



Malawi Government

# Malawi Statistical Quality Assurance Framework for National Statistical System

April 2023

Published by

National Statistical Office,

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## PREFACE



Quality Assurance Framework (QAF) encompasses all aspects of how statistical processes and outputs fulfill expectations of users. A well-developed QAF addresses respondent and data compiler concerns in the production of statistical data, and promote the skills and ethical standards of statisticians.

In order to accomplish all users' needs, strong emphasis needs to be given to key aspects of statistical quality such as impartiality, objectivity, confidentiality, completeness, accuracy, reliability, consistency, timeliness, and accessibility, among others. All these aspects are complementary and of equal importance.

Therefore, the National Statistical System (NSS) of Malawi is delighted to publish the Malawi Statistical Quality Assurance Framework (MSQAF) for Malawi's NSS to be a guiding document for quality assurance of the System, particularly data producers, with National Statistical Office (NSO) playing the key role of data production in the country. Effective coordination and communication among all the NSS member institutions is necessary in order to align to this MSQAF and on the commitment towards the harmonization of statistical data and information, standards and other aspects of statistical data production.

I would like to thank the NSS Technical Working Group member institutions who worked tirelessly towards the formulation of this document. My special thanks are also extended to other NSS member institutions outside government MDAs that were instrumental in the production of this document. Finally, I call upon all data producers within the data ecosystem in Malawi to make full use of this MSQAF to ensure that data being produced is of high quality.

Lizzie Alexandria Chikoti (Mrs.)

**COMMISSIONER OF STATISTICS**

## LIST OF ACRONYMS

CSOs	Civil Society Organizations
MDAs	Ministries, Departments and Agencies
MoU	Memorandum of Understanding
MSQAF	Malawi Statistical Quality Assurance Framework
NSDS	National Strategy for the Development of Statistics
NSO	National Statistical Office
NSS	National Statistical System
NSS SC	National Statistical System Strategic Plan
QAF	Quality Assurance Framework
SCs	Statutory Corporations
SDGs	Sustainable Development Goals
SNA	System of National Accounts
UN-NQAF	United Nations National Quality Assurance Framework

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## 1.0 BACKGROUND

### 1.1 Introduction

The term “National Statistical System” (NSS) refers to public agencies responsible for producing, analyzing, disseminating and using statistics, and encompasses the statistical outputs produced and the people involved, including both users and producers of statistics (National Statistics Act, 2013). The NSS was launched on 18 November 2006 during the African Statistics Day commemoration. It was established because of uncoordinated and diversity of statistics produced by various stakeholders. In 2013, an Act of Parliament called “National Statistics Act, 2013”, legally established the NSS. NSS includes National Statistical Office (NSO); Government Ministries, Departments and Agencies (MDAs); Civil Society Organizations (CSOs); Statutory Corporations (SCs); the private sector; media; academia and research institutions.

The National Statistics Act also empowers the Commissioner of Statistics to be the Coordinator of the NSS and oversee all statistical activities conducted by all NSS member institutions. The responsibility of the Commissioner comes with an obligation to ensure quality of the statistics produced by NSS member institutions. Care has to be taken to guard against errors in the production of statistics and to mitigate and correct for deficiencies in the supporting infrastructure and institutional environment. This is the context in which there is an initiative to manage the quality of the NSS services, statistical processes and related products, as well as communication with stakeholders in a systematic and formalized way.

A Quality Assurance Framework (QAF) can help to provide the transparency and clarity necessary to manage and respond to data users’ expectations, queries and demands while bolstering the credibility of the NSO. It is the responsibility of NSS member institutions to clearly articulate the concepts and definitions that form the basis of the statistics produced, while outlining the methodologies used. It is also the responsibility of NSS member institutions to comment on both erroneous interpretation and misuse of statistics. This is especially useful for addressing instances when the reasonableness of statistics published by NSS member institutions are questioned by members of the public whose concerns may be based on limited understanding of the methodologies used in deriving certain estimates.

Against this background, the need for modernization of NSS production and services is also being driven by the need to reduce response burden and improve efficiencies in the production of official statistics. Additionally, data users have an increasing demand for more timely and accurate data and there is growing competition from alternative data producers and researchers moving up the statistical value chain.

## *1.2 Benefits*

It has been advocated that all national statistical organizations should have a national quality assurance framework in place. The objective is to have in place an overarching framework that would provide context for quality concerns, activities and initiatives, and explain the relationships between the various quality procedures and tools. Such an organizing framework has proved to be very useful in providing a single place to record and reference the activities. The main benefits of having a quality assurance framework in place include the following:

- It provides NSS member institutions with the detailed practices they must commit to when producing and releasing official statistics.
- It provides NSS member institutions with a framework that can be applied in a proportionate and flexible way to improve public confidence.
- It provides a systematic mechanism for facilitating the ongoing identification of quality problems and possible actions for their resolution. At the same time, it serves to stimulate and maximize interaction among staff throughout the NSS.
- It gives greater transparency to the processes by which quality is assured and reinforces the image of the office as a credible provider of good quality statistics.
- It provides a basis for creating and maintaining a quality culture among NSS member institutions and contains reference material that can be helpful for training.
- It supports quality improvements and their maintenance over time.
- It is a mechanism for the exchange of ideas on quality management with other producers of statistics within the NSS and with other national and international statistical organizations.

## *1.3 Challenges*

Along with the formulation and implementation of a quality assurance framework, the following significant challenges are generally encountered.

- One of the first challenges often faced is arriving at a common understanding of the actual definition of quality. This highlights the shift from the typical “old” notion of quality as being synonymous with accuracy to the more current notion, one in which quality, when referring to statistical outputs in particular, encompasses many other dimensions such as relevance, timeliness, punctuality, accessibility, clarity, coherence and comparability, among others.
- Sometimes, there are multiple producers of statistical data. Effective coordination and communication among all NSS member institutions is necessary in order to agree on a common framework and the commitment towards the harmonization of information, standards, and other aspects of statistical information production.
- Long-term sustained support by senior management is pertinent to effective and successful implementation of a quality assurance framework.



## 2. QUALITY DIMENSIONS

For statistics, the general definition of quality is operationalized by specifying a set of factors or dimensions that characterize the quality of the product. The following quality dimensions are pertinent in the statistical production value chain:

**Relevance:** the extent to which the statistics satisfy the needs of users.

**Accuracy:** the closeness of estimates to the exact or true values that the statistics were intended to measure.

**Reliability:** the closeness of the initially estimated value(s) to the subsequent estimated value(s) if preliminary figures are disseminated.

**Timeliness:** the length of time between the end of a reference period (or date) and the dissemination of the statistics.

**Punctuality:** the time lag between the release date and the target date by which the data or statistics should have been delivered.

**Accessibility:** the ease and conditions with which statistical information can be obtained.

**Clarity:** the availability of appropriate documentation relating to the statistics and the additional assistance that producers make available to users.

**Coherence:** the ability to reliably combine statistics and data sets in different ways and for various uses. Consistency is often used as a synonym for coherence.

