THE STATE STATISTICAL COMMITTEE
OF THE REPUBLIC OF AZERBAIJAN

STANDARDS AND GUIDELINES FOR QUALITY ASSESSMENT REPORTING

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Introduction

This document has been prepared as the principal standard for the preparation of reports on data quality in official statistics, within the framework of the Quality Management System established under the Law of the Republic of Azerbaijan on Official Statistics, other relevant regulatory documents, and the Code of Practice of the State Statistical Committee of the Republic of Azerbaijan. Reports prepared in accordance with these standards will enable the statistical authorities to demonstrate that high quality standards are applied and complied with throughout all stages of the statistical production process.

The Standard for Quality Assessment Reports (hereinafter referred to as the SQAR) provides recommendations and guidance for the preparation of comprehensive quality reports covering all statistical processes and statistical products. Developed in accordance with the principles of the Code of Practice of the State Statistical Committee of the Republic of Azerbaijan, this document includes the scope and indicators of statistical processes based on administrative data and/or mixed data sources.

In the SQAR the term statistical process refers to sample statistical surveys, population and agricultural censuses or complete enumerations, the use of administrative data, the production of price or other economic indices, and the compilation of statistics based on aggregated data carried out by the national statistical service. The primary objective is to promote harmonised quality reporting across statistical authorities and statistical processes, thereby facilitating the comparability of statistical processes and products. The Standard is primarily producer-oriented and is intended to support the internal assessment of the quality of statistical processes and products.

The Standard covers five categories of statistical activities:

1. *Sample statistical survey.* A statistical survey in which data are collected directly from respondents and which is generally based on probability sampling and sample selection procedures.
2. *Census or complete enumeration*. A statistical operation covering all units of the target population.
3. *Statistical process based on administrative and mixed data sources*. In statistical processes based on administrative data, information collected for purposes other than the direct production of official statistics is used for statistical purposes. For example, statistical tables may be compiled using the administrative database of another competent authority responsible for higher education. Statistical processes based on mixed data sources involve the use of different samples, questionnaire designs, and/or sampling procedures for different segments of a sample survey.
4. *Compilation of price or other economic indices*. The calculation of price indices or other economic indices based on established methodologies, where the scope of observation and estimation is not necessarily fully defined in advance.
5. *Statistical compilation*. This category primarily refers to the compilation of economic aggregates, including those relating to the national accounts and the balance

of payments.
As noted above, the Standard has been developed in accordance with the quality principles set out in the Code of Practice and is structured around those principles. Depending on the indicators and the statistical process concerned, quality reports may be prepared in either a concise or a comprehensive format. The Standard focuses on the quality aspects of statistical processes at the national level, with the primary requirement being the provision of information that reflects all significant aspects of the quality of both statistical products and statistical processes.
Quality assessment reports are intended to be prepared on an annual basis. They should include recommendations for quality improvement, together with the rationale for the actions proposed to support their implementation.
The preparation of quality reports should be approached creatively, making full use of the available opportunities. Supporting evidence and examples of good practice should be incorporated into the reports wherever appropriate.
A number of recommended indicators for quality reports are provided in the Annex.
In preparing this document, due consideration was given to national specificities, while drawing on Eurostat's *European Statistical System Standard for Quality Reports* (ESS Standard for Quality Reports) and the *European Statistical System Handbook for Quality Reports* (ESS Handbook for Quality Reports).

Standards and Recommendations for Quality Reports

1. Introduction to the Statistical Process and Statistical Products

Each report shall include an introduction that provides the context and purpose of the quality report.

The introduction should cover the following:

- a brief description of the statistical process and the statistical products concerned;
- the broader statistical domain to which the product belongs and any related statistical products;
- the scope of the quality report and references to related quality reports, where applicable;
- a summary of all statistical products produced through the statistical process;
- references to other relevant documents, particularly the methodological documentation.

2. Relevance

Relevance refers to the degree to which statistical products meet the current and potential needs of users. It depends on whether all required statistics are produced and on the extent to which the concepts used (such as definitions, classifications, and other methodological elements) reflect users' information needs.

2.1. For all areas of statistical activity

For all types of statistical activities, a content-oriented description of all statistical products should be provided, including key indicators, sub-domains, variables, assessments of levels and changes, as well as the reference period. The needs of different user groups should be identified, and an assessment should be provided of the main products (indicators) that users seek to obtain.

In addition, plans for improving data quality, as well as unmet user needs and the reasons why these needs cannot be satisfied, should be described. This section should also indicate any identified discrepancies or inconsistencies between the definitions used within the official statistics system and internationally accepted definitions.

