

OFFICE OF MANAGEMENT AND BUDGET
STANDARDS AND GUIDELINES FOR STATISTICAL SURVEYS

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Table of Contents

LIST OF STANDARDS FOR STATISTICAL SURVEYS	i
INTRODUCTION.....	1
SECTION 1 DEVELOPMENT OF CONCEPTS, METHODS, AND DESIGN	5
Section 1.1 Survey Planning.....	5
Section 1.2 Survey Design.....	7
Section 1.3 Survey Response Rates	8
Section 1.4 Pretesting Survey Systems.....	9
SECTION 2 COLLECTION OF DATA.....	9
Section 2.1 Developing Sampling Frames.....	9
Section 2.2 Required Notifications to Potential Survey Respondents	10
Section 2.3 Data Collection Methodology.....	11
SECTION 3 PROCESSING AND EDITING OF DATA.....	13
Section 3.1 Data Editing	13
Section 3.2 Nonresponse Analysis and Response Rate Calculation.....	14
Section 3.3 Coding.....	17
Section 3.4 Data Protection.....	18
Section 3.5 Evaluation	19
SECTION 4 PRODUCTION OF ESTIMATES AND PROJECTIONS	20
Section 4.1 Developing Estimates and Projections.....	20
SECTION 5 DATA ANALYSIS	21
Section 5.1 Analysis and Report Planning.....	21
Section 5.2 Inference and Comparisons.....	22
SECTION 6 REVIEW PROCEDURES	23
Section 6.1 Review of Information Products.....	23
SECTION 7 DISSEMINATION OF INFORMATION PRODUCTS	24
Section 7.1 Releasing Information.....	24
Section 7.2 Data Protection and Disclosure Avoidance for Dissemination.....	25
Section 7.3 Survey Documentation.....	26
Section 7.4 Documentation and	

LIST OF STANDARDS FOR STATISTICAL SURVEYS

SECTION 1 DEVELOPMENT OF CONCEPTS, METHODS, AND DESIGN

Survey Planning

Standard 1.1: Agencies initiating a new survey or major revision of an existing survey must develop a written plan that sets forth a justification, including: goals and objectives; potential users; the decisions the survey is designed to inform; key survey estimates; the precision required of the estimates (e.g., the size of differences that need to be detected); the tabulations and analytic results that will inform decisions and other uses; related and previous surveys; steps taken to prevent unnecessary duplication with other sources of information; when and how frequently users need the data; and the level of detail needed in tabulations, confidential microdata, and public-use data files.

Survey Design

Standard 1.2: Agencies must develop a survey design, including defining the target population, designing the sampling plan, specifying the data collection instrument and methods, developing a realistic timetable and cost estimate, and selecting samples using generally accepted statistical methods (e.g., probabilistic methods that can provide estimates of sampling error). Any use of nonprobability sampling methods (e.g., cut-off or model-based samples) must be justified statistically and be able to measure estimation error. The size and design of the sample must reflect the level of detail needed in tabulations and other data products, and the precision required of key estimates. Documentation of each of these activities and resulting decisions must be maintained in the project files for use in documentation (see Standards 7.3 and 7.4).

Survey Response Rates

Standard 1.3: Agencies must design the survey to achieve the highest practical rates of response, commensurate with the importance of survey uses, respondent burden, and data collection costs, to ensure that survey results are representative of the target population so that they can be used with confidence to inform decisions. Nonresponse bias analyses must be conducted when unit or item response rates or other factors suggest the potential for bias to occur.

Pretesting Survey Systems

Standard 1.4: Agencies must ensure that all components of a survey function as intended when implemented in the full-scale survey and that measurement error is controlled by conducting a pretest of the survey components or by having successfully fielded the survey components on a previous occasion.

SECTION 2 COLLECTION OF DATA

Developing Sampling Frames

Standard 2.1: Agencies must ensure that the frames for the planned sample survey or census are appropriate for the study design and are evaluated against the target population for quality.