**Comparability:** the extent to which differences in statistics from different geographical areas, non-geographical domains, or over time, can be attributed to differences between the true values of the statistics.

### 3. MANAGING THE STATISTICAL SYSTEM

The NSS comprises NSO; Government Ministries, Departments and Agencies; Civil Society Organizations; Statutory Corporations; private sector; media; academia and research institutions within a country. They produce and disseminate official statistics with NSO as a coordinating agency. In order to maintain the quality of official statistics, there is need for coordinating this system, managing relations with all stakeholders and managing statistical standards.

#### *Principle 1: Coordinating the national statistical system*

Coordination is very important as far as quality statistics is concerned. There is need for strong coordination of the NSS to ensure that timely, quality and disaggregated data is available for use by planners, program implementers and researchers in order to inform the country's development policy.

**Requirement 1.1:** A National Statistics Act that gives mandate to NSO and other NSS member institutions to organize and monitor a coordinated scheme of statistics relating to Malawi. At the same time, stakeholders need to be consulted for their inputs on revision of the Statistics Act to ensure data quality.

- The coordination role of the NSO is defined in a statistical law.
- The statistical law specifies the requirements for official statistics and the scope of the NSS.
- NSS member institutions are identified in a formal document.
- Responsibilities of NSS member institutions for the development, production and dissemination of official statistics are clearly specified in the respective laws and regulations.

**Requirement 1.2:** There is an agency and mechanisms for the coordination of the NSS for activities at the local, national, regional and international level.

- The NSO is tasked with the coordination of the NSS.
- The NSO and other statistical agencies have mechanisms to ensure the coordination (including the exchange of data and statistics within the NSS) and the quality of official statistics.
- The NSO, as an NSS-wide (central) coordination agency, sets, monitors and reviews guidelines for the development, production and dissemination of official statistics.
- The NSO establishes and maintains engagement with advisory bodies, academic institutions and other regional and international bodies as appropriate.
- The NSO coordinates data collection to improve cost-effectiveness and reduce

respondent burden, in particular with regard to coordinating sample surveys.

- The NSO monitors the use of agreed standards, concepts, classifications and methods throughout the NSS.
- The NSO promotes and enhances data sharing within the NSS and liaisons with member institutions of the extended data ecosystem regarding the sharing of data.
- The NSO promotes the sharing of technical knowledge and good statistical practices and ensures the provision of training, including on the production of official statistics and Sustainable Development Goals (SDGs) indicators.
- Processes for the evaluation of the quality of the statistics are developed and applied within the NSS.

**Requirement 1.3:** Presence of a mechanism for considering data producers outside the NSS and, if necessary, for those statistics to become official.

- NSO evaluates statistics produced outside the NSS for use as official statistics or alongside official statistics, e.g. some of the SDGs indicators.
- The NSO has been given the responsibility for the evaluation of the quality of relevant statistics outside the NSS.
- There is a unit that discusses and provides support for the use of new data sources within the NSS.

**Requirement 1.4:** A national plan or program for the development of official statistics for the production and dissemination of official statistics, also referred to as a National Statistical System Strategic Plan.

- There is a multi-year national plan for the development and production of official statistics, which can take the form of a National Strategy for the Development of Statistics (NSDS) or the equivalent of a National Statistical System Strategic Plan.
- The multi-year national plan for the development and production of official statistics covers the entire NSS.
- The multi-year national plan should address quality assurance.
- Annual plans for the NSS supplement the multi-year NSS-wide plan.
- The multi-year national plan is established in close consultation with statistics producers, users and data providers.
- The programs and activities of the multi-year national plan are monitored on a regular basis by the NSO.

## *Principle 2: Managing relationships with data users, data providers and other stakeholders*

Managing relationships with statistical stakeholders is important for relevant and timely statistics. The data producers should be in a good relationship with the data users. The statistical agencies should have access to all data necessary to satisfy the information needs of society in an effective and efficient way.

**Requirement 2.1:** Stakeholders are identified and consulted regarding their interests, needs and obligations.

- The statistical agencies clearly identify all their stakeholders.
- Processes are in place to consult stakeholders about their concerns, interests, needs and obligations.
- Stakeholders are kept informed of actions taken to address their needs and concerns.

**Requirement 2.2:** To further manage statistical relationships, NSS member institutions need to have Memoranda of Understanding (MoUs) with data providers.

- User needs and how to engage with users are reflected in the statistical agencies' strategies, such as the data dissemination strategy and the NSS-wide National Strategy for the Development of Statistics.
- Service agreements or similar arrangements with the main users of the statistics are in place (e.g., with regard to what will be supplied by the agency, the quality of the statistics, the dissemination format, etc.).
- Statistical agencies have press offices, hotlines and a central email contact who responds to all user inquiries in a timely manner.
- Users can engage with statistical agencies and request for information in their preferred means of communication, such as through telephone, email and other common means of communication.
- Processes and arrangements (such as a user committees) are in place so that users can advise statistical agencies about their emerging needs and priorities and during the development of new or review of existing statistics.

**Requirement 2.3:** NSS member institutions need to be holding annual user-producer workshops where issues regarding their demand and obligations are highlighted.

**Requirement 2.4:** NSS member institutions should continuously maintain and develop relationships with the donor community, academia, research institutions and international statistical organizations.

- The statistical agency's work plans and budgets are shared with the funding

agency as appropriate to ensure mutual understanding of funding requirements and trade-offs.

- Statistical agencies maintain and develop cooperation with the scientific community to develop new statistics, improve methodology and promote the use of statistics.
- Statistical agencies cooperate with statistical organizations of other countries, regional statistical organizations and international statistical organizations.

**Requirement 2.5:** NSS member institutions need to map potential sources of administrative data.

- The statistical law provides appropriate provisions to guarantee the NSO and, if appropriate, other statistical agencies the right to obtain or access administrative data in a timely manner.
- Where statistical agencies do not have a legal right to obtain administrative data, memoranda of understanding are in place that provide for such access.
- Statistical agencies' access to administrative data is free of charge.
- Agreements with owners of administrative data are in place to operationalize data access which describe technical conditions for access and possibilities for linking the data with data from other administrative data sources.
- Statistical agencies are involved in the design and development of administrative data sets in order to make them suitable for statistical purposes; this involvement extends to the possible discontinuation of such data sets.

**Requirement 2.6:** The National Statistical Office cooperates with and provides support and guidance to data providers.

- The NSO regularly consults with data providers and maintains cooperation with the providers of administrative data, corporations, businesses and other organizations that hold data to strengthen the statistical value and usage of these sources.
- Quality reports for administrative data are developed in cooperation with the NSO and the data owner and describe accuracy, completeness, timeliness and punctuality, among other things.
- Holders of administrative data, businesses and other organizations receive feedback on the quality of the data provided, allowing for further improvements.
- Partnership agreements with data providers are in place.

