

## “Strengthening the capacity of Jordan’s Department of Statistics”

*Activity 1.3.6: Standardized production process and the role of metadata*

# Reference Metadata

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Delegation of the European  
Union to Jordan



# Outline

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In the European Statistical System (ESS)

# ESS - European Statistical System



Eurostat is charged with the production of official statistics for the European Union.

The ESS is a partnership in which Eurostat and the national statistical authorities of each EU Member State and EFTA country cooperate.

Mission: provide independent high quality statistical information at European, national and regional levels and to make this information available to everyone.

Backbone: the **European Statistics Code of Practice**

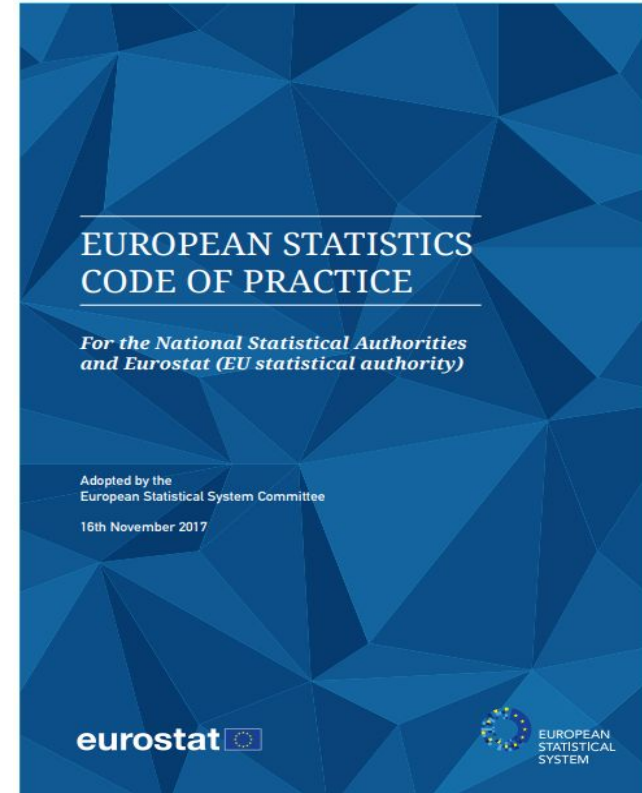
# European Statistics Code of Practice



The European Statistics Code of Practice (CoP) sets the standards for developing, producing and disseminating European statistics.

It defines 16 key principles.

A set of 84 indicators of best practices and standards provides a reference for reviewing the implementation of the CoP.



# The ESS Quality Assurance Framework



Guidance and complement on how to implement the CoP.

The aim of the ESS Quality Assurance Framework is to accompany the CoP by providing examples in the form of more detailed methods and tools as well as good practices for the high-level principles and indicators outlined in the CoP.



# Hierarchical structure



This architecture applies to National Statistical Authorities:  
National Statistical Institutes (NSI) + Other National Authorities (ONAs)  
responsible for the development, production and dissemination of European  
Statistics.

The list of ONAs is periodically updated and transmitted to Eurostat by NSIs.  
Eurostat publish the lists of NSIs and ONAs on its website.



# CoP and Metadata

## PRINCIPLE 8

### Appropriate Statistical Procedures

Appropriate statistical procedures, implemented throughout the statistical processes, underpin quality statistics.

INDICATOR

**8.1** When European Statistics are based on administrative and other data, the definitions and concepts used for non-statistical purposes are a good approximation to those required for statistical purposes.

**8.2** In the case of statistical surveys, questionnaires are systematically tested prior to the data collection.

**8.3** Statistical processes are routinely monitored and revised as required.



**8.4** Metadata related to statistical processes are managed throughout the statistical processes and disseminated, as appropriate.

**8.5** Revisions follow standard, well-established and transparent procedures.

**8.6** Agreements are made with holders of administrative and other data which set out their shared commitment to the use of these data for statistical purposes.

**8.7** Statistical authorities co-operate with holders of administrative and other data in assuring data quality.

## PRINCIPLE 15

### Accessibility and Clarity

European Statistics are presented in a clear and understandable form, released in a suitable and convenient manner, available and accessible on an impartial basis with supporting metadata and guidance.