Required Notifications to Potential Survey Respondents

Standard 2.2: Agencies must ensure that each collection of information instrument clearly states the reasons the information is planned to be collected; the way such information is planned to be used to further the proper performance of the functions of the agency; whether responses to the collection of information are voluntary or mandatory (citing authority); the nature and extent of confidentiality to be provided, if any, citing authority; an estimate of the average respondent burden together with a request that the public direct to the agency any comments concerning the accuracy of this burden estimate and any suggestions for reducing this burden; the OMB control number; and a statement that an agency may not conduct and a person is not required to respond to an information collection request unless it displays a currently valid OMB control number.

Data Collection Methodology

Standard 2.3: Agencies must design and administer their data collection instruments and methods in a manner that achieves the best balance between maximizing data quality and controlling measurement error while minimizing respondent burden and cost.

SECTION 3 PROCESSING AND EDITING OF DATA

Data Editing

Standard 3.1: Agencies must edit data appropriately, based on available information, to mitigate or correct detectable errors.

Nonresponse Analysis and Response Rate Calculation

Standard 3.2: Agencies must appropriately measure, adjust for, report, and analyze unit and item nonresponse to assess their effects on data quality and to inform users. Response rates must be computed using standard formulas to measure the proportion of the eligible sample that is represented by the responding units in each study, as an indicator of potential nonresponse bias.

Coding

Standard 3.3: Agencies must add codes to collected data to identify aspects of data quality from the collection (e.g., missing data) in order to allow users to appropriately analyze the data. Codes added to convert information collected as text into a form that permits immediate analysis must use standardized codes, when available, to enhance comparability.

Data Protection

Standard 3.4: Agencies must implement safeguards throughout the production process to ensure that survey data are handled to avoid disclosure.

Evaluation

Standard 3.5: Agencies must evaluate the quality of the data and make the evaluation public (through technical notes and documentation included in reports of results or through a separate report) to allow users to interpret results of analyses, and to help designers of recurring surveys focus improvement efforts.

SECTION 4 PRODUCTION OF ESTIMATES AND PROJECTIONS

Developing Estimates and Projections

Standard 4.1: Agencies must use accepted theory and methods when deriving direct survey-based estimates, as well as model-based estimates and projections that use survey data. Error estimates must be calculated and disseminated to support assessment of the appropriateness of the uses of the estimates or projections. Agencies must plan and implement evaluations to assess the quality of the estimates and projections.

SECTION 5 DATA ANALYSIS

Analysis and Report Planning

Standard 5.1: Agencies must develop a plan for the analysis of survey data prior to the start of a specific analysis to ensure that statistical tests are used appropriately and that adequate resources are available to complete the analysis.

Inference and Comparisons

Standard 5.2: Agencies must base statements of comparisons and other statistical conclusions derived from survey data on accep

Documentation and Release of Public-Use Microdata

Standard 7.4: Agencies that release microdata to the public must include documentation clearly describing how the information is constructed and provide the metadata necessary for users to access and manipulate the data (See also Standard 1.2). Public-use microdata documentation and metadata must be readily accessible to users.

INTRODUCTION

This document provides 20 standards that apply to Federal censuses and surveys whose statistical purposes include the description, estimation, or analysis of the characteristics of groups, segments, activities, or geographic areas in any biological, demographic, economic, environmental, natural resource, physical, social, or other sphere of interest. The development, implementation, or maintenance of methods, technical or administrative procedures, or information resources that support such purposes are also covered by these standards. In addition, these standards apply to censuses and surveys that are used in research studies or program evaluations if the purpose of the survey meets any of the statistical purposes noted above. To the extent they are applicable, these standards also cover the compilation of statistics based on information collected from individuals or firms (such as tax returns or the financial and operating reports required by regulatory commissions), applications/registrations, or other administrative records.

Background

Standards for Federal statistical programs serve both the interests of the public and the needs of the government. These standards document the professional principles and practices that Federal agencies are required to adhere to and the level of quality and effort expected in all statistical activities. Each standard has accompanying guidelines that present recommended best practices to fulfill the goals of the standards. Taken together, these standards and guidelines provide a means to ensure consistency among and wj0.00imure Obest practices the governmompilationthe stended
statisted onimforndkby5(t)-1test. The developmentation

- Development of concepts, methods, and design
- Collection of data
- Processing and editing of data
- Production of estimates and projections
- Data analysis
- Review procedures
- Dissemination of Information Products.

