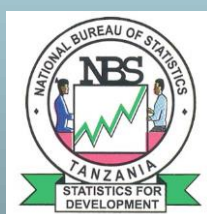




The United Republic of Tanzania

A HANDBOOK OF QUALITY GUIDELINES FOR STATISTICAL PRODUCTION IN TANZANIA



National Bureau of Statistics
Ministry of Finance
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ACRONYMS

AC	Air Condition
ANC	Antenatal Care
ASIP	Annual Survey of Industrial Production
BR	Business Register
CAFE	Computer Assisted Field Editing
CAPI	Computer Assisted Personal Interview
CIP	Census of Industrial Production
COICOP	Classification of Individual Consumption by Purpose
CPC	Central Product Classification
CPI	Consumer Price Index
CSPro	Census and Survey Processing System
CSI	Customer Satisfaction Survey
DP	Development Partner
EDP	Electronic Data Processing
ESS	Employment and Earnings Survey
FP	Family Planning
GDP	Gross Domestic Product
GNP	Gross National Product
GPS	Global Positioning System
HBS	Household Budget Survey
IBS	Integrated Business Survey
ICR	Intelligent Character Recognition
ISIC	International Standard of Industrial Classification
LGA	Local Government Authority
MCR	Mark Character Recognition
MDAs	Ministries, Departments and Agencies
MDGs	Millennium Development Goals
MKUKUTA	Mkakati wa Kukuza Uchumi na Kupunguza Umaskini Tanzania
MKUZA	Mpango wa Kukuza Uchumi na Kupunguza Umaskini Zanzibar
MCR	Mark Character Recognition
MSE	Mean Square Error
MTEF	Medium Term Expenditure Framework
NBS	National Bureau of Statistics
NER	Net Enrolment Ratio
NPES	National Poverty Eradication Strategy
NSO	National Statistical Office
NSS	National Statistical System
OCGS	Office of the Chief Government Statistician
OCR	Optical Character Recognition

PES	Post Enumeration Survey
PORALG	President's Office – Regional Administration and Local Government
SNA	System of National Accounts
SPSS	Statistical Package for Social Statistics
STATA	Statistical Software Package
TDHS	Tanzania Demographic and Health Survey
TNADA	Tanzania National Data Archive
TSE	Total Survey Error
TSED	Tanzania Socio-Economic Database
TSMP	Tanzania Statistical Master Plan
TSPA	Tanzania Service Provision Assessment
UN	United Nation
USB	Universal Serial Bus

PREFACE

The National Bureau of Statistics (NBS) as a Government Agency is responsible for production, coordinating, supervision and dissemination of official statistics, and for the custodianship of official statistics in Tanzania. In order to properly perform the activities, the NBS approves statistical work done by MDA's and other organizations in producing guiding documents for use by statistical stakeholders within the National Statistical system. The NBS may in performance of its functions, subcontract other organizations or individuals. The Department of Statistical Methods, Standards and Coordination is responsible for producing guiding documents for use by statistical stakeholders within the National Statistical System (NSS).

Assessing data quality is one of the core aspects of a statistical institution'. Therefore the NBS through its publication of 'Handbook on Quality Guidelines for Statistical Production' provides guidelines for improving data quality within the National Statistical System (NSS). The Publication is within the implementation process of the Tanzania Statistical Master Plan (TSMP). The TSMP, among other tasks, aims at improving the Quality of Data, through strengthening the statistical infrastructure within the National Statistical System as a pre-requisite for producing quality statistics.

The main new feature of the 2015 edition of the 'Handbook on Quality Guidelines for Statistical Production' is the addition of new chapters of Quality Control Supervision Guidelines and Statistical Report Writing Guidelines.

The publication has Five parts: Part One is on General Overview covering Background, Basic Processes of Statistics Production, Data Quality Concepts and Definitions, Part Two is on Quality Framework covering Introduction, Total Survey Error, Fitness for Intended Use and Survey Process Quality, Part Three is on Quality Inputs and Guidelines in Data Production Steps covering Introduction, Survey Coverage and Frames, Sample Design, Questionnaire Design, Translation of Survey Instruments, Interview Methods, Recruitment and Training of Enumerators/Supervisors, Pre-testing, Data Collection, Processing, Statistical Adjustment and Dissemination, Part Four is on Quality Control Supervision Guidelines covering Introduction, Objectives of Quality Control and Quality Control Guidelines, while part Five is on Statistical Report Writing Guidelines covering Introduction, How should a statistical Report be Organized and Detailed Guidelines for use in constructing the Main Body of a Statistical Report.

The NBS tried to make the handbook self explanatory and would like to acknowledge with thanks the helpful suggestions made by many reviewers of the handbook. These comments have been essential in our attempt to continue to improve the handbook.

Dr. Albina A. Chuwa
Director General.

PART ONE

GENERAL OVERVIEW

1.0 Background

The increase in demand for both traditional and development statistics for policy and development agenda has influenced the Government of Tanzania to review NBS's mandate and enable other data producers to facilitate informed decision-making process, through the provision of relevant, timely and reliable user-driven statistical information (*official statistics*). A careful decision has been made on how best to develop quality guidelines for data producers to facilitate the production of official statistics most effectively and efficiently across the whole National Statistical System.

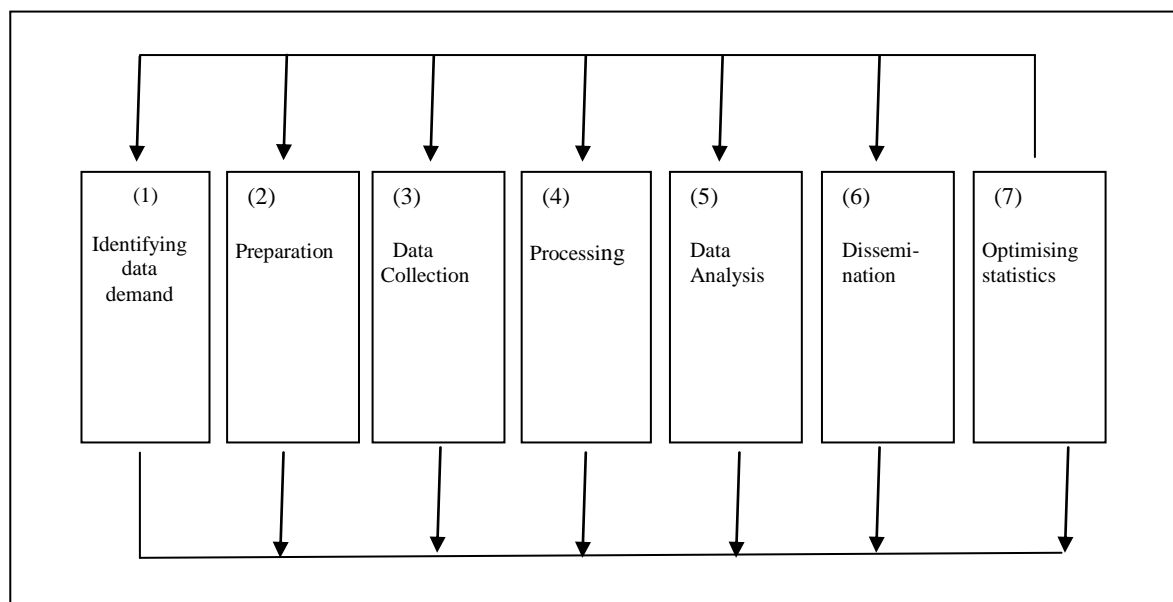
In this regard, the National Bureau of Statistics (NBS) and the Office of the Chief Government Statistician (OCGS) of the Revolutionary Government of Zanzibar, have prepared a Handbook on Quality Guidelines for Statistical Production in Tanzania to be used by all data producers and users. The handbook addresses possible errors produced at all stages of data collection, processing and dissemination with possible measures to be undertaken to minimize them. This initiative is in line with the Tanzania Statistical Master Plan (TSMP) which aims at strengthening the National Statistical System so that quality statistics for decision making are made available objectively, in a coordinated manner, timely and cost effectively.

The main purpose of this handbook is to enhance data quality and efficiency to ensure that the statistics produced by all data producers are relevant, reliable and timely available and easily accessible within the NSS. In the NSS the National Bureau of Statistics is the central institution in Tanzania Mainland while in Tanzania Zanzibar, it is the Office of the Chief Government Statistician. Other key Ministries, Departments and Agencies (MDAs) that collect economic, social, demographic and environment statistics are the Ministries of Local Government; Agriculture, Food Security and Co-operatives; Livestock and Fisheries Development; Finance; Education and Vocational Training; Science and Technology; Labour, Employment and Youth Development; Water and Irrigation and Health and Social Welfare. Key agencies and departments include: Registration Insolvency and Trusteeship Agency; Bank of Tanzania; Tanzania Meteorological Agency; Tanzania Revenue Authority and Tanzania Police Force. Other ministries and institutions also collect, use and provide statistical information and form part of the NSS.

In its statistical operations the NBS has its own guidelines for statistical production. These guidelines cover the following areas: relevance/serviceability, accuracy/reliability, credibility/integrity, timeliness and punctuality, accessibility, interpretability/clarity, coherence/consistence and comparability for indicators as well as methodological soundness. The guidelines also cover coverage and frames, sample design, listing, preparation of survey instruments, translation of survey instruments, interview recruitment and training, pre-testing, data collection, data processing and statistical adjustment and data dissemination.

This document must, therefore be used with professional care and judgment. The guidelines provided in this document are not substitutes for expertise and judgment on the part of survey design staff, the underlying concern for quality must cover all activities. All staff involved in statistical activities are responsible for ensuring that quality has high priority in the design and implementation of statistical methods and procedures under their control.

1.1 Basic Processes of Statistical Production



Source: Quality Standards in German Official Statistics

1.1.1 Identifying Data Demand

This is usually done by establishing a dialogue between data users and data producers who are within and outside the National Statistical System so as to reach a mutual agreement on the way forward. National statistical offices identify emerging data demands through observations and contacts with many institutions and groups that are relevant to society. If such demands cannot be met by means of the existing data, the NBS which is responsible for producing official statistics

must submit proposals as to how the problem might be solved. This often includes conducting a new survey to cover the new data demand depending on the availability of resources.

For example in 1997, when the Government adopted the National Poverty Eradication Strategy (NPES), an idea emerged to have a data collection system for monitoring poverty trends in the country. The aim of the NPES was based on the goals of vision 2025 and took into account the Millennium Development Goals (MDGs) to reduce poverty, hunger, diseases, illiteracy, environmental destruction and put emphasis on empowering vulnerable groups in the country like women, children etc. The monitoring process required relevant data that could be collected, processed and disseminated.

1.1.2 Preparation

Based on the identified data demand, main activities for data collection are prepared. This includes: participating in the development of the legal basis by giving advice and comments, defining the group of respondents and obtaining their consent, confidentiality, scope and coverage, implementing the survey mode and variables in a questionnaire and performing the relevant tests, sample planning, budgeting of resources, selection of the survey method, preparing for data processing, tabulation plan and data analysis as well as dissemination. Conducting stakeholders' meetings/workshops for identifying types of questions needed to capture the required indicators are among initiatives that aimed at minimizing the possibility of collecting irrelevant data.

1.1.3 Data Collection

This phase covers the practical steps of data collection through field work or using administrative data/records, including the technical-organizational preparations like recruiting qualified and well trained data collectors. Thereafter, collection of data is done in accordance with the established data collection instruments such as Computer Assisted Field Editing (CAFE), Computer Assisted Personal Interview (CAPI), questionnaires, instruction manuals and control forms for controlling movements of materials at all stages of the data collection exercise. Data collection is done under close supervision in order to ensure that the survey operation is done properly and the produced statistics are of good quality.

1.1.4 Data Processing

Data processing is done through several stages, starting with manual editing and coding of questionnaires received from respondents, followed by data entry and verification then data validation and updating through relevant computer programs. Due to the emerging modern technology, tablets (CAFE and CAPI) are now used for data capturing and verification. For further processing, the data are brought into a form allowing Electronic Data Processing (EDP) and errors are eliminated through corrections. Plausible data are expanded or weighted in case of sample surveys. Finally, the data are tabulated and made available for further evaluations.

