Activities of The Office of Federal Statistical Policy and Standards on Errors in Surveys

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Introduction

This panel of contributed papers was organized to provide an opportunity for presenting current suggestions for encouraging better measurement of and reporting of errors associated with various statistical surveys. In this concluding paper of the panel, I will review activities of the Office of Federal Statistical Policy and Standards (OFSPS) in its role as the chief planning and coordinating agency in the Federal Government on topics concerning the reporting of errors of Federal statistical surveys. In this paper, I will review past activities of the office which relate to the subject of today's panel and I will offer a few suggestions concerning future activities.

First, it will be useful for those of you who are not fully familiar with the role of the Office of Federal Statistical Policy and Standards for me to comment briefly upon our specific responsibilities, especially as they relate to today's topic. Since the mid-1930's, there has always been a central coordinating office for overseeing and encouraging improvement in Federal statistical programs.1/

Currently, the basic charter for the Office of Federal Statistical Policy and Standards is Section 103 of the Budget and Accounting Procedures Act of 1950 which indicates that the President has responsibility for planning and coordinating statistical programs and especially for the development of standards which are to be followed by the Federal Government agencies.2/

While there are no specific penalties for agencies that fail to follow standards which are established for statistical policy, there are three important inducements to agencies which assure that they will attempt to follow the standards which have been established. First, OFSPS advises the Office of Management and Budget on the clearance of all statistical surveys. Thus, if an agency designs an inquiry that does not use appropriate classification standards, it takes the risk that the inquiry itself may be disapproved. Second, the office advises the Office of Management and Budget on the priorities which appear appropriate among statistical programs. Once again, failure to implement appropriate standards may have a negative impact on future budget requests. Finally, and most important in my judgment, is the fact that most Federal statistical agencies practice a high degree of professionalism and are eager to obtain cooperation from other statistical agencies. The coordination function of OFSPS assists the agencies in achieving such collaboration. In order to be an effective part of the total statistical team of the government, it is essential for agencies to have the respect of other agencies and to have support from the coordinating mechanism. This subtle dimension of "self-interest" is particularly important in the implementation of standards and good statistical practice.

Standards Relating to Surveys

At the broadest level, a focus of this panel is, "How can we assure that Federal agencies will follow the best scientific practice?" Obviously, it is difficult to establish a statistical standard which says, "You should be a good statistician." While all would agree on the objective, the definition of good statistical practice, the evaluation of good statistical practice, and the monitoring of statistical practices are all activities which require judgment concerning the methodology used, given available resources and program objectives.

While it is difficult to create a standard of "good statistical practice," it is worth noting that several important efforts have been made in recent years. I will not attempt to inventory all of the various professional reviews and study commissions which been focused on improving the government statistical practice; rather, I will simply review some very recent efforts of the office. 3/ A number of important reviews have occurred since that list was published. Especially noteworthy are the recently completed studies of the Levitan Commission (on employment and unemployment statistics), the Rees Commission (on measures of productivity), and the Bonnen Federal Statistical System Project (on strengthening planning and coordination, including standards).

The predecessor of OFSPS was the Statistical Policy Division in the Office of Management and Budget. It issued Circular No. A-46 which included in its first edition in 1952 Appendix A entitled, "Standards for Statistical Surveys," a simple statement of important procedures to be used in the design of any survey.4/ Office of Management and Budget circulars fundamentally set forth principles and guidelines that are to be followed by the statistical agencies. This section of A-46 was designed to encourage good practice in undertaking establishment and household surveys. The Statistical Policy Division also issued in 1969 a technical paper entitled, Household Survey Manual, which offered more detailed suggestions concerning household survey design.

In 1974, Circular No. A-46 was revised. At that time the standards for survey design were improved. However, both of these efforts tended to focus on basic sampling procedures, respondent relations, (including such things as explaining the purpose of the survey) and reporting suggestions which were discussed in Appendix B of A-46. The major focus was on errors due to sampling.