Within this framework, the 20 standards and their related guidelines for Federal statistical surveys focus on ensuring high quality statistica

achieved by continual assessment of information needs, anticipating emerging requirements, and developing new products and services.

To ensure that information disseminated by Federal agencies meets the needs of the intended users, agencies rely upon internal reviews, analyses, and evaluations along with feedback from advisory committees, researchers, policymakers, and the public. In addition, agencies should clearly and correctly present all information products in plain language geared to their intended audiences. The target audience for each product should be clearly identified, and the product's contents should be readily accessible to that audience.

In all cases, the goal is to maximize the usefulness of information and minimize the costs to the government and the public. When disseminating their information products, Federal agencies should utilize a variety of efficient dissemination channels so that the public, researchers, and policymakers can locate and use information in an equitable, timely, and cost-effective fashion.

The specific standards that contribute directly to the utility and the dissemination of information include: Survey Planning (1.1), Survey Design (1.2), Pretesting Survey Systems (1.4), Review of Information Products (6.1), Releasing Information (7.1), Survey Documentation (7.3), and Documentation and Release of Public-Use Microdata (7.4).

Integrity refers to the security or protection of information from a2mi

For each statistical survey in existence when these standards are issued and for each new survey, the sponsoring and/or releasing agency should evaluate compliance with applicable standards. The agency should establish compliance goals for applicable standards if a survey is not in compliance. An agency should use major survey revisions or other significant survey events as opportunities to address areas in which a survey is not in compliance with applicable standards.

Federal agencies are required to adhere to all standards for every statistical survey, even those that have already received OMB approval. Agencies should provide sufficient information in their Information Collection Requests (ICR) to OMB under the Paperwork Reduction Act (PRA) to demonstrate whether they are meeting the standards. OMB recognizes that these standards cannot be applied uniformly or precisely in every situation. Consideration will be given to the importance of the uses of the information as well as the quality required to support those uses. If funding or other contingencies make it infeasible for all standards to be met, agencies should discuss in their ICR submissions the options that were considered and why the final design was selected.

The agency should also include in the standard documentation for the survey, or in an easily accessible public venue, such as on its web site, the reasons why the standard could not be met and what actions the agency has taken or will take to address any resulting issues.³

The following standards and guidelines are not designed to be completely exhaustive of all efforts that an agency may undertake to ensure the quality of its statistical information. Agencies are encouraged to develop additional, more detailed standards focused on their specific statistical activities.

The standards are presented in seven sections. For each standard, there is a list of key terms that are used in the standard or accompanying guidelines, and these terms are defined in the appendix to provide clarification on their use in this document. The guidelines for each standard represent best practices that may be useful in fulfilling the goals of the standard and provide greater specificity and detail than the standards. However, as noted earlier, these standards and guidelines are not intended to substitute for the extensive existing literature on statistical and

SECTION 1 DEVELOPMENT OF CONCEPTS, METHODS, AND DESIGN

Section 1.1 Survey Planning

Standard 1.1: Agencies initiating a new survey or major revision of an existing survey must develop a written plan that sets forth a justification, including: goals and objectives; potential users; the decisions the survey is designed to inform; key survey estimates; the precision required of the estimates (e.g., the size of differences that need to be detected); the tabulations and analytic results that will inform decisions and other uses; related and previous surveys; steps taken to prevent unnecessary duplication with other sources of information; when and how frequently users need the data; and the level of detail needed in tabulations, confidential microdata, and public-use data files.

Key Terms: bridge study, confidentiality, consistent data series, crosswalk study, data series, effect size, individually-identifiable data, key variables, measurement error, microdata, minimum substantively significant effect (MSSE), pretest, public-use data file, respondent burden, survey system

The following guidelines represent best practices that may be useful in fulfilling the goals of the standard:

Guideline 1.1.1: Surveys (and related activities such as focus groups, cognitive interviews, pilot studies, field tests, etc.) are collections of information subject to the requirements of the Paperwork Reduction Act of 1995 (Pub.L. No. 104-13, 44 U.S.C. § 3501 et seq.) and OMB's implementing regulations (5 C.F.R. § 1320, Controlling Paperwork Burdens on the Public). An initial step in planning a new survey or a revision of an existing survey should be to contact the sponsoring agency's Chief Information Officer or other designated official to ensure the survey work is done in compliance with the law and regulations. OMB approval will be required before the agency may collect information from 10 or more members of the public in a 12-month period. A useful reference document regarding the approval process is OMB's *Questions and Answers When Designing Surveys for Information Collections*.