### *Principle 3: Managing statistical standards*

Statistical Standards refer to a comprehensive set of statistical concepts, definitions, classifications and models, methods and procedures used to achieve the uniform treatment of statistical issues within or across processes and across time and space. These promote the consistency and efficiency of statistical systems at all levels. They are also useful when it comes to comparing data from different sources.

**Requirement 3.1:** The National Statistical System member institutions cooperate in the development of international, regional and national statistical standards e.g. Compendium of statistical concepts and definitions.

- The NSO actively works with other statistical agencies, international and regional statistical organizations in developing, reviewing, promoting and implementing statistical standards.
- The NSO has an organizational unit responsible for facilitating and coordinating the adoption and development of international, regional and national statistical standards and supporting statistical programs/domains in their efforts to adopt and develop such standards.
- All relevant staff in statistical agencies are aware of statistical standards and any changes made to them.
- There is a repository and a list of all standard classifications available in all statistical agencies.
- The process for originating, developing and approving statistical standards involves statistics producers, data providers and data users.
- The impact of the adoption of new statistical standards is assessed, documented and communicated to users; where applicable, conversion tables are provided.
- The statistical agencies use conceptual frameworks, such as the System of National Accounts, that provide a basis for integrating statistical information.
- Statistical standards (concepts, definitions, classifications, etc.) are regularly reviewed.

**Requirement 3.2:** NSO should provide guidance and support to all data providers and producers of official statistics in the implementation of statistical standards.

- The NSO monitors the extent to which statistical standards are used by data providers and producers of official statistics.
- Periodic reports are prepared with regard to compliance with international, regional and national statistical standards.
- Statistical standards are communicated and made available to all data providers

and producers of official statistics.

- Plans and schedules for the development and application of new standards are communicated in advance.
- The NSO assists other statistics producers and data providers in the implementation of international, regional and national statistical standards as appropriate.

**Requirement 3.3:** Divergences from the international, regional and national statistical standards should be kept to a minimum and are documented and explained to all users.

- Concordance tables for international, regional and national standard classifications are developed and made available in cases where diverging standards are used.
- The adopted standards (concepts, definitions, classifications, etc.) are explained to all stakeholders.
- Stakeholders are informed about compliance with international, regional and national statistical standards.

## 4. MANAGING THE INSTITUTIONAL ENVIRONMENT

Globally, statistical agencies are required to operate in an open environment, independent of political influence and without any bias towards government policies. It is also critical to provide an environment that protects the confidentiality of data suppliers. In addition, the quality of data must be assured through provision of adequate financial resources, skilled human resource and adequate infrastructures in order to enhance public trust and promote the use of official statistics.

### *Principle 4: Assuring professional independence*

The role of the Commissioner of Statistics is to provide advice and reports to the Minister responsible for statistics without compromising the responsibilities of independence according to the National Statistics Act. Such professional independence and freedom from inappropriate influence ensures the credibility of official statistics. The mandate of NSO and other NSS member institutions also entails promotion of proper use of statistical concepts, methodologies and interpretation of statistical data.

NSS member institutions work in collaboration with research institutions and academia to ensure that there is coherence, consistency and sound methodological practices in all official statistics.

**Requirement 4.1:** NSS member institutions shall choose the most professional attributes in statistical methods, procedures, accuracy, relevance, integrity, timeliness without any regard to undue external influence.

- The head of the NSO and the heads of the statistical units within government that produce official statistics decide, under the direction of the head of NSO, independently, on the basis of professional considerations, on the statistical methods, standards and procedures for the development, production and dissemination of official statistics.
- The reporting of the NSO to its administrative government bodies and to ministries, department and agencies does not affect its professional independence.

**Requirement 4.2:** The appointment of the head of the NSO, and other statistical agencies where appropriate, is based on professional criteria and follows transparent procedures. Reasons for dismissal cannot include reasons affecting professional independence.

- National legislation provides a clear and detailed description of the procedure for the appointment and dismissal of the head of the NSO.
- The rules applied for appointing, assigning positions and responsibilities and dismissing the head of the statistical agency are based on professional competence and are transparent and free from political considerations.



- Processes are in place to ensure that the head of the statistical agency is of the highest professional calibre.
- The head of the NSO has sufficiently high hierarchical standing to ensure access to the political and administrative leadership of government bodies.
- The heads of statistical units within other statistical agencies have the necessary qualifications, knowledge and capacity.
- The basis and process for the termination or removal of the head of the NSO and the heads of the statistical units within government that produce official statistics are specified in the legal framework and administrative regulations. These cannot include reasons related to professional or scientific independence.

**Requirement 4.3:** Personnel recruited into NSS member institutions shall be professionally competent and have expertise in any field of statistics, specifically with regards to the area of work for which they are in charge.

**Requirement 4.4:** Official statistics disseminated by NSS member institutions shall be clearly distinguished from, and issued separately from, political statements.

**Requirement 4.5:** NSS Steering committee shall comprise of professionally competent experts who advise on the general policy and strategic plans of the system and ensure that the entity adheres to its legislative mandate of professional independence.

**Requirement 4.6:** When appropriate, the NSS Steering Committee shall issue public statements on statistical matters, including criticisms, and shall address misuses of official statistics.

**Requirement 4.7:** The head of the NSO and other statistical agencies, where appropriate, have the sole responsibility over the decisions on statistical methods, standards and procedures, and on the content and timing of statistical releases.

***Principle 5: Assuring impartiality and objectivity***

To promote impartiality and objectivity, NSO and other NSS member institutions shall report facts and findings irrespective of expectations from government agencies, policy makers and any other interested parties. NSS member institutions shall advance research and studies based on identified priorities.

**Requirement 5.1:** NSS member institutions shall compile statistical data and information on an objective basis and based on prescribed relevant guidelines. Statistical agencies should develop, produce and disseminate statistics following professional standards and treat all users in the same way.

- Professional cultures and traditions assure the impartiality and objectivity of the statistics produced by the statistical agencies independently from the existence

or absence of any laws or formal provisions.

- The objectivity and impartiality of official statistics is recognized (and not disputed) by neutral observers and the public (e.g., measured by image studies).

**Requirement 5.2:** Choices of sources and statistical techniques by NSS member institutions are informed by statistical considerations.

- Sources, concepts, methods and processes for the development, production and dissemination of data are chosen on the basis of statistical considerations, national and international principles and best practices.

**Requirement 5.3:** The statistical agencies implement a declaration or code of conduct or ethics that governs statistical practices and compliance with it.

- There are ethical guidelines or a code of conduct for assuring impartiality and objectivity.
- The guidelines are available to the public.
- The implementation of the guidelines is followed up.

**Requirement 5.4:** In cases in which errors are detected, they are corrected as soon as possible, and users are informed as to how they affected the released statistics.

- There is an established policy on how to correct published data when errors are discovered. The error treatment policy is publicly available.

**Requirement 5.5:** Statistics of NSO and other NSS member institutions have release dates and times pre-announced annually.

- A publicly available and easily accessible release calendar containing information on the releases planned in the upcoming 12-month period exists.
- Statistics are released at a fixed date and time.
- Changes in the release calendar are announced in advance and their reasons are explained.
- The sharing of statistical results ahead of the official release (a “privileged pre-release”) is kept to a minimum and is well justified and strictly controlled and documented.

