The Future of the Survey of Income and Program Participation

Constance F. Citro and Graham Kalton, Editors; Panel to Evaluate the Survey of Income and Program Participation, National Research Council

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Panel to Evaluate the Survey of Income and Program Participation
Committee on National Statistics
Commission on Behavioral and Social Sciences and Education
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PANEL TO EVALUATE THE SURVEY OF INCOME AND PROGRAM PARTICIPATION

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Acknowledgments

The Panel to Evaluate the Survey of Income and Program Participation (SIPP) wishes to thank the many people who made possible the preparation of this report.

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Statistical Methods Division, including Preston Jay Waite, chief, Rajendra Singh, income branch chief, and Vicki Huggins, now with the Economic Statistical Methods Division; staff of the Population Division, including Arthur Norton, assistant chief, and David McMillen, now on the staff of the Senate Committee on Governmental Affairs; Gerald Gates of the Program and Policy Development Office; and Kent Marquis of the Center for Survey Methods Research.

Policy analysts in federal agencies that use SIPP shared their knowledge and insights with the panel about SIPP's role: Christine Schmidt-Bayne, formerly with the Food and Nutrition Service, U.S. Department of Agriculture, and now with the U.S. Department of Health and Human Services; Michele Adler and Joan Turek-Brezina of the Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services; Susan Grad and Denton Vaughan of the Office of Research and Statistics of the Social Security Administration; and Roberton Williams of the Congressional Budget Office. The panel also benefited from the views expressed in interviews conducted with a large number of analysts in federal agencies as part of the Committee on National Statistics's interim assessment of SIPP (see Committee on National Statistics, 1989:App. A).

The participants in the Conference on the Future of SIPP convened by the panel in Washington, D.C., in April 1991 contributed a wealth of knowledge about SIPP's usefulness for research and analysis and suggestions to improve its relevance and utility in the future. Appendix B lists the topics covered at the conference and the paper authors and invited discussants, who included social science researchers and policy analysts.

The panel greatly appreciates the work of Timothy Smeeding of Syracuse University, who prepared a stimulating paper on priorities for improving income data from surveys and administrative records. Courtenay Slater of Slater-Hall Information Products and Harold Watts of Columbia University contributed useful commentaries on Smeeding's paper.

The panel also benefited from the deliberations and views of other advisory bodies for SIPP, including the Working Group on Technical Aspects of SIPP of the Survey Research Methods Section of the American Statistical Association and the SIPP Committee of the Association of Public Data Users (APDU). The papers from the conferences sponsored by the SIPP Committee of the Social Science Research Council (see David, 1983, 1985b; Bureau of the Census, 1988a) provided useful material for evaluating SIPP and considering ways to enhance its usefulness in the future.

Other individuals who made helpful presentations or provided useful comments include Pat Doyle, chair of the APDU SIPP committee, formerly with Mathematica Policy Research, Inc., and now with the Agency for Health Care Policy and Research of the U.S. Department of Health and Human Services; Thomas Jabine, statistical consultant and principal author of the

SIPP Quality Profile; David Cantor, principal investigator for cognitive research on the SIPP questionnaire at Westat, Inc.; Alan Tupek, formerly with the Bureau of Labor Statistics and now with the Science Resources Studies Division of the National Science Foundation; James Lepkowski of the Survey Research Center of the University of Michigan; and James Smith and Joseph Waksberg of Westat, Inc.

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Agnes Gaskin served very ably as the senior project assistant for the panel. She made excellent logistical arrangements for the large number of plenary and working group meetings held by the panel and for the Conference on the Future of SIPP. She also performed admirably in preparing the final manuscript of the report.

A special acknowledgment is due to Connie Citro for her excellent work as the panel's study director. She had primary responsibility for organizing the panel's activities and drafting the final report. She demonstrated exceptional skills in synthesizing the panel's views and producing a coherent document, she readily appreciated different viewpoints on an issue, and she patiently and good-humoredly rewrote parts of the draft to meet concerns of panel members. In addition to all of this, she made many significant contributions to the panel's discussions on the basis of her extensive knowledge of SIPP. On behalf of the panel and personally, I thank Connie for her unstinting efforts and outstanding work. She contributed not only to the quality of the final report, but also to panel members' enjoyment and satisfaction with the enterprise.

Finally, I thank the panel members for their generous contributions of time and expert knowledge. Several of them participated in working sessions that developed detailed specifications for tabulations on income and program participation from SIPP. Others conducted on-site evaluations of data collection and processing systems and the proposed plan to oversample low-income groups in SIPP. Many of them prepared useful background papers or sets of working notes. Overall, this was an exceptionally hardworking group of people, who conducted a wide-ranging and very thorough assessment of the SIPP program. It has been a genuine pleasure to work with them.

Graham Kalton, *Chair*

Panel to Evaluate the Survey of Income and Program Participation

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Summary

The Survey of Income and Program Participation (SIPP) is a major continuing household survey, conducted by the Bureau of the Census, on people's economic well-being and their receipt of assistance from a wide range of government programs. Beginning in 1983, new samples of households have been selected for the survey every year. The adults in these households become panel members who are interviewed at 4-month intervals over a 32-month period. The questionnaire for each interview wave includes a core questionnaire about income, employment, and program participation and one or more supplemental modules on related topics.

Funding cutbacks hindered the development of this highly complex survey in its early years, but SIPP is now clearly established as an important source of information for federal policy making and social science research. The survey has a growing community of users in federal agencies, academic institutions, and other organizations. Analysts have used the data for new knowledge about such topics as part-year poverty and program participation, multiple program participation, the effect of asset holdings on program eligibility and poverty, patterns of health insurance coverage, and the short-term behavioral dynamics of individuals and families. Despite its successes, however, SIPP has experienced problems that have kept it from being as useful as it could have been in the past and that, if not adequately addressed, could affect its usefulness in the future.

After nearly 9 years of operation, the Census Bureau has under way a comprehensive reassessment of SIPP. A new sample design, using informa

tion from the 1990 census, will be implemented for SIPP beginning with the 1995 panel. At that time, the Census Bureau will make other changes to enhance the utility and cost-effectiveness of the program.

As part of the evaluation and redesign effort, the Bureau asked the Committee on National Statistics (CNSTAT) to convene a study panel to conduct an independent review of SIPP. The panel drew on the work of an interim assessment of SIPP, performed by CNSTAT in 1989, which focused on federal agency uses of the data; consulted widely with users both inside and outside federal agencies; and conducted its own assessments of SIPP. Our report covers the following aspects of SIPP: the survey's goals and their implications for content and the relationship of SIPP to other surveys and administrative record data sources; survey and sample design; data collection and processing; publications and other data products; analytical methods for using the complex longitudinal data from SIPP; methodological research and evaluation needed to plan and evaluate the SIPP redesign; and the management and oversight of the SIPP program. The first part of the Summary presents our overall conclusions and recommendations on those aspects; the second part presents all the panel's detailed recommendations.

GOALS

Over the course of SIPP's history, many people involved with the survey have wanted to expand it in one or another way to provide detailed information for their fields of concern. To satisfy these varied interests, SIPP would need to be an all-encompassing survey in the area of social welfare policy. We believe that SIPP cannot and should not be viewed as such. Rather, it is essential for the cost-effective operation of the program that it focus on a core set of major goals.

The two primary goals for SIPP should be, as its name implies, to provide detailed information on the distribution of income and other economic resources and on eligibility for and participation in government assistance programs. Within these two goals, the survey should pay most attention to improving information for people who are economically at risk: poor people and near-poor and middle-income people who, if they experienced an event such as loss of a spouse or parent or job, would be at risk of economic deprivation and in need of assistance. As an added but secondary goal, SIPP should continue and strengthen its capability to respond to current policy needs for data in topical areas that are related to its core subjects, such as support for children and use of health care.

We have identified several ways in which the data from SIPP should be enhanced to better serve the two primary goals. In the area of income-related measures, the priorities for improving information are: enhancing the quality of those measures that are relevant to program eligibility and

participation; developing measures of taxes and after-tax income; and developing measures that take account of in-kind benefits and that reflect changing family characteristics. In the area of program-related measures, the priorities for improving information are obtaining more complete and frequent data with which to determine program eligibility and developing adequate measures of periods or spells of both eligibility and participation. Finally, it is important that SIPP keep up to date with respect to new and changing sources of income and types of programs.

How SIPP best achieves its goals raises the issue of its relationship to other surveys and administrative records. SIPP was developed to provide added information and remedy deficiencies in the March income supplement to the Current Population Survey (CPS), which for decades has been the primary source of the nation's income and poverty statistics. SIPP's design enables it to collect more detailed information than is possible in the March CPS (e.g., intrayear and cross-year in addition to annual measures). Also, SIPP has achieved improvements in data quality (e.g., less item nonresponse) that would be difficult to match in the March CPS. However, to date, such problems as small sample size and lack of timeliness have limited SIPP's ability to provide regular income statistics. Changes that are implemented as part of the redesign should alleviate these problems. We urge the Census Bureau to set a target date by which time SIPP will be able to serve as the primary source of annual and other measures of income and poverty. (Some information on income should of course continue to be collected in the CPS for use in analyses of the labor force data that are the prime focus of that survey.)

The use of administrative records (e.g., program case records and tax returns) can be helpful to SIPP in many ways. These records can provide additional information on sample persons, furnish the means to obtain additional samples for groups of policy interest, and provide the basis for evaluating and improving the quality of the survey responses. However, the use of administrative records poses technical and operational problems that will need to be addressed. Also, some uses raise concerns about the confidentiality of the information, which must be adequately protected.

SURVEY DESIGN

We evaluated several alternative designs for SIPP—varying in panel length, frequency of introduction of new panels, length of recall period, and total sample size—all of which were constrained to have the same number of annual interviews as provided for by the current SIPP budget. Each design has its own strengths and weaknesses relative to the current design and the other alternatives.

We conclude that the current design is not optimal to the needs of SIPP

users for timely, high-quality, and relevant data for cross-sectional and longitudinal applications. We recommend that the length of each SIPP panel be increased from 32 to 48 months, a change that will make SIPP more suitable for analysis of spells of poverty and program participation and the dynamics of poverty and program entrances and exits. We also recommend that panels be introduced every 2 years rather than annually, a change that should reduce the operational complexity of the survey and facilitate timely data processing without compromising data quality. We recommend retaining the 4-month recall length, which means that each panel under the new design will have 12 interviews. However, we urge the Census Bureau to conduct research on 6-month versus 4-month recall periods, since an increase in recall length—if there were no adverse effects on the quality of the intrayear information—would permit longer and larger panels. Under the design that we propose, the total sample size of each panel would increase from 20,000 to 27,000 households, and it could increase further if savings are achieved through the introduction of new data collection and processing technology.

DATA COLLECTION AND PROCESSING

The Census Bureau is planning to convert SIPP data collection from paper-and-pencil methods to computer-assisted personal interviewing (CAPI). The Bureau is also planning to install a modern relational or other database management system for processing SIPP. We support both of these initiatives, which should lead to improvements in data quality and timeliness of data products. We encourage the Census Bureau to identify CAPI and database management systems that incorporate all of the features necessary to handle the complex SIPP data. For example, the systems chosen should permit data from a previous interview to be used in the current interview and in the imputation of missing items. The data processing performed by the database management system should be fully and carefully integrated with the SIPP CAPI system. Because of the necessity for thorough testing of CAPI and database management technology in conjunction with other proposed changes in SIPP, we urge the Census Bureau to consider fielding a somewhat smaller dress rehearsal panel in 1995 as a means of working out operational problems. Under this scheme, full implementation of the new design would occur in 1996.

DATA PRODUCTS AND THEIR USE

To earn a high return on the investment in a survey as rich and complex as SIPP, it is critical that the responsible agency have an active dissemination

program that includes timely and accessible published reports, computer-readable data products, and associated explanatory materials. In the past, there have been weaknesses in the data dissemination effort for SIPP, including the absence of a regular publication series for the core content on income and program participation.

We support the Census Bureau's plans to publish regular, comprehensive descriptive reports from the SIPP core data. These reports should include longitudinal statistics on the dynamics of income, poverty, and program status and cross-sectional measures and should be issued on a frequent schedule. In addition, we encourage the Bureau to establish a research report series to include in-depth analytical studies of topics related to income and programs. The Bureau should also continue publications from the topical modules and should produce reports from SIPP on the dynamics of major demographic and employment transitions.

Development of statistics from the SIPP core data gives rise to difficult conceptual and measurement issues, particularly in the case of longitudinal measures. These issues include developing statistics that appropriately relate to policy needs, specifying analysis units (e.g., household or person), characterizing change in contextual variables (e.g., marital status changes), constructing equivalence scales (i.e., income measures that are adjusted for household characteristics), measuring the duration of spells of poverty and program participation, and treating missing interviews. Because the issues involved in developing appropriate statistics from SIPP are so complex, we urge the Census Bureau to ensure that the analysis staff are able not only to prepare publications, but also to undertake an ongoing research program and keep up to date with regard to relevant analytical techniques and policy concerns.

In addition to published reports, the Census Bureau should develop improved microdata products from SIPP to support policy analysis and social science research. Priorities for improvement include moving toward a goal of releasing core data files within 6 months after the end of data collection and producing calendar-year files that combine two panels. Improvements in documentation and related user information services are also necessary and important for SIPP.

METHODOLOGICAL RESEARCH AND EVALUATION

One strength of SIPP, going back to the days of its predecessor, the Income Survey Development Program, has been the extent of research on data quality and ways to improve both the quality and the efficiency of the survey. SIPP should continue that focus on methodological research and evaluation. In the immediate future, the Census Bureau will need the results of methodological studies to develop the details of the proposed redesign. Research

should be conducted on proposed questionnaire changes, using small-scale administrative record-check studies and taking full advantage of the findings of current experiments with cognitively based interviewing procedures and questionnaire formats. Research should also be conducted on other aspects of the redesign, including alternative methods of oversampling the low-income population and the best combination of personal and telephone interviews in an environment of computer-assisted interviewing. Research should be carried out as well on issues of estimation and data use in light of the redesign, including ways to improve weighting and imputation. In the longer term, the Census Bureau will need information on the impact of the redesign to identify successes and to respond to problems. Finally, it will be important for the Bureau to monitor error levels in present and future SIPP panels on a continuing basis and to provide regularly updated information to users.

MANAGEMENT AND OVERSIGHT

An effective management structure is a key component to a survey's success. In the case of SIPP, the Census Bureau has leadership, analysis, and dissemination responsibilities that are not typical of the household surveys that it conducts for other agencies. These responsibilities, together with SIPP's complexity, argue for a management structure for SIPP that is stronger and more focused than the Bureau's structure for its other household surveys. We recommend that the Bureau establish a high-level position of project director with full responsibility for its income statistics program, including both SIPP and the March CPS income supplement. The project director needs to combine relevant substantive expertise with strong survey management skills and have a sufficiently large staff to guide the program, prepare reports and analyses, and address analytical concepts and methods.

Finally, the Census Bureau has made commendable efforts to seek outside advice about SIPP, which is essential to keeping the survey oriented to user needs and up to date with improvements in survey design and analysis. We urge the Bureau to strengthen its advisory mechanisms, particularly in seeking input from users in the academic community, and in obtaining expert advice on analytical methods that is comparable to the advice it currently obtains on survey methodology and data products.

RECOMMENDATIONS

The text of all of the panel's recommendations are presented here, keyed to the chapters in which they appear in the report.

Goals for SIPP

Recommendation 2-1: The two primary goals of SIPP should be to provide improved information on the distribution of income and other economic resources for people and families and on eligibility for and participation in government assistance programs. Within these two goals, most attention should be paid to improving the information for people who are economically at risk. A third important but subordinate goal is for SIPP to have a capability to respond to current policy needs for data in topical areas that are related to the core subjects of SIPP.

Achieving SIPP's Goals

Recommendation 3-1: Priorities for improved income and related measures from SIPP should include:

- enhancing the quality of income and related measures that are relevant to program eligibility and participation;
- developing measures of taxes and after-tax income;
- valuing (or otherwise taking account of) in-kind benefits; and
- constructing income and related measures that take account of family characteristics and changes in families over time.

SIPP should also keep up to date with respect to new sources of income and other economic resources.

Recommendation 3-2: The measurement of asset-related information in SIPP should be reassessed in light of SIPP's focus on programs and the economically at-risk population. The collection of asset items should be redesigned and simplified, if possible, to reduce respondent burden and improve the quality of the data needed to serve SIPP's primary goals.

Recommendation 3-3: SIPP should develop, on an experimental basis, selected measures of economic security against risk, such as access to credit.

Recommendation 3-4. Priorities for improved measures of program participation and eligibility from SIPP should include improving the range and frequency of information needed to determine eligibility for major assistance programs and providing adequate measures of spells of both eligibility and participation. SIPP should also keep up to date with respect to newly important programs and program changes.

Recommendation 3-5: The topical module component of SIPP should continue and be strengthened by:

- obtaining input from both government agencies and the social science research community about topics related to SIPP's core goals to consider for modules;

- streamlining the content development process so that timely information can be collected on emerging policy and research issues; and
- using some topical modules as a means for the Census Bureau's analysis staff to conduct research on expanded and alternative measures of income and programs.

Recommendation 3-6: SIPP should become, over time, the primary source of the nation's income statistics in place of the March CPS income supplement. SIPP should receive priority for major investments to develop improved income measures. As there will necessarily be a transition period during which SIPP and CPS income statistics are both published, every effort should be made to increase user understanding of differences and similarities and to effect incremental improvements as appropriate in both surveys.

Survey Design

Recommendation 4-1: SIPP should be redesigned as an ongoing panel survey in which each panel lasts for 4 years and has 12 4-month interviews, with a new panel introduced every 2 years. The sample size for each panel should be increased over that for the current design.

Recommendation 4-2: The Census Bureau should conduct research on the data quality effects of 6-month versus 4-month reference periods in SIPP, so that information is available to consider other possible design changes at a later date, including the possibility of further extending the length of SIPP panels beyond 4 years.

Recommendation 4-3: The use of a monthly rotation group structure should be retained for SIPP. The Census Bureau should consider cost-effective means to obtain the core data for the last calendar year of each panel that will otherwise be missing for some months for some groups. The Census Bureau should also investigate ways to minimize the loss of mover households that may result in pan from the closeout of follow-up at the end of each month.

Recommendation 4-4: The Census Bureau should investigate alternative methods of oversampling the low-income population in SIPP, including the use of screening interviews as a possible complement to or substitute for an approach based on using information from the 1990 census.

Recommendation 4-5: The Census Bureau should take steps to ensure that it will be possible to extend the length of SIPP panels for selected subgroups of interest or to follow them up at a later date, should such options be desired to obtain additional sample size and longitudinal information.

Recommendation 4-6: SIPP panels should treat all children who reside in interviewed households at the first wave and also children born during the course of a panel to original sample mothers as original sample members, who are followed if they move into households without an original sample adult. SIPP panels should also continue to follow and collect data for both original sample adults and children if they move into institutions.

Data Collection and Processing

Recommendation 5-1: We strongly support the Census Bureau's goal to convert SIPP to computer-assisted personal interviewing (CAPI). Since the Bureau's current CAPI software system (QUISC) does not appear to meet the data collection requirements for SIPP, the Census Bureau should give high priority to investigating other available CAPI systems and determine the most appropriate system for SIPP.

Recommendation 5-2: We strongly support the Census Bureau's plans to adopt a new database management system for SIPP. The Census Bureau should use the capabilities of a DBMS to the fullest in seeking to make improvements in all aspects of processing, analyzing, and documenting the data from SIPP. The processing performed by the database management system should be fully integrated with the SIPP CAPI system.

Recommendation 5-3: In view of the major advances that continue to occur in computing hardware and software, the Census Bureau should devote significant resources to continued education and training of its data processing staff. In particular, the SIPP processing staff should take advantage of the experience of other data processing facilities outside the Census Bureau that deal with longitudinal surveys.

Recommendation 5-4: The Census Bureau should make every effort to ensure smooth implementation of CAPI and an improved database management system for SIPP under the new design of 4-year panels introduced every 2 years. One option that the Census Bureau should consider is to field a large-scale dress rehearsal panel in 1995 as a way to work out any operational problems. Under this scheme, full implementation of the SIPP survey redesign would occur in 1996.

Data Products and Their Use

Recommendation 6-1: The Census Bureau should move forward with its plans for regular, comprehensive series of descriptive reports on income, programs, and related topics from the core data in SIPP. Longitudinal statistics (e.g., on the dynamics and correlates of transitions in income,

poverty, and program status) should be published; cross-sectional statistics should also be issued on a frequent schedule.

The Census Bureau should also establish a research report series to include in-depth analytical and methodological studies of special topics related to income and program participation. Data sources for these studies could include—in addition to SIPP—the March CPS income supplement and other surveys and administrative records.

Finally, the Census Bureau should continue publications from the topical modules and also establish a regular series of summary and in-depth reports from SIPP on the dynamics and correlates of major demographic and employment transitions (e.g., marriage, retirement).

Recommendation 6-2: The Census Bureau should ensure that its analysis staff, in addition to preparing the regular publications from SIPP, are able to undertake an ongoing program of research and development into effective means of analyzing and presenting SIPP statistics and are able to stay well-versed in relevant policy issues and analytical techniques.

Recommendation 6-3: The Census Bureau should continue to develop improved microdata products from SIPP to support policy analysis and social science research. Priority improvements include:

- moving toward a goal of releasing core data files within 6 months after the end of data collection;
- producing calendar-year files that combine panels, in addition to wave and panel files;
- determining, in consultation with users, changes and additions to the file contents that would assist their analyses; and
- developing additional ways of delivering SIPP microdata products to users, such as by means of high-storage capacity compact disks (CD-ROM) and an improved on-line data extraction system.

Recommendation 6-4: The Census Bureau should work to improve documentation and related user information services for SIPP. Priority improvements include:

- making use of CAPI and database management system technology to fully integrate documentation (including frequency counts for variables) and data;
- developing documentation for recoded variables and the types of imputations that are performed for missing data in SIPP;
- developing means to update key explanatory documents, such as the *SIPP Users' Guide*, on a more frequent basis;
- restoring and expanding information and training programs, such as training sessions, working papers, and compilations of professional society presentations; and

- maintaining effective channels of communication for users to feed back problems and suggestions and learn of the Bureau's response, and for users to be informed of new developments in the survey and its data products.

Methodological Research and Evaluation

Recommendation 7-1: The Census Bureau should support methodological research and evaluation for SIPP leading up to and following the survey redesign. The research program should include the following components:

- research to improve the format and wording of the questionnaire, making use of record-check studies and, to the extent possible, of findings from the current program of cognitively based questionnaire experimentation;
- research targeted to other aspects of the current redesign (and to possible design changes later on), including the length of the recall period, screening techniques to obtain larger sample sizes for subgroups of interest, and data collection modes (the best combination of computer-assisted personal and telephone interviewing and the possible role of centralized telephoning);
- research on issues of estimation and data use, taking into account the features of the redesign and including ways to improve cross-sectional and longitudinal weights, imputation procedures, and population coverage;
- research to evaluate the success of major elements of the redesign (e.g., the attrition effects of longer panels); and
- the implementation of the redesign.

Recommendation 7-2: The Census Bureau should undertake continuous monitoring of error levels in present and future SIPP panels and regularly provide information on errors to users, in periodic updates of the *SIPP Quality Profile* and other publications.

Recommendation 7-3: We strongly support the Census Bureau's program of cognitively based research and experimentation with the SIPP questionnaire, which could contribute to questionnaire improvements for the current redesign and perhaps, in the future, to a major revision of the questionnaire and interviewing procedures. The Bureau should subject the cognitive work to rigorous evaluation, including record-check studies to evaluate data quality.

Management and Oversight

Recommendation 8-1: To be as effective as possible in carrying out its responsibilities to produce timely, comprehensive, relevant, high-quality,

and analytically appropriate statistics on income and program participation, the Census Bureau should establish a senior-level position of project director for the Bureau's income surveys, SIPP and the March CPS income supplement. That position should include full management and budgetary authority for the income statistics program and sufficient resources to obtain the level of analysis staff that is needed to provide substantive guidance to the program, prepare reports, conduct analyses, and evaluate analytical concepts and methods. The person who fills this position should have recognized substantive expertise in topics related to income, poverty, and assistance programs, combined with strong survey management skills.

Recommendation 8-2: We support the Census Bureau's efforts to obtain outside advice about the SIPP program and encourage the Bureau to further strengthen its advisory mechanisms. The Bureau should regularly seek advice about the content, overall design, and goals of SIPP from federal agency users and from other users, including academic researchers. The Bureau should also regularly seek advice about technical matters from experts in the field. Working groups should be formed or continued in three main areas: (1) survey methods and evaluation of ways to improve data quality; (2) conceptual and analytical issues in the development of appropriate income and program statistics from complex longitudinal data; and (3) microdata products, documentation, and means of data access.

1

Introduction

The most exciting thing going on in social science in the 1980s; ... the most significant statistical survey in four decades; ... the most important data available in the 1980s for research on American families and individuals; ... a survey that ... fill[s] a major void and benefit[s] many agencies . . . .

(Hunt, 1985:99–100, 148)

The object of these glowing words—the Survey of Income and Program Participation (SIPP)—began operations in the fall of 1983, when interviewers of the Bureau of the Census fanned out across the country to ask residents of 20,000 households a set of detailed questions about their social and economic circumstances. At 4-month intervals ("waves") over the next 2-1/2 years, the interviewers returned to each household in the 1984 SIPP panel to obtain updated information. The survey did not stop with one panel: beginning in February 1985 and each year thereafter, Census Bureau interviewers queried a new sample of households, revisiting each of them at 4-month intervals over a period of about 2-1/2 years. What is this survey and why were people so enthusiastic about its prospects?[1]

SIPP IN BRIEF

As its name implies, SIPP was designed to improve information on the income distribution and economic well-being of the population and on participation and eligibility for a wide range of government social welfare

[1] The set of comments quoted above about SIPP are from Charles Lininger, an economist who directed developmental work on SIPP at the U.S. Department of Health and Human Services for several years; Joseph Duncan of Dun and Bradstreet, formerly chief statistician of the U.S. government; Guy Orcutt, an economist at Yale University (recently retired); and Bruce Chapman, director of the Census Bureau in the early 1980s.

programs—for example, Aid to Families with Dependent Children (AFDC), food stamps, social security, unemployment compensation, Medicare, and Medicaid. Other continuing surveys, including the Current Population Survey (CPS) March income supplement, which since the mid-1940s has supplied most of the available statistics about household income, could not meet the growing needs for information to support federal social welfare program planning and socioeconomic research.

Within this broad framework, the following specific goals of SIPP and some of the design features that resulted from those goals were identified:

- to improve the reporting of family and personal income, both cash and in-kind, by source—by asking more questions and by obtaining reports more frequently than once a year;
- to obtain detailed information, comparable to administrative data, on program participants, including multiprogram participants, and on the dynamics of participation over time—by asking for monthly information at each interview, with more detailed questions and relevant explanatory variables, and by following the same people to observe program entries and exits;
- to obtain information necessary to determine program eligibility, including data on assets, and to characterize participants in comparison with eligible nonparticipants;
- to provide an opportunity to obtain timely information on emerging concerns of social welfare policy, broadly defined—by including special sections of questions (topical modules) on subjects of current policy interest (e.g., disability, child support, day care, health status, and use of health care);
- to maintain the quality of annual income and poverty statistics and other cross-sectional estimates developed from the longitudinal SIPP data—by starting a new SIPP panel every year with a fresh sample of households; and
- to improve both participant and income-by-source information—by comparing survey reports with various administrative files.

The first SIPP panel that was introduced in October 1983 included about 21,000 households. Because of budget restrictions, the sample sizes of subsequent panels have varied from 12,500 to 23,500 households, and some panels have had fewer than the originally planned eight interview waves. The sample for each panel includes adults 15 years of age and older who were living in the household at the time of the first interview; they are followed if they move to new addresses during the panel's life. For children under 15 and adults who reside in a household containing an original sample adult during the life of a panel, data are collected only if they continue to reside with an original sample adult.

The SIPP questionnaire contains two sections. The core section includes questions about income sources and amounts, program participation, and labor force activity: it is asked in every 4-month interview wave. The topical module section, which is also asked in all waves, includes one or more modules on selected topics. "Fixed" topical modules, which are asked of each panel once or twice in its life, cover assets and liabilities, income taxes paid, annual income, program eligibility, and personal histories. "Variable" topical modules, for which there is competition to appear in SIPP, have ranged over a large number of topics, such as child care expenses, health status and use of the health care system, housing costs and financing, and child support.

SIPP was long in the making: planning and development activities spanned most of the decade of the 1970s. And when SIPP was originally scheduled to become operational (January 1981), it appeared that the survey would be stillborn: all funds for SIPP were deleted from the federal budget in 1980 and again in 1981. A rescue effort mounted by the newly appointed director of the Census Bureau and other staff in the executive branch and Congress persuaded the administration and Congress in the summer of 1982 to restore full funding for SIPP in the budget of the Census Bureau. (The original plan had been to have the survey sponsored by the Social Security Administration and conducted by the Census Bureau, with costs divided between them.) The restoration of funds permitted the survey to get under way in 1983. It is currently funded at about $31 million annually.

Now, after nearly 9 years of operation, the Census Bureau has initiated a thoroughgoing reassessment of SIPP. The survey has been functioning long enough for users both inside and outside the Census Bureau to develop experience in working with the data. In addition, results are available on many aspects of SIPP operations and data quality from the extensive methodological research program that has been part of SIPP since the beginning. Hence, there is the basis for an in-depth review and consideration of changes that could enhance the utility and cost-effectiveness of the program in the future.

A review at this juncture is also timely because of the 10-year cycle—centering around each decennial census—that typically characterizes evaluation and redesign of the continuing household surveys that the Census Bureau conducts. A new sample design for SIPP, based on data from the 1990 census about the geographic distribution and other characteristics of the population, will be implemented beginning with the 1995 panel. It is convenient to make any other major changes in the survey that appear desirable at the same time. Such changes could affect the design and content of the SIPP questionnaire, features of the survey design (e.g., length of panels or frequency of interviews), strategies for data collection and processing, and publications and other data products.

As part of the redesign effort, the Census Bureau asked the Committee on National Statistics (CNSTAT) at the National Research Council to appoint a study panel to conduct a wide-ranging review of SIPP. The panel, which began its work in summer 1990, was asked to pay particular attention to ways to make more use of the longitudinal data from SIPP and to use data from SIPP and other related surveys and administrative records to improve the nation's statistical series on the distribution of income. The panel was also asked to consider how the views of users could best feed into the planning and conduct of the survey.

SIPP TO

Achievements

There is no question, in our view, that SIPP is clearly established as a major continuing survey that provides important information for federal policy making and social science research. A few years ago, this conclusion might have been in doubt, given the rocky childhood that followed SIPP's difficult birth. As noted, repeated budget cutbacks forced the Census Bureau to reduce the sample size for most panels and, for some panels, to reduce the number of interview waves as well. The Census Bureau then experienced difficulties in processing the large volume of data generated by the stream of interviews from the field. Users also experienced problems in working with the complex data sets from the survey and, consequently, only slowly began to exploit the richness of the information.

At present, funding is sufficient for the Census Bureau to operate the survey at the originally planned level. Even more important, the survey has developed a growing community of committed users who have used the data for a range of policy analyses and research studies. In this section we highlight just a few examples of important new insights from SIPP that are relevant to social welfare policies and programs and to research.

Part-Year Poverty and Program Participation

Federal and state assistance programs such as AFDC and food stamps are designed to help people who experience short periods of hardship, as well as those in need for longer periods. SIPP provides information that was previously unavailable on part-year periods of low income and on the proportion of program recipients who rely on benefits for temporary assistance in comparison with the proportion who depend on them over the longer term.

Using data from the 1984 SIPP panel, Ruggles and Williams (1987:Table 1) found that fully 26 percent of the population experienced at least

1 month of income below the poverty line in a year, although relatively few people—about 6 percent—were poor every single month. These rates varied dramatically across family types. For example, only 3 percent of people in married-couple families were poor every month of the year; in contrast, 26 percent of people in female single-parent families were poor every month.

Ruggles (1989:Table 1) estimated from the 1984 SIPP panel that the median duration for receipt of AFDC was about 11 months, providing a different picture of the program from previous analyses using annual data. For example, Bane and Ellwood (1983), working with the Panel Study of Income Dynamics (PSID), estimated that the median duration of AFDC was about 2 years. Although the reasons for the differences in estimated spell length are not definitely established, it seems likely that the SIPP monthly data pick up short spells of AFDC that are omitted or merged into fewer, longer spells in the PSID annual data.[2] In Ruggles's study, people most likely to stop receiving AFDC in less than a year were the previously married or previously employed (60–65 percent exited AFDC within a year). In contrast, only 40 percent of never-married recipients exited the program within a year, and another 40 percent were still receiving AFDC after 2 years.

Multiple Program Participation

The number and scope of federal and state assistance programs have grown enormously since the 1960s. The annual data from the March CPS income supplement can only show how many people receive benefits from more than one program at some time during the year. SIPP can distinguish among intrayear patterns of multiple program participation, specifically, whether people receive multiple benefits concurrently or follow a sequential process of program receipt.

Doyle and Long (1988:Tables D-1-D-6) found complex patterns of program participation in the first 12 months of the 1984 SIPP panel. In the initial month, 23 percent of the population participated in one or more of the following programs: social security, Supplemental Security Income (SSI), public assistance (including AFDC and general assistance), and food stamps. Of program recipients, 24 percent participated in more than one program. The most popular combinations were public assistance and food stamps (70% of all multiple program participants), social security and food stamps (9%), and social security and SSI (8%). During the next 11 months, about 23 percent of initial program recipients experienced at least one transition to a different program combination or ended their participation.

[2] In an analysis of AFDC receipt from the 1984 and 1985 SIPP panels, Fitzgerald (1992) obtained the same results as Ruggles.

Effect of Assets on Program Eligibility and Poverty

Public assistance programs typically place a low ceiling on the value of assets that people can hold and still be eligible to receive benefits. More generally, assets that people can "spend down" provide a cushion against periods of low income. SIPP, in contrast to the March CPS, provides sufficient information to assess the role that capitalizing on assets can play in maintaining adequate income and, hence, consumption levels.

In a study with the 1984 SIPP panel, Ruggles and Williams (1989:Table 6) found that simulating the spend-down of financial assets eliminated 35–40 percent of all the periods of poverty that were observed over a 32-month period. However, the median duration of the remaining periods was slightly longer than when assets were not taken into account.

Doyle and Trippe (1989:Table 15) found that a simulation of the food stamp program for August 1984 based on SIPP data produced a lower estimate of households eligible for benefits—and hence a higher participation rate in the program—than did a simulation based on March CPS data. A primary reason was that the more extensive asset data in SIPP (in comparison with the CPS) resulted in disqualifying a larger number of households from eligibility for food stamp benefits because they failed to meet the asset test.

Health Insurance Coverage

Public and private spending for health care in the United States currently accounts for one-eighth of the gross national product, yet many Americans lack health care insurance. Issues of insurance coverage and affordability of health care are at the forefront of public policy debate. SIPP provides data that can inform policy makers about the extent to which loss of health insurance coverage is a short-term or long-term phenomenon and whether proposed public policies, such as mandated employer health insurance benefits, are effectively targeted at the problem.

Using data from the 1984 SIPP panel for adults aged 18 and over, Swartz and McBride (1990:Table 1) estimated that one-half of periods without health insurance lasted less than 5 months and two-thirds lasted less than 9 months. However, 25 percent lasted longer than 1 year, and 15 percent lasted more than 2 years. McBride and Swartz (1990:26) found that people with longer uninsured periods (lasting 9 months or more) were more likely to be unemployed or out of the labor force, have low monthly family incomes, and work in a service occupation, in comparison with people with shorter spells.

Moffitt and Wolfe (1990) found significant relationships between ex

pected health care benefits and the work-or-welfare participation decisions of low-income female-headed families in the 1984 SIPP panel. An index of the expected value of Medicaid benefits was negatively related to the likelihood of employment, while an index of the expected value of private health insurance benefits showed a strong positive association.

Behavioral Dynamics

SIPP has made important contributions to social science research, particularly to increased understanding of the short-term dynamics of individual and family behaviors. A few examples of studies in this area include:

- Speare, Avery, and Goldscheider (1990), who examined the interrelationship of leaving home and other characteristics in the 1984 SIPP panel: they found that young women were more likely to leave their parents' home than young men, that young men who had left were more likely to return, and that the parents' income had a negative association and the young person's employment, income, and education had a positive association with nest leaving;
- Koo and Gogan (1988), who documented the extensive amount of change experienced by households in their membership over a 9-month period, using data from the 1979 research panel of the Income Survey Development Program (the predecessor to SIPP); and
- Fitzgerald (1991), who explored marriage prospects and the duration of periods of welfare in the 1984 SIPP panel, finding that spouse availability (as measured by the ratio of employed single men to all single men) exhibited a positive association with the likelihood that a woman would exit a spell of welfare.

Researchers have also developed and refined analytical methods and concepts through their use of SIPP data. For example, a study by Hagstrom (1991) of the work effort of husbands and wives in relation to their decision to participate in the food stamp program involved the specification of a complex three-way model of choices.

Overall, SIPP has provided the grist for a wide range of policy analysis and research studies. The number of papers and articles based on SIPP data increased appreciably from 1984 to 1990 (see Appendix A). Topics covered in these studies include: income and poverty, jobs and work-welfare decisions, program participation, the elderly, family change and living arrangements, assets and wealth, child care and children, disability, health care and health insurance, race and ethnicity, long-term care, migration, education, veterans, and the rural population.

Problems

Clearly, SIPP is an important survey for many areas of public policy and research interest. However, there are problems in SIPP—problems that have kept the survey from proving as useful as it could have been in the past and that, if not adequately addressed, could handicap its usefulness in the future.

SIPP has one of the most extensive programs for data quality research and improvement of any federal survey. On many dimensions of data quality, SIPP has registered signal improvements over the March CPS income supplement.[3] However, weaknesses—many of which SIPP shares with other surveys—remain, including: incomplete coverage of the population, particularly young minority men; high nonresponse rates for some types of income and assets; timing errors in reporting receipt of benefits from programs, along with errors due to confusion among program names; and loss of sample cases (i.e., attrition or dropping out from a panel after the first interview), particularly among low-income people, minorities, movers, renters, and single young adults.

The SIPP design has achieved success in generating detailed data for analyzing the intrayear dynamics of income and program participation. However, some aspects of the design that had broad acceptance at the outset have not worked well or are now widely seen as limiting the usefulness of the survey for important kinds of policy analysis. For example, the introduction of new panels every year, when coupled with content changes, has contributed to delays in data processing, with the result that few analyses have been able to benefit from combining panels. The length of each panel—32 months—limits the ability of the survey to provide information on such increasingly important policy concerns as welfare dependency over the longer term. Also, the survey lacks information for people who become institutionalized and, in many instances, for children who move to another household. Of course, the grave compromises to the original design necessitated by the imposition of budget cuts on the Census Bureau—namely the reductions in sample size and number of interviews for most panels fielded to date—have materially affected the usefulness of the information.

Along with data quality and design limitations, users have been troubled by problems with the data products from SIPP. There have been successes—for example, the useful series of publications from the topical modules—but there have also been significant failures, including: long lags in releasing

[3] See Citro (1991); Jabine, King, and Petroni (1990); Singh, Weidman, and Shapiro (1988); and Vaughan (1988) for comparative analyses of the quality of SIPP data.

microdata files;[4] inadequate documentation and user support services; a period of several years when no publications were issued from the core data on income and program participation; and limitations in the data files and reports that provide longitudinal measures from SIPP.

Over the last few years, the Census Bureau has worked hard, and with appreciable success, to alleviate such problems as delays in producing data products and the lack of a publication series for the core information. However, these improvements have come at a price that reduces the survey's flexibility—namely, the imposition of a freeze on the content of the core questionnaire.

SIPP is certainly not unique among federal surveys in experiencing problems, particularly given that it has been in a start-up phase. Moreover, it has achieved many successes and served many important policy and research needs. Yet the Census Bureau faces an especially heavy burden in striving to remain on top of SIPP and to find cost-effective ways to improve it in the future.

SIPP is indeed unique in the following respect: it is arguably the most complex continuing household survey—considering the range and detail of questionnaire items (many of them on complicated and sensitive topics), the number and frequency of interviews and introduction of new panels, and the large sample size—that the federal government has ever fielded. Although it is certainly possible to simplify some aspects of SIPP so as to reduce the data collection and processing burden (and this report discusses appropriate ways to accomplish this), there is only so much to be gained in this direction. SIPP will remain inherently complex, given the complexity of the real-world behavior that it is trying to measure. As such, SIPP requires the highest level of quality in every component of its operation. There is little room for mistakes, particularly in implementing innovations, given that SIPP's size and complexity will rapidly compound any problems that occur.

SIPP is also unique from the Census Bureau's perspective in that the Bureau both sponsors and operates SIPP, unlike all other household surveys, for which it collects data on behalf of another statistical or policy analysis agency. There is no "Center for Income and Program Statistics" that is the counterpart of the Bureau of Labor Statistics, the National Center for Education Statistics, or the National Center for Health Statistics. Hence, the Census Bureau must cope with a much broader range of issues and bring to bear a much broader range of expertise—involving data content and analysis as well as collection and processing—than for any of its other household surveys.

[4] Most analyses conducted to date have used the original 1984 SIPP panel, both because it was the only panel available for a period of time and because of its large sample size (the largest of any panel until 1990).

LOOKING TO THE FUTURE

Roles for SIPP

In considering the environment in which SIPP will operate in the future, we have identified both challenges and opportunities for the survey and the Census Bureau. SIPP, with its focus on income and program participation and its longitudinal design, clearly has the opportunity to make even more important contributions to policy analysis and research in the future than it has to date. Public policy concern with questions such as the following is growing and likely to continue to grow as the United States enters a period of difficult economic and social adjustment:

- To what extent has the distribution of income and poverty become less equal and what will be the future trends in inequality of well-being?
- Do welfare programs lead to long-term dependency, and what can be done to reduce dependency?
- What can be done to help the nation's children, many of whom, particularly in single-parent families, appear to fare increasingly bleak prospects?
- As the population ages, how severe will be the problems of long-term care for the elderly, particularly for the "sandwich generation" that must care for parents as well as children?

SIPP should be well positioned to shed light on these and related issues, particularly if its design is modified in some respects. At the same time, social and economic changes pose challenges for cost-effective data collection in SIPP (and other panel surveys).[5] Increasingly, fewer and fewer households in the United States are "survey friendly": that is, fewer households contain families, all of whose members live together and, if they move, stay together and are easy to trace. More and more common are situations in which one spouse becomes difficult to trace after a divorce; children of divorced parents shuttle back and forth between parents; and the relevant economic unit for understanding a child's financial circumstances includes the custodial parent, the noncustodial parent, the new spouse of one or both parents, and the child's grandparents. Also increasingly common are households in which several unrelated people reside and who share some, all, or none of the living expenses. Low-income, inner-city areas continue to pose difficult problems of data collection, particularly to obtain

[5] See Bianchi (1990) for a review of changing patterns of family composition and other socioeconomic trends that involve children, many of which have implications for survey data collection. See Fein (1989) for a review of problems in obtaining complete coverage of young minority men and other population groups in censuses and surveys; see also Shaw and Guthrie (1992).

complete coverage of young men, many of whom "float" among several households maintained by their relatives or friends. More and more people are at risk of entering institutions, including long-term care facilities and prisons: understanding the economic situation of their families requires information on the institutionalized member. Whatever the family structure, sources of economic support—whether in the form of new or modified government programs, new financial instruments, or new fringe benefits—continue to proliferate, and they present problems for accurate data collection.

Recent developments in questionnaire design research, survey collection and processing technology, and longitudinal analysis methods afford opportunities for improving the timeliness and quality of data from SIPP (and other panel surveys). Better understanding of how respondents answer questions—obtained through cognitive laboratory experiments, focus groups, and related methods—can lead to improved question wording and, consequently, more accurate responses obtained with less burden. Computer-assisted personal and telephone interviewing (CAPI and CATI) can facilitate the collection of high-quality data on complex topics in a manner that minimizes the requirements for subsequent coding or editing and maximizes the capacity to change the questionnaire as needed. The use of modern database management systems can support an integrated approach to data processing that makes it easier to link data for families and individuals across interview waves and to improve data quality (e.g., by using all available information from prior waves to supply values for missing data). Improved methods for analysis of behavioral changes over time (e.g., periods of program participation and poverty), which take account of incomplete observations and shifting family characteristics, can produce useful longitudinal statistics for reports. At the same time, these methods and technologies pose substantial implementation challenges, particularly in the context of an ongoing survey program of the size and complexity of SIPP.

The Panel's Report

We begin our detailed assessment with two chapters that focus on the goals for SIPP. No survey program, no matter how large, can or should be all things to all people; hence, it is critical to set out clearly the main goals for the survey as a necessary precursor to considering changes in content, design, or other features.

In Chapter 2 we review the development of SIPP and its goals. We summarize the conclusions reached by the Committee on National Statistics from a preliminary assessment of SIPP in 1989; we summarize the views of current users about goals for SIPP; and we present our conclusions and recommendation about appropriate future goals for SIPP in light of policy

and research needs and budget and operational constraints. We reaffirm the CNSTAT recommendation that SIPP concentrate on improving data on income and program participation, with a particular focus on the population that is economically at risk.

In Chapter 3 we identify priority areas for improvement within each of SIPP's goals and address their broad implications for the content of the survey. We also consider the relationship of SIPP to the March CPS and to administrative records from the perspective of developing improved income statistics.

In Chapter 4 we consider the basic design of SIPP. We review a range of design parameters—including panel length, recall length of the interview, frequency with which new panels are introduced, sample size and design—that have important implications for the quality and utility of the data and for ease of survey operation. We discuss the pros and cons of alternative designs and present the panel's preferred design, which includes extending the length of each panel to 4 years and having new panels introduced every other year rather than annually (to contain costs and reduce processing burden). Several of the changes that we recommend to the survey's design and content should greatly improve SIPP's ability to provide needed information for addressing the increasingly important issue of welfare dependency. These changes include lengthening each SIPP panel; keeping open the option of further extending panel length to obtain additional observations for population subgroups of policy interest; and improving the retrospective information that is collected on respondents' previous program participation and family background.

Next, in Chapter 5 we consider operational alternatives for SIPP data collection and processing, including the use of computer-assisted interviewing and database management systems. We conclude that major improvements are needed in data processing at the Census Bureau to enable SIPP to run efficiently and at the same time have a capability for flexible response to changing circumstances.

In Chapter 6 we change focus from issues of data input to those of data output. Widespread dissemination of the information from SIPP through regular publication series and well-documented, timely microdata files is essential to the cost-effectiveness of the survey. We consider the dimensions of the publication program and other products and services that should be provided to users of the SIPP data. We pay particular attention to the issues involved in appropriate publication and analysis of the rich longitudinal data in SIPP.

In Chapter 7 we consider priority areas for SIPP methodological research and evaluation, including research on the potential of new questionnaire formats to improve data quality. Such evaluation and research studies are needed to supply important information to current users, to inform the

upcoming redesign of SIPP, and to provide the basis for the next major reassessment and possible redesign of the survey, which should occur no later than 2005.

Finally, in Chapter 8 we consider issues related to the oversight, coordination, and management of SIPP. We note that the Census Bureau has a number of means of obtaining outside input to the survey program, and we discuss ways in which the SIPP advisory mechanisms could be made even more effective.

The preliminary evaluation of SIPP by the Committee on National Statistics (1989:75) recommended that our panel review the management of SIPP within the Census Bureau. An effective management structure is a key component to the success of any survey and is particularly critical for SIPP because of the inherent complexity of the program and the fact that the Census Bureau has a greater range of responsibilities for SIPP than it does for its other household surveys. Moreover, the many changes that are proposed as part of the upcoming redesign of SIPP—including changes in content, survey and sample design, data collection and processing, and data products—will place especially heavy burdens on management over the next few years. We propose ways to strengthen the management of SIPP that we believe are vitally important to the smooth implementation of the redesign and, more broadly, to the successful operation of the Census Bureau's income statistics program in future years.

2

Goals for SIPP

A necessary prerequisite for any decision to change the design, content, or other features of a survey is to set out clearly the survey's goals. The history of SIPP reveals some changes in the goals for SIPP over time, particularly in the extent to which SIPP has been viewed as a very broad versus a somewhat narrower vehicle for informing social science research and policy analysis. The record also makes clear that the Census Bureau has achieved greater success to date in meeting some of SIPP's original goals than others. Currently, views about the goals for SIPP on the part of users and observers exhibit considerable diversity, although some common themes are present. We tour the landscape—both historical and contemporaneous—as background for our conclusions and recommendation for SIPP's goals for the future.

THE DEVELOPMENT OF SIPP AND ITS GOALS

As new and expanded government social welfare programs were introduced in the late 1960s and early 1970s, the inadequacy of the then available statistical base about household economic resources and the need for and use of assistance programs became apparent. SIPP traces its origins to an interagency committee sponsored by the Office of Management and Budget (OMB) that was concerned with improving the personal and family income estimates derived from the Current Population Survey (CPS) March income

supplement.[1] Some improvements had been achieved, but CPS estimates still fell far short of independently derived estimates, even after imputation for nonresponse. The interagency committee recommended in the early 1970s that a research program be developed on the best way to improve the collection of income data from households.

At the same time, policy analysts, in attempting to provide more relevant information to federal policy makers, were troubled by the recognized deficiencies of available income statistics. During this period, several federal agencies sponsored the development of a major new policy tool—large computer microsimulation models designed to evaluate alternative designs for government tax and transfer programs (see Citro and Hanushek, 1991a: Ch. 4). Based for the most part on the March income supplement to the CPS, these models had to contend with the limitations of this data source: incomplete reporting of income amounts, particularly from property and welfare; income and employment data that represented annual totals with no information available on intrayear fluctuations in economic circumstances that could make some families eligible for government programs for part of the year; scanty and suspect information on the numbers and characteristics of program participants, and, especially, on persons and families receiving benefits from more than one program; data on family composition and characteristics that were reported, not for the prior income year, but for March (the interview month); and the absence of information on asset holdings and taxes, which are needed to determine program eligibility and also to fully characterize the economic status of the household sector.

The Income Survey Development Program

Impetus for a new survey of income and program participation arose in the Social Security Administration, where one of the first policy models developed from the CPS March supplement was housed, and in the Office of the Assistant Secretary for Planning and Evaluation (ASPE) in the Department of Health, Education, and Welfare. ASPE established a working group to guide the planning of a new survey on behalf of the whole department, and the Census Bureau participated in the planning process because it was expected to be the data collector. A major testing and research program, the Income Survey Development Program (ISDP), was initiated in 1975 to help with the basic design of SIPP, and a number of research organizations were enlisted to work on various issues.[2]

[1] Key references on the evolution of SIPP are David (1983) and Hunt (1985). This section is adapted from Committee on National Statistics (1989: Ch. 4).

[2] For an annotated bibliography of articles, papers, and memoranda authored by the Income Survey Development Program staff, contractors, and consultants over the program's 7-year history, see David (1983).

The major goals for a new survey were not explicitly stated, but they appear to have been:

- to improve the depth, breadth, and quality of data on family and personal income;
- to obtain detailed information on eligibility for and participation in a wide range of government assistance programs, including information on program exits and entrances over the short term;
- to provide an opportunity—through topical modules asked in addition to the recurring core questions—to obtain timely information on emerging concerns of social welfare policy, broadly defined; and
- to link survey responses with administrative records to evaluate and enhance data on income and program participation.

Although the focus of the effort was on improving understanding of the population potentially eligible for government income support programs, there was also considerable interest in improving data on the income and asset holdings of people at the upper end of the income distribution and in improving the capability for modeling tax as well as transfer programs (Scheuren, 1975). Thus, the largest survey fielded by the ISDP—the 1979 ISDP research panel, which obtained monthly data from a sample of about 11,500 families, who were interviewed six times over an 18-month period—oversampled both high-income and low-income families. Moreover, one of the four research centers sponsored by the ISDP was focused on improving the measurement of assets and net worth. The other three centers worked on improving the measurement of cash and in-kind income, exploring the use of SIPP for microsimulation modeling, and developing improved imputation techniques for handling survey nonresponse.

Early SIPP Goals

When the ISDP was fully launched and plans were being made to start up SIPP, a 1980 interagency memorandum described the major goals of SIPP as follows:[3]

(1) to extend the scope and precision of policy analyses for a wide range of federal and state tax and social welfare programs;
(2) to improve current estimates of income and income change, including annual and subannual estimates, by source of income; and
(3) to broadly assess the economic well-being of the population.

[3] The memorandum was signed by John J. Carroll, representing the Social Security Administration (U.S. Department of Health and Human Services); George E. Hall, representing the Census Bureau (U.S. Department of Commerce); and Wray Smith, representing the Office of the Assistant Secretary for Planning and Evaluation (U.S. Department of Health and Human Services) (see Kasprzyk, 1988a).

