GUIDELINES FOR CONDUCT OF SURVEYS

Version 01

ROYAL GOVERNMENT OF BHUTAN

NATIONAL STATISTICS BUREAU

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INTRODUCTION

The National Statistics Bureau (NSB) is developing guidelines to ensure that the survey design and implementation processes of the Bhutan Statistical System (BSS) yield high-quality and internationally comparable data. These standards and guidelines is an adaptation to the national context of existing international standards and guidelines and are generally agreed upon policies or best practices to be adhered to in the conduct of surveys. The current national practices are also incorporated. The guidelines are statements which elaborate on the implementation of the standard(s). It contains detailed instructions/recommendations for carrying out different phases of the survey process. Once the guidelines and standards are adopted, it is essential that the Bhutan Statistical System follow them.

In addition to the standards and guidelines, the document provides recommendations which are designed to further improve the quality of the survey implementation and results. The recommendations are suggestions based on experience and best practices which would be acceptable approaches or activities to be undertaken in conjunction with a standard(s). Inquiries pertaining to the BSS standards should be addressed to NSB headquarter, Thimphu.

The standards and guidelines is a living document and will be continuously updated as and when new and pertinent national and international standards and guidelines which are evolving based on information needs become available. This document is a direct result of the recommendation of the Organizational Development Exercise carried out in the year 2017 by Royal Civil Service Commission.

SECTION 1: SURVEY DESIGN STANDARD

1.1 FORMULATION OF THE STATEMENT OF OBJECTIVES

The information needs to be met should be clearly defined. At the same time potential users and uses of survey results should be identified. Therefore, surveys should be designed in order to meet the needs of main users.

The survey objectives should be clearly specified and written down during the planning phase of the survey. More specifically, the following items should be explicitly described in a document: survey objectives, information needs to be met, specific requirements such as content, concepts, periodicity and quality targets, and expected uses of survey results. It is also recommended to clearly point out the legislative acts from which the statistical process originates (e.g. Government order, Annual Work Plan). Finally, the need to carry out the survey should be adequately justified with regard to both costs and response burden.

The information needs to be satisfied are determined by current and potential users of survey results. Therefore, main users should be clearly identified and involved in defining objectives and in survey planning.

One of the most important tasks in a survey is to formulate the Statement of Objectives. This establishes not only the survey's broad information needs, but the operational definitions to be used, the specific topics to be addressed and the analysis plan. This step of the survey determines what is to be included in the survey and what is to be excluded; what the client needs to know versus what would be nice to know.

In general, users are heterogeneous and they often have conflicting interests. For this reason, it is important not only to know the various user types, but also to be able to rank user relevance with respect to survey results. It is useful to produce and regularly update documentation on main users and their characteristics.

Consultation of main users, in order to identify current and potential information needs, may be carried out in various ways, with various levels of formalization and involvement.

Other tools for consultation, such as exploratory surveys on large groups of users, or focus groups on limited number of users, may be arranged ad hoc as needed. Finally, research protocols and agreements are examples of high involvement of privileged users who may contribute to the survey both thematically and financially.

In addition to the above mentioned tools for consultation, other channels of contact with main users should be activated and maintained, allowing also to identify information needs not yet satisfied and to anticipate future ones. For example, participation of agency staff to thematic conferences promoted by users or organization of bilateral meetings or workshops with user groups should be fostered.

In order to identify information needs, indirect methods, based on the analysis of the already available information, should also be used. For example, user requests which was not yet possible to satisfy may be analyzed.

At the end of the survey process, direct tools, such as user satisfaction surveys, or indirect tools, for example the analysis of performance indicators (e.g. number of publications required, number of downloads) should be used in order to evaluate the level of user satisfaction with respect to the produced results and their relevance.

Referring to continuous quality improvement, the main unmet user needs should always be borne in mind and the implementation of projects aiming at satisfying them should be promoted. Survey objectives, contents and procedures should therefore be regularly reviewed, while it is necessary to tend to improving information supply.

Quality Related Actions

- Develop list of key stakeholders, comprising users and sponsors.
- Ensure all key stakeholders are aware of the plans for the survey.
- Publicise the survey, emphasising its benefits and indicating that they depend upon the information provided by respondents.

Quality and Performance Indicators

- List of key stakeholders.
- Number of key stakeholders with whom survey has been discussed.
- Number of survey advertisements appearing in the newspapers and on the TV.
- Coverage of the survey on social media.

1.2 SAMPLING FRAME

The frame should properly cover the target population. It should include accurate and updated information to be used to contact survey units. In the case of sample surveys, where possible, the frame should include information so as to allow the selection of an efficient sample (e.g. stratification or selection of units with probabilities proportional to some measure of size).

The survey frame provides the means of identifying and contacting the units of the survey population.

The sampling frame is the list from which the sample is selected, and so the quality of the sampling frame affects the quality of the sample. Standards for sampling frames are necessary to minimize coverage error and ensure that adequate information is available for carrying out sampling, data collection, weighting, and nonresponse bias analyses. It is also important that exclusions be clearly specified and limited as much as possible so that no extensive biases are introduced as a result of under coverage of the population.

Usually, the statistical agency has the choice of using an existing frame, supplementing an existing frame or creating a new one. The frame chosen determines the definition of the survey population and can affect the methods of data collection, sample selection and estimation, as well as the cost of the survey and the quality of its outputs

Standards, Guidelines and Recommendations

Standard 1.2.1 The sampling frame at each stage should include any information necessary for sample design, sample selection and estimation purposes. It should include sufficiently reliable information to sample individual units and ultimately to locate individuals for the interview and assessment.

Guidelines

In order to choose and make the best use of the frame, the following tips and guidelines are useful:

i. When deciding which frame to use (if several are available), assess different possible frames at the planning stage of the survey for their suitability and quality.
ii. Avoid using multiple frames, whenever possible. However, when no single existing frame is adequate, consider a multiple frame.
iii. Use the same frame for surveys with the same target population or subset of the target population. This avoids inconsistencies across surveys and reduces the costs associated with frame maintenance and evaluation.
iv. Incorporate procedures to eliminate duplication and to update for births, deaths, out-of-scope units and changes in any other frame information in order to improve and/or maintain the level of quality of the frame.
v. Incorporate frame updates in the timeliest manner possible.
vi. Emphasize the importance of coverage, and implement effective quality assurance procedures on frame-related activities. This helps minimize frame errors.
vii. Monitor the quality of the frame coverage periodically by matching to alternate sources and/or by verifying information during data collection.
viii. Determine and monitor coverage of administrative sources through contact with the source manager, in particular when these sources are outside the control of the survey.
ix. Include descriptions of the target and survey population, frame and coverage in the survey documentation.
x. Implement map checks for area frames, through field checks or by using other map sources, to ensure clear and non-overlapping delineation of the geographic areas used in the sampling design.

Quality Related Actions

- Sampling frame exclusions from the target population, justifications for the exclusions and the under coverage rate;
- Source of the sampling frame(s);
- Date of the last frame update and description of updating procedures;

- Any known frame problems, such as duplicates, out-of-scope units or undercoverage, and plans for addressing these problems;
- Variables on the frame for stratification;
- Variables on the frame for calculating measure of size, if applicable; and
- Variables on the frame for weighting adjustments and nonresponse bias analysis.

Quality and Performance Indicators

- Sampling frame exclusions from the target population and the under coverage rate.
- Sample selection forms with population totals from the frame.

1.3 SAMPLING PROCEDURE

Sampling is the selection of a set of units from a survey frame. This set of units is referred to as the sample. The choice of sampling method has a direct impact on the data quality. It is influenced by many factors, including the desired level of precision of the information to be produced, the availability of appropriate frames, the availability of suitable stratification variables, the estimation methods that will be used and the available budgets.

The intention is to gather useful information from the sampled units to allow inferences about the target population.

Standards, Guidelines and Recommendations

Standard 1.3.1 Specify sample size goals for each stage of sample selection. For each survey we must also specify its assumptions about nonresponse and ineligibility rates and about design effects.

Guidelines

i. When determining sample size, take into account the required levels of precision needed for the survey estimates, the type of design and estimator to be used, the availability of auxiliary information, as well as both sampling factors (e.g. stratification) and non-sampling factors (e.g. non-response).
ii. For highly skewed populations, include in the survey a stratum of large units that will be sampled with certainty.
iii. In determining sample allocation for stratified samples, account for expected rates of misclassification of units in the frame.
iv. For periodic surveys that use designs in which the sample size grows as the population increases, develop a method to keep the sample size stable.
v. For periodic surveys, if efficient estimates of change are required or if response burden is a concern, use a rotation sampling scheme that replaces part of the sample in each period.
vi. For periodic surveys develop procedures to monitor the quality of the sample design over time. Set up an update strategy for selective redesign of strata that have suffered serious deterioration.

Quality Related Actions

- The response rate and ineligibility rate assumptions specified as part of the Survey Design will be reviewed to help ensure that initial sample sizes are large enough to achieve the target sample size.

Quality and Performance Indicators

- Key variable selected for sample size determination.
- Non response rate from previous surveys.
- Design effect.

1.4 SURVEY DESIGN FOR TOTAL SURVEYS (CENSUSES)

The decision to conduct a total survey (Census) should be justified. The impact of this choice, with respect to a sample survey, should be evaluated in terms of costs, response burden, accuracy and level of detail of the final estimates.

The decision to conduct a total survey rather than a sample survey may be determined by several reasons. For instance, if the target population is relatively small, a total survey may be an adequate choice; the same, if estimates for small study domains are required.

Observing all units obviously determines higher response burden, especially when the same population is involved in other surveys during the same period.

