GUIDELINES ON QUALITY CRITERIA

IN THE NATIONAL STATISTICAL SYSTEM OF BULGARIA

The document is updated according to the revised version of the European Statistics Code of Practice, adopted by the European Statistical System on 28 September 2011

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1 INTRODUCTION

The National Statistical System (NSS) of Bulgaria produces and disseminates the official statistical information of the country. The NSS ensures impartial, timely and accurate information on the status and trends in development of economic, social sphere, demography and environmental fields. The improvement of statistical information quality is one of priority direction in the NSS development. The vision, objectives and priorities in the development of the NSS are set in the Strategy for Development of the National Statistical System of the Republic of Bulgaria, 2008-2012.

VISION
NSS produces and disseminates objective, timely and accurate statistical information by using in full the possibilities of contemporary information and communication technologies and observing the principles of the European Statistics Code of Practice.

MAIN OBJECTIVE
To improve the development, production and dissemination of statistical information about all user groups by improving the institutional capacity of the system and speeded implementation of contemporary information and communication technologies.

PRIORITIES
- reduction of response burden on reporting units;
- improvement of statistical information quality;
- improvement of statistical information storage and dissemination;
- speeded implementation of new ICT and integration of IT activities within NSS;
- development of human resources and improvement of labour conditions;
- development of European partnership and international cooperation;
- achievement of more effective interaction and coordination within NSS;
- promotion of confidence in official statistics.

TASKS AND ACTIVITIES ON QUALITY IMPROVEMENT OF STATISTICAL INFORMATION
- implementation of standard quality assessment reports of statistical products, services and processes in the production of statistical information;
- creation of mechanisms for monitoring, control and management of quality;
- implementation of external methodological audits on quality of statistical products;
- implementation of the best practices in the field of statistical surveys and quality management of statistical products and services;
- training the staff of NSI and the Bodies of Statistics in applying the methods and standard quality reports of statistical products, services and activities;
- introduction of a system for annual self-assessment of quality, based on the model of the European Foundation of Quality Management.

The *Guidelines on quality criteria in the NSS of Bulgaria* presents synthesized information for the main quality principals of statistical products. The paper outlines quality assurance framework in the NSS and provides guidelines for improvement of the statistical products quality, following the European Statistics Code of Practice. The Guidelines is applicable to National Statistical Institute, Bodies of Statistics and Bulgarian National Bank in their roles as producers, compilers and disseminators of statistics. The Guidelines is elaborated by the National Statistical Institute of Bulgaria and it is a result of participation in the project

"Quality Assurance in the National Statistical System", funded by the Statistical Office of the European Communities (Eurostat) and the NSI of Bulgaria.

2 BACKGROUND

2.1 National Statistical System

The National Statistical System of Republic of Bulgaria carries out the statistical activity of the state and is an integral part of the European Statistical System (ESS). The NSS consists of National Statistical Institute, Bodies of Statistics[1] and Bulgarian National Bank. At national level, the NSS carries out activities on collection, processing, analyzing and storing of statistical data, as well as provision and dissemination of official statistics.

The National Statistical Institute and the Bodies of Statistics carries out statistical activities of the state by conducting periodic and single statistical surveys, included in the National Statistical Programme (NSP). The surveys conducted by NSS are consistent with the contents, methodology, periodicity and publication deadlines, set out for ESS by Eurostat.

The National Statistical Institute, the Bodies of Statistics and the Bulgarian National Bank are the source of official statistics in the Republic of Bulgaria. The National Statistical Council defines the policy and strategy of the NSS. The Council is consultative body attached to the President of National Statistical Institute. The National Statistical Council includes representatives of Bodies of Statistics, Bulgarian National Bank, academic society, different groups of respondents and users. The NSI plays the leading methodological and coordinating role in the NSS. The Bodies of Statistics shall work under the methodological guidance of the NSI in the performance of the NSP. The coordination in the field of quality is carrying out on the base of the following basic principles:

- Openness and transparency;
- Effective links with partners in the NSS;
- Uniform methods and tools for quality assessment and quality assurance;
- Introduction of European standards and best practices.

The leading methodological and coordinating role of NSI in the field of quality (during development, production and dissemination of statistical information in the NSS) is realized by the following **coordination mechanism**:

- Legal bases – Law on Statistics, internal legal documents, agreements with other bodies of statistics and bodies of public administration, which are administrative data sources.
- Statistical infrastructure – classifications, nomenclatures, registers, information systems;
- National Statistical Programme (NSP);
- National Statistical Council;
- Working groups;
- Committees;
- External review/evaluations
- Dialogue with users
- Training
- Collaboration with partners of the ESS.

[1] Bodies of Statistics shall be state bodies or their structural units, which develop, produce and disseminate statistical information. (according to Art. 3.(2) of the Law on Statistics)

The challenge that stands in the future to ESS and the NSS is the characterization of **new phenomena,** such as globalization, climate change, aging populations, energy efficiency and others, require implementation of a new integrated approach combining data from different sources.
These in turn requires **horizontal and vertical integration** at national and European level, maximum use of existing information and development of new integration levels, based on existing data sources[2].

The challenges for National Statistical System are the following:

- to increase flexibility of National Statistical Systems, in terms of new needs and challenges;
- to increase effectiveness and cost efficiency;
- to improve comparability and coherence of data;
- to reduce respondents burden.

The aim is to streamline the production process, to characterize the complex phenomena and processes in economic, social sphere and ecology, and to reflect several interrelated and mutually dependent underlying phenomena.

2.2 Legal bases

In the process of ensuring the quality of statistical information in the National Statistical System are applied the principles outlined in the following documents:

International Documents

- Fundamental Principles of Official Statistics

EC/Eurostat Documents

- Regulation (EC) No 223/2009 of the European Parliament and of the Council on European statistics
- ESS Quality Declaration
- European Statistics Code of Practice (CoP)
- EC Regulations in the field of statistics containing provisions on quality
- ESS Standard for Quality Reports, 2009 and ESS Handbook for Quality Reports, 2009

National Documents

- Law on Statistics
- Strategy for Development of National Statistical System of the Republic of Bulgaria, 2008-2012

3 QUALITY IN THE NSS

3.1 Quality – theoretical context

"Quality" is the degree to which a set of inherent characteristics fulfils requirements[3]. The common definition of quality as defined in international ISO 9000 standard and adopted as general concept by Eurostat stated that quality is a composite of all the characteristics, including performance, of an item, product or service that bear on its ability to satisfy stated or implied needs.

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[2] According to **Regulation (EC) № 223/2009** on European statistics and **COM (2009) 404** on the production method of EU statistics: a vision for the next decade.

[3] SDMX Content-Oriented Guidelines (2009), Annex 4 - Metadata Common Vocabulary

Quality management refers to the set of systems and frameworks which are in place within an organisation to manage the quality of statistical products and processes. The quality management includes the following elements: *quality assurance, quality assessment, quality documentation.*

"Quality assurance" refers to all planned and implemented systematic activities that could be demonstrated to provide confidence that the processes will fulfil the requirements for the statistical output. The quality assurance is in contrast of quality control, which refers to the check-up of quality of processes and products towards a particular standard or set of quality requirements. Quality control is limited to controlling whether the products meet the quality requirements. Quality Assurance is a process that guarantees that the quality control is carried out continuously, correctly and in a manner, that allows identification of possible ways of strengthening and/or improvement of quality.

"Quality assessment" contains the overall assessment of data quality, based on standard quality criteria. Scoring may be quantitative or qualitative.

"Quality documentation" contains documentation on methods and standards for assessing data quality, based on standard quality criteria such as relevance, accuracy and reliability, timeliness and punctuality, accessibility and clarity, comparability, and coherence.

3.2 Statistical information quality

Quality is a concept that has different interpretations depending on the context in which it is used. In the National Statistical System, the quality of statistical information is considered as correspondence of statistical products to the statistical information needs of different user groups. The quality of statistical information is most usefully defined in terms of how well statistical output meets the quality criteria, or whether they are "fit for purpose".

The statistical output is a result of performing certain and consistent statistical processes. The statistical processes quality directly affects products and their quality. Quality evaluation is mostly related to set goals or quality standards. The quality evaluation could be done by self-assessments, conducted internally, or outside assessments done fully or partially by an outside party. The quality assessments could be based on qualitative or quantitative measures or combinations of these.

3.3 Quality description in the NSS

In the NSS, statistical information has to be accompanied by a quality description. The quality description should be a concise assessment of the quality, reliability and relevance of the statistics for different purposes. Its main objective is to show what approach and tools are used, and how the quality criteria are fulfilled.

The quality description originally has to be presented only for surveys with quality requirements in the regulations. Gradually, this process will expand under the European law on statistics and will cover all surveys included in the National Statistical Programme.

The quality description should be published at the same time as the publication of statistics concerned, so that the users of the statistics to have easy and timely access to it. The users have to be informed for errors, some restrictions caused by the particularities of survey. The quality description is important because it has to ensure transparency in quality evaluation and quality assurance.

The quality description has to be posted on the website to the relevant section, giving all other existing forms of dissemination, included printed publications. Different versions of

the quality description have to be stored in other to inform users and to ensure comparability.

The quality description has to include the following quality components:

- **Relevance of statistical information**
  - *A summary of the information content and purpose of use of the statistics. The national comprehensiveness of the data is defined.*
  - *An introduction to the concepts essential for understanding the statistics, and the used classifications, research subject and data providers.*
  - *An account of how the users' perspective is taken into consideration in the development of the statistics.*
  - *Intentions for improvement.*
- **Accuracy of data**
  - *A proof that the statistics measure the phenomenon they are supposed to measure.*
  - *An account of the research method of the statistics, the population, used basic data, survey design, data collection method, estimation methods and use of weighting coefficients in sample surveys.*
  - *An account of the issues that can influence the reliability of the statistics, the main elements that may cause uncertainty, the possible sources of error should be reported – sampling and non-sampling errors.*
  - *Descriptions of revision practices and procedures for correcting errors in the statistics.*
- **Timeliness and punctuality of data**
  - *The release frequency and measurement period of the statistics are indicated.*
  - *A notification is given about whether the data are preliminary or final. Where the statistics are first published as preliminary data, the time when the final data will be available is stated.*
  - *If the data may become revised in future due to, for example, seasonal adjustment the probability of change must be made explicit to the users of the data*
  - *The web address where the release calendar can be found is given.*
- **Accessibility and clarity of data**
  - *The publication channels of the statistics and the contact details of the unit producing information services are stated.*
  - *Information is given on where the description, metadata, and extensive quality and methodological descriptions of the statistics can be found.*
- **Comparability and coherence of data**
  - *The uniformity and coherence of the statistics are assessed relative to other statistics on the same topic. The used general classifications and concepts are identified and reasons are given if they are not used.*
  - *Information is given about the temporal comparability of the statistics and their comparability with other data. The lengths of the available time series are given for the statistics from whose data comparable time series have been produced.*

4 NATIONAL STATISTICAL SYSTEM QUALITY ASSURANCE FRAMEWORK

The Quality Assurance Framework in the National Statistical System includes tools and procedures that aim to ensure the required statistical information quality.

Relationships between the quality and performance aspects are indicated in the following table:

Quality	Performance
Effectiveness	Efficiency
Product	Process
"Doing the right thing"	"Doing the thing right"
Quality indicators	Performance indicators

Quality Assurance Framework should always acknowledge performance/cost. The NSI has elaborated a List of indicators to control and monitor the implementation of the NSI activity. The List of indicators includes five groups of indicators to characterize inputs, outputs, impact assessment, efficiency and European and international cooperation. Information on these indicators, the so-called "statistics about statistics" is presented in the NSI Annual Report on implementation of National Statistical Programme and NSI activities.