1.1.5 Data Analysis

The main steps in this process are further processing of the statistical results to form overall systems, documenting the surveys and their data quality, as well as analysing and interpreting the data. This must be done by ensuring that socio-economic indicators such as Gross National/Domestic Products, Consumer Price Indices and Net Enrolment Ratios which are useful for measuring development outcomes are revealed.

1.1.6 Dissemination

Dissemination of statistical information is the last step after the collection and analysis activities in order to ensure that the produced statistics are used for planning and decision making processes at different administrative levels from national, regional, district and down to lower administrative levels such as wards and villages. Statistical information is disseminated to stakeholders in various forms of publications including hard copies, soft copies, in discs and by posting on the websites. In order for the results to be user-friendly, charts, tables and relevant attachments are normally included. Dissemination is normally based on marketing concepts of the statistical offices. Depending on customer interest, and in line with the marketing model, the statistical information is offered as free basic provision, as standard products or as customer-specific requirements.

1.1.7 Optimizing Statistics

Main goal is the continuous improvement of data quality and an increase in efficiency by continuously analysing and improving all the above-mentioned work processes and their results. This is usually done in order to achieve both the value for the resources spent in producing the statistics and customer satisfaction i.e getting value for money. In addition to that, quality statistics are essential for making both evidence based plans and results oriented decisions.

1.2 Quality Concepts and Definitions in Statistics

The quality of statistical data is assessed by means of a whole set of quality criteria such as relevance, accuracy, reliability, timeliness, punctuality, accessibility, clarity, interpretability, coherence, comparability, credibility, integrity, methodological soundness, and serviceability. These have been used by many statistical agencies and organizations in defining quality though the criteria may slightly differ within the agencies/institutions.

1.2.1 Relevance/Serviceability

1.2.1.1 Relevance

The relevance of statistical information reflects the degree to which it meets the actual needs of clients. It is concerned with whether the available information sheds light on the issues that are important to users. Assessing relevance is subjective and depends upon the varying needs of users. The statistical producers' challenge is to weigh and balance the conflicting needs of the current and potential users to produce a program that goes as far as possible in satisfying the most important needs within the given resource constraints.

1.2.1.2 Serviceability

Another area of concern for users is whether the data that are produced and disseminated are actually useful. This dimension of quality relates to the need to ensure that data are produced and disseminated in a timely fashion, with an appropriate periodicity, provide relevant information on the subject matter, is consistent internally and with other related datasets, and follow a clear revisions policy.

1.2.2 Accuracy/Reliability

1.2.2.1 Accuracy

The accuracy of statistical information is the degree to which the information correctly describes the phenomena it was designed to measure. It is usually characterized in terms of error in statistical estimates and is traditionally decomposed into bias (systematic error) and variance (random error) components. It may also be described in terms of the major sources of error that potentially cause inaccuracy (e.g. coverage, sampling, non response and response errors.)

1.2.2.2 Reliability

Reliability of statistical information refers to the closeness of the initial estimated value to the subsequent estimated value. Studies should always be undertaken to make this assessment. If the initial estimate shows consistent higher or lower estimates than the subsequent estimates, then there may be evidence of bias in the initial estimates. If the differences are random, but large, then consideration should be given to reassessing the timeliness/reliability trade-off that has been adopted

1.2.3 Timeliness and Punctuality

1.2.3.1 Timeliness

Describes the length of time between data availability and the event or phenomenon they describe.

1.2.3.2 Punctuality

Punctuality of statistical information refers to the time lag between the actual delivery of the data and the target date when it should have been delivered. This concept is linked to that of "timeliness". A statistical release can be punctual, i.e. released on the scheduled release date, but still be untimely if the release date is so far away from the reference period as to degrade their value of decision-making.

1.2.4 Accessibility

The accessibility of statistical information refers to the ease with which it can be obtained from the statistical producers. This includes the ease with which the existence of information can be ascertained, as well as the suitability of the form or medium through which the information can be accessed. The cost of the information may also be an aspect of accessibility to some users.

1.2.5 Interpretability/Clarity

1.2.5.1 Interpretability

The interpretability of statistical information reflects the availability of the supplementary information and metadata necessary to interpret and utilize it appropriately. This information normally includes the underlying concepts, variables and classifications, the methodology of data collection and processing, and the indication or measures of the accuracy of the statistical information.

1.2.5.2 Clarity

The clarity of statistical information refers to the data's information environment whether data are accompanied with appropriate documentation and metadata, illustrations such as graphs and maps, whether information on their quality is also available (including limitation in use etc.) and the extent to which additional assistance is provided to users by data providers.

1.2.6 Coherence/Consistency

1.2.6.1 Coherence

The coherence of statistical information reflects the degree to which it can be successfully brought together with other statistical information within a broad analytic framework and over time. The use of standard concepts, classifications and target populations promotes coherence, as does the use of common methodology across statistical productions. Coherence does not necessarily imply full numerical consistency.

1.2.6.2 Consistency

Desired property of behaviors as the number of items in the data set to which they are applied increases indefinitely.

1.2.7 Comparability

Comparability of statistical information is the ability to compare statistics on the same characteristics between different points in time, geographical areas or statistical domains.

It aims at measuring the impact of differences in applied statistical concepts and measurement tools/procedures when statistics are compared between geographical areas, non-geographical domains, or over time. It is the extent to which differences between statistics are attributed to differences between the true values of the statistical characteristic.

There are three main approaches under which comparability of statistics is normally addressed: comparability over time, between geographical areas, and between domains.

1.2.8 Credibility/Integrity

1.2.8.1 Credibility

Credibility of statistical information refers to the confidence that users place in statistical products based simply on their image of the data producer, the statistical authority i.e., the brand image. Credibility depends upon the extent to which data are perceived to be produced professionally in accordance with appropriate statistical standards with transparent policies and practices. Where

lacking, doubts may arise in the minds of the users about the quality of the statistics being produced by the authority.

1.2.8.2 Integrity

The integrity of statistical information refers to values and related practices that maintain users' confidence in the agency producing statistics and ultimately in the statistical product. This includes the need for the statistical system to be based on the United Nations (UN) principles of official statistics and includes principles of objectivity in collection, compilation and dissemination of data to ensure unbiased statistics which are not subject to confidentiality breaches or premature releases.

1.2.9 Methodological Soundness

It refers to the application of international, national, or peer-agreed standards, guidelines, and practices to produce statistical outputs. Application of such standards fosters national and international comparability.

These quality criteria are overlapping and interrelated. There is no general model that brings them together to optimize a level of quality. Achieving an acceptable level of quality is the result of addressing, managing and balancing these elements of quality over time with careful attention to cost, respondent burden, professionalism and design constraints that may affect information quality or user expectations. This balance is a critical aspect of the design of the statistical productions.

PART TWO

QUALITY FRAMEWORK

2.0 Introduction

The quality framework is for assuring and assessing quality. It highlights three aspects of quality: total survey error, fitness for intended use and survey process quality, followed by guidelines for managing and assessing quality throughout the statistical production lifecycle.

2.1 Total Survey Error

The total survey error (TSE) paradigm is widely accepted as a conceptual framework for evaluating survey data quality. It defines quality as the estimation and reduction of the mean square error (MSE) of statistics of interest, which is the sum of random errors (variance) and squared systematic errors (bias). TSE takes into consideration both measurement (construct validity, measurement error, and processing error) i.e., how well survey questions measure the constructs of interest and representation (coverage error, sampling error, non response error and adjustment error) i.e., whether one can generalize to the target population using sample survey data. In the TSE perspective, there may be cost-error trade-offs, that is, there may be a tension between reducing these errors and the cost of reducing them. In this framework, TSE may be viewed as being covered by the accuracy dimension.

2.2 Fitness for Intended Use

This is a more modern paradigm, it is multidimensional and focuses on criteria for assessing quality in terms of the degree to which survey data meet user requirements. By focusing on fitness for the intended use, study design strives to meet user requirements in terms of survey data accuracy and other dimensions of quality (such as comparability and timeliness). In this perspective, ensuring quality on one dimension (comparability) may conflict with ensuring quality on another dimension (timeliness); and there may be conflict between meeting user requirements and the associated cost of doing so on one or more dimensions.

Dimensions of quality that are often used to assess the quality of national official statistics in terms of both survey error and fitness for the intended use are illustrated below showing the indicators of quality and the guidelines related to these dimensions.

2.2.1 Relevance/Serviceability

The produced statistical data should be valuable inputs that can fulfill the needs of the clients or users. For example, a dataset for trends in age-specific fertility rates derived from Tanzania Demographic and Health Surveys (TDHS) is relevant to the Ministry of Education for the projections of number of pupils expected to start primary education at a certain period of time.

2.2.1.1 Indicators for Relevance/Serviceability

2.2.1.1.1 Description of clients and users of data

This indicator identifies data producers and users. How relevant the information/statistics are to the clients, and whether the available information/statistics derived from various sources related to statistical production are important to users and whether they meet client's needs.

2.2.1.1.2 Description of users' needs (by main groups)

This indicator describes the needs of the users by categorizing their groups, with regards to the available information/statistics derived from various sources related to statistical production.

2.2.1.1.3 Assessment of user satisfaction

The indicator evaluates the level of customer satisfaction through Customer Satisfaction Index (CSI) related to the importance of the derived data.

2.2.1.1.4 Conformity of the data with relevant international standards

The indicator evaluates whether the produced statistics observe the international standard such as System of National Accounts (SNA), International Standard of Industrial Classification (ISIC), Central Product Classification (CPC) and Classification of Individual Consumption by Purpose (COICOP).

2.2.1.1.5 Rate of available statistics

The indicator measures the rate of the available statistics in relation to the user needs. It allows the user to know exactly the kind of data that is available and that is not available.

2.2.1.2 Guidelines

- 2.2.1.2.1 Goals and objectives of statistical production should be clearly stated.
- 2.2.1.2.2 While designing the questionnaire, ensure that all survey questions are relevant to the statistical production objectives.
- 2.2.1.2.3 Construct a data file with a data dictionary of all variables in the selected elements data file, with all variable names and accompanying descriptions which are relevant to the statistical production objectives.

2.2.2 Accuracy/Reliability

The accuracy of data products is the degree to which the data correctly estimate or describe the quantities or characteristics they are designed to measure. Accuracy refers to the closeness between the values provided and the (unknown) true values. This can be assessed in terms of Mean Square Error (MSE).

2.2.2.1 Indicators for Accuracy/Reliability

2.2.2.1.1 Sampling errors

Sampling errors are mainly related to;

- (i) Type of sample design (stratified, clustered, etc)
- (ii) Sampling unit at each stage of sampling - sampling unit to be defined at the beginning of the report
- (iii) Stratification and sub-stratification criteria
- (iv) Selection schemes
- (v) Sample distribution over time
- (vi) The effective sample size
- (vii) Coefficient of variation of estimates and a description of the method used to compute them (including software)
- (viii) An assessment of resulting bias due to the estimation method
- (ix) Imputation rate and ratio

2.2.2.1.2 Measurement errors

Measurement errors are associated with;

- (i) A description of the methods used to assess measurement errors (any field tests, re interviews, split sample experiments, or cognitive laboratory results, etc)
- (ii) A description of the methods used to reduce measurement errors
- (iii) Average time used to interview one person
- (iv) An assessment of the effect of measurement errors on accuracy

2.2.2.1.3 Processing errors

These are mainly caused by instruments or human error; and may be associated with;

- (i) A description of the methods used to reduce processing errors
- (ii) A description of the editing systems
- (iii) The rate of failed edits for specific variables
- (iv) The error rate of coding for specific variables and a description of the methodology followed for their estimation
- (v) A description of confidentiality rules and the amount of data affected by confidentiality treatment

2.2.2.1.4 Coverage errors

Coverage errors are mainly dependent on;

- (i) A description of the sampling frame (e.g. intended household is collective instead of individual)
- (ii) Rates of over- coverage, under-coverage and mis-classification broken down according to the sampling stratification
- (iii) A description of the main mis-classification and under- and over- coverage problems encountered in collecting the data
- (iv) A description of the methods used to process the coverage deficiencies

2.2.2.1.5 Response and Non response errors

Response and Non response errors are mainly dependent on;

- (i) Unit non response rate
- (ii) Identification and description of the main reasons for non response (e.g. non-contact, refusal, unable to respond, non-eligible, other reasons)
- (iii) A description of the data collection method used
- (iv) Item non response rates for variables

- (v) A description of the methods used for imputation and/or weighting for non-response
- (vi) Variance change due to imputation
- (vii) An assessment of resulting bias due to non-response
- (viii) Rates of invalid or uncodable responses

2.2.2.2 Guidelines

2.2.2.2.1 Pre-test all the versions of the survey instruments to ensure that they adequately convey the intended research questions and measure the intended attitudes, values, reported facts and /or behaviours.