**Requirement 5.6:** All users have equal access to statistical releases at the same time and any privileged pre-release access to any outside user is limited, controlled and publicized. In the event that leaks occur, pre-release arrangements should be revised so as to ensure impartiality.

**Requirement 5.7:** Statistical releases and statements made by NSS member institutions

in press conferences are objective and non-partisan.

- Statistical releases and statements made to the media are objective and based strictly on the available evidence and do not take any position on a political issue.
- Appropriate internal and external communication strategies exist that include recognizable logos, designs or formats for the products of statistical agencies, which identify them as being unaffiliated with any political or policy bodies.

**Requirement 5.8:** The statistical agencies comment publicly on statistical issues, misinterpretation and misuse of official statistics, as appropriate.

- There is a formal policy or well-established custom entitling statistical agencies to comment publicly on statistical issues, criticisms, misinterpretations and misuses of official statistics.
- The statistical agencies respond, as appropriate, to negative media reporting to facilitate fair reporting of their positions.

#### *Principle 6: Assuring transparency*

Policies and practices of NSS member institutions on transparency fulfill the obligation to account for its own activities and to disclose results in a transparent manner. NSS member institutions shall provide information on the sources, methods and procedures that have been used in line with scientific standards to facilitate a correct interpretation of data.

**Requirement 6.1:** Official statistics shall be prepared using methodologies and technical processes based on impartiality and transparency.

**Requirement 6.2:** The standards, classifications, methods and processes used to produce the statistics shall be documented and made known to the public.

**Requirement 6.3:** Revisions shall follow well-established standard procedures in accordance with an established time-table. Studies and analysis of revisions shall be made known to the public.

#### *Principle 7: Assuring statistical confidentiality and data security*

The National Statistics Act empowers the NSO and other NSS member institutions to anonymize all data disclosures and prohibits use of data for any other purpose than statistics. Statistical databases shall be stored in accordance with established security and confidentiality protocols and existing standards. In addition, statistical agencies should guarantee that the privacy of data providers (persons, households, enterprises and other data providers) will be protected, and that the information they provide will be kept confidential, will not be able to be accessed by unauthorized internal or external users.

**Requirement 7.1:** The legislation in force specifies that data are confidential and shall be used for statistical purposes only.

**Requirement 7.2:** Persons with access to individual or confidential information shall sign a declaration stating their respect for confidentiality and taking note of the penalties for non-compliance.

**Requirement 7.3:** The legislation in force specifies standards and commitments to confidentiality for staff in NSS member institutions involved in the generation of official statistics, together with the penalties that apply for noncompliance.

- Legal or other provisions are in place that allow administrative, penal and disciplinary sanctions for the violation of statistical confidentiality.
- Information on the provisions that allow sanctions for the violation of statistical confidentiality is shared with all staff and is available to the public.

**Requirement 7.4:** There shall be protocols establishing guidelines on the security and integrity of statistical databases.

**Requirement 7.5:** Respondents shall be informed of the main uses of data and limitations in terms of access to the information that they provide.

**Requirement 7.6:** Access to micro-data shall be subject to confidentiality protocols for external users who access them for purposes of analysis and statistical research.

- Clear conditions for granting access by researchers to confidential data for scientific purposes are set in the statistical law or other formal provision.
- Confidentiality rules, disclosure control and microdata access procedures apply throughout the statistical business process.
- The statistical agencies monitor the use of microdata sets to identify any circumstances in which data confidentiality may be breached (e.g., through file matching), and take immediate corrective action to address such a situation.

**Requirement 7.7:** Information shall be stored in accordance with established security and confidentiality protocols and existing standards.

### ***Principle 8: Assuring the quality commitment***

Quality can be defined as the extent to which a product or a service is fit for users' intended purposes. NSS member institutions shall strive to produce high quality products all the time. Products of NSS member institutions shall be assessed for quality improvement frequently using definitions of quality indicators from the UN National Quality Assurance Framework (UN-NQAF) Manual. This report will be disseminated to all NSS member institutions.

**Requirement 8.1:** Product quality in all NSS member institutions is regularly monitored through the Malawi Statistical Quality Assurance Framework.

- The statistical agency has quality guidelines that are made available to external users, at least in a summarized version.

**Requirement 8.2:** Processes are in place in all NSS member institutions to monitor the quality of the collection, processing, dissemination and communication of statistical data and information.

**Requirement 8.3:** There is a specific agency responsible for quality management or the coordination of quality management within the statistical agency, and it receives necessary support to fulfil this role.

- A quality manager, committee, unit or group of coaches or advisers is assigned responsibility for quality management.
- An agency-wide data quality task force is established and meets regularly.
- Quality issues are discussed with and by management regularly (e.g., at an annual quality review meeting).

**Requirement 8.4:** Staff of NSS member institutions receive training on quality management.

- Staff training and development programs are in place to ensure that staff are aware of the statistical agency's quality policy, including the use of an NQAF, and that staff have an understanding as to how quality is assured.
- A staff awareness "campaign" is undertaken to emphasize the statistical agency's commitment to quality.

**Requirement 8.5:** Quality guidelines are documented by all NSS member institutions and staff are well trained. These guidelines are spelled out in writing and made known to the public.

**Requirement 8.6:** There is a regular and thorough review of the key statistical outputs from all NSS member institutions using external experts where appropriate.

**Requirement 8.7:** NSS member institutions shall participate in local and international cooperation activities in order to share with, and transfer knowledge to, government Ministries, Departments and Agencies, international bodies and other national statistical offices.

**Requirement 8.8:** Local, regional and international cooperation mechanisms shall be developed for the transfer of knowledge.

### *Principle 9: Assuring adequacy of resources*

NSS member institutions shall assess from time to time the resource capacities i.e. financial, human and infrastructure availability for the development, production and dissemination of official statistics. A frequent review shall look into organizational capacity, hardware and software needs and regularly assess its financial adequacy.

**Requirement 9.1:** Sufficient human, financial, physical and technological resources shall be made available in order to meet the needs for statistical information.

- A resource mobilization strategy such as a National Strategy for the Development of Statistics is in place.
- The annual work plan is feasible given the available resources.
- Costs (staff costs and other costs) of each stage of the production process are measured.

**Requirement 9.2:** The coverage and detail of official statistics and the cost and time necessary for their generation shall be based on an analysis of information requirements.

**Requirement 9.3:** New requests for information shall be assessed and justified with reference to their costs, using control mechanisms.

**Requirement 9.4:** The exclusion, inclusion or continuity of official statistics shall be evaluated periodically by those responsible for statistical production in order to optimize resources.

## 5. MANAGING STATISTICAL PROCESSES

International standards, guidelines and good practices are fully observed in the statistical processes used by NSS member institutions to develop, produce and disseminate statistics, while constantly striving for innovation.

### *Principle 10: Assuring methodological soundness*

In developing and producing statistics, NSS member institutions should use sound statistical methodologies based on internationally agreed standards, guidelines and best practices.

