Printed media,
- Website,
- Email,
- Magnetic media, and
- Others.

9.5. PUBLICATION OF QUALITY MEASURES

It is applicable for statistical operations by probabilistic sampling.

9.5.1. The publication of statistical information shall include, at least one of the quality measures, such as:

- Percentage of coverage,

- Percentage of non-response,
- Confidence intervals,
- Coefficients of variation, and
- Sampling error.

9.5.2. The entity should generate notes of interpretation with respect to the elements set forth in sub-section 9.5.1 of this standard.

9.6. PUBLICATION OF THE COVERAGE PERCENTAGE

Applies to statistical operations by census or probabilistic sampling.

The entity shall publish the coverage percentages.

9.7. CONDITIONS OF USE OF STATISTICAL INFORMATION

The entity shall describe the conditions of use and confidentiality pertaining to the statistical information.

9.8. AUTHORIZATION OF PUBLICATION OF STATISTICAL INFORMATION

9.8.1. The entity shall determine the person in charge of approving approving the dissemination of statistical information.

9.8.2. There shall be documented information supporting the authorization of dissemination and it shall be stored in each dissemination.

9.9 CONTINUITY OF THE STATISTICAL OPERATION

The entity shall demonstrate that its statistical operations maintain:

- Historical or time series,
- Methodological documents, and
- Disseminated results.

10. PERFORMANCE EVALUATION

10.1. ANALYSIS AND EVALUATION

The entity shall analyze and document the results of the monitoring and control mechanism of the statistical process (see sub-section 4.9) and identify the difficulties that arose and the actions taken to address them.

10.2 INTERNAL AUDIT

The entity shall conduct internal audits at planned intervals in order to verify that the effectiveness and efficiency of the statistical process is consistent with:

- The requirements of this standard,
- The entity's own requirements for the statistical process and
- The legal requirements applicable to the entity, with respect to the production of statistical information.

NOTE: ISO 19011 provides guidelines for internal audits.

11. IMPROVEMENT

11.1. GENERALITIES

The entity shall determine and select opportunities for improvement and implement any action necessary to meet the requirements of this standard.

Opportunities for improvement shall:

- Correct, prevent or reduce undesirable effects on the statistical process and its results, and
- Improve the performance and effectiveness of the statistical process.

11.2. NON-COMPLIANCE AND CORRECTIVE ACTION

11.2.1. When a non-compliance arises with respect to the statistical process, the following needs to be done:

- a) Take actions to control and correct it;
- b) Assess the need for action to eliminate the causes of non-compliance, so that it does not recur, by means of:
 - The review and analysis of the non-compliance;
 - The determination of the causes of the non-compliance;
 - The determination of whether there are similar non-compliances, or others that may potentially arise.
- c) Implement any necessary action to correct the non-compliance.

11.2.2. The entity shall keep documented information as evidence of:

- The nature of the non-compliances and any action taken subsequently, and

- The results of any corrective action.

11.3 CONTINUOUS IMPROVEMENT

The entity shall continuously improve the efficacy, efficiency and effectiveness of the statistical process.

The entity shall consider the results of the follow-ups, reviews and evaluations for the continuous improvement of the statistical process.

ANNEX A
(For information purposes)

**TABLE OF CORRESPONDENCE BETWEEN NTC-ISO 9001: 2008,
NTC-ISO 9001: 2015 AND NTC-GP 1000: 2009**

The table below shows the relationship between the requirements of this technical standard and the standards of quality management systems.

NOTE: At the time of implementation, it is necessary to consider the specific aspects of this standard, in relation to the corresponding sections.

Section	Requirement in this standard	NTC-GP 1000:2009	NTC-ISO 9001:2008	NTC-ISO 9001:2015
4.	GENERAL REQUIREMENTS			
4.1	RESPONSIBILITIES OF SENIOR MANAGEMENT	5	5	5
4.2	REQUIREMENTS OF THE ENTITY	-	-	-
4.3	CONFIDENTIALITY OF THE INFORMATION COLLECTED	-	-	-
4.4	DOCUMENTED INFORMATION OF THE STATISTICAL PROCESS	4,2	4,2	7,5
4.5	PERSONNEL OF THE STATISTICAL PROCESS	6,2,1	6,2,1	7,2
4.6	USE AND APPLICATION OF STATISTICAL GUIDELINES	-	-	-
4.7	RISK MANAGEMENT	-	-	-
4.8	STATISTICAL PROCESS	-	-	6,1
4.9	MONITORING AND FOLLOW-UP	8,2,3	8,2,3	9,1
5.	DETECTION AND ANALYSIS OF REQUIREMENTS	-	-	-
6.	DESIGN AND TESTS	-	-	-
7.	EXECUTION	-	-	-
8.	ANALYSIS	-	-	-
9.	DISSEMINATION	-	-	-
10	PERFORMANCE EVALUATION	8	8	9
10.1	ANALYSIS AND EVALUATION	8,2,3	8,2,3	9,1
10.2	INTERNAL AUDIT	8,2,2	8,2,2	9,2
11	IMPROVEMENT	8,5	8,5	10
11.1	GENERALITIES	-	-	10,1
11.2	NON-COMPLIANCE AND CORRECTIVE ACTION	8,5,2	8,5,3	10,2
11.3	CONTINUOUS IMPROVEMENT	8,5,1	8,5,1	10,3

ANNEX B
(For information purposes)

**TABLE OF EXCLUSION OF REQUIREMENTS ACCORDING TO
THE INFORMATION CAPTURE METHOD**

The table below shows the requirements that apply (and those that do not) according to the method by which the information is collected.