The results of a total survey may be less accurate than those of a well-done sample survey, especially in case of large-scale total surveys where the incidence of non-sampling errors may be very high. Consequently, the survey should be designed so that the impact of non-sampling errors is minimized and the impact of main errors, which has not been possible to avoid, might be evaluated ex post.

1.5 SAMPLE DESIGN

Sample selection should be carried out according to well-defined probabilistic criteria. The use of non-probabilistic methods for sample selection should be justified. Sample design and sample size should be such so as to ensure a predefined accuracy level for the key variables in the main domains.

There are two kinds of surveys: sample surveys and census surveys. In a sample survey, data are collected for only a fraction (typically a very small fraction) of units of the population while in a census survey, data are collected for all units in the population. Two types of sampling exist: non-probability sampling and probability sampling. Non-probability sampling provides a fast, easy and inexpensive way of selecting units from the population but uses a subjective method of selection. In order to make inferences about the population from a non-probability sample, the data analyst must assume that the sample is representative of the population. This is often a risky assumption given the subjective method of selection. Probability sampling is more complex, takes longer and is usually costlier than nonprobability sampling. However, because units from the population are randomly selected and each unit's probability of selection can be calculated,

reliable estimates can be produced along with estimates of the sampling error and inferences can be made about the population. Since non-probability sampling is usually inappropriate for a statistical agency, this manual focuses on probability sampling.

There are many different ways to select a probability sample. The sample design chosen depends on such factors as: the survey frame, how variable the population units are and how costly it is to survey the population. The sample design in part determines the size of the sample, which impacts directly on survey costs, the time required to complete the survey, the number of interviewers required and other important operational considerations. There is no magical solution and no perfect recipe for determining sample size. Rather, it is a process of trying to fulfil as many requirements as possible – one of the most important being the quality of the estimates – as well as operational constraints.

Standards, Guidelines and Recommendations

Standard 1.5.1 Each person in the total population will have a non-zero probability of selection resulting from the application of established and professionally recognized principles of scientific sampling.

Standard 1.5.2 The sample design at each stage of sampling will be probability based to allow an overall probability of selection to be derived for each sampling unit. Hence, non-probability designs, such as quota sampling and the random route approach, are not allowed at any sampling stage.

Standard 1.5.3 The core design is a self-weighting design of sampling units. A self-weighting design is typically achieved when each sampling unit has an equal probability of selection.

Guidelines

Non-probability sampling: The choice of a non-probability sampling design should be justified both theoretically and empirically.

i. Inferences on a target population based on a non-probability sample may be misleading, since the risk that estimates may be biased (selection bias) is high. In these circumstances, it is therefore necessary to clarify the assumptions justifying the sample representativeness and to calculate both the estimates of population parameters and the related sampling error estimates.
ii. All aspects of sample design should be well documented.

Probability sampling: The sample design should be adequately defined with respect to survey objectives; it should be as simple as possible; it should ensure that each unit of the sampling frame has a non-zero inclusion probability in the sample (in the case of multi-stage designs, this should be valid for each stage).

i. The sampling frame should be clearly defined, evaluating its consistency with the objectives of the survey.

ii. The sampling design should provide a stratification of the units to create strata of homogeneous units with respect to the information to be collected and to allow the main domains to be obtained by the union of elementary strata.
iii. The optimal sample size should be determined by statistical methods to ensure an adequate accuracy of the estimates for the main variables at the level and for the main study domains. If a substantial reduction of the sample size is expected due to a high number of ineligible units or unit nonresponse, it may be useful to increase the number of the selected sample units.
iv. The sampling design should allow for the estimation of sampling errors (sampling variance).
v. In general, it is advisable to analyze alternative sample designs, to evaluate pros and cons of each one and to document the reasons of the choice of a specific design.
vi. All aspects of sampling design should be properly documented.

Recommendation

Stratification is used to reduce the sampling variance associated with the resulting survey estimates. Stratification combines sample units into homogeneous groups and eliminates sampling variability between such groups. To maximize the benefit of stratification, stratification variables should be reliable and related to the survey outcome. Examples of stratifiers related to poverty are geography, urbanicity, education, income, age, employment status and gender etc.

Quality Related Actions

- As part of the survey clearance process, each survey will be required to provide details of its specific Sampling Plan. The plan will be reviewed for adherence to the above standards prior to survey clearance.

1.6 QUESTIONNAIRE DESIGN

Questionnaires should be designed in order to: effectively collect the information of interest, contain only the necessary questions, do not result in excessive respondent burden and be structured to ensure interview fluency. Whenever possible, standard definitions and classifications - or systems that may be mapped to them - should be used. Questionnaires should be designed so as to facilitate data processing, for example data entry and coding. The graphical layout of paper questionnaires should convey positive perceptions and help user orienting among the different sections. The graphics chosen should be used consistently within the questionnaire.

Electronic questionnaires should be developed exploiting the technological potential for routing management and on-line quality control, without unduly burdening the course of the interview.

A questionnaire is a set of questions designed to collect information from a respondent. A questionnaire may be interviewer-administered or respondent-completed, using paper methods of data collection or electronic modes of completion. Questionnaires play a central role in the data collection process. They have a major impact on data quality, respondent behaviour, interviewer performance and respondent relations.

The design of questionnaires takes into account the statistical requirements of data users, administrative requirements of the survey organization, and the requirements for data processing, as well as the nature and characteristics of the respondent population

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 to derive the variables and indicators of interest.

In the preliminary stages of questionnaire design, when the questions are not yet well defined, it is recommended to conduct focus groups and qualitative interviews to see how concepts and issues are perceived and interpreted by potential respondents.

In preparing the questionnaire, some general principles should be followed. Some key elements should be clearly visible at the beginning of the questionnaire, such as the institution in charge of the survey, the survey title and topic, explanations about survey objectives, the request for cooperation and assurance of confidentiality. The inclusion of each question should be carefully evaluated against respondent burden. The question whether to provide a final text-box for additional comments by respondents should be evaluated. A sentence on appreciation for respondent participation should end the questionnaire.

The questionnaire is one of the main sources of measurement error and item nonresponse. Therefore, in designing survey forms, particular attention should be paid to the prevention of such errors.

Researcher should be aware that the administration of a questionnaire induces a cognitive process in the respondent, consisting of several phases (encoding, comprehension, retrieval, judgment, reporting). The analysis of these phases in a cognitive perspective helps to identify possible sources of error and allows to better evaluate several issues, including the choice of the reference period, the use of proxy respondents, the formulation and sequence of questions and response options. In general, the main topic of the survey should be phased in during the interview and the language should be as neutral as possible, consistently using concepts and terms throughout the entire questionnaire. The answer categories should be mutually exclusive, exhaustive or provide for the possibility of the category options to be considered should be assessed in relation to the technique. The choice of open-ended versus closed questions should be carefully evaluated considering the type of information required, the level of accuracy sought, respondent characteristics, the resources available for data entry and coding tasks. When respondents are highly qualified in the field of interest, such as in many cases in business surveys, the language should be technical.

With regard to the questionnaire structure, the sections of the questionnaire and - within the sections - the questions, should follow a logical order, understandable to respondents.

Particular care should be taken in the preparation of instructions for respondents or interviewer. The instructions should be clear and easily accessible.

Questionnaires are not only a means of gathering information but also a communication tool. They should appear attractive and professional at the same time. The graphic solutions adopted

in questionnaires should be uniform and allow to clearly identify the different types of text associated with: titles of sections, questions, answer categories, instructions, routing, and so on.

Questions on topics that respondents may perceive as embarrassing or highly sensitive may lead to inaccurate answers. To overcome this drawback, it is appropriate to carefully evaluate several factors such as: to adopt a minimally intrusive technique, i.e. preferring a telephone survey or a self-administered questionnaire to a face-to-face technique; to introduce the sensitive topic in a gradual manner, to provide additional assurances of confidentiality; to make further attention to the neutrality of the language used; to explicitly permit respondents not to answer the question; to evaluate, whether interviewer characteristics may have an influence on responses and to establish specific criteria for their selection; to promote specific training of interviewers.

Guidelines

i. Questionnaires in periodic surveys should be evaluated regularly.

ii. Use words and concepts that have the same meanings for both respondents and the questionnaire designers. In the case of business surveys, choose questions, time reference periods and response categories that are compatible with the respondent's record-keeping practices.

iii. In the introduction to all questionnaires:
- ✓ Provide the title or subject of the survey
- ✓ Explain the purpose of the survey
- ✓ Request the respondent’s co-operation
- ✓ Indicate the authority under which the survey is taken, and what confidentiality protection arrangements are in place.

iv Ensure that the value of providing information is made very clear to respondents. In addition, the importance of completing the questionnaire and how the survey data will be used must be highlighted.

v The opening questions should be applicable to all respondents, be easy and interesting to complete, and establish that the respondent is a member of the target population.

vi Questionnaires that are to be administered in person or over the telephone must be made interviewer-friendly as well as respondent-friendly.

vii Ensure that the instructions to respondents and or interviewers are short, clear, and easy to find. Provide definitions at the beginning of the questionnaire or in specific questions, as required.

viii Ensure that time reference periods and units of response are clear to the respondent, specify “include” or “exclude” in the questions themselves and not in separate instructions.

ix Ensure that response categories are mutually exclusive and exhaustive.

x Provide titles or headings for each section of the questionnaire, and include instructions and answer spaces that facilitate accurate answering of the questions.

xi Translation of questionnaire into national language is encouraged.

Quality Related Actions

- Justify every question in the questionnaire in terms of user needs.
- Ensure that data from every question are disseminated or are used in compiling or checking data that are disseminated or as used to support a skip. If not eliminate the question.
- Design the questionnaire to minimize collection and capture time.
- Pilot test the questionnaire and make changes as needed based on the results.