The quality activities in NSS are built on the fifteen principles of the European Statistics Code of Practice, covering the institutional environment, statistical processes and statistical outputs.

European Statistics Code of Practice principles:

Institutional Environment	Statistical Processes	Statistical Outputs
1. Professional Independence	7. Sound Methodology	11. Relevance
2. Mandate for Data Collection	8. Appropriate Statistical Procedures	12. Accuracy and Reliability
3. Adequacy of Resources	9. Non-excessive Burden on Respondents	13. Timeliness and Punctuality
4. Commitment to Quality	10. Cost Effectiveness	14. Coherence and Comparability
5. Statistical Confidentiality		15. Accessibility and Clarity
6. Impartiality and Objectivity		

In the NSS, the Quality Assurance Framework **includes** systematic coordination of methods and tools to ensure compliance with the minimum requirements in terms of statistical processes and products.

The Quality Assurance Framework includes the following **methods and tools**: documentation and measurement, evaluation and conformity. On the way from "documentation and measurement" to "conformity", information on the quality of the statistical process has to be increasingly summarized, making it more appropriate for managers and users. The information available at the various layers has to feed back into the production processes to improve the quality of statistics (see Figure 1).

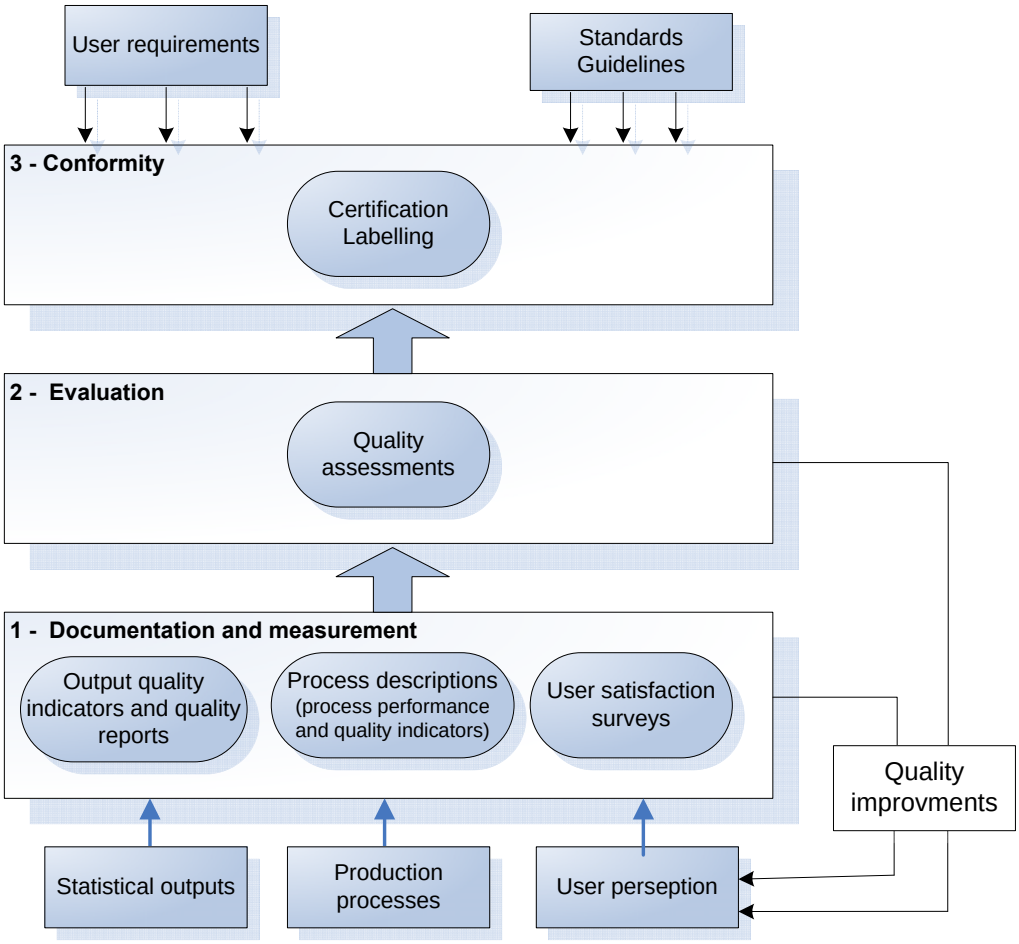


Figure 1: Quality assurance methods and tools

1 – Documentation and measurement

At this stage, the complex information obtained from measurement and documentation has to be selected and structured. In the individual statistical domains, experts responsible for the surveys should use the following methods and tools,: identifying key process variables and quality indicators, structured quality reports, quality profiles for integrated sets of indicators (Structural Indicators, Sustainable Development Indicators, as well as the headline indicators of strategy Europe 2020)[4] and user satisfaction surveys.

2 - Evaluation

Work related to quality, evolving over time, evaluation goes a step further after the "documentation and measurement". At this second stage, statistical information is evaluated by internal or external standards (e.g. defined in regulations, by working groups, etc.). Quality assessments can range from self-assessments to other more comprehensive assessments involving external expertise (e.g. peer review, audit). The common elements at this stage for

[4] Quality Profile (QP) for Structural Indicators:
http://epp.eurostat.ec.europa.eu/portal/page/portal/structural_indicators/indicators/short_list
Quality Profile (QP) for Sustainable Development Indicators:
http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi/indicators
Quality Profile (QP) for headline indicators of strategy Europe 2020:
http://epp.eurostat.ec.europa.eu/portal/page/portal/europe_2020_indicators/headline_indicators

each type of evaluation are taking the improvement actions and identification of good practices.

3. Conformity with recognised standards
Certification/Labelling further condenses the information to demonstrate the compliance with defined standards and requirements (based on Code of Practice). Certification/Labelling thus can help to enhance trust and credibility in official statistics.

How should be provided the common quality framework in NSS?

- Quality assessments take as their input existing information on quality, evaluate the statistical processes and its outputs against pre-fixed standards, identify strengths and weaknesses and derive the corresponding improvement actions.
- Addressing the shortcomings identified by these improvement actions will enhance the quality of the statistical process and its outputs as well as users' perceptions.
- The cycle of "documentation and evaluation" will continue until the pre-fixed standards are fully met, leading then to the conformity layer "Certification/Labelling".

In NSS, the output quality is evaluated against the following criteria: ***relevance, accuracy, timeliness and punctuality, accessibility and clarity, comparability and consistency***. The quality of statistical information is ensured by regular assessment of quality components and taking measures for improvement. During the process of measurement and documentation of statistical processes and products quality are used quality and performance indicators, quality reports, self-assessments and user satisfaction surveys.

4.1 Managing Relevance

A main characteristic for the quality of statistics in the ESS, which is used in quality evaluation and management in the NSS, is relevance. The relevance is an important criterion, because if statistics is not applicable, no matter whether it is accurate, timely, comparable, etc.

Relevance of statistical information shows whether all statistics (required by users) is produced and what is the extent to which used concepts (definitions, classifications, etc.) reflect user needs.

Principle 11 „Relevance" of European Statistics Code of Practice set the following: „*European Statistics meet the needs of users*".
In the National Statistical System of Republic of Bulgaria, the main objective of all producers of statistical information is to meet users' needs. The producers of statistics are working on fulfilment of the following main indicators defined in CoP:

Indicator 11.1 Processes are in place to consult users, monitor the relevance and utility of existing statistics in meeting their needs, and consider their emerging needs and priorities.
Indicator 11.2 Priority needs are being met and reflected in the work programme.
Indicator 11.3 User satisfaction is monitored on a regular basis and is systematically followed up.

The National Statistical System works on strengthening the dialogue with all user groups and building up a user-oriented approach in provision and dissemination of statistical information. The National Statistical Council discusses how to improve the development, production and dissemination of statistical information based on different users' requirements. Given the limited budget for conducting statistical activity, it is impossible to meet and satisfy all

statistical information needs. The priority subject-matter areas and surveys, proposed by Bodies of Statistics, are included in the National Statistical Programme.

The *managing relevance* embraces those processes that lead to the determination of what information will be produced and what will be the necessary resources. The National Statistical Programme is elaborated considering users' needs of statistical information, on national and international level, and the necessary resources to realize the statistical activity. The processes that are used to assure relevance also permit basic monitoring of other elements of quality and correspondingly to assess user requirements in these other dimensions.

The National Statistical Programme and the statistical outputs have to reflect properly and continuously the most important information needs for the country. Since these needs evolve over time, a process for continuously reviewing programs in the light of client needs and making necessary adjustments is essential. There have to be put in place processes that monitor the relevance of existing programme, that identify new or emerging information gaps that the current programme is not filling. That leads to discussion and change of the programme in terms of relevance of the programme to users' needs. NSS has faced the challenge to balance diverse and sometimes contradictory needs of current and potential users. In the National Statistical Programme are included surveys and activities that satisfy in the best possible way the main and most important statistical information needs, within the given resources. The processes on management of relevance include: users and stakeholders feedback mechanisms; review and update of the programme; data review; priority-setting; planning; programme and budget decisions.

The *assessment of relevance* of provided statistical information should comprise a description of the extent to which statistical data had been useful and had been used from wide range of users. The relevance of statistics depends on opinion and requirements of different user groups at national and international level. The users of official statistics are the government, the business, the non-government organizations; the scientific and academic society, the mass media, citizens, EU, UN, IMF and others international organizations.

Only user is one who knows what information he needs and could assess whether the available statistical information is useful and applicable to the specific objectives. Users evaluate the product quality and perceive the provided statistical information in different manner comparing to producers.

DEFINITION	GUIDELINES	INDICATORS
1. Relevance		
The degree to which the statistics meet current and potential user needs, at national and international level.	Any assessment of relevance needs to consider: • who are the main users of the statistics; • what are their needs; and • how well does the output meet these needs? • what are the gaps identified against the users requirements in terms of scope and detail of available data? • which definitions of statistical target concepts (population, statistical units and aggregation formula) have discrepancies from ESS/international concepts? • what is the completeness compared with relevant regulations/guidelines? • which are the available quality indicators?	R1. Rate of available statistics.

As a rule, the statistical domains, for which is adopted EU regulation[5] or guideline it is not necessary to measure the relevance of the data. Once the data are required by legislation, then the data are relevant and they should be produced and realized without to put in question the relevance of data. For statistics, that is a result of application of an ESS regulation or guideline, could be calculated the indicator *R1. Rate of available statistics.* The indicator shows the completeness of the statistics:

> *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.

Indicator *R1. Rate of available statistics* is a main quality indicator and it is used in assessment of relevance of disseminated statistics. The indicator *R1* should be included in the quality report. The usefulness of this indicator could be improved if in assessment of the indicator there is an appropriate system for measuring the importance of output components.

The rate of available statistics could be further defined for subject-matter domain: (i) the set of relevant data elements; (ii) possible weighting, distinguishing key and non-key data elements.

Indicator *"R1. Rate of available statistics"* could be calculated in another way by measuring the volume of data that are not available. When we use this alternative method, we should recognize that statistics are not of equal importance for all users and we have to calculate a weighted coefficient for the information that is not available. If it is not possible to calculate the weighted coefficient we could use not weighted coefficient, which have to present what is not available information and what are the reasons. In this way, users will be able correctly to interpret the provided information. Another possible way to calculate the available of statistics is to divide the number of values provided in a concrete data set divided by the total number of fields for which data has to be provided.