Then, in 1981, the ISDP was abruptly halted when budgetary support was denied both for its completion and for the initiation of the planned SIPP. Despite its premature demise, the ISDP made signal contributions to improved data on the income and economic well-being of the population. The methodological and substantive research that was conducted with the 1979 (and also 1978) research panel generated important new insights of relevance for survey design and for policy. Moreover, the example of the ISDP led the Census Bureau to expand the detail collected in the March CPS income supplement on both cash and in-kind income and to adopt a new format for income reporting that the ISDP demonstrated resulted in more complete data. However, the need for a survey with the unique features of the SIPP design, especially monthly reporting for samples of households followed over time, remained.

A wide range of ambitious expectations for SIPP were generated in the process of enlisting support for the rebirth of the survey in 1982. It appears that at least some participants hoped that SIPP would become a general-purpose social survey, a survey to which all sorts of questions appropriate to households or families might be added. Some expected that SIPP would eventually replace other federal household surveys. Other participants hoped that SIPP could serve more long-run basic research interests as well.

The Census Bureau's statement of goals in its April 1982 management plan for SIPP is similar to but somewhat broader ranging than the memorandum by Carroll, Hall, and Smith (see Kasprzyk, 1988a):

> The Survey of Income and Program Participation (SIPP) is designed to satisfy the need for improved data on the economic situation of persons and families in the United States. Information will be collected on various sources of money and nonmoney income, taxes, and assets and liabilities, to produce improved estimates of income distribution, poverty, and wealth. A major use of the data will be to study the efficiency of federal and state transfer and service programs, to estimate future program costs and coverage, and to assess the effects of welfare reform proposals, tax reform, social security funding problems, and other proposed policy changes.

Despite the long incubation period, SIPP was initiated in a great rush because the enabling legislation called for the survey to be in the field within a year. The questionnaire was extensive, the survey design complex, and many processing and estimation procedures still had to be resolved. This complexity, together with budget cuts and technical problems of producing estimates from detailed longitudinal data, resulted in a very slow rate of issuance of reports and public-use tapes (see Chapter 6).

Over the last few years, the Census Bureau has made a concerted effort to reduce the time lag between collection and release of data. To accomplish this aim, the agency has concentrated on two primary goals—that of providing information on actual and potential program participation and its

concomitants and that of improving income data. With the exception of the variable topical modules (those modules that are held open in each panel for federal agencies to determine content that is most relevant to current policy concerns), the Census Bureau has entertained only those questionnaire content changes that fit within one or the other of the two primary goals, narrowly interpreted. The Bureau intends to maintain this policy for SIPP panels through 1994, but it is reopening the issue of SIPP's goals and content in looking toward the planned redesign of the survey.

Assessments of Early Goals

Assessments of the success to date of the Census Bureau in achieving various goals for SIPP are an important source of information about possible barriers to meeting current or proposed goals. Although one should expect that many operational problems can and will be overcome, it is important to pay heed to evidence about the range of goals that the survey can reasonably be expected to accommodate. A major source for the panel on this topic was the interim review of SIPP carried out by the Committee on National Statistics (CNSTAT) (1989). That report documented problems experienced by the Census Bureau that resulted in a failure to achieve fully all of the goals originally set for SIPP.[4]

From its survey of uses of SIPP data made by federal agencies, the committee found that SIPP was reasonably successful in meeting the goal of describing the circumstances surrounding participation and eligibility for federal transfer programs (Committee on National Statistics, 1989:37–38):

> Data from SIPP have already supported important studies of the characteristics of single and multiple program participants. Longitudinal measurement has proved feasible, and analyses are being made of duration of spells and number and correlates of transitions during the 32-month period covered by the full 1984 panel . . . .
>
> SIPP data, including information on assets, have supported studies of program eligibility, and the new integrated eligibility module introduced in wave 7 of the 1987 panel should strengthen this capability . . . .
>
> Of course, the goal of providing detailed information on program participation and eligibility could be expanded in a number of ways . . . . SIPP could provide information on such topics as client evaluation of program performance and reasons why many eligible people do not participate. SIPP could also provide information on additional social service programs.

[4] We note that the CNSTAT interim assessment was completed in summer 1989. Subsequently, more progress has been made toward meeting the survey's goals (e.g., estimates of year-to-year income transitions have been produced). However, the general conclusions of the interim report remain largely valid.

> Expanding the goal in these directions would require major additions of questions to the survey. Similarly, extending the ability of SIPP to follow the dynamics of program participation over time and to shed light on how people cope with economic setbacks generally would require major changes to the survey design, such as extending the length of panels for all or some people in the sample. The committee believes that extensions of the goals of SIPP in one or more of these directions are reasonable to consider for the future and that they should be thoroughly evaluated in the planned second phase of the SIPP study.

With regard to a second goal of improving understanding of the income distribution in the United States, the committee concluded that this goal was only partly being met (Committee on National Statistics, 1989:38–39):

> On the plus side, SIPP has achieved major improvements in the reporting of many sources of income, data are now available for subannual periods, and innovative studies of intrayear spells of poverty have been carried out. Moreover, the collection of asset data for people at the lower end of the income distribution scale has succeeded. . . .
>
> However, the collection of data on asset holdings and income for high-income individuals has not been materially improved, and the attempt to collect information on taxes has suffered from major nonresponse effects [for some items]. As a result, SIPP has not yet proved useful in the modeling of tax programs, one objective of this goal. Moreover, annual calendar-year estimates, for strengthening certain parts of the national income accounts and for providing a basic monitoring series that many users will consult, are not yet being issued. Nor are estimates for multiyear accounting periods available.

With regard to a third original goal of providing information on policy issues related to household well-being through topical modules, the committee found a mixed picture (Committee on National Statistics, 1989:39):

> Issues that can be analyzed from existing SIPP questionnaires can be and are being studied; for these issues SIPP is a rich data source. [But] ... the objective of providing policy-relevant information will not be fully met until SIPP procedures for developing and approving additions to the questionnaire are better defined and streamlined . . . .

Finally, the report noted that the prominent role originally envisioned for matches of administrative records with SIPP data has only been partly realized. The expectation was that administrative records would be used to increase sampling efficiency by providing supplementary frames of participants in specific programs or persons with other specified characteristics; to provide additional data (e.g., by matching with social security earnings records to obtain longitudinal earnings histories to add to the SIPP files); and to compare and validate specific items common to both sources, by means of record-check studies. Social Security Administration (SSA) and

Internal Revenue Service (IRS) records were considered prime candidates for such use. To facilitate matching, SIPP had from the outset a very successful program to obtain and validate social security numbers (SSNs) for sample members of each panel, reporting about a 95 percent success rate, even though no attempt is made to match or find a number for a person who refuses to give one in the interview (Bowie and Kasprzyk, 1987:6–7). (By contrast, the March CPS does not have a regular program of validating SSNs, and, when matches are attempted, generally reports only an 80 percent success rate.)

However, to date, there has been only limited use of administrative records for supplementation or evaluation of SIPP data. No supplementary sampling frames have been developed from administrative records for SIPP.[5] A match with SSA records was carried out for the 1984 panel and provided to SSA analysts under an agreement that limited its use to SSA staff for a 2-year period. A limited match with IRS tax records was carried out for the 1984 panel to develop weighting factors for reducing the variance of income estimates from SIPP (Huggins and Fay, 1988).[6]

A single record-check study, which matched SIPP records in four states from the first two waves of the 1984 panel with records from eight state and federal programs (AFDC, food stamps, unemployment insurance, workers' compensation, federal civil service retirement, social security, SSI, and veterans' pensions and compensation) was carried out to evaluate the quality of survey reports of these income sources (Marquis and Moore, 1989, 1990a, 1990b). The study was a full record check, designed to identify false positive responses (i.e., people who report participation in a program to SIPP but for whom the agency has no record of participation) in addition to false negatives (i.e., people who fail to report their participation to SIPP). The study encountered serious delays.[7] Almost 5 years elapsed from its initiation in 1984 until detailed research results appeared. Even then, many potentially useful analyses were never undertaken (e.g., analysis of benefit amounts as distinct from recipiency). However, the study did stimulate the Census Bureau's current cognitive research program for improving the SIPP questionnaire (see Chapter 7).

The ISDP had considerably more success with the use of administrative records to evaluate the quality of survey responses and improve question

[5] Administrative records were used to provide supplementary sampling frames for the ISDP. However, the data were never analyzed because linked data files with appropriate weights could not be produced on a timely basis (see Kasprzyk, 1983; see also Chapter 4).

[6] Further work on variance reduction using this approach is in progress.

[7] Delays occurred in part because of the time required for negotiations with state welfare agencies to obtain program records. Indeed, it ultimately proved impossible to obtain records from one of the four states. Problems at the Census Bureau in conducting the matches and preparing analysis files also contributed materially to the delays.

wording and interviewer training procedures (see Kasprzyk, 1983; Logan, Kasprzyk, and Cavanaugh, 1988). The ISDP used forward record-check studies in which people included in independent samples from administrative sources (including IRS and federal and state program records) were administered the ISDP interviews. Such a design eliminates the need for record matching as such and hence reduces processing time; however, it permits identifying only false negative responses, not false positive responses.

The committee's report noted major impediments to the use of administrative records, not only in SIPP but also in other survey programs (Committee on National Statistics, 1989:51–52). Such linkages involve different agencies with different rules, regulations, and objectives. Moreover, at present, linkages are greatly constrained by legal requirements and ethical considerations of protecting the confidentiality of individual responses.

VIEWS ABOUT SIPP'S GOALS

To obtain input for our study panel's consideration of future goals for SIPP, we consulted a wide range of users and observers. One source was the 1989 report of the Committee on National Statistics, which included information from an extensive series of interviews with federal agency staff about their uses of SIPP and their wish lists for the future.

We organized the Conference on the Future of SIPP in April 1991, which invited researchers and policy analysts from both government agencies and academia to discuss the usefulness of SIPP in a wide range of subject areas, assess SIPP's comparative advantage vis-à-vis other data sources, and make recommendations for improving SIPP for future research and policy use (the list of paper authors and invited discussants is provided in Appendix B). The topics covered in the conference, which gave particular attention to longitudinal uses of SIPP, included: child care and child support, employment and labor force transitions, extended measures of wellbeing, health and disability, income transitions for the elderly, interactions of family composition and income change, modeling program eligibility, poverty status and transitions, and program participation dynamics. (The conference papers have been published in a 1992 special issue of the *Journal of Economic and Social Measurement* [JESM] [Vol. 18, Nos. 1–4].)

Another source of information for the panel resulted from a specific part of our charge–to consider ways in which SIPP might be used in conjunction with the March CPS and administrative records to develop improved statistics on income. We commissioned a paper on this topic that was also published in the special issue of JESM (Smeeding, 1992) and obtained reviews of the paper from several analysts (Slater, 1991; Watts, 1991). We also had available pertinent research and planning documents from Census Bureau staff.

The CNSTAT Report

The interim review of SIPP presented the following conclusions regarding the goals that the Census Bureau should adopt, at least in the short term (Committee on National Statistics, 1989:40):

> During this start-up period, the committee believes that SIPP should be narrowly focused on ... [two goals]: improving data on program eligibility and participation and improving information on the income distribution of the United States. The committee thus agrees with the narrow focus now being given to the program by the Census Bureau in its efforts to speed up the release of data . . . .
>
> In considering priorities within [these goals], the committee agrees that the prime focus of SIPP should be on the population *economically at risk* [emphasis added]. SIPP is appropriately designed to obtain information on people who are currently poor or in need of government assistance and also on people in the near-poor and middle-income range who, if they experienced an event such as loss of a spouse, loss of a parent, or loss of a job, could be at risk of economic deprivation . . . . In considering the intensity with which ... topics should be covered—for example, the range of detail and the longitudinal duration—the requirements for identifying and analyzing program eligibility and participation should predominate.
>
> The committee is not recommending that SIPP be *limited* to people on the lower half of the income scale, but that it should give *priority* to changes that will enhance information on the less well-off part of the population . . . .
>
> The committee believes that SIPP should not be viewed as a general-purpose survey. In future years, after the start-up period, the goals, priorities, and focus of SIPP may be expanded. The committee is very dubious, however, that SIPP could ever become a general-purpose survey . . . .
>
> Finally, the committee believes that there are a number of steps that are imperative to take in the short term to improve the capability of the SIPP program to meet its priority goals, even with the narrow interpretation that they have been given by us and by the Census Bureau. These steps include restoring the sample size to that originally intended for the SIPP, developing estimates based on combined panels, and improving the quality and timeliness of the SIPP data products.

Conference on the Future of SIPP

Participants in the Conference on the Future of SIPP expressed a wide range of views regarding the goals of SIPP.[8] Most participants were cognizant of

[8] Participants also expressed views on SIPP's design and data products, which an discussed in later chapters. We note, of course, that the conference participants do not necessarily represent the full community of SIPP data users, although we believe that they offered a variety of perspectives (see Appendix B).

the need to keep the scope of the survey and the questionnaire within bounds. However, they usually wanted to expand SIPP to provide more information for their particular area of interest. Often they asked for more extensive topical modules, asked more frequently (e.g., on health and disability and child care)—thereby contradicting the strong recommendation in the CNSTAT report that SIPP focus on the core income and program participation data. There was little agreement on which topical modules were most important, although the survey could not hope to accommodate all of the suggestions made.

The diversity of interests expressed at the conference is understandable given that we asked each of the participants to focus on a particular topic, without considering tradeoffs with other topics. Also, the enthusiasm for topical modules may in part stem from the fact that topical module data have generally proven easier to process and analyze than core data—both by the Census Bureau itself, which to date has produced more reports from the topical modules than from the core (see Chapter 6), and by other analysts.

Nonetheless, some common themes emerged from the conference:

- Many conferees expressed interest in having SIPP provide more and better information about families and children, reflecting increased policy concern with the economic and social hardships being experienced by children and the need for additional information to understand fully family circumstances given high rates of family breakup. Specific suggestions included:

- extending the length of SIPP panels (to 4 or 5 years) to provide more information about the socioeconomic consequences of family composition change over the short to medium term;
- following children who move to a nonsample household (e.g., children in a single-parent family at the start of a panel who go to live with the other parent);
- following children and other family members who move to institutions;
  —adding questions about children's health status and utilization of health care;
- adding questions about children's income and receipt of Supplemental Security Income (SSI) benefits;
- adding questions about nonresident kin, income flows among kin, and the financial circumstances of noncustodial parents;
- adding questions about intrafamily and intrahousehold sharing of income;
- adding more detailed questions about child care, including participation in federal programs such as Head Start and preschool child care for nonemployed mothers;

- adding questions about dependent care provided by family members (both for children and elders); and
- adding questions to permit complete identification of the relationships among all household members (needed, in part, to make a more accurate determination of eligibility for transfer programs).

- The conferees generally expressed strong interest in exploiting the potential of administrative records to supplement and enhance the data from SIPP. Specific suggestions included:

adding supplemental samples of program beneficiaries drawn from administrative records;
obtaining additional and higher quality information on selected topics from administrative records matches (e.g., with employer, social security, and IRS records); and
routinely publishing comparisons of data from SIPP, the March CPS, and administrative records.

A number of participants voiced support for adding supplemental measures of socioeconomic hardship and deprivation, which, in some cases, would also improve measures of program eligibility. Specific suggestions included:

asking about episodes of hunger;
ascertaining consumption for housing and other basic necessities;
expanding questions on disability, both in the core and topical modules; and
adding questions on access to credit.

- Overall, there was clear, if implicit, agreement with the recommendation in the CNSTAT report that SIPP should focus on the economically at-risk population. Although the conference participants expressed the desire to maintain the ability to analyze the entire income distribution and, specifically, to obtain improved information on after-tax income, no one supported turning SIPP into a survey of wealth or the wealthy. Instead, the emphasis throughout the discussions was on people eligible for assistance programs and on families and children at risk of economic hardship. Many of the suggestions listed above stem from this orientation, as does the suggestion made by some participants to oversample low-income people, in addition to increasing SIPP sample size generally, which was supported by all participants.

The Role of SIPP in Improving Income Data

An Outside Perspective

In the paper commissioned by the panel, Smeeding (1992) addresses issues of definition and measurement of income and the role of SIPP, the March

CPS, and administrative records in improving the nation's income statistics. The goal of his paper is to present a wealth of broad ideas to stimulate thinking, rather than to discuss specific details.

Smeeding comments first of all that the policy context must be kept in mind when determining priorities for improvement of income data. Three developments of particular consequence in this regard are the growing use by the federal government of the tax system to achieve social welfare goals (e.g., the recent expansion of the earned income tax credit to help the working poor); the growing interest in such economic outcomes as welfare dependency that can only be measured with longitudinal data; and the interest in reassessing the current measure of poverty (both the standard of need and the definition of resources to compare to the standard).

Smeeding proposes that the Census Bureau develop a concept of "full income," or the ability to maintain a given level of consumption, to use as a template for identifying priority areas for improvement.[9] The traditional definition of money income is generally confined to payments made in cash to the family on a regular or at least periodic basis: it excludes such "income" as in-kind benefits, lump-sum payments (e.g., gifts), and (net) imputed returns from housing and other assets. The traditional concept also does not subtract taxes or other mandatory contributions such as child support, nor does it include contributions (received or made) of time (e.g., caregiving).[10]

With regard to SIPP, Smeeding identifies a dozen areas of opportunity and assigns them priorities. He states four premises that underlie his choices: (1) SIPP should complement the CPS, not substitute for it; (2) SIPP should help improve the CPS but also have its own constituency and hence its own report series; (3) in general, SIPP should be innovative—in fact, experimental—in its approach to most issues, which may include imputation and valuation in addition to measurement of various types of income; and (4) SIPP

[9] Watts (1991) notes that "full income" is not well defined by Smeeding and could be confused with the term as it is usually understood by economists—namely, the maximum income that a worker could achieve if he or she worked as much as humanly possible (i.e., had zero leisure).

Both Watts and Slater (1991) critique specific aspects of Smeeding's concepts but agree that the recommendation for the Census Bureau to adopt a broad definition of income to use as a guide for research and development is sound. In our detailed discussion in Chapter 3 of moving SIPP toward this goal, we use the term "income and other economic resources;" elsewhere, we use "income" as shorthand for a broader definition.

[10] Smeeding notes that the Census Bureau has invested considerable effort in developing alternative income measures from the March CPS, specifically measures that exclude most taxes and include selected in-kind benefits and returns from assets—see Chapter 3. He compliments the Census Bureau on this effort but points to conceptual and measurement problems that remain.

should serve the federal policy community and perhaps state policy needs as well.[11]

Smeeding assigns the highest priority to development of after-tax measures of income from SIPP, followed closely by efforts to value basic noncash benefits, including food, housing, and medical benefits. Next in his priorities are improved measurement (in topical modules) of caregiving, health insurance and health care finance, and disability. Smeeding argues that each of these topics is central to current public policy debates and each is undertreated in current measurement work. Improved data from SIPP will support analysis of these topics in their own right and also contribute to development of improved measures of components of income and need.

Next in order, Smeeding supports work to improve the quality of measures of transfer payments through links with administrative records. Next comes work to develop improved equivalence scales for comparing income across different types of families (which have different needs) and work on measuring intrahousehold sharing of income. Smeeding assigns lowest priority to improved measurement of wages and salaries, self-employment income, property income, and imputed rent.

Census Bureau Perspective

About 2 years ago, Census Bureau staff began to develop a concept for improving the nation's income statistics that in some ways would expand and in other ways limit the future role of SIPP. The proposal started with two key premises. The first is that the March CPS and SIPP will continue to coexist, rather than the latter ever replacing the former as the primary source of income information. The second is that the Census Bureau should set aside its traditional approach of generating data files and published reports from individual surveys (e.g., income data from the March CPS are currently published in the P-60 series, while the new P-70 series is used for income data from SIPP); instead, the goal should be to produce the best income statistics based on all available data sources—including the March CPS, SIPP, and administrative records.

Census Bureau staff initially sketched out an ambitious plan to accomplish this goal.[12] In broad outline, the project would involve using admin

[11] To be responsive to state needs, Smeeding suggests that SIPP oversample six or seven states with maximum variation in their policy approaches to topics of national interest (e.g., income transfer policy), so that estimates for state-specific subgroups could be developed at some acceptable level of accuracy.

[12] This description of the Census Bureau's plan is based on a presentation by John Coder to the panel, July 30, 1990; see also Coder (1991). Herriot (1989) first outlined the concept of an integrated income statistics system. His paper envisioned a more prominent role for SIPP than

istrative records and other sources to assess the extent and nature of errors, such as underreporting and misreporting, in the March CPS and SIPP income data. There would then be an attempt to adjust the SIPP data through some sort of multivariate imputation or weighting technique. Alternatively, exactly matched administrative values might be substituted directly in the SIPP records, if the problems of data access could be worked out. Then, the adjusted SIPP data would be used to improve the quality of income data from the March CPS through a related imputation or modeling procedure. The CPS data would retain the advantage of timeliness (assuming that the adjustments would be made from an earlier SIPP file), and the later SIPP data would provide the advantage of additional subject detail and intrayear amounts.

Initial work began on the project with a match of selected IRS data and March CPS records to evaluate the quality of earnings reported by married couples (Coder, 1990). However, the enormity of the entire effort quickly became evident. The latest paper developed by staff in the Housing and Household Economic Statistics (HHES) Division gives higher priority to making selected improvements to SIPP and CPS income measures and views the development of a fully integrated system of income statistics as a much longer range goal (Bureau of the Census, 1991a).

The HHES staff paper agrees with Smeeding that SIPP should complement rather than substitute for the CPS. With regard to SIPP income measures, the paper gives priority (as does Smeeding) to implementing improvements that have already been undertaken for the March CPS—specifically, developing a model to estimate after-tax income and methods for valuing noncash benefits. The tax model developed for SIPP should be superior to that for the March CPS, because the SIPP model can take advantage of tax information reported in each year's tax topical module (but see Chapter 3 on this point); the CPS model bears no direct relationship to actual tax data. The availability of a SIPP tax model, together with an improved CPS-IRS match that includes additional IRS data, should make it possible to improve the CPS tax model as well. With regard to noncash benefits, the current plan is to apply the CPS methodology to SIPP. Funding will be sought to use updated information to value employer-provided medical benefits (from the 1987 National Medical Care Expenditure Survey) and home equity (from an updated match of American Housing Survey and CPS records).

The Census Bureau plan also includes improved publication series and user access to microdata from both SIPP and the March CPS (see discussion

do the proposals subsequently developed by the Census Bureau staff (see discussion in the text). Herriot suggested that CPS income estimates, adjusted on the basis of SIPP estimates for an earlier year, would be issued as "preliminary" figures for the most recent year, to be superseded when higher quality SIPP estimates became available.

in Chapter 6). A regular SIPP report series is being developed that will include both cross-sectional and longitudinal statistics on income and program participation. SIPP income data will also be included in the CPS P-60 reports, although the intention is for the March CPS to remain the primary source of annual income estimates. Recently, the CPS report series was expanded to include estimates of state-level median income and poverty rates. Reports that provide more detailed analysis of SIPP longitudinal and CPS time series data are also planned.

Finally, with regard to assessment and correction of reporting errors in the SIPP and March CPS, which is an essential component of a fully integrated income statistics system, the current plan is to treat this as a long-range goal. Initially, a major study to compare SIPP and CPS statistics on income, poverty, the labor force, and other topics will be undertaken, using the 1990 SIPP panel and the March 1991 CPS. Work will also continue on evaluating income reporting in both the SIPP and CPS through exact matches with administrative records. For the March CPS, after completion of the work on wages and salaries, the next step is to study interest and dividend reporting using the same CPS-IRS exact-match file. The scope of potential exact matches with SIPP is much broader: for example, it involves linkages with records for assistance programs such as SSI, food stamps, and AFDC as well as a match with IRS data.

In summary, the staff paper asserts (Bureau of the Census, 1991a:13):

> Our ultimate goal is to provide public access to microdata files that are likely to contain a combination of survey responses, modelled responses, and administrative information. If successful, our efforts could result in a regular series of income and poverty estimates that would be adjusted for nonsampling error. Note that CPS and SIPP estimates would be adjusted to the same totals . . . . This would represent an enormous improvement over our current survey estimates.

However, the paper acknowledges that progress toward this goal will necessarily be slow, given budget and staff constraints and also the time and effort required to obtain new sources of administrative data and increase the amount of information from sources to which the Census Bureau now has access (e.g., additional items from IRS records).

We gave serious attention to the Census Bureau's proposals to develop an integrated income statistics system. We fully agree that there is a need to improve the nation's statistics on income, poverty, and related measures. Indeed (see below), we view the improvement of data on income and other economic resources as a primary goal for SIPP. We further agree that administrative records can contribute over the long term to improving the income measures from SIPP. However, we conclude that SIPP should become the nation's primary source of income statistics and, hence, should have priority for investments to evaluate and develop improved income

measures. The CPS should continue to collect data on income (needed to support analysis on labor force topics), but the March CPS income supplement can never be designed to provide the same extent of detail or achieve the same quality of reporting as in SIPP. (See the discussion in Chapter 3 of the role of the March CPS and administrative records in achieving SIPP's goals.)

RECOMMENDATION

Despite the diversity of views about goals for SIPP, we agree with the conclusion of the CNSTAT interim report that SIPP cannot and should not be viewed as an all-encompassing general-purpose survey in the area of social welfare policy. Rather, it is essential for the cost-effective operation of the program that it focus on a core set of major goals, which we present here; in the next chapter we discuss how to achieve these goals.

We believe that a primary goal for SIPP should be to provide improved data on the income and other economic resources of the population. Such data are vitally needed by government agencies to track a key component of the economy—the extent and distribution of resources available to the household sector—and to plan, operate, and assess government programs and policies that affect household resources. Despite improvements in the March CPS income supplement, a major survey is needed to obtain detailed and high-quality measures of income and other economic resources (e.g., assets) for periods both shorter and longer than a year, one that includes the necessary corollary information (e.g., family composition and changes in composition over time) to support analysis of important subgroups of the population.

We believe that a second primary (and interrelated) goal for SIPP should be to provide improved data on eligibility for and participation in government assistance programs. Currently, there are a large number of programs that provide income support and other assistance to retirees, disabled people, people temporarily out of work, people whose income is not sufficient to cover their bills for medical care or higher education, and low-income families with dependent children. Government outlays for these programs are substantial.[13] Administrative records for individual assistance programs provide useful information, but a major survey is needed to collect information required to determine who is eligible to participate in programs as well as who participates, to determine eligibility for and participation in more

[13] In fiscal 1988, federal, state, and local governments spent more than $350 billion on social insurance programs (including social security, Medicare, unemployment insurance, and workers' compensation) and close to $175 billion on all forms of cash and in-kind assistance to people with limited income (Bureau of the Census, 1991d:Tables 583, 584).

than one program at a given time or over time, and to follow the dynamics of program entrances and exits.

Within these two primary goals, we believe that SIPP should concentrate on improving information for people who are economically at risk, as that term is defined by the CNSTAT report (see above). That report suggested that a focus on the economically at-risk population might characterize SIPP only so long as the survey was in a start-up phase. However, we conclude that SIPP should retain this focus over the longer term. Despite the many improvements that we fully expect will be implemented as part of the upcoming redesign of SIPP, the survey will still be very much in a developmental phase. Attempting to obtain markedly improved data on income and other economic resources (e.g., assets) for the very well-off, which the evidence shows is difficult for household surveys to accomplish (see Chapter 3), could well compromise SIPP's ability to provide improved information for most of the population. Moreover, it is the population that already receives or is at risk of becoming eligible for government assistance on which good data are most needed to support program analysis and related social welfare research.

We believe that SIPP should have a third, but subordinate goal, namely, obtaining additional policy-related information on topics of current interest that relate to the main goals of the survey. The core questions need to remain relatively stable during the period between major redesigns. Yet important changes may occur in the economic circumstances of the population or in the kinds of policies that are proposed to respond to assistance needs, and, correspondingly, there ought to be a way to obtain timely information from SIPP in response. The topical modules can serve this purpose, as well as provide a means to obtain information that is included in the survey on a continuing basis but does not need to be asked more than once or twice a panel.

> ***Recommendation 2-1:*** **The two primary goals of SIPP should be to provide improved information on the distribution of income and other economic resources for people and families and on eligibility for and participation in government assistance programs. Within these two goals, most attention should be paid to improving the information for people who are economically at risk. A third important but subordinate goal is for SIPP to have a capability to respond to current policy needs for data in topical areas that are related to the core subjects of SIPP**.

3

Achieving SIPP's Goals

In this chapter we amplify our views on SIPP's goals, indicating priority areas for research and development and the implications that we see for modifications or improvement to the survey content. Chapters 4–6 discuss, respectively, the implications for SIPP's design, data collection and processing, and data products. We also consider in this chapter the role of both the Current Population Survey (CPS) March income supplement and administrative records in the achievement of SIPP's goals.

IMPROVING DATA ON INCOME AND OTHER ECONOMIC RESOURCES

Since at least the time of the Great Depression and World War II, a major goal of the federal statistical system has been to measure the economic resources of the population and of family and household units. There has been continuing keen interest in assessing how resources have changed over time for these units and in characterizing the distribution of economic resources in the population as a whole and for important subgroups.

Resources are important to measure because they represent the potential ability of people and households to consume goods and services in order to attain a level of economic well-being. Conceptually, economists might agree that consumption should be examined directly as a measure of eco

nomic well-being.[1] However, because of difficulties in measuring consumption and because many government programs provide cash payments (i.e., potential rather than actual consumption), the United States historically has relied on measuring economic resources as a proxy for economic well-being. (Economists relate economic resources to consumption following the Haig-Simons accounting identity that defines flows of income as the sum of changes in net worth and current consumption; see Bradford, 1986.)

For many years, the focus of official measures in the United States has been one component of economic resources, namely, regular cash income before taxes.[2] Since the early 1980s, the Census Bureau has supported research on experimental income measures that subtract out most taxes (which represent a use of resources that makes them unavailable to support consumption) and that take account of other kinds of resources, including major types of in-kind benefits (Bureau of the Census, 1982, 1988b, 1990a, 1990b, 1991b). To date, the Census Bureau's work has not extended to the valuation of asset holdings (other than equity in one's house) or the contribution of nonmarket, nongovernment resources (e.g., the value of home production or income from the underground economy).[3]

[1] As is always the case with attempting to assert a general point, there are exceptions. The first one is the difference between what a unit actually consumes and how it values it. The issue here is the utility from consumption and the attempt to make interpersonal comparisons of this utility through such devices as equivalence scales. However, equivalence scales are controversial enough, both conceptually and practically, that it does not seem useful to put forward the measurement of the utility of consumption as a goal for a federal statistical program such as SIPP.

[2] Anderson (1988:Ch. 7) documents the efforts in the 1930s to develop reliable measures of the unemployed population and people eligible for government assistance, which ultimately led to the CPS as a vehicle for collecting employment and income data. See Goldfield (1958) for a history of income data in the CPS and the decennial census through 1955 and Welniak (1990) for an updated history of income questions in the CPS.

With regard to more direct measures of consumption, the Bureau of Labor Statistics has a long history of conducting consumer expenditure surveys: major surveys were conducted in 1888–1891, 1901–1903, 1918–1919, 1935–1936, 1950, 1960–1961, and 1972–1973, and a continuing Consumer Expenditure Survey (CEX) was initiated in 1979 (see Goldberg and Moye, 1985). The survey data have been used to study aspects of economic well-being, but their primary use has been to develop the market baskets that are the basis for the consumer price index. The current continuing CEX has a small sample size: 6,800 consumer units for the quarterly interview survey component and 6,000 consumer units for the 2-week diary survey component.

[3] Currently, the Census Bureau publishes 14 experimental income measures in all. The taxes that are excluded from one or more of these measures are social security payroll taxes, federal and state individual income taxes, and property taxes on owner-occupied housing. The valuations of in-kind benefits that are included in one or more measures cover food stamps, school lunches, Medicaid, Medicare, employee health insurance premiums, and subsidized housing. Some of the measures include estimates for realized capital gains, and one measure includes the net imputed return on equity in owner-occupied housing.

We agree with Smeeding (1992) and others who argue that the Census Bureau should adopt a broad definition of economic resources to use as a guide for developing improved measures. We note that SIPP was originally designed and has been striving to achieve this goal. In comparison with the March CPS, SIPP's measures of many of the components of cash income (including returns to assets) and in-kind benefits are much more detailed, are obtained for more disaggregated time periods, and can be aggregated for a greater variety of economic units (individuals, households, families, and subunits eligible for such programs as AFDC and SSI). Tables 3-1 and 3-2 list nonasset and asset income sources collected in SIPP and for what time periods information is obtained about recipiency and amounts for each source. Unlike the CPS, SIPP obtains direct measures of taxes and the value of asset holdings. In comparison with administrative records sources of income data (e.g., IRS tax returns), SIPP provides a wealth of relevant demographic and socioeconomic detail for analysis. Also, SIPP includes close to the entire population, not just taxpayers or program beneficiaries, and close to all sources of income and other economic resources, not just those subject to taxation or considered in the calculation of program benefits.

SIPP has also attained a high level of quality in measures of many types of income and related variables (see further discussion in Citro, 1991; Jabine, King, and Petroni, 1990; Singh, Weidman, and Shapiro, 1988; Vaughan, 1988). Rates of nonresponse to basic income and asset recipiency and labor force items were very low in the 1984–1986 SIPP panels; see Table 3-3. For example, fewer than 1.5 percent of respondents failed to say whether they received income from social security, unemployment compensation, or food stamps or whether they owned savings accounts or shares of stock. Nonresponse rates for income amounts were somewhat higher in the 1984–1986 panels: for example, 4–10 percent of recipients failed to provide income amounts from wages and salaries, social security, unemployment compensation, or food stamps; and 14–17 percent failed to provide amounts of self-employment salary or draw (Table 3-3).

In comparison with the March CPS income supplement, however, SIPP has achieved markedly reduced rates of nonresponse for amounts of virtually all types of income. For example, about 8 percent of recipients of Supplemental Security Income (SSI) in the 1984 SIPP panel failed to provide an amount compared with 20 percent in the March 1985 CPS (see Table 3-4; SIPP nonresponse percentages are shown on an average monthly basis for each quarter of 1984). As another example, 7–9 percent of earners failed to provide an amount for wages and salaries in the 1985 SIPP panel compared with 17 percent in the March 1986 CPS; see Table 3-5. Overall, regular money income estimated for 1984 from the SIPP included 11 percent imputed values due to missing responses, while the corresponding figure from the March 1985 CPS was 20 percent imputed values; see Table 3-6.

TABLE 3-1 Nonasset Income Sources in SIPP

Income Source	Time Period Covered for Recipiency	Time Period Covered for Amount
Wages and salaries (before deductions, including tips, bonuses, overtime pay, commissions, and, for armed forces members, cash housing allowances and other special pay)	Monthly	Monthly
Self-employment income (before deductions)	Monthly	Monthly
Earned income tax credit	Twice a panel	Twice a panel
Social security for self (or self and spouse, total before deductions)	Monthly	Monthly
Social security for one's children	Monthly	Monthly
U.S. government railroad retirement	Monthly	Monthly
State unemployment compensation	Monthly	Monthly
Supplemental unemployment benefits	Monthly	Monthly
Other unemployment compensation (Trade Adjustment Act benefits, strike pay, other)	Monthly	Monthly
Veterans' compensation or pensions	Monthly	Monthly
Black lung payments	Monthly	Monthly
Workers' compensation	Monthly	Monthly
State temporary sickness or disability	Monthly	Monthly
Employer or union temporary sickness	Monthly	Monthly
Payments from own sickness, accident, or disability insurance policy	Monthly	Monthly
Federal Supplemental Security Income	Monthly	Monthly
State Supplemental Security Income	Monthly	Monthly
Aid to Families with Dependent Children	Monthly	Monthly
General assistance	Monthly	Monthly
Indian, Cuban, or refugee assistance	Monthly	Monthly
Foster child care payments	Monthly	Monthly
Other welfare	Monthly	Monthly
Child support payments	Monthly	Monthly
Alimony payments	Monthly	Monthly
Pension from company or union	Monthly	Monthly
Federal civil service or other federal civilian pension	Monthly	Monthly
U.S. military retirement pay	Monthly	Monthly
National Guard or Reserve forces retirement	Monthly	Monthly
State government pension	Monthly	Monthly
Local government pension	Monthly	Monthly
Income from paid-up life insurance policies or annuities	Monthly	Monthly

TABLE 3-1 *Continued*

Income Source	Time Period Covered for Recipiency	Time Period Covered for Amount
Estates and trusts	Monthly	Monthly
Other payments for retirement, disability, or survivor	Monthly	Monthly
Income assistance from charitable group	Monthly	Monthly
Money from relatives or friends	Monthly	Monthly
Lump-sum payments	Monthly	Monthly
Income from roomers or boarders	Monthly	Monthly
National Guard or Reserve pay	Monthly	Monthly
Incidental or casual earnings	Monthly	Monthly
Other cash income not included elsewhere	Monthly	Monthly
Medicare	Every 4 mos.	N.A.
Medicaid	Monthly	N.A.
CHAMPUS health insurance	Monthly	N.A.
CHAMPVA health insurance	Monthly	N.A.
Military health insurance	Monthly	N.A.
Current employer or union health insurance	Monthly	N.A.
Former employer health insurance	Monthly	N.A.
Other health insurance	Monthly	N.A.
Food stamps	Monthly	Monthly
WIC (women, infants, and children nutrition program)	Monthly	Monthly[a]
Energy assistance	Every 4 mos.	4-mo. total
School lunch	Every 4 mos.[b]	N.A.
School breakfast	Every 4 mos.[b]	N.A.
Public housing	Twice a panel	N.A.
Subsidized housing	Twice a panel	N.A.
G.I. Bill	Monthly	Monthly
Other VA educational assistance	Monthly	Monthly
College work study	Every 4 mos.	12-mo. total
Pell Grant	Every 4 mos.	12-mo. total
Supplemental Educational Opportunity Grant	Every 4 mos.	12-mo. total
National Direct Student Loan	Every 4 mos.	12-mo. total
Guaranteed student loan	Every 4 mos.	12-mo. total
JTPA training	Every 4 mos.	12-mo. total
Employer educational assistance	Every 4 mos.	12-mo. total
Fellowship/scholarship	Every 4 mos.	12-mo. total
Tuition reduction	Every 12 mos.	12-mo. total
Other educational financial aid	Every 4 mos.	12-mo. total

NOTES: Information that is available by month or every 4 months is obtained in the core interviews; information that is available twice a panel or every 12 months is obtained in topical modules. The 1990 panel is used as the basis for the table entries. Major differences between the 1990 and earlier panels include:

The 1984 panel included a topical module (in wave 6) on employee fringe benefits, including health insurance, life insurance, use of company vehicle, expense account, meals, and lodging;

Military health insurance coverage was not directly ascertained prior to the 1990 panel;

The earned income tax credit was not ascertained prior to the 1990 panel;

Prior to the 1987 panel, residence in public or subsidized housing was ascertained only at the initial visit; and

Separate types of educational assistance were not identified in the 1984 panel, but the total amount of such assistance was ascertained every 4 months.

[a]Amounts of WIC vouchers are imputed by the Census Bureau from information supplied by the U.S. Department of Agriculture.

[b]Recipiency information includes whether school lunch or breakfast was free, reduced price, or full price.

N.A., Not applicable or not available.

SIPP has also obtained more complete reporting of many types of income than has the March CPS when aggregate amounts from the two surveys are measured against independent sources. For example, average monthly food stamp benefits by quarter reported in the 1984 SIPP panel amounted to 83–90 percent of the corresponding quarterly totals from independent sources, whereas total food stamp benefits in 1983 from the March 1984 CPS amounted to only 71 percent of the annual total from independent sources. Similarly, average monthly SSI benefits by quarter from the 1984 SIPP panel averaged 90–99 percent of the quarterly totals from independent sources, whereas total SSI benefits in 1983 from the March 1984 CPS amounted to only 85 percent of the annual total from independent sources; see Table 3-7.

At the same time, SIPP's success in measuring each and every one of the components of cash and in-kind income and asset holdings has not been complete. Some measures are subject to appreciable error: for example, average monthly Aid to Families with Dependent Children (AFDC) benefits by quarter from the 1984 SIPP panel averaged only 76–86 percent of the quarterly totals from independent sources. These figures are not a marked improvement over the March 1984 CPS, for which the total AFDC benefits in 1983 amounted to 76 percent of the annual total from independent sources (Table 3-7). Comparisons of SIPP aggregates with independent sources for another income type—state unemployment compensation—show widely varying rates of completeness by quarter (from 107 percent of the independent total in the third quarter of 1983 to only 73 percent in the third quarter of 1985); see Table 3-8.

TABLE 3-2 Assets and Asset Income Sources in SIPP

Asset	Time Period Covered for Ownership	Income Amount	Value
Interest-bearing bank accounts			
Joint with spouse			
Regular passbook savings accounts	Every 4 mos.	combined 4-mo. total	combined value twice a panel[a]
Money market deposit accounts	Every 4 mos.		
Certificates of deposit	Every 4 mos.		
Interest-earning checking accounts	Every 4 mos.		
Own			
Regular passbook savings accounts	Every 4 mos.	combined 4-mo. total	combined value twice a panel[a]
Money market deposit accounts	Every 4 mos.		
Certificates of deposit	Every 4 mos.		
Interest-earning checking accounts	Every 4 mos.		
Other interest-earning assets			
Joint with spouse			
Money market funds	Every 4 mos.	combined 4-mo. total	combined value twice a panel[a]
U.S. government securities	Every 4 mos.		
Municipal or corporate bonds	Every 4 mos.		
Other interest-earning assets	Every 4 mos.		
Own			
Money market funds	Every 4 mos.	combined 4-mo. total	combined value twice a panel[a]
U.S. government securities	Every 4 mos.		
Municipal or corporate bonds	Every 4 mos.		
Other interest-earning assets	Every 4 mos.		
Stocks or mutual fund shares			
Jointly held with spouse (cash and reinvested dividends separately; value and debt or margin account separately)	Every 4 mos.	4-mo. total	Twice a panel[b]
Own (cash and reinvested dividends separately; value and debt or margin account separately)	Every 4 mos.	4-mo. total	Twice a panel[b]
Rental property			
Jointly held with spouse (gross and net rent separately; market value and principal owed on mortgage separately)	Every 4 mos.	4-mo. total	Twice a panel
Own property (gross and net rent separately; market value and principal owed on mortgage separately)	Every 4 mos.	4-mo. total	Twice a panel
Held with others (share of net rent; market value, principal, share of net equity separately)	Every 4 mos.	4-mo. total	Twice a panel
Mortgages			
Jointly held with spouse	Every 4 mos.	4-mo. total	Once a panel

TABLE 3-2 Assets and Asset Income Sources in SIPP

Asset	Time Period Covered for Ownership	Income Amount	Value
Mortgages—*cont'd*			
Own	Every 4 mos.	4-mo. total	Once a panel
Other mortages	Once a panel	N.A.	Once a panel
Royalties	Every 4 mos.	combined	N.A.
Other financial investments	Every 4 mos.	4-mo. total	Twice a panel
U.S. Savings Bonds	Every 4 mos.	N.A.	Twice a panel
Checking accounts (no interest)			
Joint with spouse	Twice a panel	N.A.	Twice a panel
Own	Twice a panel	N.A.	Twice a panel
Debt owed on store or credit cards			
Joint with spouse	Once a panel	N.A.	Once a panel
Own	Once a panel	N.A.	Once a panel
Debt owed on bank or credit union loans (except car and home equity)			
Joint with spouse	Once a panel	N.A.	Once a panel
Own	Once a panel	N.A.	Once a panel
Any other debt (e.g., medical bills)			
Joint with spouse	Once a panel	N.A.	Once a panel
Own	Once a panel	N.A.	Once a panel
Individual Retirement Accounts[c]	Twice a panel	Twice a panel	Twice a panel
KEOGH accounts[c]	Twice a panel	Twice a panel	Twice a panel
401K accounts[c]	Twice a panel	N.A.	Once a panel
Life insurance (including employer)	Twice a panel	N.A.	Twice a panel
Employer life insurance separately	Once a panel	N.A.	Once a panel
Own home			
Mortgages, equity, market value	Once a panel	N.A.	Once a panel
Mortgage/rent payments, utilities	Once a panel	N.A.	Once a panel
Vacation/second home	Twice a panel	N.A.	Twice a panel
Cars/vans/trucks (details on year/make/model and debt owed for individual vehicles)	Twice a panel	N.A.	Twice a panel
Recreational vehicles (market value, debt owed)	Twice a panel	N.A.	Twice a panel
Own business	Monthly	Monthly	Once a panel
Debt owed against own business	Once a panel	N.A.	Once a panel
Capital gains	Twice a panel	N.A.	Twice a panel

NOTES: The 1990 panel is used as the basis for the table entries. Major differences between the 1990 and earlier panels include:

In the 1984-1986 panels, values for almost all assets and liabilities were obtained twice a panel, because the asset and liabilities and real estate and vehicle topical modules were generally asked twice a panel (see Table 3-13). Subsequently, these modules were asked only once a panel; however, selected assets were also asked about in the program eligibility set of modules.

Prior to the 1990 panel, the annual income round-up topical module obtained recipiency and calendar-year income amounts separately for each interest and dividend-bearing asset (e.g., money market deposit accounts, municipal bonds, etc.).

[a]Asset value is asked every 4 months for those respondents who do not know the amount of interest received.
[b]Debt or margin account on stocks is ascertained only once a panel.
[c]Information on IRA and KEOGH accounts is obtained in the annual income round-up (asked in waves 5 and 8 in the 1990 panel), which ascertains contributions and earnings in the preceding calendar year, and in the asset and liabilities (wave 4) and program eligibility (wave 7) modules, which ascertain total market value. Information about contributions to 401K accounts is asked in the annual income roundup (waves 5 and 8), while information about total value is asked in the retirement expectations module (wave 4).
N.A., Not applicable or not available.

TABLE 3-3 Nonresponse Rates for Selected SIPP Core Items, by Panel

Question	1984	1985	1986
Labor Force Activity			
Identification of weeks absent without pay	0.1	[a]	0.1
Identification of weeks with a job or business	2.2	2.0	2.5
Presence of weeks looking or on layoff	1.0	1.3	2.0
Identification of weeks looking or on layoff	3.2	2.4	2.9
Income Recipiency or Asset Ownership			
Social security	0.6	0.6	1.0
Unemployment compensation	0.1	0.1	0.2
Food stamps	0.3	0.4	0.5
Savings accounts	1.0	0.9	0.9
Shares of stock	1.3	1.4	1.5
Income Amounts			
Hourly wage rate	9.5	10.4	10.8
Monthly wage and salary	6.2	7.2	8.4
Self-employment salary or draw	14.0	16.9	14.6
Social security	8.8	9.5	10.0
Unemployment compensation	9.1	9.7	9.9
Food stamps	3.6	4.1	4.4
Interest	34.6 (24.2)[b]	29.8 (28.9)[b]	30.8 (30.2)[b]
Dividends	9.4 (30.7)[c]	10.5 (30.5)[c]	9.4 (29.1)[c]

[a]Less than .05 percent
[b]Figure in parentheses is the nonresponse rate on balance in the account. This question was asked of people with savings accounts who did not provide an estimate of the amount of interest received (e.g., the 34.6% in the 1984 panel).
[c]Figure in parentheses is the nonresponse rate for dividends credited to accounts.

SOURCE: Jabine, King, and Petroni (1990:Table 5.5).

TABLE 3-4 Item Nonresponse Rates in the 1984 SIPP and March 1985 CPS, by Selected Income Types

Income Type	SIPP				CPS
	1st Quarter 1984 Monthly Average	2nd Quarter 1984 Monthly Average	3rd Quarter 1984 Monthly Average	4th Quarter 1984 Monthly Average	March 1985
Wage and salary	7.2%	7.5%	7.5%	7.6%	18.9%
Self-employment income	16.8	16.2	16.0	16.1	26.5
Supplemental Security Income (federal)	7.6	8.4	8.1	8.4	19.9
Social security	10.8	11.6	11.7	12.3	21.9
Aid to Families with Dependent Children (AFDC)	6.1	6.9	6.5	5.5	16.0
Unemployment compensation	10.1	13.6	10.4	12.7	21.8
Company or union pension	13.9	14.0	12.8	14.7	24.0
Food stamp allotment	5.2	6.3	6.7	6.6	13.7
Veterans' compensation or pension	11.3	11.2	11.9	13.5	18.3

NOTE: Noninterviews or complete failure to obtain cooperation from any household member have not been considered in this examination of nonresponse rates.

SOURCE: Jabine, King, and Petroni (1990:Table 5.9).

TABLE 3-5 Item Nonresponse Rates in the 1985 SIPP and March 1986 CPS, by Selected Income Types

Income Type	SIPP				CPS
	1st Quarter 1985 Monthly Average	2nd Quarter 1985 Monthly Average	3rd Quarter 1985 Monthly Average	4th Quarter 1985 Monthly Average	March 1986
Wage and salary	7.8%	6.7%	8.5%	8.3%	16.5%
Self-employment income	17.0	9.3	19.4	17.6	21.9
Supplemental Security Income (federal)	8.5	8.7	8.0	8.5	16.5
Social security	13.0	12.5	12.7	13.2	19.3
Aid to Families with Dependent Children (AFDC)	8.9	8.1	8.5	8.5	14.4
Unemployment compensation	15.0	15.6	14.9	16.0	18.6
Company or union pension	17.0	16.1	16.2	16.5	21.0
Food stamp allotment	7.1	5.9	6.3	6.6	11.1
Veterans' compensation or pension	13.1	13.4	13.2	16.2	18.8

NOTE: Noninterviews or complete failure to obtain cooperation from any household member have not been considered in this examination of nonresponse rates.

SOURCE: Jabine, King, and Petroni (1990:Table 5.10).

TABLE 3-6 1984 SIPP and March 1985 CPS Estimates of Income Aggregates, for 1984 by Type (in billions)

Type of Income	SIPP	CPS	SIPP as a Percentage of CPS	Percent Imputed	
				SIPP	CPS
Total money income	$2,419.7	$2,417.4	100.1	11.4	N.A.
Regular money income	2,414.6	2,417.4	99.9	11.4	20.1
Earnings	1,872.5	1,906.0	98.2	10.0	18.9
Public and private transfers	335.2	300.2	111.6	12.1	20.7
Property income	200.9	194.9	103.1	23.9	32.4
All other regular money income	6.0	16.3	37.0	15.4	22.3
Lump-sum payments	5.1	N.A.	N.A.	5.6	N.A.

N.A., Not available.

SOURCE: Jabine, King, and Petroni (1990:Table 10.8).

In addition, nonresponse rates for asset values and income from assets are high in SIPP; see Tables 3-3, 3-9. Also, the reporting of many types of asset values and income from assets is far from complete in comparison with estimates from independent sources; see Tables 3-10, 3-11, and the discussion below on improving the measurement of asset information in SIPP.[4] In addition, SIPP leaves out some types of economic resources (e.g., many fringe benefits). Finally, SIPP (as is true of household surveys generally, including the March CPS) obtains less than complete coverage of such groups as young black men; see Table 3-12. Population undercoverage may adversely affect SIPP estimates of low income and program participation, given the evidence that undercoverage is worse for people who are economically at risk (see Chapter 7 for further discussion).

SIPP needs to make yet further improvements in available information on economic resources, using a broad definition as a guide. Realistically, of course, priorities will need to be set. Such priority setting should take account of SIPP's focus on the economically at-risk population and also of the fact that some kinds of resources are inherently harder to measure in household surveys than others. Hence, costs of obtaining information must be balanced against potential benefits, which include the importance of the resource (i.e., the proportion it represents of total resources for all people and for subgroups): a resource that is hard to measure and, based on avail

[4] It is important to keep in mind that conceptual differences and the existence of errors in the independent estimates may affect the validity of comparisons between aggregate information from surveys and from other sources (the latter typically include program records, tax records, and estimates from the National Income and Product Accounts [NIPAJ]).

TABLE 3-7 1984 SIPP and March 1984 CPS Estimates as Percentages of Independent Estimates of Income Recipients and Amounts for Selected Income Types

Income Source	SIPP as a Percentage of the Independent Estimate of Average Monthly Recipients	SIPP as a Percentage of the Independent Estimate of Quarterly Income	CPS as a Percentage of the Independent Estimate of Annual Income for 1983
Wage and salary			
3rd quarter 1983	N.A.	95.0	99.0
4th quarter 1983	N.A.	94.3	
1st quarter 1984	N.A.	93.2	
2nd quarter 1984	N.A.	94.4	
3rd quarter 1984	N.A.	95.2	
4th quarter 1984	N.A.	94.5	
Federal Supplemental Security Income			
3rd quarter 1983	92.0	89.8	84.9
4th quarter 1983	91.3	93.5	
1st quarter 1984	94.8	96.4	
2nd quarter 1984	98.2	97.4	
3rd quarter 1984	98.3	98.6	
4th quarter 1984	98.1	99.2	
Social security			
3rd quarter 1983	99.2	99.6	91.7
4th quarter 1983	96.3	100.6	
1st quarter 1984	97.3	100.5	
2nd quarter 1984	97.7	101.1	
3rd quarter 1984	97.5	101.3	
4th quarter 1984	97.5	101.6	
Aid to Families with Dependent Children[a]			
3rd quarter 1983	78.5	76.2	76.0
4th quarter 1983	79.2	78.5	
1st quarter 1984	84.5	85.3	
2nd quarter 1984	86.0	86.0	
3rd quarter 1984	82.0	80.2	
4th quarter 1984	80.7	78.8	
Food stamps			
3rd quarter 1983	89.5	90.1	71.2
4th quarter 1983	91.0	83.1	
1st quarter 1984	90.8	85.2	
2nd quarter 1984	90.5	86.2	
3rd quarter 1984	90.3	84.6	
4th quarter 1984	91.7	83.6	
Veterans' compensation or pension[a]			
3rd quarter 1983	89.2	78.9	63.3
4th quarter 1983	89.7	79.9	

able evidence, makes a small contribution to total resources would have lowest priority for any type of measurement work.