INDICATOR

**15.1** Statistics and the corresponding metadata are presented, and archived, in a form that facilitates proper interpretation and meaningful comparisons.

**15.2** Dissemination services use modern information and communication technology, methods, platforms and open data standards.

**15.3** Custom-designed analyses are provided when feasible and the public is informed.

**15.4** Access to microdata is allowed for research purposes and is subject to specific rules or protocols.



**15.5** Metadata related to outputs are managed and disseminated by the statistical authority according to the European standards.

**15.6** Users are kept informed about the methodology of statistical processes including the use and integration of administrative and other data.

**15.7** Users are kept informed about the quality of statistical outputs with respect to the quality criteria for European Statistics.



**Indicator 8.4:** Metadata related to statistical processes are managed throughout the statistical processes and disseminated, as appropriate.

## Institutional methods

1. **Management of metadata.** An organisational structure is in place to ensure that metadata is an integral part of all statistical processes. The management of metadata is effective at all phases of the process. The metadata include reference metadata (e.g. the Single Integrated Metadata Structure), structural metadata (concepts, classifications, structure of data etc.) and process metadata.
2. **Procedures to disseminate metadata.** Clear, complete and up-to-date metadata are disseminated in accordance with ESS standards, i.e. the Single Integrated Metadata Structure (SIMS).
3. **Training courses for staff on metadata standards and quality reports.** Training courses on the use of the metadata standards and quality reports are provided for the relevant staff.

## Process/output methods

4. **Metadata on statistical processes.** Clear, standardised and complete metadata is compiled and updated on the statistical processes in accordance with ESS standards, i.e. the Single Integrated Metadata Structure (SIMS).

**Indicator 15.5:** Metadata related to outputs are managed and disseminated by the statistical authority according to the European standards.

## Institutional methods

1. **Accordance of metadata with European Standards.** The content, structure and dissemination of metadata are aligned with the ESS standards, i.e. the Single Integrated Metadata Structure (SIMS).
2. **Procedures to update and publish metadata.** Metadata is regularly updated. The updating procedures are clear and well-known to staff.
3. **Quality assurance for metadata.** A procedure for the quality assurance of metadata is in place and communicated to staff.
4. **Training courses for staff on metadata.** The statistical authorities offer training on metadata for their staff.

## Process/output methods

5. **Dissemination of metadata.** All statistical outputs are disseminated together with the relevant metadata to enable a better understanding of the outputs. If metadata are disseminated separately from the statistical outputs, clear links are provided.

# QAF and Metadata



**Indicator 6.2** *Choices of data sources and statistical methods as well as decisions about the dissemination of statistics are based on statistical considerations.*

**Method 6.2.3 Information on data sources and methodology.** The chosen data sources and statistical methods are clearly stated in methodological notes, quality or metadata reports.

**Indicator 7.2** Procedures are in place to ensure that standard concepts, definitions, classifications and other types of standards are consistently applied throughout the statistical authority

**Method 7.2.4 Methodological documentation.** Methodological documentation is elaborated for each statistical process and includes all pertinent information on concepts, methods, classifications and other types of standards, and is publicly available at least in a summary form following the ESS standard, i.e. Single Integrated Metadata Structure (SIMS).





In the IMF framework (Dissemination Standards Bulletin Board)