2.2 For statistical processes based on administrative sources

When administrative data are used for statistical purposes, the definitions of indicators are established in accordance with the primary objectives of the register, and in many cases these definitions may not correspond to statistical requirements. The quality report should include the definitions of the key indicators of the register (database) and provide their interpretation in line with users' needs.

2.3. For the calculation of price or other economic indices

For price indices, the objective of the assessment should be defined in as much detail as possible. The quality report should provide information on key issues, approaches, and methods, as well as references to relevant international methodological recommendations.

2.4. For statistical compilation

The quality report should link the definitions used in this area with international methodologies or with conceptual choices recommended through other generally accepted agreements.

In addition, the "Relevance" section should provide a content-oriented description of all statistical products, indicate their compliance with relevant methodologies, and include information on unmet user needs and the reasons for them, as well as possible quality indicators.

3. Accuracy

The accuracy of statistical products refers to the degree of closeness of statistical values to the true values.

3.1. For all types of statistical process

The purpose of statistics is to determine previously unknown values (quantities, volumes, etc.) of the studied mass socio-economic phenomena and the defined target

population. In this regard, due to variability and deviations, it is very difficult to ensure that the estimated values are identical to the true values. In particular, there are sampling errors, as well as non-sampling errors, including coverage errors, measurement errors, non-response errors, and errors arising during data processing.

The "Accuracy" section of the quality report should specify the methodology used (either by including it directly or by providing a reference to it). It is advisable that the section begins with the identification of the main sources of random and systematic errors affecting statistical products (estimates). Particular attention should be paid to indicators (variables), domains, and statistical estimates. A summary assessment of errors (random and systematic) should be provided, and the overall risk of random and systematic errors should be evaluated for the main indicators.

Depending on the level of knowledge (training level) of statistical data producers and the specific field, deviations may be assessed using quantitative criteria, qualitative criteria, or a combination of both. Deviations may be classified according to their significance using terms such as "negligible," "minor," or "major," with the underlying basis (source) indicated. The sources of errors should be explained in a separate subsection of the Accuracy section. Since accuracy is closely related to the results, this section should be prepared in detail for each statistical process.

3.2 For sample surveys:

For sample surveys, the quality report shall include information on measures of variation, the magnitude of bias, and sampling error. In addition, the report should describe the formulas and scientific methodologies used to calculate these statistical measures. Sampling errors should be interpreted in conjunction with confidence intervals so that users can clearly understand the level of accuracy of the statistical results. When presenting measures of variation, it is good practice to provide general information on outliers that were excluded from the target population and not used in the estimation process.

Since the magnitude of sampling error depends on the sampling method applied, the quality report should provide a general description of the selected sampling design and explain its potential impact on sampling errors.

The report should also include information on potential coverage errors identified during sample surveys that relate to the completeness of the target population. The purpose is to highlight errors that may arise from cost constraints, the size of the covered population, and the timing of the survey, as well as to describe the limitations of the sample coverage. To facilitate the understanding of coverage errors and their impact, the quality report should provide an adequate description of the statistical register and/or the population frame used for the survey.

This section should also describe measurement errors arising during the measurement and data collection processes that result in recorded values differing from the true

values of the variables. Such errors may include deficiencies in questionnaire design, respondent misreporting, interviewer errors, and inconsistencies identified during data editing. The report should describe the preventive and corrective measures implemented to minimise these errors, including data editing, imputation procedures, and questionnaire testing.

Information should also be provided on non-response and the methods used to evaluate and address it. The report should distinguish between unit non-response, where no information is collected from selected statistical units (for example, when a questionnaire is not completed), and item non-response, where information is missing for specific variables within a responding unit. Highlighting both the overall non-response rate and item-specific non-response rates improves the completeness and usefulness of the quality report.

Where operational processing errors occurring during statistical data processing are measured, reporting and discussing such errors is considered good practice.

3.3. For complete enumeration surveys and censuses:

Since all statistical units are included in a census, the quality report should present only the general aspects of accuracy. This section should include information on imputation, estimation procedures where applicable, data processing, coding of textual information, and other relevant processing activities that may affect the accuracy of the statistical results.

3.4. For statistical processes based on administrative and mixed data sources:

Errors affecting the accuracy of administrative data are primarily associated with the quality of administrative registers. These may result from incorrect recording of characteristics for the registered units, errors in measurement units, methodological differences, inconsistencies in classifications, and other deficiencies in the administrative data sources.

3.5. For the compilation of price or other economic indices:

In quality reports on statistical indices, particular attention should be paid to the accuracy of the methodologies applied, the appropriate selection of observation units and weights, and the identification and documentation of errors that may affect the index estimates.