2.2.2.2.2 In order to reliably project from the sample to the larger population with known levels of certainty/precision, use probability sampling.

2.2.2.2.3 Provide a report on each variable in the dataset of the selected elements to check the correct overall sample size and within the stratum sample size, distribution of the sample elements by other specific groups such as census enumeration areas, extreme values, nonsensical values, and missing data.

2.2.2.2.4 If possible, assess accuracy by looking at the differences between the study estimates and any available true standard values.

2.2.3 Credibility/Integrity

The *credibility* of data products refers to the confidence that users place on those products based simply on the image of the data producer, *i.e.*, the brand image. Confidence by users is built over time. One important aspect is trust in the objectivity of the data. This implies that the data are perceived to be produced professionally in accordance with appropriate statistical standards, and that policies and practices are transparent.

Integrity refers to the description of the policy on the availability of the terms and conditions under which statistics are collected, processed, and disseminated. It also describes the policy of providing advanced notice of major changes in methodology, source data, and statistical techniques; the policy on internal governmental access to statistics prior to their release; the policy on statistical products' identification.

2.2.3.1 Indicators of Credibility/Integrity

- 2.2.3.1.1 Statistics are produced on an impartial and independent basis i.e Statistics are produced without any bias or external pressure.
- 2.2.3.1.2 The appropriate statistical entity is entitled to comment on erroneous interpretation and misuse of statistics.
- 2.2.3.1.3 Observing international statistical standards and classification.
- 2.2.3.1.4 Evaluating the transparency of procedures used for producing statistics.
- 2.2.3.1.5 The terms and conditions under which statistics are collected, processed, and disseminated are available to the public.
- 2.2.3.1.6 Products of statistical agencies/units are clearly identified as such. The indicator will intend to establish the number of statistical products produced by statistics officer and other statistics stakeholders.
- 2.2.3.1.7 Advanced notice is given of major changes in methodology, source of data and statistical techniques. This indicator will ensure credibility of the produced statistics to the stakeholders.
- 2.2.3.1.8 Professionalism of the data provider. This indicator evaluates whether the data provider/producer have the required qualifications.
- 2.2.3.1.9 Assessing how scientific principles and professional ethics are implemented and how political pressures are managed.

2.2.3.2 Guidelines

- 2.2.3.2.1 The statistical agencies need to decide according to strict professional considerations, including scientific principles and professional ethics, on the methods and procedures for the collection, processing, storage and presentation of statistical data.

2.2.4 Timeliness and Punctuality

The timeliness of data products reflects the length of time between their availability and the event or phenomenon they describe. This indicates how timely the outputs are, as the frequency of publication indicates whether the outputs are up to date with respect to users' needs.

The quality of timeliness and punctuality are supposed to be observed at all stages of data production and dissemination. Experience has shown that, most of data production in the NSS follows accepted work plans which explain time to be taken by each activity. For example, time for designing instruments, dispatching and receiving dates of instruments, time for data processing, analysis and reporting; and date and time for dissemination. It is through this scenario, data producer can decide to measure the timeliness and punctuality based on the type of data production by selecting indicators elaborated below:

2.2.4.1 Indicators of Timeliness and Punctuality

2.2.4.1.1 The legal deadline imposed on respondents

This is an indicator which measures time set for a respondent to answer questions or reply to data producer based on the type of assignment.

2.2.4.1.2 The date instruments i.e. questionnaires were dispatched

This is an indicator used by data producers to monitor movement of instruments from the centre to the outreach offices or sub- locations or field.

2.2.4.1.3 Starting and finishing dates of fieldwork

This is a life span indicator which measures duration set for starting and finishing of data collection exercise either from the field or office. For example, if time set for data collection is one month, then, data quality assurance team should observe whether fieldwork is completed within or beyond a month.

2.2.4.1.4 Starting and finishing dates of data processing

This is also a life span indicator which measures duration set for starting and finishing of data processing exercise including data entry, editing and processing. For example, if time set for data processing is six months, then, data quality assurance team should observe if time period was correctly observed.

2.2.4.1.5 Dates for preliminary and final results computed and disseminated

This is an indicator which sets dates for the release of preliminary and final computed results to the public. This indicator depends on the completion of prior activities including field-work and data processing exercises. For example, if data is disseminated later than required by the regulation or contract, the average delay in days or months in the transmission of results with reference to the legal deadline violates the quality of timeliness and punctuality.

2.2.4.2 Guidelines

It is important to note that, timeliness and punctuality is a qualitative indicator which depends on the availability of other factors including resources in terms of human, financial and infrastructure to be used in data production process. It is advised that data producers should not be over ambitious in setting time for each activity at the planning stage in order to reduce bias. For example, data producer should be careful in setting:

- 2.2.4.2.1 Time for each activity should also be set by observing external factors which may hinder its performance properly; and
- 2.2.4.2.2 Data producer should create a study timeline, production milestones, and deliverables with due dates.

2.2.5 Accessibility

This is the ability to retrieve data for the benefit of as many users as possible. The accessibility of data products reflects how readily the data can be located and accessed from data providers. Very often, collection of data consumes a lot of financial and human resources; therefore, they should not be locked in cabinets. Data must be made available in hard copies and soft copies through various media such as libraries, CD Rom, websites and even e-mailing to regular users.

2.2.5.1 Indicators of Accessibility

- 2.2.5.1.1 Description of how to locate and access publications based on analysis of the data (the media of dissemination,). The storing of data in a systematic and classified order indicating the subject and time series the data covers. The system can be used for easy access of data by users in a library, website etc.

- 2.2.5.1.2 Information on what results are sent to the reporting units included in the survey.

This is the set of results sent to units that supply the data for a given survey. It is a feedback that creates trust between the data collector and supplier which is important as it creates the two way information traffic.

2.2.5.1.3 Information on the dissemination scheme of the results.

This is the policy statement indicating the set of data and time it is to be made available and accessible to users. It is important for data producers to make data available as per the dissemination scheme in order to create trust among the users. If the dissemination time -table is not adhered to, then, users lose trust on the data and sometimes when data are made available and accessible they may be obsolete. Therefore, the data will be useless irrespective of how much resources were spent in their collection. An example of the dissemination time-table is the Tanzania Master Plan Release Calendar.

2.2.5.1.4 A list of variables required but not available for reporting.

This is the list of attributes or quantitative values required by data users which is not available for reporting. Attributes can be Identification Number, Establishment ID while quantitative value is expressed in numeric value.

2.2.5.1.5 Reasons why variables are not available.

Reasons of why variables are not available for reporting include; the anonymity for individual data sets based on professional ethical principles for protecting privacy and maintaining confidentiality. A good example is the NBS confidentiality on individual entity data sets. Other reasons could be that the information is not collected due to budgetary constraints.

2.2.5.1.6 Suitability of the format in which the data are available. The disseminated results should be in a format that is easy for the data users to understand and retrieve.

2.2.5.2 Guidelines

2.2.5.2.1 Save all data files and computer syntax in different statistical software packages during sample design and data processing in safe and well labeled folders for future reference and use.

2.2.5.2.2 Establish procedures early in the survey lifecycle to ensure that all important files are preserved.

2.2.5.2.3 Test the archived files periodically to verify user accessibility.

2. 2.5.2.4 Create electronic versions of all project materials on a regular basis at each stage of statistical production.

2.2.5.2.5 Produce and implement procedures to distribute restricted use files, if applicable. (Removing identifiers, off-setting GPS coordinates, etc)

2.2.6 Interpretability/Clarity

The *interpretability* of data products reflects the ease with which the user may understand and properly use and analyse the data. The process of data collection and subsequent processing should have an impact to the measure of accuracy that is being represented. The information collected often includes underlying concepts, variables and classification on how it is to be used. The interpretability of data is directly related to its availability to be aggregated with other pieces of information necessary to interpret it appropriately such as *metadata* and *paradata*.

Clarity measures how easy it is to understand the reports. They are written to be free from jargon, easy to read, and for all tables, graphs and illustrations to be clearly labeled. All staff involved in producing statistical publications are suitably trained and qualified in statistical processes, methods, report writing and presentation skills to ensure that statistical reports are written in a clear and intelligible manner.

Metadata is defined as data providing information about one or more aspects of the data while *paradata* are data about the process by which the survey data were collected. For example, *paradata* topics about a survey include the time of day interviews that were conducted, how long the interviews took, how many times there were contacts with each interviewee or attempts to contact the interviewee, the reluctance of the interviewee, and the mode of communication (such as phone, Web, email, or in person).

2.2.6.1 Indicator of Interpretability/Clarity

2.2.6.1.1 A copy of methodological documents (sampling design, classifications, instructions manual, codebook) relating to the statistics provided

2.2.6.1.2 A metadata embedded with the data file may include the information on means of creation of the data, purpose of data, time and date of creation and location on a computer network.

2.2.6.1.3 A paradata document shows how each observation in the survey affect the costs and management of a survey, the findings of a survey, evaluations of interviewers, and inferences one might make about non-respondents. Sometimes *paradata* is called "administrative data about the survey".

2.2.6.1.4 Visualization tools are among the most effective instruments to display development indicators through graphs and charts. It is a visual display of data which makes comparisons easier and promotes a better understanding of trends, such as the use of bubble diagrams and flow charts.

2.2.6.2 Guidelines

2.2.6.2.1 At the data processing stage of the study, create a codebook that provides question- level metadata matched to variables in the dataset. Metadata include variable names, labels, and data types as well as basic study documentation, question text, universes (the characteristics of respondents who were asked the question) of the number of respondents who answered the question, and response frequencies.

2.2.6.2.2 Make available the system that stores all the necessary information collected during data collection.

2.2.7 Coherence/Consistence

The coherence of data products reflects the degree to which they are logically connected and mutually consistent. The quality of coherence ensures that, data can be combined with other statistical information for various secondary purposes. It further ensures that data is consistent over time, within the dataset, across datasets, and across different frequencies for the same dataset and furthermore enable international comparisons to be drawn. Two or more different statistical datasets can be used together for measuring and or determining some other statistical information, e.g. GDP with the economic growth; GDP with population growth rate, inflation rate which determines people's purchasing power and their economic welfare, etc.

Therefore, this ensures that the combined data together with other statistical information can be used in various secondary purposes.

2.2.7.1 Indicators of Coherence/Consistence

2.2.7.1.1 A description of every pair of statistics (statistical unit, indicator, domain, and breakdown) for the survey(s) that should be coherent.

2.2.7.1.2 A description of any of the differences that are not fully explained by the accuracy component.

2.2.7.1.3 A description of the reported lack of coherence, for specific statistics.

2.2.7.2 Guidelines

2.2.7.2.1 Create a clear, concise description of all survey implementation procedures to assist secondary users.

2.2.7.2.2 Provide data files in all the major statistical software packages and test all thoroughly before they are made available for dissemination.

2.2.7.2.3 Designate resources to provide user support and training for secondary researchers.

2.2.8 Comparability

The observed data from different geographical locations of the same dimension can be compared with other data-sets, if at all they explain the same phenomenon, e.g. Inflation Rate of Tanzania can be compared with those of other East African countries or even beyond the African boundaries, as stated in one of the SNA objectives. This will ensure, as much as possible, that the same statistical data from different sources or different geographical locations are comparable.

2.2.8.1 Indicators of Comparability

2.2.8.1.1 Time (temporal)

- (i) The differences, if any, in concepts and methods of measurement between last and previous reference periods.
- (ii) A description of the differences, including an assessment of their effect on the estimates.

2.2.8.1.2 Geographical (special)

- (i) All differences between local practices and national standards (if such standards exist)
- (ii) An assessment of the effect of each reported difference on the estimates

2.2.8.1.3 Domains

- (i) A description of the differences in concepts and methods across cross-cultural surveys (e.g., in classifications, statistical methodology, statistical population, methods of data manipulation, etc.)
- (ii) An assessment of the magnitude of the effect of each difference.