## IMF Data Quality Assessment Framework



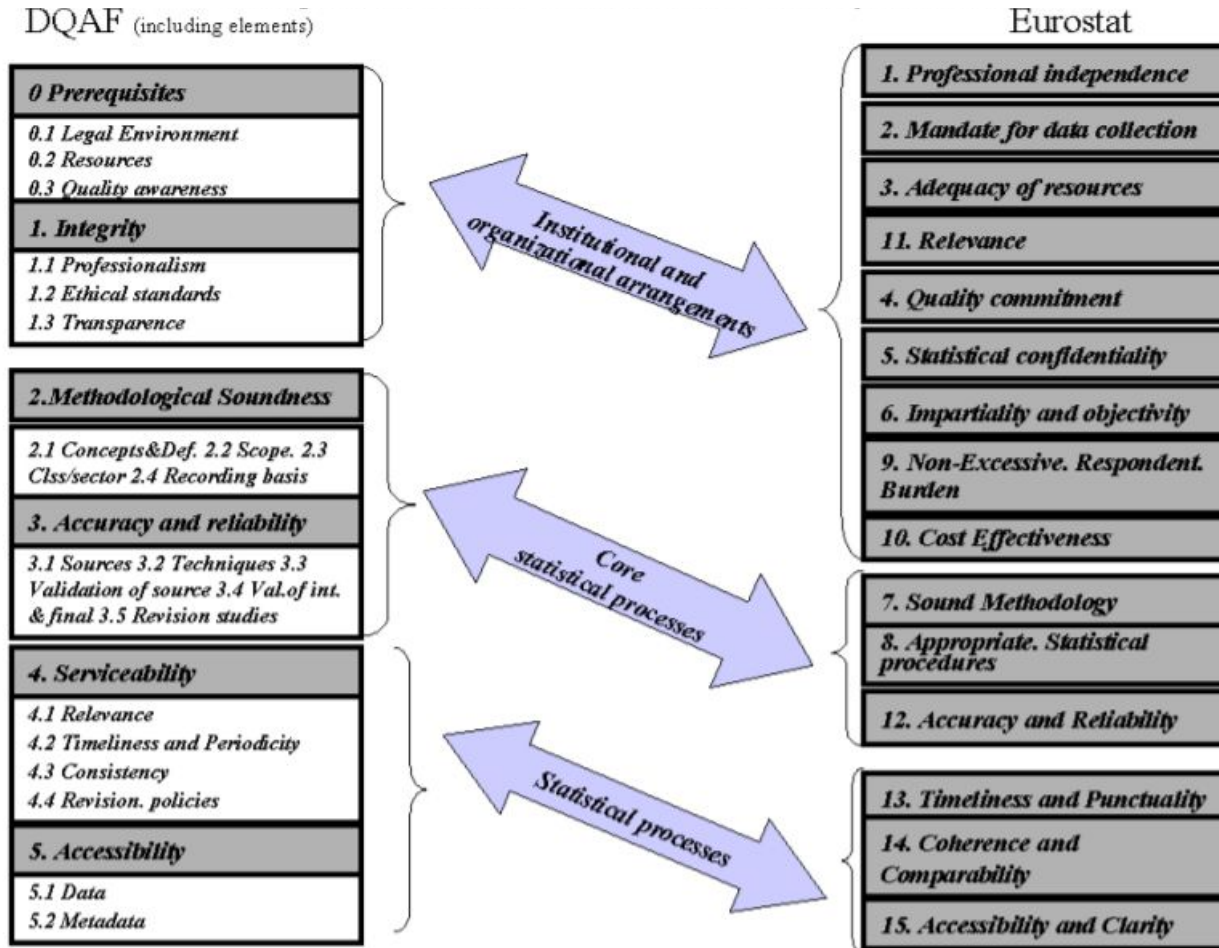
The IMF DQAF grew out of the Special Data Dissemination Standard (SDDS) and General Data Dissemination System (GDDS), the IMF's initiatives on data dissemination.

The DQAF identifies quality-related features of governance of statistical systems, processes, and products.

The DQAF provides a cascading structure that progresses from the abstract/general to the more concrete/specific details.

Five **dimensions** of data quality—*assurances of integrity, methodological soundness, accuracy and reliability, serviceability, and **accessibility***. For each dimension, the DQAF identifies 3-5 **elements** of good practice, and for each element, several relevant **indicators**.