Guideline 1.1.2: Planning is an important prerequisite when designing a new survey or survey system, or implementing a major revision of an ongoing survey. Key planning and project management activities include the following:

1. A justification for the survey, including the rationale for the survey, relationship to prior surveys, survey goals and objectives (including priorities within these goals and objectives), hypotheses to be tested, and definitions of key variables. Consultations with potential users to identify their requirements and expectations are also important at this stage of the planning process.
2. A review of related studies, surveys, and reports of Federal and non-Federal sources to ensure that part or all of the survey would not unnecessarily duplicate available data from an existing

individuals, a State, territorial, tribal, or local government or branch thereof, or a political subdivision of a State, territory, tribal, or local government or a branch of a political subdivision" (5 C.F.R. § 1320.3(k)).

data collections; methods of collection for achieving acceptable response rates; training of enumerators and persons coding and editing the data; and cost estimates, including the costs of pretests, nonresponse follow-up, and evaluation studies.

Guideline 1.2.6: Whenever possible, construct an estimate of total mean square error in approximate terms, and evaluate accuracy of survey estimates by comparing with other

Section 1.4 Pretesting Survey Systems

as schools and children or households and individuals), what was done to improve the coverage of the frame, and how data quality and item nonresponse on the frame may have affected the coverage of the frame;

4. Any estimation techniques used to improve the coverage of estimates such as post-stratification procedures; and
5. Other limitations of the frame including the timeliness and accuracy of the frame (e.g., misclassification, eligibility, etc.).

Guideline 2.1.2: Conduct periodic evaluations of coverage rates and coverage of the target population in survey frames that are used for recurring surveys, for example, at least every 5 years.

Guideline 2.1.3: Coverage rates in excess of 95 percent overall and for each major stratum are desirable. If coverage rates fall below 85 percent, conduct an evaluation of the potential bias.

Guideline 2.1.4: Consider using frame enhancements, such as frame supplementation or dual-frame estimation, to increase coverage.

For more information on developing survey frames, see *Federal Committee on Statistical Methodology (FCSM) Statistical Policy Working Paper 17, Survey Coverage*.

Section 2.2 Required Notifications to Potential Survey Respondents

Standard 2.2: Agencies must ensure that each collection of information instrument clearly states the reasons the information is planned to be collected; the way such information is planned to be used to further the proper performance of the functions of the agency; whether responses to the collection of information are voluntary or mandatory (citing authority); the nature and extent of confidentiality to be provided, if any, citing authority; an estimate of the average respondent burden together with a request that the public direct to the agency any comments concerning the accuracy of this burden estimate and any suggestions for reducing this burden; the OMB control number; and a statement that an agency may not conduct and a person is not required to respond to an information collection request unless it displays a currently valid OMB control number.

Key Terms: confidentiality, mandatory, respondent burden, voluntary

The following guideline represents best practices that may be useful in fulfilling the goals of the standard:

Guideline 2.2.1: Provide appropriate informational materials to respondents, addressing respondent burden as well as the scope and nature of the questions to be asked. The materials may include a pre-notification letter, brochure, set of questions and answers, or an 800 number to call that does the following:

1. Informs potential respondents that they have been selected to participate in a survey;
2. Informs potential respondents about the name and nature of the survey; and

3. Provides any additional information to potential respondents that the agency is required to supply (e.g., see further requirements in the regulations implementing the Paperwork

1. Given the characteristics of the target population, the objectives of the data collection, the resources available, and time constraints, determine the appropriateness of the method of data collection (e.g., mail, telephone, personal interview, Internet);
2. Collect data at the most appropriate time of year, when relevant;
3. Establish the data collection protocol to be followed by the field staff;
4. Provide training for field staff on new protocols, with refresher training on a routine, recurring cycle;
5. Establish best practice mechanisms to minimize interviewer falsification, such as protocols for monitoring interviewers and reinterviewing respondents;
6. Conduct response analysis surveys or other validation studies for new data collection efforts that have not been validated;
7. Establish protocols that minimize measurement error, such as conducting response analysis surveys to ensure records exist for data elements requested for business surveys, establishing recall periods that are reasonable for demographic surveys, and developing computer systems to ensure Internet data collections function properly; and
8. Quantify nonsampling errors to the extent possible.