Income Source	SIPP as a Percentage of the Independent Estimate of Average Monthly Recipients	SIPP as a Percentage of the Independent Estimate of Quarterly Income	CPS as a Percentage of the Independent Estimate of Annual Income for 1983
Veterans'—*cont'd*			
1st quarter 1984	90.6	78.0	
2nd quarter 1984	90.8	74.5	
3rd quarter 1984	89.8	76.3	
4th quarter 1984	93.3	79.7	

[a]Recipients exclude dependents covered by payments.

N.A., Not available.

SOURCE: Jabine, King, and Petroni (1990:Table 10.1).

Income and Related Measures

Measures Relevant to Programs

In our view, a priority goal for SIPP should be to provide high-quality measures of the income and assets of relevant economic units in order to determine accurately the incidence, distribution, and temporal changes of program eligibility. Relatedly, SIPP should give priority to measuring relevant types of income and other resources that are of interest when examining participation in government programs. It is important not to lose sight of SIPP's focus on program eligibility and participation: it is ultimately more important that SIPP measures well the resources that are relevant for people who are economically at risk than those that are relevant primarily for people who are unlikely to become eligible for programs.

We have identified several important implications of a focus on programs. First, SIPP should take a different approach to the measurement of assets and asset income—one that is designed to obtain good measures on a more frequent basis for use in determining program eligibility but explicitly accepts some loss of detail for the remainder of the population (see below for our suggested approach).

Second, SIPP needs to have the best possible measures of the extent of program participation and the amount of benefits received in order to support analysis of program participation rates and to compare the characteristics of participants and eligible nonparticipants. To this end, we support research on the use of administrative records data for major assistance pro

grams (e.g., AFDC, food stamps, SSI, unemployment insurance) to evaluate and suggest ways to improve SIPP reports for these sources (see last section of this chapter).

TABLE 3-8 Comparisons of SIPP 1984 State Unemployment Compensation Estimates with Estimates Derived from Independent Sources (recipients in thousands, amount in millions)

	SIPP		Independent Estimate[a]		SIPP as a Percentage of Independent Estimate	
Period	Recipients	Amount	Recipients	Amount	Recipients	Amount
1983						
3rd quarter	3,084	$1,287	3,056	$1,259	100.9	102.2
4th quarter	2,878	1,193	2,784	1,117	103.4	106.8
1984						
1st quarter	2,982	1,206	3,608	1,415	82.6	85.2
2nd quarter	2,212	897	2,682	1,079	82.5	83.1
3rd quarter	1,927	762	2,456	949	78.5	80.3
4th quarter	2,462	978	2,590	969	95.1	100.9
1985						
1st quarter	3,225	1,393	3,771	1,470	85.5	94.8
2nd quarter	2,220	927	2,872	1,193	77.3	77.7
3rd quarter	1,917	783	2,633	1,078	72.8	72.6
4th quarter	1,981	854	2,506	1,103	79.1	77.4

NOTE: Monthly averages for specified quarters.

[a]Excludes federal supplemental compensation.

SOURCE: Jabine, King, and Petroni (1990:Table 10.2).

Finally, the Census Bureau should undertake a thorough reexamination of the procedures that are used to edit program data obtained in SIPP and to impute missing income and asset information for program recipients. The SIPP record-check study found that substantial underreporting of receipt of AFDC benefits in Pennsylvania was largely because respondents confused AFDC with the general assistance program in that state (Marquis and Moore, 1989:522). Cantor et al. (1991) provide evidence of confusion among program names as well. To the extent that improved questions and field procedures do not eliminate the problem, we suggest that editing procedures be developed to correct these kinds of reporting errors.[5] Similarly, there is

[5] It should be feasible to develop such procedures in many cases. For example, given different eligibility rules, it is likely that families with children who report receipt of general assistance or other welfare in fact received AFDC, while single individuals who report AFDC in fact received general assistance, other welfare, or some other type of assistance. Coder and Ruggles (1988) provide examples of the types of edits that could be carried out to correct obvious errors in reports of AFDC and general assistance in SIPP.

evidence that the current procedures for imputing income and assets to program beneficiaries (and low-income people, generally) are deficient.[6] Information obtained from record-check studies that compare SIPP reports with administrative data could be used to investigate the characteristics of nonrespondents, to evaluate the effects of current imputation procedures, and to provide guidance on possible improvements.

TABLE 3-9 Item Nonresponse Rates for Asset Amounts in SIPP and the Income Survey Development Program (ISDP) 1979 Research Panel

	Nonresponse Rate (percent)		
	SIPP		ISDP
Asset Type	1984	1986	
Amount in savings accounts	16.8	22.8	24.9
Amount in checking accounts	13.3	21.2	23.1
Amount in bonds and government securities	25.9	23.1	32.2
Market value of stocks and mutual fund shares	41.5	36.9	65.8
Debt on stocks and mutual fund shares	41.1	38.6	87.3
Face value of U.S. savings bonds	24.9	24.9	35.8
Value of rental property	33.5	31.3	39.9
Value of own business	37.9	41.8	55.3
Debt on own business	28.8	31.5	50.4

NOTE: Nonresponse rates for SIPP are from waves 3 and 4 of the 1984 panel and wave 4 of the 1986 panel.
SOURCE: Jabine, King, and Petroni (1990:Table 5.8).

Measures of Taxes and After-Tax Income

Another priority goal for SIPP is to develop accurate measures of federal, state, and local taxes. Such measures are needed to calculate after-tax (disposable) income for comparisons of resources for consumption across the population. Such measures are also needed to study eligibility and use of transfer programs that are administered through tax credits (notably, the earned income tax credit). Finally, the availability of good tax measures will permit analysis of the distribution of the tax burden on families with

[6] The Census Bureau's "hot-deck" imputation procedures do not take account of poverty or receipt of program benefits in imputing specific income and asset values (although they do take account of income levels in broad terms). Hence, the imputations create instances of people who report receipt of benefits from such program as food stamps but who have imputed incomes or asset values that are too high for them to be eligible (see Doyle and Dalrymple, 1987; Allin and Doyle, 1990).

different gross incomes. In this regard, we note that tax burdens can be significant for such groups as the working poor and near-poor who are part of the economically at-risk population and hence of concern to SEPP. Pechman (1985) estimated that the individual income tax rate for the bottom one-tenth of taxpayers was about 4 percent in 1985, compared with 1 percent in 1966, and that social security payroll taxes had doubled for this group over the same period (although recent tax changes have reduced income taxes for the poor and increased offsetting tax credits).

TABLE 3-10 1984 SIPP, March CPS, and Independent Estimates of Aggregate Interest and Dividend Income, 1983-1984 and Calendar 1984 (in billions of dollars)

Income Source	1983-1984 (NIPA-based)	1984 NIPA-based	1984 Reported to IRS
Interest			
Independent estimate	$239.1	$254.6[a]	$176.4
Survey estimates			
SIPP	$115.7	$115.4	
CPS			
Original imputation	$104.7	$109.2	
Revised imputation[b]	$129.5	$138.7	
Survey estimates as a percentage of the independent estimate			
SIPP	48.4%	45.3%	65.4%
CPS			
Original imputation	43.8%	42.9%	61.9%
Revised imputation	54.2%	54.5%	78.6%
Dividends			
Independent estimate	$63.6	$66.5[a]	$50.6[c]
Survey estimates			
SIPP	$38.3	$40.3	
CPS	$29.1	$30.7	
Survey estimates as a percentage of the independent estimate			
SIPP	60.1%	60.7%	79.7%
CPS	45.8%	46.1%	60.6%

[a]Personal income aggregate from the National Income and Product Accounts (NIPA) adjusted to the survey universe based on observed relationship between NIPA aggregate and independent estimate for the CPS universe in 1983.
[b]The revised imputation corrects for bias in the pre-1983 imputation procedure by making use of matched Internal Revenue Service information on interest income.
[c]Total domestic and foreign dividends received.

SOURCE: Jabine, King, and Petroni (1990:Table 10.3).

For all these reasons, we support the high priority that the Census

TABLE 3-11 Asset and Liability Estimates from SIPP and the Federal Reserve Board (FRB) Balance Sheet Data for the Household Sector, for 1984 and 1988 (amount in billions)

Category	1984 FRB Balance Sheet (Amount)	1984 SIPP (Amount)	1984 Ratio of SIPP to FRB Balance sheet	1988 FRB Balance Sheet (Amount)	1988 SIPP (Amount)	1988 Ratio of SIPP to FRB Balance sheet
A. Equity in owner-occupied housing	$2,316.3	$2,823.6	1.22	$3,042.1	$3,628.6	1.19
Gross value	3,606.4	3,958.2	1.10	5,180.6	5,235.0	1.01
Debt	1,290.1	1,134.6	0.88	2,138.5	1,606.4	0.75
B. Equity in motor vehicles	287.0	410.5	1.43	424.3	490.3	1.16
Gross value	459.6	558.8	1.22	708.9	741.0	1.05
Debt	172.6	148.3	0.86	284.6	250.7	0.88
C. Equity in noncorporate business	2,235.1	1,680.2	0.75	2,410.7	1,764.9	0.73
Rental property	N.A.	909.6	N.A.	N.A.	1,025.9	N.A.
Other business equity	N.A.	770.6	N.A.	N.A.	739.0	N.A.
D. Financial assets	3,858.9	2,826.1	0.74	5,753.5	3,813.2	0.66
Interest-earning assets[a]	3,167.5	1,635.7	0.52	4,348.5	2,432.5	0.56
Corporate equities[b]	1,403.2	1,062.7	0.76	2,171.4	1,114.2	0.51
Other financial assets[c]	128.2	127.8	1.00	176.6	266.5	1.51
Less: Financial assets held by nonprofit sector or in personal trusts	(840.0)	—	—	(943.0)	—	—
E. Installment and other consumer debt[d]	379.9	241.5	0.64	409.1	245.8	0.60
F. Net Worth (A+B+C+D-E)	8,122.9	7,498.8	0.92	11,221.5	9,451.2	0.84

NOTE: SIPP data are from the 1984 panel for 1984 and from the 1986-1987 panels for 1988.

[a]Includes passbook savings accounts, money market deposit accounts, certificates of deposit, checking accounts, money market funds, and other interest-earning assets.
[b]Includes equities in stocks, mutual fund shares, and incorporated self-employed businesses or professions.
[c]Includes mortgages held by sellers and other financial assets not otherwise specified.
[d]Excludes debt for automobiles and mobile homes.

N.A., Separate estimates not available.
—, Not applicable.

SOURCE: Eargle (1990:Table D-2).

Bureau staff have assigned to developing a tax model for SIPP. We note, again, that this work can benefit greatly from the use of administrative records. SIPP (unlike the March CPS) includes a tax module, but the quality of the information collected for many key items is poor (e.g., filing status and the kinds of forms filed are well reported but not amounts of deductions, adjusted gross income, or taxes paid). By taking advantage of IRS information, there is an opportunity to obtain higher quality estimates of after-tax income and at the same time reduce the level of detail on taxes that SIPP tries to obtain directly from respondents.

Currently, the IRS provides the Census Bureau with a limited set of items from the complete Individual Master File (IMF) of tax returns. The Bureau has carried out and plans further matches of these data with SIPP (and March CPS) records for evaluation and methodological research purposes (see last section). However, the IMF data have not been subject to the quality control that is applied to a sample of tax returns drawn each year by the Statistics of Income (SOI) Division of IRS. Moreover, the IMF information furnished to the Census Bureau does not include taxes paid or sufficient information to calculate taxes.[7]

We believe that it is very important for the Census Bureau and the SOI Division to work together to obtain high-quality estimates of after-tax income for SIPP. Such cooperation would be very cost-effective for the SIPP program and could also provide useful information to support the tax policy modeling and research that is carried out by the Treasury Department.

One possible approach is for the Census Bureau to have the SOI staff use social security numbers (SSNs) to pull the tax records of SIPP respondents, clean them in the same manner as is done for the SOI sample, and return the information to the Census Bureau to use in estimating after-tax income. Such an approach would be very powerful in terms of providing accurate tax data, including the filing versus nonfiling status of all SIPP respondents—an important piece of information for tax policy modeling. However, a major obstacle to implementing this approach concerns the protection of confidentiality. Fully adequate procedures would have to be worked out to ensure that there could be no opportunity to identify SIPP respondents for tax enforcement or other purposes.

Another possibility is for the IRS to provide samples of tax returns from the SOI files that would be included in SIPP panels (i.e., to develop a multiple-frame sample for SIPP—see last section). The linked tax and survey information for these cases would permit much more accurate modeling of taxes for the regular SIPP respondents than is currently possible.

[7] Items released by the IRS to the Census Bureau include type of return (e.g., joint or single), wage and salary income, interest income, and dividend income. Recently, after a lengthy negotiation process, the IRS agreed to provide total adjusted gross income as well.

TABLE 3-12 Coverage Ratios for SIPP and CPS Samples: March 1984 and March 1986

	March 1984							
	Male				Female			
	CPS		SIPP		CPS		SIPP	
Age Group	Black	Nonblack	Black	Nonblack	Black	Nonblack	Black	Nonblack
16-17	.9485	.9390	.9650	.9504	.8672	.9674	1.0374	.9557
18-19	.9133	.8955	.9302	.9667	.8763	.9094	.9021	.8825
20-21	.7465	.8865	.8862	.9214	.8190	.9139	.8698	.9664
22-24	.6561	.8615	.6433	.8144	.8483	.8845	.7929	.8838
25-29	.8029	.9065	.7419	.8461	.9069	.9278	.9205	.9283
30-34	.7054	.9079	.8701	.8957	.8487	.9499	.9335	.8855
35-39	.7677	.9109	.7294	.8711	.8441	.9465	.8489	.9022
40-44	.9043	.9286	.8770	.8868	.9793	.9376	.8652	.9446
45-49	.8630	.9215	.7576	1.0039	.9500	.9678	1.1315	.9930
50-54	.8418	.9595	.9355	.9378	.9048	.9791	.7172	.9718
55-59	.8302	.9604	.9864	.9267	.8943	.9476	.8494	.9361
60-61	1.0034	.9622	.9265	.9637	.9675	.9133	1.0557	.9801
62-64	.8591	.9261		.9352	.9329	.9500	1.0363	.9345
65-69	1.0990	.9335	.9589	.9400	1.0704	.9506		.9839
70-74	.8942	.9289		.9457	1.0186	.9450	1.0492	.9178
75-79				.9206				.9184
80-84	1.0135	.9266	.9733	1.0358	.9804	.9384	.9380	.9517
85 and over				.7831				.9759
Total 16 and over	.8350	.9193	.8460	.9095	.9012	.9407	.9172	.9330

NOTE: Coverage ratios (see text for definition) are similar for other months.

In any event, the burdensome tax module in SIPP could be scaled back to include only those items (e.g., filing status, type of return, number of dependents) that facilitate linkage with IRS records.

Valuation of In-Kind Benefits

Still another high-priority goal that the Census Bureau staff have set to improve income and related statistics from SIPP, which we endorse, is to develop measures of the value of in-kind benefits.[8] Noncash transfers, both

[8] In-kind benefits are sometimes literally in kind, such as the provision of a public housing unit to a low-income family; more often, they are rendered in the form of coupons (e.g., food stamps) or cash payments to third parties (e.g., reimbursement for heating, child care, or

March 1986							
Male				Female			
CPS		SIPP		CPS		SIPP	
Black	Nonblack[a]	Black	Nonblack	Black	Nonblack[a]	Black	Nonblack
0.9215	0.9739	0.8973	0.9713	0.8891	0.9542	1.0208	0.9876
0.7435	0.8915		0.7955	0.8620	0.8821		0.1342
0.7976	0.8685		0.7424	0.7809	0.8804	1.0013	0.8732
0.7229	0.8893		0.9259	0.7913	0.9138		0.9812
0.7276	0.8946	0.5786	0.7869	0.8659	0.9389	0.6960	0.8788
0.7559	0.9094		0.8270	0.9037	0.9446		0.9497
0.8501	0.9390	0.8669	0.9627	0.8555	0.9783	0.8344	0.9970
0.8608	0.9349		0.9377	0.9511	0.9483		1.0340
0.9479	0.9186		0.9826	0.8587	0.9298		0.9695
0.9211	0.9461		0.8987	0.8968	0.9398		0.9225
0.7999	0.9639	0.8736	0.9897	0.8651	0.9488	0.8970	0.9517
0.7097	0.9162		1.0598	0.9528	0.9174		1.1853
0.8574	0.8830		1.1076	0.8665	0.9695		1.0689
0.8596	0.9367		0.9805	0.9506	0.9661		1.1253
1.0065	0.9792		1.1712	1.0014	0.9986	1.2688	1.0364
0.8679	0.9596		0.9953	1.0929	1.0029		0.9912
							0.8502
0.8172	0.9259	0.797	0.9252	0.8932	0.9485	0.8892	0.9788

[a]CPS coverage ratios are for whites. Hispanic persons may be classified as either white or black: most probably fall in the white category

SOURCE: Jabine, King, and Petroni (1990:Tables 10.12, 10.13).

public and private, have expanded dramatically over the past 20 years. The food stamp program did not even exist at the national level in 1970; by 1990 it was annually providing more than $15 billion in benefits (Congressional Research Service, 1991:198). Spending on Medicare and Medicaid has also grown enormously since 1970. Some of this increase reflects rising prices for health care services, but there has also been a major expansion in the receipt of health benefits. Privately provided fringe benefits, such as health insurance and pension coverage, also have become much more common, and they are now estimated to represent as much as one-fourth of employers' total labor costs (Levitan and Gallo, 1989:14).

medical bills). The key distinction is that in-kind benefits can be used only to obtain the designated good or service and not for other consumption of the recipient's choice.

The difficulty comes in valuing in-kind benefits.[9] Some publicly provided benefits, including food stamps and public housing, are relatively easy to value, since the cost of the benefit to the government (its "market value") and the value to the recipient ("fungible value") are known to be close.[10] Much more problematic is the valuation of benefits from Medicare and Medicaid. As noted by Census Bureau staff (Bureau of the Census, 1991 a:8):

> There is great controversy about the valuation of benefits from Medicare and Medicaid, caused in part by the fact that market values of benefits can exceed the poverty line (intended to cover all basic needs) and are always a very large proportion of the poverty line. A second problem is that persons can [appear to] gain income by moving into a risk class with a high level of medical need (e.g., the aged or the disabled). There are fewer problems with the valuation of employer-provided medical benefits because employees have chosen to receive part of their compensation in this form.

For several reasons—because access to medical care is an issue in its own right, the public's willingness to subsidize medical care exceeds its willingness to provide cash income,[11] and the tax-exempt status of employer-provided health insurance premiums is a major benefit to many people—it is clearly important that SIPP continue to regularly collect complete information on the health insurance unit(s) in households and the existence of health insurance coverage. It is also important that the Census Bureau continue to investigate alternative ways of attempting to incorporate a value for health insurance coverage (public and private) into the SIPP measure of income.[12]

We note, however, that some analysts have expressed caution on this matter. For example, Watts (1991:2) argues that it is difficult to know how to allocate the incidence of public medical care transfers "between direct beneficiaries, their extended families, suppliers of medical services, and the common weal." Watts suggests that, instead, there might be a deduction from income for people lacking any health insurance coverage. Another conservative alternative might simply be for SIPP income statistics to show

[9] See Bureau of the Census (1982) for seminal work by Smeeding on valuation methods for in-kind transfers; see also the proceedings of a conference that was held on this topic (Bureau of the Census, 1985a).

[10] In addition to food stamps and public housing, the March CPS expanded income estimates currently include the value of school meals. For SIPP, there seems no reason not to include home beating assistance as well.

[11] Government spending for medical care for low-income people is currently 55 percent greater than government spending on cash assistance (Congressional Research Service, 1991:Table 6).

[12] For a description of the methods currently used to value benefits from Medicare, Medicaid, and employer-provided health insurance for inclusion in the March CPS expanded measures of income, see Bureau of the Census (1991b).

routinely, for each income class, the proportion of people lacking health insurance (see, e.g., Aaron, 1985).

Smeeding (1992) suggests that other nonpension employer-provided fringe benefits may add appreciably to the resources of employed people—almost as much, by his calculations, as the value of employer-provided health insurance.[13] However, some of these benefits (e.g., employee subsidies for education) raise the same problems of valuation as public subsidies for education and health care, while others (e.g., employee meals furnished in lieu of pay) are likely to prove hard to measure in terms of their incidence, let alone their value. One strategy would be to occasionally include a topical module in SIPP on fringe benefits,[14] and use the results together with relevant data from other sources (e.g., the Survey of Consumer Finances) to determine those fringe benefits that appear to be most widespread and potentially most important for an expanded income measure. Research on measurement and valuation methods could be targeted on these benefits.

One type of in-kind benefit provided by both the public and private sectors that is of growing policy importance is subsidies for child care. Currently, SIPP obtains measures of out-of-pocket costs for child care in the child care topical module. However, there are no questions about government or employer-provided subsidies for such care even though more and more parents are apparently opting to use some form of paid child care.[15] It would be useful for SIPP to obtain information about private and public child care subsidies, particularly since the Omnibus Budget Reconciliation Act of 1990 established a new child care and development block grant, which provides funds to states to subsidize child care services for working poor families (Congressional Research Service, 1991:173). Such information would be in keeping with SIPP's focus on programs and would provide data that could be used if SIPP subsequently provides a broader income measure that includes valuations for child care subsidies.

[13] In Smeeding's analysis, such fringe benefits include life insurance, short-and long-term disability insurance, accident insurance, dental insurance, employee subsidies for education, discounts on goods and services, employee meals furnished in lieu of pay, and profit-sharing and thrift benefits. Not included in his analysis are travel and entertainment allowances, other perquisites (e.g., free use of company cars, club memberships, tickets, etc.). and child care subsidies.

[14] Wave 6 of the 1984 SIPP panel included a fairly comprehensive module on fringe benefits, but there has been no such module in subsequent panels.

[15] On the basis of CPS and SIPP data, the distribution of primary child care arrangements used by employed mothers for children under 5 in 1977 was 56.7 percent by relatives (including care by mothers who worked out of their home), 29.4 percent by nonrelatives, and 13.0 percent in day care or nursery school; the comparable figures in 1987 were 45.9 percent by relatives. 28.5 percent by nonrelatives, and 24.4 percent in day care or nursery school (O'Connell and Bachu, 1990:Table C).

Static and Dynamic Measures Related to Family Characteristics

A basic goal of SIPP should be to collect reasonably detailed demographic and socioeconomic information (e.g., ethnicity, family composition, marital and labor force status) that permits comparative analysis of the distribution of income and other economic resources for different types of people and families, households, and other economic units. SIPP should support both cross-sectional analyses and longitudinal analyses that examine changes in resources across time as they are associated with changes in other characteristics, such as family composition.

The SIPP questionnaire has generally included a wealth of demographic and socioeconomic information: many items are tracked on a monthly basis in the core interviews, and others are asked occasionally in topical modules. Items of this type should be reviewed periodically to determine whether all of the detail is still needed or, conversely, whether some additional detail would be helpful in order to add explanatory power to SIPP.

The weekly information on employment status may be a candidate for reduction in scope, for two reasons. First, the monthly CPS, not SIPP, is the nation's labor force survey. Second, there is some evidence that the detailed labor force questions, which come at the beginning of the interview, may reduce the likelihood of respondents answering the income questions (Cantor et al., 1991). Labor force data clearly need to be collected in SIPP because labor force characteristics are important contextual variables for analyses of income, program participation, and related topics. However, the level of detail needed for such analyses may be considerably less than that currently collected.

Conversely, the addition of a few simple questions about the family of origin—for example, parents' education, number of siblings, and whether one grew up in an intact family—could enhance SIPP's ability to estimate the distribution of economic risk within the population and contribute to the understanding of persistent poverty and welfare participation. (These kinds of questions were asked in the 1986–1988 panels, but they were subsequently dropped.)

To date SIPP has not had great success in developing good, understandable indicators of changing characteristics to use to present longitudinal statistics on income and other resources in reports—for example, how to characterize the annual income of a "family" in which the spouses divorced midyear (see discussion in Chapter 6). A related problem, confronted generally by researchers working on issues of income distribution, is determining an appropriate set of equivalence scales to use for comparative analysis of income as a measure of well-being—for example, to answer the question of how much more income is required to provide an equivalent level of

consumption for a four-person rather than a two-person family. We discuss some interim solutions to these problems for SIPP publications on income and related measures and outline areas for research in Chapter 6.

New Forms of Income and Other Economic Resources

As we have noted, economic resources are not static over time. Thirty years ago, the government provided hardly any in-kind benefits to low-income people; in fiscal 1990, in-kind benefits (medical care, food, housing, education and training, services, and energy assistance) exceeded expenditures for cash aid by a ratio of 2.8 to 1 (Congressional Research Service, 1991:Table 6). Similarly, fringe benefits have clearly become an increasing share of a worker's total compensation over time.

There is an inevitable tension in any income survey between the need to add new questions to reflect the changing composition of economic resources and the need to maintain the comparability of time-series data. We strongly suggest that the Census Bureau strive for flexibility in SIPP's measurement of economic resources and, as Smeeding argues, be more innovative and willing to experiment in this area than has been done in the March CPS or the initial phases of SIPP. One specific mechanism to achieve flexibility and innovation without unnecessarily disrupting the core survey is to make use of topical modules. In addition to the topical modules in each panel that are open for federal agencies and other outside users to specify questions on topics of emerging policy interest, there could well be another module that is for the use of the Census Bureau analysis staff to develop new measures that relate to the core subjects in SIPP, namely, income and program participation. (We explore this idea in the section on topical modules, below.)

Recommendation

Recommendation 3-1: **Priorities for improved income and related measures from SIPP should include:**

- **enhancing the quality of income and related measures that are relevant to program eligibility and participation;**
- **developing measures of taxes and after-tax income;**
- **valuing (or otherwise taking account of) in-kind benefits; and**
- **constructing income and related measures that take account of family characteristics and changes in families over time.**

SIPP should also keep up to date with respect to new forms of income and other economic resources.

Assets and Asset Income

We believe that it is imperative for the Census Bureau to reassess how assets and asset income are measured in SIPP. Asset-related information is needed in SIPP for two purposes. The first is to permit accurate determination of eligibility for means-tested assistance programs, which typically impose a 100 percent tax on unearned income and greatly limit the type and value of assets that people can own and remain eligible for benefits. The second is to provide information, including periodic revaluation of household balance sheets in SIPP, for measuring the economic resources of families and households under the broad definition outlined earlier (i.e., a definition that includes resources, in addition to cash income and in-kind benefits, that can be used to support future consumption).[16] The contribution of assets to resources that are potentially available for consumption can be substantial for some subgroups.[17]

There are a number of conceptual and technical issues associated with valuing assets for inclusion in an expanded definition of income. In the case of such financial assets as stocks and bonds, one approach is to assign an annuity value that is added to the owner's cash and in-kind income (after first subtracting any reported income from these assets so as to avoid double counting). However, the results from this approach will be sensitive to the period over which the annuity is calculated. Alternatively, people in various income categories could simply be cross-classified by whether their asset holdings are above or below a specified amount. In the case of nonfinancial assets, such as a home, one approach is to calculate the amount of rent the home would bring in the market, net of expenses related to home ownership. Another approach, which is used by the Bureau of the Census (1991b:Appendix B) for the March CPS expanded income estimates, is to impute a rate of return to the estimated amount of home equity.[18]

[16] A third purpose for asset-related information is to provide detailed information for assessing the distribution and types of wealth in the United States: we believe this is neither essential nor feasible for SIPP.

[17] For example, the Bureau of the Census (1991b:Tables D, F, I) estimated that median household income in 1990 was $1,900 higher and the national poverty rate 1.2 percentage points lower under a resource measure that imputed a return to just one type of asset—equity in own home. The differences were most pronounced for people aged 65 and older. Ruggles (1990a: 155) argues caution against estimating a return for the full value of home equity because it may not be feasible to convert all of that value readily to cash, although she generally supports the concept of valuing assets under a broader definition of economic resources.

[18] See Ruggles (1990a: 149–158) for a discussion of the pros and cons of various approaches for incorporating asset values into a measure of economic resources from the perspective of estimating the poverty population. Ruggles discusses intangible as well as tangible assets, the former including human capital or skills. See also Weisbrod and Hansen (1968) and Moon (1977) on the topic of asset valuation for purposes of measuring poverty.

We encourage the Census Bureau to investigate alternative methods of valuing assets so that, ultimately, expanded income measures that are developed from SIPP can take account of asset holdings in some way. In the remainder of this section we discuss how SIPP can best obtain high-quality information about assets and asset income, which is a prerequisite for valuation or such other uses as determining program eligibility.

Currently, SIPP devotes a considerable amount of space to asset-related items, including such financial assets as bank accounts, stocks, and bonds and such nonfinancial assets as houses and cars (see Table 3-2 for details). The core interviews ask a detailed battery of questions about asset ownership every 4 months. These questions require respondents to make fine distinctions (e.g., between a money market deposit account and a money market fund and between jointly owned and individual holdings). Respondents are then asked to provide income amounts for a 4-month period for combinations of asset types (e.g., all types of interest-bearing joint bank accounts). There are no core questions about asset balances or liabilities (e.g., mortgage or credit card debt). Instead, these questions are asked twice or, in some cases, only once in a panel's life, generally in the topical modules on assets and liabilities (including real property and vehicles) and program eligibility, although a few asset types (such as individual retirement accounts) appear in the annual roundup or retirement expectations modules.

Nonresponse rates are low for the core asset ownership questions (e.g., about 1% for savings accounts and stocks) but generally high for the questions on 4-month income flows (e.g., 30–35% for interest and 30% for reinvested dividends; see Table 3-3). In a study of how respondents perceive and respond to the core SIPP questionnaire that used cognitive interviewing techniques, Cantor et al. (1991) found that few respondents know the amount of interest or dividend income they receive in a 4-month period, that lower income respondents are offended by the asset questions, and that few respondents consult records but rather provide very rough "guesstimates" in reply to the asset income questions (see further discussion in Chapter 7). After imputation for nonresponse, SIPP obtains an estimated 80 percent of the dividend income reported to the IRS (compared with 61% in the March CPS) and an estimated 65 percent of reported interest income (compared with 79% in the March CPS, which uses an improved imputation procedure).[19]

[19] The March CPS estimate of interest income using the old imputation procedure is only 62 percent of the IRS estimate. Both SIPP and the March CPS fall much farther short of dividend and interest income aggregates when the comparison is made to the National Income and Product Accounts (NIPA); however, the NIPA estimates require extensive adjustments, which may not be complete, for comparability with household survey estimates (see Table 3-10).

Nonresponse rates to the questions on value of asset holdings in the topical modules are also very high, although lower than were experienced in the Income Survey Development Program (ISDP): 35–40 percent for value of own business, market value of stocks and mutual fund shares, and debt on these assets; see Table 3-9. After imputation, SIPP obtains higher estimates of equity in homes and motor vehicles in comparison with estimates of the Federal Reserve Board because of somewhat higher estimates of gross value and considerably lower estimates of debt in SIPP, but it obtains considerably lower estimates of equity in noncorporate business, value of financial assets, and consumer debt (see Table 3-11; Lamas and McNeil, 1986:Table D-3; Eargle, 1990:Table D-2).[20]

Originally, the assets and liabilities module was asked twice in every panel. However, 1-year intervals for assessing balance sheets appeared to be too short to provide reliable measures of change in net worth (see McNeil and Lamas, 1989; David, 1989). The Census Bureau conducted an experiment to determine if reminding respondents at the second administration of the module of their answers the first time would improve the quality of the data, but the results were inconclusive (Lamas and McNeil, 1987; Weidman, King, and Williams, 1988). Beginning in the 1987 panel, the assets and liabilities module (including real property and vehicles) was asked only once. However, the new program eligibility module instituted in the 1987 panel included asset valuation questions, thereby providing two measures per panel for most types of assets (but not most types of debt).[21]

The conclusion that we reach from reviewing the bewildering extent and variable quality of asset data in SIPP is that the Census Bureau should rethink the amount of detail and frequency of collection of asset information from the perspective of its two primary goals. For purposes of assessing program eligibility, the core questions on asset ownership and income flows are needlessly detailed. At the same time, the core interviews do not obtain asset valuation information that is required for eligibility determination. For purposes of measuring the contribution of assets to total economic

[20] It should be kept in mind that a number of differences between SIPP and the Federal Reserve Board data limit the extent to which inferences can be drawn from comparisons of estimates from them.

[21] We note that SIPP is not alone is experiencing quality problems with the collection of asset data. A number of panel surveys provide estimates of wealth that fall short of those from the Survey of Consumer Finances (SCF), a complete survey of household wealth that includes a household sample together with a sample of high-income households drawn from the IRS Statistics of Income file who agree to participate. Curtin, Juster, and Morgan (1989) reach this conclusion from comparing the 1984 SIPP panel and the 1984 round of the Panel Study of Income Dynamics with the 1983 SCF; Juster and Kuester (1991) reach the same conclusion from comparing the 1979 round of the Retirement History Survey and the 1981 round of the National Longitudinal Survey of Mature Men with the 1983 SCF.

resources, a periodic revaluation of the household balance sheet is needed. However, the current set of topical modules obtains a complete balance sheet only once in the life of a panel.

One useful strategy may be to focus measurement in the core on those assets that are most relevant for program eligibility and most likely to be held by low-income households, such as checking accounts, regular savings accounts, houses, and cars. Measures of their value could be included in the core questionnaire instead of only once or twice a panel in topical modules. For houses and cars, it would suffice to ask whether the respondent still lived in the same house and still had the same vehicle(s), asking about value only if a change had occurred.

A complete balance sheet, including valuation of other assets, should be obtained at an early interview—perhaps the second or third interview, using the first interview to locate the key financial person in the family and establish information about record-keeping for later use, encouraging respondents to consult records. The use of an unfolding scale might also help minimize nonresponse to questions about asset holdings: that is, if a respondent answers "don't know" to a question about the value of an asset, a follow-up question could ask whether the value is above or below a certain amount. The balance sheet interview needs to clarify the subtleties of asset ownership (e.g., assets being managed for children's college education, etc.). Also, as Slater (1991) urges, the balance sheet in SIPP should be constructed with a view toward maximum comparability with the aggregate household sector balance sheet that the Federal Reserve Board prepares annually and with the National Income and Product Accounts.[22]

With regard to measuring asset income flows, questionnaire research may well show that people can more reliably indicate the balance in their savings accounts every 4 months than estimate their interest income. In this case, imputation using current interest rates could provide estimates of equal if not better quality than asking about interest income directly. An approach of imputing income flows rather than measuring them directly may work for other asset types as well.[23]

The balance sheet interview can be used to obtain detail on income flows from assets that will provide an independent source of the rate of return imputed to such assets as savings accounts. The balance sheet measurement needs to be repeated but at an interval determined by the rate of change of asset values in relation to the level of response error. If response

[22] Slater (1991) notes that improvements in the Federal Reserve balance sheet and integration with the NIPA are being addressed as part of the U.S. effort to conform to the United Nations System of National Accounts.

[23] A different measurement strategy may be needed for people out of the labor force who do not report periodic transfer income (i.e., people whose main source of income is from assets).

error is as high as for the present SIPP, it will be more meaningful to measure assets at longer than yearly intervals. Our proposed redesign of SIPP (Chapter 4) would permit asset reevaluation twice each panel at an interval of 2 to 4 years.

Whether or not our particular suggestions ultimately prove feasible, it is clear that the measurement of asset-related information in SIPP is ripe for rethinking and experimentation. Innovative ways need to be found to provide the information that is needed to serve SIPP's primary goals while acknowledging the real limitations on what can be obtained from household respondents.

Recommendation 3-2: **The measurement of asset-related information in SIPP should be reassessed in light of SIPP's focus on programs and the economically at-risk population. The collection of asset items should be redesigned and simplified, if possible, to reduce respondent burden and improve the quality of the data needed to serve SIPP's primary goals.**

Other Resources

There are some other types of resources that may be important to consider in developing improved income and related measures from SIPP. For example, home production, which can take many forms (e.g., home-grown food, housework, and child care), is a significant source of goods and services for many households. In particular, with so many mothers in the labor force, it may be important to recognize the value of unpaid child care contributed by parents or other relatives that would otherwise have to be purchased in the market. Similarly, it may be important to value the caregiving time that is contributed by relatives for children and for adults who need long-term care services.

SIPP has included questions in topical modules about parent- and other kin-provided child care, long-term care providers for respondents age 15 and older, and the time that respondents contribute to assisting people outside their household (see Harpine, McNeil, and Lamas, 1990). We believe that continued collection of this kind of information, with the frequency determined by agency needs, could be important for many policy purposes. However, given the difficult measurement issues involved (see Ruggles, 1990a:147–149), we do not suggest that SIPP should go very far in the direction of valuing caregiving time (or other types of home production) for inclusion in an expanded measure of income.[24]

[24] We also do not suggest that SIPP attempt at this time to address the issue of income from the underground economy.

Smeeding and others have argued that SIPP should gather new data, not only on the incidence and degree of caregiving, but on such items as access to support from neighbors and kin, access to credit, and whether the household owns standard appliances (e.g., a washing machine) that make it less dependent on the need to purchase services in the market. Many of these topics have to do with measuring the degree to which families and individuals are economically secure against various types of risk. To express the concept another way, these items have to do with measuring the access that people have to sources of economic support above and beyond the types of income and benefits that they currently receive. This type of information could make an important contribution to understanding poverty and differences in various types of behavior across demographic groups (for an analysis of economic risk facing the elderly, see Smeeding and Holden, 1989).

We do not give as high priority to developing measures of protection against economic risk as we do to the other areas discussed above for improved income data from SIPP. However, this topic represents a potentially important aspect of income and well-being, and we suggest that the Census Bureau support research on how to measure such items as access to credit,[25] with a goal of having an appropriate topical module within a few years.

We note in this regard that wave 6 of the 1991 panel and wave 3 of the 1992 panel will include a new module on extended measures of well-being. This module has questions on consumer durables (e.g., whether the family has a clothes washer or dryer); living conditions (e.g., whether the house is in good repair and the neighborhood is safe); and ability to meet expenses for basic needs (e.g., whether the family was ever evicted for nonpayment of rent). A few questions on sources of help when in need are also included (e.g., how much help you could expect to get from family living nearby if you were sick), but the module as currently designed focuses much more on measures of hardship than on measures of access to sources of economic support.

Recommendation 3-3: **SIPP should develop, on an experimental basis, selected measures of economic security against risk, such as access to credit.**

IMPROVING DATA ON PROGRAM ELIGIBILITY AND PARTICIPATION

Since at least the 1960s, policy makers and researchers have wanted information for understanding, assessing, and planning government social insur

[25] Measures of access to credit may also serve as a proxy for such intangible assets as knowledge and skills.

ance and assistance programs. Not until SIPP, however, had a single data collection program existed that was designed to provide the full range of information required for such understanding. Program records provide data on participants, but they lack detailed information about recipients' characteristics, they omit information about people who are eligible but do not participate, and the records for one program rarely contain information about other programs in which recipients participate. The March CPS obtains information about participation in many but not all programs and has some of the information needed to determine program eligibility. However, the yearly accounting period of the March CPS greatly limits its suitability for analysis of programs (particularly participation in multiple programs), many of which use a monthly accounting period.[26] The CPS also lacks many of the variables needed to determine eligibility—for example, asset values and such expenditures as child care, which can be deducted from income in determining eligibility for many programs. The March CPS also lacks intrayear information on family composition, which enters into the eligibility determination for most programs (e.g., AFDC provides benefits only to certain types of families or subfamily units).

SIPP, by contrast, provides detailed intrayear information on a wide range of government assistance programs (see Table 3-1) along with income, employment, and family composition, making it a rich source for analysis of such topics as multiple program participation and such events as loss of a job or marriage that may trigger a program entrance or exit. For programs, SIPP obtains monthly reports on recipiency and benefits for all types of cash income assistance—both means-tested programs (e.g., AFDC, SSI, earned income tax credit) and non-means-tested programs (e.g., social security, unemployment compensation, black lung benefits). SIPP also obtains detailed information for the major types of in-kind assistance (e.g., food stamps, the supplemental food program for women, infants, and children [WIC], school lunches, energy assistance, Medicare, Medicaid, although public housing is only ascertained sporadically). Finally, SIPP asks at each interview about educational assistance (e.g., Pell grants, Veterans' Administration educational benefits) and training (e.g., Job Training Partnership Act [JTPA] programs), although information on amounts or extent of benefits for most of these programs is obtained on an annual rather than monthly or 4-month basis.

Improved Eligibility Measures

Although a vast improvement over the March CPS data, SIPP's information on program eligibility has been a relatively weak component of the survey's

[26] Thus, families with an annual income too high to qualify for means-tested assistance programs may have had periods of sufficiently low income to be eligible for benefits for some months of the year.

program-related data (see Doyle et al., 1987). In the early panels (1984–1986), not all needed information was collected for such major programs as AFDC and food stamps. Moreover, the information collected was scattered throughout several topical modules, so that an analyst had to merge files for several waves and assume that information from different interviews was contemporaneous (although, in fact, the information from one wave on, say, child care expenses might not apply to the family situation at a different wave). In response to user requests, the Census Bureau developed a unified program eligibility topical module that has been included in wave 4 or 7 of each panel since 1987 (see below).[27] This module includes eligibility-relevant information for the major assistance programs on countable assets (e.g., homes, vehicles, life insurance), deductible expenses for the prior month (e.g., out-of-pocket medical care costs, dependent care costs, and shelter expenses including rent or mortgage payments and utilities), and existence of a work disability.

We strongly urge the Census Bureau to consider including eligibility questions for the major programs in each wave's core interview. Information on eligibility is a key contribution of SIPP to program analysis: without such information, it is not possible to answer such questions as whether an increase in the caseload (as has occurred recently for both food stamps and AFDC) represents an increase in the program participation rate, an increase in the eligible population (due to deteriorating economic conditions perhaps), or a combination of both phenomena. It seems odd to have monthly data on program participation and some factors related to eligibility (such as employment status and income) and not to have more frequent data on other factors involved in eligibility. In addition, more frequent information on such expenses as medical, dependent care, and shelter costs could prove useful for developing expanded concepts of income or wellbeing. Residence in public or subsidized housing needs to be ascertained at least once a year and also whenever respondents move.

Another eligibility-related topic on which improved information is needed is family composition. Such programs as AFDC have very complicated rules regarding which household members are considered part of the eligible unit and which members' incomes must be considered in determining benefits: for example, some portion of a stepparent's income must be counted, and, if a mother under age 18 who is living with her parents applies for benefits, some portion of her parents' income must be counted as available to her and her child (see U.S. House of Representatives, 1991:567). Although SIPP collects information at each interview about arrivals and departures of household members, the relationship of everyone in the house

[27] However, because the 1989 panel was terminated after three waves due to budget cuts, there is a 3-year gap between the collection of eligibility data in wave 4 of the 1988 panel (spring 1989) and wave 7 of the 1990 panel (spring 1992).

hold to the reference person or household head, and the parent or responsible person for each child under 18, this information is not always sufficient to determine the eligible assistance unit in households in which no one is currently participating in a program.[28]

It would be useful for SIPP to obtain more detailed information about household and family relationships, not only to permit more accurate determination of eligible units, but also to support social science research on household and family living arrangements. In particular, it would be useful to ascertain the relationships of children to all adults in the household and to add the category of "partner" to identify consensual unions.[29] Research on questions that could ascertain which members of the household share food expenses would also be useful, as such information is needed to determine eligible units for the food stamp program.[30]

To make room for additional information on program eligibility in the core questionnaire, some other items would most likely need to be eliminated or cut back. We suggested earlier that the weekly information on employment status might be a candidate for reduction in detail. We also strongly urged that some of the asset information currently included in the core (e.g., detailed information on asset ownership and income) be scaled back in favor of obtaining more frequent valuations of asset types that are important for program eligibility.

Spell Information

For analysis of programs as well as income distribution, a major focus of policy interest is in time-series statistics for such periods as months, quarters, and years. For program analysis there is another major focus of interest, namely, the dynamics of program eligibility and participation (a similar interest extends to the dynamics of poverty). Policy makers are interested in the extent to which program recipients use benefits to cope with temporary economic reverses in the short term versus the extent to which they depend on benefits over a longer time span. Hence, analysts want informa

[28] Also, sometimes, the composition of *participating* units cannot be determined accurately on a mouth-by-mouth basis because information about the unit is ascertained only at the time of the interview and not also for each reference month.

[29] Wave 2 of each panel collects detailed information on relationships among all household members, but such information is not available as household composition changes over the course of a panel. (Note that it would be necessary only to update the information when new people join a household and not to burden respondents otherwise.)

[30] In most cases, the food stamp recipient unit is the same as the census household; however, subunits and multiple units within a household are possible, including instances in which all members of a household do not purchase or prepare meals together (Doyle et al., 1987:II.2–II.5)

tion to estimate both the length of individual spells of participation and the total time on welfare (or in poverty), counting repeated spells for the same individual (see Ellwood, 1986, for an example of the latter type of analysis with the Panel Study of Income Dynamics [PSID]). Although less frequently examined, spells of program eligibility and how they relate to participation spells are also of interest. Finally, more understanding is needed of the correlates and consequences of entrances to and exits from programs.

Analysis of spells and welfare dependency issues ideally requires observation of program participation behavior over individuals' lifetimes or, at least, large portions of their lives. The PSID, which has followed a sample of families for 25 years, has proven the nation's richest source of longitudinal data for analysis of such topics as welfare dependency and long-term poverty. SIPP was not intended to compete with the PSID or other long-running panel surveys (such as the National Longitudinal Surveys of Labor Market Experience [NLS]), which have followed cohorts of men and women for periods of 15 to almost 25 years); rather, SIPP was designed to provide more detailed information on short spells of program participation and poverty, including spells of less than a year, which the longer term panel surveys do not measure well because their interviews occur at annual or biennial intervals.[31] However, we believe that SIPP can and should improve the data that it provides for analysis of program eligibility and participation spells over the short to medium term. Such data are needed to respond to the growing policy concern about welfare dependency and the interest in reforming welfare programs so as to lessen dependency.

One essential improvement, as we argued in the discussion of improved income measures, is to maximize the accuracy of information about participation during the time span covered by SIPP. As noted above, record

[31] See Hill (1992) for a description of the PSID, which has conducted annual interviews since 1968 with an initial sample of about 5,000 families (including an oversample of low-income families headed by someone under 60 years of age), augmented in 1990 with a sample of 2,000 Latino families. The PSID is managed by the University of Michigan Survey Research Center with funding from the National Science Foundation and other agencies.

See Center for Human Resource Research (1988) for a description of the NLS, which is managed by the Center at Ohio State University with funding from the Bureau of Labor Statistics. The NLS includes an older men's cohort of 5,000 men aged 45–99 in 1966 who were interviewed 12 times from 1966 to 1993 and again in 1990; a mature women's cohort of 5,100 women aged 30–44 in 1967 who were interviewed 15 times from 1967 to 1990; a young men's cohort of 5,200 men aged 14–24 in 1966 who were interviewed 12 times from 1966 to 1981; a young women's cohort of 5,200 women aged 14–24 in 1968 who were interviewed 15 times from 1968 to 1990; and a youth cohort of 12,700 men and women aged 14–21 in 1979 who have been interviewed annually since then.

See Matthew Greenwald & Associates, Inc. (1991) for brief descriptions of major panel (and cross-sectional) surveys that provide information about the socioeconomic circumstances of the population.

check studies that make use of administrative program data offer an important means to achieve this goal. In addition, we recommend (see Chapter 4) that the length of SIPP panels be increased from 32 months to 4 years, so that more spells are observed in their entirety rather than being "censored," there is a longer time span in which to observe behavior prior and subsequent to program entry and exit, and there is more opportunity to observe repeated spells of participation for the same person.[32]

We also recommend that SIPP follow children who move out of original sample households and that it follow both children and adults who move into institutions (see Chapter 4). Children are an increasingly important object of concern for public policy. They are also more and more likely to live with different people at various times in their childhood, some of whom may not be original sample members: for example, a child in a single-parent family at wave I who moves to live with the other parent is now lost to the survey. Information on children's spells of program participation and the impact of programs on their well-being is unnecessarily limited by the current SIPP design. Similarly, institutionalized persons are a sizable component of the Medicaid caseload and are also part of the caseload for such other programs as SSI (U.S. House of Representatives, 1991:738,1430); tracking people in and out of institutions and obtaining some information about them while they are institutionalized would fill an important gap in SIPP's ability to support analyses of spells and other aspects of program participation.

Finally, we believe it is important for SIPP to obtain some information about respondents' program participation histories prior to the first interview—for example, whether a current spell of participation as of wave I is the first or a repeat spell and the beginning date of the first spell. This type of information is needed to analyze long-term welfare participation, including multiple spells. Recipiency history was collected in wave 5 of the 1984 SIPP panel, which was not ideal for a number of reasons: attrition meant that no history was obtained for some original sample members and the length of recall was unnecessarily long. Moreover, information was collected only for AFDC, SSI, and food stamps. Starting with the 1986 panel, wave 2 included questions on the beginning dates of spells in progress at the initiation of the panel for almost all social insurance and assistance programs. In addition, for AFDC, food stamps, and SSI, respondents were asked about previous receipt of benefits, the beginning date of the first spell, and the total number of spells.

Miller and Martini (1992) evaluated the 1986 wave 2 recipiency history

[32] We recommend other design changes so that increased panel length does not increase the annual number of interviews and hence is cost-neutral for the SIPP program overall (see Chapter 4).

questions, concluding that the data were of generally good quality. For example, the distribution of time on AFDC, based on the beginning dates of current recipiency, closely resembled the distribution of time on AFDC found in administrative data. Respondents appeared to correctly distinguish the question on the beginning date of the current spell of receipt from that on the beginning date of the first spell. Miller and Martini suggested wording changes to further improve the quality of the data, which the Census Bureau incorporated into the questionnaire for the 1992 panel.[33] We encourage the Census Bureau to continue to evaluate and seek ways to improve the recipiency history information in SIPP, which can increase the usefulness of the survey for analyses of longer term program participation.

Emerging Programs and Program Changes

The coverage of social insurance and assistance programs (both cash and in-kind) in SIPP is impressive. However, for the most part, SIPP does not obtain information about social service programs—for example, Head Start and other state and local programs that provide child care assistance or programs that provide counseling or home health care services.[34] SIPP also does not obtain information about meal programs, other than the major nutrition programs administered by the Department of Agriculture (e.g., Meals on Wheels for the elderly).[35]

There are many difficulties in obtaining good measures of participation in social service programs, which vary greatly in availability and scope across localities, and we do not suggest that SIPP devote much attention to this area. However, we do suggest that occasional measurement of social service programs in SIPP may be important to provide data to identify important changes in program mix. As an historical example, the food stamp program grew from a pilot program in a few states in the early 1960s to a national program that, by 1975, served more than 7 percent of the population (and more than 60% of the poor population) (U.S. House of Representatives, 1991:1401). SIPP needs to be able to identify emerging programs that are becoming an important resource for people, particularly those who are economically at risk.[36]

[33] Beginning in the 1992 panel, recipiency history for AFDC, food stamps, and SSI is being collected in wave 1.

[34] A home health care topical module was included in the 1987–1989 panels.

[35] The long-term care topical module included in the 1986–1988 panels asked a global question for respondents aged 15 and older about meals received per week from a community service either in the home or a group setting.

[36] For brief descriptions of the full range of existing cash, in-kind, and social service programs that provide assistance to low-income people (almost 80 in all), see Congressional Research Service (1991).

It is also important that SIPP keep up with policy trends and changes in established programs. Two of the most notable today are the increased use of the income tax system to provide benefits to poor and near-poor working families with children and the renewed focus on services in such programs as AFDC—for example, training, employment, and child care services that are intended to help improve the skills and employability of welfare recipients and, over time, move them away from long-term dependency on cash assistance.

Hence, it is important that SIPP develop mechanisms to track programs that may become a more important source of economic resources in the future and to keep abreast of program developments. The use of topical modules for these purposes seems a particularly promising approach.

Recommendation

Recommendation 3-4: **Priorities for improved measures of program participation and eligibility from SIPP should include improving the range and frequency of information needed to determine eligibility for major assistance programs and providing adequate measures of spells of both eligibility and participation. SIPP should also keep up to date with respect to newly important programs and program changes.**

TOPICAL MODULES

The use of SIPP as a vehicle to respond to social welfare policy concerns in areas that are related to the survey's core subjects is an important goal. Indeed, the data from topical modules have proven very popular with a wide range of users; see Table 3-13 for a listing of topical modules included in SIPP panels to date. Nonetheless, the topical modules must necessarily play a supporting rather than a dominant role in the overall SIPP program.