1.7 QUESTIONNAIRE TESTING

New questionnaires or new questions/sections of pre-existing questionnaires should be evaluated through a testing strategy. Questionnaires already in use in current surveys should be periodically evaluated. The testing or evaluation strategy should include both pre-field and field testing.

The drafting of questionnaires should be evaluated by means of a set of pre-field and field tests. The aim is to explore a variety of issues ranging from graphical layout, to language, instructions for questionnaire routing, order of sections and questions, usability of questionnaires. Preliminary assessments as informal tests or experts' reviews may also help identify major defects in the instrument. Cognitive interviews are generally oriented to assess whether respondents understand the questions in the manner sought by researchers and if they may remember and provide answers to the questions. Generally, though not necessarily, cognitive interviews are carried out in very different conditions from those that actually occur during the survey. For example, they are conducted in the laboratory and with test-persons, and it is therefore necessary to integrate these methods with others carried out in the actual survey conditions, or in situations as close as possible to the real ones.

Many tests are carried out directly on the field, such as the observation of behaviour of respondent, interviewer or both using structured schemes (behaviour coding). The aim is to understand whether interviewers plays their role properly, how respondents reacts, but also their interaction. Other applicable methods are respondent and interviewer debriefings and intense or follow-up re-interviews.

Interviewers should be involved in the evaluation process since they may provide important feedback on questionnaire adequacy (interviewer debriefing).

It is advisable to include questionnaires among the tools that are tested by means of pilot surveys, if carried out, since this allows for the evaluation of the instrument in conditions similar to those of the survey.

In current surveys, specific analyses aimed at deriving information on the quality of the instrument used and at implementing improvements for subsequent survey occasions should be carried out. In particular, ex-post indirect assessments should be conducted, based on the analysis of item nonresponses and the frequencies of "do not knows", "not remember" and other similar

categories to some questions. Also the frequency of edit failures in the editing and imputation procedure may be a signal of potential problems in the questionnaire.

When developing electronic questionnaires, the software should be agreed as an internal or international standard. In such a situation, the electronic version of the questionnaire with respect to its functionality and, where possible, with respect to its usability, should be tested.

Electronic questionnaires permit to introduce quality controls on the data collected during the interview. The extent of such quality controls should be carefully evaluated and properly balanced not to overload the interview with frequent interruptions that could compromise its completion. Routing errors should be treated by means of "hard" controls (i.e. not allowing the continuation of the interview if they are not resolved). Range errors may be treated in a "hard" mode if the defined domains are large or in "soft" mode within sub-domains. Finally, consistency errors should be controlled in "hard" or "soft" mode depending on the importance of the variables they apply to.

The factors guiding questionnaire design, as well as the results of the testing phase, should be properly documented.

Informal testing (sometimes referred to as pretesting) is easy and inexpensive and is a fundamental step in the development of a questionnaire. If no other testing of the questionnaire is done, as a minimum, informal testing should be performed. The size of the informal test sample can range from 20 to 100 or more respondents. If the main purpose is to discover wording or sequencing problems, very few interviews are needed. More interviews (50 to 100) are necessary to determine response categories for closed questions based on the responses to open questions in the informal test. The questionnaire should be administered in the same manner as planned for the main survey (e.g., interviewer-assisted in person or by telephone; paper or computer-assisted). However, self-enumeration questionnaires should be tested using an interviewer.

With informal testing, respondents are not debriefed; the respondent simply completes the questionnaire or interview, mirroring what would happen during the actual data collection. Informal testing only indicates where there is a problem. Without further investigation, it does not identify why or how it can be corrected. Also, informal testing may not identify all problems with the questionnaire.

Informal testing of questionnaires is used to:

- ✓ discover poor question wording or ordering;
- ✓ identify errors in questionnaire layout or instructions;
- ✓ identify problems with the computer software application, if computer-assisted;
- ✓ determine problems caused by the respondent's inability or unwillingness to answer the questions;
- ✓ suggest additional response categories that can be pre-coded on the questionnaire;
- ✓ provide a preliminary indication of the interview length and response rate (including item nonresponse).

Standards, Guidelines and Recommendations

Standard 1.7.1 For each survey, must conduct a field test prior to the main study.

Guidelines

i. The first round of the field test will, to the extent possible, serve as a dress rehearsal of all aspects of the main study. The field test can also be used to experiment with alternative procedures, as long as the added experiments do not in any way impact the main objectives of the field test.
ii. All assessment and questionnaire items, including instrument translation and adaptation, will be evaluated**.**
iii. Survey sampling activities, including sample design and selection, will be evaluated.
iv. All survey operational procedures, including interviewer training and interview administration, will be assessed.
v. The field test will be conducted in households to test the administration of the instruments in a household setting. Quality control forms and procedures will be developed and tested**.**
vi. The field test will be used to evaluate scoring procedures, including scoring standards and scorer training for paper-based instruments and automated scoring procedures for the computer-based instruments.
vii. Data capture and data processing will be evaluated.
viii. At the conclusion of the field test, each enumerator will collect information froma special questionnaire developed for this purpose (referred to as Interviewer Observation items). Enumerator or supervisor may choose to addquestions to serve its purpose.

Standard 1.7.2 The standards and guidelines in this document must be followed for the field test, with the following exceptions**.**

Guidelines

i. A representative sample is not required for the field test, but the field test should pilot the aspects of probability sampling to be used for the main study. The sample must come from the same target population as the main study and must meet the requirements of the psychometric testing. In addition, countries with a sample design involving a household sampling stage are required to test the within-household sampling procedures during the field test**.**
ii. The sampling frame used for the field test is not required to cover 95% or more of the core target population, but it should include all major analytic subgroups of interest.
iii. The field test sample will be conducted in the different region, west, central and east.
iv. The definition of a complete is different for the field test and main study. For the field test, a case is considered complete if it has gone through the Core instrument and the main task instrument, even if all are failed.
v. There is no minimum response rate goal for the field test, but agency or organization should use the field test to evaluate their procedures for obtaining high response rates.

vi. No weighting or non-response bias analysis is required for the field test. However, agency is still required to deliver a sample design file. Agency performing their own weighting for the main study are encouraged to test the procedures during the field test.

Quality Related Actions

- The Agency conducting the survey will review each Survey Design and Planning Report before the field test.
- During the survey planning and data collection period for the field test, teams will be required, as part of the Monitoring Report, to report on the status of all of the various survey activities, just as they will during the main study.
- The organization must produce a field test report which will examine the results of the field test and make recommendations for changes to field operations for the main study.

SECTION 2: DATA COLLECTION STAFF TRAINING STANDARD

2.1 TRAINING APPROACH

To ensure that all data collection staff are thoroughly trained in survey instruments and procedures and well-prepared to collect high-quality data.

In-person training is designed to maximize trainees' involvement and participation in the training and to provide ample opportunity for supervisory staff to observe and evaluate trainee performance. Conducting a single in-person training session enables the agency to use its best training staff and allows the field period to start at the same time for all data collectors.

All enumerators training sessions must be fully scripted to ensure consistency of presentation across training rooms, which is particularly important when a large number of enumerators are being trained in separate sessions. Scripted materials also ensure that all training points are adequately covered, eliminating the need for training staff to speak extemporaneously, and allowing all trainers to study the training guides in advance and rehearse their roles. To maintain trainee interest and attention, the training sessions use a mixture of presentation techniques, such as demonstrations, interactive lectures and interviews, and exercises.

Standards, Guidelines and Recommendations

Standard 2.1.1 The comprehensive enumerators training package developed by the agency conducting the survey must be used to train their data collectors.

Guidelines

i. The data collector training must be conducted in person, with some elements distributed as home study materials before the in-person session. Distributing a home study packet to trainees prior to in-person training is cost-efficient and will maximize productivity at training.
ii. Detailed training agenda must be developed to ensure that training covers all aspects of the data collector's job and addresses all components of the study. The training agenda must include the length of each training session, as it will be used during training to keep the sessions on schedule.
iii. The training must be fully scripted and use a variety of tools, including lectures, interactive discussions, role plays and exercises. The exercises are designed to simulate situations enumerators are likely to encounter in the field and provide a means for evaluation of the enumerators by training staff.
iv. The trainer guide must include all materials to be used in training, including lecture scripts, role-playing exercises, handouts, transparencies and written exercises with answer keys.
v. An enumerator manual must be developed to provide detailed information on the background of the study, the study design and purpose. Enumerator will use this as a reference after training when situations arise in the field.
vi. Explanation of each question should be included in the enumerator's manual.

Quality Related Actions

- Agencies must document their proposed approach to training and their preliminary plan for conducting the session.

2.2 ORGANIZATION AND LOGISTICS OF TRAINING

To provide adequate training staff, space and equipment to ensure a successful data collector training.

To ensure that the training sessions run smoothly and that trainees are effectively instructed in all aspects of the study, agencies must secure appropriate meeting space, equipment, and experienced staff and make all logistical arrangements. Trainers must be 1) very familiar with the study and the materials and 2) effective trainers with the ability to motivate and control trainees and keep the training on schedule. Adequate space, equipment and logistical planning are especially important on a computer-assisted interviewing survey.

Standards, Guidelines and Recommendations

Standard 2.2.1 Agencies must locate and reserve adequate space in which to conduct the training sessions.

Guidelines

i. The training location must have sufficient meeting space to accommodate the required number of separate training rooms, as well as additional space for an office and storage of training materials and equipment.
ii. Each training room must have an adequate electrical supply to support the laptop computers and other equipment. Agencies must arrange for data display machines, overhead projectors and any other technical equipment needed.