3.6. For statistical compilations:

Statistical compilations mainly cover aggregated statistical outputs, such as the System of National Accounts, the Balance of Payments, and similar macroeconomic statistics. In these statistical processes, no standard mechanism for measuring accuracy exists. Nevertheless, the quality report should provide information on the treatment of the non-

observed economy, validation and consistency checks applied during table compilation, theory-based balancing procedures, consistency with financial accounts where applicable, and gap analysis performed during the compilation process.

In addition to the information described above, the **Accuracy** section of the quality report should, where relevant, include information on the models, mathematical algorithms, software applications, and other tools used to ensure the accuracy of statistical results.

Where seasonal adjustment is applied, the quality report should include the following information:

- a brief description of the seasonal adjustment method applied and the history of its implementation or revisions;
- details of the diagnostics and quality criteria used to assess the adequacy of the selected model and to evaluate the results of the seasonal adjustment process;
- the approach adopted for validating seasonally adjusted data, either jointly with or separately from the validation of unadjusted data, including the scope of validation related to seasonal factors.

Where imputation has been applied for the relevant statistical indicators, the quality report should describe the reasons for its use, the extent of its application, and the procedures followed.

Where errors have been identified in published or disseminated statistical data, it is recommended that the report include information on the mechanisms used to correct those errors and the outcomes of the corrective actions. In line with established practice, this section may also include information on errors identified and corrective measures implemented over a recent reference period, for example, the last five years.

Any validation activities, quality reviews, or audits carried out to assess the accuracy of statistical data should also be reported, where applicable.

4. Timeliness and Punctuality

The timeliness of statistical products refers to the length of time between the occurrence of the event or phenomenon being measured and the date on which the corresponding statistical information becomes available. The primary objective is to demonstrate that statistical information is disseminated according to the established reference periods and release schedule. Punctuality may be assessed as the time difference between the actual release date of statistical data and the release date specified in the official release calendar.

This quality dimension is measured by the extent to which dissemination activities are carried out according to the established schedule and reflects the degree of compliance with planned release dates. The quality report should document whether statistical

outputs were released on time in accordance with the approved dissemination schedule, the official release calendar, and any other relevant dissemination commitments.

Where statistical products are disseminated in different versions (for example, preliminary, revised, and final results), timeliness and punctuality should be assessed separately for each release. The relevant releases should therefore be identified and presented individually in the quality report.

In areas where quality standards have been established, specific indicators may be used for comparative purposes, such as the ratio of the actual production time to the planned production time or the difference between them. Where delays occur in statistical production or dissemination, the reasons for such delays should be explained, together with the measures taken or planned to prevent similar delays in the future.

5. Accessibility and Clarity

This section of the quality report should describe the extent to which users are provided with equal access to statistical information and whether the information is disseminated in a clear and understandable manner. It should cover issues such as the presentation of statistical data and metadata, dissemination channels, confidentiality arrangements, and access to microdata, where applicable.

To facilitate the correct interpretation and understanding of statistical information, the quality report should include a concise description of the presentation of statistical outputs, supporting documentation, explanatory notes, quality indicators, and other relevant information.

The quality report should be prepared with due consideration for the needs of all categories of users, including both expert and non-expert audiences, taking into account their differing levels of statistical knowledge and information needs.

6. Coherence and Comparability

The quality report should demonstrate the coherence of one or more statistical products by confirming that they are based on consistent concepts, classifications, definitions, target populations, and harmonised methodologies within the statistical process in which they are produced. The report should also describe the possibilities for integrating and jointly using statistical outputs by indicating whether they refer to the same target population, reference period, and geographical area, thereby enabling their combined use.

Where published statistics may be compared with other available data that could lead to different interpretations, the report should provide appropriate explanations and precautionary notes to prevent the misuse or misinterpretation of statistical information.

The following aspects should be addressed in this section:

- **Internal coherence.** Any shortcomings in the internal coherence of statistical outputs within the statistical process should be identified and described.
- **Coherence with the System of National Accounts.** Where relevant, the report should describe the results of comparisons with the principles and aggregates of the System of National Accounts, including feedback from national accounts concerning coherence and accuracy issues.
- **Coherence with other statistical products.** Where statistical outputs are combined with statistics produced by other statistical processes, the report should describe any limitations affecting their coherence and the conditions under which they may be used together.
- **Assessment of inconsistencies.** Any identified inconsistencies and their implications should be evaluated and documented, where applicable.