We support the continued availability of open, or variable, topical modules in each panel so that federal agencies that have responsibilities for social welfare policy planning and analysis can insert questions of current interest.[37] For this component to be most useful, it is critically important that SIPP respond in a timely and flexible manner to agency needs. Hence, we encourage the Census Bureau to do everything possible to streamline procedures for eliciting input from federal agencies and reaching decisions that best accommodate what may often be conflicting agency priorities.

[37] Fixed modules also play an important role, namely, collecting data on the core subjects of SIPP that do not need to be asked in every interview (e.g., asset holdings).

TABLE 3-13 Topical Modules in SIPP, 1984-1990 Panels

	Panel and Wave						
Topic	1984	1985	1986	1987	1988	1989	1990
Total number of waves[a]	9	8	7	7	6	3	8
Annual income and retirement accounts	6,9	5,8	5	5	5		5,8
Income taxes	6,9	5,8	5	5	5		5,8
Child care	5	6	3,6	3,6	3,6	3	3
Child support	5	6	3,6	3,6	3,6	3	3,6
Support for nonhousehold members	5,8	4,6	3,6	3,6	3,6	3	3,6
Disability status of children[b]	3	6	3	6	3,6	3	3,6
Functional limitations and disability[b]	3				6	3	3,6
Use of health care[b]	3	6[c]	3[c]	6[c]	3,6	3	3,6
Home health care				6	6	3	
Long-term care		6	3		3		
Educational financing and enrollment	6,9	5,8	5	5	5		5,8
Eligibility for selected major programs							
Selected financial assets	(see also wealth)			7	4		7
Dependent care costs	(see also child care)			7	4		7
Medical care expenses				7	4		7
Shelter costs	4		6	3,7	4		7
Real estate and vehicles	(see also wealth)			7	4		7
Work disability	(see also functional limitations)			7	4		7
Energy usage	4		6	3			
Personal history							
Education and training			2	2	2	2	2
Education and work	3						
Employment			2	2	2	2	2
Family background			2	2	2		
Fertility	8	4	2	2	2	2	2
Household relationships	8	4	2	2	2	2	2
Marital status	8	4	2	2	2	2	2
Migration	8	4	2	2	2	2	2
Recipiency[d]	5		2	2	2	2	2
Work disability			2	2	2	2	2
Wealth							
Assets and liabilities	4,7	3,7	4,7	4			4
Real estate property and vehicles	7	3,7	4,7	4			4
Pension plan coverage and retirement expectations	4,7[e]	7	4,7[e]				4

	Panel and Wave						
Topic	1984	1985	1986	1987	1988	1989	1990
Work expenses	5,8	4	6	3			
Work schedule				6	3,6	3	3
Employee benefits	6						
Job offers	5[f]	6	3				
Job training	6						
Spells outside the work force							6

NOTES: Question content for many of the modules (e.g., child care, disability) differs across panels.

The 1991 panel has the same modules as the 1990 panel, with the following exceptions: the program eligibility set of modules moves from wave 7 to wave 4; the wealth set of modules moves from wave 4 to wave 7; and wave 6 includes a new module on extended measures of well-being (see text). The wave 6 modules included in 1990 (e.g., child support) are not included in the 1991 panel.

The 1992 panel has the following changes from the 1991 panel: the employment and recipiency history modules move from wave 2 to wave 1; the program eligibility set of modules moves from wave 4 to wave 7; the wealth set of modules moves from wave 7 to wave 4; and the extended measures of well-being module is part of wave 3 (and the only module in that wave). What modules will be included in wave 6 is not yet decided.

Generally, "variable" topical modules (those determined by the current needs of federal agencies) are included in waves 3 and 6, while "fixed" modules (e.g., annual income and retirement accounts, income taxes, educational financing and enrollment, and the program eligibility, personal history, and wealth sets of modules) appear in other waves (see Committee on National Statistics, 1989:Tables 2-2, 2-3, for identification of fixed versus variable topical modules in the 1984-1990 panels).

[a]The number of waves in each panel differs due to budget cuts. Also, only two of four rotation groups in the 1984 panel received 9 waves; the other two groups received 8 waves. Also, one rotation group in each of the 1985 and 1986 panels received one fewer wave than the other three groups.

[b]Disability and health care-related modules have different names across panels.

[c]Includes single question on overall health status.

[d]Recipiency history in 1984 panel covers food stamps, AFDC, and SSI only; in subsequent panels it covers most government programs, with varying detail.

[e]Excludes characteristics of job from which retired; also, pension plan coverage in the second administration of the module is asked only for people who changed jobs or became newly employed since the first administration of the module.

[f]Includes reservation wage.

The Census Bureau should also obtain suggestions from academic researchers and other nonfederal users of SIPP data for questionnaire content to include in topical modules. Improvements in policy analysis that can support more informed government policy making ultimately rest on advances in social science research knowledge. Hence, SIPP can serve a useful purpose by offering the opportunity for researchers, as well as agency policy analysts and program planners, to contribute to the specification of variable topical modules (see Chapter 8 for discussion of input mechanisms).[38]

In addition, the Census Bureau should use topical modules as a component of its research and development program to enhance the survey's core measures on economic resources and programs. Dedicating a topical module in each panel for use by Census Bureau analysts (with input from outside experts) offers one low-cost way for the survey to keep up to date with trends in the composition of income and the mix of programs and to be innovative in providing information that expands knowledge of well-being and program-related behavior. Some questions that are first asked in topical modules may subsequently move into the recurring core part of the interview; other questions may not be appropriate for the core but may nonetheless provide important analytical information. Our recommendation to increase the length of SIPP panels and maintain the 4-month reference period (see Chapter 4) will make it possible to include topical modules for this purpose without sacrificing existing modules.

Thus, under our proposed design of 12 interviews per panel, one possible sequencing of topical modules that leaves room for a Census Bureau module in addition to variable modules for policy needs is as follows:

wave 1, recipiency and employment history
wave 2, other personal history modules
wave 3, wealth modules
wave 4, open
wave 5, annual income and taxes
wave 6, open
wave 7, open
wave 8, annual income and taxes
wave 9, wealth modules
wave 10, open
wave 11, annual income and taxes
wave 12, open

This scheme obtains personal history information early in the life of a panel, provides measures of balance sheets twice per panel and measures of

[38] We note that Statistics Canada is designing a new longitudinal Survey of Labour and Income Dynamics for which the agency has invited academic researchers to specify the content of topical modules. The researchers are responsible for obtaining funding for the modules.

income and taxes on an annual basis, and leaves five modules open. An assumption of this scheme is that program eligibility information is asked in the core interview. If, for some reason, this does not prove possible, then it would be important to obtain eligibility measures on at least an annual basis. This could be done by administering the program eligibility modules in waves 6 and 12 and also including selected eligibility questions in waves 3 and 9.[39] Such a scheme would leave open 3 topical modules, or one more per panel than under the current design.

In developing topical modules on subjects that are of interest for social welfare policy, it is important to keep in mind that SIPP is primarily a survey about income and programs. The temptation to add great detail to the questionnaire on topics that are not central to the core should be resisted. There are, and should continue to be, other surveys that focus on such topics as long-term care, educational attainment, and job characteristics. SIPP cannot and should not attempt to duplicate the detail in these special surveys.

Yet SIPP should also not exclude topics just because they are the focus of other surveys. SIPP's great advantage is that it constitutes a continuing series of panel surveys with a core of demographic and socioeconomic variables that are relevant for many types of analysis. Hence, SIPP can support initial research (with a rich set of explanatory variables) on a topic for which a special survey is subsequently developed; provide a useful time series (in the case of a topic that is covered in more than one panel); and, because its samples are nationally representative, serve to anchor and extend the analysis for special surveys that are limited to specific population groups. For all these uses, it is important that the Census Bureau work closely with analysts in other federal agencies to ensure comparability in basic questions and concepts between SIPP and other surveys.

Recommendation 3-5: **The topical module component of SIPP should continued and be strengthened by:**

- **obtaining input from both government agencies and the social science research community about topics related to SIPP's core goals to consider for modules;**
- **streamlining the content development process so that timely information can be collected on emerging policy and research issues; and**
- **using some topical modules as a means for the Census Bureau's analysis staff to conduct research on expanded and alternative measures of income and programs.**

[39] The wealth modules scheduled for these waves already include many of the program eligibility questions; it would simply be necessary to add the non-asset-related items (i.e., expenses and disability—see Table 3-13).

SIPP AND THE MARCH CPS

The Census Bureau's plan for improving income statistics (reviewed in Chapter 2) states that the March CPS will remain the primary source for annual income and poverty estimates. Certainly, many users are comfortable with the March CPS annual reports and data files, finding attractive their large sample size, timely release (within 5–6 months of data collection), and relative ease of use.

Although we agree that the March CPS provides a very important historical time series that should and will continue for the foreseeable future, SIPP was launched to improve the depth, breadth, and quality of income and related statistics for the United States. SIPP provides more detail than the March CPS on economic resources, broadly defined, including information on assets and a greater number of in-kind assistance programs. SIPP has already made important gains in data quality relative to the March CPS: for example, it obtains more complete reporting of most income sources (although there is still room for further gains). The monthly information in SIPP makes possible the construction of improved measures of annual income and poverty that include income from people who left the universe during the year (e.g., because they died or moved abroad) and that more accurately represent family composition than is possible with the March CPS. In addition to annual statistics, SIPP supports intrayear and multiyear measures, which are important to better understand economic well-being and the role of government assistance programs.

Until now, it has not been possible for SIPP to serve as the primary source of the nation's income statistics because of such problems as small sample size and lack of timeliness. However, with the redesign that we propose, SIPP would provide adequate sample sizes for both longitudinal and cross-sectional measures, particularly for the low-income population. Moreover, technological developments in data collection and processing—specifically, the use of computer-assisted interviewing and an improved database management system (see Chapter 5)—would make it possible to process SIPP data on as timely a basis as the March CPS and make the SIPP data files more accessible.[40]

Hence, we urge the Census Bureau to set a target date—perhaps the year 2000, certainly no later than the year 2005—for the data from SIPP to be of sufficient reliability, quality, and timeliness to be used instead of the March CPS data as the basis for annual (and other) measures of income and poverty. Obviously, the changeover should take place gradually. In this

[40] The use of computer-assisted interviewing may also effect cost savings that permit a further increase in the SIPP sample size. This increase could be useful for the production of detailed income and poverty statistics and also for analyses of participation in many smaller programs.

regard, we support the Census Bureau's plans to include supplementary SIPP data in the March CPS P-60 report series as an important way to accustom users to SIPP. In addition, we propose an expanded program of cross-sectional reports from SIPP in the P-70 series (see Chapter 6) that would be issued alongside the CPS reports for some years. Once a sufficient time series is built up under the new SIPP design and it has proven possible to release the data on a timely basis, it will be appropriate to replace the current P-60 series with the SIPP P-70 reports on income and poverty.

At that time, it will also be appropriate to determine the extent to which the income data on the March CPS can be scaled back. The CPS should always include some information on income, which is an important variable for analyzing the labor force data that are the principal focus of that survey.[41] However, the decision on the level of income detail to include should be made on the basis of labor force analysis needs, not on the basis of the requirements for national income statistics.[42]

Our recommendation that the Census Bureau set a target date for turning to SIPP as the basis for income and related measures has implications for the concept of an integrated income statistics system as outlined in Chapter 2. The Census Bureau originally suggested the use of administrative records to correct SIPP estimates and then the use of corrected SIPP estimates from earlier years to adjust March CPS estimates. We support increased use of administrative records to improve and enhance SIPP measures related to income and programs (see the next section). However, we agree with the Census Bureau's latest position that the goal of using administrative records to correct income estimates for reporting errors in SIPP must be viewed as a long-term and not a short-term objective, as there are many methodological as well as procedural hurdles to overcome.

Moreover, if SIPP is to be the prime income survey, it does not make sense for the Census Bureau to use scarce resources to develop extensive SIPP-based adjustments to March CPS measures. Furthermore, we believe SIPP should receive priority over the March CPS for major investments designed to improve measures of income and program participation. For example, resources for administrative record-check studies or for improved income imputation procedures should be devoted to SIPP, not the March CPS. Of course, when improved procedures can readily be implemented for both surveys, that should be done.

[41] The information that is collected in the March CPS income supplement on prior-year work experience is also important for analyses of the CPS labor force data.

[42] A reduction in income detail may also ease the data collection burden for the labor force information that is the prime focus of the CPS. At present, interviewers accept relatively high nonresponse rates to the income supplement so as not to increase the chances that a household will refuse to answer the next month's labor force questions (see Citro, 1991).

Given that there will be a period before data from the redesigned SIPP are available and a longer period in which SIPP and March CPS income measures are both produced, we favor work that will help users understand differences between SIPP and CPS and implement their own adjustments for their own purposes. Thus, we are very supportive of the Census Bureau's plan to conduct a major comparative study of the 1990 SIPP panel and the March 1991 CPS. We also support incremental improvements to the March CPS.

In this regard, we point to a recent Committee on National Statistics panel study (Citro and Hanushek, 1991a) that evaluated microsimulation models for social welfare programs: it concluded (Ch. 5) that the March CPS will remain for some time the database of choice for many of these models because of its large sample size and timeliness. The report suggested some modifications to the March CPS (e.g., a few additional questions) that could improve its usefulness for social welfare policy analysis and modeling and, in particular, make it easier for users to develop SIPP-based imputations and adjustments to the March CPS data.

> ***Recommendation 3-6:*** **SIPP should become, over time, the primary source of the nation's income statistics in place of the March CPS income supplement. SIPP should receive priority for major investments to develop improved income measures. As there will necessarily be a transition period during which SIPP and CPS income statistics are both published, every effort should be made to increase user understanding of differences and similarities and to effect incremental improvements as appropriate in both surveys.**

SIPP AND ADMINISTRATIVE RECORDS

Operating agencies at all levels of government, corporations, and other organizations regularly generate large volumes of administrative records about individuals (e.g., taxpayers, program beneficiaries, employees) and individual transactions (e.g., payments, eligibility redeterminations). These records can provide a wealth of useful information for statistical purposes, both on a stand-alone basis (i.e., analysis that is limited to the records themselves, such as tabulations of tax returns) and, more powerfully, through linkages with household survey data. Such linkages can provide supplemental data at low marginal cost as well as a means to validate and improve the quality of survey responses. The widespread adoption of computerized systems of record-keeping has greatly enhanced the potential utility of administrative records for statistical research and analysis purposes in recent years.

Not all statistical programs can benefit. For some, no records exist

with which to validate or supplement survey reports by individuals of many types of behavior; for others, relevant records exist but are very difficult and costly to access. In general, there are drawbacks to the use of administrative records, including:

- differences in content, format, and recording medium across agencies, even for the same program (e.g., not all states have computerized records for such programs as AFDC and Medicaid);
- the fact that content (and format) may change without consideration of the needs of statistical analysis (e.g., frequent changes in tax laws have meant that IRS records do not contain consistent information year-to-year for such items as deductible expenses);
- different rules, regulations, and procedures across organizations with regard to access to their records for analytical purposes; and
- a finally, heightened public concern about protecting the confidentiality of individual replies that has led statistical agencies to take a very strict view about the use of data files that link administrative and survey information by outside researchers.

Yet despite the difficulties of accessing and using administrative records, statistical programs for which relevant records exist cannot ignore their potential to enhance data quality and scope at reasonable cost. SIPP is particularly well positioned to exploit administrative records because of its focus on income and program participation, for which many relevant public and private record systems exist.

We see several ways in which administrative records may be of great benefit to SIPP. The first is to match administrative records with SIPP cases in order to obtain additional data items and to extend the available information for each cast backwards and forwards in time. For example, social security earnings histories could be appended to each SIPP record for years prior to and including the time covered by the survey. Such data would be very useful for projecting expected future social security benefits and also for studying the lifetime work experiences for various population groups. Also, earnings data could continue to be added for subsequent years to support such analyses as the work efforts of SIPP respondents who experienced a spell of welfare participation. Social security benefit information could similarly be added for SIPP respondents who were nearing retirement age at the end of a panel's life.

In addition to operational problems that affect any use of administrative records (e.g., records may not be available on a timely basis or may not exist in computerized form), the chief difficulty in seeking to augment SIPP records with administrative data concerns access to the resulting linked files. Historically, the Census Bureau has not been willing to release linked files to outside researchers because of concerns about protection of confi

dentiality. (Indeed, the file of linked social security and survey data for the 1984 SIPP panel that the Census Bureau prepared for the Social Security Administration [SSA] was made available only to SSA analysts under strict conditions of use.) A panel of the Committee on National Statistics is nearing completion of a study of confidentiality and data access, and its report may suggest ways for the Census Bureau (and other agencies) to provide access to linked files.

The second possible type of use for administrative records in SIPP is as the basis for multiple-frame samples for SIPP panels, that is, area probability samples of households together with cases that are drawn from one or more type of administrative record (e.g., program records, tax records, or employer records). Every case in the multiple-frame sample would be administered the SIPP questionnaire; in addition, the cases drawn from the administrative frame(s) could have appended data items from the particular type of administrative record (provided the access problems referred to above could be worked out). Multiple-frame samples can be an efficient way to oversample selected population groups for analysis purposes (e.g., program recipients) if the relevant records are readily accessible.[43]

We discuss the benefits of this approach for oversampling low-income population groups in SIPP in Chapter 4. We also discuss operational and technical difficulties that can make it difficult to develop multiple-frame samples and produce timely analysis files. We suggest that the cost-effective use of a multiple-frame approach for SIPP will generally require the active cooperation and support of an agency that is interested in adding a component to the SIPP sample that is drawn from its records.

Finally, administrative record-check studies can be a very important means of evaluating and improving the quality of survey information. Such studies can lead to improved wording of questions, improved imputation methods for survey nonresponse, and even adjustments to survey responses for reporting errors. Because record-check studies use administrative data for evaluative and methodological research, they can be restricted to use within a statistical agency and hence do not pose the same degree of concern about protection of confidentiality.[44]

Full record-check studies involve matching administrative with survey records after completion of data collection in the survey. Such studies look for matches in the administrative records for all survey records. They can

[43] It would be difficult at present to develop a national multiple-frame sample for such state-administered programs as AFDC, given the lack of good computerized record systems in many states.

[44] Such use need not be limited to the agency staff. Other researchers may be able to work with the data under special on-site arrangements: for example, the Census Bureau has allowed researchers to work with confidential data at the agency as special sworn employees.

thus identify "false positives," that is, people who erroneously report participation in a program (or receipt of a fringe benefit), as well as "false negatives," that is, people who fail to report their participation, and hence can estimate the net extent of underreporting (or overreporting) of an income type or program benefit. The match of the first two waves of the 1984 SIPP panel with records for eight federal and state assistance programs was a study of this type (see Marquis and Moore, 1989, 1990a, 1990b). As another example, Census Bureau staff in the Housing and Household Economic Statistics Division (HHES) are currently conducting matches of IRS records with the 1990 SIPP panel as part of their work to evaluate income data in SIPP and the March CPS and to develop a model for estimating after-tax income from SIPP.[45]

Forward record-check studies involve selecting samples from administrative records and giving the selected individuals the survey interviews. Such studies are more limited than full record checks in that they do not permit false negatives to be identified; however, forward record checks can be carried out on a more timely basis because there is no need to match administrative and survey records.

We support the work that is under way by the HHES staff to match administrative records with the 1990 SIPP panel for research and development purposes. We also recommend (see Chapter 7) the use of small-scale forward record-check studies (e.g., with records from selected states for such programs as AFDC, SSI, and food stamps) in the implementation of several elements of the SIPP redesign—for example, in helping to determine improved wording for important questionnaire items and improved methods to treat nonresponse.

Overall, we strongly support an increased role for administrative records in the SIPP program. However, there are many operational and technical problems, in addition to concerns about confidentiality, that impede their ready use, and we do not think that there can be fast progress toward such goals as using administrative records to adjust SIPP responses for reporting errors. Nonetheless, we urge the Census Bureau to seek innovative ways for SIPP to benefit from the extensive information that is available on income and programs from administrative record sources.

[45] We noted earlier the significant benefits that could accrue to SIPP from working with the Statistics of Income Division staff on ways to develop high-quality tax information for SIPP while at the same time reducing the burden of the tax module in the current questionnaire.

4

Survey Design

In this chapter we review and compare the current SIPP design and available alternatives in light of our recommended goals for the survey. In Chapter 5 we do the same for the SIPP data collection and processing system. From both reviews we conclude that changes in the design and operation of SIPP would enhance the utility of the data and increase the cost-effectiveness of the SIPP program.

MAJOR DESIGN ELEMENTS AND ALTERNATIVES

The design of a continuing panel survey such as SIPP includes several components, each of which affects the quality and utility of the data and the costs of data collection, processing, and use. In this section we consider the following major design elements:

- the number of interviews or waves in each panel;
- the length of the reference period covered by each interview;
- the length of each panel (a function of the number of interviews and the reference period length);
- the frequency with which new panels are introduced; and
- the total initial sample size for each panel.

We also consider the advantages and disadvantages of spreading out the workload by interviewing portions of the sample (called rotation groups) each month rather than interviewing the entire sample at the same time for

each wave. In the last two sections we consider aspects of the SIPP sample design, namely, the use of oversampling to increase the sample size for the low-income population and the rules for following people that determine who is included in the sample for each panel over time.

The major design components listed above cannot be assessed in isolation. They interact in a number of ways. Given a fixed budget that puts a ceiling on the number of interviews that can be fielded each year, a change in one of the design elements will generally necessitate an offsetting change elsewhere. For example, an increase in panel length must be offset by one or more of the following changes: a reduction in the frequency with which new panels are introduced, a reduction in the sample size per panel, or an increase in the reference period length for each interview wave.

Current SIPP Design

SIPP is a true panel survey, in that it follows individual people—including those who change their address—in contrast to quasi panel surveys, such as the Current Population Survey (CPS) and Consumer Expenditure Survey (CEX), which return to the same address and interview the people who currently reside there. To obtain the sample for each SIPP panel, a list of addresses is designated for interviewers to visit in the first wave. Typically, about 75–80 percent of the addresses represent occupied housing units whose occupants are eligible for the survey; the rest are vacant, demolished, or nonresidential units. Of the eligible households, 92–95 percent of the residents usually agree to participate in the survey (Bowie, 1991). The adult members of these households (people aged 15 and over) are deemed original sample members. Each of them is followed until the end of the panel or until the person leaves the universe (e.g., by dying, entering an institution, or moving abroad) or the sample (e.g., by refusing to continue to be interviewed, moving to an unknown address, or moving outside the area covered by the SIPP interviewing staff[1]). Children of original sample members are followed as long as they reside with an original sample adult, and adults and children who join the household of an original sample adult are included in the panel as long as they remain in that household.

The basic SIPP design calls for members of each panel to be interviewed at 4-month intervals over a period of 32 months for a total of eight

[1] People who move to an address more than 100 miles from a SIPP primary sampling unit (PSU) area are not followed, although interviewers are instructed to conduct telephone interviews with them if possible. Almost 97 percent of the U.S. population lived within 100 miles of the sample PSUs for the 1984 panel (Jabine, King, and Petroni, 1990:16). Attempts are made to keep track of people who enter institutions so that if they leave the institution at a later point during the life of the panel, they can be brought back into the panel.

interview waves. (One-half of the 1984 SIPP panel was interviewed nine instead of eight times.) A new panel is introduced each year. To even out the interviewing workload, the sample for each panel is divided into four rotation groups, one of which is interviewed every month. Interviewing for the first 1984 SIPP panel began for the first rotation group in October 1983; interviewing for all subsequent panels has begun in February (see Committee on National Statistics (1989:Table 2-1) for an illustration of the rotation group design). Each interview includes a set of core questions about income, program participation, and employment. In most cases, information is requested on these subjects for each of the 4 preceding months. Each interview also includes one or more modules on specific topics that are administered only once or twice in each panel. (See Tables 3-1, 3-2, and 3-13 in Chapter 3 for information on the questionnaire content.)

The sample design for SIPP is a multistage clustered probability sample of the population in the 50 states and the District of Columbia that only excludes inmates of institutions and those members of the armed forces living on post without their families. There is currently no oversampling of specific population groups in SIPP, with one exception: the 1990 panel includes about 3,800 extra households continued from the 1989 panel, selected because they were headed by blacks, Hispanics, or female single parents at the first wave of the 1989 panel.

The initial sample size for the first 1984 SIPP panel was about 21,000 eligible households, with the expectation that, by combining two panels of that size, users would be able to obtain a total sample size of about 37,000–38,000 households.[2] However, budget cuts necessitated an 18 percent reduction in the sample size midway through the 1984 panel (beginning with wave 5). Initial sample sizes for the 1985 through 1989 panels and the 1991 panel were only 12,500 to 14,500 beginning with wave 4). The initial sample size for the 1990 panel eligible households (and the 1985 panel sample was further reduced was about 23,600 eligible households; however, to fund this larger size, the Census Bureau had to terminate the 1988 and 1989 panels at six and three interviews, respectively. Budget cuts also necessitated limiting the 1986 and 1987 panels to seven rather than eight waves.[3]

The Census Bureau received sufficient funding for fiscal 1992 to enable it to return to the original SIPP design. The 1992 panel began in February

[2] Attrition reduces the number of actual cases that can be obtained by combining early waves of one panel with later waves of another, although new household formation by original sample members somewhat offsets this effect.

[3] Also, for other reasons, one rotation group in the 1985 and 1986 panels received one less wave than the other three groups (i.e., seven instead of eight waves in the 1985 panel and six instead of seven waves in the 1986 panel; see CNSTAT [1989:Table 2-1]).

with an estimated initial sample of 21,600 eligible households whose original sample members will be interviewed for eight waves. It is expected that subsequent panels will be funded at about the same level.

User Views

In considering whether to recommend any changes to the SIPP design, we consulted with researchers and policy analysts working in a range of relevant subject areas. We asked them to assess the usefulness of the data produced by the current SIPP design and to suggest design modifications that they thought would improve data quality and utility (see Chapter 2). Virtually without exception, these SIPP data users indicated that the sample size per panel, particularly for panels with sample size reductions due to budget cutbacks, is too small to support analysis of many of the subgroups of most interest, such as participants in assistance programs. Users view the option of combining panels in order to increase sample size as cumbersome; moreover, combining panels is not an option for such uses as longitudinal analysis of a single panel or analysis of a variable topical module that was asked in only one panel.

Users differ in their opinions on other major design elements, depending on their interest in longitudinal or cross-sectional applications of the data. Users who value most the longitudinal information from SIPP support increasing the length of each panel to provide an improved capability to study transitions and spells of program participation and other behaviors. Longer panels would increase the sample size of events of interest, such as marital status or job changes or program exits and entrances, and would provide longer periods of observation before and after these events for analyzing their antecedents and consequences. Longer panels would also reduce the "right-censoring" problem, that is, the problem that the duration of some spells is not known because they are still in progress when the panel ends. Users most often suggest extending SIPP panels to 5 years, although some users would be satisfied with extending them to 4 years; at least one user has suggested lengthening SIPP panels to 10 years to permit the data to be used to study welfare dependency and persistent poverty (Manski, 1991).

In order to increase sample size and panel length, many users of the longitudinal data say they are willing to live with longer reference periods for each interview, thereby decreasing the number of interviews per year, typically from three 4-month to two 6-month waves. They are also quite willing to reduce the frequency with which new panels are introduced—perhaps introducing a new panel every 2 or 3 years instead of every year.

Users who are more concerned about cross-sectional applications, such as describing the characteristics of program participants at any given time

and estimating the likely effects of a program change using comparative static microsimulation modeling techniques,[4] have a different viewpoint. These users are worried about proposals to reduce the frequency with which new panels are introduced because they assume that estimates based on a panel that has been in the field for longer than a year will exhibit higher levels of error than estimates based on a "fresh" panel. They are also loathe to increase the reference period of the interviews, assuming that longer recall periods will reduce the quality of the monthly data that are needed for program analysis. (Users who are concerned with fine-grained longitudinal analysis of program dynamics—i.e., analysis of short spells and intrayear changes in participation and related characteristics within the context of a longer panel—also share this view.)

The views of Census Bureau staff have tended in the past to coincide with those of analysts who are most interested in cross-sectional applications of SIPP. The original plans called for the Census Bureau to publish improved annual and subannual income statistics using core SIPP data. From this perspective, yearly refreshment of the sample appeared highly desirable, as did short reference periods. However, for a variety of reasons (see further discussion below), the Bureau has yet to realize this goal. More recently, the Census Bureau staff have tended to emphasize the longitudinal uses of SIPP, arguing for continued use of the March CPS to provide basic annual income and poverty statistics (see Chapter 2).

Staff at the Census Bureau have also argued strongly for design features that they believe promote operational efficiency. Specifically, they have supported using monthly rotation groups in order to spread out the workload for the interviewers. Analysts, in contrast, find that the use of monthly rotation groups complicates data processing (see discussion in later section). Similarly, Bureau staff made the original decision to have reference periods of 4 months, instead of 6 or 3 months, as a compromise between the need for accurate monthly data and reduced cost of field operations.

Selected Design Alternatives

We could not investigate every design alternative. More important, while we felt it essential to look at designs that could improve the usefulness of

[4] Microsimulation models of such programs as Aid to Families with Dependent Children (AFDC) and food stamps typically create an average monthly snapshot of the population, simulating program eligibility and participation under current program regulations and then simulating what the differences would be if program provisions were modified (e.g., if benefits were liberalized). Historically, these models have used the March CPS as their microlevel database, employing information from such sources as the Income Survey Development Program (ISDP) and SIPP to allocate the annual CPS employment and income data to months. Several models of the food stamp program have been built directly from SIPP cross-sectional monthly data; see Citro and Hanushek (1991a, 1991b).

the survey for longitudinal applications, we did not want to consider alternatives that undercut the uniqueness of SIPP: namely, that it is the only household survey that provides monthly data for fine-grained analysis of changes in income and program dynamics on a short- to medium-term basis. Hence, we did not give serious attention to extending the panel length beyond 5 or 6 years nor the reference period length beyond 6 months at most.[5] Other surveys, such as the Panel Study of Income Dynamics (PSID), will continue to serve users interested in analysis of longer term dynamics. Moreover, because of our conclusion that SIPP, not the March CPS, should serve as the primary source of the nation's income statistics, we did not believe it appropriate to consider alternatives that could seriously affect SIPP's ability to provide reliable cross-sectional estimates. Our concern that any design change not cause major problems for Census Bureau operations also influenced our deliberations.

Below we sketch in the basic features of five alternatives: the current (fully funded) design and four designs intended to provide somewhat longer periods of observation with varying panel and reference period lengths and frequency with which new panels are introduced. For each design, we calculate the sample size per panel under the assumption of a fixed field budget that supports 160,000 interviews per year once a design is fully phased in.[6] The total of 160,000 interviews per year is the number entailed by full implementation of the original SIPP design, that is, each year having a new panel that is interviewed three times, a panel in its second year that is interviewed three times, and a panel completing its term that is interviewed two times, with all panels having an original sample size of 20,000 eligible households. Note that none of the other designs has more than two panels in the field at the same time.

[5] However, in the section on sample design considerations, we discuss extending the length of SIPP panels—for a longer period than whatever is the standard length for the full sample—for subgroups of interest as a means of adding sample size and longitudinal information for the subsampled groups.

[6] Attrition will reduce the number of required interviews: eligible households that do not respond in the first wave are dropped from the sample; eligible households that subsequently fail to respond are pursued for one more interview before being dropped. Formation of new households by original sample members will somewhat offset the effects of attrition. Also, at the first wave, an additional 4,000–5,000 visits are required to addresses that turn out to be vacant, demolished, or nonresidential (i.e., not eligible). Because of budget cuts, the Census Bureau has actually fielded no more than about 100,000–120,000 interviews in most years. Note that, for simplicity, we assume that interviews carry the same average cost under each design, that is, that the cost of a 6-month recall interview is the same on average as the cost of a 4-month interview. We also do not take into account any extra data collection costs that could result for longer panels from greater dispersion of the sample due to geographic mobility.

Current Design Start a new panel every year; run each panel for 32 months and interview in 4-month waves, for a total of eight interviews. The sample size per panel is 20,000 originally eligible households.

Alternative Design A Start a new panel every 2 years; run each panel for 4 years (48 months) and interview in 6-month waves, for a total of eight interviews (two per year). The sample size per panel is 40,000 originally eligible households. (Two interviews times two panels times 40,000 equals 160,000 interviews per year.)

Alternative Design B Start a new panel every 2 years; run each panel for 4 years and interview in 4-month waves, for a total of 12 interviews (3 per year). The sample size per panel is 26,650 originally eligible households. (Three interviews times two panels times 26,650 equals 160,000 interviews per year.)

Alternative Design C Start a new panel every 2-1/2 years; run each panel for 5 years and interview in 6-month waves, for a total of 10 interviews (2 per year). The sample size per panel is 40,000 originally eligible households. (Two interviews times two panels times 40,000 equals 160,000 interviews per year.)

Alternative Design D Start a new panel every 3 years; run each panel for 6 years and interview in 6-month waves, for a total of 12 interviews (2 per year). The sample size per panel is 40,000 originally eligible households. (Two interviews times two panels times 40,000 equals 160,000 interviews per year.)

We initially considered another very different design that strives to reconcile the widely voiced desire for larger sample size with the view that cross-sectional uses require short reference periods and frequently refreshed samples (Doyle, 1992). In brief, this scheme would encompass two related kinds of surveys: (1) large, annual cross-section surveys, designed to obtain highly robust information for January of each year, and (2) small 2-year panels, introduced annually in midyear as subsets of the cross-sectional samples and designed to provide monthly information from six 4-month waves for limited analysis of program dynamics.

More precisely, this design would do the following: start a new panel every year; field a large initial cross-section and interview once with a 1-month reference period; then, 6 months later (to allow time to draw the subsample), continue a subsample for 2 years, interviewing in 4-month waves, for a total of six interviews (three per year). The cross-section sample size is 55,000 eligible households and each panel subsample includes 17,500 originally eligible households. (55,000 plus three interviews times two panels times 17,500 equals 160,000 interviews per year.) To make the relatively small panels more useful for certain kinds of analysis, Doyle (1992) proposes to oversample a particular target group in each panel: for

example, oversample low-income people in one panel and higher income people the next.

We early on determined that the costs of the Doyle design were likely to outweigh its possible benefits. As a practical concern, the Census Bureau would have to gear up each year for a very large cross-sectional survey and then scale down its operations to handle the much smaller panels. Moreover, the cross-sectional survey component would provide estimates only for the month of January, while the panel survey component would provide longitudinal data only for 2 years for small samples.[7] This design also introduces new panels on an annual basis—a feature that we argue below is a major complication for SIPP data processing and use under the current design.

Our discussion in the next section considers the likely effects that designs A-D would have on the quality and utility of SIPP data in comparison with the current design. Each design makes tradeoffs within a fixed field budget. For example, design A increases the sample size and overall length of each panel in comparison with the current design, but lengthens the reference period and reduces the frequency with which new panels are introduced. Designs C and D have 6-month reference periods like design A, but further lengthen each panel and reduce the frequency with which new panels are introduced. Design B retains the 4-month reference period of the current design, but provides fewer additional sample cases than the other designs. Our challenge was to assess the implications of these design choices for the "bottom line": the ability of SIPP to provide high-quality, relevant data for research and policy analysis related to income and program participation.

In considering alternative choices of panel length and number of interviews, we focused on the implications for errors in panel survey estimates due to the following factors:

- attrition—or the cumulative loss from the sample over time of people who cannot be located or no longer want to participate, which can bias survey estimates and also reduce the sample size available for analysis;
- time-in-sample effects—or changes in respondents' behavior or reporting of their behavior due to their continued participation in the survey; and
- censoring of spells of program participation, poverty, and other behaviors—that is, the failure to observe the beginning and ending dates of all spells within the time span covered by the panel. (We also considered the implications of panel length for analysis of transitions and spells more generally.)

[7] The proposed solution to the problem of small sample sizes, namely, to oversample different groups each year, would complicate the design and use of survey.

In considering the choice of length of reference period, we focused on two kinds of errors:

- respondents' faulty recall, which is usually assumed to get worse as the period about which the respondent is queried is farther away;
- a related phenomenon known as the "seam" problem, whereby more changes (e.g., transitions in program participation or employment or changes in benefit amounts) are reported between months that span two interviews (e.g., the last month covered by wave 1 and the first month covered by wave 2) than are reported between months that lie entirely within the reference period of one interview.

In considering the choice of how often to introduce new panels, we looked at the possible reductions in error for cross-sectional estimates—reductions both in sampling error and in bias from attrition and time-in-sample effects—afforded by the opportunity to use newer panels. We also looked at the negative effects of more frequent panels, one of which is a reduction in sample size available for longitudinal analysis of single panels. Negative effects can also stem from what we term the "complexity factor": specifically, having multiple panels in progress at the same time can increase the burden on interviewers and data processing operations, which, in turn, can introduce errors and reduce timeliness of data products. A complex design can also affect the costs to users of accessing and analyzing the data. Finally, given the importance of sample size to users, we considered the implications of alternative sample sizes for cross-sectional and longitudinal uses of the data.

We attempted, whenever possible, to quantify the relationships of the various design dimensions to the various sources of error.[8] Such quantification is highly desirable for making informed choices among design alternatives. For example, in considering the optimum panel length and number of interviews, it is not enough to note that attrition bias and time-in-sample effects are assumed to worsen as a function of the number of interviews and also, perhaps, of the overall length of the panel, and that censoring is reduced with an increase in panel length. One needs to know the relative size of these effects and their implications for important uses of the data. Unfortunately, the literature does not always provide clear guidance, and, ulti

[8] Other sources of nonsampling error appear related primarily to questionnaire design and data collection procedures and hence are not discussed here. They include undercoverage of population groups in the survey (see Chapter 7), nonresponse to specific questionnaire items that is not a function of length of recall, and reporting errors that are not a function of length of recall. Jabine, King, and Petroni (1990) provide an excellent review of the literature on sampling and nonsampling errors in SIPP. Other useful sources are Kalton, Kaspryk, and McMillen (1989); Lepkowski, Kalton, and Kasprzyk (1990); and Marquis and Moore (1989, 1990a).

mately, we have relied on our professional judgments in recommending design changes to SIPP.

TABLE 4-1 Cumulative Household Noninterview and Sample Loss Rates, 1984–1988 and 1990 SIPP Panels (in percent)

	1984 Panel			1985 Panel			1986 Panel		
	Noninterview			Noninterview			Noninterview		
Wave	Type A	Type D	Loss	Type A	Type D	Loss	Type A	Type D	Loss
1	4.9	—	4.9	6.7	—	6.7	7.3	—	7.3
2	8.3	1.0	9.4	8.5	2.1	10.8	10.8	1.5	13.4
3	10.2	1.9	12.3	10.2	2.7	13.2	12.6	2.3	15.2
4	12.1	2.9	15.4	12.4	3.4	16.3	13.8	3.0	17.1
5	13.4	3.5	17.4	14.0	4.1	18.8	15.2	3.7	19.3
6	14.9	4.1	19.4	14.2	4.8	19.7	15.2	4.3	20.0
7	15.6	4.9	21.0	14.4	5.2	20.5	15.3	4.8	20.7
8	15.8	5.7	22.0	14.4	5.5	20.8			
9	15.8	5.7	22.3						

NOTES: Differences in rates for the 1984 panel in comparison with subsequent panels may be due in part to differences in the sample design. Rates are not shown for the 1989 panel because it lasted only 3 waves.

Type A noninterviews consist of households occupied by persons eligible for interview and for whom a questionnaire would have been filled if an interview had been obtained. Reasons for Type A noninterview include: no one at home in spite of repeated visits, temporarily absent during the entire interview period, refusal, and unable to locate a sample unit. Type D noninterviews consist of households of original sample persons who are living at an unknown new address or at an address located more than 100 miles from a SIPP PSU and for whom a telephone interview is not conducted.

Attrition

All household surveys are subject to unit nonresponse, that is, the failure to locate or obtain the cooperation of some fraction of the eligible households (or of individual members of otherwise cooperating households). Panel surveys are also subject to wave nonresponse, or attrition, at each successive interview.[9]

[9] More precisely, total sample loss at each interview, or total wave nonresponse, includes attrition per se, that is, nonresponse by households that are never brought back into the survey, plus nonresponse of households that miss a wave but are successfully interviewed at the next wave. (In SIPP, households that miss two interviews in a row are dropped from the survey.) In addition, in every SIPP interview, there are "Type Z" nonrespondents, that is, individual members of otherwise cooperating households for whom no information is obtained, either in person or by proxy.

1987 Panel			1988 Panel			1990 Panel		
Noninterview			Noninterview			Noninterview		
Type A	Type D	Loss	Type A	Type D	Loss	Type A	Type D	Loss
6.7	—	6.7	7.5	—	7.5	7.1	—	7.1
11.1	1.5	12.6	11.4	1.5	13.1	10.9	1.5	12.6
11.5	2.6	14.2	12.0	2.3	14.7	11.5	2.5	14.4
12.3	3.3	15.9	13.0	3.0	16.5	12.6	3.3	16.5
13.7	4.1	18.1	13.9	3.3	17.8	13.7	4.5	18.9
13.6	4.9	18.9	13.6	4.0	18.3	14.1	5.2	20.1
13.6	4.9	19.0				14.3	5.8	21.0
						N.A	N.A	N.A

The sample loss rate consists of cumulative noninterview rates adjusted for unobserved growth in the noninterview units (created by splits).

[a] Rates for 1990 are for the nationally representative portion of the sample; they exclude the households that were continued from the 1989 panel.

N.A., Not available.

SOURCE: Data from Jabine, King, and Petroni (1990:Table 5.1) and unpublished tables from the Census Bureau.

Attrition reduces the number of cases available for analysis—including the number available for longitudinal analysis over all or part of the time span of a panel and the number available for cross-sectional analysis from later interview waves—and thereby increases the sampling error or variance of the estimates. More important, people who drop out may differ from those who remain in the survey. To the extent that adjustments to the weights for survey respondents do not compensate for these differences, estimates from the survey may be biased.

Evidence on Attrition To date, the wave nonresponse rates from SIPP show a definite pattern (see Table 4-1). Total sample loss in the 1984–1988 and 1990 panels is highest at the first and second interviews—5–8 percent of eligible households at wave 1 and an additional 4–6 percent of eligible households at wave 2. Thereafter, the additional loss is only 2–3 percent in each of waves 3–5 and less than 1 percent in each subsequent wave.[10] By

[10] Indeed, looking closely at later panels in comparison with earlier ones, the numbers suggest that SIPP interviewers are experiencing somewhat less success in obtaining responses from households in waves 1 and 2 of later panels but better success in retaining cooperative households for subsequent waves of later panels.

wave 6 (after 2 years of interviewing), cumulative sample loss from SIPP is 18–20 percent of eligible households; by wave 8, it is 21–22 percent.

At later waves, increased attrition is almost entirely a function of "Type D" loss, that is, the loss of sample members who move and cannot be located or who move more than 100 miles from a SIPP primary sampling unit and cannot be interviewed by telephone. The increase in "Type A" loss at later waves is virtually nil: Type A cases are those households for which no interview is obtained because there was no one at home, the occupants were temporarily absent, or the occupants refused to give out information. Refusals account for most Type A attrition: they accounted for 70–76 percent of wave 1 nonresponse in the first four SIPP panels (Bowie, 1988:8).

The attrition patterns in SIPP are similar to those of other panel surveys. The 1979 ISDP research panel experienced a total sample loss of 18.1 percent after 6 waves (with 3-month reference periods), compared with sample loss rates for the SIPP 1984–1988 panels of 18–20 percent after 6 waves (with 4-month reference periods).[11] As in SIPP, the largest attrition rates occurred in ISDP in the early waves; for example; the wave 1 sample loss in the ISDP was 8.5 percent (Nelson, Bowie, and Walker, 1987:7–8). The PSID, which has conducted annual interviews of sample members since 1968, experienced a large sample loss—24 percent—at the first interview,[12] but additional sample loss dropped to 14 percent of the eligible members at the second interview and was only 2–3 percent at each interview thereafter (Survey Research Center, 1986).

The evidence suggests that attrition is primarily a function of the number of interview waves rather than the total length of the panel. Hence, design A, with eight interviews over a 48-month (4-year) span, might have a level of attrition comparable to that of the current design, with eight interviews over a 32-month span. Design B, with 12 interviews over a 4-year span, and design D, with 12 interviews over a 6-year span, would likely have more attrition than the other designs. However, the differences would not be great, given the finding that attrition drops off dramatically after the first three or four waves.

Our best estimate is that designs B and D would experience no more than 25 percent attrition by the end of a panel, compared with 21–22 percent for the current design. Tempering our confidence in this estimate is the lack

[11] The sample loss in the ISDP might well have been higher except that a special effort was made in the last interview (wave 6) to convert Type A nonrespondents from previous waves.

[12] This loss was partly due to the PSID sample design, which included a national probability sample of about 3,000 families and a sample of about 2,000 low-income families drawn from the sample used for the 1967 Survey of Economic Opportunity (SEO). Several factors increased the nonresponse for the SEO sample, including the requirement by the Census Bureau that SEO families sign a release allowing their names to be passed on to the PSID (Hill, 1992).

of direct evidence about attrition for panels of moderate length with frequent interviews. The PSID has experienced very little attrition after the initial waves despite its very long length, but respondents know that they will be interviewed only once a year, and the PSID interviewing staff have a long period each year in which to track down respondents. Conversely, under the current SIPP design, respondents are interviewed frequently but know the survey will be completed in a couple of years. It is possible that design B, which lengthens the panel and retains frequent interviewing, could result in higher initial refusal rates at wave 1 and hence a higher overall attrition rate than the other designs.

Evidence on Attrition Bias Attrition does not necessarily introduce bias into survey estimates. Several studies of the PSID in the 1980s found that, although cumulative sample loss by that time was over 55 percent, there was no evidence that attrition correlated with individual characteristics in a way that would produce biased estimates.[13] For example, Becketti et al. (1988:490) found no evidence that attrition "has any effect on estimates of the parameters of the earnings equations that we studied" (see also Curtin, Juster, and Morgan, 1989, and other studies cited in Hill, 1992).

The evidence from SIPP is less encouraging. Studies of nonresponse from the 1984 panel show that household noninterview rates after the first wave tended to be higher for renters, for households located in large metropolitan areas, and for households headed by young adults. Individuals who did not complete all of the interview waves, compared with those who did, tended to include more residents of large metropolitan areas, renters, members of racial minorities, children and other relatives of the reference person, people aged 15–24, movers, never-married people, and people with no savings accounts or other assets (Jabine, King, and Petroni, 1990:35–37, Table 5.4).

Furthermore, there is evidence that the current noninterview weighting adjustments for SIPP do not fully compensate for differential attrition across subgroups. One evaluation of the procedures to adjust for household nonresponse at each wave developed two sets of weights for wave 2 households in the 1984 panel—one set based on all wave 2 households and one set based just on those wave 2 households that provided interviews at wave 6. Comparing wave 2 estimates from these two samples showed that the latter set pro

[13] Duncan, Juster, and Morgan (1984) report an interesting study that simulated the effects of less intensive efforts to interview respondents in the PSID (e.g., fewer follow-up calls) in the period from 1973 to 1980. The resulting sample included only two-thirds of the actual PSID respondents in 1980, and nonresponse after the first wave for the simulated sample was significantly related to several first-wave characteristics, particularly race, income, and age. However, reweighting the simulated sample for differential nonresponse minimized the differences between the estimates from that sample and the actual sample.

duced higher estimates of median income and fewer households with low monthly income compared with the former set, evidence that the weights do not adequately adjust for higher attrition rates among low-income households (Petroni and King, 1988). A subsequent study that compared samples from the 1985 panel of all wave 2 households and those that provided interviews at wave 6 obtained similar findings (King et al., 1990).

It is important to note that current cross-sectional nonresponse adjustments in SIPP make only minimal use of the information that is available from previous waves for many current nonrespondents. Also, in constructing longitudinal files from SIPP panels, the Census Bureau assigns zero weights to original sample members who missed only one or a few waves in addition to those who missed all or most waves. In Chapter 7, we urge research on ways to improve nonresponse adjustments in SIPP (some of which the Census Bureau is already investigating). Here, we note that the alternative designs under consideration would likely add little to the bias or sample loss due to attrition, given the evidence of markedly reduced attrition rates at later interview waves.

Time-in-Sample Effects

People who participate in panel surveys may, with successive interviews, change their behavior or their reporting of their behavior in ways that bias the survey estimates. They may acquire new knowledge that affects their behavior: for example, they may apply for benefits from public assistance programs as a direct consequence of learning about such programs from the survey. They may also gain experience with the questionnaire that leads them to change their responses: for example, they may learn to give a "no" answer to an early question in order to shorten the interview. Not all such changes necessarily introduce bias —for example, respondents may gain a better understanding of the meaning of a question over time and hence provide more valid responses at later than at earlier interviews.

In practice, it is often difficult to distinguish time-in-sample—or panel conditioning—effects from other changes across waves, notably attrition. Moreover, the finding that respondents' answers differ across waves due to conditioning does not establish whether the reports for the later or the earlier waves are more accurate; the reports would have to be compared with other independent studies.

Evidence from Other Surveys The literature on panel conditioning is not extensive (see Kalton, Kasprzyk, and McMillen, 1989; Lepkowski, Kalton, and Kasprzyk, 1990). Most of the studies examine conditioning effects in continuing surveys, such as the CPS, that are designed to produce regular cross-sectional estimates and use a rotation group scheme, whereby each

month's (or quarter's or 6-months') sample includes some respondents who are new to the survey and others who have been interviewed before. Studies of such surveys have regularly documented "rotation group bias," although it is not known to what extent such bias is due to conditioning effects per se. For example, the unemployment rate estimated for households in the incoming CPS rotation group each month is 7 percent higher than the average for all eight rotation groups (Bailar, 1989:Table 6). (The CPS interviews households at sample addresses for 4 months in a row, drops them from the sample for 8 months, and then interviews them again for another 4 months.) Rotation group bias has also been found in the Canadian Labour Force Survey, and studies of the National Crime Survey (NCS) have found that victimization rates decline for rotation groups the longer they have been in the sample (Woltman and Bushery, 1975). (The NCS interviews households at 6-month intervals, keeping each household in the survey for 3-1/2 years.)

A few validation studies have compared panel respondents' reports with outside sources. Traugott and Katosh (1979) found that longer term members of a panel survey of election behavior gave more accurate responses on voting behavior and, moreover, actually voted in larger numbers than did newer members. However, it is not clear whether these results are due to panel conditioning, to attrition, or to both factors. Ferber (1964) found that longer term respondents gave better reports of asset holdings in comparison with newer respondents. This improvement was due in part to attrition of the poorer reporters and in part to an improvement in the accuracy of reporting for the respondents who remained. In contrast, Mooney (1962) found that older persons' reports of illness were higher and, compared with their physicians' reports, more accurate in the first interview than in later interviews. (The respondents were more likely to overreport illnesses in the first interview but much more likely to underreport illnesses in later interviews, so that estimates of illnesses from later interviews showed substantial downward biases.)

Lepkowski, Kalton, and Kasprzyk (1990:10) conclude from the literature that "where panel bias [conditioning] is observed, there is no consensus about the inevitability of the effect, or its size. In the same panel surveys where panel conditioning has been found for some items, it is small or absent from others."

Evidence from SIPP Several recent studies have examined conditioning effects in SIPP. None of the available studies completely separates out the effects of attrition, nor do most of them assess the validity of reports from later waves in comparison with earlier waves.

Lepkowski, Kalton, and Kasprzyk (1990) compared responses from wave 4 of the 1984 panel with wave 1 of the 1985 panel for original sample

persons. They found insignificant differences between respondents in the two panels in reports of receipt of social security, AFDC, and food stamp benefits and in reports of receipt of social security income and personal earnings for January 1985. However, they found significant differences in reported levels of AFDC income and in reports of unemployment: in both cases, respondents who had been interviewed four times had lower levels of income and less unemployment than those interviewed once. They speculate that respondents may gain a better understanding of selected questions over time and hence improve their reporting.

In a continuation of this work, Pennell and Lepkowski (1992) found only scattered instances of differences between respondents in the 1985–1987 SIPP panels, and the differences were not always in the same direction. For example, respondents in the 1985 panel reported significantly lower receipt of assets for calendar year 1986 than did respondents in the 1986 panel. Conversely, respondents in the 1985 panel reported significantly higher amounts of income from general assistance for calendar year 1986 than did respondents in the 1986 panel. There were also few differences between respondents in the 1985–1987 panels in estimates for specific calendar months.

McNeil (1991) compared estimates across 20 quarters using data from the 1984–1988 SIPP panels. He determined for each variable whether there were very few or very many quarters in which earlier and later waves differed. He found little effect for estimates of median income and program participation, somewhat larger effects for poverty and unemployment rates for women, and a large effect for health insurance coverage (people were less likely to report lacking coverage the longer they were in sample).

McCormick, Butler, and Singh (1992) compared quarterly estimates of earnings, labor force activity, poverty, and program participation for 1985–1987, using data from the 1984–1987 SIPP panels.[14] In general, they found little evidence of time-in-sample effects. They did find significant differences occurring across panels when comparing estimates for the first quarter of each year, indicating that there may be systematic differences between wave I and subsequent interviews. They suggest as possible reasons for these differences that wave 1 is an unbounded interview (i.e., the respondents have an open-ended time frame from which to recall their answers) and that the respondents are just getting to know the interviewers. However, the differences were not always in the same direction. They also found significant differences between the 1984 and 1985 panels for the quarterly estimates for 1985—but not for the other years and panels they examined—for which they could offer no explanation.