Recommendations

- ✓ All enumerators should be trained simultaneously, with approximately 25 to 30 enumerators per training room. The number of trainees will determine the number of training rooms required.
- ✓ Tables should be arranged in the training room in a U-shaped pattern, to allow all trainees a good view of both the trainer and each other and to permit technical staff to easily assist individuals if necessary.
- ✓ During interactive instrument lectures, a data display machine and laptop computer should be set up so that trainees can follow along with the trainer.

Standard 2.2.2 Agencies must assemble a competent, experienced staff to conduct the training sessions.

Guidelines

The enumerators training staff must be capable of discussing all aspects of the interview work, including study overview, face-to-face interviewing, administration of the questionnaire and

assessments, contact strategies, refusal avoidance and conversion, quality control, and administrative tasks.

i. Each training room must have a lead trainer who has training experience and who possesses the expertise required to provide training on the activities listed above.
ii. An assistant trainer must be present in each room to assist the lead trainer and the trainees. The assistant trainer must also observe and evaluate the trainees during the sessions.
iii. An individual designated as "technical support" must be assigned to every one to two training rooms to resolve any systems-related issues. The availability of technical support staff allows for the timely resolution of systems issues and thereby prevents delays in the training.

Recommendations

- ✓ In each training room, a designated individual should operate the laptop computer that is projected on the screen for all enumerators to view (during applicable sessions).
- ✓ During training, trainees should be grouped by supervisory groups. The trainees' field supervisor should serve as the assistant trainer, so that s/he has an opportunity to evaluate the enumerators s/he will supervise during data collection.
- ✓ Training staff, preferably field supervisors, should score the written exercises completed by trainees during training.
- ✓ The field manager should be the lead trainer for general interviewing techniques training. Field supervisors should also be present during this session to evaluate the trainees.

Quality Related Action

- Agencies will be required to document their proposed plan for scheduling and conducting training, including location, background of the lead trainers and other aspects of the training plan.

2.3 SUPERVISOR TRAINING AND TRAINING-OF-TRAINERS

To provide training for the staff responsible for the training and supervision of enumerators, so they can adequately train, evaluate and supervise the interviewing staff.

Conducting a training-of-trainers' session ensures standardization of training script delivery in the enumerators training sessions and gives the training staff an opportunity to learn the procedures and materials before enumerators training. The training-of-trainers session also serves as a dry run of the training materials, enabling agencies to revise the materials as needed before enumerators training.

Supervisor training provides the field supervisors with the skills to monitor and motivate the enumerators in their group. It is crucial that supervisors are familiar with all aspects of the study procedures and materials, as they will serve as the primary source for ongoing training during data collection and will conduct quality control measures.

Standards, Guidelines and Recommendations

Standard 2.3.1 Agencies must conduct a training-of-trainers session in which training staff are introduced to the training scripts and materials they will use to conduct enumerators training.

Guidelines

i. All lead trainers, assistant trainers and technical support staff must attend the relevant portions of the training-of-trainers session.
ii. The training-of-trainers session must be scheduled approximately three to four weeks prior to the start of data collection, allowing sufficient time for revisions to enumerators training materials.
iii. The training-of-trainers session must be conducted by an experienced member of the survey staff.
iv. The training-of-trainers session must cover all scripts and exercises that will be used in the enumerators training so that it can serve as a dress rehearsal for the enumerators training.
v. The training-of-trainers session will be approximately three days in length depending on the type of survey conducted.
vi. The training-of-trainers session must immediately precede the supervisor training session.

Standard 2.3.2 Agencies must conduct a supervisor training session, to be attended by all regional supervisors and field managers.

Guidelines

i. Supervisor training must cover supervisory responsibilities during data collection, including report monitoring, oversight of enumerators and quality control.
ii. Supervisor training must immediately follow the training-of-trainers session.
iii. Supervisor training must be conducted by an experienced member of the survey staff.
iv. Supervisors must receive a detailed supervisor manual.

Recommendation: Supervisor training should be approximately one to two days in length.

Quality Related Action

- Agencies will be required to document their proposed plans for the training-of-trainer and supervisor training sessions.

2.4 ENUMERATOR TRAINING

To provide adequate training in all aspects of administration, as well as general interviewing techniques and administrative procedures, so that enumerators are able to collect high-quality data and obtain required response rates.

If enumerators are to accurately follow the study procedures, collect high-quality data and achieve high response rates, they must be knowledgeable about both general interviewing techniques (GIT) and the details of survey. Providing training on GIT and computer-assisted interviewing (CAI) helps to ensure that new enumerators acquire the basic skills necessary to

work as an enumerators and to participate in survey-specific training. Specifically addressing refusal aversion and conversion should increase response rates. Finally, the survey-specific training will ensure that the interviewing staff is well trained on concepts, instruments and procedures.

Standards, Guidelines and Recommendations

Standard 2.4.1 Each agency is responsible for training its team of data collectors.

Standard 2.4.2 All enumerators must receive a sufficient amount of in-person survey-specific training.

Guidelines

i. The survey training must take place no earlier than two weeks before, and preferably the week immediately prior to, the scheduled commencement of data collection. This will allow enumerators to immediately apply the skills developed in training and will minimize the likelihood of enumerators forgetting material learned at training.

ii. The following aspects must be covered during survey-specific training:
- ✓ Introduction to survey;
- ✓ Review of advance materials;
- ✓ Contact strategy for contacting intended respondents;
- ✓ Gaining the co-operation of contacted respondents, avoiding refusals and converting refusals;
- ✓ Locating households and respondents;
- ✓ Study management system operation, including data transmission procedures;
- ✓ Administrative tasks, including rules on assignment of disposition codes, use of the household/case folder and completion of the record of contact;
- ✓ Administration of automated and pencil-and-paper assessment instruments;
- ✓ Quality control and monitoring of enumerators work;
- ✓ Practice interviews, in the form of role plays and/or live respondent practice;
- ✓ Question-and-answer session following the role plays and/or live respondent practice.

iii. A question box should be available in each training room for trainees to submit written questions. This practice reduces interruptions caused by excessive trainee questions and provides a forum for enumerators who are reluctant to ask questions. The questions should be discussed at the evening debriefing session, and memoranda addressing the questions should be distributed to training staff the next morning for discussion with trainees.

iv. During training, agencies should provide supplemental evening review sessions for enumerators who want additional practice or are identified as needing additional practice with the various study components.

v. Training staff should hold daily debriefing sessions to discuss the progress of training, trainee evaluations, and any procedural or technical issues or questions that have arisen.

Recommendation: All enumerators should have the opportunity to conduct at least one complete unscripted practice interview with a respondent unfamiliar with the study. The enumerator should receive feedback on this interview from training staff.

Standard 2.4.3 Enumerators must receive home study training prior to in-person training.

Guidelines

i. Home study packets will be distributed to enumerators approximately two to three days prior to in-person training.
ii. The home study training must include, at a minimum, an introduction to and an overview of survey. A written exercise should be included to ensure that the enumerators complete the required components of the home study packet. The written exercise must be collected and verified at in-person training.

Recommendation: Agencies may choose to include additional materials or exercises in the home study packet, such as selected procedures, administrative tasks or materials from GIT training, or a hard-copy CAI tutorial.

Standard 2.4.4 Enumerators who are new to social science interviewing must receive GIT training prior to survey-specific training.

Guidelines

GIT training must include the following components:

i. An introduction to survey research, providing examples of types of survey questions and interviewing terminology;
ii. The conventions for asking survey questions and recording answers;
iii. Written and oral exercises on asking questions, recording responses and applying probing techniques to obtain accurate data;
iv. Gaining respondent co-operation, in which the following concepts are discussed:
   - ✓ Enumerator behavior and style when making contact with the respondent;
   - ✓ The importance of making effective and fast connections with the respondent;
   - ✓ Methods to overcome resistance and address respondent concerns;
   - ✓ Written and oral exercises on refusal aversion techniques and how to answer respondent questions.
v. Remuneration and administrative aspects of working for the survey agency;

Recommendations: To minimize travel costs and optimize learning, GIT training should be held immediately before survey-specific training. GIT training should be conducted in person, but some components may be administered as part of the home study training, if this better suits the agency's needs.

Standard 2.4.5 Enumerators who are new to CAI must receive instruction on CAI basics as part of the survey-specific training session.

Guideline: The CAI instruction must instruct enumerators on CAI questionnaire format, question types, function keys and special commands specific to the study. This content should be incorporated into the first training session in which enumerators use the computer.

Quality Related Action

- Agencies will be required to document their proposed training plans and materials.
- The results of training must be documented, including the number of enumerators who completed training as well as the number of enumerators who were released during or after training and the reasons for their termination.
- At the conclusion of the enumerator training session, agencies must complete an enumerator training report.

2.5 DEVELOPMENT OF TRAINING MATERIALS

To ensure the production of well-developed training materials, which are essential to the successful conduct of training.

The training materials developed by the Agency conducting the survey will provide enumerators with thorough instruction on the administration of the interview. The use of materials developed by the agency will ensure that field staff will receive standardized training.

Standards, Guidelines and Recommendations

Standard 2.5.1 Agencies will use the training materials developed by the agency in conducting their enumerators trainings.

Guidelines: Training materials to be developed by the agency should include the training agenda, the training guide, the enumerators manual and written exercises.

Standard 2.5.2 Eachagency must develop training materials on any agency-specific topics, such as additional background questionnaire items, the study management system, administrative procedures, the screening questions, and procedures for locating households and respondents.

Guideline: The training must be fully scripted, must address all common scenarios, and must be fully reviewed and tested in advance of training.

Standard 2.5.3 A supervisor manual must be produced for all field supervisors.