2.2.8.2 Guidelines

2.2.8.2.1 Define comparable target populations and verify that the sampling frames provide adequate coverage to enable the desired level of generalization.

2.2.8.2.2 Minimize the amount of measurement error attributable to survey instrument design, including error resulting from context effects.

2.2.8.2.3 Minimize or account for the impact of language differences resulting from potential translations.

2.2.8.2.4 Minimize the effect interviewer attributes have on the data through appropriate recruitment, selection, and case assignment; minimize the effect that interviewer behavior has on the data through formal training.

2.2.8.2.5 Identify potential sources of unexpected error by implementing pretests of translated instruments.

2.2.8.2.6 Reduce the error associated with non-response as much as possible.

2.2.8.2.7 Minimize the effect that coder error has on the data through appropriate coder training.

2.2.8.2.8 Provide variables definitions to minimize comparability of incomparable variables.

2.2.9 Methodological Soundness

The extent to which the methodology used to compile statistics complies with the relevant international and national standards, agreed standards, guidelines or best practice including the professional standards enshrined in the Fundamental Principles for Official Statistics.

2.2.9.1 Indicators of Methodological Soundness

2.2.9.1.1 The methodological framework for statistics complies with internationally agreed standards, guidelines and best practices.

2.2.9.1.2 The conceptual and methodological framework applied to statistics is developed in agreement with the statistical functions of other international organisations, and takes account of the views of data users.

2.2.9.1.3 The processes used for the development, collection, compilation and production of statistics are well documented and regularly reviewed to assess their efficiency and effectiveness.

2.2.9.2 Guidelines

2.2.9.2.1 Staff participates in training courses, conferences and international meetings to the extent necessary to keep their methodological knowledge up to date.

2.2.9.2.2 Major innovations in statistical processes or information technology are introduced in all steps of the production and dissemination of statistics.

2.3 Survey Process Quality Management

This approach focuses on quality at three levels; the organization, the process and the product. Quality products cannot be produced without quality processes, and having quality processes requires an organization that manages for quality. A focus on the survey process quality is to ensure the quality of survey production processes and consequently the survey data throughout the statistical production lifecycle, as well as a clear and comprehensive documentation of study methodology and to provide indicators of the process and data quality.

The following procedures for Survey Process Quality Management are used to assess the quality of processes throughout the statistical production lifecycle.

2.3.1 Develop a Sustainable Quality Management Plan

2.3.1.1 Rationale

- 2.3.1.1.1 Developing planned, systematic quality assurance and quality control activities helps to ensure that the study and survey data meet the client or user requirements. It also facilitates development of a quality profile or quality report, which documents survey methodology, key indicators of quality, lessons learned, and recommendations for improvement.

2.3.1.2 Procedural Steps

- 2.3.1.2.1 Review the existing quality profiles and lessons learned from other studies. Use the standardized quality profiles and protocols to establish sustainable quality management.
- 2.3.1.2.2 Review the study requirements for quality assurance and quality control. These may be developed at the study design stage by the survey organization.
- 2.3.1.2.3 Review the study goals and objectives, required products and deliverables, study timeline and budget.
- 2.3.1.2.4 Through analysis of the process in the statistical production lifecycle (process analysis), identify characteristics of survey products (e.g. coded data) that could vary during the process (e.g. verification failures). For example,
- (i) Use tools to analyze a process, to determine what steps in the process need to be monitored to ensure quality, and to identify quality indicators to monitor.
 - (ii) Identify key indicators of the quality of the process products in terms of TSE and other dimensions of quality, as well as factors such as cost, burden, and the risk of not meeting quality requirements.
 - (iii) Define measurement and reporting requirements for use during quality assurance and quality control, and determine who would be responsible for ensuring that quality assurance and quality control activities are carried out.

- (iv) Assess whether the requirements can be met through the current procedures and system and with currently collected data and if not, develop a process improvement plan.
- (v) Create cost and error trade-off decision rules about how to alter the features of the study design if the goals are not met.

2.3.1.2.5 Use quality planning tools to help determine what performance analyses and assessments should be used. For example,

- (i) A cost-benefit analysis of potential quality management procedures and activities; that is, evaluating their benefits in relation to the cost of performing them relative to the overall study costs.
- (ii) Benchmarking, that is, comparing planned activities against those of similar studies, and the outcomes of those activities, to form a basis for performance measurement.
- (iii) Statistical analysis of factors that may influence indicators of the process or product quality.

2.3.1.2.6 Develop a quality assurance plan, which could include:

- (i) The process improvement plan.
- (ii) Performance and product quality baselines.
- (iii) Process checklists.
- (iv) A training plan.
- (v) Recommended performance analyses and assessments, for example quality assurance procedures for verifying interviews and evaluating interviewer performance (PES).

2.3.1.2.7 Develop a plan for continuous monitoring of processes to ensure that they are stable and that products are meeting the requirements (Quality Control). Such a plan could include:

- (i) The process improvement plan.
- (ii) Performance and product quality baseline.
- (iii) Quality indicators identified in the process of analysis and planning for the design.
- (iv) Performance analyses and assessments to monitor the process.

- (v) Tools to monitor the process and product quality, e.g. statistical process control charts.
- (vi) Reports to prepare performance measurement, such as interviewer training certification.

2.3.1.2.8 Develop procedures to ensure that throughout the statistical production lifecycle, all documentation, reports and files related to quality planning and assurance, quality monitoring and control, and process improvement are retained.

2.3.1.2.9 Develop procedures for updating the quality management plan as needed during the statistical production lifecycle.

2.3.2 Perform Quality Assurance Activities

2.3.2.1 Rationale

Quality assurance is the planned procedures and activities an organization uses to ensure that the study meets the process and product quality requirements. It specifies ways in which quality can be measured.

2.3.2.2 Procedural Steps

2.3.2.2.1 Perform quality assurance activities as outlined in the quality management plan.

2.3.2.2.2 Carry out performance and product quality assessments. For example:

- (i) Certification of interviewers after training (e.g. rate of certification and rate of certification after follow-up training) that is, based on evaluation of interviews, determination that the interviewer is ready to work on the study.
- (ii) Verification of coded questionnaires (rate of verification failures).

2.3.2.2.3 Generate indicators of quality for each assessment, based on baselines established in quality planning, and create reports on performance and quality assessments, which can be used for both quality monitoring and control.

2.3.2.2.4 Provide documentation for:

- (i) Performance and quality assessments
- (ii) Recommended corrective actions and corrective actions taken
- (iii) Changes to quality assurance plan.

2.3.3 Perform Quality Control Activities

2.3.3.1 Rationale

Quality control is the planned system of process monitoring, verification and analysis of indicators of quality, and updates to quality assurance procedures, to ensure that quality assurance works.

2.3.3.2 Procedural Steps

2.3.3.2.1 Perform quality monitoring and control activities as outlined in the quality management plan, such as:

- (i) Monitor the process of quality indicators
- (ii) Analyze and report on the results of quality assurance activities such as interviewer training certification, data entry verification and checking that a process met the specifications.

2.3.3.2.2 Determine whether there is a need to:

- (i) Recommend corrective actions
- (ii) Modify the process improvement plan
- (iii) Modify the quality management plan

2.3.3.2.3 Provide documentation for:

- (i) Performance and quality assessments
- (ii) Recommended corrective actions and corrective actions taken
- (iii) Changes to the quality management and quality assurance plans

2.3.4 Create a Quality Profile

2.3.4.1 Rationale

A quality profile (quality report) combines information from other sources, documenting survey methodology used throughout the statistical production lifecycle, providing indicators of the process and data quality, lessons learned and recommendations for improvement. It provides to the user all the information available to help assess data quality in terms of fitness for the intended use and total survey error.

2.3.4.2 Procedural Steps

2.3.4.2.1 Document all relevant aspects used for key stages or processes in the statistical production. For example, for sample design, this would include:

- (i) Time dimension of the design
- (ii) Target and survey population definitions, including inclusion/exclusion criteria
- (iii) Sampling frame descriptions
- (iv) Maps and protocol used in field listing
- (v) Description of all stages of selection, including sample sizes, stratification, clustering and number of replicates fielded at each stage
- (vi) Documentation of procedures to determine probabilities of selection and weights for each stage of selection
- (vii) Tables of the precision of the estimates of key survey statistics

For Each documented process should include:

- (i) Quality assurance procedures
- (ii) Quality control procedures
- (iii) Corrective actions taken

2.3.4.2.2 Document lessons learned and make recommendations for improvement in studies of the same design, and if possible, make recommendations for methodological research that could inform design of similar studies in the future.

PART THREE

QUALITY INPUTS AND GUIDELINES IN DATA PRODUCTION STEPS

3.0 Introduction

This section brings together guidelines and checklists on major issues that need to be considered in the pursuit of quality objectives in the execution of statistical activities. Its focus is on how to assure quality through effective and appropriate design and implementation of a statistical programme from inception through data evaluation, documentation and dissemination. It is organized in sub-sections that correspond to the main activities of a typical survey. All the sub-sections follow the same structure, describing the inputs, guidelines and quality indicators related to each activity.

Guidelines

These are known good practices that have evolved in the design and implementation of statistical surveys. The quality guidelines for statistical processes aim at describing the principles to be followed when planning, running and assessing a statistical process, as well as at illustrating quality requirements of statistics. However, not all of these guidelines can be applied to every statistical production. The guidelines provide checklists to aid survey designs.

Quality indicators

These consist of information which is a by-product of the statistical process. They do not measure quality directly but can provide enough information to offer valuable insight into quality. It will be of interest to directors, statistical production managers and data users, who will use the indicators to assess and compare the quality of various statistical products. It will also provide a basis to directors and managers of different program areas for monitoring performance in terms of quality of the processes and products in the program areas.

3.1 Coverage and Frames

Requirement: The survey population should be reasonably consistent with the target population in order for the survey results to be relevant.

Coverage is the completeness of the information for the target population that would be derived if all the frame units were to be surveyed. The frame should conform to the survey population and should contain minimum under-coverage and over-coverage. Frame data should be up-to-date and

accurate because of their use in stratification, sample selection, collection follow-up, data processing, imputation, estimation, quality assessment and analysis.

3.1.1 Quality Inputs

- 3.1.1.1 Define the target and survey population
- 3.1.1.2 Description of the frame and its coverage errors

3.1.2 Guidelines

- 3.1.2.1 Frames should be tested at the planning stage of a survey for their suitability and quality, assess the coverage of the frame and of the target collection units.
- 3.1.2.2 Ensure that the frame is as up to date as possible relative to the reference period for the statistical production.
- 3.1.2.3 Where possible, use the same frame for surveys with the same target population to avoid inconsistencies, to facilitate combining estimates from the surveys and to reduce costs of frame maintenance and evaluation.
- 3.1.2.4 Implement survey procedures to detect and correct coverage errors from the frame, provide feedback to up-date and maintain the frame.
- 3.1.2.5 Monitor the frame between the time of sample selection and the survey reference period.
- 3.1.2.6 Implement training and procedures for data collection and data processing staff aimed at minimizing coverage error.
- 3.1.2.7 Minimize frame errors through effective training of staff, putting emphasis on the importance of coverage, and the implementation of quality assurance procedures of frame and related activities.
- 3.1.2.8 Implement procedures to detect and minimize errors of omission and mis-classification that can result into under-coverage, and to detect and correct errors of mistaken inclusion and duplication resulting into over-coverage.
- 3.1.2.9 Monitor the frame quality by periodically assessing its coverage and the quality of the information on the characteristics of the units.

3.1.3 Quality Dimension and Indicators

The quality dimension is *accuracy* in terms of coverage error and *relevance*.

3.2 Sample Design

Requirement: In each survey, to select an optimal, cost-efficient probability sample that is representative of the target population and allows users to make inferences to the target population, and to standardize sample designs without hampering optimal designs.

3.2.1 Quality Inputs

- 3.2.1.1 Target and survey population description.
- 3.2.1.2 Sampling frame definitions, including definitions of strata and sampling units, and any up-dating of the frame that was needed.
- 3.2.1.3 Desired level of overall precision and for specific sub-groups.
- 3.2.1.4 Sample size based on specified levels of precision.
- 3.2.1.5 Selection procedure(s) and estimates of probabilities of selection at each stage.
- 3.2.1.6 Field listing standard procedures and minimum requirements of field listers.
- 3.2.1.7 Unique, sample identification codes for each selected sampling unit.