[14] Their analysis also involved comparing SIPP estimates of participation in selected programs with estimates from administrative records.

We cannot draw firm conclusions about the extent or level of biases due to time-in-sample effects that would be introduced—or ameliorated—by additional interviews in SIPP. However, the available evidence suggests that the effects are limited and, hence, that designs that specify a longer panel length should not be rejected on grounds of panel conditioning.

Censoring

A problem in longitudinal analysis of the dynamics of program participation, employment, family composition, and other behaviors is that it is rarely, if ever, possible to observe the start and end dates of all spells that are experienced by respondents during the time span covered by the panel survey. Some spells will have started before the survey began and other spells will not end until after the survey is completed.

There are ways to address the biases that stem from having incomplete information on spell lengths (see Chapter 6). However, it is clearly advantageous for analysis of spells and transitions to have a longer period of observation. The question is the optimum panel length for a survey, which, in turn, depends on the survey's goals. The PSID and National Longitudinal Surveys of Labor Market Experience (NLS) are designed to answer questions about the long-term social and economic outcomes for samples of families and cohorts of individuals as they move through major life stages. SIPP has a shorter focus, which includes providing subannual snapshots of income, employment, and program participation, as well as information on the dynamics of income and program participation over the short and medium term.

To be useful for analyses of program dynamics, even in the fairly short term, SIPP needs to follow sample members for longer than a year or two and, we believe, for somewhat longer than the 32 months of the current design. With the current panel length, a significant proportion of poverty and program participation spells are right-censored (i.e., they still exist at the end of the panel). For example, 38 percent of AFDC spells, defined on a monthly basis, that began after the start of the 1984 panel were censored (Flory, Martini, and Robbin, 1988:Table 1), as were 27 percent of spells without health insurance (McBride and Swartz, 1990:Table 1).[15] Extending the panel length from 32 to 48 months would not only enlarge the sample size of spells of program participation, poverty, and other states, but de

[15] Note that these figures include spells that were right-censored because of sample reduction in the 1984 panel, as well as those right-censored because the panel ended. The duration of another 15 percent of AFDC spells and 12 percent of spells without health insurance that began in the 1984 SIPP panel was not observed because the respondents dropped out of the survey.

crease somewhat the proportion that are right-censored. For example, we estimate that the number of right-censored AFDC spells would decrease by 10–15 percent.[16] Also, a somewhat longer length would increase the number of times when multiple spells (or recidivism) are observed and provide longer periods of observation before and after events to determine their short-term antecedents and consequences.

Recall Error and Seam Effects

One of the concerns of the ISDP that laid the groundwork for SIPP was the appropriate recall or reference period for each interview. The goal for SIPP was to obtain improved estimates of annual income, compared with the March CPS, and to obtain estimates of subannual income and program participation that could be related to administrative data. To serve both purposes, the decision was made to ascertain monthly information. It seemed obvious that interviews must be conducted more frequently than once a year in order to minimize recall errors on the part of respondents. Indeed, there is ample evidence that SIPP obtains more complete reporting than the March CPS annual survey for most sources of income and also for part-year work, unemployment, and health insurance coverage (see Jabine, King, and Petroni, 1990:127–129). The question was how often the interviews could be conducted without breaking the field budget or overburdening the interviewers or the respondents and, conversely, how seldom the interviews could be conducted without seriously affecting the quality of the monthly data.

The ISDP Site Research Test in October 1977-February 1978 included a 2×2 factorial experiment, in which the two treatments were recall length (one 6-month or two 3-month interviews) and length of the questionnaire (short or long form). The sample for this test included 2,400 respondents in five sites (Dallas, Houston, San Antonio, Milwaukee, and Peoria). Unfortunately, there were several statistical problems with the design of the experiment and the subsequent analyses, such that virtually no conclusions can be drawn from the results about the efficacy of 3-month or 6-month reference periods in SIPP (Biemer, 1991; Singh, 1987).

The 1978 and 1979 ISDP research panels used 3-month interviews and followed respondents for 15 and 18 months, respectively.[17] Other short-term panel studies, such as the CEX and the 1977 and 1980 National Medi

[16] This estimate was constructed using data on AFDC spell duration from Ruggles (1989:Table 1) for the 1994 SIPP panel and from Kalton, Miller, and Lepkowski (1992) for the 1987 SIPP panel.

cal Care Expenditure Surveys, also have 3-month interviews, while the NCS uses 6-month interviews. Given that SIPP panels were to last longer than most of these other surveys, the decision was made to use 4-month interviews to balance the concern for accuracy of monthly reports with the concern for minimizing survey costs and burden on interviewers and respondents.

We could find only a few studies from other surveys that bear on the question of whether moving from 4-month to 6-month interviews, as proposed in designs A, C, and D, would impair data quality from SIPP (see Chu et al., 1992, for an overview of the literature on recall effects). Bushery (1981), in research conducted for the NCS, found that reported victimization rates were higher for 3-month than for 6-month reference periods and that the 6-month rates, in turn, were higher than rates for a 12-month reference period. Neter and Waksberg (1964, 1965), in research on the CEX, found that reporting of house repairs and alterations of small dollar value (less than $10) was not affected by lengthening the reference period from 1 to 3 months, but the reporting declined by 20 percent when the reference period was lengthened from 1 to 6 months and by 11 percent when the period was lengthened from 3 to 6 months. They suggested that this effect would be less pronounced for house repairs and alterations with larger dollar values, which respondents could more easily recall. The limited evidence from these studies suggests that lengthening the recall period for SIPP might reduce reports for small sources of income or short spells of program participation, unemployment, etc.

Another cause for concern with lengthening the reference period is the seam problem, which was first documented in the 1979 ISDP (Moore and Kasprzyk, 1984), but has since been found in other panel surveys, including SIPP (see Jabine, King, and Petroni, 1990:58–61; Kalton and Miller, 1991) and the PSID (Hill, 1987). As noted above, the seam problem refers to higher levels of reported changes (e.g., going off or on a welfare program) between pairs of months that span two interviews (e.g., for SIPP, months 4–5, 8–9, 12–13, etc.) than between pairs of months for which data are collected from the same interview.

The seam phenomenon affects most variables for which monthly data are collected in SIPP—often strongly. For example, in the first year of the 1984 SIPP panel, four times as many social security participants reported exiting the program between months that spanned interviews as between months within the reference period of a single interview. Similarly, over twice as many nonparticipants reported entering the social security program between seam months than nonseam months (Jabine, King, and Petroni, 1990:Table 6.2).

The reasons for the occurrence and extent of the seam phenomenon are not well understood. Research to date has found few links to characteristics of respondents, edits and imputations, proxy versus self-response, or changes

[17] "The 1979 ISDP panel included an experiment with recall length for a subset of items: one-half of the households were asked about asset income on a 6-month rather than a 3-month basis. The results suggested that accuracy of reporting was reduced in the longer recall period (Ycas and Lininger, 1983:28).

in interviewer assignments (Lepkowski, Kalton, and Kasprzyk, 1990:7–8; Marquis and Moore, 1990a), although Kalton and Miller (1991) found some effects of proxy reporting for social security payments. Analysis of the cognitive processes that SIPP respondents use to answer questions suggests that they often adopt simple rules in place of making the effort to recall the information (Cantor et al., 1991; Marquis, Moore, and Bogen, 1991). Hence, one explanation for the seam problem may be that some respondents who experience a transition in the middle of a reference period simply report their current status for all 4 months of the reference period. Thus, a respondent being interviewed in May who entered the AFDC program in March would report receipt of AFDC for January and February as well as for March and April. Comparison of these reports with reports of no AFDC participation in the previous January's interview would (erroneously) date the transition at the seam between the two interviews.

Whatever the mechanism, the seam problem clearly results in errors in the timing of transitions in SIPP and the duration of spells of participation. It may or may not result in errors in the number of transitions that occur within a given period. For example, in the case of food stamps, total exits and entrances from SIPP are close to the rates derived from food stamp administrative records. In contrast, whether due to the seam effect or other factors, entrance rates from SIPP for SSI are significantly higher than those shown by program records (Jabine, King, and Petroni, 1990:59–60).

The Census Bureau is currently pursuing research and testing of alternative questionnaire designs that could reduce the seam problem (Marquis, Moore, and Bogen, 1991; see discussion in Chapter 7). However, it is not likely, in our view, that this research will produce definitive answers by the time that SIPP is redesigned. We are concerned that extending the length of the SIPP interview reference period from 4 to 6 months as part of the redesign could exacerbate the seam problem. In general, given the need for accurate monthly data to serve the goals of SIPP and the possibility that introducing too many changes to the design could have adverse effects, we are hesitant about extending the reference period in the absence of more definite research knowledge about the likely consequences. Yet longer reference periods would have the undoubted advantage of permitting an increase in sample size and perhaps an increase in length of panels. Clearly, research on recall effects should be a priority area for the Census Bureau.

Overlapping Panels

One of the major features of the current SIPP design—the yearly overlapping of panels—was adopted with the goal of maximizing sample size and minimizing the effects of attrition and time-in-sample biases for cross-sectional estimates. Introducing new SIPP panels annually afforded users the

opportunity to combine panels for months, quarters, or years. This strategy was expected to increase sample size and reduce bias by mixing cases that had been in the field for more than a year with fresh cases. Unfortunately, actual experience with the option of combining panels has not been encouraging. Indeed, what happened is an instance in which a design feature that was expected to have positive effects on data quality so complicated the survey operations as to have the opposite result.

At the start of SIPP, having to cope with a new panel every year (frequently with changed content) put great strains on the data processing system at the Census Bureau, which led to serious delays—over 3 years in some cases—in releasing data products (Committee on National Statistics, 1989:Table 2-4). These delays discouraged users from combining panels and hence left them with smaller sample sizes—and higher sampling errors—for cross-sectional estimates than originally planned. The difficulty of combining panels, coupled with the forced reductions in sample size for the 1985–1989 panels, have had the result that most users to date have confined their analyses to the larger 1984 panel. These problems in turn have motivated the preference of many users for larger panels introduced on a less frequent basis.

The Census Bureau originally expected to be a heavy user of combined panels for input to annual and subannual cross-sectional estimates of income and program participation. However, after producing six quarterly income reports based solely on the 1984 panel, the Census Bureau did not for several years produce any statistics from the core data. Instead, most reports were based on the topical modules. More recently, the Bureau has issued reports on income and program participation, using complete panel files, that have focused on such longitudinal issues as duration of participation and year-to-year change in economic status. The Bureau's future plans for a regular report series from the core data include cross-sectional as well as longitudinal statistics (see Chapter 6).

The question for the future is whether it will be possible for overlapping panels to serve the original goal of reducing sampling error and bias in cross-sectional estimates. On a positive note, the Census Bureau has made great strides in the past few years in regularly meeting a schedule of releasing data products within a year after data collection. However, this success has come at the price of greatly reducing SIPP's flexibility. Essentially, except for the variable topical modules, the Census Bureau has permitted very few changes in the questionnaire content. There is also little capacity in the data processing operations to keep up with new technology (see Chapter 5) and, in particular, to get ready for such major proposed changes as the use of computer-assisted interviewing.

We conclude that overlapping panels on an annual basis will inevitably impose substantial costs on interviewers, data processors, and users. As

suming that each panel is longer than 2 years, introducing panels annually implies having at least three distinct panels in operation for most of each year, with one of them in a start-up mode. As a result, interviewers must cope with different questionnaires: for example, under the current design, the wave 1 and 2 questionnaires for the new panel differ from the wave 4 and 5 and wave 7 and 8 questionnaires for the other two panels that are still in operation.[18] Data processors must go through the same operations of editing, imputing, reformatting, and weighting separately for each of three panels, which inevitably adds to costs and the opportunities for making mistakes. Users must go through an extra set of steps in order to combine panels for analysis.

Other designs that we considered also overlap panels, but at a less frequent rate: designs A and B introduce new panels every 2 years, design C every 2-1/2 years, and design D every 3 years. Such designs permit larger sample sizes per panel, with the important benefit that many users may never need to combine panels. Such designs also never have more than two panels in the field at the same time and give users and producers a breather between the introduction of new panels. On the down side, such designs mean that, for some years, cross-sectional estimates will involve older panels. For example, under designs A and B, estimates for every other year will include cases from panels in their second and fourth year, but none from a panel in its first year. We believe that improved weighting adjustments can compensate for attrition and time-in-sample effects, so that the benefits of less frequent introduction of new panels will more than outweigh the costs.

Sample Size

A pervasive complaint about SIPP panels is that they provide too few sample cases for observation of subgroups of policy interest—for example, recipients of food stamps and AFDC. We made rough estimates of the number of cases for these two populations that would be available for analysis by the end of waves 1, 4, 8, and 12 from SIPP panels of different size initial samples (without any oversampling of low-income groups or combining of panels). The results (see Table 4-2) show clearly the inadequacy of the smaller SIPP panels that were fielded in 1985–1989. Only 470 cases of AFDC units would be available even at wave I from a panel with an initial sample size of 12,500 households. This number would not be sufficient to

[18] Wave 1, as the start-up interview, has a different format from that used in subsequent waves; wave 2 includes personal history modules that are not repeated in any other interview. For subsequent interviews, the Census Bureau strives to field the same topical modules, for example, asking about wealth in wave 7 of one panel and wave 4 of the next panel, both of which are fielded at the same time (see Table 3–13 in Chapter 3).

study subgroups of the AFDC population—for example, there would be fewer than 50 cases of AFDC units with earnings, a group of considerable policy interest that comprises less than 10 percent of the caseload (Citro and Hanushek, 1991a:129). More sample size would be available for food stamp recipients, but the numbers are still small for detailed analysis.

TABLE 4-2 Estimated Minimum Sample Sizes for Subgroups of Policy Interest from SIPP Panels of Different Sizes

Subgroup and Wave	Initial Sample Size (Households)				
12,500	17,500	20,000	26,700	40,000	
Food stamp recipients					
Wave 1	1,160	1,630	1,860	2,480	3,720
Wave 4	1,060	1,490	1,700	2,270	3,400
Wave 8	990	1,380	1,580	2,110	3,160
Wave 12	940	1,310	1,500	2,000	3,000
AFDC recipients					
Wave 1	470	650	740	990	1,490
Wave 4	430	600	680	910	1,360
Wave 8	400	550	630	840	1,260
Wave 12	380	530	600	800	1,200

NOTES: Calculations are for single panels (not for combined panels) and assume that: food stamp recipient units are 10 percent of total households and AFDC recipient units are 4 percent of total households and attrition is a function of the number of waves: cumulative attrition is 7 percent of the initial sample size at wave 1, 15 percent at wave 4, 21 percent at wave 8, and 25 percent at wave 12. Results are rounded to the nearest 10 and are labeled as "minimum sample sizes" because no account is taken of the increase in sample cases that is likely to occur due to household formation by original sample members or that could be obtained by combining panels or by oversampling low-income people. However, no account is taken of the decrease in sample cases that could occur because of higher attrition rates for low-income people.

The initial sample size of 20,000 households that was the original goal for SIPP yields more cases of food stamp and AFDC recipients, but the numbers are still relatively small. The initial sample size of 26,700 households (proposed in design B) is significantly better—even by wave 12 it provides more cases than the 20,000 sample does in wave 1.

There are, of course, ways to improve the efficiency of the SIPP sample by oversampling subgroups of interest, and we consider such designs below. However, we believe that there is an argument for appreciably increasing the SIPP panel sample size, even if oversampling strategies are used.[19]

[19] We note in Chapter 5 that changes in the data collection strategy for SIPP—specifically, implementation of computer-assisted personal interviewing (CAPI)—could result in savings from eliminating the need for large regional office editing operations. These savings might well support an added increase in the sample size of SIPP panels.

Rotation Groups

For each of the designs considered above, we made the assumption that the Census Bureau would continue to use a monthly rotation group scheme and not alter this aspect of the survey. The practical need to have a fairly even workload for the Census Bureau interviewers is a compelling argument in favor of monthly rotation groups. In addition, a monthly rotation scheme will smooth out the effects of recall errors on cross-sectional estimates for calendar periods and ensure that the reference period is as close as possible to the time of interview for all respondents.[20]

However, there are drawbacks to the use of monthly rotation groups. For one thing, it complicates analysis of SIPP data. To produce calendar-period estimates for specific months, quarters, or years, users need data for different reference months for each rotation group—and often the appropriate reference months are in different waves.

In addition, a monthly rotation group scheme may increase attrition. If interviewers must try to close out each month's workload by the end of that month, or very soon after, they will have less time to follow up hard-to-track cases than if the interviewing could extend over a longer period.

Most important, when coupled with any design in which the panel length is an even multiple of 12 months, the use of monthly rotation groups leaves a gap in the completeness of the data for the last calendar year of each panel. Thus, under design B of 4-year panels, with interviewing starting in February of the first year, only one group will have complete data for the fourth calendar year, and the other three groups will be missing 1 to 3 months of data; see the column labeled "Begin in February" in Table 4-3. For example, the first rotation group, with its first interview in February of year 1, will have its twelfth and last interview in October of year 4, and hence be missing data for October–December of year 4. Designs A, C, and D also have this problem for the last year of each panel.[21] These missing data will impair the ability to construct reliable estimates for the calendar year involved or for year-to-year comparisons.[22]

[20] Given monthly rotation groups and 4-month interview waves, the recall length for calendar-period cross-sectional estimates will vary across the sample: for example, for a calendar-month estimate, the recall period will vary from 1 to 4 months, with an average recall length of 2-1/2 months. In contrast, if all interviews were conducted at the end of each 4-month reference period, different calendar months would have different recall lengths (e.g., 4 months for January, May, September; 3 for February, June, October, etc.). In addition, it is likely that with a bunched-up workload, interviewing would have to extend for longer periods (e.g., interviews for the January–April reference period might have to be conducted in June or even July as well as in May), which would further lengthen the recall period.

[21] In the case of design C, which introduces panels at intervals of 2-1/2 years, there is the further complication that every other panel begins in the middle of a year.

[22] The missing data are not necessarily a problem for average monthly estimates (e.g., of poverty or program participation) for a calendar year, which we propose as a basic component of the cross-sectional reports from SIPP (see Chapter 6). Such estimates could pull in data for the missing months from the first interview of the next panel that is starting up.

TABLE 4-3 Reference Periods for Rotation Groups for SIPP Redesign

Reference Month and Year		Begin in February				Begin in March			
		Rotation Group				Rotation Group			
		1	2	3	4	1	2	3	4
Year 0	October	1							
	November	1	1			1			
	December	1	1	1		1	1		
Year 1	January	1	1	1	1	1	1	1	1
	February	2	1	1	1	1	1	1	1
	March	2	2	1	1	2	1	1	1
	April	2	2	2	1	2	2	1	1
	May	2	2	2	2	2	2	2	1
	June	3	2	2	2	2	2	2	2
	July	3	3	2	2	3	2	2	2
	August	3	3	3	2	3	3	2	2
	September	3	3	3	3	3	3	3	2
	October	4	3	3	3	3	3	3	3
	November	4	4	3	3	4	3	3	3
	December	4	4	4	3	4	4	3	3
Year 2	January	4	4	4	4	4	4	4	3
	February	5	4	4	4	4	4	4	4
	March	5	5	4	4	5	4	4	4
	April	5	5	5	4	5	5	4	4
	May	5	5	5	5	5	5	5	4
	June	6	5	5	5	5	5	5	5
	July	6	6	5	5	6	5	5	5
	August	6	6	6	5	6	6	5	5
	September	6	6	6	6	6	6	6	5
	October	7	6	6	6	6	6	6	6
	November	7	7	6	6	7	6	6	6
	December	7	7	7	6	7	7	6	6
Year 3	January	7	7	7	7	7	7	7	6
	February	8	7	7	7	7	7	7	7
	March	8	8	7	7	8	7	7	7
	April	8	8	8	7	8	8	7	7
	May	8	8	8	8	8	8	8	7
	June	9	8	8	8	8	8	8	8
	July	9	9	8	8	9	8	8	8
	August	9	9	9	8	9	9	8	8
	September	9	9	9	9	9	9	9	8
	October	10	9	9	9	9	9	9	9
	November	10	10	9	9	10	9	9	9
	December	10	10	10	9	10	10	9	9
Year 4	January	10	10	10	10	10	10	10	9
	February	11	10	10	10	10	10	10	10
	March	11	11	10	10	11	10	10	10
	April	11	11	11	10	11	11	10	10
	May	11	11	11	11	11	11	11	10

Reference Month and Year		Begin in February Rotation Group 1	2	3	4	Begin in March Rotation Group 1	2	3	4
Year 4—*cont'd*									
	June	12	11	11	11	11	11	11	11
	July	12	12	11	11	12	11	11	11
	August	12	12	12	11	12	12	11	11
	September	12	12	12	12	12	12	12	11
	October		12	12	12	12	12	12	12
	November			12	12		12	12	12
	December				12			12	12
Year 5	January								12

NOTE: The numbers in the table are the interview wave numbers for each rotation group and show the reference period covered. Thus, the first rotation group under a design of 4-year panels in which interviewing begins in February of the first year will be asked for information about the period from October of the preceding year (year 0) through January of year 1 in their first interview wave. The fourth rotation group under this scheme will be asked for information about the period from January through April of year 1 in their first interview in May. Under a design in which interviewing begins in March of year 1, the fourth rotation group will be asked for 5 months of information, from the period January through May of year 1 in their first interview in June, in order to obtain complete calendar information for the first year.

There are several ways of dealing with this problem.[23] One alternative is to impute the missing data, but this approach will introduce nonsampling error into the estimates. Another alternative is to base annual estimates for that year on the other panel that is in the field and not combine the two panels. However, this approach means that annual estimates for years in which a panel ends will have increased sampling error because they are based on just one panel. Still another alternative is to conduct an extra interview to pick up the missing data, but this approach will be costly.

[23] A related problem is that there will be no annual income or tax information collected for the last calendar year of a panel by means of a subsequent topical module. (In the current design, the seventh and eighth interviews, which result in three panels in the field for most of each year, serve, respectively, to complete the monthly data for the second calendar year of a panel and to obtain the annual income and tax information for that year.) The annual income roundup provides useful information with which to validate the monthly amounts but is not used directly in estimates, so that its omission for the last year is not serious. Also, we urge in Chapter 3 that ways be found to obtain most tax information from administrative records rather than from the survey. Even if this is not possible, it should be possible to readily impute tax information for the last year, given that the respondents will have provided such information for several prior years.

A fourth possibility that we think may have merit is to conduct a truncated extra interview that collects just the core information for the months that are missing. A variant of this approach that could be even more cost-effective would be to tinker slightly with the interviewing scheme. For instance, under design B, the interviewing scheme could be altered as follows (see the column labeled "Begin in March" in Table 4-3 for illustration):

- start interviewing in March instead of February of year 1, which reduces the amount of unneeded data that is collected for the prior year and has the result that two of the four rotation groups will have complete data for all 4 years (the last interviews for the third and fourth groups will occur in January and February, respectively, following year 4);
- for the fourth rotation group, which will not have its first interview until June of year 1, obtain 5 rather than 4 months of data, so that this group has complete data for the first calendar year;[24]
- use a centralized computer-assisted telephone interviewing (CATI) procedure (or have the regular interviewers phone from home) in January–February following year 4 to collect just the core data that are missing for the first and second rotation groups (i.e., November–December income for the first group and December income for the second).

Assuming that monthly rotation groups continue to be used, the collection of complete data for the last calendar year of each panel is a complicating factor in each of the alternative designs. However, we believe that a cost-effective solution can be found.

Recommendations

After consideration of the pros and cons of alternative designs for SIPP from the standpoint of data quality and utility within the assumed budget constraint of 160,000 interviews per year, we recommend that the Census Bureau discontinue the current SIPP design in favor of implementing design B. (We discuss issues of making the transition from the current design to our recommended design in Chapter 5.)

> ***Recommendation 4-1:*** **SIPP should be redesigned as an ongoing panel survey in which each panel lasts for 4 years and has 12 4-month interviews, with a new panel introduced every 2 years. The sample size for each panel should be increased over that for the current design**.

[24] The complication arising from having different reference period lengths for different rotation groups should be manageable with a CAPI mode of data collection, as is planned for SIPP. Also, the extension of the first-wave reference period for the fourth rotation group to 5 months may not introduce much additional reporting error, given that the period starts at the beginning of the year—a well-identified reference point for many people.

We believe design B represents the best tradeoff among the design elements of number of interviews, reference period length, overall panel length, frequency of introduction of new panels, and sample size. In brief, this design:

- retains the 4-month reference period length, which may be critical to the SIPP goal of providing high-quality intrayear data on income and program participation;
- extends the panel length to 4 years, which provides additional time for observation of income and program dynamics (having 12 instead of 8 interviews also affords the opportunity for additional topical modules; alternatively, some interviews could forgo topical modules in order to reduce respondent burden);[25]
- reduces the frequency of introduction of new panels to every 2 years, which relieves the pressures on the Census Bureau of dealing with three panels each year—one of them new—without, we believe, adding materially to the biases in cross-sectional estimates; and
- increases the sample size for cross-sectional and longitudinal analysis: the initial sample of 26,700 households per panel is double the size of the 1985–1989 SIPP panels and one-third more than the 20,000-household size originally planned for SIPP.

We heard strong arguments for extending the panel length and increasing the sample size even more than in design B. Certainly, increased panel length would make SIPP even more useful for policy-relevant analyses of income and program dynamics. However, designs C and D achieve an expansion in panel length (and sample size) partly by extending the reference period from 4 to 6 months, a change that we are not willing to endorse without further research. Also, these designs reduce the frequency of introduction of new panels more than may be desirable, given the need to maintain the quality of cross-sectional estimates. Again, we argue that design B, on the evidence available to date, represents the best tradeoff among competing design elements.

However, because extending the reference period length would provide the opportunity for longer and also larger panels, we believe that research on recall effects should be a high priority for the Census Bureau.[26] We urge the Bureau to conduct research on recall period length so that information becomes available on a timely basis to consider further design changes to SIPP even before the next major scheduled 10-year redesign.

[25] Chapter 3 provides suggestions of how the current topical modules might fit into the new design.

[26] Particularly with longer panels, efforts to improve weight adjustments for longitudinal and cross-sectional estimates should also be a priority; see Chapter 7.

Recommendation 4-2: **The Census Bureau should conduct research on the data quality effects of 6-month versus 4-mouth reference periods in SIPP so that information is available to consider other possible design changes at a later date, including the possibility of further extending the length of SIPP panels beyond 4 years**.

We believe that the desirability of evening out the workload of the Census Bureau field staff and of keeping each interview as close as possible to the reference period argues for retaining a monthly rotation group scheme. However, the Census Bureau will need to consider the pros and cons of alternative ways to obtain complete data for the fourth calendar year of each panel for the affected rotation groups. It will be important to determine a cost-effective solution in order to enable SIPP to provide a reliable time series of cross-sectional estimates of income and program participation. We note that the Census Bureau will have 4 years to work out a solution after the new design is implemented and thereafter will only have to address the problem every 2 years.

In addition, we are concerned that a rigid procedure for closing off efforts to follow up hard-to-track cases at the end of each month may contribute to attrition. In general, we believe that the Census Bureau should investigate ways to reduce attrition on the part of mover households, which might include allowing interviewers additional days beyond the end of each month for follow-up, assigning all hard-to-track cases to a small group of specially trained field staff, or other means.

Recommendation 4-3: **The use of a monthly rotation group structure should be retained for SIPP. The Census Bureau should consider cost-effective means to obtain the core data for the last calendar year of each panel that will otherwise be missing for some months for some groups. The Census Bureau should also investigate ways to minimize the loss of mover households that may result in part from the closeout of follow-up at the end of each month**.

OVERSAMPLING IN SIPP

As noted above, the sample for each SIPP panel is designed to cover the population in the 50 states and the District of Columbia, excluding only inmates of institutions and those members of the armed forces living on post without their families. The design is a multistage, clustered probability sample that, with the exception of the 1990 panel, does not oversample specific population groups.

The first stage in the sampling process for SIPP (as for the March CPS and other household surveys conducted by the Census Bureau) is to use decennial census data to divide the entire United States into primary sampling units (PSUs) of larger counties and independent cities and groups of smaller counties. The larger PSUs are then selected with certainty for the sample; smaller PSUs are grouped into strata and subsampled (174 PSUs were selected for the 1984 SIPP panel and 230 for subsequent panels). The final stages in the sampling process are to obtain addresses in each sampled PSU and select clusters of two to four households for interviewing. The addresses represent a combination of decennial census addresses and addresses that are obtained through field canvasses. The latter include addresses in areas of new housing construction and in areas for which the census address list was incomplete. The 1970 and 1980 censuses formed the basis of the sample design and selection of census addresses for the 1984 and 1985–1994 SIPP panels, respectively (see Jabine, King, and Petroni [1990:Ch. 3] for additional information).

The Census Bureau is currently developing a new sample design for SIPP, based on the 1990 census, that will be implemented beginning with the 1995 panel. The necessary research has been completed to identify and select the PSUs, and work is proceeding on other aspects of implementation.

A new feature of the design will be a provision to oversample low-income households (see Singh, 1991). This change is at the behest of SIPP users. In 1988–1989, the Census Bureau held several meetings with data users who were concerned about the effects of sample size reductions in SIPP due to budget cuts. Users expressed an interest in a larger sample size for a number of subgroups, including (in priority order) low-income people, the elderly, blacks, Hispanics, and the disabled. Several options for oversampling were discussed.

Given budget constraints, it became apparent that it would be extremely difficult to implement an oversampling scheme in SIPP prior to the 1995 redesign. To help users in the meantime, the Census Bureau decided to curtail the 1988 and 1989 panels (to six and three waves, respectively), in order to have funds to field a larger sample for the 1990 panel, including a supplemental sample that was continued from the 1989 panel (see section above on the current SIPP design).

We generally support the goal of oversampling low-income groups in SIPP, which accords with the survey's focus on people who are economically at risk. However, we believe that the Census Bureau's scheme for the 1995 redesign (see below) is not likely to be as effective as it is projected to be in achieving this goal. We present several alternative means of oversampling that we believe the Census Bureau should explore.

Using the 1990 Census for Oversampling in SIPP

In planning for the 1995 sample redesign, Census Bureau staff conducted research on methods for obtaining a larger sample for the low-income population, defined as households with annual income below 150 percent of the poverty threshold. The research also investigated ways to minimize the increase in the variance of estimates for people aged 55 and older that would be expected to result from oversampling the poor and near-poor (given the lower poverty rate for older than for younger people).

The Census Bureau decided to adopt a methodology from Waksberg (1973), which creates two strata within each PSU. The first stratum has a high concentration of the group of interest and is oversampled relative to the second stratum, which has a low concentration of the group of interest. For the SIPP redesign, the 1990 census address list within each PSU will be divided into strata of low-income and higher income households. For households in the 1990 census list that answered the long-form questionnaire (about one–sixth of the total), the determination of income above or below 150 percent of poverty will be made directly. For households that answered the short form, proxy characteristics will be used to make the classification: specifically, the low-income stratum will include female-headed households with children under 18; low-rent households in central cities of metropolitan statistical areas; black and Hispanic households in central cities; and black and Hispanic households in which the head is under age 18 or over age 64. For those blocks of the PSU for which there is no complete census address list (the area frame portion of the sample), the classification will be made using aggregate census information on the proportion of the population below 150 percent of poverty in each block. The low-income and higher income strata in each PSU will be sampled at higher and lower rates so that an oversample of households in the low-income strata is obtained. The extent of oversampling will be restricted by the requirement that the sampling error of estimates for persons aged 55 and older not increase by more than 5 percent.

When the new sample design is introduced in 1995, it is expected that the census address portion of the sample will constitute about 70 percent of the total and the area frame portion about 20 percent. The remaining 10 percent will represent addresses of new construction, for which no oversampling will be performed; obviously, over the course of a 10-year period, this category will grow as a proportion of the total. Moreover, one can confidently expect that the efficiency of the design will decline from what would have obtained in 1990 because of the mobility of the population: for example, by 1995, 1998, or 2003, a low-income household may occupy a sample address that was drawn from the higher income stratum and vice

versa. Also, even when the same household is present in 1995 or 1998 as in 1990, the household may have changed classification from low to higher income or vice versa. The question is how great a deterioration in the efficiency of the design will occur over time.

The Census Bureau conducted research with data from the 1980 census for 27 PSUs to determine the extent of the gains that could be expected from oversampling low-income households in the 1990 census address portion of the sample, assuming that the design was implemented immediately after the census. The results (Singh, 1991:Table 1) showed gains (i.e., decreases in sampling error) for many subgroups of interest to users, such as poor blacks and Hispanics. The Census Bureau also conducted research with data from the American Housing Survey (AHS) on the effects of time on the efficiency of the design and estimated very little increase in sampling error 5 to 15 years after the census date (Singh, 1991:Table 3). The Bureau estimated somewhat higher but still relatively low increases in sampling error due to uniform sampling in the new construction frame and the assumption that stratification will be less efficient at the block level in the area frame compared with the census address frame (Singh, 1991:Table 4).[27]

Although this research appears encouraging about the proposed oversampling scheme, we remain skeptical. There were many limitations to the research, such as the use of only 27 PSUs from just a few states in the 1980 census analysis and the inability of the analysts to replicate fully the proposed design with the AHS data (households were classified on the basis of proxy characteristics rather than on the basis of their income-to-poverty ratio). We believe that further research on the extent to which the household poverty classification assigned to an address in the census predicts the poverty classification of the household at that address 5 to 15 years later is needed to support the Census Bureau's proposed oversampling scheme. For example, it could be useful to conduct research on the extent to which the household poverty classification of addresses in the 1985 SIPP panel corresponds to the 1980 census classification.[28]

There is also no opportunity to change any aspect of the design because the Census Bureau plans to draw 10 years' worth of sample for SIPP (and other household surveys) at the same time. Hence, the samples for all of

[27] Chu et al. (1989:2.9–2.11) found that oversampling geographic areas with relatively high percentages of low-income households was not very successful in reducing the sampling errors for estimates of the poverty population in the National Health and Nutrition Examination Surveys. They attributed this outcome to the fact that many poor people live in nonpoverty areas and vice versa.

[28] We understand that a match of 1985 SIPP and 1980 census address lists is not likely to be operationally feasible, and we strongly urge the Bureau to take steps to ensure that it will be possible to perform a match of 1995 SIPP and 1990 census lists.

the panels from 1995 to 2005 will be drawn in the same way, using the same characteristics to determine the two strata within each PSU. The only exception is that provision has been made to jettison the oversampling and implement a uniform sampling rate for any SIPP panel in the 1995–2005 period if that is later viewed as desirable.

Even assuming the benefits of the proposed scheme, we believe that there are some technical ways in which it could be improved. For example, if the object is to oversample low-income households in SIPP, then the census address portion of the sample could be drawn exclusively from the long-form respondents to the 1990 census, which represent a very large fraction (1 in 6) of the total population. Selection of PSUs on the basis of poverty-related characteristics could also be beneficial. We are pleased that the Census Bureau decided to adopt the same oversampling rate across all PSUs, instead of determining PSU-specific rates as in the original plan that we reviewed. The latter procedure would have allowed the Census Bureau to better control the size of the workload across PSUs, but it would have resulted in variations in the weights for addresses sampled within each stratum—low-income or higher income—across PSUs. (Such weight variations are likely to reduce the sampling error gains.) Also, those PSUs with the highest percentages of low-income households would have had proportionately less oversampling of the low-income stratum compared with wealthier PSUs.

More broadly, we urge the Census Bureau (and the user community) to be clear about the target population in considering the use of oversampling in SIPP. For the redesign, the Census Bureau is essentially defining a cohort of low-income people on the basis of their previous year's household income-to-poverty ratio. However, many people with low incomes at wave 1 will move into a higher income category over the life of a SIPP panel and vice versa (see Short and Littman, 1990; Short and Shea, 1991). Instead of a larger sample for a low-income cohort at the start of a panel, it may be that users would prefer to have a larger sample for people who are at risk of experiencing a spell of low income at any time during a panel or at risk of experiencing a long spell of low income. Different oversampling criteria would be required, depending on the definition of the target population: for example, a combination of variables, such as family type, ethnicity, and previous year's low-income status, may be a better predictor of long-term economic disadvantage than the latter variable alone.

Screening as Another Method of Oversampling

An alternative method for oversampling the low-income population in SIPP is to use a screening interview close to the time when a new panel is to be introduced. This approach could be used to refine the proposed 1990 cen

sus-based approach (if larger-than-needed samples were drawn from the census list) or serve as a substitute for it.

The advantage of screening is that it provides information on which to draw a sample that is close in time to the introduction of the survey and thereby is likely to permit more effective oversampling since much less mobility or change in classification will have occurred in the interim. Also, screening offers flexibility —the criteria for sampling can be changed as needed (e.g., some panels could oversample minorities instead of low-income households). In addition, screening can be applied uniformly to the entire sample, instead of using different procedures for the census long-form respondents, census short-form respondents, area frame address, and new construction address segments of the sample. In the context of oversampling low-income households while not worsening the estimates for older people, screening should make it possible to develop a more efficient approach to this problem (e.g., also oversampling elderly higher income households).

On the negative side, screening imposes the costs of conducting an interview for a larger number of households than will be selected for the survey, which may necessitate a reduction in the overall sample size. It may also add costs by lessening the ability of the Census Bureau to equalize interviewers' workloads across PSUs (e.g., the screening might result in sample sizes that overtax some interviewers while underemploying others, with little time to make adjustments before the start of the survey).

However, these costs must be viewed in the context of the entire survey, which, in the case of SIPP, will amount to 12 interviews under the proposed redesign. There are also ways to reduce costs. It may be possible to conduct much of the screening using a centralized CATI system that eliminates interviewer travel costs.[29] Another way to reduce costs is to treat the screening interview as wave 1 of a SIPP panel instead of as an added interview. In a CAPI environment, the sampling criteria could be built into the interview so that the full wave 1 interview could be administered on the spot to those households selected for the sample.

Another problem with screening, when the purpose is to identify households on the basis of income or poverty, concerns measurement error. Screening interviews are typically short in order to reduce costs. However, studies have shown that respondents tend to underestimate their income in response to brief, general questions (e.g., Chu et al., 1989; Moeller and Mathiowetz, 1990), so that a short screening questionnaire may erroneously classify higher income households as low income, thereby reducing the gains from the oversampling. In addition, some low-income households may be falsely

[29] Telephone numbers would be obtained from directories that are organized by address. Some personal screening would also be required for addresses with no telephones or with an unlisted number.

classified as higher income based on their responses to the screening questionnaire. Such households will thus not be oversampled. There is also the issue, noted above, of defining the target population—for example, people at risk of a long-term spell of low-income during a SIPP panel rather than a low-income cohort—and defining appropriate variables to use in the screening questionnaire. Despite the problems of a screening approach, we believe that the potential benefits in terms of a more efficient sample design and greater flexibility merit a careful examination of its cost-effectiveness for oversampling the low-income population in SIPP.

> ***Recommendation 4-4:*** **The Census Bureau should investigate alternative methods of oversampling the low-income population in SIPP, including the use of screening interviews as a possible complement to or substitute for an approach based on using information from the 1990 census**.

Increasing Sample Size by Extending Panel Length

The Census Bureau's census-based plan and the use of screening do not exhaust the possible approaches for oversampling low-income households or other subgroups in SIPP. Another possibility is to extend the length of one or more SIPP panels for subgroups of interest. This strategy both provides additional longitudinal information for the subsampled cases and makes it possible to treat them as an addition to the sample for the next panel (see David, 1985a). This approach was followed in the 1990 panel, for which the sample includes households from the 1989 panel that were headed by blacks, Hispanics, and female single parents as of wave 1 of that panel.

Users have often expressed interest in periodically extending the length of SIPP panels for people who may be at economic risk because of experiencing a divorce or job loss or for people who benefit from programs or have certain demographic characteristics (e.g., single parents). We are not now recommending that such an approach be built into SIPP because we believe that the Census Bureau confronts a very large agenda in implementing the proposed redesign of 4-year panels introduced every 2 years together with computer-assisted interviewing and an improved database management system (see Chapter 5). However, we do believe that the concept has merit and should be an option for the future. Hence, we urge the Census Bureau to take the steps that are necessary to permit this and related options to be considered for SIPP at some future date. (A related option, which would add longitudinal information although not necessarily increase the sample size for the next SIPP panel, would be to return at annual or longer intervals to selected cases.)

One such step involves informed consent. Respondents need to be informed at the outset that there is a possibility that they may be asked to answer further questions after the closeout of their SIPP panel. If such consent is not sought, then, under current views about the obligations of statistical agencies to their respondents, it would probably not be possible to later impose this additional burden on them.

Another step involves setting in place procedures for tracking respondents after the end of a panel. Particularly if it appears desirable to revisit the subsampled groups at less frequent intervals (e.g., yearly), the Census Bureau will need to have good procedures developed to keep in touch with them so as to minimize sample loss.

> ***Recommendation 4-5:*** **The Census Bureau should take steps to ensure that it will be possible to extend the length of SIPP panels for selected subgroups of interest or to follow them up at a later date, should such options be desired to obtain increased sample size and longitudinal information**.

Multiple-Frame Samples

Yet another way to obtain an additional sample for subgroups of interest in SIPP is to develop multiple-frame samples, that is, samples of households together with cases that are drawn from one or more types of administrative records—for example, program records, tax records, or employer records.[30] Augmenting a household sample with cases from administrative records can offer considerable benefits. First of all, such a strategy may be a very efficient means of oversampling such subgroups as program recipients. Also, providing that confidentiality and data access issues are resolved, additional records data could be obtained for the administrative cases, not only concurrent with but also preceding and following the time span of the survey interviews. Analysis of the relationships of the records data and survey responses for the administrative cases could serve a number of useful purposes. For example, in a multiple-frame sample of program recipients, the records information could provide the basis for imputing program characteristics to recipients in the household sample for use in improved policy models for program analysis and simulation of program changes.

The drawback to the multiple-frame approach for increasing sample size and information for subgroups of interest is that a number of problems impede its ready implementation. Many of the problems are operational in

[30] A sample of households together with cases drawn from one source of records is termed a dual-frame sample.

nature.[31] Permission for the records must be obtained, which can be time-consuming and difficult to achieve. In the case of programs that are state administered (e.g., AFDC and food stamps), there are differences across states in access rules and in the extent to which the records are appropriately computerized so that access is operationally feasible. At this time, only a small number of states have good computerized records for such programs as AFDC; hence, it would not be possible to develop a national multiple-frame sample for these programs. Also, the Census Bureau itself may not be able to have access to an entire administrative file for purposes of sample selection, in which case it would have to rely on the responsible agency's ability to properly implement a specified sampling procedure. Finally, the addresses in the sampled records may not be current, in which case a tracing operation, with likely problems of its own, would be necessary (see Logan, Kasprzyk, and Cavanaugh, 1988).

A multiple-frame approach poses technical difficulties as well, including the determination of appropriate weights for the combined sample. Taking the simple case of a dual-frame sample, some fraction of the household sample will have a probability of selection in the sample drawn from records, and all members of the records sample will have a probability of selection for the household sample. Consequently, it is necessary to develop weighting adjustments to compensate for dual selection probabilities, and this requires identifying those members of the household sample who are included in the administrative frame. One way to identify these members is to rely on respondents' reports of their status at the time of drawing the administrative sample. (For example, in the case of a dual-frame sample including SSI cases drawn the August before the start of a SIPP panel, the questionnaire would ask about receipt of SSI in the preceding August.) A possibly more reliable approach is to match the household sample members with the administrative frame. However, this procedure adds a step to the data processing that could cause delays in the release of data files and reports. (The 1979 ISDP multiple-frame sample initiative came to grief on this very point—usable, fully weighted data files were not completed before the program ended; see Kasprzyk [1983].)

In addition, there are technical issues to resolve with regard to the type of sample to draw from administrative records (assuming that the sample can be properly selected.) In the case of a program such as AFDC, one needs to decide whether a cross-section sample or a sample of new entrants is appropriate. A cross-sectional sample will overrepresent longer term

[31] Record-check studies, including forward record checks and full record checks, face many of the same operational problems: see, for example, the discussion in Marquis and Moore (1990b) of the difficulties in carrying out the SIPP record-check study, which obtained records for eight federal and state programs.

recipients. If new entrants are sampled, the decision must be made as to the time period or window during which cases are eligible for selection (a month, year, or other period). Ideally, for program analysis, one would like to sample people who are eligible for programs, not just participants, but there is no record system available to do this.

The usefulness of a multiple-frame or dual-frame sample for SIPP depends very much on user interest in particular population groups, such as program recipients. We suggest that a decision to adopt this means of oversampling, particularly in light of the operational and technical difficulties it would pose, should be contingent on the support and cooperation of an interested agency. We encourage the Census Bureau staff to keep up to date on the methodology of multiple-frame samples, so that SIPP can be responsive to requests from agencies that want to obtain a larger sample size and information for a particular population by adding a component to the SIPP sample that is drawn from their records.[32]

FOLLOWING RULES

At present, SIPP follows original sample adults—that is, all people aged 15 and older who resided in an interviewed household in wave 1—for the life of a panel or until they leave the universe or drop out of the survey. SIPP also keeps track of original sample adults who enter institutions and interviews them if they return to a household setting.[33] Adults who join the household of an original sample adult after wave 1, are followed only so long as they continue to reside with an original sample member. Similarly, children, regardless of whether they were present in wave 1, are followed only so long as they reside with an original sample adult. We believe that the utility of SIPP for important research and policy concerns would be enhanced by changing the following rules for two groups—all children and children and adults who enter institutions.

Many users expressed great interest in having more information with which to analyze children's changing circumstances (see Chapter 2). Fewer and fewer children have a stable family or economic situation throughout their childhood, and more and more children are experiencing economic and social distress. Extending the length of SIPP panels will make the survey

[32] The report of the ISDP special frames study (Logan, Kasprzyk, and Cavanaugh, 1999), which was designed to test the feasibility of sampling and locating respondents from administrative records, provides pertinent information for consideration of multiple-frame samples in SIPP; see also Kasprzyk (1983).

[33] Tracking the institutionalized was not originally intended for SIPP but was initiated in May 1985 for the 1984 panel and in October 1985 for the 1985 panel (Jean and McArthur, 1987).

more useful for analyzing children's circumstances over time. However, the current following rules preclude using the survey to obtain a complete picture of children's family dynamics. For example, in wave 1 of the 1984 panel, 24 percent of children under 15 lived with only one parent or with another relative (McArthur, Short, and Bianchi, 1986:Table 6). Any of these children who subsequently moved in with an adult not part of the original sample (e.g., the other parent or another relative) would not be tracked under the current following rules. Similarly lost to follow-up would be children who went to live with, say, a grandparent following a divorce, or children born to a marriage between a sample and nonsample adult who stayed with the nonsample parent following a marital separation.[34] The numbers of such events will increase with longer panels, but the current following rules will preclude analysis of them. We urge the Census Bureau to treat all children present in interviewed households at wave 1 together with children born subsequently to original sample mothers as original sample members who are followed throughout the life of a panel. When original sample children move into a household of nonsample members, information would be obtained about them and about other members of their new household.

There is also user interest in learning about both children and adults who become institutionalized. SIPP is not the appropriate vehicle to provide information about the institutionalized population as such, but because the survey follows people over time, it naturally provides a sample of entrants to all types of institutions (e.g., mental health treatment facilities, nursing homes, prisons). Extending the current practice of following original sample members who enter institutions to include children and, in addition, obtaining at least some limited information for them would enhance the usefulness of SIPP for analysis of socioeconomic well-being in the United States. For example, for fuller analysis of some government programs, it is important to include institutionalized people who can still receive benefits under such programs as social security and SSI.[35] It would also be useful to know about other sources of income for institutionalized people, such as private pensions, asset income, and transfers from relatives.

[34] Of children present in all 8 waves of the 1984 SIPP panel who lived with both parents in wave 1, 7 percent had experienced a change in the marital status of their parents by the end of the panel (Bianchi and McArthur, 1991:Table A). This is likely a lower bound estimate of children at risk of a marital separation to the extent that the weights do not adequately adjust for the higher attrition rates of children in nonintact families (McArthur, Short, and Bianchi, 1986:Table 6).

[35] Coder (1988:Table 9) found that 4 percent of SSI recipients in the first month of the 1984 SIPP panel had entered an institution by the end of the panel, as was also true for 3 percent of recipients of social security and veterans' payments and 1 percent of private pension recipients.

These data would be useful for analysis in their own right and also in conjunction with the data for the people in the household they left.

We do not offer detailed suggestions about the kinds of data to collect for original sample members who enter institutions during the course of a SIPP panel, nor even about the preferred data collection mode (e.g., some items might best be obtained from the institution and others from the family). However, we do urge the Census Bureau to investigate the needs of users for information about institutionalized persons that fall within SIPP's goal of providing improved data on economic resources and assistance programs, particularly for people and families who may be economically at risk.

Recommendation 4-6: **SIPP panels should treat all children who reside in interviewed households at the first wave and also children born during the course of a panel to original sample mothers as original sample members, who are followed if they move into households without an original sample adult. SIPP panels should also continue to follow and collect data for both original sample adults and children if they move into institutions.**

5

Data Collection and Processing

In this chapter we consider the operational aspects of SIPP—how the data are collected and processed. Survey operations—as distinct from design, evaluation, and analysis—represent by far the largest component of total survey costs. Moreover, the care and efficiency with which a survey is operated directly and substantially affect the quality and timeliness of the data. Hence, no assessment of SIPP would be complete without a review of SIPP's present operations and the Census Bureau's plans for future changes.[1]

CURRENT OPERATIONS

Table 5-1 shows a rough distribution of SIPP costs by function as a reference for our discussion of SIPP interviewing and data processing operations. Field costs that are associated with the interviewing staff (travel and communications, payments to interviewers, and training) amount to 41 percent of the total. Data processing costs—of which about two-thirds are

[1] Our evaluation of SIPP operations and plans for future improvements is greatly indebted to the work of panel members Martin David and Randall Olsen and to Carol Sheets, head of the data processing staff for the National Longitudinal Surveys of Labor Market Experience (NLS) at Ohio State University. These people visited the Census Bureau headquarters twice and developed a background paper with assessments and recommendations; Dr. Olsen also visited the Census Bureau's Chicago regional office. They and the entire panel are very appreciative of the wholehearted cooperation of Census Bureau staff during the site visits and in response to requests of the panel for information about SIPP operations.

associated with the regional offices and one-third with headquarters—amount to another 27 percent of the total annual expenditure of $31 million for SIPP.

TABLE 5-1 SIPP Budget, by Major Function, Fiscal 1992 (in percent)

Function	Percent of Budget	
Sample design and selection	6.0	
Questionnaire development and materials	3.0	
Field	40.8	
Travel and communications		7.2
Payments to interviewers (420 people)		29.4
Training		4.2
Data processing	27.2	
Regional office data entry (keying)		4.2
Regional office clerical operations		12.0
Other regional office activities		3.0
Data processing (headquarters)		8.0
Research and evaluation	10.0	
Data analysis, reports, and printing	8.0	
Data dissemination	3.0	
Administration	2.0	
Total costs	100.0 ($31.0 million)	

NOTE: Distribution of costs is before institution of maximum telephone interviewing in February 1992.
SOURCE: Estimates from Census Bureau staff.

Interviewing

From the beginning, SIPP was expected to involve labor-intensive interviewing procedures in order to obtain high-quality responses to detailed questions on complex aspects of households' socioeconomic status and wellbeing. For the 1984–1990 panels, face-to-face interviewing has been the preferred mode and the one used in most cases. Telephone interviewing has been permitted to follow up for information not obtained in face-to-face interviews, to interview people who would not or could not participate otherwise, and to interview sample people who moved to locations more than 100 miles from a SIPP primary sampling unit area. For the 1984 and 1985 panels, about 5–6 percent of interviews were conducted by telephone, with the proportion increasing from the second through the final wave of each panel (Jabine, King, and Petroni, 1990:20).

SIPP interviewers collect information from respondents using paper

and-pencil techniques. At each visit, the interviewer updates a large control card (containing basic demographic characteristics of household members, housing structure characteristics, telephone numbers, and some other items) and completes a bulky questionnaire for each adult aged 15 and older, using numerous flash cards to aid respondents. The questionnaire differs across waves because of the inclusion of different topical modules; the wave 1 questionnaire also differs from all other waves because of the use of dependent interviewing for many items after wave 1 (i.e., reminding respondents of their answers in the prior wave and updating the information rather than asking each question afresh).

The questionnaires are highly structured, with complex skip patterns and a good deal of redundancy as a way of jogging respondents' memories and providing a basis to check for inconsistencies or impute missing information. Interviewers must transcribe many items, either during the course of the interview or prior to the interview (to capture needed information from the previous wave). For example, each income source mentioned in the recipiency section must be coded onto the income source summary at the back of the questionnaire. For each code on that summary, the interviewer asks questions about income amounts received during the 4-month reference period.