Guideline 2.3.4: Develop protocols to monitor data collection activities, with strategies to correct identified problems. The following issues are important to consider:

1. Implement quality and performance measurement

SECTION 3 PROCESSING AND EDITING OF DATA

Section 3.1 Data Editing

Standard 3.1: Agencies must edit data appropriately, based on available information, to mitigate or correct detectable errors.

Key Terms: editing

The following guidelines represent best practices that may be useful in fulfilling the goals of the standard:

Guideline 3.1.1: Check and edit data to mitigate errors. Data editing is an iterative and interactive process that includes procedures for detecting and correcting errors in the data. Editing uses available information and some assumptions to derive substitute values for inconsistent values in a data file. When electronic data collection methods are used, data are usually edited both during and after data collection. Include results from analysis of data and input from subject matter specialists in the development of edit rules and edit parameters. As appropriate, check data for the following and edit if errors are detected:

1. Responses that fall outside a prespecified range (e.g., based on expert judgment or previous responses) or, for categorical responses, are not equal to specified categories;
2. Consistency, such as the sum of categories matches the reported total, or responses to different questions are logical;
3. Contradictory responses and incorrect flow through prescribed skip patterns;
4. Missing data that can be directly filled from other portions of the same record (including the sample frame);
5. The omission and duplication of records; and
6. Inconsistency between estimates and outside sources.

Guideline 3.1.2: Possible actions for failed edits include the following:

1. Automated correction within specified criteria;
2. Data verified by respondent, and edit overridden;
3. Corrected data provided by respondent;
4. Corrected data available from other sources;
5. If unable to contact respondent, and after review by survey staff, an imputed value may be substituted for a failed edit; and
6. Data edit failure overridden after review by survey staff.

Guideline 3.1.3: Code the data set to indicate any actio

Section 3.2 Nonresponse Analysis and Response Rate Calculation

Standard 3.2: Agencies must appropriately measure, adjust for, report, and analyze unit and item nonresponse to assess their effects on data quality and to inform users. Response rates must be computed using standard formulas to measure the proportion of the eligible sample that is represented by the responding units in each study, as an indicator of potential nonresponse bias.

Key Terms: bias, cross-wave imputation, cross-sectional, eligible sample unit, frame, imputation, item nonresponse, key variables, longitudinal, longitudinal analysis, missing at random, missing completely at random, multivariate analysis, multivariate modeling, nonresponse bias, overall unit nonresponse, probability of selection, response rates, stages of data collection, unit nonresponse, wave, weights

The following guidelines represent best practices that may be useful in fulfilling the goals of the standard:

Guideline 3.2.1: Calculate all response rates unweighted and weighted. Calculate weighted response rates based on the probability of selection or, in the case of establishment surveys, on the proportion of key characteristics that is represented by the responding units. Agencies may report other response rates in addition to those given below (e.g., to show the range of response rates given different assumptions about eligibility) as long as the rates below are reported and any additional rates are clearly defined.

Guideline 3.2.2:

the *i*th case is not a noncontacted sample unit known to be eligible;
 O_i

K = the last stage of data collection used in the analysis;
 I^1 = the number of responding cases common to all waves in the analysis
 R^1_k = Refusals at wave 1 at stage k
 so that $I^1_k + R^1_k + O^1_k + NC^1_k + e_k(U^1_k)$ is the entire sample entered at wave 1