3.2.2 Guidelines

- 3.2.2.1 When determining the sample size, take into account the required levels of precision needed for the survey estimates, the type of design and estimators to be used, the availability of auxiliary information, budgetary constraints as well as both sampling and non-sampling factors.
- 3.2.2.2 Alter the survey design during data collection to minimize costs and errors.
- 3.2.2.3 For longitudinal panel surveys, determine its duration in the sample by balancing the need for duration data with sample attrition and conditioning effects.

- 3.2.2.4 For periodic surveys, develop procedures to monitor the quality of the sample design over time. Set up an up-to-date strategy for selective redesign of the strata that have suffered serious deterioration.
- 3.2.2.5 For periodic surveys, make the design as flexible as possible to deal with future changes such as increases or decreases in sample size, re-stratification, re-sampling and updating of selection probabilities.
- 3.2.2.6 Establish an expected response rate using a pre-test or data from previous occasions of the same or similar surveys, which can in turn be used in sample size determination.

3.2.3 Quality Dimension and Indicators

The quality dimension is *accuracy* in terms of coverage error and sampling error as described previously.

3.3 Listing

Requirement: The listing of households for each cluster is used in selecting the final sample of households to be included in the survey.

3.3.1 Quality Inputs

- 3.3.1.1 Recruitment and training timeline
- 3.3.1.2 List of selected sampled clusters
- 3.3.1.3 Base map for each selected cluster
- 3.3.1.4 Field listing standard procedures and minimum requirements of field listers.
- 3.3.1.5 Listing manual and forms
- 3.3.1.6 GPS equipment

3.3.2 Guidelines

- 3.3.2.1 Prepare a household listing manual and listing form.
- 3.3.2.2 Recruit enumerators to participate in the household listing operation. The teams should consist of enumerators for listing and mapping.
- 3.3.2.3 Select the coordinator to monitor entire operations and perform quality check to ensure that the work done by each listing team is acceptable.
- 3.3.2.4 Clarify responsibility of listing staff in the listing manual

3.3.3 Quality Dimension and Indicators

Accuracy expressed in terms of coverage error and sampling error as described previously.

3.4 Preparations of Survey Instruments

a) Questionnaire design

Requirement: To maximize the comparability of survey questions across different surveys and cultures and reduce measurement error related to questionnaire design.

3.4.1 Quality Inputs

- 3.4.1.1 Survey objectives and research questions.
- 3.4.1.2 Review of literature and any relevant studies to identify useful material.
- 3.4.1.3 Documentation templates.
- 3.4.1.4 Documentation of the origin of any existing questions or materials to be considered for re- use.
- 3.4.1.5 Available resources in terms of budget
- 3.4.1.6 Number of personnel recruited and time to be used in interview.

3.4.2 Guidelines

- 3.4.2.1 Before designing a questionnaire, a study of literature and an analysis of existing surveys on the topic or on related topics should be carried out. Survey objectives should be translated into clear questions, allowing deriving the variables and indicators of interest
- 3.4.2.2 Design self-completed questionnaires to be attractive and easy to complete, give a positive first impression in the cover letter and front cover and make the questionnaire appear professional and business-like.
- 3.4.2.3 Choose questionnaire design and wording that encourage respondents to complete the questionnaire as accurately as possible. The questionnaire must focus on the topic of the survey, be as brief as possible and flow smoothly (including skip patterns) from one question to the next.
- 3.4.2.4 Consult major data users during the questionnaire design process for clear understanding of how the data are to be used. Undertake a review of the existing subject matter literature and surveys both nationally and internationally for a well designed questionnaire that meets the users` needs.
- 3.4.2.5 In the introduction to the questionnaire, provide the title of the survey, explain the purpose of the survey, identify the sponsor, indicate the authority under which the survey is being executed, the confidentiality protection measures, and request the respondent`s cooperation.
- 3.4.2.6 Harmonize concepts and wording with those already in use, when appropriate re-use questions from other surveys.
- 3.4.2.7 With respect to questionnaire layout, provide headings for each section of the questionnaire, instructions and answer spaces that facilitate accurate answering of the question. Use colour, shading, illustrations and symbols to attract attention and guide the respondents or interviewers to the parts of the questionnaire that are to be read and to indicate where answers are to be placed. At the end of the questionnaire, provide space for additional comments by respondents and include an expression of appreciation to the respondents.

- 3.4.2.8 Consider two phases of questionnaire testing (mock interviews and pre-testing). This involves testing the questionnaire at an early stage of its development, making revisions to the questionnaire based on the findings, and then testing the revised questionnaire.
- 3.4.2.9 Hold de-briefing sessions with interviewers after testing the questionnaire. Let the interviewers discuss their experiences in interviewing respondents and how the questionnaire performed. They can identify potential sources of response and non-response errors as well as areas where the questionnaire can be improved.
- 3.4.2.10 Conduct pilot-testing after a thorough questionnaire test to observe how all the survey operations, including the administration of the questionnaire and survey logistics work together in practice. The pilot test provides an opportunity to fine-tune the questionnaire and logistics before their use in the main survey.

3.4.3 Quality Dimension and Indicators

The quality dimension is *accuracy* in terms of measurement error and *relevance* and *coherence*.

b) Instruction Manual

Requirement: To guide interviewers, supervisors and editors in achieving the highest precision, quality, reliability, and integrity in the collection of information.

3.4.4 Quality Inputs

3.4.4.1 Questionnaires under study

3.4.4.2 Documentation of the origin of any existing instructions manuals materials to be considered for re- use.

3.4.5 Guidelines

3.4.5.1 Prepare interviewer, supervisor and editors instruction manuals according to questionnaire and survey objectives.

3.4.5.2 Clarify the responsibilities of interviewers, supervisors and editors in the instructions manuals.

3.4.5.3 Make a clear elaboration of questions in the interviewer's manual especially the purpose of questions, how to ask them and response categories.

3.4.5.4 Interviewers' manual should contain definitions, procedures, regulations and instructions which should orient and facilitate field work and is particularly directed to interviewers with the purpose that they have a reference tool to aid them in their important work of collecting information because, to a large extent, the success of the surveys depends on their efforts.

3.4.5.5 Train supervisors and editors with interviewers and select supervisors and editors from interviewers according to their performance and train them separately on supervisor and editor manuals. Supervisors and editors have primary links between the senior survey staff and the interviewers and they are responsible for ensuring both the quality and progress of fieldwork.

3.4.6 Quality Dimension and Indicators

The quality dimension is *accuracy* in terms of measurement error and *relevance*.

3.5 Translation of survey instruments

Requirement: To create and follow optimal procedures to standardize, assess, and document the processes and outcomes of survey questionnaire translation.

3.5.1 Quality Inputs

3.5.1.1 Source questionnaire and any material to be translated.

3.5.1.2 Templates of translation development, as relevant.

3.5.1.3 Delivery schedule including any further refinements proposed that relate to translation (procedure such as language harmonization, adaptation, pre-testing and any required adjudication steps).

3.5.1.4 Back translation.

3.5.2 Guidelines

3.5.2.1 Create translation team, briefing, training and monitoring.

3.5.2.2 Produce draft translations, checking translator output at an early stage of production.

3.5.2.3 Maintain documentation at each stage.

3.5.2.4 Review and adjudicate the translations.

3.5.2.5 Pre-test the translations.

3.5.2.6 Repeat any translation refinement step as needed.

3.5.3 Quality Dimension and Indicators

The quality dimension is *accuracy* in terms of measurement error and *interpretability*.

3.6 Interview, Recruitment and Training

Requirement: To improve the overall quality of the survey data by minimizing interviewer effects while controlling costs by optimizing interviewer efficiency.

3.6.1 Quality Inputs

3.6.1.1 Recruitment and training timeline

3.6.1.2 Minimum standards for survey staff employment

3.6.1.3 Study specific requirements (e.g. gender, language, etc)

3.6.1.4 Assessment tests for employment

3.6.1.5 Minimum interviewer requirements checklist

3.6.1.6 Criteria for dismissal or follow-up training

3.6.2 Guidelines

3.6.2.1 Train the trainers before they train the interviewers

3.6.2.2 Trainees should have at least attained secondary education (Form IV) or a certificate in data collection from a recognized institution

3.6.2.3 Trainees should have an age of not exceeding 50 years.

3.6.2.4 In case of many trainees e.g 200, there should be independent rooms each with the capacity of accommodating not more than 50 trainees.

3.6.2.5 Prepare trainers guide to be followed by all trainers in order to have quality training and common understanding among interviewers. Trainers guide should have topics and each topic should specify objectives to be attained by the end of the session, key points, methodology, working tools and time to be used.

- 3.6.2.6 Trainers should plan to meet every day after class to harmonize and share experiences concerning training.
- 3.6.2.7 Trainees from different classes should meet in one room for recap and debriefing for one hour every morning.
- 3.6.2.8 Complete the checklist during candidate screening
- 3.6.2.9 Take attendance during the training
- 3.6.2.10 Certify the candidates
- 3.6.2.11 Dismiss or retrain candidates who fail certification
- 3.6.2.12 Maintain written records of the candidates certification tests results
- 3.6.2.13 Administer an oath of secrecy to all trainees to assure confidentiality of the data being collected
- 3.6.2.14 The Training classroom should be arranged in such a way that the trainers can easily access each trainee. Expected facilities in each room include but not limited to, enough light, ventilation (or installed with working AC), a working public address system, a white board, flip chart, clear wall or a board for a projector.

3.6.3 Quality Dimension and Indicators

The quality dimension is *accuracy* in terms of measurement error and *relevance*.

3.7 Pre-testing

Requirement: To ensure that the versions of the survey instruments adequately convey the intended research questions, measure the intended attitudes, values, reported facts and behaviour, and that the collections of data are conducted according to the specified study protocols in every survey.

3.7.1 Quality Inputs

- 3.7.1.1 Pre-testing plan, including pretest goals, evaluation techniques, timeliness, and budget
- 3.7.1.2 Standard procedures for cognitive interviews

3.7.1.3 Standard procedures for recruiting pre-test and/or pilot staff

3.7.2 Guidelines

3.7.2.1 Identify what the pre-test should achieve and choose a pre-test design that best fits the study goals.

3.7.2.2 Combine pre-testing techniques to create a comprehensive design plan that takes advantage of the strengths and minimizes the weaknesses of each method.

3.7.2.3 Train or hire staff members who are able to adequately implement the chosen pre-testing technique(s).

3.7.2.4 Use experienced enumerators to pre-test and/or pilot survey instruments

3.7.2.5 Conduct the pre-test in the same mode of data collection (interviewer administered or self-administered) as the main survey.

3.7.2.6 Conduct the pre-test with the same population as the target population for the survey.

3.7.2.7 Pre-test the survey instrument or part of it in each appropriate language.

3.7.2.8 Document fully, the pretesting protocol and findings.

3.7.3 Quality Dimension and Indicators

The quality dimension is *accuracy* in terms of measurement error.

3.8 Data Collection

Requirement: To achieve an optimal statistical survey data collection design by maximizing the amount of information obtained per monetary unit spent within the allotted time, while meeting the specified level of precision and producing data of good quality.