7. Trade-offs Between Output Quality Components

As noted above, the different quality components are interrelated. Consequently, some output quality components may overlap, and actions taken to improve one component may have an adverse effect on another. The quality report may therefore describe the trade-offs made within the available budget and resource constraints, as well as the measures taken to improve each quality component. Examples of such trade-offs include the following:

- **Trade-off between relevance and accuracy.** For example, relevance may improved by increasing the number of data items collected but time available for editing each data item will be reduced and the potential for measurement errors increased, thus adversely affecting accuracy.
- **Trade-off between relevance and timeliness.** Likewise, timeliness can be improved by reducing the number of data items being collected and processed and/or by replacing some of the items that are more difficult to report or process by ones that are easier. This will have a negative effect on relevance.
- **Trade-off between relevance and coherence.** Improvements in relevance of a particular statistical process in response to user requirements, for example by fine-tuning the definitions of some variables or classifications may reduce the coherence of its outputs with those of other processes.
- **Trade-off between relevance and comparability.** Improvements in relevance in response to user requirements, for example by redefining the items for which data are collected, or moving to a later version of a classification, will reduce comparability over time, perhaps to the point of requiring a series break.
- **Trade-off between spatial and temporal comparability.** Similarly, measures taken to improve comparability across geographical areas may require methodological changes that reduce comparability over time.

- **Trade-off between accuracy and timeliness.** Timeliness may be improved by shortening the time available for data collection and processing, particularly through earlier completion of data collection, producing estimates based on fewer responses, and/or reducing the extent of data editing. Such measures are likely to reduce the accuracy of the statistical results.

The quality report should identify and describe the trade-offs that are relevant to the statistical process concerned, with particular emphasis on those that occur most frequently or have the greatest impact on the quality of the statistical outputs.

8. Assessment of User Needs and User Perceptions

The assessment of user needs should include information on the identification and categorisation of users, the intended purposes for which statistical products are used, the priority needs of users, and the extent to which those needs are met. One of the most effective approaches is to evaluate the results of user satisfaction surveys, complaints received, and recommendations provided through user feedback mechanisms.

The assessment should, where applicable, address the following aspects:

- the methods used to identify the purposes for which users require statistical products;
- a brief description and categorisation of user groups;
- a description of the purposes for which statistical information is requested, including the distribution of user needs by purpose;
- key and regular users, together with the statistical information they use most frequently;
- the mechanisms used to collect user opinions and feedback;
- the main findings on user satisfaction, including the date of the most recent user satisfaction survey.

9. Cost-effectiveness and Respondent Burden

In accordance with Principles 12 and 13 of the Code of Practice of the State Statistical Committee of the Republic of Azerbaijan, resources should be used efficiently, and the burden placed on respondents should be proportionate to users' needs and should not be excessive. Accordingly, the quality report should describe measures relating to the distribution of the statistical burden, the use of existing data from appropriate databases where available, electronic data transmission, estimation methods applied where data are difficult to obtain, the extensive use of administrative data sources, data exchange arrangements, process automation, and the continuous optimisation of the productive potential of information and communication technologies (ICT) throughout the processes of data collection, processing, and dissemination.

For the assessment of quality and efficiency, it is also recommended that the report include information on cost measurement, a comprehensive assessment of all costs associated with the statistical process, and estimates of the time required for the preparation of statistical reports.

The following aspects should also be considered in the assessment:

Cost-effectiveness

- annual operating costs broken down by the main cost components;
- the most recent measures implemented to improve efficiency;
- procedures for internal efficiency assessments and independent external evaluations;
- the degree of automation of repetitive and standard operations, particularly data collection, coding, validation, and imputation;
- the extent to which ICT is effectively used in data collection and dissemination, together with opportunities for further improvement.

Respondent burden

- the annual burden placed on respondents, expressed in terms of financial cost and/or time;
- objectives established to reduce respondent burden;
- the most recent initiatives undertaken to minimise respondent burden;
- whether the level of detail and the range of information collected through sample surveys are limited to what is strictly necessary;
- the extent to which administrative data and other alternative data sources are used wherever possible;
- the extent to which information requested from enterprises can be obtained directly from their existing reporting systems;
- the use of electronic data collection tools, where applicable, to facilitate reporting;
- estimation methods applied where complete or accurate data are not available.

10. Confidentiality, Transparency and Security

The quality report should describe the guarantees provided to reporting statistical units regarding the confidentiality of the information they supply and its use exclusively for statistical purposes. It should also state that the statistical authority treats all users equally and produces and disseminates official statistics in accordance with the principles of objectivity, professional independence, and transparency. References to the relevant legal provisions governing these principles should be included.