Guidelines

The supervisor manual must contain the following components:

- ✓ Techniques for supervising staff;
- ✓ instructions for using the study management system to oversee production, run reports, assign and transfer cases, and perform other functions;
- ✓ Quality control responsibilities;
- ✓ Administrative procedures.

Quality Related Action

- Agencies will be required to document their proposed training plan.

2.6 EVALUATION OF TRAINEES

To assess enumerators' abilities before they begin data collection and to provide feedback as needed.

Training provides an opportunity to assess enumerators before they begin data collection. Enumerators performance – generally throughout training and specifically on scored written exercises and in role plays – demonstrates ability and allows training staff to identify weaknesses and work with the enumerators to improve their skills.

Standards, Guidelines and Recommendations

Standard 2.6.1 Agencies must evaluate enumerators' performance during training.

Guidelines

i. Evaluation of trainees will be based on criteria developed according to the requirements of the interview instruments, materials and procedures.
ii. To evaluate trainees, training staff will use the evaluation form designed by the agency.
iii. Training staff must identify trainees with potential performance problems and discuss remedial measures.

Recommendations

i. Agencies should certify enumerators based on the following components:
   - ✓ A completed role-play or paid respondent interview, observed by a member of the training staff;
   - ✓ Completed exercises from general interviewing techniques training, computer-assisted interviewing training and survey-specific training;
   - ✓ Language certification, as appropriate.

ii. Trainees exhibiting performance problems should be paired during the role play interviews with a more experienced trainee or with the assistant trainer.
iii. Each agency should hold daily review sessions on an as-needed basis for trainees in need of additional help. Trainees may volunteer to attend the daily session or be required by supervisors to attend.
iv. If a trainee does not successfully complete training, the agency may choose to either provide the trainee with post-training remedial work or dismiss the trainee.

Standard 2.6.2 At supervisor and enumerators training, the project team must evaluate supervisors on their ability to perform their defined responsibilities.

Quality Related Action

- Agencies will be required to document their proposed plan for evaluating trainee performance.

2.7 ONGOING ENUMERATORS TRAINING

To ensure that enumerators are kept informed of new issues that arise during the field period, that their skills are maintained and that they are adequately trained in areas that need improvement.

Through field monitoring and other forms of quality control, agencies may identify issues during data collection that require additional training. Appropriate documentation of these issues and their resolution will ensure that all enumerators receive adequate training and adhere to standard procedures.

Standards, Guidelines and Recommendations

Standard 2.7.1 Each agency must, in a timely fashion, address issues that arise during data collection by providing appropriate retraining or training on new issues.

Guidelines

Enumerators must receive feedback, both individually and as a group, as follows:

- ✓ Provide immediate individual feedback if there has been a critical error.
- ✓ Provide routine individual feedback for self-improvement.
- ✓ Offer group feedback to focus efforts on improving the data collection process.

Recommendation

To ensure cost efficiency, agencies should provide ongoing training in the form of training memoranda or packets that are distributed to the appropriate enumerators and discussed between enumerators and supervisors, rather than conducting additional in-person training sessions. Enumerators should be given written exercises to complete. Role-play exercises can be conducted by enumerators over the telephone.

Supervisors should conduct conference calls with all enumerators in their groups to discuss issues that arise.

Quality Related Action

- Agencies will be required to document their proposed training plan, including plans for retraining as appropriate.

SECTION 3: DATA COLLECTION STANDARD

The purpose of this section is to present the various methods of data collection – including self-enumeration, interviewer-assisted, computer-assisted, administrative data and others – and the criteria for deciding which method is most appropriate.

3.1 USE OF ADMINISTRATIVE DATA

Collaboration and good partnerships with data providers should be established to ensure timely acquisition of administrative records with a good level of accuracy. Definitional and technical aspects should be agreed upon and validation of the data received should be carried out.

Some surveys can obtain the information they require from existing administrative data. Administrative data are those that have been collected for administrative purposes (e.g., to administer, regulate or tax activities of businesses or individuals) as opposed to statistical purposes (to study groups of individuals, businesses, farms, etc.).

Administrative records have a huge advantage in that they avoid a major portion of data collection costs and respondent burden. They can also result in timely survey results since the data already exist. However, the purpose of the administrative program may be quite different from that of the survey, therefore concepts and definitions must be carefully assessed (e.g., the target population and coverage of the target population). Also, there is a lack of control over the quality of the data (which is determined by the administrator, not the statistical agency). Follow-up of edit failures is usually impossible. There is also usually considerable processing work to be done to ensure that the administrative data are in the format required by the statistical agency. Finally, there may be privacy concerns regarding the use of the administrative data for statistical purposes.

Guidelines

i. Whenever data are collected using administrative sources, having a say in the legal aspects that regulate the production of administrative data represents a favourable condition to ensure the relevance of administrative data for statistical purposes and the comparability of statistical products over time.
ii. Good relationships with the agencies providing administrative archives should be established and maintained, by setting up formal agreements. These agreements should cover procedures and timing for data transmission, required quality level of administrative archives, documentation supporting the archive transmission, and also statistical information feedback to archive providers. The objective is the improvement of the production process and, in general, of data quality.
iii. It is necessary to fully understand the context in which administrative data are generated and managed, i.e. relevant legislation, purposes and uses of administrative archives. Indeed, such information has a considerable influence on the use of administrative records for statistical purposes (for example with respect to coverage, content, concepts and definitions used, frequency and timeliness of administrative records, quality of key

information, stability over time). In particular, all metadata necessary for the proper use of administrative archives should be requested to the Institution in charge of them. Furthermore, it would be appropriate to collect information on the underlying quality of these archives, and on whether and what procedures have been applied to improve the completeness and consistency of the information they contain.

iv. The evaluation of the quality of the administrative archive through the evaluation of coverage with respect to the target population for statistical purposes (eligible and non-eligible units for statistical purposes, under coverage) should be performed before starting the data processing phase. Eligible units should be analyzed to evaluate the proportion of missing or inconsistent information. To this end, it is advisable to calculate a set of quality indicators or to perform more complex analysis based on integrations and comparisons with other archives. The impact of potential errors in administrative sources on final data quality should be evaluated.
v. The transmission of administrative archives should be carried out by using secure channels and standard protocols. It is advisable to use transmission checks to prevent data loss.
vi. All phases of acquisition and processing of administrative archives should be documented.

3.2 DIRECT DATA COLLECTION

Data collection techniques and instruments should be selected taking into account survey objectives and target population characteristics, and in order to maximize data quality while limiting statistical respondent burden and costs.

Data collection is the process of gathering the required information for each selected unit in the survey. During data collection, members of the population – be individuals or organizations – are located and contacted and their participation in the survey is sought. A questionnaire is then administered and answers recorded. This process is expensive, time consuming, requires extensive resources and has a direct impact on data quality. Since it is the general public's main contact with the statistical agency, it contributes to the image of the statistical agency and has a broad impact on the agency's relevance and on the quality of its data.

During the planning phase of a survey, many decisions must be made regarding the method of data collection. Should the questionnaire be administered by an interviewer? If yes, should the interview be conducted in person or over the telephone? Should a combination of methods be used – should respondents fill out the questionnaire themselves and non-respondents be followed-up with a telephone interview? Should the questionnaire be paper or computer-based? Should administrative data be used to collect some of the survey data? Should data collection for several surveys be combined?

The method of data collection should be chosen to achieve a high participation rate and collect data that are as complete and accurate as possible while minimizing the burden to the respondent and satisfying the agency's budget and operational constraints.

The two main types of sampling are probability sampling and non-probability sampling. Non-probability sampling is of limited use for surveys conducted by statistical agencies, since the biased selection of units does not readily permit inferences to be made about the survey population. However, it is fast and easy and can be useful for exploratory studies or during the development phase of a survey (e.g., to test the questionnaire).

Probability sampling should be used when inferences about the population are to be made based on the survey results. In a probability sample, every unit on the frame has a non-zero probability of being selected and the units are selected randomly. As a result, selection is unbiased and it is possible to calculate the probabilities of inclusion, calculate the sampling variance of estimates and make inferences about the population. The main disadvantages of probability sampling is that it requires more time, is more costly than non-probability sampling and requires a high quality sampling frame.

The simplest probability sample designs are simple random sampling and systematic sampling, which result in equal probabilities of inclusion. More complex designs that can result in unequal probabilities of inclusion and most of which require auxiliary information include: stratified, probability-proportional-to size, cluster, multi-stage and multi-phase sampling. Unequal probability designs are typically used to improve the statistical efficiency of the sampling strategy or to reduce the cost of sampling. Sometimes, their use is dictated by the sampling frame.

When deciding between the various possible designs, the first thing to determine is what designs are feasible given the survey frame, units on the survey frame, domains of interest, response burden, the method of data collection, budget, etc.