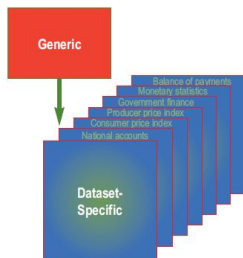
# Mapping frameworks



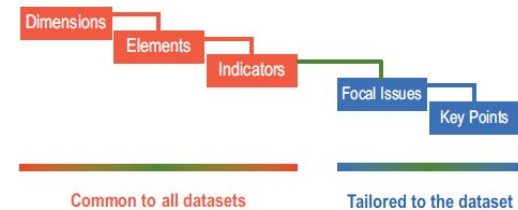
# IMF Data Quality Assessment Framework



Quality Dimensions	Elements	Indicators
<p><b>5. Accessibility</b></p> <p><i>Data and metadata are easily available and assistance to users is adequate.</i></p>	<p><b>5.1 Data accessibility</b>—<i>Statistics are presented in a clear and understandable manner, forms of dissemination are adequate, and statistics are made available on an impartial basis.</i></p> <p><b>5.2 Metadata accessibility</b>—<i>Up-to-date and pertinent metadata are made available.</i></p> <p><b>5.3 Assistance to users</b>—<i>Prompt and knowledgeable support service is available.</i></p>	<p>5.1.1 Statistics are presented in a way that facilitates proper interpretation and meaningful comparisons (layout and clarity of text, tables, and charts).</p> <p>5.1.2 Dissemination media and format are adequate.</p> <p>5.1.3 Statistics are released on a preannounced schedule.</p> <p>5.1.4 Statistics are made available to all users at the same time.</p> <p>5.1.5 Statistics not routinely disseminated are made available upon request.</p> <p>5.2.1 Documentation on concepts, scope, classifications, basis of recording, data sources, and statistical techniques is available, and differences from internationally accepted standards, guidelines, or good practices are annotated.</p> <p>5.2.2 Levels of detail are adapted to the needs of the intended audience.</p> <p>5.3.1 Contact points for each subject field are publicized.</p> <p>5.3.2 Catalogs of publications, documents, and other services, including information on any changes, are widely available.</p>



Further, more detail and more concreteness tailored to the dataset are provided by **focal issues** and **key points**.



# IMF Data Quality Assessment Framework



**5.2.1 Documentation on concepts, scope, classifications, basis of recording, data sources, and statistical techniques is available, and differences from internationally accepted standards, guidelines, or good practices are annotated.**

*i. The external debt statistics metadata give adequate information about the meaning of the data and about the methodology used to collect and process them.*

- A comprehensive sources and methods document is published and updated regularly, and it includes the following:
  - Information on concepts, definitions, classifications, data sources, compilation methods, statistical techniques and other relevant methodological aspects and procedures;
  - Departures from internationally accepted standards, guidelines, or good practices;
  - Information on survey sources, such as survey characteristics (response rates, survey monitoring and studies of non sampling errors) and other survey features (method, sample frame, sample design and selection, estimation and imputation techniques, etc.), and on the nature of administrative data sources; and main linkages with related major data systems.
  - If consistency is achieved by deriving any component residually, this is identified in the notes accompanying external debt statistics.
  - Departures from internationally accepted standards, guidelines, and good practices are well documented in the metadata.
  - The SDDS/GDDS metadata, SDDS summary methodologies, and other related descriptions are reviewed and updated regularly.
  - The metadata are readily accessible (e.g., websites, statistical publications) and their availability is cross-referenced in data releases, and otherwise well publicized (e.g., in catalogs).

**5.2.2 Levels of detail are adapted to the needs of the intended audience.**

*i. Different levels of metadata detail are made available to meet users' requirements.*

- General use information (e.g., a brochure) about the balance of payments, IIP, and other external sector statistics (e.g., how to locate the data) is available and made public.
- More specialized information (e.g., background papers, working documents) is available and made public.

**5.2.2 Levels of detail are adapted to the needs of the intended audience.**

*i. Different levels of metadata detail are made available to meet users' requirements.*

- General use information (e.g., a brochure, FAQ) about the CPI and other price statistics (e.g., how to locate the data) is available and made public.
- Good practice would include such information being readily available on the data-producing authority's website.
- More specialized use information (e.g., background papers, working documents) is available and made public.