**Requirement 10.1:** The methodologies applied by NSS member institutions are consistent with international standards, guidelines and good practices, and are regularly reviewed and revised as needed.

- Organizational structures for the development and application of sound statistical methods are commensurate to needs.
- Review and reporting processes are in place that allow the management of the statistical agency to be assured that sound methodological approaches have been adopted and applied throughout the production process.
- The methodologies of surveys and the use of administrative data and other sources of data are evaluated periodically.
- Sampling design is based on sound methodology.
- Proper follow-up procedures are planned and implemented in cases of non-response.
- Statistical editing procedures and imputation methods are based on sound methodology.
- When statistical modelling is used in the statistical production process (e.g., for seasonal adjustment), the validity of model assumptions is carefully considered and the impact on final estimates is evaluated.
- NSO reviews the methods used by external partners for the compilation of data and the production of statistics.

**Requirement 10.2:** NSS member institutions recruit qualified staff and conduct regular programs to enhance their methodological skills.

- Staff of the statistical agency are recruited on the basis of their academic background, qualifications and experience.
- Appropriate qualification requirements are specified for all posts.
- Training and development programs are in place to ensure the staff acquire and

continuously update their methodological knowledge.

- Staff skills are regularly updated so that staff are able to utilize new data sources and tools and can easily change positions.
- Attendance of staff at relevant training courses and/or at national or international conferences is encouraged.

**Requirement 10.3:** NSS member institutions choose data sources taking into account accuracy and reliability, timeliness, cost, the burden on respondents and other necessary considerations.

- The use of alternative sources of data, including existing surveys and census, administrative data, big data or other sources of data, is constantly evaluated.
- Quality has to be assessed when using administrative data or other data sources. Ideally, when using administrative data, it should be assured that:
  - The population is consistent with the statistical output requirements
  - The classifications are appropriate
  - The underlying concepts are appropriate
  - The records are complete and up to date
  - The geographical coverage is complete and the measurement units are appropriately defined/identified
- When using other data sources (such as big data), the specific methodological challenges such as those linked to the statistical population and the veracity and volatility of such data have to be considered.

**Requirement 10.4:** The business register and the sampling frames for surveys are regularly evaluated and adjusted, if necessary, in order to ensure high quality.

- A systematic approach is in place for updating the survey frames to ensure accurate coverage of the target population.
- For all surveys, the appropriate statistical population frames are updated regularly.
- Information gathered during the conduct of surveys is used to assess and improve the quality of the frame, especially with regard to its coverage and the quality of the contact variables and the auxiliary information.

**Requirement 10.5:** NSS member institutions cooperate with the scientific community to improve methods and promote innovation in the development, production and dissemination of official statistics.



- Collaboration with the scientific community is in place, for example through conferences, workshops, task forces and training/courses, to discuss relevant methodological and technological developments (e.g., with regard to exploiting new data sources).
- There are agreements in place with academic institutions on cooperation and the exchange of qualified personnel.
- Staff collaborate on methodological issues with colleagues at international level.
- Regular participation and presentations at relevant national and international conferences is encouraged for the exchange of knowledge and experiences.
- National and international conferences, seminars, workshops or similar events with the participation of the scientific community are organized by the statistical agencies.

### *Principle 11: Assuring cost-effectiveness*

NSS member institutions should assure that resources are effectively and efficiently used. They should be able to explain to what extent set objectives were attained, that the results were achieved at a reasonable cost and are consistent with the principal purposes of the statistics.

**Requirement 11.1:** The costs of producing all individual statistics are measured and analyzed, and mechanisms are in place to assure the cost-effectiveness of statistical activities or processes.

- The costs of producing the statistics are well documented at each stage of the production process and are regularly reviewed and analyzed across statistical products to assess the effectiveness of their production.
- Cost-benefit analyses are carried out to determine the appropriate trade-offs in terms of data quality.
- The cost-effectiveness of every statistical survey is assessed.
- The need for each survey variable to be collected is justified.
- There is an ongoing review process that considers whether a particular program is still operating in the most cost-effective way to meet its stated requirements.
- Data collection instruments are designed to minimize coding, and editing cost and time at data processing stage.

**Requirement 11.2:** Procedures exist to assess and justify demands for new statistics against their cost.

- Demands for new statistics are regularly registered and assessed by statistical

experts with regard to the proposed methodology and associated costs, and are discussed by management, based on inputs from users and in cooperation with other stakeholders.

- Before contemplating a new data collection, there are mechanisms to review whether already available data sources can be utilized with minimal impact on their purpose and quality.
- When introducing new statistics, a cost-benefit analysis is conducted.

**Requirement 11.3:** Procedures exist to assess the continuing need for all statistics, to determine whether any can be discontinued to free up resources.

- There are regular discussions by management on the usefulness of all statistics; the discussions include inputs from users, such as the results from user satisfaction surveys.
- The usage of different statistical products, including statistical databases, is monitored and assessed to evaluate their relevance.
- Users and stakeholders are informed and consulted about the possible discontinuation of statistical outputs.

**Requirement 11.4:** Modern information and communication technologies are applied to improve the performance of statistical processes.

- An appropriate IT strategy exists and is regularly reviewed and updated to improve the effectiveness and efficiency of the statistical processes.
- The IT architecture and hardware infrastructure are regularly reviewed and updated, and possibilities for innovation and modernization are identified.
- Routine clerical operations and statistical processes (e.g., data capture, coding, data editing, data validation, data exchange) are automated where possible and are regularly reviewed.
- Centralized IT and methodological units exist and provide possibilities for the pooling of resources and investments.

**Requirement 11.5:** Proactive efforts are made to improve the statistical potential of administrative data and other data sources.

- Statistical agencies provide input to the legislative process to obtain and maintain access to administrative and other data sources for statistical purposes.
- Appropriate arrangements (e.g., service-level agreements or national legislation) with owners or holders of administrative data and other data collections are made and updated as needed, specifying the access to and flow of data and metadata and other relevant aspects.

- An assessment of possible administrative data sources is carried out prior to launching any new survey.
- Data linking and integration methods are proactively pursued while ensuring data security and privacy.
- Quality reports for administrative and other data used for official statistics are established by the responsible statistical agency in cooperation with the data owners.

***Principle 12: Assuring appropriate statistical procedures***

Careful planning of the implementation process for statistical activities based on internationally agreed standards and guidelines and the application of sound and scientific methods facilitates timeliness, accuracy and reliability of statistical outputs.

**Requirement 12.1:** Statistical processes are tested before implementation.

- Data capture procedures and data collection tools and instruments such as electronic systems are tested to ensure simplicity and minimal intrusion on privacy, and are adjusted if required before their implementation.
- Survey questionnaires are tested using appropriate methods (e.g., pilot survey, focus groups, etc.).
- Collection systems for administrative and other data are tested before use.
- Data treatment and data processing procedures are tested and adjusted, if required and if possible, prior to their actual application.
- Test results are taken into account in the implementation of the production process and are approved.
- In the case of integrating data from one or more sources, the quality of the linkage procedures is tested.