Guideline 3.2.6: Calculate item response rates (RRI) as the ratio of the number of respondents for whom an in-scope response was obtained (I^x for item x) to the number of respondents who were asked to answer that item. The number asked to answer an item is the number of unit-level respondents (I) minus the number of respondents with a valid skip for item x (V^x). When an abbreviated questionnaire is used to convert refusals, the eliminated questions are treated as item nonresponse:

$$RRI^x = \frac{I^x}{I - V^x}$$

Guideline 3.2.7: Calculate the total item response rates (RRT^x) for specific items as the product of the overall unit response rate (RRO) and the item response rate for item x (RRI^x):

$$RRT^x = RRO * RRI^x$$

Guideline 3.2.8: When calculating a response rate with supplemented samples, base the reported response rates on the original and the added sample cases. However, when calculating response rates where the sample was supplemented during the initial sample selection (e.g., using matched pairs), calculate unit response rates without the substituted cases included (i.e., only the original cases are used).

Guideline 3.2.9: Given a survey with an overall unit response rate of less than 80 percent, conduct an analysis of nonresponse bias using unit response rates as defined above, with an assessment of whether the data are missing completely at random. As noted above, the degree of nonresponse bias is a function of not only the response rate but also how much the respondents and nonrespondents differ on the survey variables of interest. For a sample mean, an estimate of the bias of the sample respondent mean is given by:

$$B(\bar{y}_r) = \bar{y}_r - \bar{y}_t = \frac{n_{nr}}{n} (\bar{y}_r - \bar{y}_{nr})$$

Where:

variables to determine if nonresponse bias exists. Comparison of the respondents to known characteristics of the population from an external source can provide an indication of possible bias, especially if the characteristics in question are related to the survey's key variables.

Guideline 3.2.10: If the item response rate is less than 70 percent, conduct an item nonresponse analysis to determine if the data are missing at random at the item level for at least the items in question, in a manner similar to that discussed in Guideline 3.2.9.

Guideline 3.2.11: In those cases where the analysis indicates that the data are not missing at random, the amount of potential bias should inform the decision to publish individual items.

Guideline 3.2.12: For data collections involving sampling, adjust weights for unit nonresponse, unless unit imputation is done. The unit nonresponse adjustment should be internally consistent, based on theoretical and empirical considerations, appropriate for the analysis, and make use of the most relevant data available.

Guideline 3.2.13: Base decisions on imputation on the basis of the most relevant data available. When imputing longitudinal data sets, use cross-wave imputations or cross-sectional imputations. Imputations should be taken to use imputations that minimize the attenuation of underlying relationships. When imputing longitudinal data sets, use cross-wave imputations or cross-sectional imputations.

Guideline 3.2.15: Clearly identify all imputed values on a data file (e.g., code them).

Statistical Policy Working Paper 31, Measuring and Reporting Sources of Error in Surveys.

Section 3.3 Coding

Use standardized codes, when available, to enhance comparability. Use standardized codes, when available, to enhance comparability.

Key Terms: coding, quality assurance process

Guideline 3.3.1: Insert codes into the data set that clearly identify missing data and cases where an entry is not expected (e.g., skipped over by skip pattern). Do not use blanks and zeros as codes to identify missing data, as they tend to be confused with actual data.

Guideline 3.3.2: When converting text data to codes to facilitate easier analysis, use standardized codes, if they exist. Use the Federal coding standards listed below, if applicable. Provide cross-referencing tables to the Federal standard codes for any legacy coding that does not meet the Federal standards. Develop other types of codes using existing Federal agency practice or standard codes from industry or international organizations, when they exist. Current Federal standard codes include the following:

1. FIPS Codes. The National Institute of Standards and Technology maintains Federal Information Processing Standards (FIPS) required for use in Federal information processing in accordance with OMB Circular No. A-130. Use the following FIPS for coding (see www.itl.nist.gov/fipspubs/index.htm for the most recent versions of these standards):
 - 5-2 Codes for the Identification of the States, the District of Columbia and the Outlying Areas of the United States, and Associated Areas
 - 6-4 Counties and Equivalent Entities of the United States, Its Possessions, and Associated Areas
 - 9-1 Congressional Districts of the United States
 - 10-4 Countries, Dependencies, Areas of Special Sovereignty and Their Principal Administrative Divisions
 2. NAICS Codes. Use the North American Industry Classification System (NAICS) to classify establishments. NAICS was developed jointly by Canada, Mexico, and the United States to provide new comparability in statistics about business activity across North America. NAICS coding has replaced the U.S. Standard Industrial Classification (SIC) system (for more information, see www.census.gov/epcd/www/naics.html).
 3. SOC Codes. Use the Standard Occupational Classification (SOC) system to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data (for more information, see www.bls.gov/soc).
 4. Race and Ethnicity. Follow OMB's Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity when collecting data on race and ethnicity (for more information, see www.whitehouse.gov/omb/inforeg/statpolicy.html).
- Statistical Areas. Use the Standards for Defining Metropolitan and Micropolitan Statistical Areas for collecting, tabulating, and publishing Federal statis