When we measure the relevance of disseminated statistical information, we could use as a measure the number of visits on the website, taking into account the type of searched and downloaded information by users, by type of subject-mater areas.

When we evaluate the statistics quality, we should take into account the consumers' perceptions on statistics quality in terms of quality components in relation to the stated or implied by users needs. Therefore, it is important to gather information about the expectations and needs of different users. The easiest way to evaluate whether the user needs are met is by conducting of a regular *User satisfaction survey*[6]. The consumer satisfaction is a modern approach in quality assessment and quality management. The measurement of consumer satisfaction is achieved by setting a series of specific questions. Each question measured the degree of satisfaction or dissatisfaction of the individual user. The aim is to explore and examine the views of the largest possible number of users and to make a proper assessment and analysis of user satisfaction by provided statistical information. The user satisfaction survey is one of the feedback mechanisms. It gives an opportunity to gain a clear idea what are the issues and areas of interest for each main user, and respectively what are the resulting information needs. The feedback contributes to establish the satisfaction level and to identify

[5] EU legal acts relating to statistics

[6] The NSI of Bulgaria conducts a pilot study of User Satisfaction by provided statistical information products and services in the period 01.08 - 31.12.2009. The analysis of survey results is posted at: http://www.nsi.bg/user_satisfaction_survey/user_satisfaction_survey_nsi_2009.pdf

The questionnaire is available at: http://www.nsi.bg/user_satisfaction_survey/

the opportunities to provide new information. In assessing the user needs and user perceptions, it is recommended to use the following indicators:

US1. User satisfaction index.
US2. Length of time since most recent user satisfaction survey.

The user satisfaction index has to be calculated for different user groups according to specific priorities.
In case a user satisfaction survey is not possible to be conducted, may be used other substituted indicators and proxy measures for user satisfaction, as number of sold publications, number of consultations, number of requests, objections and complaints. All these indicators could be used in assessment and management of relevance of disseminated statistical information.

Measures to control and manage relevance of statistics:

- ✓ set a long-term programme;
- ✓ collaboration agreements with external parties;
- ✓ to make the improvement of relevance visible;
- ✓ to map and streamline the communication with main important users;
- ✓ to promote relevance of statistics to all users groups.

4.2 Managing Accuracy

The accuracy of statistical outputs is the degree of closeness of estimates to the exact or true values that statistics aims to measure, i.e. accuracy of the data is the degree of closeness of the data estimates to the concrete data values. The accuracy has many characteristics and in fact, there is not a universal measure of it. In practice, these characteristics are usually described or measured by errors and inconsistencies at the various statistical process phases.

In the European Statistics Code of Practice, the Principle 12 "Accuracy and Reliability" defines that *"European statistics accurately and reliably portray reality"*.
The following indicators for the component "Accuracy and Reliability" are given in the ESS CoP:

Indicator 12.1 Source data, intermediate results and statistical outputs are regularly assessed and validated.
Indicator 12.2 Sampling errors and non-sampling errors are measured and systematically documented according to the European standards.
Indicator 12.3 Revisions are regularly analysed in order to improve statistical processes.

In assessment of the criterion "accuracy" we could use the following standard indicators:

DEFINITION	GUIDELINES	INDICATORS
2. Accuracy		
The degree of closeness between estimates and the exact or true values.	In assessment of the accuracy it is necessary to examine the sampling errors and non-sampling errors. The non-sampling error includes: • coverage error; • measurement error; • non-response error; • processing error; Analysis of the revisions.	A1. Coefficient of variation; A2. Rate of overcoverage; A3. Edit failure rate; A4. Unit response rate; A5. Item response rate. A6. Imputation rate; A7. Number of mistakes made, by type. A8. Average size of revisions

The correctness of data is of great importance for the users as well as the organizations which release data and finally for the whole society from the point of view of determination of economic and social policy of a country. It is necessary to find the optimum between the accuracy required by users and costs for its assessment i.e. reducing inaccuracies to minimum. The accuracy of statistical data depends on methods and approaches applied to identify and control the errors which may occur at statistical process input or statistical sub process. They may present also in the usage of additional information on methods of data weighing, etc. Assessment of errors is carried out on the base of the quality self-assessment of statistical surveys, and estimates are described in detail in the quality reports.

The assessment of accuracy includes:

- ✓ to identify the major sources of errors;
- ✓ to analyze the permissible statistical errors, the difference/deviation between the results and the actual or estimated values.

The errors occurred in statistical process are defined as sampling errors and non-sampling errors.

Sampling errors:
Sampling errors occur in sample surveys because of the fact that only a part of population units is examined and the conclusions are referred to whole population. The obtained results differ from values that would be obtained if all population units had been studied. Sampling errors does not mean that the sample is based on a wrong method. A traditional indicator to measure these errors is *A1 Coefficient of variation* (reveals the degree of divergence/dispersing from indication average level) but standard error and confidence interval are also used mainly for major variables.

Non-sampling errors:
The non-sampling errors occur in all sub processes of the statistical process. They are connected with sample surveys as well as exhaustive surveys or administrative source data. Non-sampling errors basically refer to: survey coverage, lack of response, measurement and data processing.

Coverage errors
The coverage errors may be caused by a missed opportunity to include recently appeared units in the observed population or a missed opportunity to include/exclude units for which a change had been occurred.

The coverage errors are:

- ✓ Overcoverage – arises from presence of units in the frame not belonging to the target population or appearing in the frame more than once;
- ✓ Undercoverage – results from the omission of units in the frame belonging to the target population.

Coverage errors depend primarily on the data quality in the Register of statistical units which is used to compose the survey frame/sample. Undercoverage refers to the (new) units not included in the framework due to the latest updated list, newly or merged enterprises, or wrongly classified main activity.

Indicator A2 Rate of overcoverage presents the percentage of units in the frame not belonging to the target population.

Measurement errors

These errors originate from the way of data collection or differences between recorded and true variable value of a certain unit. Sources of these errors are:

- ✓ Survey statistical tools - the form, questionnaire or measurement method used at data collection phase may cause recording wrong values. Questionnaire errors occur if the questions are wrongly formulated even misleading; if questionnaire structure is illogical or not all possible answers to the closed questions are available;
- ✓ Respondents – they may consciously or unconsciously provide wrong information. The reason may be an incorrect remembering of past events (memory effect), misunderstanding of the question, respondent carelessness, age and education effects, fear that sensitive (personal) information (incomes for instance) may be used for purposes other than statistical, a tendency to round off numbers (years for example), etc.
- ✓ Interviewers – they may affect the respondents' answers;
- ✓ Input data errors – errors in data entry from inquiries and questionnaires in an information system or errors in data set entry in an information system.

The methods for assessment of these errors are: seasonal adjustments, calibration, econometric results from the sampling survey. In connection with assessment of survey statistical tools, secondary measurement could be performed by using alternative phrases in questions or different interviewers. It is more difficult to assess the impact of respondents because of necessity of independent sources of information on the same respondent.

Non-response errors

Lack of response is a failure of the survey in the phase of data collection because of impossibility to receive data from all population units as well as data for all variables in the questionnaire. The difference between results from collected data and results that could be calculated if there are not missing values, represents the error which occurs in case of lack of response. There are two types of lack of response:

- ✓ Lack of response from population unit – when there are no data collected on this unit;
- ✓ Lack of response for some variables in the questionnaire – when there are data only for some but not all characteristics (variables).

Lack of response affects the results towards increase in their variation and appearance of bias. The variation increases because lack of response reduces the available number of responses. The bias originates from the fact that non responded respondents may differ from the responded ones in respect of some variables. In this case the assessment concerns:

- ✓ Lack of response (after secondary contact or data collection from other sources but before imputation); percentage (coefficient) of non responded units and non responded by variables – weighed and non weighed;
- ✓ Imputation methods used (if applicable);
- ✓ Description of reasons for lack of response;
- ✓ Conclusions on availability or lack of similarity between non responded units and respondents in respect of survey main variables;
- ✓ Information on secondary calls or data collection from other sources, indications for accuracy of coming responses;
- ✓ Information on tools (incentives, respondents' law obligations, interviewers training and random responds) used to reduce the lack of response.

Processing errors

The processing errors occur in data entry, coding, editing, and measurement:

- ✓ Editing errors – these errors occur at the time of correcting other errors or omission of editing. Although the editing aims at error reduction, errors may occur in this process too;
- ✓ Imputation errors – they occur when units are added to data set. Non existing units could be incorrectly added and the added units may contain incorrect values;
- ✓ Classification errors – errors in classification of objects in incorrect class, group;
- ✓ Outlier errors – outlier errors are errors made during the detection of outliers. Outliers may be detected wrongly or overlooked. Outliers may be detected at several levels of aggregation, from micro to macro level;
- ✓ Linkage errors – Linkage errors are errors that arise during the matching datasets, e.g. false matches or non-matches;
- ✓ Transformation errors – errors occurred in the process as a result of changes in sense of population, unit or indicators. The probability of transformation errors in secondary data collection is greater;
- ✓ Weighing errors – Weighing errors are errors that arise during the calculation of weighing factors;
- ✓ Extrapolation errors – Extrapolation errors are errors that arise during the extrapolation of the dataset to the target population. The size of the total population may be estimated wrongly. Extrapolation errors may also be caused by errors in the register that serve as the extrapolation frame.

Assessment of these errors includes:

- ✓ Description of data processing between phases of data collection and preparation of results;
- ✓ Description of whether these errors (and corresponding methods for their detection) have been considered in assessment of the results and their variation;
- ✓ Description of other errors impact on results (bias and possible additional variation because of not corrected and not detected errors);
- ✓ Specification of reasons for errors in data processing;
- ✓ Description of measures for control and reduction of processing errors (training in coding, data presentation, software automatically coding, personnel training for data entry, data editing, used imputation algorithms).

Sampling errors and non sampling errors are distributed depending on used data sources as follows:

- ✓ Errors in datasets and registers (secondary data sources to be used in the process) – overcoverage/undercoverage; classification errors; errors in identification of studied units; errors in characteristics of studied units;
- ✓ Field survey errors (primary data sources) – sampling errors (in sampling surveys); non sampling errors in: measurement (in connection with questionnaire quality, interviewer, respondent and their interaction with the survey programme); unit non response; item non response; errors at data entry;
- ✓ Data processing errors – in procedure of data editing on micro/macro level; imputation errors; classification errors; indicator outlier errors; errors in possible transformation in case of conceptual changes in survey; errors in data weighing; publication errors.

Identification and restriction of these errors provide an opportunity to rule this component with a view to approach real results.

Accuracy of administrative sources

The accuracy of administrative sources used in statistical process is extremely important in production of statistics. A major advantage of using administrative data for statistics compared to survey data is that it reduces the costs of data collection and reduces the administrative burden on respondents – persons and enterprises. The NSI uses an administrative data source[7] for a purpose different than the one for which the data was originally collected. As a result of this difference, the 'statistical' usability of a data source needs to be thoroughly studied by NSI prior to its use.