3.8.1 Quality Inputs

3.8.1.1 Target outcome rates (e.g. response, refusal, non contact), and completion rates

3.8.1.2 Target hours per interview

3.8.1.3 Re-contact or re-interview the respondents

- 3.8.1.4 Percentage of interviewer cases to be verified
- 3.8.1.5 Verification of questions
- 3.8.1.6 Interviewer performance checklist

3.8.2 Guidelines

- 3.8.2.1 Interviewers are critical to the success of most of the data collection exercises. Interviewer manuals and training must be carefully prepared and planned since they provide the best way to guarantee data quality, the comprehension of survey efforts and subject matter, as well as to ensure proper answers to the questions from the respondents. Interviewers should be provided with all the required material and with a manual of instructions and other informative material about the survey.
- 3.8.2.2 Some characteristics of interviewers and their level of training may influence the quality of the responses collected. If the socio-demographic characteristics of interviewers are related to the information of interest, it is necessary to establish criteria and requirements for their selection.
- 3.8.2.3 Interviewers should receive extensive training on all aspects concerning survey objectives and questionnaire contents, communication and contact with potential respondents, ways to convert refusals, management of questionnaire skips, use of electronic questionnaire etc
- 3.8.2.4 Careful planning of the data collection process should include the establishment of roles and responsibilities regarding all aspects linked to data collection, in order to reduce respondent's burden and collection cost, and maximize timeliness and data accuracy
- 3.8.2.5 Establish appropriate sample control procedures for all data collection operations. Such procedures track the status of sampled units from the beginning through the completion of data collection so that data collection managers and interviewers can assess progress at any point in time.
- 3.8.2.6 Establish and maintain good respondent's relationships in order to obtain a good response rate. Such measures can include advertising the up-coming survey, an introductory letter to inform the respondents that they will be part of the survey, an

informative brochure with key statistics to maintain their interest in participating in the survey and a letter thanking them for their participation. These will help to sensitize the selected units in the sample to participate in the survey.

- 3.8.2.7 Assure respondents on confidentiality of information collected and provide contact information of survey director/manager to respondents to clear the doubt of the interview.
- 3.8.2.8 Ensure that the respondent within the responding household is contacted at the appropriate time so that the information is readily available. Allow the respondents to provide data in a method and format that is convenient to them. This will help to increase response rates and improve the quality of the information obtained from the respondents.
- 3.8.2.9 Tracking should be conducted to locate and contact the respondents when the available contact information on the survey unit is likely to be out-dated. Tracking increases response rate and also helps in determining if the sampled unit is still in the scope.
- 3.8.2.10 Establish quality control team to organise a frequent consultation with interviewers (debriefing) to bring out any problems found and to have opportunity to timely find solutions.
- 3.8.2.11 Apply ethical clearance for the survey which involves biomarker testing, anthropometric measurement, etc.

3.8.3 Quality Dimension and Indicators

The quality dimension is *accuracy* in terms of Non response error and *Timelines and Punctuality and Interpretability*.

3.9 Data Processing and Statistical Adjustment

Requirement: To code and capture data from their raw state to an edited data file that can be used within the survey organization for quality assessment of the survey implementation and harmonized with other surveys' data files in preparation for statistical adjustment, dissemination, and eventually substantive research.

3.9.1 Quality Inputs

- 3.9.1.1 Percentage of manually entered questionnaires to be verified
- 3.9.1.2 Items to be coded
- 3.9.1.3 Coding protocol (manual or automatic)
- 3.9.1.4 Percentage of manually coded cases to be checked
- 3.9.1.5 Data editing protocol
- 3.9.1.6 Appropriate statistical software
- 3.9.1.7 Appropriate statistical adjustments (e.g. imputation, weights)
- 3.9.1.8 Appropriate standard error estimation

3.9.2 Guidelines

- 3.9.2.1 Use coding to classify survey responses into categories with associated numeric values. This can be done as follows:

3.9.2.1.1 Review survey answers for response patterns and make any necessary modifications to the pre-coded response options in order to accurately represent range of the collected data, as well as use this data review to create codes for each variable that had not been pre-coded. Create code structures systematically as follows;

- a. Design the code framework with the following attributes:
 - (i) One value for each code number
 - (ii) A text label for each code number
 - (iii) A code number for each possible response category (remember to include code numbers for item-missing data, e.g. “Don’t know,” “Refused,” and “Not Applicable”)
 - (iv) Mutually exclusive response categories for each variable
 - (v) The appropriate number of categories to meet the analytic purpose.
- b. With hierarchical code structures, have the first character to represent the main coding category with subsequent characters representing subcategories.
- c. Use consistent codes across survey items. For example:
 - (i) A “Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree” scale would always have the values ranging from 1 = Strongly Agree to 5 = Strongly Disagree.

- (ii) A “Yes-No” item would always have the values 1 = Yes and 2 = No.
 - (iii) Refused item-missing data would always have the values of 9 (or if two-digit code numbers, the values of 99).
 - (iv) More than one response is coded by capital letters A-Z
 - d. Keep a link from the codes to the verbatim data to facilitate quality control.
- 3.9.2.1.2 Generate a data dictionary entry for each survey item. Each entry should contain the following information:
- (i) Variable ID, name, and label.
 - (ii) Data format.
 - (iii) Response options and associated code numbers.
 - (iv) Universe statement.
 - (v) Interviewer and respondent instructions.
- 3.9.2.1.3 Building upon data dictionary, develop a code-book which describes how the survey responses are associated with all the data. The code-book includes additional metadata on the survey items, such as the question text and raw frequency of responses.
- 3.9.2.1.4 For automated coding, feed the responses into a computer with software that assigns appropriate code- numbers based on matching the responses to a data dictionary.
- 3.9.2.1.5 Properly train coders on the study’s coding design, and periodically assess their abilities.
- 3.9.2.2 Capture the data into an electronic format. This can be done as follows;
- 3.9.2.2.1 Use similar conventions in programming the data entry application as used when programming the survey instrument application. For example, maintain the question order and the measurement units of the survey in the data entry system.
 - 3.9.2.2.2 When entering values, allow for interviewer/ key editor checks to reduce processing error. Prepare editing manual to be used by key editor to check consistency and processing error.

- 3.9.2.2.3 With a paper and pencil questionnaire, minimize the required amount of interviewer judgment by having an expert, such as a supervisor; check the responses before data entry. The expert should mark the questionnaire with the value to be entered when the response is not clearly indicated.
- 3.9.2.2.4 Perform independent data entry verification.
 - (a) Have two data entrants work separately or one in the field and the other one in the office and then compare their work. If possible field data entrant to use Computer Assisted Field Editing (CAFE) and Computer Assisted Personal Interview (CAPI).
 - (b) Settle the discrepancies with a computer or an adjudicator.
 - (c) Strive to verify 100% of the data entry.
 - (d) Look for the following data entrant errors:
 - (i) Wrong column/field
 - (ii) Corrected/modified (misspelled) responses.
- 3.9.2.2.5 Consider automated alternatives to data entry, including:
 - (i) Optical Character Recognition (OCR) to read machine-generated characters.
 - (ii) Intelligent Character Recognition (ICR), commonly known as scanning, to interpret handwriting.
 - (iii) Mark Character Recognition (MCR) to detect markings.
- 3.9.2.3 Edit the data as a final check for errors as follows:
 - 3.9.2.3.1 Create editing rules that the interviewers and editing staff can follow both during and after data collection. This can include checking for the following:
 - (i) Wild values (such as out of range responses, unspecified response categories, etc.)
 - (ii) Imbalance values (e.g. subcategories that do not sum to the aggregate)
 - (iii) Inconsistent values (e.g. males that report pregnancies, etc)
 - (iv) Implausible outliers (e.g. extremely high or low values)
 - (v) Entirely blank variables.
 - (vi) Confirming the proper flow of skip patterns.
 - (vii) Flagging omitted or duplicated records.

- (viii) Ensuring a unique identification number for every sample element, as well as a unique identification number for each interviewer.

- 3.9.2.3.2 Create a flag that indicates a change has been made to the collected data, and keep an un-edited dataset in addition to the corrected dataset. The latter will help to decide whether the editing process adds value. If an unedited data are not kept, it is truly impossible to establish whether or not improvements have been made.
- 3.9.2.3.3 Assess a random sample of each interviewer's completed questionnaires by examining the captured data. Review the use of skip patterns and the frequency of item-missing data to see if the interviewer needs additional training on navigating the instrument or probing for complete answers.
- 3.9.2.4 Develop survey weights for each interviewed element on the sampling frame.
- 3.9.2.5 Consider using single or multiple imputations to compensate for item-missing data. Single imputation involves replacing each missing item with a single value based on the distribution of the non-missing data or using auxiliary data; and the goal of multiple imputations is to account for the decreased uncertainty imputed values have compared to observed values.
- 3.9.2.6 When calculating the sampling variance of a complex survey design, use a statistical software package with the appropriate procedures and commands to account for the complex features of the sample design.
- 3.9.2.7 Document the steps taken in data processing and statistical adjustment.

3.9.3 Quality Dimension and Indicators

The quality dimension is *Interpretability* in terms of Metadata.

3.10 Data Dissemination

Requirement: To ensure that data producers and users of all cultures involved in a project follow the accepted standards for the long-term preservation and dissemination of data to the social science research community and the wider public.

3.10.1 Quality Inputs

- 3.10.1.1 Procedures for testing accessibility of archives with knowledgeable users

3.10.1.2 Procedures for electronic preservation of files

3.10.1.3 Procedures for testing files with major statistical packages

3.10.2 Guidelines

3.10.2.1 Make dissemination and data preservation plan early in the statistical project lifecycle that includes archiving, publishing and distribution. Verify and ensure that the released data after all the processing steps are consistent with the source data. In the case of the derived variables, it means that one should be able to reproduce the same results from the source data.

3.10.2.2 Preserve sustainable copies of all key data and documentation files produced during the data collection process, as well as those files made available for secondary analyses. Consider:

3.10.2.2.1 To define the long-term preservation standards and protocols used.

3.10.2.2.2 To maintain older versions of important data and documentation files so that users can follow the changes made from one version to the next.

3.10.2.2.3 Archiving collections in one archive which would keep master copies of files in several locations but minimize the possibility of conflicting versions of data and documentation files.

3.10.2.3 Conduct a disclosure analysis to protect respondent confidentiality. The key goal of disclosure risk analysis is to ensure that the data maintain the greatest potential usefulness while simultaneously, offering the strongest possible protection to the confidentiality of the individual respondents.

3.10.2.4 Think about the production of both public and restricted use of data files. Consider the following:

- (a) Make data files fully available to the research community by establishing clear rules under which researchers can obtain the data.

- (b) Establish clear policies for how users may access the restricted data files by creating a set of application materials and restricted-use data agreement that specify how users can obtain and use such data.
 - (c) In order to provide optimal utility for the users, produce a variety of products for varied constituencies;
 - (i) Produce set-up files and ready to use portable files in SPSS and STATA to address the needs of those who seek to do intensive statistical analyses with particular software packages.
 - (ii) Consider disseminating data through data base media, such as CD ROM or DVD if appropriate.
- 3.10.2.5 Consider disseminating research findings. This can be done by creating a dissemination plan and making research results accessible to the desired audiences such as study participants, community members, agencies and services providers and policy makers.

3.10.3 Quality Dimension and Indicators

The quality dimension is *relevance, accessibility, timeliness and coherence*.

PART FOUR

QUALITY CONTROL SUPERVISION GUIDELINES

4.0 Introduction

Quality control is the planned system of process monitoring, verification and analysis of indicators of quality, and updates to quality assurance procedures, to ensure that quality assurance works.

The quality control procedures aim at avoiding the problem of poor data quality and minimizing error rate at all stages of data collection. The approach requires that each process performed in data collection must pass through certain quality improvement. Therefore, the main purpose of effecting quality control is to eliminate mistakes made in pre-enumeration, enumeration and post enumeration stages of data collection.

4.1 Objectives of Quality Control

- i. To identify factors affecting the accuracy, validity and reliability of survey data
- ii. To prevent and correct errors,
- iii. To avoid common causes of mis-reporting
- iv. To strengthen the role of supervision and team interaction in the field

In order to perform the quality control supervision activities in a good way, there must be guidelines in every survey and census to ensure the data collected are of good quality.

4.2 Guidelines

4.2.1 General Household Survey Supervision Guidelines

The NBS has been conducting a number of household based surveys as part of fulfillment of its mandate. It is a routine, for every survey undertaking, to plan and execute field visits done by supervisors from the main office. It is, therefore, a good practice to have some guidance that will help officers to decide what should be the priority areas of the filled-in questionnaires. Hence, an officer together with others should check the priority areas intended.

Therefore, the following questionnaire sections must be checked to make sure that their complete:

Cover Page

Check if all fields' identifications are completed as required including names and codes of region, district, ward, enumeration area, household number, household head, enumerator and supervisor.

Roster

All listed members of the household must have their relationship to the head of household established. From experience some enumerators do confuse the sex of the household members with the codes for relationship to the head. This might result into households being recorded with multiple household heads, multiple spouses, etc.