Guidelines

i. The data collection mode should reduce statistical burden and costs and, at the same time, maximize data timeliness and accuracy. The selection should take into account many different factors, sometimes difficult to combine. In particular, it is convenient to analyse the following aspects.
ii. It should be considered whether the general objectives and the specific topics of the survey address towards the choice of a particular technique. For example, when collecting data on sensitive topics it is advisable to use a self-administered mode. Also telephone interview, in which the interviewer is present but less intrusive, may be used, if overall convenient. If a face-to-face interview is chosen, despite dealing with sensitive topics, strategies to protect the respondent privacy should be adopted, e.g. closing answers in a sealed envelope or using the method of randomized responses.
iii. The complexity and extent of the topics to be investigated should be taken into account. A topic that requires a high articulated interview, i.e. a questionnaire with many “skips” and complex “routing”, may not be surveyed by a self-administered paper questionnaire, while it may be more effectively managed through the use of computer-assisted techniques, such as Computer Assisted Personal Interviewing (CAPI) or

iv. Telephone (CATI) interviewing. In telephone surveys, the interview length should be limited, compared to mail and face-to-face techniques.
v. It is useful to analyze the target population and to ascertain the existence of characteristics which are positively related to survey participation in order to choose the data collection mode which is more appropriate to meet respondents' needs. Mixed modes should be preferred when they help meeting manifold needs. How the information of interest is organized should be taken into account for surveys on businesses or institutions. For example, mail or web modes should be preferred when information should be retrieved from archives, from a specific office of the business surveyed or outside the business (e.g. from an accountant). For surveys on public bodies and institutions, data collection modes should be agreed upon via formalized agreements.
vi. It should be evaluated which is the best period of the year to carry out the survey. In the case of surveys on public bodies and institutions, the data collection period should be agreed with them. During the data collection period the best time to contact, inform, schedule an appointment and finally visit respondents, should be chosen. Such time constraints have an impact on the organization of the data collection phase. Some techniques are more suitable than others to meet the needs of respondents (for example, as households are easier to contact in the evening, then it becomes preferable to carry out telephone interviews than visits).
vii. The best technologies available should be utilized. If possible, computer-assisted techniques should be preferred, as they ensure: efficiency gains in the survey production process resulting in improved timeliness; anticipation of checks (consistency, domain and flow) on responses provided in the data collection phase with opportunity to verify responses during the interview; overall cost reduction and, in particular, reduced use of paper in compliance with national policies.
viii. In the case of adoption of mixed modes, the "mode effect", that is the impact in terms of variability and bias attributable to the use of different techniques on subsets of the target population, should be evaluated, also experimentally.

In order to reduce non-response and achieve a high quality level of the information collected, adequate measures should be taken to improve cooperation with intermediate bodies involved in data collection. Actions to monitor the activities of these bodies should be planned.

In order to ensure adequate response rates and a high quality level of the information collected, participation of respondents should be encouraged, and measures on the collection phase should be produced and evaluated.

Interviewers should be selected, trained and monitored so as to ensure that the data collected is as accurate as possible. It is good practice that the interviewer bias effect be assessed through ad hoc studies.

Guidelines

i. In direct data collection, statistical information is collected from (all or part of) the units of a population, which may also consist of administrative bodies, according to a statistical survey design.
ii. In some cases, it is possible that the support of intermediate bodies, such as *Thromdes,* chambers of commerce, and also of private companies is used in data collection operations. In this case, before the beginning of the data collection phase, it is necessary to clearly establish responsibilities, agree on the timing and activities to be performed, preferably with formal documents, and maintain good relationships with these intermediate bodies. It is also necessary to organise training meetings to develop a support and supervision system. During data collection, it is necessary to monitor the activities of intermediate bodies also through the analysis of ad hoc indicators, to agree upon data file transmission, even if partial, and to check it.
iii. Since one of the most critical aspects during data collection concerns unit participation, a series of actions to prevent unit nonresponse should be planned and implemented. In fact, unit nonresponse may lead to not negligible bias in the estimates. Examples of actions to prevent nonresponses are: sending a presentation letter signed by the head of the agency; providing respondents with a brief description of the objectives of the survey, explicitly guaranteeing the protection of confidentiality, establishing a toll-free line or an email for respondents. If, despite prevention, it is believed that there might be a problem of nonresponse bias, it is advisable to try to compensate for it through the use of appropriate methodologies when processing data.
iv. Especially in some contexts, for example in business surveys, it should be carefully evaluated who is the most appropriate person to fill in the questionnaire and how he/she may be effectively contacted. Similarly, the aspect concerning the organisation of the information required from respondents and its accessibility should be deepened. In some circumstances, responses from proxy respondents are also accepted, namely from individuals other than the person from whom information is intended to be collected, such as parents who are asked to answer questions relating to their children, too young to do it themselves. Although this choice is sometimes necessary and helps in keeping the nonresponse rate low, it should, however, be borne in mind that the answers provided by proxy respondents may differ systematically from those reported directly by respondents. The benefits and risks for data quality, resulting from the use of proxy respondents, should thus be carefully evaluated.
v. Other aspects to be taken into account are: the choice of the best time to call or visit the survey unit which implies careful planning of the attempts to contact it and the follow-up strategy; the implementation of a monitoring system based on indicators of nonresponse, following the standards of the agency. The definition of the minimum set of information allowing for a unit to be considered respondent is a pre-requisite for the development of such a system.
vi. During data collection, the progress of the survey should be constantly monitored according to the developed tools, and all the necessary actions to achieve the quality targets should be implemented.

vii. Interviewers are essential to the success of data collection operations. 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. In addition, 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. Interviewers should be provided with all the useful material and with a manual of instructions and other informative material about the survey. During the data collection phase, frequent consultations with interviewers (debriefing) should also be organized to bring out any problems found and to have the opportunity to timely find solutions.

viii. Monitoring tools allowing for in-progress monitoring of interviewer work should be designed and implemented. They range from field supervision, to follow-up calls and analysis of performance and quality indicators, also applying appropriate methods for summarizing them (for example, control charts). The interviewers' workload should be monitored and excessive turnover should be avoided. The risk of a potential interviewer bias effect on data should be considered in advance and the fieldwork should be possibly organized in such a way to allow evaluating it with specific statistical measures.

ix. Data transmission from respondents, should be carried out using secure transmission channels.

x. The data collection phase should be properly documented

SECTION 4: DATA PROCESSING STANDARD

Processing transforms survey responses obtained during collection into a form that is suitable for tabulation and data analysis. It includes all data handling activities – automated and manual – after collection and prior to estimation. It is time-consuming, resource-intensive and has an impact on the quality and cost of the final data. It is therefore important that it be well planned, the quality of its implementation monitored and corrective actions taken when required.

The extent and order of the processing activities depend, among others, on the nature of the data that are collected, the collection method, the survey budget and objectives in terms of data quality. Coding, for instance, can occur before or after data capture while editing typically occurs throughout the survey.

There are two ways of processing data. One is paper based data collection and the other one is computer assisted data collection.

The following are the processing activities for a paper based data collection:

i. Manual Editing: After collection, check the data on the questionnaire. This step ensures that all necessary information has been received and legibly recorded, that interviewer notes have been reviewed and some preliminary edits performed to check for gross errors and inconsistencies.
ii. Coding: Code any data on the questionnaire that requires coding (e.g., written answers to open questions).
iii. Data Entry: Capture the data electronically into a computer. Data capture may be followed by more coding. Data are entered into the programmed template by trained data-entry operators.
iv. Batch Editing: Perform detailed editing. Questionnaires that fail one or more checks are put aside for further examination, either for follow-up with the respondent, or for imputation.
v. Export Data to statistical packages for Analysis.
vi. Perform outlier detection to identify suspicious or extreme values.
vii. Store the data on a database to facilitate data management during the post-processing activities.

In order to streamline processing, several of the above activities – namely, capture, editing and coding – may be combined through automation using computer-assisted collection methods.

Since errors are likely to occur at each stage of processing – particularly for those manual and repetitive activities such as coding, capture and editing – processing should be monitored and corrective actions taken when necessary in order to maintain or improve quality. This is done by implementing quality control and quality assurance procedures.

The following are the processing activities for a computer assisted data collection:

i. Coding: Some of the codes are filled in during the time of interview while others are supervisor prefilled to be filled in by the supervisor after the enumerators submits the collected information to the supervisor.
ii. Data Entry: Capture the data electronically into a tablet.
iii. Editing: The flow of questions is automated, so the enumerator does not need to decide which question comes next; it is calculated by the tablet. Many other quality control measures are possible with CAPI, such as logical checks, pre-filling information and setting constraints on answer ranges. The data is also available right away in a digitized format to look for any other problems. Editing are also done on two dashboards. Supervisor and Head Quarter Dashboard to check for any inconsistencies in the data collected by the enumerators.
iv. Export Data to statistical packages for Analysis.
v. Perform outlier detection to identify suspicious or extreme values.
vi. Store the data on a database to facilitate data management during the post-processing activities.

The purpose of this section is to cover the main processing activities: coding, data capture, error detection and treatment (editing & imputation), estimation and data validation.

4.1 CODING

The coding process (automated, computer assisted or manual) should ensure a high level of quality. Quality measures should be collected and evaluated.

Coding is the process of assigning a numerical value to responses to facilitate data capture and processing in general. Some questions have coded response categories on the questionnaire, others are coded after collection during a manual or automated process. Data capture and coding are expensive and time-consuming activities that are critical to data quality since any errors introduced can affect the final survey results. Therefore, emphasis should be placed on error prevention in the early stages. Two methods of monitoring and controlling errors are quality assurance and quality control. The purpose of quality assurance is to anticipate problems and prevent them while the purpose of quality control is to ensure that the number of errors that occur are within acceptable limits.

Standards, Guidelines and Recommendations

Standard 4.1.1 To facilitate comparability in data analysis, each agency will be required to map its own dataset into a highly structured, standardized record layout. In addition to specifying the position, format and length of each field, the layout (codebooks) should include a description of each variable and indicate the categories and codes to be provided for that variable.

Quality Related Actions

- Agencies will provide a description of their coding system and coding quality control procedures.

- NSB will provide the national standard codebooks for statistical purposes and will provide training sessions. NSB will refer and adapt international codes to suit the national need.
- Agencies will check the quality of their coding of the respondent's highest educational level, occupation and industry against the distribution in the most recent Labour Force Survey or equivalent survey.

4.2 DATA CAPTURE

The data capture process performed by operators should ensure high quality level. Quality measures should be collected and evaluated.