Data from registers could be used directly as input data in statistical process or could be used to define the sample frame. In principle the quality of registers is predefined and can not be influenced. The quality could be assessed in view of insufficient accuracy regarding:

- ✓ Data in register – the degree to which figures meet the real values and it concerns data items and classification variables;
- ✓ Consistency within a unit in a register (internal inconsistency) – the degree to which combinations of figures within one unit (or record) are correct;
- ✓ Coverage of the register – the degree to which the size of the register corresponds to the size of the target population;
- ✓ Fill rate of the register – degree to which the units and/or data items are filled in stead of empty. Insufficient fill rate can be caused by non-response in creating the register;
- ✓ Linkage of the register – the degree to which registers can be linked to another dataset. Values of linkage variables may be false, or double values of linkage variables may exist;
- ✓ Insertion of units in the register – if errors in registers are caused during creation of the register then the same errors occurs in the creation of data in the statistical process.

Indicator A6 Imputation rate concerns imputed values (in case of missing, invalid, incompatible or unsuccessfully edited data) of a variable and measures the contribution of imputed values to the final estimation. The imputation solves the problem of missing, invalid and incorrect answers identified in editing process. For that purpose some answers have been modified or missing values in edited record have been replaced in order to ensure acceptable and completed record.

The missing information on a unit imputes on the base of similar information from other units having the same characteristics. In estimation of indicators with preliminary data it is necessary that all imputed values to be specifically marked (flagged) in order to distinguish them from true values of the other units.

Indicator A7 Number of mistakes made, by type identifies serious errors in estimations or in presentation of aggregates determined nearly after the publication.

Indicator A8 Average size of revisions refers to the conducted data revisions. Revisions are assessments of reliability in reference to current and occasional methodological omissions and their measurement is different. Reasons for the revisions and their eventual improvement of accuracy could be indicated as metadata. Revisions are terminologically connected with reliability and stability of data. Revisions could be defined also as closeness of initially estimated values to subsequent estimated values.

"Managing accuracy" refers to assessment of errors and possibilities to restrict them. *Mechanisms for* accuracy management include:

[7] In compliance of the Law on statistics, **administrative source** is a register or information system created by law, containing information for the objects of the statistical surveys.

- ✓ Monitoring of planned survey methodology;
- ✓ Test of tools/questionnaires;
- ✓ Training of interviewers to heighten their competence;
- ✓ Good contacts with respondents and other data suppliers in a view to achieve higher response degree;
- ✓ Control on received administrative source data and creation of feedback (organizational and technological) to correct registration errors and to increase reliability and quality of the register.
- ✓ Analysis of errors found in statistical process and their elimination with appropriate methods;
- ✓ Increasing reliability of data processing software;
- ✓ Detail description of data files, codes and carriers to be used for provision of the results.

Main direction to increase accuracy of statistical information:

- ✓ Improvement of organization of the statistical surveys;
- ✓ Conditions for reception of reliable input information;
- ✓ Improvement of methodology and tools/questionnaires of the statistical surveys;
- ✓ Provision of coverage of the statistical surveys;
- ✓ Improvement of the register of statistical units;
- ✓ Precise control on administrative source data;
- ✓ Improvement of software and hardware;
- ✓ Improvement of interaction between Central Office of the NSI and Regional Statistical Offices;
- ✓ Improvement of interaction between the NSI and the other organizations (including other bodies of statistics) – at national and local level;
- ✓ Improvement of contacts with respondents and feedback;
- ✓ Support and heightening of the employees' qualification.

4.3 Managing Timeliness and Punctuality

The **timeliness** of statistical outputs is the length of time between the event or phenomenon they describe and their availability.

Timeliness of primary data refers to the period between the end of reference period/date and the date on which data are actually derived from the sources. The timeliness of statistical information is the time lag between the end of the reference period/date and the time of presentation of data (preliminary or final).

Punctuality is the time lag between the release date of data and the target date on which they were scheduled for release (as announced in an official release calendar, laid down in Regulations or previously agreed among partners).

DESCRIPTION	GUIDELINES	INDICATORS
3. Timeliness and Punctuality		
Timeliness of statistical outputs is the length of time between the event or phenomenon they describe and their availability. *Punctuality* is the time lag between the release date of data and the target date on which they were scheduled for release.	The assessment of timeliness and punctuality should consider the following: • production time; • frequency of release; and • punctuality of release.	T1. Time lag between end of reference period and date of first/provisional results. T2. Time lag between the end of reference period and date of final results. T3. Punctuality of publication.

The statistics must be produced on time and the punctuality of output presentation to be observed, as it is related to search and use the statistical surveys results. The phenomena and processes have different dynamics, which have an impact on frequency of their statistical measurement and request of data.
Timeliness is defined in the process of survey planning, and often requires compromise with accuracy and cost. Timeliness is an important characteristic that is observed over time and the improving the timeliness is not an unconditional objective.

In the European Statistics Code of Practice, the Principle 13 "Timeliness and Punctuality" defines that *"European statistics are released in a timely and punctual manner"*.

The following indicators are included in the ESS CoP:

Indicator 13.1 Timeliness meets European and other international release standards.
Indicator 13.2 A standard daily time for the release of statistics is made public.
Indicator 13.3 The periodicity of statistics takes into account user requirements as much as possible.
Indicator 13.4 Divergence from the dissemination time schedule is publicised in advance, explained and a new release date set.
Indicator 13.5 Preliminary results of acceptable aggregate accuracy can be released when considered useful.

Other indicators that could be used in assessment of quality criteria "timeliness and accuracy" are:

- Time lag between the end of the reference period and the publication of the results in days or months.
  (The parameter indicates whether preliminary or final data are in time toward the user needs.)
- Time lag between the planned publication date and the actual publication date in days or months.
  (The parameter indicates the punctuality of the output)
- Time lag between the reference period and the first publication of the preliminary or final results.
  (The parameter indicates whether the first results are in time toward the users needs)
- Degree of compliance with the planned dates of publication and actual dates.
- Time lag between the receiving of a customers request and the date of the implementation of the request.
  (This parameter indicates the timeliness of customer request the execution on the bases of available sources.)
- Time lag between the obligation to conduct a new or a single survey and the date of notification of results.
  (This parameter indicates whether the new survey results are timely toward the users needs.)

The mechanisms on **management of timeliness** include:
- Preliminary announced dates for presentation of the results;
- Publication of preliminary estimates;
- Better use of information technologies.

The assessment of timeliness and punctuality should be consistent with:
- Time for production of statistical information
- Frequency of data presentation, and
- Punctuality of releases.

Factors that hinder the *timeliness of statistics* are:
- Poor planning and control;
- Cases, where the publication of statistics depends on external information;
- Provision of user feedback is not possible.

Factors that hinder the *punctuality of statistics* are:
- Delay of produced information;
- Low respondents rate;
- Inadequate control in the planning;
- Insufficient capacity;
- Untimely provision of the information systems.

Measures to improve the timeliness of statistics:
- At the survey planning phase - reducing dependence on data suppliers; methodology change;
- At statistical production phase - limiting the organizational difficulties; planning and control; enhance the adaptability and maintainability of information systems;
- Change management of information systems;
- Take decisions to publish the preliminary data and provide measures to improve timeliness.

Measures to improve the punctuality of statistics:
- Control on data, obtained from administrative sources;
- Monitoring of planning;
- Provision of additional staff, in case of necessity;
- To include the preparation of press releases in production phase;
- Approved rules and quality requirements for publication of statistical information.

4.4 Managing Accessibility and Clarity

In the European Statistics Code of Practice, the Principle 15 "Accessibility and Clarity" defines that *"European statistics are presented in a clear and understandable form, released in a suitable and convenient manner, available and accessible on an impartial basis with supporting metadata and guidance"*.

The following indicators on "Accessibility and Clarity" are included in the ESS CoP :

Indicator 15.1 Statistics and the corresponding metadata are presented, and archived, in a form that facilitates proper interpretation and meaningful comparisons.
Indicator 15.2 Dissemination services use modern information and communication technology and, if appropriate, traditional hard copy.
Indicator 15.3 Custom-designed analyses are provided when feasible and the public is informed.
Indicator 15.4 Access to microdata is allowed for research purposes and is subject to specific rules or protocols.
Indicator 15.5 Metadata are documented according to standardised metadata systems.

Indicator 15.6 Users are kept informed about the methodology of statistical processes including the use of administrative data.

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

Accessibility and clarity are related to the opportunity, users to obtain statistical information, using simple and fast procedures. Statistical information should be available in expected form and within a reasonable period of time, with appropriate supporting information (metadata) and assistance to users.

Accessibility is related to the physical conditions under which users can obtain statistical information such as: distribution channels, request procedures, required delivery time, clear pricing, marketing conditions (copyright, etc.), availability of macro- and microdata (level of detail of information), different format (printed, files, CD-ROM, Internet, Database in electronic format (Excel, Access, Oracle), possibility to make information requests, etc. The accessibility is *passive* (there are data at the website and printed publications) and *active* (providing clearly understandable information to users, open dialogue with users, meeting the users' information needs). The accessibility to statistical information includes communication, marketing, interpretation, visualization (giving an example from practice), information, education.

Clarity is related to the degree of ability to understand information, including information environment of data, i.e. whether data are accompanied by appropriate metadata (text information, annotations, documentation, etc.), illustrations (tables, graphs and maps), availability of information related to the quality of statistical data (including possible restrictions on use) and the extent to which additional assistance is provides to users by the NSI.

DEFINITION	GUIDELINES	INDICATORS
4. Accessibility and Clarity		
Accessibility: the ease with which users are able to access the data. It also relates to the format(s) in which the data are available and the availability of supporting information. *Clarity*: refers to the quality and sufficiency of the metadata, illustrations and accompanying advice.	The assessment of accessibility and clarity should consider the following • needs of users, and especially the needs of analysts; • assistance to locate information; • clarity; and • dissemination.	AC1. Number of subscriptions/purchases of each of the key paper reports. AC2. Number of accesses to on-line databases. AC3. Rate of completeness of metadata.

Often is considered that requirements to accessibility are met if data are available on the website, and clarity is satisfactory, if there are available explanatory notes or links to definitions. The meeting of user requirements in this area is essential, because the component "clarity and accessibility" affects users, which underlie the concept of quality.

Statistical information, to which users do not have easy access, do not know about it, is not in the desired format, or is difficult to find it, does not have any value and meaning for them.

Accessibility to information is determined by the dissemination policy and delivery systems in an organization[8].
The clarity is more difficult to assess. It depends upon the quality of statistical metadata, disseminated alongside the statistical outputs. In the evaluation of clarity, on one hand there is needed the assistance of statisticians - to describe additional information related to data, and on the other hand, the assistance of users - to assess the adequacy and relevance of information. Metadata must be presented in a structure and to document basic predetermined characteristics. The metadata have to be simplified and to be designed in a way that is understandable by expert users, and by occasional users. A summary description on metadata (documentation, explanation, quality limitations, etc.,) should be included in the quality report.

When we managing "accessibility", it is important to:

✓ Determine statistical products and services[9]
- Conducting market research studies
- Measurement of user satisfaction
- Determining users profile
- Reporting on the volume of products sold and made information services
- Assessment of electronic products and services, and support to end-users.

✓ Determine design and dissemination form:
- Common design for products
- Common structure for disseminated products

✓ Determine information delivery means/systems:
- Internet
- Printed and electronic publications
- Press Releases
- Press Conferences
- Media
- Direct links with users on the basis of contracts, agreements and additional requests and inquiries
- Library

✓ Determine how to provide information to researchers for research, analysis and other scientific purposes.

✓ Ensure effective mechanisms to facilitate users to search and navigate the available information (services, tools and features that help consumers to discover the NSS information).