Key Terms: confidential, individually-identifiable data

The following guidelines represent best practices that may be useful in fulfilling the goals of the standard:

Guideline 3.4.1: For surveys that include confidential data, establish procedures and mechanisms to ensure the information's protection during the production, use, storage, transmittal, and disposition of the survey data in any format (e.g., completed survey forms, electronic files, and printouts).

Guideline 3.4.2: Ensure that

1. Individually-identifiable survey data are protected;
2. Data systems and electronic products are protected from unauthorized intervention; and
3. Data files, network segments, servers, and desktop PCs are electronically secure from malicious software and intrusion using best available information resource security practices that are periodically monitored and updated.

Guideline 3.4.3: Ensure controlled access to data sets so that only specific, named individuals working on a particular data set can have read only, or write only, or both read and write access responsible for that data set in order to guard against unauthorized release or alteration.

2, Report

ion of the Confidential Information Protection and Statistical Efficiency Act of 2002 (IPSEA).

ection 3.5 Evaluation

interpret results of analyses, and to help designers of recurring surveys conduct improvement efforts.

response, measurement error, nonresponse error, nonsampling error, sampling error, weights

1. Potential sources of error, including
 - Coverage error (including frame errors);
 - Nonresponse error;
 - Measurement error, including sources from the instrument, interviewers, and collection process; and
 - Data processing error (e.g., keying, coding, editing, and imputation error);
2. How sampling and nonsampling error will be measured, including variance estimation and studies to isolate error components;
3. How total mean square error will be assessed;
4. Methods used to reduce nonsampling error in the collected data;
5. Methods used to mitigate nonsampling error after collection;
6. Post-collection analyses of the quality of final estimates (include a comparison of the data and estimates derived from the survey to other independent collections of similar data, if available); and
7. Make evaluation studies public to inform data users.

Guideline 3.5.2: Where appropriate, develop and implement methods for bounding or estimating the nonsampling error from each source identified in the evaluation plan.

For more information on evaluations, see *FCSM Statistical Policy Working Paper 15, Measurement of Quality in Establishment Surveys*, and *FCSM Statistical Policy Working Paper 31, Measuring and Reporting Sources of Error in Surveys*.

SECTION 4 PRODUCTION OF ESTIMATES AND PROJECTIONS

Section 4.1 Developing Estimates and Projections

Standard 4.1:

Agencies must plan and implement evaluations to assess the quality of the estimates and projections.

Topics include: stratification, projection, raking, ratio estimation, sensitivity analysis, strata, variance, weights

2. Source information, such as a survey form number and description of methodology used to produce the information or links to the methodology;
3. Quality-related documentation such as conceptual limitations and nonsampling error;
4. Variance estimation documentation;
5. Time period covered by the information and units of measure;
6. Data taken from alternative sources;
- 7.

16. Overall unit response rates (weighted and unweighted) and nonresponse bias analyses (if applicable); and
17. Item response rates and nonresponse bias analyses, (if applicable).

Guideline 7.3.2: To ensure that a survey can be replicated and evaluated, the agency's internal archived portion of the survey system documentation, at a minimum, must include the following:

1. Survey planning and design decisions, including the OMB Information Collection Request package;
2. Field test design and results;
3. Selected sample;
4. Sampling frame;
5. Justifications for the items on the survey instrument, including why the final items were selected;
6. All instructions to respondents and/or interviewers either about how to properly respond to a survey item or how to properly present a survey item;
7. Description of the data collection methodology;
8. Sampling plan and justifications, including any deviations from the plan;

APPENDIX DEFINITIONS OF KEY TERMS

-B-

Bias is the systematic deviation of the survey estimated value from the true population value. Bias refers to systematic errors that can occur with any sample under a specific design.

example, a **cross-sectional imputation** for a time 2 salary could simply be a donor's time 2 salary. Alternatively, a cross-wave imputation could be the change in a donor's salary from time 1 to time 2 multiplied by the time 1 nonrespondent's salary.