Data capture is the transformation of responses into a machine-readable format. With paper-based collection methods, capture occurs after collection (usually after the questionnaire has been groomed and some preliminary edits have been performed). For example, data capture might consist of a clerk (referred to as a keyer) manually typing into a computer the reported values on the questionnaire. With computer assisted collection methods, capture occurs at the time of collection.

There are several ways to improve the efficiency of data capture. One is to use computer-assisted data collection methods. The main benefit of computer-assisted methods is that collection and capture are combined, resulting in an integrated, faster and more efficient data collection and capture process than paper-based methods. One disadvantage of computer-assisted methods is that the software programs require extensive development and testing.

For paper-based collection methods, pre-coding closed questions can greatly improve the efficiency of manual data capture. With paper-based collection methods it is particularly important that quality assurance and quality control procedures be implemented to minimize and correct errors introduced during data capture.

Standards, Guidelines and Recommendations

Standard 4.2.1 All staff working on for data capture, coding and management at the agency must understand and obey confidentiality rules and practices in survey research.

Guidelines

i. The operators that are in charge of converting paper forms into electronic format (keyers) should be properly trained and provided with adequate tools.
ii. The software used for data entry should include a range of controls to minimize entry errors: "hard" controls on identification codes and preferably "soft" ones (domain, flow and consistency) on other data. Controls, however, should not be excessive, in order to avoid too frequent interruptions in the entry.
iii. It is preferable to use generalized software designed for data capture as it allows to manage the controls to be performed in an efficient manner.
iv. The quality of the data capture process should be evaluated both in relation to accuracy (minimizing the incidence of errors in recording) and in relation to the time spent for that phase, which should not cause a large delay in the data release stage.

v. Assessments made on accuracy and required time of data capture may be used to improve the production process on subsequent survey occasions.

Quality Related Actions

- Define and document the data collection and capture processes.
- Prepare test and distribute data collection, capture, coding and editing training materials and operating procedures well in advance.
- Train staff in the data collection and capture processes.
- Provide effective supervision and monitoring system.
- Follow up non-respondents intensively.
- Incorporate edit rules (including outlier detection) in the data entry system to the maximum extent possible enabling data verification and correction at entry point.
- Automate coding to the extent possible, referring difficult cases to experts in the relevant classification.
- Based on the check list, document the assessment of the accuracy and required time of data capture for improving the production process on subsequent survey occasions.

4.3 ERROR DETECTION AND TREATMENT

The overall procedure for error detection and treatment, item non response should be designed taking into account the following issues: survey characteristics; amount and type of data to be checked; data timeliness; available methods, auxiliary information and resources. Furthermore, it should be organized in phases according to the different error types and to the proper methods for correcting them.

The editing and imputation procedure should be based on sound statistical methodologies and should be the most appropriate for the survey data; it should be documented and assessable. If available, generalized software implementing these methodologies should be used.

4.3.1 EDITING

Editing is the application of checks to identify missing, invalid or inconsistent entries that point to data records that are potentially in error. Editing are done for both paper based data collection and computer assisted data collection however the editing takes place differently.

With paper based data collection, the first editing referred to as the manual editing takes place after the data collection. During the data entry several checks are put in place to detect any inconsistencies in the data that is collected. After the entry Batch editing occurs where a detailed editing is performed and questionnaires that fail one or more checks are put aside for further examination for follow-up with the respondent.

With computer assisted data collection, many other quality control measures are possible, such as logical checks, pre-filling information and setting constraints on answer ranges. The data is also available right away in a digitized format to look for any other problems. The editing is done

right after the data is collected on the supervisor and head quarter dashboard as the enumerators are still able to return to any household if they need to make a correction.

The purpose of editing whether it is for paper based or computer assisted is to better understand the survey processes and the survey data in order to ensure that the final survey data are complete, consistent and valid. Edits can range from simple manual checks performed by interviewers in the field to complex verifications performed by a computer program. The amount of editing performed is a trade-off between getting every record 'perfect' and spending a reasonable amount of resources (time and money) achieving this goal.

4.3.2 IMPUTATION

While some edit failures are resolved through follow-up with the respondent or a manual review of the questionnaire, it is nearly impossible to correct all errors in this manner, so imputation is often used to handle the remaining cases. Imputation is a process used to determine and assign replacement values to resolve problems of missing, invalid or inconsistent data.

Although imputation can improve the quality of the final data, care should be taken in order to choose an appropriate imputation methodology. Some methods of imputation do not preserve the relationships between variables or can actually distort underlying relationships in the data. The suitability of the method chosen depends on the type of survey, its objectives and the nature of the error.

Standards, Guidelines and Recommendations

Standard 4.3.1 Each agency will perform error detection and treatment of its database to identify and, if necessary, resolve errors and inconsistencies in the data. Such verifications will be conducted using the data integration software developed for the survey and in accordance with the specifications in the corresponding operational manuals and record layouts.

Guidelines

The following are guidelines for editing:

i. Edits should be developed by staff who have expertise in the subject matter, questionnaire design, data analysis and with other similar surveys.
ii. Editing should be performed at several stages of the survey.
iii. Edits applied at each stage should not contradict edits at some other stage (edits applied throughout collection and processing should be consistent with each other).
iv. Editing should be used to provide information about the survey process, either in the form of quality measures for the current survey or to suggest improvements for future surveys.
v. When starting a survey, some assumptions are made about the data. During editing, it is possible to test the validity of these assumptions. For example, it may become obvious that some range edits were too strict or that some sequencing edits failed too frequently, indicating inappropriate edit rules (or some problems with the questionnaire). This information should be used to adjust the edits in the future (or to improve the design of the questionnaire).

vi. Information on the types of edits performed and the impact of editing on the survey data should be communicated to users.
vii. Quality assurance and quality control procedures should be applied to minimize and correct errors introduced during editing

The following are guidelines for imputation:

i. Imputed records should closely resemble the failed edit record. This is usually achieved by imputing the minimum number of variables, thereby preserving as much respondent data as possible. The underlying assumption (which is not always true in practice) is that a respondent is more likely to make only one or two errors than several.
ii. Good imputation has an audit trail for evaluation purposes. Imputed values should be flagged and the methods and sources of imputation clearly identified. The unimputed and imputed values of the record's fields should be retained so that the degree and effects of imputation can be evaluated.
iii. Imputed records should satisfy all edits.
iv. The imputation methods should be chosen carefully, considering the type of data to be imputed.
v. The imputation method should aim to reduce the nonresponse bias and preserve relationships between items as much as possible (i.e., the fit of the model underlying the imputation method should be assessed).
vi. The imputation system should be thought out, specified, programmed and tested in advance.
vii. The process should be automated, objective, reproducible and efficient.
viii. The imputation system should be able to handle any pattern of missing or inconsistent fields.
ix. For donor imputation methods, the imputed record should closely resemble the donors selected. This will tend to ensure that the combination of imputed and unimputed responses for the imputed record not only satisfy the edits but are also plausible.

Quality Related Actions

- The agency should generate the reports necessary to carry out the error detection, treatment and verification as the survey progresses. Frequencies and basic statistics should be produced to support the review of data.
- The editing and imputation procedure and its impact on data should be periodically evaluated and documented. The assessment results should be used to improve it and, possibly, other phases of the survey process.

4.4 ESTIMATION

In order to produce estimates, the data collected and appropriately treated (coding & editing) should be processed according to consolidated and approved methodologies (at national or international level). The use of auxiliary information for developing model-based estimates should be justified, assumptions underlying the models should be made explicit and their actual

validity should be assessed. The produced estimates should be released together with estimates of sampling errors to allow for their correct use and interpretation.

Once the data have been collected, captured, coded, edited and imputed, the next step is estimation. Estimation is the means by which the statistical agency obtains values for the population of interest so that it can draw conclusions about that population based on information gathered from only a sample of the population. An estimate may be a total, mean, ratio, percentage, etc.

For a sample survey, the basis of estimation is the unit's weight, which indicates the average number of population units it represents. A population total can be estimated, for example, by summing the weighted values of the sampled units. The initial design weight is determined by the sample design. Sometimes, adjustments are made to this weight, for example, to compensate for units that do not respond to the survey (i.e., total nonresponse) or to take into account auxiliary information. Nonresponse adjustments may also be applied to data from a census survey.

Sampling error occurs in sample surveys since only a portion of the population is enumerated and the sampled units do not have exactly the same characteristics as all of the population units that they represent. An estimate of the magnitude of the sampling error for each estimate should always be provided to indicate to users the quality of the data.

Standards, Guidelines and Recommendations

Standard 4.4.1 Estimates produced using the data will be weighted population estimates that use the final sample weights.

Standard 4.4.2 The sampling error measures for population estimates – such as variances, standard errors and coefficients of variation – will be computed using the replication method.

Guidelines

i. The procedure to derive estimates (totals, proportions, contingency tables) should be well and clearly defined.
ii. Typically, in case of surveys based on probability samples, estimates are calculated using weights that are derived directly from the sampling design (sampling weights), then corrected to compensate for the impact of non-sampling errors (unit nonresponse, undercover age) or to exploit the auxiliary information available in order to obtain more accurate estimates (e.g. calibration).
iii. In sample surveys that make use of non-probability samples, estimates are generally derived by using appropriate statistical models. It should be noted that the use of models may also occur in surveys based on probability samples. In this case sampling weights are usually not taken into consideration. In general, the use of model-based estimation procedures should be justified and the related assumptions should be plausible and, if possible, tested. In some cases, model validations may be carried out ex post, where new surveys, based on probability samples, are carried out on the same population.

iv. If auxiliary variables are used in the estimation process, they should be correlated to the survey variables and updated. The use of a particular model should be documented as well as the main underlying assumptions. If several auxiliary variables are available, it should be explained how the variables actually used were selected.
v. Estimates should be released with error measures. These measures should take into account, where possible, the main errors (sampling and non-sampling) observed in the whole process.
vi. The criteria for estimate dissemination should be established prior to their production: that is, by fixing the error level above which estimates are not disseminated.
vii. The estimation procedure should be carried out using generalized software.
viii. All results of estimation processes should be replicable (exactly or with minor approximations), meaning that by repeating all processing procedures, the same results have to be obtained.