Measures to improve accessibility:
- Regular publication of relevant data on the website
- Free access to information on the website
- Ability to download and print data
- Ability to purchase and subscription of printed and electronic publications by phone, mail and e-mail
- Ability to make requests for statistical information services
- Provide microdata under certain conditions

[8] BNSI disseminates statistical information according to the Rules for dissemination of statistical information products and services

[9] Statistical products and services, dissseminated by NSI, are defined in Article 3 of the Rules for dissemination of statistical information products and services.

- Agreements for the mutual exchange of data.

When we managing "clarity", it is important to have:

- User-oriented approach in production of statistics;
- Conceptual metadata, information on methodology, production process and data quality. This information is needed to users for clear interpretation of statistical results and correct use of statistics;
- Online dictionaries;
- Visualization (tables, graphs, maps) to data;
- Provide additional help to users.

Possible measures to improve clarity:

- Develop and implement a uniform standard for metadata in NSS (to apply *ESMS metadata structure*[10]);
- Training on presentation of statistical information
- Update of published statistical metadata
- Support for users of statistical information (help desk).

4.5 Managing Coherence and Comparability

Statistical information is consistent internally, over time and comparable between regions and countries; it is possible to combine and make joint use of related data from different sources.

Comparability is the degree to which statistical data from different geographical/non geographical areas or over time, differ from the actual data values.

Coherence of statistical data is their adequacy to be reliably combined in different ways and for different purposes. When data are from one source they are related in the sense that the primary results obtained from the survey could be reliably combined in different ways for compilation of more complex (integrated) results. In case when data come from different sources and in particular, from different types and/or frequency of surveys, the information could not be fully linked, because surveys could apply different approaches, methodologies and classifications. It is possible the results of similar surveys to be unrelated, but users must be informed for this.

In the European Statistics Code of Practice, the Principle 14 „Coherence and Comparability" defines the following:

Indicator 14.1 Statistics are internally coherent and consistent (i.e. arithmetic and accounting identities observed).

Indicator 14.2 Statistics are comparable over a reasonable period of time.

Indicator 14.3 Statistics are compiled on the basis of common standards with respect to scope, definitions, units and classifications in the different surveys and sources.

Indicator 14.4 Statistics from the different sources and of different periodicity are compared and reconciled.

[10] Commission Recommendation 2009/498/EC on reference metadata for the European Statistical System

Indicator 14.5 Cross-national comparability of the data is ensured within the European Statistical System through periodical exchanges between the European Statistical System and other statistical systems. Methodological studies are carried out in close cooperation between the Member States and Eurostat.

DEFINITION	GUIDELINES	INDICATORS
5. Coherence and Comparability		
Comparability: The degree to which data can be compared over time and domain. *Coherence*: The degree to which data that are derived from different sources or methods, but which refer to the same phenomenon, are similar.	Comparability should be addressed in terms of comparability over: • time; • spatial domains (e.g. sub-national, national, international); and • domain or sub-population (e.g. industrial sector, household type). Coherence should be addressed in terms of coherence between: • data produced at different frequencies; • other statistics in the same socio-economic domain; and • sources and outputs.	CC1. Lengths of comparable time series. CC2. Asymmetries for statistics mirror flows.

The users need more integrated and consistent data, as the phenomena to which data are related, are becoming more complex and interrelated. In this sense, the NSI and Bodies of statistics must provide coherent and comparable information, based on horizontal and vertical integration of data sets and combining data from different sources[11].

In evaluating the comparability and coherence of statistical data must be determined:

- Main sources and reasons for lack of coherence/comparability (changes in concepts and/or methods).
- Degree of not coherence or not comparability.
- Comparability over time - it is necessary to ensure consistent time series, so that statistics can be easily and reliably comparable for different periods of time. It is necessary to identify reasons, treatments and reference periods when time series breaks (if any) occurred.
  (*Example*: Comparability over time of monthly data from the Labour Force Survey in a Member State).
- Comparability over region – a quantitative assessment of comparability across regions based on the (weighted) number of differences in metadata. Comparability over region may be assessed in two different ways: pair-wise comparisons of the metadata across regions; and comparison of metadata for the region with a standard, in particular an ESS standard or, in its absence, an example of other best practice.

[11] COM(2009) 404 on the production method of EU statistics: a vision for the next decade.

(*Example:* Comparability over region of data for the same month from the Labour Force Survey in two Member States.)

- Comparability over other domain – domains over which comparisons are often made include economic activity group, occupational group, and sex. It is useful to made distinction between situations where essentially the same statistical instrument is used, for example a direct survey, and those where different instruments are used.
  (Example: Comparability between annual structural data for agriculture with annual structural data for manufacturing that are collected by a different survey).
- Internal Coherence – referring to data produced by a single statistical process (but possibly comprising several different segments) for a single time period and region. Published statistical data must be internally coherent.
- Coherence between sub-annual and annual statistics - for example monthly and annual production data for the same industries in the same region.
- Coherence with the National Accounts - For the economic surveys that feed into the national accounts, coherence is vital and, in so far as it is lacking, the National Accounts compilation process will detect it. Where relevant, the results of comparisons with National Account framework and feedback from National Accounts with respect to coherence and accuracy problems.
- Mirror Statistics - Assessment of discrepancies (if any). Mirror statistics involve coherence, geographical comparability as well as accuracy issues. Having assessed the degree of lack of coherence, any difference in outputs that cannot be explained in terms of coherence are an indication of the lack of accuracy in either or both of the outputs and/or may reflect lack of comparability between the countries for the same data items.
- Coherence with other statistics - Where the statistical outputs were combined with those from other processes. For example, coherence between *employment* produced by a Labour Force Survey of members of households and *numbers of employees* produced by an economic survey of enterprises.

Factors that hinder *comparability of statistics*:

- A new time series may have been started intentionally, perhaps because a number of principles of the series are outdated after a number of years. Weightings may, for example, may have become obsolete.
- There may be many and/or large changes in the statistical process, perhaps to increase the efficiency of the process or reduce the administrative burden.
- Problems with comparability between domains indicate a lack of coordination between parties. The meanings of data items are still not harmonized.

Factors that hinder *coherence of statistics*:

- Ambiguous definitions of populations, statistical units and data items.
- Different names of data items with the same definition.
- Different definitions of data items with the same names.
- Differences in populations.
- Differences in statistical units.
- Differences in classifications or versions of these classifications.
- Differences in the extent of detail.
- Lack of a standard for permitted statistical units, classifications and data items.
- Tables that could be published jointly are still published separately.

Measures to ensure comparability of statistics:

- Prevent aging of series. This will generally mean that data such as weighing factors are kept up to date.
- Change the process gradually and spread changes out over time.
- Change retro-actively: correct earlier figures.
- Experimental review. This is an activity alongside the regular production activity.
- Explanation of breaks.
- Estimation of breaks through time series methods. To do this, both old and new series of some length are required.
- To promote comparability between domains it is necessary to harmonize concepts between domains. If possible, the statistical process should also be harmonized to obtain data of comparable accuracy.

Measures to ensure coherence of statistics:

- Clear definitions
- Uniform terminology
- Coordinated concepts and classifications
- Standard concepts and classifications
- Consistent data
- Coherent presentation

5 TRADE-OFFS BETWEEN OUTPUT QUALITY COMPONENTS

The quality components are not independent, but interrelated. The relations between output quality components could be positive (improvement of one component lead to improvement of other components) as well as negative (improvement of one quality component lead to deterioration with respect to another component). There logically emerged the pattern - where the links between individual components are positive, then is increasing the extent to which user needs are met. There are cases where must decide how to balance the confronted quality components by taking the balancing operations, and taking into account the respondents burden and costs. The examples given below illustrate the types of trade-offs that are most likely to require consideration:

- *Trade-off between relevance and accuracy* - Relevance may be 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. Conversely, if we limit the number of collected data items it will improve accuracy, but will restrict the relevance.
- *Trade-off between relevance and timeliness* - 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. Conversely, the improvement of relevance by collecting data at a lower level, e.g. regional and municipal level, could be produced more data and/or more detailed data, consequently the timeliness will be reduced.
- *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. Conversely, the desire to keep consistency between statistical outputs, which are result of two statistical processes, could prevent changes that are needed to improve the relevance of particular users.

- *Trade-off between relevance and comparability over time* - 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. On the other hand, the desire to keep comparability may cause changes in content.
- *Trade-off between comparability over region and comparability across time* - In a similar fashion, the desire to have more comparability across region may well result in changes that reduce comparability over time.
- *Trade-off between accuracy and timeliness* - This is probably the most frequently occurring and important of the trade-offs. Improvement in timeliness can be obtained by reducing collection and processing time, in particular by terminating collection earlier, compiling outputs based on a smaller number of responses and/or by reducing the amount of editing. However, this reduces accuracy. A balancing action could be taken in case of important statistical data, as we published earlier set of estimates and one, two or more revisions. Although final data are not entirely accurate, they are usually more accurate than the values in the announced preliminary results. So the result of the revisions is an indicator of the degree of accuracy. This action is necessary to improve the timeliness of outputs.

Table: Relationship between quality components of statistical output

Relationship between quality components of statistical output					
	Relevance	Accuracy	Timeliness and Punctuality	Accessibility and Clarity	Coherence and Comparability
Relevance		X	X	X	X
Accuracy			X	X	X
Timeliness and Punctuality				X	X
Accessibility and Clarity					X
Coherence and Comparability					

Combined distribution of quality components with high estimates in the NSI and NSS:

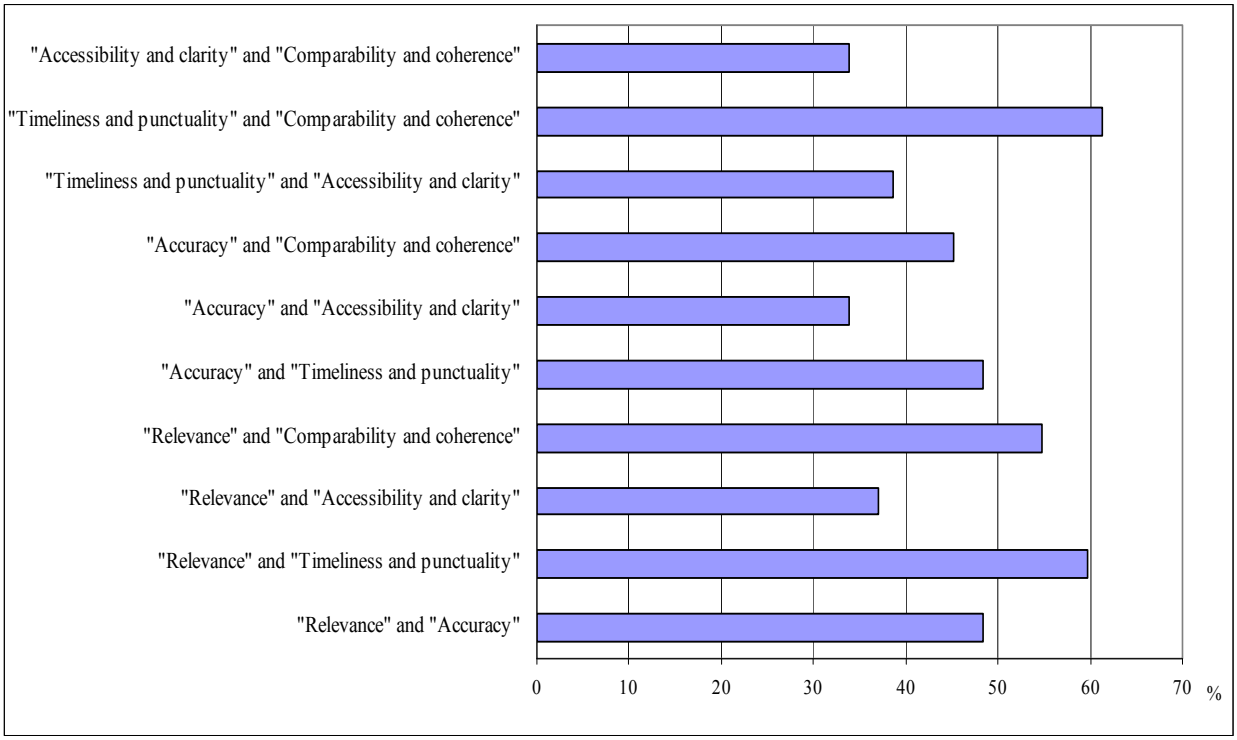
In the quality self-assessment carried out by NSI statistical divisions[12] in 2008, and by NSS representatives[13] in 2010, was applied specific approach on combined assessment of relations between different quality components. For each statistical product has been evaluated each

[12] Self-assessment in NSI is made in the framework of the Grant project: Definition of process variables and development of quality standards, in 2008.