The report should provide an overview of the procedures applied to ensure confidentiality throughout the processes of data collection, processing, and dissemination. It should also describe the protocols governing access to individual data

on a strict need-to-know basis, the rules for identifying confidential information in statistical outputs, and the procedures implemented to protect statistical data. In addition, the report should explain the legal and procedural framework that enables external users to access microdata for scientific or research purposes.

The quality report should also describe how respondents are informed about the legal authority under which statistical surveys are conducted.

The following aspects are recommended for inclusion, reference, or further consideration in the quality report:

Confidentiality

- the relevant legal framework governing statistical confidentiality;
- the legal documents regulating access to microdata for research purposes and the confidentiality safeguards applied;
- procedures for ensuring confidentiality during data collection, processing, and dissemination, including the rules for identifying confidential cells in statistical outputs and the procedures for preventing and managing the risk of residual disclosure.

Transparency

- the methods used to inform respondents about the purposes for which data are collected and the guarantees provided regarding confidentiality;
- statistical announcements and press releases issued through press conferences or other official communication channels;
- information on errors identified in published statistical data and the actions taken to correct them.

Security

- safeguards ensuring the security of data collection processes, particularly for data collected via the internet or other electronic channels;
- existing measures to ensure the security and integrity of completed questionnaires, microdata and macrodata databases, and statistical outputs.

11. Conclusion

The quality report should conclude with a section summarising the principal quality issues identified during the statistical process. Each identified issue should, where appropriate, be accompanied by recommendations for improvement. The conclusion should also specify the intended users of the quality report and outline the follow-up actions planned or recommended to address the identified issues and further improve the quality of statistical outputs.

Annex 1

Recommended Quality and Efficiency Indicators to Be Included in the Quality Report

Indicator name	Brief description
Relevance	
R1. Rate of available statistics.	The ratio of the number of output data elements provided in accordance with a relevant ESS regulation to those required by the regulation.
Accuracy	
A1. Coefficient of variation (CV).	A statistical measure used to describe the degree of variability of observed values relative to their mean and to assess the magnitude of sampling error and the precision of statistical estimates.
A2. Rate of overcoverage.	The extent of deviation identified when information collected from the sample is used to represent the target population, reflecting errors arising from under-coverage, over-coverage, or other imperfections in the coverage of the target population.
A3. Edit failure rate.	The proportion of responding units for which an error signal is triggered by a specified checking algorithm.
A4. Unit response rate.	The ratio of the number of units for which data for at least some variables have been collected to the total number of units designated for data collection.
A5. Item response rate.	The ratio of the number of units which have provided data for a given variable to the total number of designated units.
A6. Imputation rate	The ratio of the number of assigned values (data are missing, invalid or inconsistent or have failed edits) for a given variable to the total number of values.
A7. Number of mistakes made, by type.	The number of serious mistakes in calculation or presentation of aggregates that are not found until after publication.
A8. Number of revisions	The number of revisions made to preliminary and final statistical data in accordance with the established revision policy, together with the ratio or difference between the revised values and the initially published values.

Timeliness and Punctuality	
T1. Time lag between end of reference period and date of first/ provisional results.	The number of days from the last day of the reference period to the day of publication of first results.
T2. Time lag between the end of reference period and date of final results.	The number of days from the last day of the reference period to the day of publication of final results.
T3. Punctuality of publication.	The number of days separating a previously announced date of publication and the actual date.
Accessibility and Clarity	
AC1. Number of subscriptions/ purchases of each of the key paper reports.	The number of subscriptions and orders for printed statistical reports during the reference period.
AC2. Number of accesses to on-line databases	The number of electronic accesses to the online database for a specific statistical product or reporting form during the reference period.
AC3. Rate of completeness of metadata	The ratio of the number of statistical indicators accompanied by metadata to the total number of indicators for which metadata are required.
Coherence and Comparability	
CC1. Lengths of comparable time series.	The length of the published time series, measured as the period between the first and the most recent reference period (e.g. years or months).
CC2. Assessment of Coherence Across Different Statistical Sources (e.g. Mirror Statistics)	The number or extent of inconsistencies identified between related statistical data sources, such as discrepancies between corresponding import and export statistics in international trade (mirror statistics).
Assessment of User Needs and User Perceptions	
US1. User Satisfaction Index	The degree of satisfaction with services and products for different segments of users.
US2. Length of time since most recent user satisfaction survey.	Past period (month, year)
Cost-effectiveness and Respondent Burden	
PCR1. Annual Operating Cost by Major Cost Components	Direct costs of staff involved in data collection (questionnaires, distribution, capture), reducing non-response, processing, and compilation of estimates.

PCR2. Annual Respondent Burden (Time and/or Cost)	The annual burden imposed on respondents, expressed in terms of the time required to provide statistical information and/or the associated financial cost.