Despite the magnitude and complexity of the task, interviewing in SIPP has proceeded quite smoothly. At the outset of the program, there were fears that the interviewers (and respondents) could not cope well with such a long and involved survey. Indeed, the turnover rate for interviewers was initially high—32 percent in fiscal 1986—but in fiscal 1988 the rate was down to 18.5 percent, in comparison with 20–25 percent for other major surveys conducted by the Census Bureau (Jabine, King, and Petroni, 1990:24). Interviewers have also become more experienced: in fiscal 1986 only about 33 percent had 3 or more years of survey experience; in fiscal 1988 almost 60 percent of the interviewers had that much experience. Continuous training is provided to SIPP interviewers, and their work is monitored in several ways (e.g., by personal observation and reinterview). Often their reactions are sought about the success of one or another experiment and about proposed changes in procedures (e.g., greater use of telephone interviewing).

Although the SIPP interviewers are highly professional in their work, it is also evident that the answers they elicit from respondents are often flawed (see Chapter 3). It appears likely that the structure of the questionnaire contributes to such data quality problems in SIPP as underreporting of asset income and confusion among program names. Also, paper-and-pencil techniques with such a long, involved questionnaire inevitably lead to inefficiencies and introduce opportunities for interviewer as well as respondent errors (e.g., transcribing errors and mistakes in following the skip patterns).

Recently, the Census Bureau decided to switch to a mode of maximum

telephone interviewing as a cost-cutting measure. Beginning in February 1992, waves 1, 2, and 6 of each SIPP panel are to be conducted as before by face-to-face interviewing to the extent feasible; however, the remaining waves are to be conducted by telephone, again to the maximum extent feasible. The telephoning and personal visits will be carried out by the same interviewers using the same questionnaire, with the interviewers making phone calls from their homes.

The Census Bureau conservatively expects to save about $500,000 per year from the switch (roughly 4 percent of total costs associated with interviewing—see Table 5-1), due to reductions in travel costs and the time of interviewers.[2] The plan is to use the savings to improve SIPP's data products and dissemination program. The Bureau hopes that there will be little loss of data quality.[3] Experiments conducted with maximum telephone interviewing in 1985–1986 found relatively few differences in nonresponse rates and analytical measures between the experimental and control groups (Gbur and Petroni, 1989; Gbur, Cantwell, and Petroni, 1990). However, there was some evidence, particularly for blacks, that maximum telephone interviewing produced lower estimates of the poverty rate and other measures related to low income and receipt of means-tested program benefits. Also, the experiments covered only two successive waves, so no information is available on mode differences over a longer period.

Regional Office Operations

The Census Bureau's 12 regional offices play an important role in processing SIPP data. Clerks check the completed questionnaires mailed in by the SIPP interviewers for errors and omissions and assign geographic codes for sample people who moved. Data entry clerks key the information from the questionnaires, using software that checks for the presence of identifiers and selected control card data items. Batches of keyed questionnaires are verified, and data files for accepted batches are transmitted electronically to Census Bureau headquarters in Suitland, Maryland. Quarterly reports on verification results indicate that error levels in the keying operations are very low (Jabine, King, and Petroni, 1990:81).

[2] Interviewers are paid by the hour. In order not to reduce the pay of interviewers already on the staff, the Census Bureau planned to hire fewer new interviewers than would otherwise be needed for the 1992 panel, which has a larger initial sample size than the 1991 panel.

[3] The program to improve the data products is in the formative stages, and so there is a lack of available detail. This makes it impossible to determine whether the $500,000 will be too much, too little, or about right to support these future changes. Likewise, it is impossible to determine whether these future improvements justify the possible risk to data collection of maximum telephone interviewing.

Errors in the data that are diagnosed in Suitland are returned to the regional offices for correction, if possible. Regional editors are given little latitude to use judgment or knowledge of the case to edit problematic cases. Calls to interviewers to resolve problems are rare, and follow-up calls to respondents even more so.

Home Office Operations

The Census Bureau's home office in Suitland, Maryland, handles all subsequent editing and preparation of SIPP data files, with the exception of coding of industry and occupation, which is accomplished at the Bureau's processing facility in Jeffersonville, Indiana. Data for each wave of each panel are processed separately. Steps in data preparation include (see Jabine, King, and Petroni, 1990:80–81):

- checking each file transmitted from the regional offices to ensure that all expected cases, both interviews and noninterviews, are received;
- transmitting keyed verbal descriptions of occupation and industry to the Jeffersonville facility for coding;
- imputing data for noninterviewed people in interviewed households (Type Z nonresponse);
- performing extensive consistency edits within and between sections of the questionnaire, between the control card and the questionnaire, and among responses for people in the same family and household;
- performing extensive sets of edits and imputations on each section of the questionnaire, including topical modules, to ensure that responses appear when they should and to impute missing values;[4]
- developing recodes based on combinations of data items to add to the data records;
- checking the accuracy of geographic codes;
- imputing an estimated household size for households that moved and could not be located, to use in the calculation of weights for movers;
- calculating cross-sectional weights for each month in the wave; and
- reformatting records and altering some data items to protect confidentiality as input to microdata files that are suitable for public release.

Later, after all waves of a panel are processed, the data for selected items are further edited for consistency over time, longitudinal weights are developed, and a public-use longitudinal file constructed. Changes due to longitudinal edits are not carried over to the cross-sectional wave files.

[4] When edit programs diagnose a problem, that problem is resolved mechanically. While operationally efficient, in some cases this approach may degrade data quality.

Although SIPP home office processing operations have settled down and are currently running relatively smoothly, it is no overstatement to say that data processing at Suitland has been the Achilles heel of the SIPP program. When SIPP began in a great rush, there was no time to evaluate the processing system that had been used for the Income Survey Development Program (ISDP) or think through the computing requirements for a continuing longitudinal survey of the size and scope of SIPP. The Census Bureau modified a system developed for the Current Population Survey (CPS) to use for SIPP, which treated each wave of each panel as a separate cross-section and was highly inflexible. This decision was dictated by outmoded hardware and software at Suitland (problems that generally affect data processing at the Census Bureau) and the fact that the programming staff were trained primarily in low-level assembly and procedural languages. SIPP had to contend with the limited disk space available on the Suitland office's UNISYS equipment (being phased out), necessitating slow and outmoded tape-to-tape operations for many processing steps, and with the limitations of FORTRAN for editing and cleaning programs. For database management, the SIPP staff used the internally developed system, RIM, that lacked features of modern database management systems.

Initially, the SIPP processing staff were able to keep up with the flow of data. The first report from the 1984 panel (providing measures of income and program participation for the second quarter of 1983) was released in September 1984, as was a public-use microdata file for wave 1—only 8 months after the last month of data collection. However, as the data continued to pour in from the field, month after month, the processing system buckled under the strain. And the initial success in prompt release of microdata files was undermined by user reports of errors, which necessitated the recall of most of the 1984 panel cross-section files.[5] Final files for the core information from waves 1–9 of the 1984 panel were still released on a reasonably timely basis—about 13 months on average after the last month of data collection. However, topical module files were delayed, with an average release date of about 22 months after data collection; and the 1984 longitudinal panel file was not released until April 1988, or 20 months after the last month of data collection.

The introduction of a new panel each year added greatly to the strain on the data processing staff, particularly given the need to rewrite large sections of computer code to keep up with changes to the questionnaire and to other aspects of the survey—changes that were inevitable for a new, complex data collection program. As a result, delivery schedules deteriorated

[5] Recalls were necessitated not only because of errors, but also because of design flaws. For example, wave 1 public-use files omitted the employer number, an identifier essential to establishing continuity of jobs from wave to wave.

greatly. The Census Bureau did not publish any reports from the 1985 or later panels until 1990 (see Chapter 6). Microdata files from the 1985 panel took an average of 31 months from the last month of data collection until release, and files from the 1986 panel took an average of 26 months from the last month of collection until release. Not until midway through the 1987 panel did the Census Bureau begin to achieve delivery times in the range of a year after data collection (Committee on National Statistics, 1989:Table 2–4).

To enable the data processing to catch up, the Census Bureau decided in late 1987 to freeze the core questionnaire, permitting only changes that appeared absolutely essential to meet the survey's goals of providing improved data on income and program participation.[6] The agency also strove to minimize changes in the fixed topical modules. This strategy was successful in that the Census Bureau began to meet its delivery targets of release of public-use files within a year of collection. However, giving up flexibility in the questionnaire was a high price to pay for a new, still evolving survey that is intended to be responsive to emerging policy concerns—particularly as some of the initial design decisions had already limited the detail in the SIPP questionnaire to try to make it easier to process the data. As examples, respondents were asked about earnings for a maximum of two employers and about program income for a maximum of six sources. Also, respondents were asked about earnings on a monthly basis rather than in terms of individual paychecks; hence, respondents who were paid biweekly or on some other basis had to engage in considerable mental arithmetic to answer the questions.

During the past few years, the Census Bureau has shown commendable attention to user needs and concerns with regard to data products. Not only have delivery schedules been speeded up, but the data processing staff—working with an advisory group from the Association of Public Data Users—have recently redesigned the core data files in a person-month format to be much more accessible for many analyses (see Chapter 6). However, many other needed improvements—for example, longitudinal editing of the wave files and an automated system to generate complete and accurate documentation (e.g., documentation of edits and imputations)—have yet to be made.

The Census Bureau is aware of the problems that have afflicted SIPP operations, and the agency is planning major improvements through the adoption of new technology. Specifically, the Bureau plans to convert SIPP interviewing from paper-and-pencil techniques to computer-assisted personal

[6] For example, some wording changes were made in the 1988 panel to try to reduce the magnitude of the seam problem (e.g., asking respondents specifically to indicate the month in which program payments began before providing monthly amounts).

interviewing (CAPI) by 1995. Also, the Census Bureau already has well under way a program to replace its UNISYS equipment with networked VAX computers, and the SIPP staff intend to switch to a commercial database management system for processing. We review the Bureau's plans for CAPI and database management technology for SIPP below.7 We also consider investment needs for continuing education of the SIPP data processing staff and issues involved in the transition to the new technology, together with the new survey design for SIPP.

COMPUTER-ASSISTED INTERVIEWING

There is currently considerable interest in the use of various methods of computer-assisted survey information collection (CASIC) (see Subcommittee on Computer Assisted Survey Information Collection, 1990). Relevant techniques include:

- centralized computer-assisted telephone interviewing (CATI), in which interviewers clustered at one or more central locations telephone respondents, read them questions displayed by a computer, and enter the answers into the computer (CATI can also operate in a decentralized mode, in which interviewers call respondents from their homes);
- decentralized computer-assisted personal interviewing (CAPI), in which interviewers go to respondents' homes or offices with a portable computer and read the questions from and record the answers into the computer; and
- various forms of computer-assisted self-interviewing (CASI), including prepared data entry (PDE), in which respondents themselves use a personal computer or terminal to fill out interactively the survey questionnaire; touchtone data entry (TDE), in which respondents answer computer-generated questions by pressing buttons on a telephone; and voice recognition entry (VRE), in which respondents answer questions by speaking directly into a telephone.

These methods promise many advantages, including:

- improved data quality because the computer program automatically controls skip patterns and includes editing features to prevent or detect inconsistencies and other errors on the spot; also, keying errors are likely to

[7] We note that the use of innovative data collection and processing technology, while promising many benefits for SIPP (and other surveys), is not a panacea. For data quality to be high, respondents must understand the questions and be motivated to answer them fully and accurately. In Chapter 7 we discuss a relatively new methodological research program at the Census Bureau that is applying cognitive techniques to the issue of how well respondents understand and answer the current SIPP questionnaire. On the basis of the results of that work, experiments are in progress to assess alternative, less structured interviewing techniques that promise to improve data quality.

be reduced because there is no need for clerks to key the paper questionnaire (although the interviewers themselves may make keying mistakes);

- more timely data capture and development of analysis files because some data entry steps are eliminated and because of extensive upfront edits; and
- increased flexibility in data gathering because multiple versions of the questionnaire (e.g., in different languages) can be readily offered and changes to the questionnaire more readily programmed and documented.

We note that CASIC methods are undergoing development and that survey organizations are still learning how to use them effectively. The process of converting to a CASIC survey operation can be painful, and it is not always the case that the potential advantages from CASIC techniques will be realized in a particular application. Nonetheless, the potential gains clearly warrant investment in development and implementation.

At the present time, CATI, which is the oldest CASIC technique in use, is widely employed by government, academic, and private survey organizations in the United States and abroad. It is estimated that there are more than 1,000 CATI installations throughout the world (Subcommittee on Computer Assisted Survey Information Collection, 1990:11). The Census Bureau maintains a CATI installation and has considerable experience with the technique.

CAPI is a newer technique that is just beginning to be used in the United States.[8] Evaluation of large-scale pilot studies for the NLS new youth cohort (NLSY) in 1989 (300 cases) and 1990 (2,400 cases—one quarter of the national effort) were very favorable (Olsen et al., 1990; Olsen, 1992). CAPI training for the NLSY took the same time as paper-and-pencil training, and there were no serious field problems. Data transmission over telephone lines was smoothly implemented and error-free. Compared with paper-and-pencil cases, the CAPI data were determined to have fewer errors and to be of uniformly higher quality in the dimensions examined (skip errors, undocumented codes, internal inconsistencies, etc.), even though the paper-and-pencil cases were subsequently edited and the CAPI cases were accepted without cleaning.

The CAPI pilot study for the Medicare Current Beneficiary Survey (CBS) in early 1991 was also successful, and the initial rounds of interviewing in fall 1991 and winter 1992 for the full CBS sample of about 15,000 Medicare beneficiaries have proceeded smoothly (Sperry, 1991; Sperry, Bittner, and Branden, n.d.). On the basis of the pilot study, the survey contractor for the CBS (Westat, Inc.) determined that additional training

[8] The Netherlands developed a CAPI System called BLAISE (after Blasie Pascal) for collecting household survey data as early as the mid-1980s (see Bethlehem and keller,1991).

was required, with a particular focus on ways to solve problems during the interviews. Also, there were initial problem—which are currently being resolved —with transmitting the data over modems attached to the interviewers' personal computers. In all other respects, including interviewer and respondent acceptance of the technique, preliminary indications of data quality, timeliness, and the ability to feed back data from an earlier interview to the next interview, the CAPI procedures appear to be working well for the CBS.

Not all experiences with CAPI have been as favorable. The Census Bureau's initial effort to collect the AIDS supplement for the Health Interview Survey (HIS) was not a success, due to hardware and software problems (National Center for Health Statistics and Bureau of the Census, 1988). However, the Census Bureau is proceeding with further tests of CATI and CAPI for the HIS, using newer portable computers with materially increased performance. Problems were also encountered in the use of CAPI by a private contractor for the 1987–1988 Nationwide Food Consumption Survey, although these problems appeared to stem largely from management failures rather than the use of CAPI per se (U.S. General Accounting Office, 1991).

The Census Bureau is committed to expanding the use of CASIC interviewing techniques for both its household and establishment surveys, and there is a high-level task force working on a Bureau-wide CASIC implementation strategy (Bureau of the Census, 1991f). The Bureau is currently working to convert the CPS to both CATI and CAPI by January 1994. Both techniques are needed because the CPS uses maximum personal interviewing for the first month in which an address is in the sample and maximum telephone interviewing for the remaining interviews. The Census Bureau is also planning to convert SIPP data collection to CAPI methods by February 1995. SIPP is a nearly ideal application for CAPI because it is a large, complex survey with a continuing field effort. As part of its CAPI planning for SIPP, the Census Bureau will undoubtedly evaluate the experience with maximum telephone interviewing in the panels under way as of early 1992 and determine the most cost-effective mix of telephone and personal interviews. The decentralized SIPP interviewing staff could administer a computer-assisted interview in both modes. In its review, the Bureau should also consider the possible contribution of a centralized CATI operation, which affords opportunities for increased quality control of the interviewers' work. CATI might, for example, be used to interview SIPP cases that move from one primary sampling unit (PSU) to another.

Potential Improvements for SIPP

CAPI technology offers enormous potential to improve the timeliness and quality of SIPP data and other aspects of the SIPP program, but it is also

relatively new. We therefore describe in some detail the sorts of capabilities that the Census Bureau should expect and plan for in a fully implemented CAPI system and their implications for the smooth running of the SIPP processing system. In the next section we consider the cost implications. And in the subsequent section we provide a list of important functions that we believe a SIPP CAPI system should have and review the capabilities of the Census Bureau's existing CAPI software.

Successful implementation of CAPI for SIPP should produce significant improvements in timeliness of data processing and analysis. If there is no imputation, weighting, or special coding to be done (i.e., industry and occupation), it should be possible to produce frequencies and provide Census Bureau analysts with a fully documented data file that is suitable for analysis with a widely used software package (such as SAS) within a week or two at most after the last case is transmitted from an interviewer.[9] Given the need for various kinds of post-field processing of the data, it is essential that such processing operations be fully integrated with the design of the questionnaire. Such integration is needed to maximize smooth, timely operations and minimize bottlenecks (see further discussion, below).

CAPI should improve data quality by greatly reducing interviewer error and supporting more complex questionnaire design than is feasible for paper instruments. For example, some analysts believe that better quality data can be obtained by collecting information on income, employment, and program participation in the form of event histories in which the respondent supplies start and end dates, instead of by using fixed monthly reference periods (see discussion in Chapter 7 on cognitive research). CAPI would make it easier to collect event history data, which have often been hard to manage in paper formats. CAPI would further improve data quality by readily enforcing the natural temporal ordering of events (e.g., jobs must be started before they are left).

Obtaining the full power of CAPI to improve data quality at reduced cost and time requires that the entire process of data editing and cleaning be redesigned, taking into account the ability to perform real-time checks with CAPI. The Census Bureau will need to review and restructure its edit specifications for SIPP, deciding which potential inconsistencies it wants to resolve during interviews; which inconsistencies it wants to eliminate by structuring the questions and allowable responses so that inconsistent replies are not logically possible; and which inconsistencies it will not attempt to resolve, prevent, or eliminate.

[9] The availability of such a file would permit Census Bureau analysts to have an early look at the raw data and assess data quality in terms of item nonresponse rates, extreme values, and the like.

A CAPI system should make it much easier to change and correct the questionnaire than is the case with paper instruments. So that SIPP can be readily modified, the CAPI system adopted should permit easy insertion of new questions. The system should include sound procedures to permit corrections while the survey is in the field, to allow for any questionnaire design flaws (e.g., inappropriate skip patterns) that are not found beforehand. The CAPI questionnaire should also drive the generation of the documentation and the database structure, so that questionnaire changes are automatically reflected in the codebook and the main database. With this flexibility and integration, the implications for data processing of a questionnaire change become relatively minor; only the imputation programs must be modified. The questionnaire content can be determined by substantive concerns rather than potential processing problems. The original substantive compromises in SIPP that were dictated by the processing system would be unnecessary.

A CAPI system should make it possible to treat SIPP as a single questionnaire in which the control card is integrated with the core questions for each respondent, and the topical modules are treated as conventional skip patterns. Having a single questionnaire for SIPP coupled with a sound database structure that is driven by the questionnaire has major implications for improved quality and timeliness of SIPP operations. In particular, such a design should facilitate the ability to carry data forward from previous interviews. Hence, more extensive use can be made of dependent interviewing methods, and editing can be carried out on a longitudinal basis that makes full use of information from other waves. In addition, such a design should greatly facilitate the timely preparation of longitudinal public-use data files. An integrated design would require more front-end work but, once done, would also have the advantage of allowing a rapid phase-in of CAPI.

A significant weakness of the current processing system for SIPP is the absence of a database structure that connects the data with the documentation. With CAPI it is possible to unify the structure of the data with that of the documentation in a manner not currently done for most surveys, including SIPP. The issue can be illustrated by a typical problem that arises in complex surveys.

Surveys such as SIPP often involve complicated skip patterns that are dependent on answers to prior questions. Even relatively short interviews such as the CPS follow complex paths to ascertain the needed information. When one looks at a standard paper-and-pencil questionnaire, one can follow the interview in the direction it is administered—that is, by looking at any question or check item, one can determine the next question to be asked. However, the researcher often needs to do the reverse, that is, determine the universe for a question that was not asked of all persons. The

universe may not be clear from the preceding questions on the page because the question may have been reached from a jump several pages earlier. It is even more difficult to determine the universe for a question from the SIPP codebook, which is very terse.

However, some CAPI software systems allow the researcher (and perhaps more importantly, the interview designer) to track the flow of the questionnaire both forward and backward and to produce a printed version of the questionnaire that lists for each question all of the answers to previous questions that will lead an interviewer to ask a respondent that question. This information can then be incorporated into the codebook, enabling a researcher to move backward through the questionnaire.

Costs

It is important to consider the costs as well as the benefits of any new technology such as CAPI. The experience with other surveys shows that it may take no longer to train a new interviewer to use CAPI as a paper-and-pencil method. However, because SIPP has so many experienced interviewers, a conversion to CAPI will incur substantial costs to retrain the staff of about 400 interviewers. In addition, each interviewer must be equipped with a suitable laptop computer and modem. The costs of training and equipping the interviewers could perhaps be held to about $1.5–2.0 million. There would also be costs to develop the initial CAPI questionnaire for SIPP, carry out field tests, and conduct other conversion activities. Once the system is operational, there would be costs for periodic replacement of computing equipment.[10] Offsetting these costs are current SIPP expenditures of almost $5 million per year for regional clerical and data entry services (see Table 5-1), none of which would be required with CAPI. Once the CAPI start-up costs have been absorbed, savings in regional office operations might support a considerable increase in the sample size of SIPP panels in subsequent years.

How the Census Bureau makes the transition to CAPI can also affect the start-up costs. If the Census Bureau tries to phase in CAPI gradually by using paper-and-pencil methods with existing panels and introducing CAPI with new panels, then the economies from eliminating the regional office editors and data entry staff could not be immediately realized and costs could increase in the transition period. We consider the problems involved in the transition to CAPI in the last section of this chapter.

[10] There would also be home office data processing costs to maintain and update the CAPI questionnaire and monitor transmission of data from 400 interviewers rather than from 12 regional offices. However, there should be cost savings from elimination of many of the current editing programs.

A CAPI System for SIPP

Needed Features

We identified the following specific functions that we think a CAPI (or CAPI and CATI) system should provide for SIPP:

- an authoring procedure that enables survey specialists to design and edit all but the most technically demanding parts of the questionnaire;
- extensive diagnostics and a debugging facility to enable the questionnaire designers to detect and correct logical errors;
- a flowchart facility to support proofing the skip patterns;
- the ability to produce a printed version of the questionnaire that is understandable to researchers;
- the ability to handle rosters (e.g., household members or jobs);
- sufficient capacity to support the inclusion of the SIPP core and all topical modules simultaneously;
- the ability to handle text "fills" that make the wording of questions dependent on previous answers (a simple example is using "she" or "he" in a question asked of a parent about a child, depending on a previous response about the child's sex);
- the ability to enforce range restrictions on allowable answers that make use of previous answers, constants, or both (e.g., the system might reject a response for AFDC income above a certain amount);
- the ability to display data collected earlier in the same interview in a summary form to help the interviewer (e.g., to show a history of on-the-job, vacation, and other labor force statuses);
- the ability to incorporate responses from prior interviews into the current data collection and integrate these responses in a way that exploits the potential of dependent interviewing techniques;
- the ability to backtrack to any previous question and then return to the current question in a manner that preserves the integrity of the skip patterns;
- the ability to interrupt an interview and resume it later with no loss of data;
- support for multilingual interviewing;
- the ability to make changes to the questionnaire (modification of skip patterns, range restrictions, question wording, list of alternatives for close-ended field coding of verbatim responses) while in the field, when necessary;
- the ability to integrate the database of the raw information with a database that describes the questions, skip patterns, frequencies, range restrictions, and other characteristics of the questionnaire that should be included in the codebook; and

- the ability to provide outputs that can be readily integrated with post-field systems for longitudinal and cross-sectional imputation, other post-field edits, construction of new variables, and weighting.

Current Census Bureau Software

The Census Bureau has an in-house CATI/CAPI software package—Questionnaire Implementation System Census (QUISC—that it initially regarded as a likely candidate to use for SIPP. The Bureau's experience in preparing a CAPI questionnaire using QUISC is largely based on the CPS, which has a very short and simple interview. Because SIPP is more demanding than CPS, we were naturally concerned about the viability of SIPP using QUISC.

Our observation of the QUISC implementation for CPS revealed important weaknesses that could well increase costs and prevent full realization of the gains expected from a CAPI system. One concern we have is the process of authoring (i.e., turning the questionnaire into computer program code). The questionnaire designers need to be able to mold the questionnaire to the purposes that are important for research and policy making. For all but the most complex parts of the interview, the design of the CAPI version of the questionnaire should therefore be within the capability of the questionnaire designers and should not require substantial programming skills. Interposing programmers, as appears to be necessary for QUISC, makes the process of questionnaire development more segmented and introduces new opportunities for costly miscommunication and delay.

On a related matter, although QUISC has a feature to check for use of the correct syntax (i.e., commands that are intelligible to QUISC), a serious deficiency is that it has virtually no diagnostics (i.e., no checks for errors in the logical content of the program). As a questionnaire becomes longer and more complex, the number of interconnections within the questionnaire grows rapidly. The designer must ferret out such skip errors as questions that cannot be reached, groups of questions that form cycles, and logical errors in the skip patterns. The absence of extensive diagnostics places a heavy burden on the designer and increases the need for extensive testing. QUISC does not generate a printed version of what looks like a questionnaire, nor does it supply a flowchart for the interview logic. These tools are essential to design and debug a complex questionnaire. To the best of our knowledge, QUISC does not have a means for the designer to test for errors on an interactive, real-time basis. With the QUISC program for the relatively simple CPS producing about 250 pages of output (in part because the questionnaire includes Spanish text), one can appreciate how difficult it would be to debug SIPP, given the lack of both diagnostics and an interactive testing feature.

QUISC appears limited in its ability to carry out a necessary function

for SIPP—obtaining data for all persons in a household and many jobs and sources of income for each person. Since QUISC stores a rectangular data structure in memory, the maximum number of persons per household, the maximum number of jobs per person, and so on must be anticipated. These kinds of limits and lack of flexibility were precisely what produced the unsatisfactory paper questionnaire (with two jobs and six income types) in the past. The alternative is a database management system (see next section) that accommodates varying numbers of logical records for each interview and provides the flexibility so that data processing constraints do not again force compromises in data content.

Another drawback of QUISC, according to the information we have from Census Bureau staff, is that if it is necessary to interrupt an interview in the middle (e.g., because the respondent is called away), the interview must be started over. This burden on the interviewer and respondent could be a problem for SIPP, which has a much longer questionnaire and hence is likely to experience more interruptions than CPS.

Finally, it is important in our view that the CAPI system chosen for SIPP not only facilitate the interviewing process, but also make an integral contribution to the improvement of SIPP data processing at Suitland. However, the current QUISC software does not support integrating the design of the questionnaire with the generation of documentation or a seamless interface with the final data and documentation databases. The lack of diagnostics or an interface to post-field processing systems increases the exposure of the system to serious errors. To overcome these limitations, the Census Bureau staff would have to devote an unknown amount of effort to systems development even as they sought to phase in CAPI. Thus, the system to process SIPP data would likely remain inherently inflexible for the foreseeable future.

It is possible—although unlikely in our judgment—that with sufficient time, effort, and money, the problems with QUISC could be corrected. However, CAPI systems outside the Census Bureau have developed rapidly, and SIPP (as well as other surveys) might be better served if the Bureau turned to a different software architecture.[11] Although we did not conduct a thorough review of available CAPI systems, we are aware of several that provide more capabilities than QUISC, including:

- Autoquest, which is the system being used at the University of Mchigan to convert the Panel Study of Income Dynamics (PSID) to a CATI/CAPI operation;

[11] The Bureau determined recently that it would probably not use QUISC (sometimes referred to as Micro CATI) as its primary CAPI system but might seek to incorporate features of QUISC into another system; see Bureau of the Census (1992a).

- BLAISE, which is the system developed by the Netherlands Central Bureau of Statistics;
- CASES, which is maintained at the University of California at Berkeley;[12] and
- the Ohio State CAPI system, which is maintained by the Center for Human Resource Research at Ohio State University and used for the NLSY.

We urge the Census Bureau to give high priority to investigating existing outside CAPI systems to find one that meets the needs of SIPP more effectively than QUISC.

Recommendation 5-1: **We strongly support the Census Bureau's goal to convert SIPP to computer-assisted personal interviewing (CAPI). Since the Bureau's current CAPI software system (QUISC) does not appear to meet the data collection requirements for SIPP, the Census Bureau should give high priority to investigating other available CAPI systems and determine the most appropriate system for SIPP.**

DATABASE MANAGEMENT

The Census Bureau is currently in the process of updating its computing equipment, including replacing UNISYS mainframe, batch-oriented processors with networked VAX computers that facilitate interactive processing and the use of modern database management technology. The new equipment will assist data processing operations throughout the Bureau. The SIPP staff plan to take advantage of the shift to the VAX network by converting their data files and processing to powerful database management system (DBMS) software that is commercially available, such as Oracle or Relational Data Base software (Bureau of the Census, n.d.). Another candidate is Scientific Information Retrieval (SIR) software, which is used for the NLSY. These commercial systems offer various capabilities and features of the relational database model, which was originally developed as a logically rigorous and complete statement of database structure and manipulation (see Codd, 1985; Date, 1987). Other kinds of database management systems embody network or hierarchical database models.[13] (For

[12] We note that the Census Bureau's QUISC system evolved, like CASES, from a system that was originally developed at Berkeley. We understand that CASES, perhaps augmented with some features from QUISC, has recently become the Census Bureau's leading candidate for future CATI/CAPI development for SIPP and other surveys.

[13] The term "relational," which distinguishes the relational model from traditional network or hierarchical database models, refers primarily to the organizational structure of the data. A relational database creates a series of rectangular tables or "flat" files, each of which is "normalized" according to the relational model in order to contain information in a very simple

further discussion and assessment of database management systems, see Gray, 1984; Silberschatz, Stonebraker, and Ullman, 1990.)

Database management systems offer important capabilities that can facilitate processing and analysis of SIPP's complex data sets that embrace multiple panels, waves, households, families, people, and sources of income. They permit large databases to be accessed in an interactive mode by multiple users, which can support editing and imputation procedures that use information from other waves of data and make it possible for analysts to readily review problem cases as needed. Database management systems also provide interfaces to statistical packages that are widely used for analysis and estimation. In addition, DBMS technology, especially RDBMS software, facilitates the integration of data and documentation.

Relational database management systems offer other features that are likely to be especially helpful for a survey like SIPP. They have query languages for obtaining information from the database, using logical operations, which can be of direct utility for editing complex data. The powerful structured query language (SQL) has recently been adopted as an industry standard that will be supported to some degree by all RDBMS vendors.[14] RDBMS technology also embodies consistency features that greatly reduce the opportunity for errors to occur in data processing.[15] Finally, an important feature of RDBMS systems is that they provide flexibility in handling changes to a questionnaire without disrupting the entire database structure. In particular, RDBMS technology offers dynamic independence, that is, the ability to add new data to the system without restructuring the existing data, provided that the initial database design anticipates this need.

[14] Query languages operate in a different manner from scientific programming languages and statistical packages. Analysts would not want to use query languages in place of statistical packages for estimation purposes; however, interfaces can be designed to exploit the power of the RDBMS for efficient data retrieval together with the computational capability of a statistical package like SAS or SPSS. An example of a linkage between a statistical package and a DBMS is the PROC SQL module of SAS.

structure (e.g., in the SIPP context, there might be separate files for people, families, jobs, and income types). Relationships between entities (e.g., people having jobs) are also represented in these tables, as is the internal documentation of the database (the set of tables) itself. This simple but powerful structure is key to many of the advantages of relational database management technology, including its query and processing capabilities. However, for performance and other practical reasons, no current relational database management system (RDBMS) software conforms completely to the relational model in all of its features. Nevertheless, the term RDBMS is used for a DBMS that attempts to implement most of the key relational features.

[15] The relational database model specifies structural integrity constraints that enforce structural consistency on the data. In addition, the logical rules that govern data entry can draw on any part of the existing data to enforce consistency in data values; consistency may be applied to individuals, households, or other entities and combinations of entities. A properly designed RDBMS will ensure that adjustments to the database do not leave garbage in the system.

We strongly support the development of an improved database management system for SIPP that integrates the documentation with the data and facilitates timely, accurate, and flexible data processing (we indicate below some specific functions that a DBMS needs to provide for SIPP). To achieve this goal will require adequate disk space and processing resources. We urge the Census Bureau to allocate sufficient disk space and processing resources to SIPP so that the data processing and analysis staffs can store and access SIPP data on-line in a DBMS, using magnetic tapes only for backup and other special purposes.

Needed Database Management Capabilities for SIPP

There are several capabilities that we believe it is important for an improved database management system to provide for SIPP. First, the system should be designed with sufficient flexibility so that changes in the SIPP questionnaire that are expected to improve data quality or relevance can be accommodated. It should not be the case in the future, as has happened in the past, that difficulties in processing lead the Census Bureau to "freeze" the interview content for some time. As we noted above, the relational database model has features that make it possible to change a questionnaire without having to redesign the rest of the database structure.

Second, the system should facilitate the ability to supply fully edited data from the previous interview in sufficient time to use in the next interview with the respondent. There needs to be careful coordination of this feedback capability, which is critical for achieving data quality improvements in SIPP at the source, with the design and operation of the CAPI system (see below).[16]

Third, the system should have the capability to supply values for missing data in a timely manner. DBMS software generally offers advantages in this regard. Because the technology permits large data sets to be on-line, the use of a DBMS should enable the Census Bureau to move away from treating each SIPP wave as a separate cross-section for imputation purposes. Instead, it should be possible for the Bureau to develop more extensive yet timely longitudinal imputations by using data from surrounding waves—a goal that the SIPP data processing staff have indicated is a high priority.[17]

[16] Presumably, most of the editing will be performed within the CAPI system, but some additional editing may be required within the DBMS. Careful coordination of the CAPI and database management systems is also needed to achieve flexibility with regard to the questionnaire content.

Fourth, the database management system should support the ready modification of imputation procedures when required. The current cross-sectional imputation system for SIPP is very inflexible and is known to be less than optimal in some respects (e.g., in the imputation of income and asset values for program recipients—see Chapter 3). To the extent that some imputations must continue to be made on a cross-sectional rather than longitudinal basis, the database management system should provide a capability to implement modifications to the imputation scheme and evaluate their effects on data quality in a timely manner. Longitudinal imputations will likely be of better quality because information from other waves is used for the actual respondent instead of information from the same wave for another (albeit similar) person. However, longitudinal imputations involve complex logic, and the automated imputation schemes that are implemented at the beginning of a panel will not likely be optimal for the full panel. Hence, there will be a continuing need for a ready capability to modify the longitudinal imputation procedures as knowledge is gained of their implications for data quality.[18]

In this regard, we are concerned about the SIPP staff's plans to use a DBMS and at the same time retain their FORTRAN-based editing and imputation programs. It seems unwise to have a hybrid system that does not make full use of the capabilities of the chosen database management system. The Census Bureau argues that it does not want to become overly dependent on commercial software vendors, but adopting a particular commercial system is no longer necessarily a major risk. Most vendors of DBMS's are committed to operating on different computers under various operating systems (technically, they offer "platform independence"). Furthermore, in the case of relational systems, databases can readily be moved from one RDBMS to another if a change in the RDBMS becomes necessary.

Fifth, the database management system developed for SIPP should provide a ready interface to such statistical packages as SAS and SPSS. Such interfaces will facilitate internal analysis of the data by Census Bureau staff both for evaluation purposes (e.g., analyzing the effect of imputations on

[17] The ability to handle large data sets on-line should also make it possible to readily produce multiple-wave analysis files with appropriate weights, as well as to integrate the processing of waves from separate panels that represent the same time period of data collec

[18] In addition, it could be useful for the database management system to provide a capability for multiple imputation, in which a range of imputed responses is generated for each missing value in order to permit users to assess the variability in an estimate that can be attributed to the imputation process (see Little and Rubin, 1987).

the quality of estimates from the data) and for substantive studies on income, program participation, and related topics.

Finally, the database management system that is used to construct the SIPP database should also support construction of a complete corresponding database of the documentation. At present, there is no documentation database for SIPP that can be related to the data, which contributes to problems in releasing fully documented analysis files on a timely basis and hinders users in obtaining a complete understanding of the file structures and data content. This lack also substantially reduces the ability to institute more modern methods of releasing data—for example, supplying data on compact disks with extraction software or providing a facility to create extracts over such communications networks as Internet. For most cost-effective use, these access methods require integration of the documentation, ideally including frequency counts for each variable, with the data.[19] We cannot overstress the importance of seeking a database management system with comprehensive documentation capabilities and then using those capabilities to the fullest in preparing data files from SIPP.

As noted above, DBMS technology, especially RDBMS software, often facilitates integration of data and documentation. An RDBMS can be implemented to maintain a vocabulary of names for each measurement, each transformation or other processing procedure, and each relationship encompassed in the database. The RDBMS will ensure that variable names are uniquely and permanently assigned, no matter how many users are making independent uses of the data. This capability should make it possible to track processing activities and changes and to generate updated descriptions of the database as each SIPP panel proceeds and as new panels are created. This tracking information can be used to produce documentation for all data processing steps, such as weighting, imputation, construction of recoded variables, and development of analysis files. The result should be greater productivity in processing multiple panels and public-use files and greater clarity and completeness in the documentation of all data processing steps.

Integration of CAPI and Database Management

We have noted the importance of integrating the CAPI and database management systems for SIPP to facilitate smooth, timely data processing and to minimize errors. The CAPI system will likely perform all data entry functions; however, if any paper forms remain, then the database management system should be used to enter data from them.

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tion: for example, wave 7 of the 1991 panel and wave 4 of the 1992 panel will be fielded at the same time. However, we note that there are some capabilities of a DBMS that would be desirable for survey processing but are not yet commercially available. For example, current systems do not support economical ways of dealing with "versions" of data that will arise as information for each SIPP panel is captured in successive interviews and longitudinal weights and imputations are altered to make use of accumulating information.

[19] See Chapter 6 for a review of the current computer data products and documentation for SIPP and a discussion of gaps and needed improvements: for example, there is currently no documentation at all of the data editing and imputation procedures.

Ideally, the CAPI system chosen for SIPP will generate the following inputs to the database management system:

- a data dictionary that defines all questionnaire items;
- the logical rules that clearly determine the universe for each question;
- the logical rules applied at the time of an interview to enforce consistencies;
- the list of responses partitioned into sets for each separate universe defined by the rules of the interview—for example (in the context of SIPP), one set for the address, one set for each individual, one set for each job, and one set for each spell of property or program income receipt, all recorded on the basis of the relevant accounting or reference period;
- the list of exceptions, comments, and annotations to each question; and
- the set of information about the environment of the interview—time, place, mode, interviewer, duration, etc.

Whether an RDBMS or some other database management system is used, we stress again how important it is that the DBMS for SIPP have the capacity to internally track and maintain the information needed to document fully the data content and the data collection and processing activities, including imputation, weighting, construction of new variables, and reformatting. This information is necessary to produce fully documented internal and public-use files and to properly feed back information for use by the CAPI system in subsequent interviews.

Recommendation 5-2: **We strongly support the Census Bureau's plans to adopt a new database management system for SIPP. The Census Bureau should use the capabilities of a DBMS to the fullest in seeking to make improvements in processing, analyzing, and documenting the data from SIPP. The processing performed by the database management system should be fully integrated with the SIPP CAPI system.**

INVESTING IN THE DATA PROCESSING STAFF

The Census Bureau has a distinguished history of making seminal contributions to data collection and processing technology. However, in recent years, the Bureau has lagged behind best practice and has lacked the hardware and software with which to implement state-of-the-art methods of data collection and processing. We are pleased that technological improvements are under way. We urge the Census Bureau to recognize the need to devote resources to modernization of its computing hardware and software on a continuing basis.

We further urge the Census Bureau to recognize the need for a continuing program of investment in the education and training of the data processing staff. In order to make best use of new hardware and software, the staff must be fully trained in new data processing methods. Steps must also be taken to ensure that the data processing staff regularly visit and learn from other organizations.

To date, the SIPP processing staff have been so focused on production problems that they have not been able to devote time and resources to modernization. We believe that SIPP needs the equivalent of at least one full-time staff member devoted to systems modernization: this does not mean one person, but some of the time of the best staff that is devoted to continuing education, software development, networking, and systems development. Improvements in data processing systems may later reduce staff requirements in data processing, but investments must first be made.

The SIPP processing staff should have the resources and be encouraged to visit other data processing facilities. They could find it useful to meet with the staff at the National Opinion Research Center (NORC) and Ohio State University who deal with the NLS, and the staff at the University of Michigan who deal with the PSID—both longitudinal surveys that are similar to SIPP. The SIPP staff could also learn from the experience of the Statistics of Income Division at the Internal Revenue Service and its transition to the Oracle RDBMS. They could also examine how statistical agencies in other countries (e.g., Statistics Canada) are using database management systems in the processing of survey data.

Just as the Census Bureau invests in the staff that work on survey design, methodology, and evaluation (e.g., by sponsoring methodological research conferences), it is critical that the Bureau invest in the equally important data production people. The ability of the processing staff to make full use of improved technology greatly depends on the support they receive for continued development and use of their data processing skills.

> ***Recommendation 5-3:*** **In view of the major advances that continue to occur in computing hardware and software, the Census Bureau should devote significant resources to continued education and training of its data processing staff. In particular, the SIPP processing staff should take advantage of the experience of data processing facilities outside the Census Bureau that deal with longitudinal surveys.**

TRANSITION TO A CAPI/DATABASE MANAGEMENT SYSTEM FOR SIPP

Moving a survey to CAPI and an improved database management system affects nearly every step of the survey, from questionnaire design through

data dissemination. We are concerned that there may not be enough time to fully test and work out the inevitable operational problems prior to the scheduled implementation in February 1995 of a full-blown CAPI/database management system for SIPP. The new technologies must not only be fully developed and tested in their own right, but also mesh with other changes to SIPP, such as questionnaire content and format changes. The length and complexity of the SIPP questionnaire, which entail the need for complex editing and data processing procedures, and the frequency of interviews will pose substantial challenges to the smooth implementation of CAPI/database management technology.

We believe it is critical to the future success of SIPP that all aspects of the redesign work well from the start. It would be tragic to have a replay of the situation that occurred at the inauguration of SIPP, when the need to move immediately into the field precluded making needed changes to the data processing system, with consequent adverse effects for the delivery of data products. At present, the Census Bureau has more than 2 years before the scheduled redesign in 1995 to develop a CAPI/database management system for SIPP. However, this amount of time may not be sufficient to ensure a problem-free changeover, particularly given all of the other changes that are likely to be introduced at the same time and the fact that a final decision has not yet been made on which CAPI or database management system to use.

A review of the current Census Bureau schedule (Fischer, 1992) shows the following key milestones that relate to CAPI and database management technology:

- finalize the content of the wave 1 questionnaire by December 1992;
- develop the CAPI wave 1 questionnaire (including specifications and programming) in January–October 1993 and have a dress rehearsal in February 1994;
- develop the CAPI wave 2 questionnaire in March 1993–March 1994 and have a dress rehearsal in June 1994;
- develop the wave 1 systems design in June 1992-April 1993 and the specifications for the wave 1 processing system in January–November 1993; and
- develop the wave 2 systems design in November 1992-October 1993 and the specifications for the wave 2 processing system in November 1993-October 1994.

This schedule is very tight. It requires making an early decision on the content of the questionnaire, which precludes making much use of results from the current program of cognitive questionnaire research or from the forward record-check studies that we strongly urge for questionnaire testing and experimentation (see Chapter 7). The schedule also allows very little

time for testing the integration of the CAPI/database management system for wave 2 and subsequent interviews, which is essential for such functions as feeding back data from the previous to the current interview.

Although we agree that it is important to have the SIPP redesign implemented on a timely basis, we do not believe there is any magic to the current scheduled start-up date. If additional time for development and operational testing would permit a smoother transition, then we believe that time would be well spent. We suggest that the Census Bureau consider the following schedule (see Table 5-2): field a somewhat smaller panel of, say, 15,000 households in 1995 that uses CAPI and database management technology for data collection and processing. The primary purpose of the 1995

TABLE 5-2 Suggested Schedule for Implementing the SIPP Redesign and Use of CAPI/DBMS Technology, Including a Large Dress Rehearsal Panel in 1995

	Panel and Wave					
Calendar Year	1992	1993	1994	1995	1996	1998
	Paper and Pencil					
1994	7	4	1			
	8	5	2			
		6	3	CAPI/DBMS		
1995		7	4	1		
		8	5	2		
			6	3		
1996				(4)	1	
				(5)	2	
				(6)	3	
1997				(7)	4	
				(8)	5	
				(9)	6	
1998					7	1
					8	2
					9	3
1999					10	4
					11	5
					12	6
2000	1998 panel continues and 2000 panel begins					
Original sample size (households)	20,000	20,000	20,000	15,000	26,700	26,700

NOTE: ( ) indicates optional.

panel would be to conduct a full-bore dress rehearsal of the new system, identifying operational problems that could be corrected in time for implementation of all aspects of the redesign with the 1996 panel. (The redesign of the sample per se could be introduced in 1995 as scheduled. Indeed, it would be advantageous to do so, as then all panels that are based on the new technology would have the same sample design.)

In the best outcome, the 1995 panel would provide a smooth transition for 1996 and also provide high-quality data for users; at worst, the 1995 panel would fulfill the former very important function. At a minimum, the 1995 panel would include three interviews; if it is going well, it could be continued for another year or two and used for additional testing that could feed into the next new panel, which would start up in 1998.[20] (Continuing the 1995 panel, as shown in Table 5-2, has the advantage of avoiding big changes in the total interviewing workload.)

This schedule has several benefits, primarily that it should greatly reduce the risks from unanticipated operational problems with the CAPI/database management system. Also, it should permit greater flexibility over the next couple of years for the Census Bureau to experiment with questionnaire content and format. Even with an additional year, we are not sanguine that a CAPI system could be developed to handle the type of free-form questionnaire that is being evaluated in the cognitive research program (see Chapter 7). However, we do believe that it should be possible to improve the current structured questionnaire by making use of the results of that research. Yet another advantage of this schedule is that a new panel will start up at the time of the year 2000 decennial census, thereby providing a better opportunity to compare the census and SIPP than if SIPP panels were introduced in odd years.

There remains the question of what to do with the 1993 and 1994 panels, which will have begun with paper-and-pencil methods—namely, whether to switch them to the CAPI/database management system when the 1995 test panel is introduced or run the paper-and-pencil and CAPI systems side by side. As we noted above, the latter strategy means increased costs. However, a sudden switch could pose other kinds of problems: for example, the regional offices would have to cope with an abrupt reduction in workload. Also, the data processing staff would have to make special efforts to quickly move the data from the most recent waves of existing panels so that the next wave could be CAPI and also prepare CAPI versions

[20] To the extent possible, the regular SIPP data products should be provided to users from the 1995 panel, although, if problems arise, it may be necessary to release data products as "research" files or reports to be used with caution. (The Census Bureau has issued "research" products in the past, when it had reason to doubt their quality or viewed them as preliminary.)

of the SIPP questionnaires for existing as well as new panels. These efforts would greatly increase the burden on the data processing staff.

In our view, the problem of the 1993 and 1994 panels is another argument for running the 1995 panel as a dress rehearsal for the CAPI/database management system with a somewhat smaller sample size that should free up resources to handle the new as well as the old systems. Under this plan, it seems most feasible to continue the use of paper-and-pencil methods for the 1993 panel, which will have only two remaining waves in 1995. We also suggest that the Census Bureau consider truncating the 1994 panel at six instead of eight waves (see Table 5-2). If this step is taken, it would seem most feasible to continue the 1994 panel under the old system—the 1994 panel would have only three remaining waves in 1995 and would end before the start of the 1996 panel. Beginning in 1996, the Census Bureau would have only the CAPI/database management system to run.[21]

> ***Recommendation 5-4:*** **The Census Bureau should make every effort to ensure smooth implementation of CAPI and an improved database management system for SIPP under the new design of 4-year panels introduced every 2 years. One option that the Census Bureau should consider is to field a large-scale dress rehearsal panel in 1995 as a way to work out any operational problems. Under this scheme, full implementation of the SIPP survey redesign would occur in 1996.**

[21] Under the suggested schedule, it will be important to carefully consider the order of topical modules and determine which ones (e.g., program eligibility) are essential to include if the 1994 panel is truncated.

6

Data Products and Their Use

Obviously, an investment in data collection can only earn a return to the extent that the data are used for basic and applied research, policy analysis, and improved public information. In order for the investment in a rich, complex survey such as SIPP to earn a high return, it is imperative that the responsible agency have an active data dissemination program that includes published reports, computer-readable data products, and associated explanatory materials —all produced on a timely basis and in accessible formats.

In this chapter we discuss the requirements for an effective data dissemination program for SIPP. We cover both the types of reports that should be developed and some of the conceptual and measurement issues that arise in estimating income and program statistics from the complex information in SIPP. We also consider microdata products and review the kinds of informational and instructional materials that SIPP users—whether of computer-readable files or printed reports—need in order to make the most effective use of the survey data.

PUBLICATIONS

Regular publication series from a major, continuing survey such as SIPP serve many important purposes. Such publications, containing basic descriptive statistics plus key analytic measures (e.g., spell lengths for program participation), are a valuable reference source for the general user—and their value increases as each successive report adds to a time series.

The annual P-60 series on income and poverty from the March Current Population Survey (CPS) is a notable example—each fall's publication is eagerly awaited and immediately used by a broad community of policy analysts, researchers, and executive branch and congressional staff. Such publications also serve to orient an analyst who is using or plans to use the more detailed information contained in computer data products: they introduce the analyst to the survey, help the analyst develop fruitful study plans (e.g., the numbers may suggest hypotheses or indicate that the sample size is or is not sufficient for analysis of subgroups), and provide important control totals for the analyst to determine the accuracy of his or her computer output. The last function is particularly important for a complex survey like SIPP.

Preparation of regular publications is also vitally important to the agency that sponsors the survey. It is only by having analysts who work with the data regularly develop tabulations and analytic measures that the agency can gain first-hand, in-depth knowledge of the quality and utility of the information. The agency, of course, needs input from outside users regarding data quality and utility, but it needs its own assessment as well to plan needed improvements in the survey and to provide informed guidance to users.

For most of its household surveys, the Census Bureau is the data collection agency but not the sponsor agency and so is not directly involved with the publication program. However, for SIPP, the Census Bureau is both the sponsor and the collection agency and, consequently, has publication responsibility. It is especially important that the Census Bureau have a comprehensive publication program for SIPP because of the richness and complexity of SIPP data. Users need to be made keenly aware, through regular publications that present and explain key indicators, of both the analytical power of SIPP-based measures and the problems that may result from incomplete understanding of such measures. To date, the publication program for SIPP, while including many useful reports, has not adequately served these needs.

A Checkered History

The Census Bureau's publication program for SIPP has been very uneven, including a stretch of several years in which almost nothing was published from the core information on income and program participation (see Table 6-1 for a chronological list of SIPP report titles published through 1991). Initially, the Census Bureau, which established a new Household Economic Studies series (P-70) for SIPP, fully intended to publish a regular set of cross-sectional statistics from the core. The first SIPP report, released in September 1984, provided average monthly data on income and program

TABLE 6-1 SIPP Reports Published in P-70 Series Through 1991 by U.S. Bureau of the Census (in chronological order)

Publication Date (and Number)	Report Title	Source of Data Wave and Panel
Sept. 1984 (P-70-1)	*Economic Characteristics of Households in the United States: Third Quarter 1983*	Wave 1, 1984
Feb. 1985 (P-70-2)	*Economic Characteristics of Households in the United States: Fourth Quarter 1983*	Waves 1-2, 1984
April 1985 (P-70-3)	*Economic Characteristics of Households in the United States: First Quarter 1984*	Waves 2-3, 1984
May 1985 (P-70-4)	*Economic Characteristics of Households in the United States: Second Quarter 1984*	Waves 3-4, 1984
Oct. 1985 (P-70-5)	*Economic Characteristics of Households in the United States: Third Quarter 1984*	Waves 3-5, 1984
Jan. 1986 (P-70-6)	*Economic Characteristics of Households in the United States: Fourth Quarter 1984*	Waves 4-5, 1984
July 1986 (P-70-7)	**Household Wealth and Asset Ownership: 1984*	Wave 4, 1984
Dec. 1986 (P-70-8)	**Disability, Functional Limitations and Health Insurance Coverage: 1984-85*	Wave 3, 1984 (disability) Waves 2-9, 1984 (health insurance)
May 1987 (P-70-9)	**Who's Minding the Kids? Child Care Arrangements: Winter 1984-85*	Wave 5, 1984
Aug. 1987 (P-70-10)	**Male-Female Differences in Work Experience, Occupation, and Earnings: 1984*	Wave 3, 1984
Sept. 1987 (P-70-11)	**What's It Worth? Educational Background and Economic Status: Spring 1984*	Wave 3, 1984
Sept. 1987 (P-70-12)	**Pensions: Workers Coverage and Retirement Income: 1984*	Wave 4, 1984
Oct. 1988 (P-70-13)	**Who's Helping Out? Support Networks Among American Families*	Wave 5, 1984
April 1989 (P-70-14)	*Characteristics of Persons Receiving Benefits from Major Assistance Programs*	1984 panel file
Aug. 1989 (P-70-15)	*Transitions in Income and Poverty Status: 1984-85*	1984 panel file
July 1989 (P-70-16)	*Spells of Job Search and Layoff . . . and Their Outcomes*	1984 panel file

participation for the third quarter of 1983 (July–September) from wave 1 of the 1984 panel. From February 1985 to January 1986, the Census Bureau published five more quarterly reports—for the fourth quarter of 1983 through the fourth quarter of 1984—in the same format, but then discontinued the series (see Figure 6–1 for the contents of the quarterly reports).