[13] Self-assessment in NSS is made in the framework of Grant project: Quality assurance in the NSS, in 2010.

component on three dimensional scales: high, medium, and low. A review of the combined high estimates[14] of the components present the following results:
In NSI, high estimate is given for more than half (59.7%) of products, for the components "relevance" and “timeliness and punctuality”. A relatively similar percentage (54.8%) is assessed for the products with high estimates to "relevance" and “coherence and comparability”. In the combined high estimate of "relevance" and "accuracy", only 1.6 points do not reach to cover half of the products.
High estimates for “accuracy” and other quality components are given for more than a third of the products. With the lowest percentage (33.9%) in this group are the products with high marks for "accuracy" and “accessibility and clarity.
High estimates for the components “timeliness and punctuality” and “comparability and coherence” are given for more than half products (61.3 %). Over one third of statistical products were evaluated simultaneously with high marks for the “timeliness and punctuality” and "comparability and coherence”. One third of statistical products were evaluated with high marks for the components "accessibility and clarity” and “comparability and coherence”.

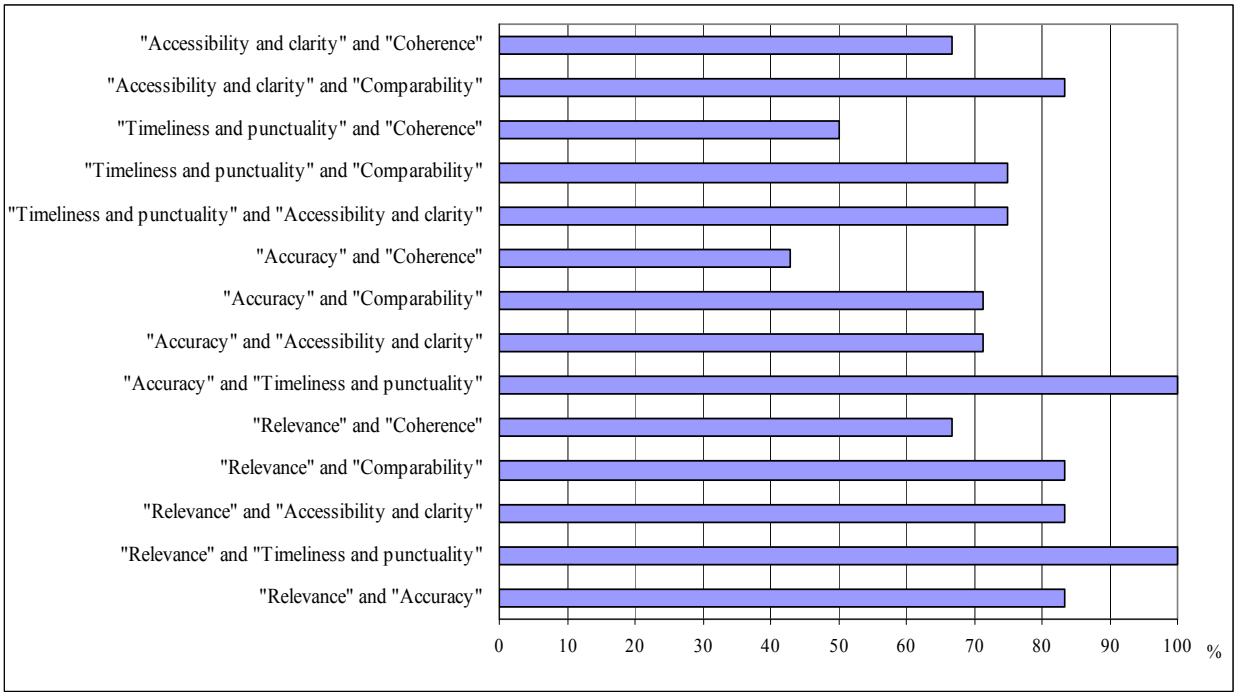
Fig. 2. Combined distribution of quality components with high estimates in the NSI



[14] High estimates are presented because they are the benchmark for the level to be reached

When combining components with high quality assessments in the NSS, the highest correlation was observed for the "relevance" and "timeliness and punctuality", and "accuracy" and "timeliness and punctuality" (100%). Least correlation is available for "accuracy" and coherence (42.9 %) and "timeliness and punctuality" and "coherence"(50%).

Fig. 3. Combined distribution of quality components with high estimates in the NSS



The presented combined estimates show that the quality should be improved for those products for which there are no high estimates for the components, which will contribute to the enhancement of the overall quality assessment of statistical information.

6 COST AND RESPONDENT BURDEN

The NSI efforts are directed towards fully implementation of the European Statistical System requirements and fulfilment of obligations, arising from the European Statistical Programme. The European Statistical Programme, in tern, determines the priorities concerning information needs with the intent to carry out the Community activities. In other to provide the required statistics, the needs are assessed according to the necessary resources at European and national level, as well as to the burden on respondents and their costs. The Commission introduced initiatives to set priorities for reduction of the response burden for the European Statistical Programme as a whole or parts of it.

In other to reduce the burden on respondents, the NSI and other national authorities and the Commission (Eurostat) have access to administrative data sources from the public administration system, where such data are necessary for the development, production and dissemination of European Statistics.

According to the European Statistics Code of Practice, Principle 9: The *reporting burden is proportionate to the needs of the users and is not excessive for respondents. The statistical*

authorities monitor the response burden and set targets for its reduction over time. and Principle 10: *Resources are used effectively.*

According to the ESS Standard for Quality Reports (2009), for the respondent burden should be described:

- Annual respondent burden in financial terms and/or hours.
- Respondent burden reduction targets.
- Recent efforts made to reduce respondent burden.
- Whether the range and detail of data collected by survey is limited to what is absolutely necessary.
- Whether administrative and other survey sources are used to the fullest extent possible.
- The extent to which data sought from businesses is readily available from their accounts.
- Whether electronic means are used to facilitate data collection.
- Whether best estimates and approximations are accepted when exact details are not readily available.
- Whether reporting burden on individual respondents is limited to the extent possible by minimizing the overlap with other surveys.
-

INDICATORS	DESCRIPTION
PCR1. Annual operational cost, with breakdown 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 in hours and/or financial terms	Respondent burden in hours is defined as number of respondents/questionnaires * average time per respondent, summed over all repetitions of statistical process within a year. Respondent burden in financial terms is defined as respondent burden in hours * average hourly cost to respondents.

According to the **EU Standard Cost Model for measuring costs imposed by legislation on businesses,** the overall cost of delivering the information requested by a particular questionnaire depends on three components:

- the number of respondents **(R)**;
- the (average) time **(T)** required to provide the information, including time spent assembling information prior to completing a questionnaire or taking part in an interview and the time taken up by any subsequent contacts after receipt of the questionnaire;
- the average hourly cost of a respondent's time **(C) (**not include the initial costs of setting up a survey systems and costs for calculations).

The total respondent burden for a questionnaire is computed as **R*T*C**. Summing over all questionnaires for all repetitions of the statistical process over a year, usually a calendar year, provides the annual cost.

The average hourly cost is likely the most difficult of the three parameters to measure, thus response burden carried by respondents is often measured simply in hours spent **(R*T)** rather than in financial terms.

Sometimes the number of questionnaires is used in place of the number of respondents, thus giving a (maximum) design level measure of respondent burden rather than the burden associated with the actual respondents.

For more information on the participation of BNSI in a general study on measuring of the respondent's burden, organized by Eurostat and studies on response burden in BNSI see *Appendix 4*.

7 CONFIDENTIALITY, TRANSPARENCY AND SECURITY

The national rules determining primary confidentiality are defined in the Bulgarian Law on Statistics. The rules fully meet the requirements of Eurostat. In accordance with the Bulgarian Law on Statistics, confidentiality of the information, provided by respondents, is guaranteed. The individual data received and collected by households, enterprises, administrative sources and other respondents are confidential. The individual data are used only for statistical purposes, and are not available to users. At dissemination phase, BNSI protect confidentiality of individual data by applying the Rules for dissemination of statistical products and services (Section III).

The NSI and Bodies of Statistics produce and disseminate the statistical information respecting scientific independence and in an objective, professional and transparent manner in which all users are treated equitably.

In the NSS are in place provisions to ensure the security of all statistical processes (data collection, editing, processing, storage and dissemination).

8 ENVIRONMENT

In the management of quality components is essential the organizational environment in which the statistical activity is performed. All aspects of the organization affect the efficiency of quality management. Some of the necessary measures that lead to effectiveness and must be taken in quality assurance in NSS are:

- Recruitment of competent and qualified staff that to be trained on issues related to quality;
- Put into practice a effective communication between experts regarding the quality assessment and quality management;
- Cooperation with respondents, providing information;
- Cooperation with users, providing information on current and new needs
- Interagency cooperation
- Coordination with international organizations

9 CONCLUSION

The guidelines on quality criteria of statistical products, presented in this paper, introduce a common approach to quality assessment and quality management in the NSS.

The effective collaboration and coordination between NSI, BNB and Bodies of Statistics will help to ensure and improve the quality of statistical information within the NSS.

The quality assurance of the statistical data should include the following aspects:

- Documentation;
- Standardization of processes and statistical methods;
- Quality measurement/assessment;
- Strategic planning and control;
- Improvement actions;
- User dialogue.

In ensuring the quality of statistics in the NSS should be taken the following measures:

- Quality requirements are documented;
- Statistical processes are clearly defined and made known to all staff;

- The correct implementation of the process is regularly monitored;
- Product and process quality are continuously monitored and documented;
- Users are being informed on the quality of the statistical information;
- A procedure is implemented that guarantees that the necessary improvement measures are being planned, implemented and evaluated.

By applying a common framework for quality assurance in NSS will lead to effective management and improvement of statistical information quality. This will increase the confidence in national statistics.