A **cut-off sample** is a nonprobability sample that consists of the units in the population that have the largest values of a key variable (frequently the variable of interest from a previous time period). For example, a 90% cut-off sample consists of the largest units accounting for at least 90% of the population total of the key variable. Sample selection is usually done by sorting the population in decreasing order by size, and including units in the sample until the percent coverage exceeds the established cut-off.

-D-

Data protection involves techniques that are used to insure that confidential individually-identifiable data are not disclosed.

Data series are repeated collections of sequential cross-sectional or longitudinal data characteristics of the target population over time.

The **design effect (DEFF)** is the ratio of the true variance of a statistic (taking the complex sample design into account) to the variance of the statistic for a simple random sample with the same number of cases. Design effects differ for different subgroups and different statistics; no single design effect is universally applicable to any given survey or analysis.

Direct survey-based estimates are intended to achieve efficient and robust estimates of the true values of the target populations, based on the sample design and resulting survey data.

Disclosure means the public release of individually-identifiable data.

Dissemination is any agency initiated or sponsored distribution of information to the public.

Domain refers to a defined universe or a subset of the universe with specific attributes, e.g., knowledge, skills, abilities, attitudes, interests, lines of business, size of operations, etc.

-E-

Editing is the data-processing activity aimed at detecting and correcting errors.

Effect size refers to the standardized magnitude of the effect or the departure from the null hypothesis. For example, the effect size may be the amount of change over time, or the difference between two population means, divided by the appropriate population standard deviation. Multiple measures of effect size can be generated (e.g., standardized differences between means, correlations, and proportions).

The **effective sample size**, as used in the design phase, is the sample size under a simple random sample design that is equivalent to the actual sample under the complex sample design. In the case of complex sample designs, the actual sample size is determined by multiplying the effective sample size by the anticipated design effect.

An **eligible sample unit** is a unit selected for a sample that is confirmed to be a member of the target population.

Estimates result from the process of providing a numerical value for a population parameter on the basis of information collected from a survey and/or other sources.

Estimation is the process of using data from a survey and/or other sources to provide a value for an unknown population parameter (such as a mean, proportion, correlation, or effect size), or to provide a range of values in the form of a confidence interval.

Estimation error is the difference between a survey estimate and the true value of the parameter in the target population.

-F-

In a **field test**, all or some of the survey procedures are tested on a small scale that mirrors the planned full-scale implementation.

A **focus group** involves a semi structured group discussion of a topic.

-L-

A **longitudinal** sample survey follows the experiences and outcomes over time of a representative sample of respondents (i.e., a cohort).

Longitudinal analysis involves the analysis of

-N-

Nonprobabilistic methods—see “”probabilistic methods.”

-V-

Validation studies are conducted to independently verify that the data collection methodology employed will obtain accurate data for the concept studied.

Validity is the degree to which an estimate is likely to be true and free of bias (systematic errors).

Variance or variance estimates— The variance is a measure based on the deviations of individual scores from the mean. However, simply summing the deviations will result in a value of 0. To get around this problem the variance is based on squared deviations of scores about the mean. When the deviations are squared, the rank order and relative distance of scores in the distribution is preserved while negative values are eliminated. Then to control for the number of subjects in the distribution, the sum of the squared deviations, $S(X - \bar{X})$, is divided by N (population) or by $N - 1$ (sample). The result is the average of the sum of the squared deviations. Response to a **voluntary** survey is not required by law.

-W-

A **wave** is a round of data collection in a longitudinal survey (e.g., the base year and each successive followup are each waves of data collection).

Weights are the inverse of the probability of selection in most probabilistic surveys. However, in the case of establishment surveys, the weights most frequently represent the estimated proportion that the responding establishments represent of the total industry. Weights may be adjusted for nonresponse.