**Requirement 12.2:** The stages of the statistical processes shall be reviewed or updated as required by statistical operation and research.

- The statistical agencies have documented procedures and guidelines that contain recommendations for appropriate methodologies to be used at different steps of the statistical production process.
- Statistical procedures employ internationally recognized statistical techniques.
- Data from all sources are reviewed and validated to identify potential problems, errors and discrepancies such as outliers, missing data and miscoding.
- When coding is done through an automated process, a team of well-trained coders is assigned to verify the automated coding and to handle un-coded

cases.

- The effects of data editing and imputation are analyzed as part of assessing the quality of the data collection.
- All statistical databases are designed and arranged in a way that allows and facilitates data linkage, using unique identifiers for statistical units as appropriate while ensuring data security and privacy.

**Requirement 12.3:** Revisions of statistics follow standard and transparent procedures.

- A revision policy that follows international standards and recommendations exists and is made public.
- Guidelines for revisions exist and are followed.
- Revisions of the published statistics are accompanied by metadata that provides necessary explanations.
- Indicators expressing the amount and types of revisions are computed and evaluated for improvement.

**Requirement 12.4:** The concepts and definitions used when administrative registers are used for statistical purposes shall comply with the parameters required in a quality statistical process.

**Requirement 12.5:** The methodologies, questionnaires, manuals, computer-based applications and other instruments shall be checked and validated before starting the data-collection process.

**Requirement 12.6:** Computer systems shall be used for data capture, coding, evaluation and validation of information, where possible.

**Requirement 12.7:** 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.
- Statistical methods and processes are documented in such a way that allows for the recreation of the entire statistical production process.

*Principle 13: Managing the respondent burden*

The requirement to collect data should be balanced against production costs and the

burden placed on respondents. Mechanisms to maintain good relationships with providers of data and to proactively manage the respondent burden are essential to improving quality.

**Requirement 13.1:** The coverage and level of detail of the request for information from respondents shall be limited to information that is strictly necessary.

- The availability and suitability of existing surveys and administrative or other data sources are explicitly considered before suggesting a new survey.
- The collection of each data item of a survey has to be explained and justified.
- The collection of any data items that are identical or similar to those collected in another survey is limited to what is considered necessary for verification and possible data linkage purposes.
- When possible, surveys or parts of the information to be collected in the surveys are extracted or derived from available administrative registers.

**Requirement 13.2:** NSS member institutions shall reduce the respondent burden on businesses through an integrated approach to survey administration by combining data collection both within the NSS and with other statistics producers.

**Requirement 13.3:** Sound methods, including information technology (IT) solutions, are used in surveys to reduce or distribute respondent burden.

- Appropriate sampling techniques are used to minimize sample sizes to achieve the target level of accuracy.
- Sample surveys are coordinated to distribute the burden on respondents.
- Multiple modes of collection are offered to respondents, including electronic surveys.
- Collection of data is done at the most appropriate time of the day and the year, where applicable.

**Requirement 13.4:** Data sharing, data linkage and the use of administrative and other data sources are promoted to minimize respondent burden.

- Documentation of data already available within the NSS, including archived data, exists and is shared.
- Procedures and technical tools for data sharing and data linkage within the NSS (e.g., formal agreements, web services, common databases) exist.
- Data repositories are shared among statistical agencies for the production of official statistics and in compliance with confidentiality policies.
- Information on the quality of data to be linked exists (e.g., on coverage and

linkage possibilities).

- Use of administrative and other data as an alternative to survey data for producing official statistics is promoted throughout the NSS.

**Requirement 13.5:** NSS member institutions shall reduce the respondent burden on households by using measures that ensure there is a reasonable minimum time lapse before sample units are selected for inclusion in another survey.

**Requirement 13.6:** NSS member institutions shall rotate sample units out of longitudinal surveys, where possible, to reduce the general response burden.

## 6. MANAGING STATISTICAL OUTPUTS

Statistics serve the needs of national Governments, academia and research institutions, businesses, the general public and the international community. Output quality is measured by the extent to which the statistics are relevant, accurate and reliable, timely and punctual, readily accessible by and clear to users, and coherent and comparable across geographical regions and over time.

### *Principle 14: Assuring relevance*

Statistical information should meet the current and/or emerging needs or requirements of its users. Without relevance, there is no quality. However, relevance is subjective and depends upon the varying needs of users. The challenge of NSS member institutions is to weigh and balance the conflicting needs of current and potential users to produce statistics that satisfy the most important and highest priority needs within the given resource constraints.

**Requirement 14.1:** Procedures are in place to identify users and their needs and to consult them about the content of the statistical work programme.

- There is legislation or some other formal provision which includes an obligation to consult with the main users of the statistics.
- Structured and periodic consultation processes (e.g., advisory councils and committees or working groups) with key stakeholders and users are in place to review the content of the statistical programme and the usefulness of existing statistics, and to identify requirements for new statistics.
- Feedback from a user support service, centre or hotline is analyzed to understand and identify user needs.
- Data on the use of statistics (e.g., web analytics, number and types of downloads, subscribers to reports) are collected and analyzed to improve statistical outputs.

**Requirement 14.2:** Users' needs and requirements are balanced, prioritized and reflected in the work programme.

- Users' priority needs are met and reflected in the work programme of the statistical agency.
- Procedures are in place to prioritize various user needs in the work program and strategic goals.
- Data on the use of statistics are analyzed to support the setting of priorities.
- A periodic evaluation of the work programme is carried out to identify emerging needs and lower priorities.

- Processes are in place to monitor and consult with stakeholders on the relevance and practical utility of existing statistics (with regard to scope, level of detail, cost, etc.) according to current and emerging user needs.

**Requirement 14.3:** The supply of statistics nationally shall be based on mechanisms and strategies for identifying the priority information needs of Government, the business sector and the country as a whole.

**Requirement 14.4:** Users and producers of official statistics shall participate in the processes of identification, analysis and evaluation of information requirements through academic, inter-institutional and sectoral committees.

**Requirement 14.5:** NSS member institutions shall follow procedures for advising, training and reporting to users on the statistical outputs and for consulting them periodically on the practical use of statistical data and information.

**Requirement 14.6:** Reviews shall be regularly conducted to determine whether or not the related official statistics are satisfactory to users.

***Principle 15: Assuring accuracy and reliability***

NSS member institutions should develop, produce and disseminate statistics that accurately and reliably portray reality. The accuracy of statistical information reflects the degree to which the information correctly describes the phenomena it was designed to measure, namely, the degree of closeness of estimates to true values.

**Requirement 15.1:** The original data, intermediate results and statistical output shall be assessed and validated by comparing them, where appropriate, with other statistical information.

- Systems for assessing and validating source data, integrated data, intermediate results and statistical outputs are developed and managed.
- Data are systematically checked and compared with data from other sources and over time.
- Results of statistics are compared with other existing information in order to ensure validity.