10 ANNEXES

Annex 1: National Statistical System (NSS) and its partners

Annex 2: A) Quality Reporting and the New ESS Statistical Law;

B) Quality of statistical information and NSI coordination role according to the Bulgarian Law on Statistics

Annex 3: Historical overview of quality activities in NSI and NSS with adoption of European standards

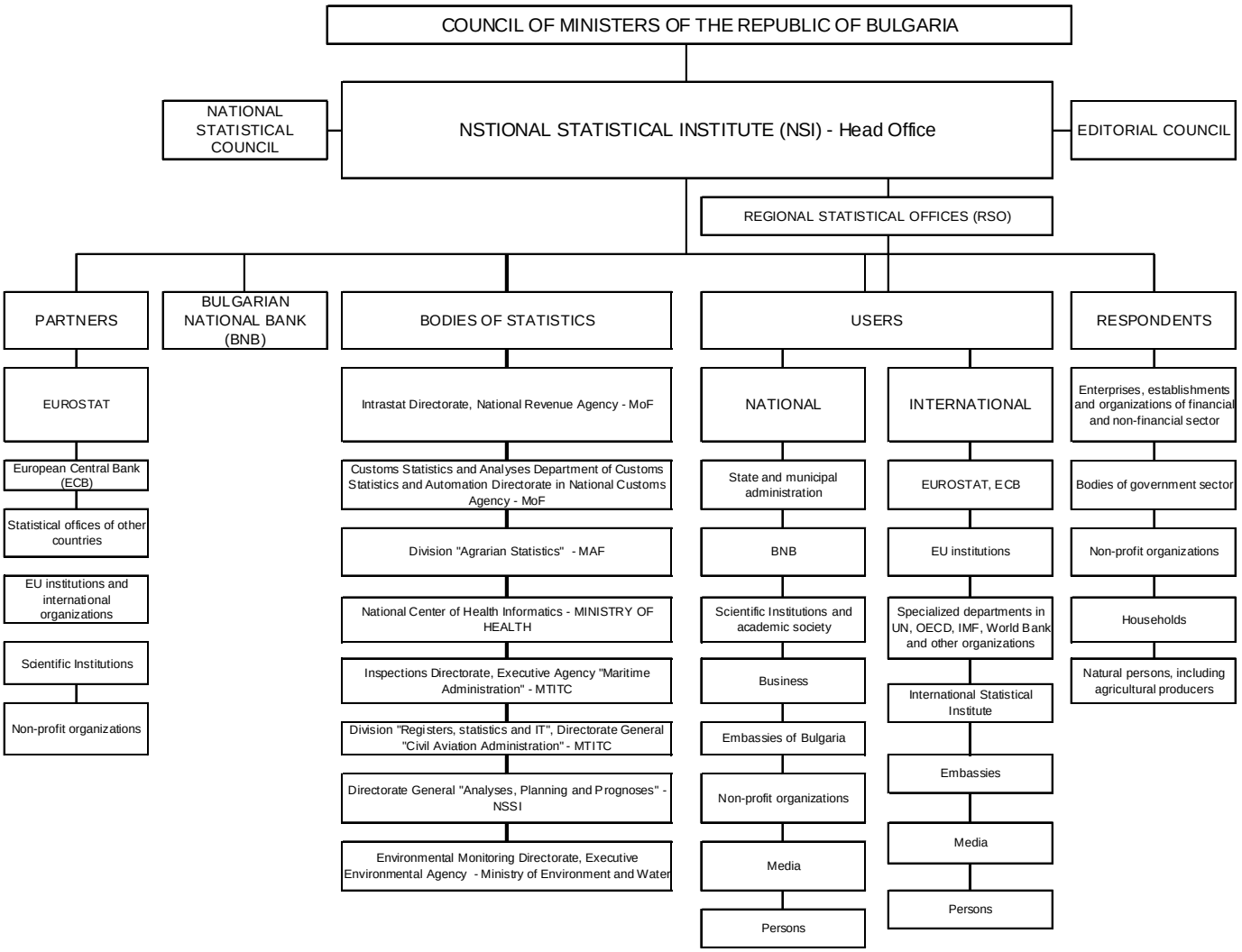
Annex 4: Response burden surveys

Annex 5: List of Quality and Performance Indicators

ANNEX 1: NATIONAL STATISTICAL SYSTEM (NSS) AND ITS PARTNERS

Annex 1

NATIONAL STATISTICAL SYSTEM (NSS)
and its partners



Annex 2

ANNEX 2: A) QUALITY REPORTING AND THE NEW ESS STATISTICAL LAW

A) Quality Reporting and the New ESS Statistical Law

Regulation (EC) No 223/2009 of the European Parliament and of the Council on European statistics – Article 2 (1) underlie the statistical principles set out in the European Statistics Code of Practice; a new Article 12 "Statistical quality", aiming to ensure the quality of statistical information and to identify common regulatory framework for statistics quality.

……..

Article 2
Statistical principles

1. The development, production and dissemination of European statistics shall be governed by the following statistical principles:

(a) 'professional independence', meaning that statistics must be developed, produced and disseminated in an independent manner, particularly as regards the selection of techniques, definitions, methodologies and sources to be used, and the timing and content of all forms of dissemination, free from any pressures from political or interest groups or from Community or national authorities, without prejudice to institutional settings, such as Community or national institutional or budgetary provisions or definitions of statistical needs;

(b) 'impartiality', meaning that statistics must be developed, produced and disseminated in a neutral manner, and that all users must be given equal treatment;

(c) 'objectivity', meaning that statistics must be developed, produced and disseminated in a systematic, reliable and unbiased manner; it implies the use of professional and ethical standards, and that the policies and practices followed are transparent to users and survey respondents;

(d) 'reliability', meaning that statistics must measure as faithfully, accurately and consistently as possible the reality that they are designed to represent and implying that scientific criteria are used for the selection of sources, methods and procedures;

(e) 'statistical confidentiality', meaning the protection of confidential data related to single statistical units which are obtained directly for statistical purposes or indirectly from administrative or other sources and implying the prohibition of use for non-statistical purposes of the data obtained and of their unlawful disclosure;

(f) 'cost effectiveness', meaning that the costs of producing statistics must be in proportion to the importance of the results and the benefits sought, that resources must be optimally used and the response burden minimised. The information requested shall, where possible, be readily extractable from available records or sources.

The statistical principles set out in this paragraph are further elaborated in the Code of Practice in accordance with Article 11.

2. The development, production and dissemination of European statistics shall take into account international recommendations and best practice.

Article 12
Statistical quality

1. To guarantee the quality of results, European statistics shall be developed, produced and disseminated on the basis of uniform standards and of harmonised methods. In this respect, the following quality criteria shall apply:

(a) 'relevance', which refers to the degree to which statistics meet current and potential needs of the users;

(b) 'accuracy', which refers to the closeness of estimates to the unknown true values;

(c) 'timeliness', which refers to the period between the availability of the information and the event or phenomenon it describes;
(d) 'punctuality', which refers to the delay between the date of the release of the data and the target date (the date by which the data should have been delivered);

(e) 'accessibility' and 'clarity', which refer to the conditions and modalities by which users can obtain, use and interpret data;

(f) 'comparability', which refers to the measurement of the impact of differences in applied statistical concepts, measurement tools and procedures where statistics are compared between geographical areas, sectoral domains or over time;

(g) 'coherence', which refers to the adequacy of the data to be reliably combined in different ways and for various uses.

2. In applying the quality criteria laid down in paragraph 1 of this Article to the data covered by sectoral legislation in specific statistical domains, the modalities, structure and periodicity of quality reports provided for in sectoral legislation shall be defined by the Commission in accordance with the regulatory procedure referred to in Article 27(2).
Specific quality requirements, such as target values and minimum standards for the statistical production, may be laid down in sectoral legislation. Where sectoral legislation does not so provide, measures may be adopted by the Commission. Those measures, designed to amend non-essential elements of this Regulation by supplementing it, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 27(3).

3. Member States shall provide the Commission (Eurostat) with reports on the quality of the data transmitted. The Commission (Eurostat) shall assess the quality of data transmitted and shall prepare and publish reports on the quality of European statistics.
……..

ANNEX 2: B) QUALITY OF STATISTICAL INFORMATION AND NSI COORDINATION ROLE ACCORDING TO THE BULGARIAN LAW ON STATISTICS

B) Quality of statistical information and NSI coordination role in Bulgarian Law on Statistics, amend. SG 98/14 Nov 2008

……..

Art. 2. (1) The statistical activity shall cover the development of the methodology and planning of the statistical surveys, obtaining, collecting, processing, storing individual data and statistical information, the analysis, provision and dissemination of statistical information.

(2) The statistical activities shall be carried out in compliance with the following principles: professional independence, impartiality, objectivity, reliability, statistical confidentiality and cost effectiveness.

(3) The statistical information shall be produced in line with the following quality criteria: relevance, accuracy, timeliness, punctuality, accessibility and clarity, comparability and coherence.

Art. 3. (1) The National Statistical System shall consist of the National Statistical Institute, the Bodies of Statistics and the Bulgarian National Bank.

.....

(7) The Bodies of Statistics shall work under the methodological guidance of National Statistical Institute when implementing the National Statistical Programme.

(8) The National Statistical Institute, the Bodies of Statistics and the Bulgarian National Bank shall be the source of official statistics in the Republic of Bulgaria.

Art. 7. (1) The National Statistical Institute shall:

1. coordinate the statistical activities of the state by means of:

.....

b) provision of methodological uniformity of the surveys;

……

f) coordinating all activities on national level relevant to the development, production and dissemination of European statistical information.

2. study and summarise the public needs of statistical information

13. render methodological and methodical assistance and exercise control over the quality of the statistical surveys, carried out by the Bodies of Statistics;

Additional Provisions

§ 1. Within the meaning of this Law:

1. “Statistical unit” is a unit of the survey, which may be a natural person, household, economic unit or other organisation, referred to by the data.

2. “Individual data” is data, related to a particular statistical unit.

3. “Statistical information” is aggregated quantitative and representative information about the condition and/or the dynamics of mass phenomena in a considered population of statistical units in the economy, demography, social area and the environment.

4. “Statistical purposes” mean the use of the collected individual data for the development and production of statistical information, statistical analyses and projections.

5. “Statistical Survey” includes observation of the statistical units, collecting, processing and analysis of individual data submitted by them with the purpose of getting statistical information. The statistical surveys shall

be considered exhaustive, when they cover all population units, or sample, when covering a representative part of it.

6. ”Administrative source” is a register or information system created by law, containing information for the objects of the statistical surveys.

7. “Eurostat” is the name of the Statistical Office of the European Communities. Eurostat shall coordinate the statistical activities of the institutions and bodies of the Commission.

8. “Development of statistical information” are the activities necessary for the development of statistical methods, standards and procedures used for the production and dissemination of statistical information, as well as the activities for development of new statistical indicators.

9. “Production” is all activities necessary for the collection, storage, processing, compilation, and analysis of the statistical information.

10. “Dissemination” is the activity of making the statistical information accessible to users.

11. “Professional independence” - a principle, meaning that the statistical information must be developed, produced and disseminated in an independent manner, free from any pressures from political or interest groups.

12. “Impartiality” is a principle, meaning that the statistical information must be developed, produced and disseminated in a neutral manner, and that all users must be given equal treatment.

13. “Objectivity” is a principle, meaning that the statistical information must be developed, produced and disseminated in a systematic, reliable and unbiased manner; it implies the use of professional and ethical standards, and that the policies and practices followed are transparent to users and survey respondents.

14. “Reliability” is a principle, meaning that statistics must measure as faithfully, accurately and consistently as possible the reality that they are designed to represent. It implies that scientific criteria are used for the selection of sources, methods and procedures.