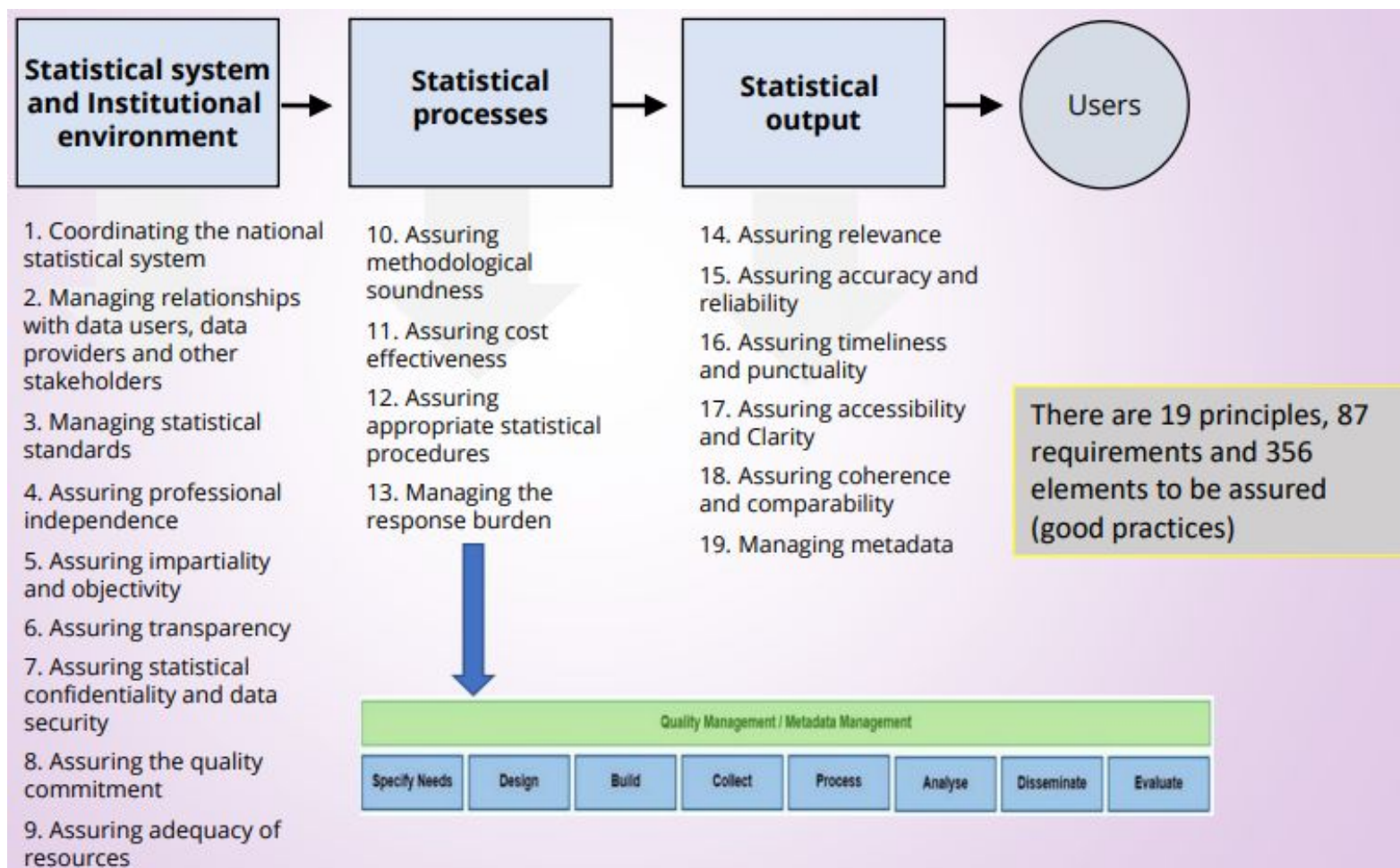




In the UN framework (Sustainable Development Goals)



# UN National Quality Assurance Framework





## UN NQAF Principle 19 on metadata

### *Principle 19: Managing metadata*

Statistical agencies should provide information covering the underlying concepts and definitions of the data collected and statistics produced, the variables and classifications used, the methodology of data collection and processing, and indications of the quality of the statistical information—in general, sufficient information to enable the user to understand all of the attributes of the statistics, including their limitations. Principle 19 is supported mainly by principle 3 of the Fundamental Principles of Official Statistics.

Requirement 19.1: The metadata management system of the statistical agency is well defined and documented.

Requirement 19.2: Metadata are documented, archived and disseminated according to internationally accepted standards.

Requirement 19.3: Staff training and development programmes are in place on metadata management and related information and documentation systems.