Age is among the most important variables of any demographic information. There are two ways of recording one's age; either by directly asking how old one is, or by recording the month and year of birth for consistency purposes, both questions are normally asked in household based surveys/censuses.

Specifically, the following must be checked;

- Ensure the Year of Birth and the Age match.
- Ensure the head of Household is listed on Row 1.
- Ensure the mother or father is older than the child; at least 12 years difference between mother and child, and 18 years difference between father and a child.
- Ensure SKIP instructions are all observed accordingly

Consistency Questions

There are some questions which need to be answered consistently. This is a very significant issue in the questionnaire for the supervisor to check. Examples of questions which check consistency are:

- Does sex and relationship match? i.e if relationship is spouse then sex must be different from that of the head of household.
- Does age and relationship match? i.e the difference in age between the head of the household and the first child should be reasonable. A difference of less than 12 years indicates that there may be a mistake in reporting or recording.
- Does age and education match? i.e nobody expects a less than 17 year-old child to have a university degree.

- Does age and occupation match? i.e it is not possible to have a medical doctor who is 15 years old.
- Does education and occupation match? i.e it is not possible to have a medical doctor whose highest level of education is less or equal to secondary school.
- Does age and marital status match? i.e under normal circumstances, if you find a child aged 12 years or less and is married, re-check with the respective household

A summary table (see annex I) with some issues to be checked in the field is attached. A supervisor must randomly pick completed questionnaires which are in the regional office and check them and complete attached table. The checking must be done in the household whose questionnaire was picked.

If a questionnaire was picked but the household visit was not conducted, it should clearly be stated in the report.

For a survey where there are two questionnaires, one for the household and another for eligible individuals, the following must be checked:

All eligible individuals are identified in the household questionnaire (roster section)

All identified eligible individuals have been interviewed or if not their questionnaires exist and reasons as to why he/she was not interviewed are provided

Conclusion

A supervisor must submit a written supervision report covering all of the above parts and others that are not enumerated here as these are just the quick ones that are easily seen or that an eye can easily catch. But a supervisor is expected to go beyond these and also include even administrative issues that she/he thinks are of a great importance to the success of the survey. The report must be submitted to the survey Desk Officer within seven days of return so that the findings can be communicated to the rest of the survey enumerators and supervisors for implementation of what might be important.

These are general in a sense that most if not all questionnaires for household based surveys carry most of these topics. In case of additional needs for areas/fields to be checked for a specific survey, the responsible coordinator must provide them in addition to these.

4.2.2 General Establishment Based Surveys

The National Bureau of Statistics (NBS) in collaboration with different MDAs is working on the improvement of quality of statistics in the country by putting in place a better infrastructure of statistical production. This involves updating of basic data from different establishments based surveys including the Annual Survey of Industrial Production (ASIP), Employment and Earnings Survey (EES), Integrated Business Survey (IBS), Census of Industrial Production (CIP), Foreign Private Capital Flow Survey and Business Register (BR). The establishment-based survey is directed towards collecting data required to provide statistical information for determining the structure and level of each activity in the sector. The information collected is used for planning and policy formulation as well as to meet the needs of other stakeholders.

Therefore, the following sections must be checked to make sure that their complete.

Cover Page

On the cover page of each questionnaire, check if;

- The establishment identification number is coded properly in the six boxes provided, since it is a unique identifier of the establishment. The first four boxes represent batch number and the last two boxes represent sheet number.
- Full name of the establishment which refers to the registered name of establishment or the name under which the unit does business. For small units, which do not have business names, the name of the owner or one of the partners will do. Names should be written in full.
- The Region, District and Ward is coded properly according to the Population and Housing census coding specifications; 2-digits for Region code, 2- digits for District code and 3-digits for Ward code.
- Employment size is coded properly in one box provided, employment size codes will be indicated as follows;
 - 1= (1-4 persons engaged)
 - 2= (5-9 persons engaged)
 - 3= (10-19 persons engaged)
 - 4= (20-49 persons engaged)
 - 5= (50-99 persons engaged)

6= (100-499 persons engaged)

7= (500+ persons engaged)

Establishment Description

- Check if the full name of establishment, physical location, contact address and full name of contact person of the establishment is completed.
- Check if the type of establishment is entered in the space provided whether the establishment is single, head office or branch.
- The activities of the establishment which include main and auxiliary activities should be written precisely in order to be able to code the ISIC properly.
- Check if the name of product(s) manufactured by establishment is correctly written.
- Check the origin of ownership of the establishment whether it is national, foreign or joint is completed.
- Check if form of ownership of the establishment is verified or not, whether the establishment is public, private or mixed.
- Check the year in which the establishment started operation
- Check to which period data provided by the establishment refers to.

Conclusion

A lot of efforts need to be made to prevent non-response but it is almost inevitable that some will occur. Every such instance must have a supporting reason that can aid in the process of deciding appropriate action after the event. Essential components of these reasons should be sufficient to determine whether the non-responding organization ever existed; whether it operated at all during the reference period; whether there has been any significant change in its operations; and if it is currently operational then, what are the reasons for the non-response, is it lack of establishment's wisdom; just reluctance to provide data or whatever. All these components help to decide what action to take. The Supervisor should note down non-response cases so that he or she can take some further action.

PART FIVE

STATISTICAL REPORT WRITING GUIDELINES

5.0 Introduction

This part provides a general guidance with regard to statistical report writing whose basis is a statistical analysis. The important component of a statistician's work is concerned with presenting the results to the audience who are not necessarily very conversant with statistics. The purpose of this document, therefore, is to provide guidance that will provide standard format in all statistical reports published by the National Bureau of Statistics. The main aim of the statistical reports is to get messages contained therein to the general public

On their own, statistics are just numbers and numbers do not speak for themselves; a statistical narrative is required to bring them to life¹. This narrative component of the statistical report should be of a great help to a reader to be able to understand the meaning of the pattern and trends presented by the statistics. A statistical report should also help a reader to understand with confidence the level of reliability of the estimates and to what use the statistics can be put to. This will help a user to make an informed utilization of the statistics at hand.

5.1 How Should a Statistical Report be Organized?

Report organization approaches vary; however, the structure that will be discussed here has many advantages. The report is made up of several parts/sections/chapters that are going to be discussed according their order of sequence. In cases of shorter reports the suggested structure may not be relevant.

5.1.1 Title

Every report, be statistical or any other report, needs a title, most preferably on an independent title page. This title page should also include the author's name, address, institution, department or other affiliation, and the date of publication. The title should be self explanatory.

5.1.2 Summary/Abstract

In no more than a page and most preferably half a page, the reader should generally be told what a report is about and why it may be useful reading it. The content of the abstract/summary should be;

¹ UK Statistics Authority (26 November 2012), *Statement*,

the statement of the problem, what have been done, what conclusions are made, and should as much as possible not use symbols or numbers and technical terminologies should be minimal in unavoidable.

5.1.3 Abbreviations

It is a good and recommendable practice that before an introduction is constructed, all short forms that are found throughout the report be listed along with their long forms on an independent page. This will allow a reader of the report to always seek a long form of any letters found inside the report. It is emphasized that all short forms be explicitly listed on this page with the title “Abbreviations”.

5.1.4 Acknowledgement

The process of gathering data, processing, analysis, and report writing involves a number of individuals, groups, institutions, etc. The only way to show appreciation for their contribution to the entire process is to as much as possible mention them and writing the word of thanks to all in few paragraphs under the title “Acknowledgement”. The role each one of the mentioned persons played should also appear here.

5.1.5 Introduction

This should cover aspects such as background, description of available data, the manner in which and the purpose for which they were generated.

5.1.6 Methodology

This is a very important part of a statistical report, under which a description of a fair amount of details, that should include any theory, is necessary. The amount of details required under this part cannot be predetermined. The aim should be to provide detailed explanations to a non-technical reader so that he can gain enough understanding on the way the data for which a report is constructed was made available, step by step. Details provided should include but not limited to the following; description of the frame of interest, stages followed in drawing a sample, data collection tools (questionnaires, manuals, various control forms, etc.), data collection personnel, training of data collection personnel, supervision, data processing, data analysis (production of analytical tables). The reader after going through this part should be as confident as possible that if he wishes, he can repeat the exercise with minimal support.

It is a good practice to present the components of this part step by step into independent sub-sections, or paragraphs.

5.1.7 Results, Conclusions and Recommendations

Once the methodology is clear to the reader, the results are likely to easily be understood by the reader. Depending on the modules/section that were involved in the data collection process or the key indicators that are being evaluated, this part can be comprised of various chapters, sections, etc. Most importantly the presentation should give main results and conclusion. These results where applicable, can show trends and patterns. Subsidiary results (if any) are recommended to comprise part of the appendices of the report.

Approaches to this part differ from author to another. While some authors prefer each chapter that present the results have its concluding paragraph or two, others prefer having a separate chapter, usually the last chapter called conclusions and recommendations. Either one of the approaches is acceptable.

5.1.8 References

Any publication consulted, be it in a form of books, papers from journals, magazines, etc., should be listed under references. It is regarded as a crime (i.e plagiarism) if some materials were consulted at any stage and left unacknowledged. The style for writing the references is; Name (surname) of author or publisher, Year of publication in parentheses (), and title of the publication.

5.1.9 Appendix

This takes subsidiary results of each chapter/main body including large tables, technical details such as sampling errors for each indicator discussed in the main body, data collection tools, especially the questionnaire(s), list of personnel involved in the exercise, etc.

5.2 Detailed Guidelines for Use in Constructing the Main Body of a Statistical Report

1. Include an Impartial Narrative in Simple English that Draws out the Main Messages from the statistics

Include:	Avoid:
<ul style="list-style-type: none"> - The main messages at the start of the report – those points that the informed reader would regard as the most interesting and relevant to public debate. - A contents page where warranted by the length of the report. 	<ul style="list-style-type: none"> - Starting the report with general background or definitional points. - Including too many main points – four or five should usually be adequate.
<ul style="list-style-type: none"> - Explanation of what the statistics mean, placing the latest estimates in their long-term context and making clear the nature and implications of the uncertainty associated with the estimates. - Descriptions of how the statistics relate to the economy, society, environment, etc. - Possible reasons, appropriately justified, to explain what the statistics show, where these might be helpful. - Descriptions of 'special events' that may have affected the statistics. - Suitable comparisons – over time, between areas within the country, and internationally – that contribute to painting a full picture about the subject of the statistics. - References to published research findings where this helps to explain the statistics. - Explanation of how the statistics relate to other statistics, data and research on the same and related topics. 	<ul style="list-style-type: none"> - Describing rises and falls in the numbers without explanation. - Restating without explanation what is already shown in tables and charts. - Focusing on the latest estimates, or on point-to-point or month-to-month comparisons, in isolation from longer-term trends. - Attributing causation incorrectly.
<ul style="list-style-type: none"> - Only key numbers, suitably rounded, in the text. - Figures that are relevant to people (e.g. GDP per capita). - Graphs, tables and maps to illustrate the main points in the statistics. 	<ul style="list-style-type: none"> - Overloading the narrative with numbers that can be found in the summary tables.
<ul style="list-style-type: none"> - Text that is impartial, avoids statements of opinion and is demonstrably evidence-based. 	<ul style="list-style-type: none"> - Endorsing or criticising current or past government policies, and avoid giving any impression of doing so.

Include:	Avoid:
<ul style="list-style-type: none"> - Language that is straight forward and easily understood. - Explanations of technical terms in the text when first used. - A glossary of technical terms (unless very few in number). 	<ul style="list-style-type: none"> - Jargon, abbreviations and acronyms without adequate explanation. - Language that needs to be ‘translated’ by journalists or commentators into simpler English. - Referring to technical terms <i>only</i> in a glossary. - Barriers to accessibility such as the use of small fonts.