Probability sample surveys

A weight is usually associated to each sampled unit; the weight may be the direct sample weight (obtained as the inverse of the inclusion probability) or the same corrected to compensate the impact of non-sampling errors (unit nonresponse, under coverage) or to exploit available auxiliary information to derive more accurate estimates of the values of interest (e.g. calibration).The procedure to derive estimates using weights should follow sound and generally accepted methods and techniques and should be transparent and documented.

Correction of weights to compensate non-sampling errors (unit nonresponse, under coverage) should be carried out using sound methodologies that are both nationally and internationally accepted. The auxiliary variables used in the corrections of weights should be explanatory of the problem that needs to be corrected and updated. Auxiliary variables used to correct weights in order to improve estimate accuracy should be related to the variables for which it is necessary to produce estimates.

An estimate of sampling variance for the most important estimates should be produced both for the entire population and for the main domains. Such an estimate needs to take into account the design characteristics (stratification, multistage selection, etc.) and the corrections made to weights. When the estimate of sampling variance is obtained by approximate methods, such choice should be documented.

The impact on estimates in terms of variance and of bias due to non-sampling errors should be considered, if possible.

Quality Related Actions

- Estimation must take into account the sample design. To that end, design weights should be incorporated in the estimation process.
- Survey estimates should include an estimate of their sampling error, in the form of sampling variance, standard error, coefficient of variation, margin of error or confidence interval.

4.5 DATA VALIDATION

Prior to dissemination survey results should be evaluated together with subject matter experts to determine whether or not there are anomalies. Where practicable, results should be compared with the same results obtained on previous occasions of the process or with similar results obtained by other processes within the same organization or from outside agencies. Moreover, quality indicators of the process (including, for sample surveys, the level of precision of final estimates) should be calculated and analyzed, also to assess the possible introduction of improvement actions on subsequent survey occasions.

The database at the end of the data processing and integration phase will be used in subsequent steps such as weighting, scaling, estimation, analysis and reporting. It is therefore imperative that the final database incorporating all sources has been properly verified and edited to ensure that it is free of data capture errors, so that a reliable database is available for analysis

Standards, Guidelines and Recommendations

Standard 4.5.1 Each agency will perform verifications of its database to identify and, if necessary, resolve errors and inconsistencies in the data. Such verifications will be conducted using the data integration software in accordance with the specifications in the corresponding operational manuals and record layouts

Guidelines

i. Before releasing survey results, they should be evaluated through comparisons with results from previous occasions of the same survey and through comparisons with external sources. Such sources may be internal statistical sources, sources external to the Institute or administrative sources. Eventual differences should be justified and documented.

ii. If possible, consistency of results with respect to ratios that may be considered almost constant or subject to minor changes in the short period should be controlled (for example some demographic ratios). Again, eventual differences should be justified and documented.

iii. In case of suspicious values, the results should be evaluated prior to their release by subject matter experts from the Institute or by external experts such as academics or business associations. If the evaluation is performed by external experts, data confidentiality should be assured. In any case it is preferable to involve internal or external experts in the validation that are not directly involved in the data production process.

iv. During the validation phase, quality indicators such as, for example, coverage error rate, response rate and coefficient of variation, should be systematically analysed and compared with expected levels of these indicators. In case of significant deviations, the adoption of corrective actions, such as follow ups of non-respondent units and integration with data from administrative sources, should be evaluated. Finally, control surveys or ad hoc measurements should be regularly carried out to assess the

various components of non-sampling errors (e.g., nonresponse errors and interviewer effect).

v. Ad hoc analysis, as well as calculation of quality indicators, are aimed, in the first place, at ensuring the quality of the disseminated estimates and, secondly, at assessing the opportunity to adopt improvement actions for subsequent survey occasions.

Quality Related Actions

- The agency should generate the reports necessary to carry out the verification as the survey progresses and prior to data submission. Frequencies and basic statistics should be produced to support the review of data.

SECTION 5: DATA STORAGE, ANALYSIS, DISSEMINATION AND DOCUMENTATION STANDARD

Validated microdata should be stored according to standards of the agency before their dissemination. The macrodata and microdata disseminated should be pre-emptively treated in order to ensure adequate protection of confidentiality. A dissemination calendar of statistical results should be published. All phases of the process should be adequately documented.

Data analysis involves summarizing the data and interpreting their meaning in a way that provides clear answers to questions that initiated the survey. Data analysis should relate the survey results to the questions and issues identified by the Statement of Objectives. It is one of the most crucial steps of a survey since the quality of the analysis can substantially affect the usefulness of the whole survey.

Data analysis may be restricted to the survey data alone or it may compare the survey's estimates with results obtained from other surveys or data sources. Often, it consists of examining tables, charts and various summary measures, such as frequency distributions and averages to summarize the data. Statistical inference may be used in order to verify hypotheses or study the relationships between characteristics, for instance, using regression, analysis of variance or chi-square tests.

Data dissemination is the release of the survey data to users through various modes, for example, through media, paper publication and electronically.

Delivery and presentation of the final results is very important. It should be easy for the users to find, understand, use and interpret the survey results correctly. Results from the survey should be summarized and the strengths and weaknesses of the data indicated, with important details highlighted through a written report that includes tables and charts.

Before disseminating data, a data quality evaluation should be performed in order to help assess and interpret the survey results and the quality of the survey and to inform users so that they can judge for themselves the usefulness of the data. It may also provide valuable input to improve the survey (if repeated) or other surveys. This evaluation, and its accompanying report, should include a description of the survey methodology along with measures and sources of error. Disclosure control refers to those measures taken to protect disseminated data so that the confidentiality of respondents is not violated. It involves, for instance, identifying and eliminating (or modifying) table cells that risk revealing information about an individual. Before choosing a disclosure control method, various methods should be compared with respect to their impact on the survey results and an individual's risk of disclosure.

Documentation provides a record of the survey and should encompass every survey step and every survey phase. It may record different aspects of the survey and be aimed at different groups, such as management, technical staff, designers of other surveys and users. For example, a report on data quality provides users a context for informed use of the data. A survey report that includes not only what decisions were made, but also why they were made provides

management and technical staff with useful information for future development and implementation of similar surveys. During implementation, documentation of procedures for staff helps to ensure effective implementation.

Standards, Guidelines and Recommendations

Standard 5.1 The agency will prepare a final survey report after the completion of data collection

Guidelines

i. Before data dissemination, validated microdata should be stored in the repository of the agency and share with NSB if possible.
ii. Validated microdata should be stored together with the metadata needed for their interpretation (record formats, variables and classifications associated).
iii. The objective of dissemination is to allow a timely and effective use of the statistical information produced by the Institute, thereby meeting user requirements. To this end, it is useful to define a calendar for the various types of release in advance. Data should be disseminated simultaneously to all users to ensure impartiality and independence of official statistics.
iv. Dissemination of data that are easily accessible and understandable is important in order to allow a better use of them by users. Accessibility is related to the type of media used and to the ease of information retrieval. Internet has become the dominant dissemination mode, both through the development of data warehouses and through the publication of online papers, press releases and books. Clarity, however, is linked to the availability of metadata about information content and characteristics of the production process, and quality indicators. Moreover, possible data limitations should be reported, such as the presence of breaks in time series and the possible provisional nature of the data released. The various types of release, for example, yearbooks and press releases should comply with editorial standards.
v. In case of dissemination of aggregate data, specific methods may be used, for example the threshold rule, which is set as equal to or greater than three, and methods of perturbation, which consist of perturbing data in order to reduce the possibility of identification and acquisition of information on individual units. With regard to the dissemination of elementary data specific methods may be used, such as recoding of variables to reduce the information detail, suppression of specific information that may allow the identification of a unit, and methods of perturbation of elementary data. For the protection of confidentiality in data dissemination generalized software should be used.
vi. Documentation of the production process should be produced and archived at all phases of the process, from design to dissemination. Documentation should include process quality indicators, such as indicators of timeliness, coverage and nonresponse, consistency and comparability over time.

Quality Related Actions

- Define the criteria under which disclosure of individual data may be deemed to occur.
- Publicise that the data will be used only for statistical purposes and that no individual data will be revealed.
- Use the data collected only to produce statistical aggregates and (possibly) anonymised unit record data files.
- Incorporate statements that data will be used only for statistical purposes and individual data will remain confidential in statistical tables in the preamble to the survey questionnaire
- Check for potential disclosure or residual disclosure in a table of aggregates.
- Prior to dissemination, check all aggregate outputs for potential disclosure, suppress any cells that that would result in disclosure and inform users why this has been done.
- Decide whether an anonymised unit record data file will be produced, and if so, define the criteria for anonymization and the software to ensure the criteria are applied in creating the file.
- Define the criteria for determining which agency staff members should have access to individual data and/or to unpublished aggregates.
- Define and develop the IT procedures required to ensure individual data and unpublished aggregates cannot be accessed other than by authorised persons.

Quality and Performance Indicators

- Statement of disclosure criteria.
- Program to detect potential disclosure including residual disclosure in aggregate tables.
- Number of tables in which potential disclosure has been detected prior to dissemination.
- Statement of criteria for authorised access to individual data and/or to unpublished aggregates.
- Documented data access procedures.

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