In 1976, the Federal Committee on Statistical Methodology initiated a subcommittee to study nonsampling errors. This study has yielded two important documents. These documents have been issued as part of the Statistical Policy Working Paper series that was inaugurated in 1978, but which carried on the concept initiated in the

mid-1960's with the earlier series of publications In the next section I will briefly discuss the information presented in these recent papers.

Statistical Policy Working Paper 4

Statistical Policy Working Paper No. 4 offers a glossary of terminology relating to nonsampling errors. As the Subcommittee on Nonsampling Errors undertook its investigation of nonsampling error measurement, it became clear that various textbooks, technical articles, and general discussions suffered because the terminology used to describe nonsampling errors varied considerably. The subcommittee decided that it would be valuable to initiate a discussion of definitions of terms relating to nonsampling error measurement. Clearly, it is difficult to advance the state-of-the-art if the different practitioners and theoreticians are speaking different languages. Therefore, the title of the publication is Glossary of Nonsampling Error Terms: An Illustration of a Semantic Problem in Statistics.5/

Publication of the glossary generated some controversy because some readers misinterpreted the glossary as a definitive statement of the terminology. As stated in the preface to the publication, that was not the goal or expectation:

> "The Subcommittee decided to prepare this glossary not as an exhaustive list of definitions of terms related to nonsampling errors, but rather to demonstrate the semantic problem, that certain terms may be used with different meanings, creating problems of communication among statisticians."

Now that the working paper has been available for nearly 2 years, the interest in defining nonsampling errors seems to have increased. As noted by other speakers, nonsampling error is frequently more important than sampling error; therefore, it is appropriate that more attention be given to this topic than has been given in the past. The second working paper makes a more specific contribution.

Statistical Policy Working Paper 3 - An Error Profile: Employment as Measured by the Current Population Survey is an extraordinarily important document. The Current Population Survey (CPS) is one of the most thoroughly evaluated, ongoing surveys in the United States. Over the years, the Bureau of Census has undertaken a number of special methodological studies to evaluate in the CPS the importance of various dimensions of nonsampling error. This working paper prepared by Camilla Brooks and Barbara Bailar for the Subcommittee on Nonsampling Errors fully documents the research which has been underway on several major sources of nonsampling error. As defined in the publication, an error profile is a systematic and comprehensive account of survey operations that yield survey results. The errors in these results are discussed in the error profile. A listing of the chapters will illustrate the scope of the report.

I. Introduction
II. Sampling Design and Implementation
III. Observational Design and Implementation
IV. Data Processing
V. Estimation
VI. Analysis and Publication
VII. Conclusion

A careful reading of Statistical Policy Working Paper 3 will reveal that for a number of sources of nonsampling error, current methodological knowledge is inadequate. However, the importance of the working paper is that it provides a carefully developed catalog of potential sources of nonsampling error. It is indeed unlikely that it is feasible in most survey situations to undertake accurate measurement of the errors associated with these various nonsampling sources; however, the awareness that error may be introduced by such things as questionnaire design and coding of responses is very important if designers of surveys are to avoid unsuspecting pitfalls.

Important Next Steps

The earlier comments have suggested that the central statistical policy unit has for a number of years given some attention to the topic of defining sources of survey error and encouraging agencies to undertake sound statistical practices. Over the years, a large number of advances in the theory of sampling have been made and, now more recently, more attention is being focused on the need to measure both sampling and nonsampling errors. In the context of summarizing present activities in this area, I would like to make the following suggestions:

1. The proposal of D. G. Horvitz to create a "survey design information system" to bring together information on experience of survey designers and managers is an important suggestion. While there are important problems with defining the terminology and the concepts of measuring nonsampling error, it is nonetheless useful to begin creating a central information base on current surveys. As Horvitz points out, an appropriate first step is "the development of appropriate taxonomies of variables and survey designs." It seems to me that this type of project is well suited to the university or professional associations and I would encourage efforts by the ASA or by some independent universities to establish a survey design information center that would be useful to all members of the research community, including government agencies.
2. The reception which has been given to An Error Profile: Employment as Measured by the Current Population Survey has been very encouraging. It seems worthwhile for the Federal Committee on Statistical Methodology and for agencies on their own initiative to extend the concept of nonsampling error documentation to other major ongoing surveys. As a rule of thumb, we could suggest that any survey that is longitudinal in character (more than 3 cycles) or which has an annual budget of more than $2 million should be required

to prepare such documentation. While the OFSPS is not prepared at this moment to issue such a blanket requirement, we would welcome reactions from both the user community and from Federal statistical agencies.

3. A continuing program of training and professional staff meetings devoted to these issues would be very useful. For example, as followup to publication of these reports, seminars for Federal agencies were organized and the response from attendees were very enthusiastic. A first seminar on error profile was attended by about 80 Federal statisticians from various agencies and selected statisticians from outside the Federal Government. Additional seminars are being held in various agencies.

Conclusion

The concept of total survey design seems reasonable; yet, as is evident from today's discussion current practice does not fully follow through on all of the desirable elements of such an approach. As we rely increasingly upon sample surveys for program management, policy evaluation, and for social analysis, it seems evident that much more effort needs to be devoted to preplanning and designing surveys and carefully monitoring of potential sources of error; greater emphasis needs to be placed on monitoring nonsampling errors which have been frequently overlooked.

Particular importance is needed to pressure the professional community and those responsible for carrying out surveys to publish statements concerning sources of error and the importance of those various sources. We should accept no statistics which are not accompanied by a carefully developed error statement. Within the Federal Government, we will continue to promote the preparation and issuance of error profiles for major statistical series. As stated in the preface of Statistical Policy Working Paper 3:

> We expect that the error profile approach will prove useful to both users and producers of statistics. Thus, it should help to enhance the users' appreciation of the limitations of the statistics. In addition, an error profile may guide the producers in their efforts to identify those survey operations which need to be redesigned and/or controlled better in order to improve the quality of the survey results.8/

References:

1/For a detailed discussion of the history of this planning and coordinating function, see Joseph W. Duncan and William Shelton, Revolution in United States Government Statistics, 1926-1976, (Washington, D.C.: U.S. Government Printing Office), 257 pp. The history of planning and coordination is detailed in Chapter 5, pp. 145-184.)

2/The exact wording of Section 103 is: "The President through the Secretary of Commerce is authorized and directed to develop programs and to issue regulations and orders for the improved gathering, compiling, analyzing, publishing, and disseminating of statistical information for any purpose by the various agencies in the Executive Branch of the Government. Such regulations and orders shall be adhered to by such agencies."

3/For a chronological review of the many commissions examining the adequacy of Federal statistics, see President's Commission on Federal Statistics, "Commission on Statistics: Statistics on Commissions," Federal Statistics, Vol. II, (Washington, D.C.: U.S. Government Printing Office, 1971). pp. 477-495.

4/Office of Management and Budget, Circular No. A-46, "Statistical Procedures," March 28, 1952. When the Circular was revised in 1974, it was retitled, "Standards and Guidelines for Federal Statistics."

5/U. S. Department of Commerce, Office of Federal Statistical Policy and Standards, Statistical Policy Working Paper 4: Glossary of Nonsampling Error Terms: An Illustration of a Semantic Problem in Statistics, (Washington, D.C., U. S. Government Printing Office, 1978).

6/Ibid., p. ii.

7/U. S. Department of Commerce, Office of Federal Statistical Policy and Standards, Statistical Policy Working Paper 3--An Error Profile: Employment as Measured by the CPS, (Washington, D.C., U. S. Government Printing Office, 1978).

8/Statistical Policy Working Paper 3, p. iii.