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

- Procedures and guidelines are available on how to measure and manage (e.g., reduce or balance) errors.
- Sources of possible sampling errors are identified and described.
- Sampling errors are measured and evaluated.



- Non-sampling errors (errors from all sources, such as response errors, coverage errors, errors linked to measurements, processing and analyses, etc.) are identified, described and evaluated.
- Errors are analyzed to identify improvement measures.
- Information about the sampling and non-sampling errors is made available to users as part of the metadata.

**Requirement 15.3:** A review of the statistical process of each statistical programme shall be undertaken regularly to introduce improvements.

**Requirement 15.4:** Methodologies shall be updated periodically to comply with the quality criteria for producing official statistics and to bring them in line with international standards.

**Requirement 15.5:** Studies and analyses of revisions are carried out and used to improve data sources, statistical processes and outputs.

- Preliminary and revised data and statistics are clearly identified.
- Explanations about the timing, reasons for and the nature of revisions are made available.
- The revision policy follows standard and transparent procedures.
- Information on the size and direction of revisions for key indicators is used to improve the statistical processes.
- Information on the size and direction of revisions for key indicators is provided and made public.

***Principle 16: Assuring timeliness and punctuality***

NSS member institutions should minimize the delays in making statistics available. Timeliness refers to how quickly, after the reference date or the end of the reference period, the data and statistics are made available to users. Punctuality refers to whether data and statistics are delivered on the promised, advertised or announced dates.

**Requirement 16.1:** In order to be relevant, official statistics shall be produced on a timely basis, that is, within a reasonable period after the completion of the reference period.

**Requirement 16.2:** The periodicity with which the official statistics are to be made available shall be determined bearing in mind users' requirements, as well as appropriate international timeliness standards and commitments.

**Requirement 16.3:** A date and time shall be set for the dissemination of each set of official statistics, i.e. a release calendar. If the deadline will not be met, notification shall

be given in advance together with the relevant explanation and an indication of a new date for publication.

- Punctuality or the rate of punctuality (i.e., rate of statistics published on time) is measured according to the release calendar. The finalization of the release calendar should occur at least 3 months in advance of the publication of the relevant statistics.
- Information on the punctuality of the released statistics is discussed by management and made available to users.

**Requirement 16.4:** Any significant error(s) identified in the official statistics disseminated shall be corrected and the correct figures published promptly.

**Requirement 16.5:** Any substantial update in the statistical methodology, procedures or techniques shall be announced prior to the final publication of the results.

**Requirement 16.6:** Preliminary results can be released when their accuracy and reliability are acceptable.

- The possibility and necessity of releasing preliminary data for key statistics is evaluated, while also considering data accuracy and reliability.
- When preliminary statistics are released, they are clearly identified as such.
- Users are provided with appropriate information on the quality of the preliminary statistics.
- Preliminary results are revised according to the established revision policy.
- Final results are clearly distinguished from preliminary results.

#### ***Principle 17: Assuring accessibility and clarity***

NSS member institutions should ensure that the statistics they develop, produce and disseminate can be found and obtained without difficulty, are presented clearly and in such a way that they can be understood, and are available and accessible to all users on an impartial and equal basis in various convenient formats in line with open data standards. Provision should be made for allowing access to microdata for research purposes, in accordance with an established policy that ensures statistical confidentiality.

**Requirement 17.1:** Official statistics and the relevant metadata shall be made available to users clearly and precisely to enable users to interpret them correctly and make meaningful comparisons.

- Statistics are presented in a clear and understandable manner.
- Guidelines that describe the appropriate content and preferred formats and style

(layout and clarity of text, tables and charts) of an agency's outputs are available to authors of statistical publications and databases.

- Published statistics are open for free use and re-dissemination, provided that reference is made to the responsible agency.
- Staff training and development programs are in place with regard to writing about statistics (for press releases, publication highlights or other explanatory texts).
- Up-to-date methodological documents (on concepts, scope, classifications, basis of recording, data sources, compilation methods and statistical techniques), as well as quality reports and the work programme of the statistical agency, are made available to the public.
- Explanatory texts accompanying the statistics are reviewed for clarity and readability.
- Meaningful comparisons are included in the publications when appropriate.
- Metadata needed to understand and use the statistics are published together with the statistics.
- A policy for archiving published statistics is in place and is followed.

**Requirement 17.2:** A data dissemination strategy and policy exists and is made public.

- The public is made aware that custom-designed outputs, statistics not routinely disseminated and longer time series can be provided on request when feasible, and it is instructed on how the data can be requested. These outputs are made public if possible.
- Catalogues of publications and other services are made available to users.
- While official statistics are normally free and accessible for everyone, statistics that need to be produced on request might have a cost corresponding to the extra work they require. The pricing of special requests is fully transparent.
- A strategy has been developed and agreed upon with stakeholders for the release of anonymized data and microdata.

**Requirement 17.3:** Mechanisms are in place to promote statistical literacy.

- The statistical agencies have a strategy to manage media relationships and maintain regular contact with the media.
- The statistical agencies arrange regular training and outreach for journalists.
- The statistical agencies arrange training for students on how to use statistics.
- The publication of articles on statistical issues, and how statistics should be used

properly, is encouraged.

**Requirement 17.4:** NSS member institutions have a dedicated focal point that provides support and responds to inquiries from users in a timely manner.

- Well-known user support services are available to give prompt assistance to users to help them access and interpret the data.
- User support services are appropriately staffed to support a wide range of users.

**Requirement 17.5:** Access to microdata is allowed for research purposes, subject to specific rules and protocols on statistical confidentiality that are posted on the NSO's website.

**Requirement 17.6:** Different media and technologies that meet requirements and ensure full coverage shall be used for the dissemination of official statistics.

**Requirement 17.7:** All users shall be guaranteed free access to official statistics in an impartial and comprehensible manner on the basis of clearly established and well-known procedures.

***Principle 18: Assuring coherence and comparability***

NSS member institutions should develop, produce and disseminate statistics that are consistent, meaning it should be possible to combine and make joint use of related data, including data from different sources. Furthermore, statistics should be comparable over time and between areas.

**Requirement 18.1:** International, regional and national standards are used with regard to definitions, units, variables and classifications in line with the most recent Compendium of Statistical Concepts and Definitions.

- Statistical agencies promote the adoption of national, regional or international statistical standards.
- Guidelines, a common repository of statistical concepts, definitions of units and variables, and classifications and other mechanisms exist.
- 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.

**Requirement 18.2:** Statistics are kept comparable over a reasonable period of time and between geographical areas.

- Changes in methods of data compilation are clearly identified, described and analyzed to facilitate the interpretation of the results.

- Quality reporting includes a section on the assessment of internal consistency and comparability over time and with related statistics.
- Breaks in a series are explained and the methods for ensuring reconciliation over a period of time are made publicly available.
- Effects of changes in methodologies on final estimates are assessed and appropriate information is provided to users.
- Significant changes in the society and phenomena to be measured are reflected by appropriate changes to concepts, classifications, definitions and target populations.
- Differences within geographical areas or at the country level due to different concepts or methodologies are explained.