A= APPLIES NA= DOES NOT APPLY

Section	Requirement in this standard	Probabilistic sampling	Non-Probabilistic sampling	Census	Administrative records
4.	GENERAL REQUIREMENTS	A	A	A	A
5.	DETECTION AND ANALYSIS OF REQUIREMENTS	A	A	A	A
5.1	IDENTIFICATION OF INFORMATION USERS	A	A	A	A
5.2	FORMULATION OF THE COLLECTION MECHANISMS BASED ON THE STAKEHOLDERS' INFORMATION NEEDS	A	A	A	A
5.3	ANALYSIS OF THE INFORMATION NEEDS	A	A	A	A
5.4	RELEVANCE OF THE RESULTS OF THE STATISTICAL OPERATION FOR PUBLIC POLICIES	A	A	A	A
5.5	OBJECTIVE OF THE STATISTICAL OPERATION	A	A	A	A
5.6	GENERAL PLAN OF THE STATISTICAL OPERATION	A	A	A	A
6.	DESIGN AND TESTS	A	A	A	A
6.1	TYPE OF STATISTICAL OPERATION	A	A	A	A
6.2	DOCUMENTATION	A	A	A	A
6.3	THEMATIC DESIGN	A	A	A	A
6.3.1	Conceptual framework	A	A	A	A
6.3.2	Output tables	A	A	A	A
6.3.3	Standardized concepts	A	A	A	A
6.3.4	Nomenclatures and classifications	A	A	A	A
6.3.5	Relevance of the variables	A	A	A	A
6.3.6	Relevance of the source	A	A	A	A
6.3.7	Burden of respondents	A	A	A	NA
6.3.8	Thematic scope	A	A	A	A

Section	Requirement in this standard	Probabilistic sampling	Non-Probabilistic sampling	Census	Administrative records
6.3.9	Geographic coverage				
6.3.10	Collection instrument	A	A	A	A
6.4	STATISTICAL DESIGN	A	A	A	A
6.4.1	Framework (sample or census)	A	NA	A	NA
6.4.2	Sample design	A	A	NA	NA
6.4.2.1	Selection and formation of the sample	A	A	NA	NA
6.4.2.2	Maintenance of the sample	A	A	NA	NA
6.4.3	Bias control	A	A	A	A
6.5	EXECUTION DESIGN	A	A	A	A
6.5.1	Design of the collection of information	A	A	A	A
6.6	INFORMATION PROCESSING DESIGN	A	A	A	A
6.7	ANALYSIS DESIGN	A	A	A	A
6.8	PRODUCTION SYSTEMS AND WORKFLOWS DESIGNS	A	A	A	A
6.9	DISSEMINATION DESIGN	A	A	A	A
6.10	TESTING TO DESIGN	A	A	A	A
7.	EXECUTION	A	A	A	A
7.1	ACTIVITIES PRIOR TO EXECUTION	A	A	A	A
7.1.1	Training	A	A	A	A
7.1.2	Awareness raising	A	A	A	A
7.2	DATA COLLECTION	A	A	A	A
7.2.1	Capture and control of the information flow	A	A	A	A
7.2.2	Completeness of the information collected	A	A	A	A
7.3	CONTROL AND FOLLOW-UP TO COVERAGE	A	A	A	A
7.3.1	Oversight of the collection process and operational scheme.	A	A	A	A
7.4	PROCESSING	A	A	A	A
7.4.1	Data integration	A	A	A	A
7.4.2	Classification and coding	A	A	A	A
7.4.3	Validation of the information collected	A	A	A	A
7.4.4	Editing and imputation	A	A	A	A
7.4.5	Derivation of new variables and units	A	A	A	A
7.4.6	Calculation of weights	A	A	A	A

Section	Requirement in this standard	Probabilistic sampling	Non-Probabilistic sampling	Census	Administrative records
7.5	COMPLETION OF DATA FILES	A	A	A	A
8.	ANALYSIS	A	A	A	A
8.1	CONTEXT ANALYSIS	A	A	A	A
8.2	CONSISTENCY ANALYSIS	A	A	A	A
8.3	COMPARABILITY ANALYSIS	A	A	A	A
9.	DISSEMINATION	A	A	A	A
9.1	HISTORICAL SERIES	A	A	A	A
9.2	METADATA	A	A	A	A
9.3	PUNCTUALITY AND TIMELINESS	A	A	A	A
9.4	DISSEMINATION MEDIA AND ACCESS	A	A	A	A
9.5	PUBLICATION OF QUALITY MEASURES	A	NA	NA	NA
9.6	PUBLICATION OF THE COVERAGE PERCENTAGE	NA	A	A	NA
9.7	CONDITIONS OF USE OF STATISTICAL INFORMATION	A	A	A	A
9.8	AUTHORIZATION OF PUBLICATION OF STATISTICAL INFORMATION	A	A	A	A
9.9	CONTINUITY OF THE STATISTICAL OPERATION	A	A	A	A
10.	PERFORMANCE EVALUATION	A	A	A	A
11.	IMPROVEMENT	A	A	A	A

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