2. Include Information About the Context and Likely Uses of the Statistics

Include:	Avoid:
<ul style="list-style-type: none"> - A description of what is being measured, and why. - A clear description and explanation of concepts. - Factual information about the policy or operational context in which the statistics have been produced and will be used. - Details of whether the statistics are used to monitor targets, what those targets are, and what the statistics show in the context of those targets; similarly, details of relevant frameworks of indicators. - Details of any previous targets that are still relevant to the statistics. 	<ul style="list-style-type: none"> - Endorsing (or otherwise) government policy, or its effectiveness. - Commenting on the appropriateness of targets. - Any suggestion of partiality when referring to government policy or targets, including referring to government as ‘our’ or ‘we’.
<ul style="list-style-type: none"> - Details of why the statistics are important, to whom, and for what they are (known and likely to be) used, including descriptions of the types of decisions made based on the statistics, and by whom. - Appropriate cautious, speculative comments about the uses that people are likely to make of the statistics. 	<ul style="list-style-type: none"> - General descriptions of use that add little or no information (for example, ‘statistics on topic X are used to monitor topic X policy’, without saying why topic X policy is being monitored or what the potential outcomes of the monitoring might be).

3. Include Information About the Strengths and Limitations of the Statistics in Relation to their Potential Use

Include:	Avoid:
<ul style="list-style-type: none"> - Appropriate emphasis that the statistics are estimates. - Information within the narrative about the strengths and limitations of the statistics in relation to their potential uses, in order that the statistics can be used appropriately, and to reduce the risk of their inappropriate use. - Descriptions of the main likely errors (including sampling and non-sampling errors), their potential impact on the statistics, and their likely implications for use. 	<ul style="list-style-type: none"> - Any implication that the statistics are free from error. - Technical presentation of confidence intervals and other quality measures without plain English explanation. - General statements about the quality of the statistics.
<ul style="list-style-type: none"> - The nature and extent of (any) revisions, and how these revisions affect the interpretation of the statistics. - A clear explanation, where the statistics are normally subject to later revision, that they are initial estimates, and a statement about when they are likely to be revised. - Any helpful information about the extent and direction of any likely revision. 	<ul style="list-style-type: none"> - Attributing too much prominence to revisions as a measure of quality, i.e. don't imply that small revisions mean accurate statistics.

4. Be Professionally Sound

Include:	Avoid:
<ul style="list-style-type: none"> - Descriptive statements that are demonstrably consistent with the statistics. 	<ul style="list-style-type: none"> - Painting a biased picture by cherry-picking the most positive or negative results.
<ul style="list-style-type: none"> - Descriptions of proportions, changes, trends, and patterns that are professionally sound, and take into account uncertainty in the statistics. 	<ul style="list-style-type: none"> - Using too many significant figures where these may be spuriously accurate and give the impression of over-precision. - Labelling 'highest since ...' and 'lowest since ...' figures as 'records'. - Using terms that reflect a value judgment such as 'relatively strong rate', 'very few', 'small increase', 'only'. - Misusing words such as 'significant' that might suggest over-attributing a statistical validity to the comment.
<ul style="list-style-type: none"> - Charts, tables and maps that conform to good practice standards. 	<ul style="list-style-type: none"> - Misleading charts, for example those with inappropriate axes, or 3D charts where the third dimension contains no information.

	<ul style="list-style-type: none"> - Charts that are unclear when printed in black and white. - Starting time series at a point that could be perceived as not being impartial. - Comparisons of two points that could be perceived as not being impartial.
--	--

5. Include, or Link to, Appropriate Metadata

Include:	Avoid:
<ul style="list-style-type: none"> - A title that describes in simple English the coverage of the statistics and the point in time or period to which the latest statistics relate. 	<ul style="list-style-type: none"> - Overloading the title with too much detail.
<ul style="list-style-type: none"> - A statement about the frequency of release (annual, quarterly etc), the frequency with which the statistics are compiled/updated and the timing of the next release. - A statement describing which statistics in the report are new. 	
<ul style="list-style-type: none"> - The name of the producer body, and the name and contact details for the responsible statistician, or statistical Head of Profession. 	<ul style="list-style-type: none"> - Using generic departmental enquiry email addresses or phone numbers (except those specific to the particular statistics team).
<ul style="list-style-type: none"> - Information (or links to information) about definitions, data sources and methods. - Where applicable, information about how the methods and definitions used relate to European Union or other international concepts and classifications. 	<ul style="list-style-type: none"> - Including detailed descriptions of methods within the main narrative where this would dilute or detract from the statistical story.
<ul style="list-style-type: none"> - Descriptions of changes to definitions and methods where these have recently occurred. - Analysis that enables users to see the extent of differences from the previous data series. - Details of forthcoming changes to methods. 	
<ul style="list-style-type: none"> - A link to a published Revisions Policy relating to the statistics. 	
<ul style="list-style-type: none"> - Links to similar statistics within the country, and 	

Include:	Avoid:
<p>internationally.</p> <ul style="list-style-type: none"> - Links to information about the extent of comparability with these statistics. 	
<ul style="list-style-type: none"> - A clear description of whether the statistics are National Statistics or not, including clear labelling in compendium, publications of National Statistics, official statistics and non-official statistics. - The National Statistics logo in those reports designated as National Statistics. 	<ul style="list-style-type: none"> - Using the National Statistics logo for those statistics which are not so designated. - Using the logo of a government programme to which the statistics relate.
<ul style="list-style-type: none"> - Links to supplementary tables and datasets (including lower geographies and earlier time series). 	

ANNEXES

Annex I

Household Supervision Guide Checklist Form

Region Code District Code.....

Ward Code..... EA Code.....

Name of Enumerator

Name of HQ Supervisor..... Signature.....

CHECK LIST	COMMENTS				ACTION TAKEN
	Correctly filled	Partially filled	Poorly filled	Not Applicable	
Cover page					
Survey Staff details					
Head of household recorded as a first member in the roster					
Household member roster with relationship to the head of household completed using correct codes					
Sex and Age of each listed member					
Reasonable age difference between mother and child(ren), father and child(ren)					
<i>Skip instructions for age of household members</i>					
Marital status					
Education and Training					
Economic Activities of household members alongside with their respective coding instructions Also their sectors of employment, if this applies to the survey					
If unemployed, follow the definition for unemployment to scrutinize if truly unemployed					
HH assets, amenities and services					
Validity of filled answers whether they make any sense considering the fact that one has to rest for at least six hours during a 24 hour day					
If time use is part of the survey, scrutinize the completeness of it if a household member answered some questions on behalf of others					
Questionnaires for all members eligible for individual interviews completed					

Annex II

Control Form for Household Based Surveys

Dispatch of Survey Materials from NBS, HQ to the Team Supervisors

..... /...../201....
 Region/Zone Name and Signature of HQ Officer Date

S / N	Item	Unit	Quantity
1	Main Questionnaires		
2	Other Questionnaires and Forms		
3	General Materials (e.g length board, seca etc)		
4	Electronic Materials (e.g tablets, laptops, GPS etc)		
5	Miscellaneous Item(e.g Pencils, Eraser etc)		

Fill Duplicate Copies: Headquarters Original copy; and copy to Supervisor

NB: The Original copy to be submitted to the Headquarters for recording purposes

..... /...../ 201....
 Name and Signature of Supervisor Date

Annex III

Control Form for Household Based Surveys

Confirmation of NBS, HQ Receipt of Survey Materials from Supervisor

..... /..... / 201.....
 Region / Zone Name & Signature of HQ, Officer Date

S / N	Item	Unit	Quantity
1	Filled Questionnaires		
2	Other Filled Questionnaires and Forms		
3	General Materials (e.g lenthboard, seca etc)		
4	Electronic Materials (e.g tablets, laptops, GPS etc)		
5	Miscellaneous Item(e.g Bednet Sample etc)		

Fill Duplicate Copies: Headquarters Original copy; and copy to Supervisor

NB: The Original copy to be submitted to the Headquarters for recording purposes

..... /..... / 201...
 Name & Signature of Supervisor Date

Annex IV

HQ Field Visit Report Format

Name of the Census/Survey	
Dates of Visit	
Region	
District	
Name of the HQ Supervisor	
Name of the field Supervisor	

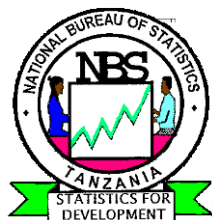
<p>Objectives of the field visit</p> <p>1.</p> <p>2.</p>
<p>Methodologies: (Direct observation, Interview, data cross checking...)</p> <p>1.</p> <p>2.</p> <p>3.</p>
<p>Monitoring Tools Used</p> <p>1.</p> <p>2.</p>
<p>Finding during visit</p> <p>Direct Observation</p> <p>1.</p> <p>2.</p> <p>Interview</p> <p>3.</p>

4.
Data cross checking
5.
6.
Major Challenges found during visit
1.
2.
3.
Recommendation (to the team)
1.
2.
Suggestion(s) (from the team)
1.
2.
Things to follow up for the next field visit (by monitoring person)
1.
2.
3.

Signature

Date.....

Annex V



Evaluation Form for Training	
Training	Training Name/Census.....
Responsible Person	Trainer from (institution).....
Date	Fromto
Place

Code 1 for Very good up to code 5 for bad in a box on the right side	1 = Very good 2 = Good 3 = Average 4 = Needs Improvement 5 = Bad
I. Total evaluation of the training in	
1. Training content 1.1 Important things of the training taught 1.2 Training topics were related to the training content 1.3 The following training environment satisfies the needs and expectation: 1.3.1 Training rooms 1.3.2 Teaching tools 1.3.3 Attentiveness 1.4 The training was participatory, correct illustrations and examples were used to make understanding easy 1.5 Training time table were friendly to all trainee	<div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div> <div><input type="checkbox"/></div>
2. Other (Please mention): 	

Code 1 for Very good up to code 5 for bad in a box on the right side	1 = Very good 2 = Good 3 = Average 4 = Needs Improvement 5 = Bad
3. Content delivery 3.1 Trainers understanding 3.2 How to deliver the content 3.3 Content completeness 3.4 Receiving and answering trainees' questions	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; width: 40px; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> </div>
4. How can this training be improved?	
II. Training content evaluation	
1. Was the content understood? 1.1: Introduction about survey/census 1.1.1 Objectives of the survey/census 1.1.2 Discipline during survey/census 1.2: Understanding and filling in questionnaires 1. 3: Class exercises 1. 4: Field exercises	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; width: 40px; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> </div>
2. How good was the presentation of the training content? 2.1: Introduction about survey/census 2.1.1 Objectives of the survey/census 2.1.2 Discipline during survey/census 2.2: Understanding and filling in questionnaires 2. 3: Class exercises 2. 4: Field exercises	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; width: 40px; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> </div>
3. Did the distribution of time for content presentation and discussion have good ratio? 3.1: Introduction about survey/census 3.1.1 Objectives of the survey/census 3.1.2 Discipline during survey/census 3.2: Understanding and filling in questionnaires 3. 3: Class exercises	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; width: 40px; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> </div>

Code 1 for Very good up to code 5 for bad in a box on the right side	1 = Very good 2 = Good 3 = Average 4 = Needs Improvement 5 = Bad
3. 4: Field exercises	<input type="checkbox"/>
4. Please, give your opinion about overall training and trainers	
III. Exercises and Test Evaluation	
1. Evaluation on:- 1.1 Exercises done in and outside the class room 1.2 Filling in quality control forms 1.3 Exercise on filling in questionnaires 1.4 Tests during training 1.5 Time for tests 1.6 Marking the tests	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2. Please give your recommendation for improvement	
V. Overall Evaluation	
1. Overall, how do you assess the training?	
2. In your opinion, what education criteria and qualification(s) should people have to participate in the survey/census as this one?	

Annex VI

Dispatch Form

INTERNAL DOCUMENTATION OF CENSUSES AND SURVEYS (complete in duplicates)

Census/Survey

S/No.	Type of Document	Format and Quantity		Recipient Department/Unit		Name of Office receiving		Date Received	Signature
		Hard copy	Soft copy	Library	IT	Library	IT		
1	QUESTIONNAIRES								
2	MANUALS								
3	CONTROL FORMS								
4	REPORTS								

Checked and dispatched by:

Name Position Signature Date

National Bureau of Statistics

Director General

18 Kivukoni Road

P. O. Box 796

11992 Dar es Salaam

TANZANIA

Tel : +255 (0) 22-2122722/3

Fax : +255 (0) 22-2130852

E-mail dg@nbs.go.tz

[Website: www.nbs.go.tz]

1. Vision

“To become a one-stop centre for official statistics in Tanzania.”

2. Mission

“To produce quality official statistics and services that meet needs of national and international stakeholders for evidence-based planning and decision making.”