Publication Date (and Number)	Report Title	Source of Data Wave and Panel
March 1990 (P-70-17)	*Health Insurance Coverage: 1986-88*	Waves 1-8, 1985 Waves 1-7, 1986-1987, 1985 panel file
June 1990 (P-70-18)	*Transitions in Income and Poverty Status: 1985-86*	1985 panel file
June 1990 (P-70-19)	**The Need for Personal Assistance with Everyday Activities: Recipients and Caregivers*	Wave 6, 1985 Wave 3, 1986
July 1990 (P-70-20)	**Who's Minding the Kids? Child Care Arrangements: Winter 1986-87*	Wave 6, 1985 Wave 3, 1986 Wave 6, 1986 Wave 3, 1987
Oct. 1990 (P-70-21)	**What's It Worth? Educational Background and Economic Status: Spring 1987*	Wave 2, 1987
Dec. 1990 (P-70-22)	**Household Wealth and Asset Ownership: 1988*	Wave 7, 1986 Wave 4, 1987
Jan. 1991 (P-70-23)	*Family Disruption and Economic Hardship: The Short-Run Picture for Children*	1984 panel file
Aug. 1991 (P-70-24)	*Transitions in Income and Poverty: 1987-88*	1987 panel file
June 1991 (P-70-25)	**Pensions: Worker Coverage and Retirement Benefits: 1987*	Wave 7, 1985 Wave 4, 1986

*Denotes reports based primarily on data from topical modules.

There were several factors behind the decision to drop the quarterly reports. First, as we discuss in Chapter 5, the Census Bureau clearly underestimated the resources and capabilities required to process the volume of SIPP data that poured in from the field. Very quickly, the data processing system began to buckle under the strain, with consequent delays in both data files and tabulations for publication. For a time, each successive panel took longer and longer to process, and, indeed, the Census Bureau did not

publish any reports—using either core or topical module information—from other than the 1984 panel until 1990.

For all persons

monthly household cash income (mean, median, and distribution from under $300 to $4,000 and over) by sex crossed by race and ethnicity, metropolitan residence, region, household relationship, age, labor force status, and work disability status;
residence in household receiving cash benefits, food stamps, and other noncash benefits for persons by characteristics (as listed above); and
mean monthly household cash income, receipt of unemployment compensation, and household receipt of cash benefits, food stamps, and other noncash benefits by age and sex crossed by labor force status. *For persons aged 16 and over*
monthly earnings (mean, median, and distribution) by sex and full-time versus other work status crossed by race and ethnicity, age, household relationship, and current occupation. *For households*
mean monthly household cash income, and household receipt of unemployment compensation, cash benefits, food stamps, and other noncash benefits by labor force status of household crossed by household type;
monthly household cash income (mean, median, and distribution from under $300 to $4,000 and over) by race and ethnicity of householder, metropolitan residence, region, household type, age of householder, and work disability status of householder;
mean monthly household cash income, and household receipt of unemployment compensation, cash benefits, food stamps, and other noncash benefits by characteristics (as listed immediately above);
household receipt of food stamps, WIC, free or reduced-price school meals, public or subsidized housing, Medicaid, Medicare, AFDC or other cash assistance, SSI, social security, veterans' benefits, and unemployment compensation by household type crossed by household receipt of food stamps, etc. (same categories as in table heading—also for persons); and
monthly household cash income (mean, median, distribution) by household receipt of earnings, property income, social security, private pensions, federal government retirement, U.S. military retirement, state or local government retirement, veterans' payments, private support payments, AFDC or other cash assistance, SSI, unemployment compensation, other income, food stamps, WIC, free or reduced-price school meals, public or subsidized housing, energy assistance, Medicaid, Medicare.

FIGURE 6–1
Contents of SIPP Quarterly Reports, Series P-70, Nos. 1–6.

Second, Census Bureau analysts documented disturbing anomalies in the quarterly data that were hard to explain. A comparison of aggregate SIPP figures for selected income types with independent sources formed a regular (and highly useful) feature of the reports. However, some income types showed erratic patterns in comparison with the independent sources: for example, average monthly unemployment insurance benefits from SIPP were more than 100 percent of the independent source for the third and

fourth quarters of 1983, but dropped to 85 and 80 percent, respectively, in the first and third quarters of 1984.

Third, for most income sources, Census Bureau analysts believed that the reports showed little change from quarter to quarter and hence would not be interesting to users. The analysts also determined that sample sizes, particularly after reductions due to budget cuts, were insufficient in many cases to ascertain quarter-to-quarter changes that were significant. For all these reasons, the Census Bureau dropped the quarterly series (although the tabulations continued to be produced in-house).

From February 1986 through April 1989, the only SIPP publications were cross-sectional reports based primarily on topical modules from the 1984 panel. (The modules are generally easier to analyze than the core—for one thing, they are specific to an interview wave.) The seven reports published during this period provided interesting and often path-breaking statistics on the following topics: child care, disability and health insurance coverage, household wealth and asset ownership, educational background and economic status, pensions, sex differences in work experience and occupation and earnings, and support networks.

From April 1989 through December 1991, the Census Bureau stepped up the pace and increased the scope of SIPP publications, releasing 12 reports in the P-70 series. Four of these reports—on child care, educational background and economic status, household wealth and asset ownership, and pensions—updated previous publications, based on the 1984 panel, with data from comparable topical modules in later SIPP panels.[1] A fifth report analyzed the topical module data on caregiving from the 1985 and 1986 panels. The other seven reports used the core data contained in longitudinal files created from all waves of a SIPP panel. Reports from the 1984 panel file included characteristics of persons receiving benefits from major assistance programs, transitions in income and poverty status for 1984–1985, spells of job search and layoff, and the effects of family disruption and economic hardship on children. Reports from the 1985 panel file included transitions in health insurance coverage (this report also used the core data from several SIPP panels to provide quarterly estimates of health insurance coverage for 1986–1988) and transitions in income and poverty status for 1985–1986 (a modified version of the 1984–1985 report). Finally, a third report in the series, on transitions in income and poverty status (for 1987–1988), used data from the 1987 panel file.

[1] In addition, tabulations on home ownership from the assets and liabilities topical module in wave 4 of the 1987 panel were published in the *Current Housing Reports series* (Fronczek and Savage, 1991); rates of migration calculated from the 1984 panel longitudinal file were published in the *Special Studies series* (DeAre, 1990); and tabulations on maternity leave arrangements during the years 1961–1985 from the fertility history topical module in wave 8 of the 1984 panel and wave 4 of the 1985 panel were published in the *Special Studies* series (O'Connell, 1990).

Reports on Income and Programs

Descriptive Reports

The Census Bureau's publication plans for SIPP (see Bureau of the Census, 1991a) include a phased-in development of regular reports from the core data on income and program participation. For the first time since the quarterly reports were discontinued, cross-sectional as well as longitudinal measures will be published on these topics. Both cross-sectional and longitudinal data from the 1987 panel will be included in a report on major assistance programs that is scheduled for release in 1992. Updated cross-sectional statistics will be published in 1993 on income, poverty status, and programs, followed by publication in 1994 of updated longitudinal statistics on transitions in income, poverty, and program participation from the 1990 panel.[2] Thereafter, cross-sectional and longitudinal reports will alternate yearly. In addition, the Census Bureau plans to prepare a major report that compares annual income and poverty data from the 1990 SIPP panel with data from the March 1991 CPS. There are also plans to incorporate some SIPP-based tabulations into the P-60 report series from the CPS. We applaud the initiatives by the Census Bureau's Housing and Household Economic Statistics Division (HHES) to develop a regular, comprehensive program of publications from the core SIPP data.

One change that we urge in the overall publication plan relates to the role of SIPP vis-à-vis the March CPS. As we recommend in Chapter 3, the long-range goal should be for SIPP to become the centerpiece of the nation's income statistics. Hence, we urge HHES to reconsider its stated intention that the March CPS remain the primary source for annual income and poverty estimates and to work instead towards a more prominent role for SIPP. Specifically, HHES should consider a publication schedule for SIPP, once the new design is phased in, of releasing cross-sectional statistics every year instead of in alternate years (with longitudinal statistics being released every 2 years). Ultimately, HHES should look to scale back the extent of detail in the P-60 series from the March CPS as users become accustomed to the SIPP data and a sufficient time series is built up from SIPP to support trend analysis. In the interim, we are very supportive of HHES's plans to assess the comparability of SIPP and March CPS estimates and to develop SIPP-based tabulations for inclusion in the P-60 series as an immediate way to make more use of SIPP and alert users to the additional detail that it provides.

[2] Updated longitudinal information is not scheduled for publication earlier than 1994: the 1988 and 1989 panels were truncated to six and three waves, respectively, and hence do not provide sufficient periods of observation, and the complete longitudinal file from the 1990 panel will not be available until late 1993.

Finally, we believe it would be useful for the Census Bureau to release an historical report containing the tabulations of average monthly income by quarter that have been produced from SIPP on a regular basis, although not published since the fourth quarter of 1984. Such a report would enable analysts to become more familiar with the SIPP core information. This report, and others from the SIPP core, should include appendix material of the type that was included in the original quarterly reports on the quality of the data (e.g., information on item nonresponse rates and comparison of SIPP aggregates with independent sources).

Research Reports

In addition to regular publications that provide tabulations and other statistics from SIPP, we urge the Census Bureau to issue a research report series of special analytical studies on topics related to income and program participation. Special studies could cover both substantive and methodological subjects—such as an analysis of trends in income and poverty status for particular subgroups of the population and an investigation of new methods of estimating duration of spells of program participation—and would go well beyond the level of analysis provided in the descriptive reports. Such studies would of course draw heavily on SIPP but should also include relevant data, as appropriate, from such sources as the March CPS income supplement, other surveys, and administrative records.

The importance of having a strong analysis program in the core subjects of SIPP at the Census Bureau stems from the agency's role as the sponsor agency for both SIPP and the March CPS income supplement and the fact that there is no other center for income statistics. The Census Bureau's program should be at least as strong as the analysis program for labor force topics in the Bureau of Labor Statistics (BLS). Indeed, BLS's *Monthly Labor Review* offers a possible model for the income and program research report series (although the Census Bureau's series could be quarterly or semiannual).

The Census Bureau needs to have a strong analytical capability, not only to serve as a beacon and source of information for the user community, but also for its own purposes (as we note above). Such a capability should put the Bureau in a better position to understand user data requirements, to assess and improve the survey data, and periodically to evaluate and improve the basic descriptive report series. We understand that Statistics Canada gives strong support to in-house analysis programs, publishing special studies in *Perspectives on Labour Force and Income*. Indeed, the Canadian statistical agency made a deliberate effort in the 1980s to improve its analytical capability.

We point out that the *SIPP Working Paper* series includes special stud

ies by Census Bureau staff and outside analysts of the type that we have in mind (see the section below on user information and training). This is an important and useful series to continue, but we believe that a regularly published research report series is also needed to provide a more visible outlet and a strong motivation for in-depth substantive analysis as well as methodological investigations on the part of the Census Bureau's income and program staff. (Most of the Census Bureau contributions to the *SIPP Working Paper* series to date focus on survey research and methodological issues rather than analysis methods or substantive research findings.) In addition, the Census Bureau should encourage the analysis staff to submit articles for publication in professional journals.

Reports on Demographic and Employment Transitions

SIPP is a rich source of information on a wide range of topics other than income and program participation. As we have noted, the Census Bureau has prepared a number of interesting and valuable publications from various SIPP topical modules. We wholeheartedly support continuation of such series; see Figure 6-2 for the schedule of topical module (and core) reports planned for 1992.

We also urge the Census Bureau analysis staff from both the Population and HHES Divisions to give attention to a somewhat neglected aspect of SIPP: its potential for analyzing the dynamics of family and household composition over time and the correlates and consequences of key demographic and employment events (such as marriage, job loss, or retirement). Some reports have been published or planned in this area (see Table 6-1 and Figure 6-2), and, in addition, the HHES publications on income and program participation include some statistics on related demographic and employment transitions. However, we believe that much more should be done.

We envision a series of publications that would focus on demographic and employment events—for example, comparing the economic situation before and after marriage or divorce or widowhood for all people experiencing each type of marital status change.[3] The series would include the following:

- summary annual reports on a wide range of demographic and employment transitions, including marital status change, family composition change involving children, change in residence, labor force status change, and job change; these reports would provide counts and basic characteris

[3] The report series on income and poverty transitions will look at the related but different issue of how many people entering a program or falling into poverty also experienced a change in marital status.

tics, such as the age and sex of those people experiencing a particular type of change; and

Characteristics of Recipients and the Dynamics of Program Participation: 1987–88
Extended Measures of Well-Being: Selected Data from the 1984 Survey of Income and Program Participation (No. 26)
Health Insurance Coverage: 1987 to 1990 (No. 29)
Job Creation During the Late 1980s: Dynamic Aspects of Employment Growth (No. 27)
What's It Worth? Earnings Data: 1990
Who's Helping Out? Support Networks Among American Families: 1988 (No. 28)
Who's Minding the Kids? Child Care Arrangements: Fall 1988
NOTE: The P-70 series number is given for reports that have been released as of summer 1992; the other reports are scheduled for publication by December. In addition to the reports shown above, a report based on SIPP data is scheduled for release in the P-23 series by December 1992: *When Households Continue, Discontinue, and Form*.

FIGURE 6–2
SIPP Reports in P-70 Series Published in 1992 (in alphabetical order)

- a special report each year that would provide an in-depth analysis of one or two particular types of events and their antecedents and consequences; a rotating schedule could be established, with reports on employment topics alternating with reports on demographic topics.

Recent papers from the PSID by Burkhauser and Duncan (1988) and from the 1984 SIPP panel by David and Flory (1988) and Ruggles and Williams (1987) provide examples of the types of analysis that the detailed special reports could include.

Recommendations

A strong publication program on income, program participation, and related topics is an essential component of the Census Bureau's responsibilities for SIPP. The program should include several types of descriptive and analytical report series that provide basic information and more in-depth analysis from the survey.

Recommendation 6–1: **The Census Bureau should move forward with its plans for regular, comprehensive series of descriptive reports on income, programs, and related topics from the core**

data in SIPP. Longitudinal statistics (e.g., on the dynamics and correlates of transitions in income, poverty, and program status) should be published; cross-sectional statistics should also be issued on a frequent schedule.

The Census Bureau should also establish a research report series to include in-depth analytical and methodological studies of special topics related to income and program participation. Data sources for these studies could include—in addition to SIPP—the March CPS income supplement and other surveys and administrative records.

The Census Bureau should continue publications from the SIPP topical modules and also establish a regular series of summary and in-depth reports from SIPP on the dynamics and correlates of major demographic and employment transitions (e.g., marriage, retirement).

The program outlined above is both important and ambitious. Our major concern is that the Census Bureau may underestimate the level of resources and capabilities required to carry it out. There are many complex technical issues involved in developing appropriate and policy-relevant statistics from SIPP, particularly those based on the longitudinal data (see discussion in the next section). Development of useful series from SIPP also requires extensive analysis to understand the quality of the data and their comparability with other widely-used data sets, such as the March CPS. In addition, major work will be needed to develop the capacity to estimate from SIPP such statistics as after-tax income and appropriate values for in-kind benefits. Hence, staff and resources need to be sufficient not only to produce publications, but also to support an ongoing program of research and development to identify and implement improved methods of analyzing and presenting statistics from SIPP.

In this regard, it is critically important for the Census Bureau to invest in the skills and knowledge of the SIPP analysis staff so that they are up to date with relevant policy issues and analytical methods. There are many avenues to accomplish this goal. The Census Bureau already has experience with several approaches: organizing in-house seminar programs and sessions at professional meetings for both staff and outside analysts to present findings and discuss analysis issues; commissioning experts, through joint statistical agreements or other means, to conduct research on specific analytical issues (e.g., longitudinal weights); and making use of the American Statistical Association (ASA)/Census fellowship program to bring researchers on-site to work with SIPP data and share their experiences. We urge the Bureau to sustain these efforts for SIPP and to focus them more directly on the needs of the analysis staff. In addition, the Bureau should provide

support for the analysis staff to enroll in courses and other continuing education programs.[4] We also recommend, as part of an improved oversight program for SIPP (see Chapter 8), that the Bureau establish a working group of expert analysts to periodically review SIPP statistics on income and programs and provide feedback and advice to the staff on conceptual and measurement issues.

Recommendation 6-2: **The Census Bureau should ensure that its analysis staff, in addition to preparing the regular publications from SIPP, are able to undertake an ongoing program of research and development into effective means of analyzing and presenting SIPP statistics and are able to stay well versed in relevant policy issues and analytical techniques.**

MEASUREMENT ISSUES FOR CORE STATISTICS

Development of appropriate and useful statistics from the rich, complex data sets provided by SIPP gives rise to difficult conceptual and measurement issues. This is the case whether one is a Census Bureau analyst seeking to develop statistics for a published report series or an outside researcher pursuing a particular analytic interest. However, the Census Bureau faces perhaps the more challenging task, in that the statistics it publishes must at the same time be methodologically sound, relevant to policy concerns, and able to be interpreted to users with varied levels of technical expertise.

Members of the panel wrestled with these problems in working on illustrative tabulations for SIPP reports on income, poverty, and program participation (for details see Citro, 1990, 1991b).[5] Here we provide an overview of some of the more important conceptual and measurement issues that will have to be considered in developing core statistics from SIPP, particularly those that involve use of the SIPP longitudinal data: relating statistics to policy concerns; specifying analysis units (e.g., persons, families); characterizing change in contextual variables (e.g., marital or employment status changes); constructing equivalence scales (i.e., household and family income measures that are adjusted for family characteristics); measuring duration of spells of poverty and program participation; and treat

[4] The Center for Survey Methods, which the National Science Foundation expects to fund in the near future at a university site in the Washington, D.C., area, may be willing to offer relevant courses.

[5] The panel's suggested tables are very preliminary. The Census Bureau will need to review them carefully, in particular, run them on SIPP data files to determine their feasibility: for example, sample sizes may be too small to support some of the suggested cross-classifications.

ment of missing data due to a respondent's missing an interview or entering or leaving the sample. Because income and program statistics from SIPP will be issued side by side with statistics from the March CPS income supplement for a period of time, we also discuss ways in which many of these measurement issues are handled in the March CPS publications and note instances in which statistics from SIPP will represent an improvement.

Policy Relevance

Census Bureau publications are mainly intended to provide statistics of interest to a broad user community, rather than to address specific policy (or research) questions. Nonetheless, it is important that SIPP statistics on income and program participation take into account important policy concerns and perspectives. Indeed, the detail in SIPP makes it possible to provide a rich set of policy-relevant statistics, for which we have several concrete suggestions.

SIPP obtains detailed information on sources of income, which we believe should be exploited in tabulations that address policy concerns. Although all of the detail cannot be shown because of publication and sample size constraints, some important classifications can and should be made. Specifically, we suggest that SIPP income reports, in addition to tables of total income, routinely include separate tabulations for people with income from the following sources: earnings (wages and salaries and self-employment income); asset income from financial and property holdings;[6] social insurance programs (social security, unemployment insurance, workers' compensation, and veterans' compensation); pensions (from public and private employers) and private disability insurance; and public assistance.

In the March CPS reports, only earnings are currently distinguished as a separate income type, and reports to date from SIPP on income transitions make no distinctions by type of income. Yet the major income types are important to identify separately so that policy analysts and other users can get a sense of what is happening when they see changes in median income, poverty rates, and other overall trend indicators. It is important to know, for example, whether all sources of income are moving in the same direction or whether an income rise (or decline) is more or less associated with a change in labor markets, returns to assets, or public programs, such as means-tested transfers. Cross-classifying people who have income of a particular type by the presence or absence of the other major income sources and the contribution that each income type makes to their total income can also provide

[6] We note that the asset data that are currently collected in SIPP are of questionable quality (see Chapter 3). It may not be a good idea to show asset income as a separate category in SIPP publications until the quality is improved.

important information. For example, trends in the proportion of public assistance recipients who receive earnings can give a sense of the effects of public policy changes and perhaps also of general economic conditions.

SIPP also obtains detailed information on assistance programs, including the timing of benefit receipt, so that concurrent versus sequential multiple program participation can be distinguished. We recommend that many more categories of programs be distinguished in published statistics than was done in the first SIPP report on participation in major assistance programs (P-70, No. 14), which showed only three categories: major assistance, defined as Aid to Families with Dependent Children (AFDC), general assistance, Supplemental Security Income (SSI), food stamps, Medicaid, and housing assistance; cash assistance, defined as AFDC, general assistance, and SSI; and food stamps. In addition, social insurance programs, as well as means-tested public assistance programs, should be shown. In determining how to group assistance programs for tabulations, it is important when possible to recognize differences in target populations. For example, among means-tested programs, SSI and AFDC have very different targets—poor elderly and disabled people in the former and poor families with dependent children in the latter. Similarly, unemployment compensation, which is targeted at people temporarily without work, is very different from such insurance programs as social security, which support retired people and those with long-term disabilities.

SIPP also includes information to determine eligibility for assistance programs.[7] Program participation rates that use the eligible population as the denominator are much more useful than rates that are based on the general population or even on demographic subgroups because assistance programs typically limit benefits to people with certain combinations of financial and other characteristics. It is important for policy analysts to know whether increased numbers of program participants represent higher take-up rates on the part of the eligible population or increased numbers of eligible people or both. We are pleased to note that the Census Bureau has begun work on a model of program eligibility and will include participation rates for eligible populations in its report series on participation in major assistance programs as soon as the model is fully developed.

Finally, the Census Bureau's decision to give high priority to developing measures of after-tax income and noncash benefits from SIPP makes eminent sense from a policy standpoint, as well as from the standpoint of the proper conceptual approach to the measurement of income and other economic resources. There has been growing use of the tax code as a social

[7] The eligibility information is most detailed in the 1987 and later panels that include a special topical module. There is room for yet further improvement in the eligibility information from SIPP (in particular, more frequent measures), as we note in Chapter 3.

welfare policy instrument, as well as growing reliance by policy makers on noncash programs of income assistance. We have already indicated our wholehearted support for an active program of research and development on these topics for SIPP (see Chapter 3). Here we note our support for a published series of alternative measures of income from SIPP—like the series published from the March CPS—that take account of taxes and noncash benefits.

Units of Analysis

The Census Bureau's P-60 reports, based on the March CPS, provide cross-sectional statistics for different units of analysis, including annual income for household and family units, personal income for people aged 15 and older, and poverty status for families and people (based on family income and poverty thresholds). The SIPP-based P-70 reports on income and poverty transitions (Nos. 15, 18, 24) have used people as the sole unit of analysis, with total family income attributed to each member in order to take account of resource sharing within the family.[8] The SIPP report on participation in major assistance programs (P-70, No. 14) also used people as the unit of analysis, with participation ascribed to the spouse or children of a primary recipient.

Statistics for household and family units are useful for a number of purposes (e.g., for government and business planning, which often requires information on households for targeting purposes). However, for policy analysis and research on such topics as income inequality and the effects of government policies on poverty, the use of household or family units can be misleading because smaller households or families are counted as equal to larger units.[9] For these purposes, it is more appropriate to present house

[8] It would also be useful to include tabulations for selected types of own income of persons in SIPP reports. We do not consider such statistics here because they do not present special measurement problems, provided that the income sources tabulated are appropriate to consider on a personal basis. For example, statistics on own earnings for adults are useful for analysis of labor market success for different kinds of individuals. However, it would be misleading to provide statistics on program participation (e.g., for AFDC or food stamps) that ascribed benefits just to primary beneficiaries and did not take into account that the primary recipient's benefit commonly covers other household members.

[9] Ruggles (1990a:123) provides a dramatic example of the effect of using families versus people as the unit of analysis. The annual poverty rate for families headed by an elderly person is *higher* than that for other families, while the poverty rate for elderly persons is *lower* than that for other persons. The reason is that more elderly people who are poor live in small family units compared with nonpoor elderly people, while the reverse is true for the nonelderly. Hence, the elderly (nonelderly) poor are a higher (lower) proportion of family units in poverty than of people in poverty. Clearly, the family-based measure distorts the picture of the types of individuals who are more likely to be poor. In a longitudinal context, Doyle and Long (1988) found differences in patterns of multiple program participation in comparing measures based on a longitudinal program unit definition with attribute-based person measures.

hold and family income statistics in terms of individual people (attributing the household or family total to each member).

A problem with the CPS annual household and family income measures, whether they are developed on a household or family unit basis or attributed to individuals, concerns the mismatch in measuring household and family composition and measuring income. Composition is measured as of the March following the income reference year and no information is obtained about intrayear changes in composition. For example, two people found to be married as of March will be classified as a married couple for the entire income reference year and assigned the combined income of both spouses for that year. However, this treatment is misleading if, in fact, the couple's marriage took place after the start of the income year.[10] SIPP was explicitly designed to overcome this problem by following people over time and collecting monthly information on family composition and income. The question is how to use this rich detail from SIPP for cross-sectional and longitudinal statistics.

For cross-sectional statistics, one can use the monthly data from SIPP directly to construct annual (or quarterly) average monthly income and program participation measures by treating each month as a separate cross-section that is weighted to represent the total population and then taking an average (as was done in the quarterly reports from the 1984 SIPP panel).[11] This approach makes it possible to construct cross-sectional household and family income and program statistics for people—and also for households and families, if desired—that reflect the appropriate classification of household and family type and the appropriate assignment of income.[12] Users will need to become accustomed to different income levels as reference

[10] Citro, Hernandez, and Moorman (1986), using data for the first 12 months of the 1984 SIPP panel, estimated that a household definition fixed in month 12 would misrepresent 9 percent of households as having had the same family type all year. This estimate is biased downward because the wave 1 SIPP interview does not completely measure family composition changes during the first 4 months. The current CPS definition, which fixes household composition as of month 15 (in the SIPP context), would most likely misrepresent a considerably higher proportion of households as having had the same family type for the entire year (and an even higher proportion as having had no change in either type or size during the year). There have been no definitive studies of the effects of a fixed household definition on income measures, but the limited available evidence suggests that annual poverty rates in the CPS are distorted to some extent (see Czajka and Citro, 1982; Scardamalia, 1978).

[11] Note that it would be important to ascertain if the anomalies found in the quarterly reports from the 1984 panel (see above discussion) persisted and, if so, determine their implications for the detail that is appropriate to publish in tabulations.

[12] The fact that intramonth changes in composition are ignored is a trivial matter for most purposes. Another advantage of average monthly measures from SIPP is that people who leave the universe during the year (or other reference period)—for example, people who die, move abroad, or enter an institution—are included for the portion of the reference period in which

points: for example, the median average monthly income in the third quarter of 1984 for households from SIPP was $1,768 (Bureau of the Census, 1985b:Table 9), compared with a median annual household income in 1984 from the March CPS of $22,415 (Bureau of the Census, 1989a:Table 2).

We note that average monthly statistics may not be appropriate for all types of economic measures. Specifically, annual poverty rates that are constructed on an average monthly basis do not likely, in our view, constitute a useful set of statistics. A month appears to be too short a period in which to establish economic hardship, given measurement error and the fact that many people experience fluctuations in income that may put them below the poverty line for a short time but not over a longer period.[13]

For longitudinal statistics, the use of the detailed income and family composition data in SIPP to develop longitudinal income measures for units that are observed over a period longer than a month (e.g., measures of change in income level and poverty or program participation status from one year to the next) is more problematic. To develop attribute-based income measures for people is conceptually straightforward, although computationally tedious because of the need to aggregate over months and household or family members. (For example, a measure of year-to-year change in poverty status would be constructed as follows: aggregate across people in each family each month to determine monthly family incomes and poverty thresholds for each individual; add the income and poverty threshold values for each person across months in year t, and divide through to obtain the person's poverty ratio for that year; similarly, for year $t + 1$.) However, some problems do arise. One problem is how best to categorize people by other contextual variables (e.g., family type, marital status, region of residence, employment status) that will often have changed over the period of measurement. Another problem is how to treat people with missing data for part of the measurement period, either because they missed an interview or entered or left the sample. (Both of these issues are discussed below).

To develop longitudinal statistics for households or families as such (or another aggregation, such as tax filing or program assistance units, which can be subsets of households) poses a more basic conceptual problem. The difficulty is how to define these units longitudinally, given observed com

they were in the sample. Such people are not included in the CPS annual income measures because they cannot be in the sample in the following March, and no attempt is made to find out about them. Finally, in the SIPP context, average monthly statistics maximize the available sample size, by including people who provided data for some but not all months. Also, sample size can readily be increased by combining panels.

[13] In arguing against the use of monthly poverty rates, we do not mean to imply that poverty rates based on *annual* income are the only appropriate measure. Indeed, SIPP provides an important capability for measuring intrayear spells of low income; see discussion of spell definition issues below.

positional changes. As one example, it may be easy to decide that a married couple that has a baby should be treated as the same family before and after the birth. A more difficult question is how to treat the couple if they later split up. Is the parent who retains custody of the child the continuation of the original family and the other parent a new family, or does the original family end at the time of the split and two new families begin? Further complicating matters is that any longitudinal household or family definition will produce units that existed for only part of the year (or other period of analysis), and a decision must be reached on whether to count part-period units the same as units that experienced no change or to apply some type of time weight to them.

Research on the effects of the choice of longitudinal household or family unit definition is mixed. Citro, Hernandez, and Moorman (1986) found from analysis of the 1984 SIPP panel that the specifics of a longitudinal household definition had relatively little effect on annual poverty rates, but only if part-year units were time weighted (e.g., a unit that existed for only 7 months would be given a weight of 7/12). Not using time weights increased the poverty rate because part-year units had considerably higher poverty rates than full-year units under all definitions. More important, the amount of the increase varied because the number of part-year units and their poverty rate varied across definitions.[14]

It is not a desirable property of a measurement concept that minor variations in specification produce important differences in results. Moreover, as noted above, the use of household or family units to present statistics on income and poverty will often produce different results from using people as the unit of analysis and attributing household or family income to them. Finally, because of the conceptual and computational problems of making a longitudinal household or family definition operational, it is tempting for users of longitudinal surveys to take the path of least resistance: namely, to study only those units that experienced little or no change in composition over time (see Duncan and Hill [1985] for a discussion of this phenomenon in the PSID context). Yet this approach discards the most interesting cases in the sample and the ones that are likely to differ appreciably from the rest.

In view of these kinds of problems, a number of analysts have concluded that there is no defensible way to define households (or other units) on a longitudinal basis (Duncan and Hill, 1985; Ruggles, 1990b). Instead, they recommend the use of attribute-based person measures. We agree with this conclusion and recommend that the Census Bureau continue the practice of developing longitudinal income, poverty, and program statistics for

[14] Findings from an analysis of the 1979 Income Survey Development Program (ISDP) research panel (Citro and Watts, 1986) were similar, except that part-year households had lower poverty rates than full-year households in that study.

SIPP reports that are person-based, with attribution of household, family, and program unit characteristics to individuals. In the case of annual statistics from the March CPS and SIPP that are designed for comparison purposes, the tables from both sources should use attribute-based person measures of annual household and family income and poverty status.

One last point regarding the unit of analysis concerns attribution of program participation when the assistance unit is a subset of the household or family. Doyle and Long (1990) included two types of attribute measures in their analysis, one that attributed program participation to members of the assistance unit per se (e.g., a mother and dependent children for AFDC) and the other that attributed program participation to all household members if any member of the household participated (e.g., attributing AFDC participation to a grandmother or aunt). They found some differences between the two attribute-based measures, as well as between each such measure and the longitudinal program unit measure.

For statistics on the characteristics of program beneficiaries, it seems most useful to use the first type of attribute measure—that based on the program assistance unit. (As we note in Chapter 3, further work is needed to improve measures of the assistance unit, which are often problematic in surveys, even in SIPP with its emphasis on program participation.) But for general purpose statistics on income and poverty that are designed to answer such questions as how many people live in families that benefit from programs and the contribution of program benefits to total family income, it seems most useful to attribute program receipt to all members of a family (or household). This approach assumes that resource sharing extends to members of the family or household other than the assistance unit, an assumption that seems reasonable but one that would obviously benefit from research.

Contextual Variables

The use of SIPP monthly data makes it possible to develop longitudinal measures of income, poverty, and program participation that properly reflect each person's economic status over the measurement period. However, during that period—whether it be a fixed calendar unit such as 1 or 2 years, the length of a SIPP panel, or the length of a spell of poverty or program participation—many people will have experienced other changes that represent important contextual variables. The problem is how to characterize these people—for example, people who changed jobs one or more times or got married or divorced—in a way that is accurate yet retains clarity and ease of understanding.[15]

[15] The problem of how to treat people with missing data for part of the measurement period is discussed below.

The simplest approach is to use a definition for such variables as marital status, employment status, and family type that is fixed at a point in time (as must be done in the March CPS, given the lack of monthly data). However, this type of definition is misleading to users who may assume, for example, that all unemployed poor people were continuously unemployed during the income reference period.

Another approach, which has been followed in the SIPP income and poverty transitions reports, is to use a definition that reflects the person's status for the largest number of months in the reference period. This type of definition more accurately represents each person's situation during the reference period, but it, too, fails to distinguish between people who did and did not experience a change. Yet that distinction is important given the strong evidence that changes in marital status, employment status, and other characteristics relate to changes in income and program participation (see e.g., Ruggles and Williams, 1987; Williams and Ruggles, 1987).

However, it can be difficult to develop indicators of change in contextual variables that do not overwhelm users with detail given the many different patterns that are possible—for example, during a year, some people may experience several employment or marital status changes of different types. We do not believe that there is a general-purpose solution to this problem. Rather, the presentation of the contextual variables in a table or set of tables should be congruent with the presentation and intended uses of the longitudinal measures of income, poverty, or program participation.

For annual income and program statistics from SIPP that are designed for comparison with the March CPS, it is appropriate to use a fixed definition for contextual variables; the end of the income reference year seems best. However, this type of table should also identify people who experienced one or more changes: for example, a table of marital status as of December could show separately for each category those people who remained in that status all year and those who experienced one or more changes in marital status during the year. We note that annual measures from SIPP will effect some improvements relative to the March CPS by summing monthly household or family incomes for people in the sample at the end of the calendar year. Not only are contextual variables measured at the end of the income reference year and not in March, but all income available to a household or family member during the year—for example, income of decedents—is included.[16]

[16] However, the income of people who lived alone and left the SIPP universe during the year will not be included. In general, such annual tables from SIPP are not ideal in that, like the current March CPS annual tables, they are neither truly cross-sectional nor truly longitudinal. Nonetheless, they will be important to produce until users become fully accustomed to average monthly cross-sectional statistics on one hand and longitudinal statistics on spells and transitions on the other.

In the case of tables that look at year-to-year changes in economic status (e.g., whether annual family income rose or fell by 5, 10, or 20 percent or more or stayed about the same across pairs of years), there is a corresponding need to distinguish people who changed employment, marital, or other statuses versus those who did not over the 2-year period. The same approach could be followed for categorizing contextual variables (e.g., marital status) in tables of year-to-year changes in annual income as suggested above for tables of annual income. First, tabulate the people whose marital status did not change over the 24-month period by the appropriate category—never married, married spouse present, married spouse absent, separated, widowed, or divorced. Then tabulate separately the people who experienced one or more changes in marital status, identifying them by their marital status at the end (or beginning) of the 24-month period.[17] Tables of year-to-year changes in annual income could also provide additional detail about changes in contextual variables (e.g., perhaps separately tabulating people with no, one, and more than one marital status change). However, such tables should not provide elaborate detail about the nature of the demographic changes given that the income change measures themselves are of a very aggregate nature.

In the case of tables that hone in on changes in income and program participation by identifying people who fall into or move out of poverty or enter or leave programs, it is appropriate and useful to provide detailed information about associated changes in contextual variables. The detail is justified given that one can legitimately seek to identify causal relationships from tables of spell duration and other characteristics for people who enter or exit poverty and programs. Using the marital status example, we suggest the following approach for categorizing contextual variables in tables of poverty or program participation spells, entrances, and exits. First, tabulate people who did not change marital status at the time of entering (or exiting) poverty or a program by the usual categories (never married, etc.). Then tabulate people who did experience a contemporaneous change by using the following categories: from never married to married, from married to separated or divorced, from married to widowed, from divorced or separated to remarried, and from widowed to remarried.[18]

[17] Sources of family income received over the 24-month period represent a somewhat different type of contextual variable. We suggest the following detail for each major source of income (e.g., earnings, asset income, social insurance income, public assistance —see above): income from this source in first year only, income from this source in second year only, income from this source in both years, no income from this source.

Equivalence Scales

A controversial issue in the assessment of economic well-being, whether measured by income, consumption, or some other concept, concerns the development of appropriate equivalence scales—that is, adjustment factors to permit comparisons across families of different size and composition. There is general agreement that an equivalence scale is needed to avoid the conclusion that everyone, regardless of family type or size, with a comparable level of income has a comparable level of well-being. There is also broad agreement on the basic outlines of an appropriate equivalence scale, namely, that it should recognize that an additional family member increases the income requirements of a family but that the increase is not uniform (because larger families can achieve some economies of scale: for example, a two-bedroom apartment typically rents for less than twice as much as a one-bedroom apartment). However, there is no agreement on the best form for an equivalence scale.

The current official poverty measure includes an equivalence scale that is based on the differing nutritional requirements of elderly people, nonelderly adults, and children. Other needs for a family are assumed to be a simple ratio of 3 times the costs of meeting the minimal nutritional needs of its members. Ruggles (1990a:Ch. 4) offers a critique of the poverty measure's equivalence scale, particularly of the lower poverty thresholds for families headed by an elderly person compared with other families and the irregular patterns of increase in the thresholds by family size.

There is a large literature on equivalence scales (see, e.g., Buhmann et al., 1988; Danziger et al., 1984; Deaton and Muellbauer, 1986; Lazear and Michael, 1980, 1988; van der Gaag and Smolensky, 1982). Methods of developing such scales include relying on expert judgment about differences in needs, using the preferences revealed in consumption data, or using opinion surveys that ask people about the minimum needed "to make ends meet." Ruggles (1990a:Ch. 4) proposes that statistical agencies conduct long-term research on this issue, including research on the desirability of developing adjustment factors for other characteristics besides family size, in particular, place of residence.[19] In the short term, Ruggles favors smoothing out the irregularities in the current poverty measure equivalence scale and

[18] The definition of a "contemporaneous" change is open to question. The study by Ruggles and Williams (1987) of entrants and exits for AFDC and food stamps applied a rigorous definition: that a change in, say, marital status had to occur in the same pair of months as a program entrance or exit. However, they pointed out that there may be lags between such

[19] Price differences among geographic areas imply that residents of higher cost areas may need more income to maintain a similar level of consumption than residents of lower cost areas.

eliminating the distinction between elderly and nonelderly people (just as distinctions by sex of family head and farm versus nonfarm residence were earlier eliminated from the official measure).

The issue of an appropriate equivalence scale for measuring poverty has broader significance because the ratio of income to poverty provides a convenient and widely used method for grouping people with equivalent income levels across the entire income distribution. For example, many of the tables in the SIPP reports on transitions in income and poverty status categorize a person's family income as a ratio of the relevant poverty threshold, using the categories of income less than 1 times the poverty level, 1 to 2 times poverty, 3 to 4 times poverty, and 5 or more times poverty. One can then answer such questions as what proportions of people in single-parent families compared with those in married-couple families are in the highest (or lowest) income-to-poverty ratio category.

We support the desirability of research into alternative methods of constructing an appropriate equivalence scale for the official poverty measure, but we focus here on the short-term question of what type of equivalence scale to use in SIPP publications at this juncture and for what purposes.[20] SIPP core publications, like those from the March CPS, will include tabulations of the distribution of family income for people unadjusted for family composition. (We suggest that a useful approach is to display the mean and upper limit values for each fifth of the income distribution instead of using fixed income categories.) Such tables should always include family type and size as contextual variables, so that users can make rough-and-ready assessments of equivalence. In addition, we urge that SIPP publications include companion tables that explicitly categorize income as a ratio of the relevant poverty threshold. Both the average monthly cross-sectional series from SIPP as well as the various longitudinal series (e.g., year-to-year comparisons) should include income-to-poverty ratio tables. Such tables should also be developed for the March CPS to facilitate SIPP-CPS comparisons.

We agree with the use of the current poverty thresholds, despite their flaws, as the basis for grouping people with equivalent income levels because we see no significantly better alternative in the short term. The Census Bureau should examine, and might consider publishing on an experimental basis, income-to-poverty ratio tables that incorporate some modifications to the thresholds, such as those proposed by Ruggles.[21] In any case, it will be important to explain clearly to users the purpose of the

events as job loss (gain) and beginning (ending) assistance receipt. They proposed investigating a definition that would recognize changes in contextual variables that occurred a month or two earlier than the associated program change. David and Flory (1988) used a looser, wave-to-wave-based definition of change in marital status.

[20] We note that a new Committee on National Statistics panel is about to undertake a comprehensive assessment of all aspects of the current poverty measure, including the equivalence scale. We hope that this panel will make recommendations that can feed into SIPP income measures over the longer term.

income-to-poverty ratio categories, namely, to facilitate comparisons across groups and, once a series is established, across time. It is particularly important to be clear on this point for the annual average monthly cross-sectional statistics from SIPP. Otherwise, users may be tempted to use the lowest income-to-poverty ratio category (less than I times the poverty level) to construct an average monthly poverty *rate*, which we note above may not be a particularly useful statistic.

Analysis of Spells

Over the past decade, there has been growing policy and research interest in such questions as the extent to which program beneficiaries are dependent on assistance over the long term versus those needing help only for short periods.[22] Paralleling this interest has been further development of the needed research tools that make it possible to analyze spells and duration of poverty and program participation—namely, large-scale longitudinal data sets, powerful computer hardware and software, and statistical methods for estimating spell duration. The SIPP longitudinal data have already been used by analysts to estimate duration of spells of low income, spells of participation in AFDC and food stamps, and spells without health insurance coverage (see Chapter 1; see also Gogan, 1988). In addition, SIPP has been used to study completed spells of job search and layoff (Bureau of the Census, 1989b).

Extending the length of SIPP panels from 32 to 48 months will increase the utility of the data for spell analysis. However, there are methodological issues that have not yet been fully resolved with such analysis, and the Census Bureau will need to consider carefully how best to present spell statistics in the core SIPP publications. To date, none of the SIPP income reports have included spell estimates. The report on participation in major assistance programs (P-70, No. 14) provided statistics on observed number of months of program participation within the 32-month period of the 1984 SIPP panel file; however, these estimates are not measures of the duration of spells.

Estimating Spell Duration

Because it is not feasible to follow people from the cradle to the grave, in any longitudinal data set there will be many spells (of low income, program participation, unemployment, etc.) that are not observed in their entirety. If

[21] Some Census Bureau analyses of March CPS data have used Ruggles's modified poverty thresholds (see McNeil, 1992; Weinberg and Lamas, 1992).

[22] As evidence of this interest, Senator Daniel Moynihan (D-N.Y.) introduced a bill in summer 1991 to require the Secretary of Health and Human Services to develop and publish statistics on welfare dependency.

no account is taken of such spells, the estimates of spell duration will be biased downwards.

The standard approach to estimating spell duration is to define the population of spells to be those that are observed to *begin* within a specified period of observation (the length of a panel or a particular calendar year or other period that is covered by the panel).[23] Survival analysis techniques are then used to estimate the probability that a given type of spell (e.g., welfare participation) will survive to the next time period (e.g., the next month) on the basis of the cumulative distribution of observed spell durations up to that point, including spells that are right-censored (i.e., spells for which the end date is not known).[24] Alternatively, one could define the population to be all spells that *ended* within a specified period of observation and estimate survival probabilities backwards in time to the start of each spell. Such an analysis, which would include cases censored at the start rather than at the end of the panel, could be useful to carry out occasionally.

As Ruggles (1990b) notes, survival analysis of this type is a popular approach for analyzing spell durations and their determinants, and we support its use to develop estimates of spells of low income and program participation for inclusion in SIPP published reports. We propose that these reports contain tables that show the median estimated spell length and the survival rate or percentage of spells in progress after 1, 4, 8, 12, 16 months, etc., derived from the product-limit (Kaplan-Meier) estimation procedure. These results should be produced for the total sample and for various population subgroups. We suggest that the spell population for duration estimates from SIPP be defined to include spells that begin in a particular calendar year. This population of spells can be readily explained, and, as a time series accumulates, users can begin to see changes in spell lengths across the yearly cohorts of new spells and relate them to other phenomena. It is probably sufficient to update the spell estimates every other year. For a given year, the estimates can then be based on the panel that starts in that year, thus permitting the maximum length of observation for the spells (up to 4 years with our new design).

[23] If more than one spell is observed for the same person, then each spell is often treated as independent. Modeling multiple spells for the same person is also an important research priority, since total time spent on welfare or in poverty is of policy and analytic interest. Ellwood (1986) has shown that it is feasible to take information about the length of initial spells and combine it with information about the chance and length of subsequent spells to construct estimates of lifetime welfare use. The relatively short duration of SIPP makes it more difficult to examine multiple spells with data from SIPP than from other, longer-term surveys (e.g., the PSID or NLS).

[24] See Tuma and Hannan (1984) for an overview of survival analysis methods; see also Blossfeld, Hamerle, and Mayer (1989); Yamaguchi (1991). See Ruggles (1990b) for a nontechnical discussion of spell analysis and other issues in longitudinal analysis of federal survey data.

The above approach produces duration estimates averaged across the calendar year. The approach assumes that spell durations do not differ systematically according to their starting time within the year. To the extent that external events—for example, legislative changes or changes in the state of the economy—affect spell durations over time, it may be misleading to pool spell observations across the period as a whole. Our recommendation to include spells that begin within a calendar year, rather than in some longer period (such as the 4-year period of observation of a SIPP panel under our proposed new design) reduces the likelihood of changes in spell durations over time, although at the cost of reducing the sample size for analysis. If insufficient sample size turns out to be a problem (which may be the case for spells on such programs as AFDC, although probably not for spells of low income), the spell population could be defined to include spells that begin within a 2-year rather than 1-year period. Also, the estimates could be developed from pooled panels (although this approach will increase the proportion of censored spells).

One issue that needs to be resolved is the sample of cases to include in the spell analysis. One possibility is to base the analysis on original sample persons in a panel file who provide data for every wave for which they are eligible, making use of the longitudinal weights in the analysis.[25] With this approach, right-censoring occurs when a spell is still in existence at the end of the panel or when a panel member leaves the survey universe through death, institutionalization, or emigration. The former type of right-censoring, which is independent of the spell duration, is routinely handled by survival analysis techniques. Although the numbers of leavers are small, appropriate methods need to be developed to handle the latter type of right-censoring. People who die may be simply treated as having ended their spell (e.g., of low income). Depending on the type of spell, people who leave the universe because they entered an institution or moved abroad can be treated either as having ended their spell or as cases whose spells were still in progress at the end of the survey. (Note that participation in social security can continue even if a person moves abroad, but not participation in AFDC.)

An alternative approach to selecting sample cases for estimating spell durations is to include all spells observed to begin during the reference period, including those experienced by persons who left the panel through attrition. In some of these attrition cases, completed spells will be observed, but in others the spell will be still in existence when a person leaves the panel. A common method of handling the incomplete spells of attrition cases is to treat them in the same way as right-censoring that is due to the

[25] There is a concern, however, that these weights may not adequately compensate for non-response—see the next section.

end of the survey—under the assumption that people with a spell in progress who drop out of the survey are as at much risk of ending the spell as people whose spell is censored by the completion of interviewing. Alternatively, attrition can be treated as a different type of exit from a spell that can be explicitly modeled. This approach recognizes that the decision to leave the survey is not random, but involves a questionable assumption of statistical independence between competing risks (see McBride and Swartz [1990:App.] for further discussion and references).

The inclusion of spells of attrition cases can appreciably increase the sample of spells for analysis. However, there are no readily available weights that can be used. For this reason, analysts who have included cases of attrition directly in their analyses have developed unweighted estimates (see discussion in the next section).

Finally, the standard approach to estimating spell durations reduces the sample size for analysis by virtue of excluding spells that exist at the start of the panel. These spells are a length-biased sample of spells since longer spells are more likely to be present at any particular date. One way to include such spells is to define the spell population to include all spells that begin in a period that began prior to the start of the survey—for example, in the case of 1990 SIPP panel, one might seek to estimate the duration of all spells of low income that began in the period January 1986 to December 1990 (or 1991). The beginning date is chosen under the assumption that all of the spells existing at the start of the panel commenced after that beginning date. This assumption, with a January 1986 start date, might be reasonable in the case of food stamp spells, most of which are relatively short in duration, but not so reasonable for AFDC spells, which may last a long time. Starting dates of program spells are collected in the personal history module. If found to be sufficiently accurate, these dates could be used to determine the beginning of spells existing at the start of a panel (see Miller and Martini, 1992).

An added complication is that a number of spells that started within the period defining the spell population will have already ended before the start of the survey (between February 1986 and fall-winter 1989–1990 in our example).[26] These unobserved spells, which are referred to as "truncated," need to be included in the analysis. Their numbers and durations can be estimated by a model with restrictive assumptions about the stationarity of the occurrence and duration of spells, or they can be estimated from past SIPP panels. However, the extension of the reference period involved in this general approach seems inappropriate for standard analyses of spell

durations. We do not recommend it for such analyses, although it may be useful for some special problems.

We suggest that the standard procedure of defining the population of spells as those that begin within a period that is observed in the survey is the best approach now for the Census Bureau to follow for SIPP for its regular publication series. However, it is important for the Bureau to keep up to date with new developments in methods for spell analysis and their potential application to SIPP. In particular, we urge that the Bureau staff become familiar with the more sophisticated survival analysis techniques (such as the Cox proportional hazards models) that are likely to be widely used for policy analysis and research. These techniques can incorporate vectors of explanatory factors relating to the type of spell, including both fixed factors (e.g., race and sex) and time-varying factors (e.g., employment status).

Defining a Spell

Another issue for spell analysis concerns the definition of a spell. SIPP makes it possible to identify spells as short as 1 month; however, it may not always be sensible to do so for published spell analyses of low income and program participation.

For duration estimates for low income, a primary concern of analysts has to do with the persistence of poverty over time. A number of individuals may have short spells of low income, but such spells may not represent spells of poverty. Thus, people may have little or no income in a given month—for example, when changing jobs—without being poor in any real sense. In addition, people who are close to the poverty line may experience small fluctuations in income (e.g., one fewer pay period in some months) that result in apparent short poverty spells with very little real change in income. Conversely, it could be misleading to recognize very short breaks in an otherwise long spell of poverty, as such breaks could result from small fluctuations in income that temporarily put long-term poor people over the poverty line.

We suggest that the duration estimates that are developed for inclusion in SIPP publications recognize an entrance into poverty only if the new state is maintained for at least 2 consecutive months. Conversely, the estimates should recognize an exit from poverty or an exit from a program only if the new state is maintained for a minimum of 2 months. We also encourage the Census Bureau staff to experiment with alternative definitions. Ruggles and Williams (1989) have done useful work in this area. In analyzing several definitions of poverty spells, they found that 25 percent of the 1984 SIPP panel sample had a spell of poverty defined as 1 month's income less

[26] The first interviews in the 1990 SIPP panel were conducted in February through May 1990, with a 4-month reference period extending back to October, November, or December 1989 or January 1990, depending on the rotation group.

than the corresponding monthly poverty threshold. The percentage with a spell dropped to 15 percent for the most stringent definition that they used.

For program participation, it is appropriate to include short spells of recipiency, provided that they are measured accurately.[27] However, because analysts are concerned with the persistence of welfare dependency, it could be misleading to recognize very short breaks in recipiency. For example, administrative actions (e.g., recertification) may deny benefits for a short period to people who are otherwise experiencing a long spell of program dependency.[28]

Finally, we believe that there is an interest in the characteristics of the long-term poor and long-term program recipients in comparison with the general population. Hence, we suggest that SIPP publications include tables for people who have been in poverty or on programs continuously over a span of 2 calendar years, using 2 years as a reasonable definition of "long term" in the SIPP context.[29] There must be accompanying text that warns users not to interpret the population in these tables as representing all long-term poor people or long-term recipients; however, we believe this approach is a reasonable way to provide some information that is of considerable policy interest.

Treating Missing Data

Household surveys never obtain complete data for all respondents. A complex panel survey like SIPP has complex missing data patterns, including missing items, missing waves for people in otherwise interviewed households (Type Z nonresponse), and missing waves for whole households. Missing data cannot be ignored: restricting analysis to only cases with complete response can greatly reduce sample size and introduce bias. Weighting and imputation procedures are commonly used to adjust for nonresponse. However, these procedures may fail to fully compensate for the nonresponse bias or fail to make use of all available information. We raise concerns about the SIPP weighting and imputation procedures elsewhere in this report—for example, that the imputation of specific income and asset values

[27] It is important to review the data to determine that confusion among program names is not present. For example, a short spell of AFDC recipiency for a person who was employed at other times could, in fact, be a spell of general assistance.