**Requirement 18.3:** The use of statistical frameworks, classifications, procedures, indicators, concepts and good practices shall be promoted in the production of official statistics in order to enhance their comparability over time and with other data sets.

**Requirement 18.4:** Procedures or guidelines are in place to ensure and monitor internal, intra-sectoral and cross-sectoral coherence and consistency.

- Statistics derived from different sources or with different periodicities (e.g., monthly, quarterly, yearly) are compared and any differences are explained and reconciled, as appropriate.
- Cooperation and the exchange of knowledge among individual statistical programs and domains is promoted.
- Process-specific procedures and guidelines are available to ensure that outputs are internally coherent.
- Before new statistics or statistical programs are launched, the conceptual and methodological relationship with existing statistics is analyzed.
- Statistical outputs are compared with results of other statistical or administrative sources that provide the same or similar information on the same subject matter, and divergences are identified and explained to users.
- Internal procedures or guidelines are developed in order to ensure and monitor internal coherence and consistency.
- Procedures and guidelines are developed in order to ensure that results from different sources can be combined. Compliance is periodically assessed.

#### *Principle 19: Managing metadata*

NSS member institutions 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.

**Requirement 19.1:** The metadata management system of the NSS 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 programs 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 fora.

## 7. QUALITY ASSESSMENT AND REPORTING

Quality assessment and reporting is an important component in the QAF as it provides procedures to alleviate problems that may arise during the statistical processes, which in turn may affect the statistical outputs. Quality assessment is conducted at different levels. From the planning stage, planners ensure the use of quality indicators and setting quality targets. At the advanced stage, planners, data collectors and researchers ensure that reports are of quality to satisfy the needs of, and address concerns signaled by, the users. Thus, this section will provide a brief outline of different levels where quality assessment is based.

### *7.1 Measuring product and process quality*

According to the United Nations National Quality Assurance Frameworks (UN-NQAF), it is advisable that before conducting quality assessment at different levels, it is imperative to clearly understand the quality principles, requirements and elements that are applicable to not only statistical processes but also statistical outputs. Such an understanding will lead to quality statistical product. Quality product is defined based on the following aspects: relevance, accuracy and reliability, accessibility, timeliness and punctuality, coherence, clarity and comparability. These aspects are preconditions for carrying out quality assessment, which can be measured by setting quality indicators.

Quality indicators are there to measure the quality of statistical products or processes from various aspects. For instance, they can provide an indication of output (e.g., timeliness) and process quality (e.g. response rates). These indicators are there to clearly describe the statistical products (output) and make it comparable in the short- and long-run.

Accuracy and reliability quality indicators can measure the degree of error on the data. These can be either sampling or non-sampling errors. Users are informed of the various statistical processes involved in the production of the statistical output. For instance, how a sampling frame was constructed, how measurement error was reduced, what was the sampling design and sample size. This information increases reliability and transparency of the statistical output.

### *7.2 Communicating about quality – quality reports*

Quality report is a tool used to inform data users of the processes used in the compilation of the statistical output. Quality is a multidimensional concept. As such, quality reports should serve the purpose of typically examining, describing and reviewing the quality of the statistical processes and outputs according to the dimensions (quality principles) that NSO has used to define its products' fitness for purpose. When communicating to users, it is advisable that we classify the users according to their needs and provide them with different indicators. The reports are aimed at conveying the necessary information to enable users assess the quality of the

product. While the main target group of a quality report is the users of the statistics, quality reports shall also serve as an important monitoring tool for statistics producers and managers.

### ***7.3 Obtaining feedback from users***

For the purpose of quality assessment, there is need to get feedback from data users which is a crucial element in the set of information needed for a comprehensive quality assessment. As best practice, NSO and other NSS member institutions shall regularly consult with users on their needs in order to get their feedback and perception on data quality. This can be achieved through well-structured user satisfactory surveys and conducting timely follow up with data users through appropriate mediums such as focus group discussions, among others, in order to obtain user feedback and their needs. Since the main objective of user surveys is normally to collect information on the users' perceptions and use it as a basis for improvement, their results can provide valuable inputs to self-assessment. It is recognized that there are different groups of users of statistics; therefore, different types of user surveys shall be carried out in form of standardized questionnaires, qualitative interviews or web-based surveys depending on the type of feedback required and the resources available.

### ***7.4 Conducting assessments***

The quality of the statistical processes and products can be evaluated based on the information collected. Evaluation can be done in the form of self-assessments, audits or peer reviews, among others, which can be undertaken by internal or external experts.

#### ***i) Self-assessments***

Self-assessments are comprehensive, systematic and regular reviews of an organization's activities carried out by the organization (i.e., those responsible for the relevant activities) itself. The results are referenced against a model or framework like the QAF. The choice of the self-assessment tool is a strategic decision, and its scope should be clearly defined. For example, the self-assessment could be applicable to the entire institutional environment or simply to the statistical production processes. A self-assessment may be biased and does not necessarily provide a correct and accurate picture. However, a self-assessment based on an established quality framework can be a good way to facilitate systematic quality work. It establishes the quality framework and quality thinking in the organization and allows for the identification of weak points and actions to improve them. The results will be used for assuring credibility in the statistics produced, by demonstrating transparency about the extent to which quality standards are met.

#### ***ii) Other internal or external assessments***

Evaluations can also be conducted by an internal group not responsible for production of the assessed statistics, or indeed by an external party.



### iii) Quality audits

A quality audit is a systematic, independent and documented process for obtaining evidence and determining the extent to which quality requirements are fulfilled. In contrast to self-assessments, audits are always carried out by a third party that is either internal or external to the organization. Internal audits are led by a team of internal statistical quality auditors who are not in charge of the process or product under review. External audits are conducted either by stakeholders or other parties that have an interest in the organization, by an external and independent auditing organization or by a suitably qualified expert. NSO and other NSS member institutions commit to be open to internal or external audit of statistical quality to assure credibility in the statistics produced.

### iv) Peer reviews

Peer reviews are a type of external audit carried out by others working in the same field (a peer), in this case typically by an external expert or team of experts in statistics, such as colleagues from another statistical agency or country. Normally, peer reviews do not address specific aspects of data quality but instead examine broader organizational and strategic questions. They are typically systematic examinations and assessments of the performance of one organization by another, with the ultimate goal of helping the organization under review comply with established standards and principles, improve its policymaking and adopt best practices. The assessment is conducted on a non-adversarial basis and relies heavily on mutual trust between the organization and its assessors, as well as on their shared confidence in the process. NSO and other NSS member institutions commit to be open to peer reviews to assure credibility in the statistics produced.

## *7.5 Assuring continuous quality improvements*

Considering that statistical knowledge in general is so dynamic and progressive, there is need to have a flexible quality management process that incorporates new information on quality when it becomes available. The continuous improvement on quality of the statistics generated forms one of an integral part of the professional and ethical statistical practice. As such, there is need to be monitoring new developments and information on quality and its use in the statistical production process.

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