# UN NQAF Elements regarding Principle 19

## *Principle 19: Managing metadata*

Requirement 19.1: The metadata management system of the statistical agency is well defined and documented.

- A strategy, guidelines and procedures are in place for metadata management and dissemination.
- Metadata management is recognized as the responsibility of all staff.

Requirement 19.2: Metadata are documented, archived and disseminated according to internationally accepted standards.

- International, regional, national or internal standards are used for metadata documentation, management and archiving.
- Procedures are in place to ensure that metadata are documented according to standardized metadata systems, and are regularly updated.
- Metadata are made available at the same time as the data and statistics to which they pertain.
- The dissemination of metadata is tailored to different needs, such as those of producers and users of statistics.
- A systematic way to archive metadata is available that also ensures that the metadata are accessible for reuse in the future.
- A glossary of statistical concepts is publicly available.

Requirement 19.3: Staff training and development programmes are in place on metadata management and related information and documentation systems.

- Process managers are trained to properly document the data and describe the relevant processes.
- Statistical agency staff participate in international metadata forums.



# UN NQAF 19 Guidelines

## NQAF 19: Managing metadata

### Description:

Statistical agencies should provide information covering the underlying concepts, variables and classifications used, the methodology of data collection and processing, and indications of the quality of the statistical information - in general, sufficient information to enable the user to understand all of the attributes of the statistics, including their limitations, for informed decision-making.

### Elements to be assured:

*At the agency level*

- Is the metadata management system of the statistical agency well defined and documented?
- Are procedures or guidelines in place for metadata maintenance and dissemination?
- Are metadata documented according to standards?
- Is a glossary of statistical concepts publicly available?
- Are staff training and development programmes in place on metadata management and related information and documentation systems?
- Is there a systematic way for archiving metadata which also ensures that they are accessible for reuse in the future?

### Supporting mechanisms:

The management of metadata is likely to be more effective if the following supporting mechanisms are in place:

- Participation at international metadata forums.
- Programmes to train staff on metadata.
- International, national or internal standards for metadata documentation, management and archiving.



## UN NQAF and quality reports

The need for quality reports is reflected in requirement 17.7 and in the list of associated elements to be assured

*Principle 17: Assuring accessibility and clarity*

Requirement 17.7: Users are kept informed about the quality of statistical outputs.

- Standards for quality reports, harmonized for the NSO and adjusted as appropriate for the NSS, and tailored for different users' needs, are defined.
- Published statistics are accompanied by standard quality reports, including information on the periodicity of the statistics, data sources, production methods and quality (i.e., accuracy and reliability, timeliness and punctuality, coherence and comparability, accessibility and clarity).
- Results from quality assessments or reviews are made public.



## Statistical outputs (principles 14 to 19)

### Principle 14: Assuring relevance

Requirement 14.4: User satisfaction is regularly measured and systematically followed up.

User satisfaction surveys include questions on the opinions of users about **metadata** availability.

### Principle 17: Assuring accessibility and clarity

Requirement 17.1: Statistics are presented in a form that facilitates proper interpretation and meaningful comparisons.

**Metadata** needed to understand and use the statistics are published together with the statistics.

### Principle 15: Assuring accuracy and reliability

Requirement 15.2: Sampling errors are measured, evaluated and documented. Non sampling errors are described and, when possible, estimated.

Information about the sampling and non-sampling errors is made available to users as part of the **metadata**.

### Principle 18: Assuring coherence and comparability

Requirement 18.1: International, regional and national standards are used with regard to definitions, units, variables and classifications.

Compliance with international, regional or national standards for statistical production is periodically assessed. Any deviations from these standards are identified and included in the publicly available **metadata**, along with reasons for such deviations.



## 12. Assuring appropriate statistical procedures

Requirement 12.5: Metadata and documentation of methods and different statistical processes are managed throughout the processes and shared as appropriate.

- There is a policy on metadata documentation linked to the statistical production processes.
- The policies and standards for maintaining and updating metadata are followed.
- Work on preparing statistics and their related metadata should be done in parallel.
- Metadata are captured throughout the statistical business process following the GSBPM and stored in a metadata management system.
- Statistical methods and processes are documented in such a way that allows for the recreation of the entire statistical production process.







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