15. “Statistical confidentiality” is a principle, meaning protection of data related to single statistical data subjects, which are obtained directly for statistical purposes or indirectly from administrative or other sources. It implies prohibition of using for non statistical purposes the data obtained and their unlawful disclosure.

16. “Cost effectiveness” is a principle, meaning that the costs of producing statistical information must be in proportion to the importance of the results and the benefits sought. The resources must be optimally used and the response burden must be minimised. The information requested should, where possible, be readily extractable from available records or sources.

17. “Relevance” refers to the degree, to which the statistical information meets current and potential future needs of the users.

18. “Accuracy” refers to the closeness of estimates to the unknown true values.

19. “Timeliness” refers to the time lag between the critical moment of the survey and the date of providing statistical information to the users.

20. “Punctuality” refers to the strict observance of the date, announced in advance, on which the statistical information should be published.

21. “Accessibility” and “Clarity” mean that the statistical information must be understandable to users and provided in a way easy for interpretation.

22. “Comparability” means that the statistical information must be comparable within temporal and spatial limits.

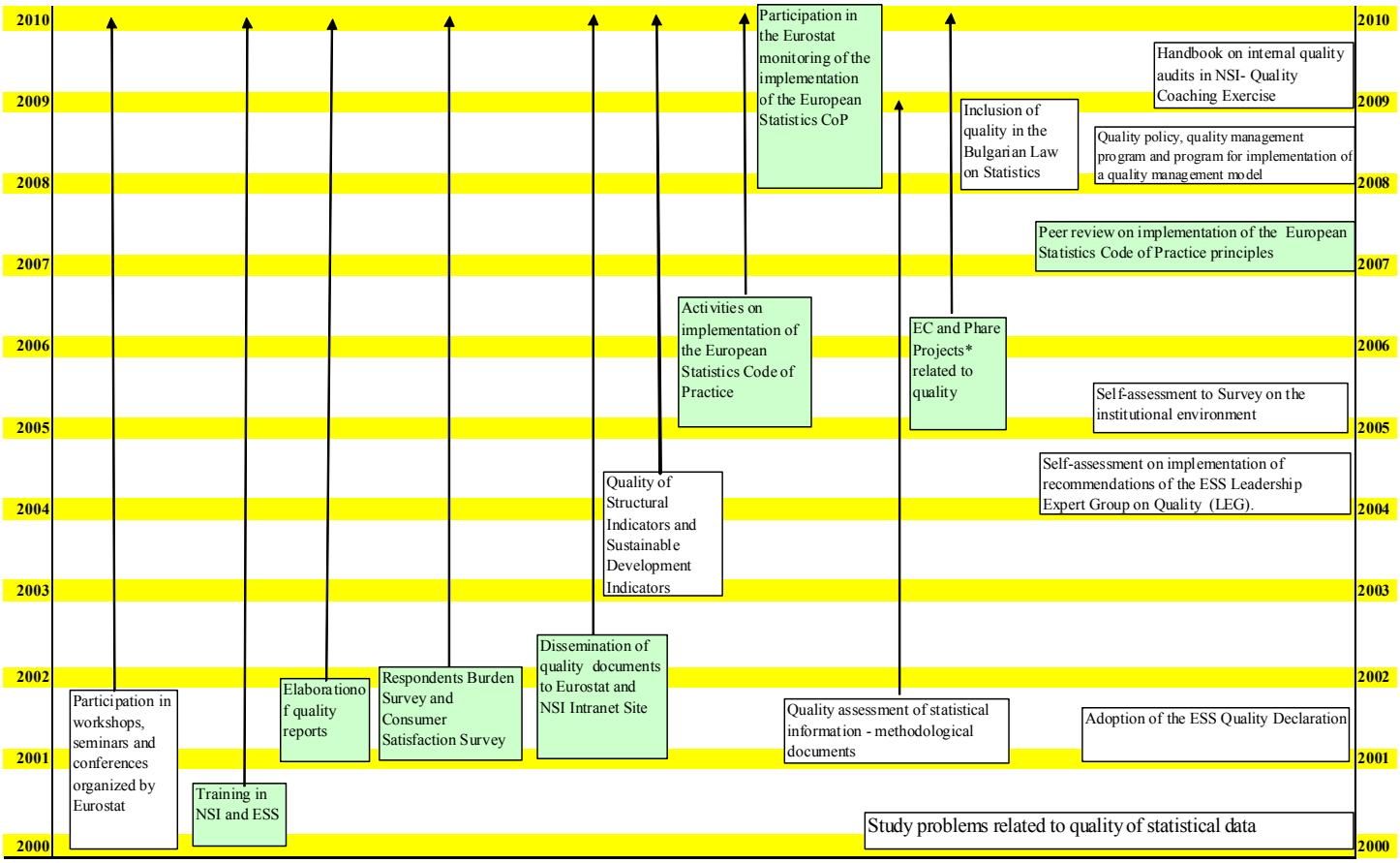
23. “Coherence” means the possibility to combine statistical information from different sources in order to form a full picture of the studied reality.

24. “Minor case" is the one where the committed crime, in view of the lack or insignificance of the harmful consequences, or in view of other attenuating circumstances represents a lower level of social danger as compared to the common cases of crime of the respective kind.

ANNEX 3: HISTORICAL OVERVIEW OF QUALITY ACTIVITIES IN NSI AND NSS WITH ADOPTION OF EUROPEAN STANDARDS

Annex 3

Overview of quality activities related to implementation of European standards



*** Grants and Phare Projects* related to quality:**

- **< Multinational Phare Project-"Quality in Statistics"- quality self-assessment with DESAP checklist and quality reports (2005)**
- **< National Phare Programme Project, Component "Quality assessment in statistics", with the following tasks: Compendium of methodology for quality assessment; Instructions for implementation of quality reports; Conception for reduction of respondents burden; Consumer Satisfaction Survey (2005)**
- **< Grant Project "Definition of process variables and development of standarts": Interviewers' satisfaction survey; Guidelines for managing Relevance; Internal quality survey (2008)**
- **< Grant Project "Quality assurance in the NSS": Guidelines for quality criteria in the National Statistical System; Quality self-assessment in National Statistical System; Update of Compendium and Instructions - Part II " Guidelines on quality in BNSI" (2010)**

ANNEX 4: RESPONSE BURDEN SURVEYS

Response burden surveys

Participation of NSI in a general study on measuring of the response burden, organized by Eurostat

Study - 2008
50 legal documents in all areas, the required information for the period 2004-2007, three groups of indicators:
- Response burden (measured by time spent, in value terms - Euros and additional information on the number of respondents, the average time, hourly rate for the respondents and frequency of the survey)
- Production cost of the National Statistical Offices
- Production costs of other producers
Bulgaria sent answers for 22 regulations - NSI and MAF

Study – 2009
24 legal documents, in all areas, for the period 2004-2008, but only for the response burden with the same characteristics as the study in 2008.
Bulgaria sent answers for 22 regulations – NSI and other Bodies of Statistics (Directorate "Agrarian Statistics" – MAF, Executive Agency "Maritime administration", Directorate General "Civil Aviation Administration") and Executive Agency for Fisheries and Aquaculture.

Study – 2010
54 legal documents in all areas were studied. The aim of the survey conducted this year was to obtain a very broad and general assessment of the response burden and costs incurred by the NSI and other producers of statistical information in connection with the implementation of key EU legislation as compared with others acts.
Bulgaria sent answers for 45 regulations - NSI, BNB, other bodies of statistics and the Executive Agency for Fisheries and Aquaculture.

Studies on response burden in NSI

The first study was conducted in 2001 with a special registration card together with the regular Labour survey. The study covers various categories of respondents: state, municipal and private companies, large, medium, small and micro enterprises. The study was performed on a sub-sample and studied employees, hours worked, wages and salaries and other labour costs.

In 2002, the burden of experts in regional statistical offices was assessed.

In 2003, in the statistical forms was included question to record the time needed to complete the form.

In 2004, a study of the burden on respondents was conducted, combined with the Survey on business circles' needs of statistical metadata.

The assessment of the burden on respondents in 2006 and 2007 is presented on the NSI website: http://www.nsi.bg/publications_e/Inter_Resp06.pdf.

In 2009, the component "Reduction of burden on respondents and Regional Statistical Offices" was finalized in the framework of the Twinning project "Sustainable Development of National Statistical System" implemented by a consortium between the Federal Statistical Office of Germany (DESTATIS) and the National Institute of Statistics and Economic Studies of France (INSEE).

ANNEX 5: LIST OF QUALITY AND PERFORMANCE INDICATORS

Quality and Performance Indicators

Indicator	Description	ESS	NSS
		Questions in DESAP Self-Assessment Check list[15]	Questions in Quality Self Assessment Check list
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.		II.1.1
Accuracy			
A1. Coefficient of variation (CV).	The standard error of the estimator divided by the expected value of the estimator.	DESAP V (4,6,7)	II.2.5
A2. Rate of overcoverage.	The proportion of units accessible via the frame that do not belong to the target population.	DESAP II (6,8-11)	II.2.1
A3. Edit failure rate.	The proportion of responding units for which an error signal is triggered by a specified checking algorithm.	DESAP IV (12, 18)	II.2.4
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.	DESAP III (45), V (15,16,17)	II.2.5
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.	DESAP III (43), V (18)	II.2.5
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.	DESAP IV (18 - 32)	II.2.5
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.		II.2.5
A8. Average size of revisions.	The average over a time period of the difference between a later and an earlier estimate expressed as the average revision, the average absolute revision, and/or the corresponding relative quantity (ies).		II.2.5

[15] DESAP Cheklist is availabe at the following address:
http://epp.eurostat.ec.europa.eu/portal/page/portal/quality/documents/desap%20G0-LEG-20031010-EN.pdf

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.	DESAP V (19,21,23)	II.3.1
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.	DESAP V (20,22)	II 3.2, II.3.3, II.3.4
Accessibility and Clarity			
AC1. Number of subscriptions/purchases of each of the key paper reports.	As stated.		
AC2. Number of accesses to on-line databases.	As stated (to be further defined in collaboration with an IT expert).		II.4.1
AC3. Rate of completeness of metadata.	The ratio of the number of metadata elements provided to the total number metadata elements applicable.	DESAP VI (2-7, 10-14)	II.4.4
Coherence and Comparability			
CC1. Lengths of comparable time series.	Number of reference periods in time series from last break.	DESAP V (25)	II.5.1
CC2. Asymmetries for statistics mirror flows.	Discrepancies between data related to flows, e.g. for pairs of countries.		
Assessment of User Needs and Perceptions			
US1. User satisfaction index.	The degree of satisfaction with services and products for different segments of users.	DESAP I (2 -8) DESAP V (1-5,29), VI (8,11-14)	II.1.2
US2. Length of time since most recent user satisfaction survey.	As stated.	DESAP V (1)	
Performance Cost and Respondent Burden			
PCR1. Annual operational cost, with breakdown by major cost components.	Direct costs of staff involved in data collection (questionnaires, distribution, capture), reducing non-response, processing, and compilation of estimates.	DESAP V (1) DESAP VII (3)	III.1

PCR2. Annual respondent burden in hours and/or financial terms.	Respondent burden in hours is defined as number of respondents/questionnaires * average time per respondents/questionnaires, summed over all production rounds of the statistical process within a year. Respondent burden in financial terms is defined as respondent burden in hours * average hourly cost to respondents.	DESAP II (24, 25,26) DESAP V (1) DESAP VII (3)	III.2 III.3

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