[28] As noted above, it would also be useful to conduct analyses of total time on welfare, including repeat spells for the same individual (i.e., multiple spells that represent a failure to maintain independence rather than a purely administrative action). SIPP is not ideal for such a purpose, but extending the panel length from 32 to 48 months will be helpful.

[29] The time span could be lengthened to 3 or 4 calendar years under our proposed design of 4-year SIPP panels; however, 2 years seems long enough and permits more rapid publication of updated estimates. The definition of "continuously" poor or on programs could be people who are in that state every month with possibly one or two exceptions during the period.

does not take account of low income or program receipt (see Chapter 3) and that the weights do not adequately compensate for differential rates of undercoverage and attrition by income level and other characteristics that are important for analysis (see Chapters 4 and 7). We also express strong support for the development of a longitudinal imputation system for SIPP, so that, to the extent possible, imputations for each wave make use of information for the same individual from previous waves (see Chapter 5).

Here we consider a more narrow question—namely, the suitability of the currently available weights for the kinds of cross-sectional and longitudinal statistics on income and program participation that we suggest be developed from SIPP. At present, the SIPP files for specific waves contain cross-sectional weights for the interview month and each reference month. These weights are assigned to all people in the sample that month, including original sample members and people who joined them after the first wave. The longitudinal panel files include up to three weights for each record: a weight for people with complete data for the first calendar year covered by the panel; a weight for people with complete data for the second calendar year; and a panel weight for people with complete data for all 32 months.[30] Records for other people who participated in the survey are also included—so that their information can be used in analysis of the weighted cases—but are not assigned weights.

We see no problem in principle in the case of average monthly cross-sectional statistics from SIPP, which can readily make use of the monthly weights and thereby include the maximum number of observations.[31] For tables of annual income that are designed for comparability with the March CPS, we suggest using the cross-sectional weights for December of the income year. Such tables present a problem, not of weighting, but of how to treat the family income of people who have data for only part of the year. We suggest the following strategy: assign newborns the mother's monthly family income for the entire year and inflate to an annual amount the income of people who joined the household of an original sample member

[30] The panel weights (which apply to March of the first year of the panel) and those for the first calendar year (which apply to January) exclude people who were not original sample members as well as original members who missed one or more waves (over the course, respectively, of the panel or the first year). However, they include original sample members with complete data up to the point when they left the universe (e.g., through death or institutionalization). The weights for the second calendar year include all people —both original sample members and people not part of the original sample—with complete data for that year along with original sample people with complete data for that year up to the point when they left the universe.

during the year, whose household missed a wave, or who were abroad for part of the year.[32]

For tables of year-to-year transitions (e.g., movement of people in and out of poverty from one to another year), we suggest that the Census Bureau develop 2-year longitudinal weights that are similar to the existing longitudinal panel and calendar-year weights. The 2-year weights would apply to all cases with complete data for the particular pair of calendar years, including people with complete data up to the time they left the universe.[33] Newborns should also receive weights. Using 2-year weights would represent an improvement over using the full panel weights (as is currently done in the Census Bureau's reports on transitions in income and poverty), because more people would receive positive weights. It will be particularly important to have 2-year weights under our proposed design of 4-year panels.

Tables that present duration estimates and other information related to spells of low income and program participation can make use of the longitudinal panel weights. However, to date, most spell analyses conducted with the 1984 SIPP panel (e.g., Ruggles, 1989; Ruggles and Williams, 1989; McBride and Swartz, 1990) have not used these (or any) weights. Analysts have doubted that the weights adequately compensate for the differences between people who dropped out of the sample and the remaining sample members. Also, a significant reduction in sample size occurred midway through the 1984 panel (because of budget cuts), and exclusion of these cases (which do not have longitudinal weights) would have further reduced the sample size available for analysis.[34]

We note that the Census Bureau is continuing to sponsor research on ways to impute information for people who are missing one or two waves in

[31] However, as we note elsewhere in the report (see Chapters 3 and 7), it is important that the Census Bureau study further the problem of different rates of attrition for important subgroups and their implications for the cross-sectional weights.

[32] A longitudinal imputation system that can fill in a missing wave should reduce the number of part-year cases that result from wave nonresponse on the part of original sample members. (See Singh, Huggins, and Kasprzyk [1990] for a review of methods to handle single wave nonresponse; see also Ernst and Gillman [1988].) There is a problem of how to treat people who were institutionalized for part of the year because their income may have been very different in the two periods. Information to address this problem should result from implementing our recommendation (see Chapter 4) that SIPP collect some data for original sample members who enter institutions. Note that annual tables that categorize income as a ratio of poverty do not necessarily have to do anything special for part-year cases, as the ratio can be calculated by dividing the sum of monthly incomes by the sum of monthly poverty thresholds for the months for which information is available.

[33] "Complete" data may include some imputed data for wave as well as item nonresponse—see below. Also, while weights can be developed for people who were in the universe for only part of the 2-year period, the year-to-year transition tables may want to exclude these people or at least show them in a separate category.

[34] The Census Bureau report on spells of job search and layoff did use the longitudinal weights for the 1984 panel, but this study included only *completed* spells for which both the start and end dates were observed.

a panel. If successful, the result would be to increase the number of people who receive longitudinal panel or 2-year weights and thereby reduce the sampling error in the weighted estimates. We urge the Bureau to give high priority to this work and also to work to improve the weights themselves in terms of how adequately they compensate for differential sample attrition (see Chapter 7).

Summary

We have examined a range of conceptual and measurement issues that enter into the development of useful income and program statistics from SIPP, particularly those that make use of the SIPP longitudinal data. Given the complex nature of many of these issues and the advances that are occurring in analytical techniques (e.g., in approaches to spell analysis), we did not develop formal recommendations on these topics. Rather, we suggest the appropriate resolution of such issues as the unit of analysis and equivalence scales that we believe may be most useful for the Census Bureau to adopt at this time. As we recommend above, the Census Bureau should carry out research and development on measurement topics, looking to make continued improvements in the core statistics from SIPP.

MICRODATA PRODUCTS

Timely release of computer-readable files containing microdata (i.e., the coded values for the information furnished by individual respondents, suitably processed to protect the confidentiality of the replies) is as important a component of the data dissemination program for a rich, complex survey like SIPP as the regular release of publications. The availability of public-use microdata products can increase the return to the investment in a survey many times over. Microdata files permit researchers to perform extensive analyses of the data, constrained only by the limits of the questionnaire content, confidentiality restrictions, and a user's imagination. Researchers can produce tabulations that disaggregate or recombine the data in ways not considered in the agency's publication program and can use advanced analysis techniques to investigate the relationships among the survey variables.

Available Products

We have described above the problems experienced at the outset of SIPP in data processing, with the result that, for a period, microdata files were released only after long delays. Moreover, many of the early files were recalled and reissued because of errors. At the present time, the Census Bureau is adhering to a schedule of releasing files containing the core infor

mation from each wave within 9–12 months of completion of data collection (e.g., the spring of the year following the first wave of a panel, for which the last interview month is May),[35] and quality problems appear to have been markedly reduced.

Initially, the Census Bureau released separate cross-sectional files for each wave of a panel in two formats on magnetic tape. One format used a modified hierarchical or relational file structure that corresponded to the structure of the Bureau's in-house database management system. The hierarchical files included separate records for household, family, and personal characteristics and people's jobs and income sources. Even before the data were available, federal agency and other users expressed strong fears that they could not work with these files, and the Bureau responded by developing a rectangular file structure with a record for each person that repeated household and family characteristics and included space to record information for multiple jobs and income sources.

The rectangular files were suitable for processing with widely available programming languages and statistical software packages. However, these very large records greatly increased demands on users' hardware and software facilities. (One user developed a preprocessing system based on the COBOL language to minimize input and output costs for preparing extracts that were then fed into a statistical package; see Doyle, Citro, and Cohen [1987].) The large records also increased acquisition costs to users. The files were priced according to the number of magnetic tape reels, but a significant portion of the tapes (usually two) for a wave file were blank because many people only had one job or a few sources of income during the reference period or were not present for all months of the reference period. This problem was even more pronounced for the longitudinal panel files (see below), which each required three, four, or five tapes.

Whether using the hierarchical or rectangular file format, users faced pitfalls if they were not thoroughly familiar with the contents and design of SIPP. For example, the records contained fields for every month of a wave, but not all people were in the sample for each month, and, hence, users had to carefully screen such people out of their analyses for those months. As another example, users had to aggregate different reference months for the four rotation groups to produce calendar-month or calendar-quarter estimates and, often, pull records from more than one wave. Users also experienced problems in trying to link wave files for longitudinal analysis. Linkages were complicated in the early panels by the fact that not all rotation groups received all interview waves (e.g., rotation group four in the 1984 panel was skipped for wave 2; hence, to develop, say, a 12-month file, users

[35] Beginning with the 1990 panel, topical module files are being issued separately a few months after the corresponding core file.

had to slot the information from waves 3 and 4 for this rotation group into the reference months covered by waves 2 and 3 for the other three groups).[36]

The SIPP ACCESS system developed at the University of Wisconsin, with National Science Foundation funding, put the hierarchical files into the INGRES relational database management system and provided many ancillary services to assist users. The SIPP ACCESS staff estimated that the system provided support for about two-thirds of the research on SIPP conducted by academic social scientists outside the Census Bureau during 1985–1990, when the facility was in operation (David and Robbin, 1992:i). However, users of SIPP ACCESS also found that various aspects of the SIPP design made the data hard to understand and work with, and, indeed, SIPP quickly gained a reputation for complexity that deterred at least some potential users from exploring the utility of the information for their needs (Committee on National Statistics, 1989:52).[37]

One problem confronting early users of SIPP was alleviated when the Census Bureau developed fully linked longitudinal public-use files. Initially, a 12-month file was developed from the 1984 panel, followed by a 32-month panel file. The longitudinal files include only information from the core questionnaire; users must merge topical module data from separate files.

Working with input from users (see, e.g., Smith, 1989), the Census Bureau recently redesigned the format of the wave files—beginning with the 1990 panel—to include "person-month" records, that is, a record for each month for which a person has data from either a self or proxy interview or by means of imputation (e.g., the Type Z people not interviewed in an otherwise cooperating household). This format reduces waste space because records are omitted for months for which a person has no data. Also, records can readily be aggregated in a variety of ways—for example, to produce estimates for all people for a calendar month or estimates for all months of a wave, or to create new family or household variables to attribute to persons—without confusion about which records to include (see McMillen, 1990). Most users expect that the person-month format will be significantly easier to understand and use.[38]

[36] This feature of the design, which was intended to better align certain topical module questions with a particular time of the year for all four rotation groups, was dropped at user insistence beginning with the 1987 panel. (See Committee on National Statistics [1989:Table 2-1] for a listing of the interviews received by each rotation group in the 1984–1986 panels.)

[37] The CNSTAT report noted that a good deal of the complexity of the SIPP data reflects the real world and is not something that the Census Bureau should attempt to simplify. However, the report urged that unnecessary complexities in the survey design and file structures be reduced.

The Census Bureau has also made other improvements to the microdata files in consultation with users: for example, standardizing the codes used to indicate that the respondent was not in the universe for a particular item and hence not asked the question. This improvement is important because of the highly complex skip patterns in the SIPP questionnaire and hence the need to distinguish carefully between a not-in-universe situation and a true zero or negative response (e.g., to a question about income amounts).

Another recent innovation with regard to SIPP microdata products is that Census Bureau staff have developed an on-line system (SIPP On Call—Data Extraction System) for users to specify and receive extracts (as SAS or plain ASCII files) from the public-use SIPP microdata. over dial-up telecommunication lines (Bureau of the Census, 1991c).[39] At present, the capabilities of the system are limited—for example, there is no facility to extract records based on the value of a continuous variable such as income or to use a recode of one or more variables in the record retrieval specifications.[40]

Priorities for Improvements

Because of the critical importance of microdata for research, microsimulation, and other types of policy analysis with SIPP, we urge the Census Bureau to continue to seek ways to improve the timeliness, format, content, and other aspects of SIPP microdata products.

Timing

Although the Census Bureau has made commendable progress in improving delivery schedules for SIPP microdata files, we believe that further improvements in timeliness are both necessary and feasible. In order to achieve the goal of SIPP's serving as the nation's main source of income statistics, core data files must be available from SIPP on about as timely a basis as they are from the March CPS income supplement—currently about 6 months

[38] However, no file format for such a complex survey as SIPP will serve all users equally well. The Census Bureau will need to evaluate the successes and problems that users experi

[39] The SIPP ACCESS system was transferred from the University of Wisconsin to the Census Bureau in mid-1990, and Bureau staff worked to make it operable at the Bureau for access to the 1984 and 1985 panels; however, the staff decided to develop SIPP On Call instead for access to the person-month files from the 1990 and subsequent panels. SIPP On Call also includes an electronic mail feature for users of the system to communicate with each other and the Census Bureau.

[40] For a recent evaluation of SIPP On Call prepared for the Food and Nutrition Service (which provided funding to help develop the system), see Doyle and Cohen (1992).

after data collection. The SIPP rotation group structure and the length and complexity of the SIPP questionnaire have made it difficult to contemplate releasing SIPP files on the same schedule as files from the March CPS. However, we believe that the implementation of computer-assisted personal interviewing (CAPI) and database management technology for SIPP should make it possible to move toward—and achieve—that goal.

Kinds of Files

Currently, the Census Bureau releases wave and panel files from each panel of SIPP (separate wave files for core and topical module information). The panel files are in the rectangular format, and we encourage the Census Bureau to consider converting them to the person-month format of the wave files. (The space-saving features of the person-month format would be particularly valuable for the lengthy panel files.)

We also urge the Bureau to release calendar-year files that contain data from both panels that are in the field at the same time. Although the ability to combine panels was originally viewed as an important feature of SIPP, the Census Bureau has, to date, approached the processing of each SIPP panel as a completely separate operation. The delays in releasing files from the early panels meant that users had to wait for very long periods to be able to combine, say, wave 6 of the 1984 panel with wave 3 of the 1985 panel. At present, the Census Bureau's data delivery schedule for SIPP specifies approximately simultaneous release of wave files from panels that are in the field at the same time (e.g., the core files for wave 8 of the 1990 panel and wave 5 of the 1991 panel are both targeted for release in April 1993). Hence, users can readily develop wave files that combine panels. We propose that the Bureau take the next step of preparing calendar-year files from combined panels, as such files are likely to prove very useful for many research and policy analysis purposes (e.g., for use in microsimulation models of tax and transfer programs).

Content and Coding

We encourage the Census Bureau to continue working with user groups (see discussion of advisory mechanisms in Chapter 8) to identify and implement changes to the content and format of the SIPP microdata. files in order to enhance their utility and ease of use. For example, users may identify recoded variables that it would be helpful for the Bureau to create rather than leaving them to the user.

We note that adding variables can add processing costs and result in records that are difficult for users to work with. However, in some instances the Census Bureau's efforts to keep the records in the SIPP data

ence with the person-month format and consider ways to alleviate problems that arise. For example, it may be possible for the Census Bureau to provide illustrative SAS code that would help users with particular kinds of applications.

files to a manageable length may have gone too far. Thus, the person-month format excludes some variables that were available in the rectangular format (e.g., it is no longer possible to determine coverage by more than one health insurance plan in the person-month files). Also, some program-related variables for which the Food and Nutrition Service provided funding to include on the initial 12-month longitudinal file from the 1984 panel were never adopted for the 32-month panel files. We urge the Census Bureau to consult with users about the benefits of reinstating these variables.

We also encourage the Census Bureau to work closely with users to further improve the information in the data files about missing values. As a general policy, the Bureau prefers to provide users with complete records for every respondent in a survey by supplying values for missing items through some type of imputation procedure. Complete records have the advantage of maximizing the sample size for analysis, as cases do not have to be discarded because of missing information. Also, there is the advantage that the Bureau can implement imputations in a consistent manner (individual users may vary in the sophistication and care with which they supply values for missing items). In a separate set of fields, the Bureau generally provides yes-no indicators of whether an individual item was reported or imputed. Because the imputations performed by the Census Bureau may have disadvantages for certain analyses (e.g., see the discussion in Chapter 3 of problems with the imputation of income and assets for program recipients) and because the imputation rates can be quite large for some variables, it is important for users to have as much information as possible about them. We believe it would be helpful for users to assess the quality of the imputations from the perspective of particular analyses if the imputation flags contained information about the reason for an imputation—that is, whether the respondent refused to answer a question or did not know the answer.

Delivery Media

We encourage the Census Bureau to explore alternative media for delivery of SIPP microdata to users that can make easier the process of obtaining extracts for analysis. We note that the days of 9-track magnetic tape as a medium for data dissemination are numbered, as more and more researchers are turning away from cumbersome mainframe systems to work with micro-or minicomputer hardware and software that use some type of direct access disk media for file storage and input and output.

The familiar floppy diskettes are much too small to serve as a file storage medium for a survey as large as SIPP. However, high-storage capacity CD-ROM (compact disk-read only memory) technology is rapidly

gaining popularity for large data sets. Users of the National Longitudinal Surveys of Labor Market Experience (NLS) currently choose CD-ROM over tape by about four to one. The Census Bureau is now releasing CD-ROM versions of the public-use data sets from the 1990 census. CD-ROM with suitable extraction software could well be a useful access medium for SIPP (although further improvements in microcomputing hardware may be necessary before CD-ROM becomes sufficiently fast and easy to access for such a large data set as SIPP).

We also encourage the Census Bureau to further develop its on-line extraction system (SIPP On Call), which could save users the time and expense of acquiring and archiving complete SIPP files when they only require a subset of the data. To be most useful, the Bureau needs to add sophisticated retrieval capabilities to the system. In addition, if SIPP On Call is to be an effective means for users to work with the large volume of SIPP data, the Bureau needs to provide access to the system over high-speed communications lines—for example, those provided by Internet. Moving large amounts of data over regular telephone lines is tedious and costly. Finally, we note the importance for the effective use of CD-ROM and on-line technology of having full documentation—including frequencies for each variable—integrated with the actual data (see discussion below and in Chapter 5).

Recommendation

Recommendation 6-3: **The Census Bureau should continue to develop improved microdata products from SIPP to support policy analysis and social science research. Priority improvements include:**

- **moving toward a goal of releasing core data files within 6 months after the end of data collection;**
- **producing calendar-year files that combine panels, in addition to wave and panel files;**
- **determining, in consultation with users, changes and additions to the file contents that would assist their analyses; and**
- **developing additional ways of delivering SIPP microdata products to users, such as by means of high-storage capacity compact disks (CD-ROM) and an improved on-line data extraction system.**

DOCUMENTATION AND SERVICES FOR USERS

For effective use of large, complex data sets, users need not only the data, but also what has been termed the metadata, that is, information that en

ables the user to access, understand, and analyze the data appropriately (see David, 1991; David and Robbin, 1989, 1990). Users of computer-readable products most obviously need basic documentation that enables them to instruct a computer program how to "read" the data on the magnetic tape or other medium. In addition, users of computer products need information to help them understand the quality and meaning of the data. Users of printed publications require such information as well.

The larger and richer the data set, the more extensive must be the accompanying documentation—also, the greater the need for ancillary services, such as training sessions, working papers, and other means of reaching and educating users about the potentials and pitfalls of the data and data products. An investment in documentation and related services is amply justified in that it minimizes wasted time and resources and increases the return to users from their processing and analysis efforts. Good documentation makes a vital contribution to the development of a strong and growing community of users for a survey like SIPP.

Documentation and Related Services to Date

Microdata Documentation

From the beginning of SIPP, each microdata file has been accompanied by a codebook providing basic information on the file structure and tape location and content of each variable. Codebooks are available in printed form and as machine-readable files attached to the data files. A *SIPP Users' Guide* containing additional explanatory information for users about SIPP and its microdata products was initiated at the start of the survey but took several years to prepare —the first edition was released in 1987 (Bureau of the Census, 1987). The guide included chapters on survey design, survey content, structure of the cross-sectional public-use microdata files, use of cross-sectional files for estimation and analysis, linking waves, and assessing the reliability of SIPP data. A second edition that added a chapter about SIPP cross-sectional weighting procedures and appendix material about the 1990 panel and the new person-month format was released in late 1991 (Bureau of the Census, 1991e).

The initial documentation did not include frequencies for the variables; at the behest of users, the Census Bureau contracted in 1989 to have frequencies prepared for each file and made available on diskettes, with a subset of key control counts provided in printed form. Such frequencies, which indicate the distribution of responses to each item, are invaluable tools for users in making initial decisions about variables and population subgroups to analyze, hypotheses to explore, and analytical methods to use.

To inform data file users about problems with the files or documenta

tion, the Census Bureau has a *SIPP User Notes* series that is sent to all file purchasers and can also be obtained on request. Notice of the user notes is contained in a supplement to the newsletter of the Association of Public Data Users (APDU) that is mailed to a large list of people who have inquired of the Census Bureau about SIPP.[41] Finally, the *SIPP Quality Profile* (Jabine, King, and Petroni, 1990) is a very valuable tool for informing data file users about the quality of the survey information.

Documentation for Printed Reports

Each SIPP publication includes appendix material that describes the survey, defines key terms, indicates how to make approximate calculations of sampling errors of the estimates, and briefly reviews other sources of nonsampling error (e.g., underreporting). Also, reference is generally made to the additional detailed information on sampling and nonsampling errors provided by the *SIPP Quality Profile*.

Other User Services

The Census Bureau regularly publishes *What's Available from SIPP* (e.g., Bureau of the Census, 1991g), a highly useful basic reference source that lists the publications, data files, and working papers from the survey. For a number of years, the Census Bureau supported a vigorous, proactive program to educate and inform users about SIPP and to keep users aware of others who were analyzing the data. This program included training sessions offered as part of the summer program of the Inter-university Consortium for Political and Social Research at the University of Michigan and as workshops in conjunction with many professional association meetings. In addition, the Bureau published the *SIPP Working Paper* series, which, by the end of 1990, totaled 140 substantive and methodological papers by analysts both inside and outside the Census Bureau (Bureau of the Census, 1991g).[42] Bureau staff also organized sessions that featured SIPP research at professional association meetings and published compilations of SIPP-related papers that were presented at meetings of the ASA. Census Bureau staff further encouraged SIPP researchers to apply for ASA/Census fellowships to use the data files on-site at the Bureau. In addition, Bureau staff regularly appeared at the monthly meetings of SIPP analysts in the Wash

[41] Arrangements for the APDU SIPP supplement and for an APDU SIPP committee to consult with the Census Bureau about the SIPP data products and documentation were made in early 1989.

ington, D.C., area and were available to meet with groups of users in other locations on request. All of these were valuable activities that enabled users and potential users to become informed about SIPP and keep abreast of what others were learning from the data.

About 2 years ago, the loss of SIPP staff who had been most active in this program led to a suspension or reduction of many of these services. Recently, with the appointment of a SIPP liaison in the HHES Division (see Chapter 8), activities such as releasing new titles in the *SIPP Working Paper* series and providing workshops about SIPP at professional association meetings have started up again. However, the level of activity has not yet reached that of the earlier years.

Recommendation

We urge the Census Bureau to continue regular consultations with users about needed kinds of documentation and other informational and instructional materials. We cannot stress enough the importance of having comprehensive, accurate, and intelligible documentation and related services to interest users in the potential of SIPP data and to enable them to make the most cost-effective use of the data. We see a number of areas in which improvements to the current documentation, information, and training package for SIPP would be useful.

First, it is vital, as part of the implementation of the proposed redesign of SIPP, to make use of CAPI and database management system technology to fully integrate the microdata file documentation with the actual data. Such integration should enable immediate calculation of frequencies for variables and inclusion of the frequencies in the printed and machine-readable forms of the codebook. Integration should also reduce the likelihood of errors in the documentation, such as field positions not matching the actual positions in the file, and make it possible to improve the description of skip patterns in the questionnaire that define the universe of respondents for particular items.

With regard to the microdata documentation, we note that an adequate description has never been developed for one important aspect of the SIPP processing system that affects the quality of a significant portion of the data: the procedures used to impute values for missing items.[43] Although it may be infeasible and indeed unnecessary to provide detailed imputation

[42] For this series, Census Bureau staff identify papers using SIPP data that have been prepared for professional meetings or initiated in draft, solicit their inclusion in the series, have them reviewed by one or two others, and edit them and prepare reproducible copy.

specifications for each variable, it should certainly be possible to describe the procedures used for various classes of variables and to provide illustrative information on the effects of imputations (e.g., before-and-after distributions for selected variables). In addition, documentation is needed for variables in the data files that result from a process of recoding other variables.[44] Again, integration of the data and documentation in a database management system may well facilitate the development of useful descriptions of imputation procedures as well as documentation of recoded variables.

It is also important to develop means to more frequently update documents —such as the *SIPP Users' Guide*—that provide important contextual information. The material in a well-formulated, comprehensive guide can be invaluable in orienting users to the data and alerting them to processing and analytical pitfalls. The limited background information carried in the codebook or documentation of individual variables and codes is not sufficient for these needs. Only two editions of the *SIPP Users' Guide* have been issued to date, even though SIPP has gone through many changes since 1983, and not all of those changes are well reflected in the latest edition (Bureau of the Census, 1991e). Most notably, there is little information provided about the longitudinal panel files, although they represent a widely used—and complex—data product from SIPP. This deficiency needs to be remedied.

Similarly, we encourage the Census Bureau to evaluate and determine ways to enhance the text in SIPP reports that is intended to educate and warn readers about the data contents. Cross-references to such other documents as the *SIPP Users' Guide* and the *SIPP Quality Profile* are helpful, but many users will not seek out those references; hence, it is important to provide as much pertinent information in the report itself as possible.

We have commented on the valuable nature of the various ancillary informational and instructional materials (e.g., working papers, compilations of professional association papers) and training programs that were developed for SIPP. We urge the Census Bureau to restore and enhance these programs to serve the growing community of SIPP users. The published research report series that we recommend above will also play a valuable role in this regard.[45] Preparation of a complete on-line bibliogra

[43] Documentation has also never been provided for the elaborate routines that are used to edit inconsistent replies or, in some cases, to supply values for missing responses by means of an edit rather than imputation. These routines, which are highly specific to individual variables, present a daunting documentation task. A benefit from the use of CAPI technology for SIPP should be that inconsistent replies are either resolved in the field or accepted, thus minimizing the need for after-the-fact editing.

[44] Work is in progress under a joint statistical agreement between the Census Bureau and the University of Michigan to develop documentation for the longitudinal imputations in the SIPP panel files, and the Census Bureau expects to make arrangements with another organization to obtain documentation for the cross-sectional imputations and edits. Also, work is in progress by Social and Scientific Systems, Inc., under contract to the Census Bureau, to develop documentation for recoded variables.

phy that includes relevant Census Bureau staff memoranda that would not otherwise be known to most users is also an idea to consider.[46] Finally, we believe it is important for the Census Bureau to take steps to ensure that there are effective channels for individual users to communicate both problems and suggestions for SIPP data products and documentation and to obtain timely feedback from Bureau staff (see Chapter 8 for a discussion of more formal advisory mechanisms). Because of the decentralized system of operations at the Census Bureau for SIPP and other surveys, it has not always been clear to users which staff members to consult about problems and suggestions. Even when a responsive staff member has been reached, it has not always been clear that there is an effective, timely system of internal communications within the Census Bureau to ensure that all relevant staff members—such as those in data processing and data user services—are informed and able to take appropriate action. Nor is it always clear that there are effective means of informing the user, or other users, of the reasons for the problem and the nature of the proposed solution or of the response to a suggestion.

The recent establishment of a SIPP liaison position in HHES is helpful in this regard, as is the use of the *APDU SIPP Supplement* as a vehicle to reach users. We urge the Census Bureau to keep a vigilant eye on its user-staff communication channels and act promptly to keep them functioning in an open and timely manner. The upcoming redesign of SIPP, which will entail changes in data products and documentation, makes it all the more important to have good means of communication with individual users and the user community as a whole.

Recommendation 6-4: **The Census Bureau should work to improve documentation and related user information services for SIPP. Priority improvements include:**

- **making use of CAPI and database management system technology to fully integrate documentation (including frequency counts for variables) and data;**
- **developing documentation for recoded variables and the types of imputations that are performed for missing data in SIPP;**
- **developing means to update key explanatory documents, such as the *SIPP Users' Guide*, on a more frequent basis;**
- **restoring and expanding information and training programs, such as training sessions, working papers, and compilations of professional society presentations; and**

[45] The research report series will not, at least until it is well established, substitute for the *SIPP Working Paper* series, which makes available the work in progress of outside analysts as well as Census Bureau staff.

[46] The SIPP ACCESS project developed such an on-line bibliography of SIPP working papers, presentations, and memoranda, which could serve as a model.

- **maintaining effective channels of communication for users to feed back problems and suggestions and learn of the Bureau's response, and for users to be informed of new developments in the survey and its data products.**

7

Methodological Research and Evaluation

One of the undoubted strengths of the SIPP program, including its forerunner, the Income Survey development Program (ISDP), has been the extent of research on the quality of the data and ways to enhance quality (and efficiency) through improving the design and operation of the survey.[1] Indeed, a strong research and evaluation component was essential during the planning and start-up phases because of SIPP's complex nature and broad scope. Looking to the future, we believe that SIPP will continue to require methodological research on many aspects of the program.[2] The Census Bureau will need information in the near term for many details of the proposed redesign. Subsequently, the Bureau will need information on the impact of the redesign to guide research and experimentation directed to further improvements in the survey. In addition, users will need continuing information on data quality to make the most appropriate use of the survey information.

[1] To assist it in determining priorities for research and evaluation and in designing specific projects, the Census Bureau has consulted with the members of the Working Group on Technical Aspects of SIPP, sponsored by the Survey Research Methods (SRM) Section of the American Statistical Association (ASA).

[2] We note also the importance of research on analytical measurement issues, such as those discussed in Chapter 6 (e.g., the definition of spell length and whether to include all spells observed in a panel in an analysis of duration), and we believe strongly (see Chapter 8) that the Census Bureau should give increased attention to analytical issues for SIPP.

In this chapter we first briefly review the scope and accomplishments to date of the SIPP methodological research program at the Census Bureau.[3] We then outline research strategies and summarize priority topics (many of which we discuss in other chapters) for which further methodological work is indicated, under two main headings: research to inform and evaluate the redesign and continuous monitoring of error levels for the benefit of analysts both inside and outside the Bureau. We conclude with a detailed discussion of a recently inaugurated program of cognitive research on the SIPP questionnaire. This innovative work shows great promise to improve data quality although it presents difficult questions of implementation and integration with other planned improvements for SIPP, such as computer-assisted personal interviewing (CAPI).

RESEARCH TO DATE

Topics

From the very early days of designing a new income survey, the Census Bureau has been concerned with identifying and conducting research on a wide range of methodological issues that were critical for SIPP to achieve its goals of providing improved data on income and program participation.[4] The ISDP investigated a number of important topics, including:

- the length of the recall period;
- respondent rules (self- versus proxy reporting);
- alternative questionnaire designs (e.g., short versus long forms of the income receipt and amounts questions; household screening format versus person-by-person format);
- mover follow-up rules; and
- the definition of longitudinal units.

The abrupt termination of the ISDP program in 1981 left many issues in various stages of resolution. Initial methodological research and evaluation at the Census Bureau during the first 2 years of SIPP concentrated on the following topics:

[3] We note that important methodological research and evaluation on SIPP has been conducted by analysts outside the Census Bureau; examples are Curtin, Juster, and Morgan (1989); Doyle and Dalrymple (1987); and Vaughan (1988).

[4] This section draws heavily on Committee on National Statistics (1989:Ch. 7), which, in turn, benefited greatly from a presentation by Daniel Kasprzyk to the Committee on National Statistics subcommittee on SIPP. See the *SIPP Quality Profile* (Jabine, King, and Petroni, 1990) for references and summaries of findings for methodological studies conducted on SIPP; see also Kasprzyk (1988b) and Petroni, Huggins, and Carmody (1989). David (1983) provides references to methodological studies conducted on the ISDP.

- wave nonresponse and its treatment;
- field considerations, including the impact of respondent rules in general, respondent rules for students, and mover follow-up rules;
- the "seam problem" (i.e., the observed tendency to report more transitions between months marking the boundary between two interviews than between months included within a single interview);
- comparisons of survey responses with administrative records data; and
- issues involved in developing and analyzing longitudinal data from SIPP, including imputation, estimation, and household and family concepts.

As more SIPP data became available for analysis, other issues pertinent to the quality and utility of the information emerged and gained in importance:

- the pervasiveness of the seam problem;
- sample attrition;
- problems with the independent collection of industry and occupation data from one wave to the next;
- the lack of baseline data (e.g., the lack of information in the first interview for program participants on when the participation spell began);
- the lack of data on employer-provided benefits; and
- the need to provide users with measures of quality through such means as comparisons of SIPP cross-sectional estimates with independent sources.

Still later, yet additional methodological concerns surfaced, including:

- problems with constructing program eligibility measures given that key data were scattered across topical modules; and
- the possibility of time-in-sample bias (i.e., systematic differences in responses by individuals between later and earlier interviews).

At the same time, budget cutbacks, which necessitated restricting sample size and the number of interviews, motivated research on ways to compensate for diminished sample size and to control costs.

Methods and Results

The Census Bureau has used a range of techniques for methodological research and evaluation, including:

- small-scale and large-scale field experiments with changes in procedures or question wording (experiments were conducted with telephone interviewing to reduce costs, gifts to reduce attrition, collecting data on employer-provided benefits, different procedures to reduce the seam problem,

and providing respondents with prior-year asset responses to improve reporting of changes in asset holdings);

- comparisons of SIPP responses with administrative records on an individual match basis (most notably, the record-check study [see Marquis and Moore, 1989, 1990a, 1990b]);
- comparisons of aggregates from SIPP with those from other surveys and administrative records;
- internal analysis of SIPP data (e.g., an evaluation of the effectiveness of the cross-sectional weights in compensating for attrition by comparing estimates at wave 2 for all wave 2 respondents and only those respondents who remained as of wave 6 [see Petroni and King, 1988; King et al., 1990]);
- analysis of data from reinterviews of SIPP respondents (e.g., Hill, 1989);
- simulation studies (e.g., simulating alternative schemes for oversampling subgroups of policy interest); and
- most recently, application of cognitive research techniques (e.g., one-on-one sessions in which the interviewer asks the respondent to think aloud in answering each question) to understand respondents' perceptions of the questionnaire (see below).

As a result of the research and evaluation program, the Census Bureau has instituted some changes in procedures and questionnaire content for SIPP. For example, a second administration in each panel of the assets and liabilities module was dropped, as was the missing wave module,[5] because of adverse research findings about the quality of the data. Research results also contributed to the recent decision to switch from maximum personal to maximum telephone interviewing for SIPP, as well as the strategy adopted for oversampling low-income households beginning in the 1995 panel. In other instances, research has not produced clear findings and hence is continuing: for example, various steps to reduce the seam problem have thus far had little effect. In still other cases, resources have not been available to implement findings: for example, no changes have yet been made to imputation and weighting procedures to adjust for biases found in research.

Whatever the outcome for SIPP operations, in almost all instances re

[5] The missing wave module was designed to fill in information for people who had missed the preceding wave but were interviewed at the wave prior to that one. The module, which was administered beginning in wave 4 of the 1984 panel and discontinued midway through the 1986 panel, asked an abbreviated set of questions on labor force status, program participation, income receipt, and asset ownership for the reference period covered by the preceding wave. Evaluation determined that the number of transitions reported was much smaller than predicted and that the additional information obtained did not appear to justify the respondent burden and cost of collection (Jabine, King, and Petroni, 1990:40).

search has generated valuable information for users on the possibilities and limitations in the data. Research results have been disseminated through the *SIPP Working Paper* series. Also, to bring together available information on data quality, the Census Bureau put a substantial effort into developing the *SIPP Quality Profile*. (The ASA/SRM working group was a prime mover behind this project.) The first edition of the profile was published as a *SIPP Working Paper* (King, Petroni, and Singh, 1987); the second edition (Jabine, King, and Petroni, 1990) represents a reorganization and significant expansion of the material.

The *SIPP Quality Profile* brings together what is known about methodological problems with SIPP at each stage from data collection through data dissemination and also includes aggregate comparisons with other data sources. The profile is of great value for data users, for survey methodologists, and for the Census Bureau in determining the agenda for further research and evaluation. Indeed, the profile sets a standard for the field that other surveys would do well to emulate.

REDESIGN OF SIPP

SIPP is scheduled to undergo a major redesign in the mid-1990s. The Census Bureau expects to decide on the basic elements of the redesign by the end of 1992, but many details will be worked out later. It will be important to have a targeted research program to provide information to help resolve outstanding issues and to ensure the smoothest implementation possible of the new design. When it is in place, the redesign should achieve important improvements in many aspects of survey operations and in the quality and utility of the data; however, it may also have untoward effects. Again, research will be needed to identify the successes of the redesign and to suggest ways to handle any problems that arise.

In this section we discuss the components of a program of methodological research that we believe the Census Bureau should put in place to inform and evaluate the SIPP redesign. These components include: research to improve the format and wording of the questionnaire; research targeted to other aspects of the redesign (e.g., implementation of CAPI); research on issues of estimation and data use (e.g., weighting and imputation) in light of the redesign; research to evaluate the success of the redesign; and, finally, a quick-response capability to address unanticipated problems in and after implementation.

Questionnaire Content

In Chapter 3 we propose a number of content changes to SIPP—for example, adding a few questions about the respondent's family of origin,

obtaining additional detail about household relationships, and ascertaining information needed to determine eligibility for major assistance programs on a more frequent basis. (Correspondingly, we identify some topics that might be scaled back in detail.) We also recommend experimental work to develop measures of protection against economic risk (e.g., access to credit). In addition, we strongly urge a total overhaul of the questionnaire content related to measurement of assets in SIPP. We are sure that the community of users will have suggestions for the questionnaire as well.

We understand that the Census Bureau hopes by the end of the year to decide on the content changes in the core questionnaire that will be implemented as part of the redesign. It appears quite reasonable to adopt this schedule for determining topic areas and the general level of detail in the core, particularly given that the staff who are working to, design the CAPI and database management systems for SIPP need this information. However, we believe that the Census Bureau should not try to lock in the precise format and question wording before thorough testing of proposed changes.

Such testing is critical in view of the inevitable tendency in any ongoing survey program to resist frequent questionnaire changes. Although we hope and expect that the conversion of SIPP to CAPI and database management system technology will make it easier to modify content and format as needed, it is still true that questionnaire changes will not and should not be made lightly. The occasion of the redesign offers the opportunity to add, delete, or modify a large number of questions. Such an opportunity will not likely occur again for many years. Hence, it is incumbent upon the Census Bureau to evaluate proposed content changes as thoroughly as possible before determining the final format and question wording for the redesign.

We realize that time is short, particularly given the need to implement the questionnaire in CAPI and a new database management system. We suggest that, in addition to standard pretests, the Census Bureau make use of two means of questionnaire testing and evaluation that we believe could be implemented rapidly.

First, we suggest that the SIPP staff who use the core data and who will redesign the questionnaire work closely with the researchers who are in charge of the Census Bureau's program to apply the results of cognitive research to developing improved methods for collecting higher quality data in SIPP (see below). That program is testing a very different set of interviewing procedures (e.g., more use of records by respondents, conducting the interview for a household on a group basis) and a very different questionnaire format, in which many of the questions are free-form (e.g., the respondent is asked to name income sources in any order and supply amounts as received rather than as fixed monthly totals). As discussed below, we are highly supportive of this program but skeptical that it can be carried out on a sufficiently rapid time schedule or with sufficient evaluation to permit the

new procedures and format to be incorporated for the redesign. Recognizing that it may be difficult to obtain the full benefits from this program unless it is adopted as a package, we nonetheless believe that the format and wording of a more standard SIPP questionnaire could likely be improved by the results of the cognitive research program.[6] We urge the SIPP design and analysis staff to make as full use as possible of the findings of this program in determining the final form of the questionnaire.

Second, we suggest that the Census Bureau use small-scale record-check studies, particularly forward record-check studies, as a vehicle for questionnaire testing and evaluation. Forward record checks would involve drawing samples of a few hundred cases each from relevant administrative record sources (e.g., program records, employer records, or tax records) and administering the SIPP interviews to each case. There are several advantages of this approach for questionnaire research. The samples can target population groups of special relevance for SIPP, such as recipients of such programs as AFDC. The availability of administrative data for the samples provides the opportunity to evaluate the quality of the responses. For example, cognitive research has demonstrated that program recipients may fail to report their benefits or may describe them as something else because they do not recognize the name of the program as it is listed in the questionnaire. A forward record check would provide a ready means to evaluate the effectiveness of alternative ways of identifying programs for respondents.

Another advantage of forward record checks for questionnaire research purposes is that, for many research objectives, it is not necessary to obtain a nationally representative sample. Hence, in the case of state-administered programs, for which there is wide variation in the quality and accessibility of administrative records, the samples could be selected from those states with the best systems.[7] Finally, forward record checks can be implemented on a timely basis because there is no need for an after-the-fact match of the administrative and survey data.

We note that the Census Bureau's cognitive research program is itself using a forward record-check approach, drawing small samples from records for four programs and one employer in Milwaukee County, Wisconsin, which will be the site of a major evaluation study of the new interviewing procedures and questionnaire format (Bureau of the Census, 1992b; see also below). We note further that the ISDP experienced considerable success

[6] For example, it might be possible to allow respondents to supply information about amounts in a somewhat freer format once recipiency has been ascertained in the standard fashion (e.g., specifying the date and amount of each payment, which could then be converted by the data processing system to monthly values).

[7] However, for programs for which eligibility rules, regulations, and administrative practices vary widely across states (e.g., AFDC), record checks that are limited to a few states may resolve reporting issues only for those states and not others.

with forward record checks for evaluating the ability of the survey questionnaire to elicit accurate reports of program participation and benefits (see Kasprzyk, 1983). We urge the Census Bureau to give high priority to using forward record-check studies for refining the questionnaire that is implemented as part of the SIPP redesign.

However, forward record-check studies cannot assess the effects of false reports of program participation (or other behaviors), since this would require drawing samples of known nonparticipants of the program under study. Since false positive errors are rare in SIPP (see Marquis and Moore, 1989, 1990a), large samples would be required to obtain a sufficient number of false positive responses to study the causes and remedies for overreporting in SIPP. More research is needed on the design of these types of record-check studies. For example, sampling efficiency could be improved if the sample could target groups of nonparticipants who are more prone to misreport program participation, such as people who experience frequent transitions into and out of programs.

Other Aspects of the Redesign

Other aspects of the SIPP redesign for which it would be useful to conduct methodological research (including design changes that could be appropriate to implement somewhat later on) are the length of the recall period, oversampling based on screening, implementation of CAPI, and telephone interviewing. We note that forward record-check studies, in addition to supporting questionnaire research, could well be used to evaluate other aspects of the redesign.

For length of recall period, we decided not to recommend a change in the current 4-month recall period for SIPP because of the possible adverse effects on the quality of the monthly information, which is critical for so many policy and research uses of SIPP. However, a move to 6-month recall could permit an increase in both the sample size and length of each panel and might reduce the effects of attrition for longer panels. The literature does not provide clear guidance on the pros and cons of 4-month versus 6-month recall for SIPP. Hence, we urge the Census Bureau to give priority to research on this issue.[8] Research is also needed to investigate recall period effects for cognitively designed interviews (see below), since memory effects for these types of interviews may be quite different from those for the traditional SIPP interview.

We do not consider it appropriate to change the recall period for the redesign. However, if the research results indicate that a 6-month recall

[8] Further analysis of the SIPP record-check study could perhaps contribute to understanding of recall effects on the quality of the monthly data.

period would provide data of acceptable quality, then the Census Bureau should give serious consideration to changing the survey design to somewhat longer and larger panels without waiting until the next major scheduled redesign.

We suggest that the efficiency of the proposed oversampling of the low-income population in SIPP, which the Census Bureau plans to implement by using information from the 1990 census, might be improved by conducting a screening interview close to the time of wave 1 for each panel. Research needs to be conducted on ways to implement the screening approach, to minimize the costs and possible difficulties of this approach for field operations, and to develop better estimates of the reductions in sampling errors, compared with those in the Census Bureau's proposal.

As the Census Bureau moves toward CAPI for SIPP, methodological research is needed to evaluate and understand CAPI's effects on the interview, the respondent, the interviewer-respondent interaction, and ultimately, the distribution of measurement error for SIPP items. In addition, more should be learned about the cost-error tradeoffs of using CAPI for SIPP. Also, research is needed to develop methods that take full advantage of the capabilities of CAPI (e.g., on-line editing, computer-directed probing, and interviewer help screens) that have the potential for reducing measurement errors. As the development of a CAPI system for SIPP progresses, research should proceed simultaneously on the quality differential between CAPI and paper-and-pencil methods for SIPP.

As part of the plan to convert to CAPI, the Census Bureau will need to consider the appropriate role of personal versus telephone interviewing in SIPP. Research is needed on the implications for costs and data quality of continuing the current mode of maximum telephone interviewing in waves 3–5 and 7–8 versus reverting to heavier use of in-person interviews. A particular concern is the feasibility of using recently developed cognitively based interviewing procedures and questionnaire formats over the telephone.

The Census Bureau's evaluation of telephone versus in-person interviewing to date (from a 1985–1986 telephone experiment) does not provide sufficient information for an informed decision. For example, sizable differences for many items were not statistically significant, indicating inadequate power for the comparisons. The telephone experiment also did not obtain adequate information to assess the cost implications of different interview modes (because only the designated interview mode—not the actual mode—was recorded).[9] More needs to be learned in order to evaluate the most cost-effective allocation of personal visits and use of the telephone in an environment of computer-assisted interviewing. Also, work should be

done to determine the possible savings in cost and improvements in quality that could be effected by using centralized computer-assisted telephoning for some types of SIPP interviews.

Estimation and Data Use

Much of the SIPP methodological research program has focused on understanding and improving data quality at the source, for example, by means of changes in questionnaire wording and interviewing procedures. Although this focus is appropriate, research is also needed on how best to treat the quality problems that remain at the points of data analysis and use. In this section we discuss needed research on weighting and imputation that is particularly important given the changes that we propose in the design of SIPP—namely, longer panels and less frequent introduction of new panels. We also discuss the problem that undercoverage in SIPP varies across population groups, which has implications for weighting adjustments as well as for improved field procedures. Population undercoverage affects household surveys generally, but it may be particularly troublesome for SIPP given the evidence that it is low-income people who are most likely to be missed.

Weighting and Imputation

To date, Census Bureau staff and outside analysts have examined weighting procedures to compensate for sample selection and attrition and imputation procedures to adjust for item nonresponse. Both cross-sectional and longitudinal procedures have been assessed. It is clear that the current cross-sectional weights do not adequately adjust for differential attrition by such characteristics as income level (Petroni and King, 1988; King et al., 1990). It appears likely as well that the weights do not adequately compensate for differential undercoverage of population groups in the survey (see below). There is also evidence that the current cross-sectional imputations do not adequately reproduce known relationships between income, assets, and program participation (Doyle and Dalrymple, 1987; Allin and Doyle, 1990). However, the research in these areas has not been carried to the point of identifying optimal revisions to the Census Bureau's weighting and imputation programs. We urge that such research be conducted and that appropriate changes in the Bureau's procedures be implemented on the basis of the results. One avenue to pursue is research on the benefits of more extensive use of wave 1 income and program participation variables to adjust for attrition in subsequent waves.

The need for further research on longitudinal weighting and imputation is even more critical. The current longitudinal weights reduce the available sample size for analysis because only people with data from all waves of an

[9] We presume the Census Bureau is obtaining cost information from the use of maximum telephone interviewing for the current SIPP panels.

entire panel (or a calendar year) are given positive weights. The current longitudinal imputations are implemented only for selected variables and only after all waves of a panel are complete.[10]

Further investigation of improved weighting and imputation procedures, both cross-sectional and longitudinal, is especially important in the context of the proposed redesign. The less frequent introduction of new panels will require research on more effective cross-sectional weighting adjustments to compensate for attrition bias in estimates for the "off" years (every other year), when a new panel is not in the field.[11] Research will be needed as well on the extent of bias in the off-year estimates (and ways to compensate for the bias) that results from loss of coverage for people who enter the SIPP universe (e.g., by leaving institutions) and have no antecedents in the previous on-year population. The increase in panel length will also require research on more effective longitudinal weighting procedures to minimize the loss of sample cases. The development of imputation procedures to supply data for waves that are missing in their entirety could help with this problem. The use of imputation seems particularly promising for cases with only one or two missing waves, in which the missing waves are bounded by interview data for the preceding and succeeding waves.[12]

For another longitudinal estimation issue, we urge the Census Bureau to conduct research on appropriate weighting for analyses of spell duration (spells of low income or program participation) that use such standard survival analysis procedures as the Kaplan-Meier and proportional hazards modeling approaches. Analysts using these methods often assume that the survival probability of people who remain in the sample is the same as those who do not (within subgroups or given a common set of covariates). Armed with this assumption, analysts proceed to make use of all sample cases up to the point of attrition. They typically ignore the survey weights because there is no appropriate set of weights available. An alternative is to restrict the analysis to cases with complete data. Then the analyst can readily adapt the Kaplan-Meier and proportional hazards procedures to incorporate survey weights that adjust for nonresponse. However, this approach fails to use all of the cases. Research is needed into alternative imputation and weighting strategies that make fuller use of the cases with

[10] These imputations replace previous cross-sectional imputations for item nonresponse; they are not used to supply data for waves that are missing in their entirety.

[11] Under the proposed design with 4-year panels introduced every other year, cross-sectional estimates with maximum sample size for "on" years can be based on the first year of a new panel and the third year of the previous panel; cross-sectional estimates with maximum sample size in "off" years can be based only on the second year of the most recent panel and the fourth year of the previous panel.

[12] Work is currently under way on this topic through a joint statistical agreement between the Census Bureau and the University of Michigan.

incomplete data for survival analysis and enable analysts to use a suitable set of weights.

Finally, looking to the implementation of CAPI and a new database management system for SIPP as part of the redesign, it is important for the Census Bureau to press forward with the research that the data processing staff have begun on ways to integrate cross-sectional and longitudinal processing. Specifically, research is needed to determine ways to improve imputation for both item and wave nonresponse on an ongoing basis, through timely use of information from prior and subsequent waves. In our view, the goal for the future should be to replace the current wave-specific processing with a system that makes use of all available information for a stream of data for each sample case in a manner that supports cross-sectional and longitudinal estimation on a consistent basis. To support research and development work in this area, the database management system chosen for SIPP (as noted in Chapter 5) should permit ready implementation of alternative imputation procedures.

Population Undercoverage

It is well known that household surveys rarely cover the population as well as the decennial census (see Citro and Cohen, 1985; Shapiro and Kostanich, 1988); SIPP is no exception. Thus, even after adjustment for nonresponse, the SIPP data for March 1984 covered only 85 percent of black men and 91–93 percent of all other people when compared with census-based population estimates. By age, black men in the 20–39 age categories were generally the worst covered (see Table 3-12 in Chapter 3).

The Census Bureau uses ratio-estimation procedures to adjust SIPP survey weights for population undercoverage. The weights are adjusted so that the population estimated from each survey agrees with the updated decennial census-based population estimates by age, sex, race, and Hispanic origin. SIPP weights are also adjusted to agree with the March Current Population Survey (CPS) weights by household type.[13]

However, these ratio adjustments do not correct all coverage errors. First, they do not correct for the undercount in the decennial census itself: although it is minimal in total—net undercount was estimated to be between 1 and 2 percent of the population in 1980 and 1990—it is substantial for some population groups. Thus, in 1980, an estimated 9–10 percent of black children under age 5 were missed, as were about 15 percent of middle-aged black men (see Fay, Passel, and Robinson, 1988:Tables 3.2, 3.3; Robinson,

[13] The CPS also exhibits undercoverage. For example, in March 1984, the CPS only covered 84 percent of black men and 90–94 percent of all others. Coverage ratios for black men were even worse in March 1996 for both the CPS and SIPP (see Table 3-12).

1990).[14] Second, the ratio adjustments do not correct for characteristics other than age, sex, and ethnic origin on which the undercovered population might be expected to differ from the covered population.[15]

The correlates of undercoverage (besides age, race, and sex) are not definitely established. However, analysis of the 1980 census postenumeration survey and of other survey, administrative records, and ethnographic data suggests that census undercount rates are higher for the following groups (see Citro and Cohen, 1985; Fein, 1989): household members other than the head, spouse, and children of the head; unmarried people; people living alone or in very large households; and people residing in central cities of large metropolitan areas. In addition, there is evidence that the rate of undercount increases as household income decreases.

Overall, these tentative findings suggest that minorities, unattached people, and low-income people are at much greater risk of not being covered in household surveys than other people and, hence, that undercoverage affects SIPP-based estimates of program eligibility and participation. However, quantifying the impact of undercoverage on estimates of welfare program costs and caseloads developed from SIPP is not straightforward. For example, increasing the number of low-income households through a coverage adjustment would presumably enlarge the eligible pool for such programs as Aid to Families with Dependent Children (AFDC). On the other hand, adding "missing men" to some of these households might reduce the size of the eligible pool, depending on their relationship to the AFDC unit, their employment status, and their contribution to the household's resources.

Household surveys other than SIPP experience substantial undercoverage for some population groups, but undercoverage may be particularly important for SIPP with its two main goals of improving information on income and programs. We urge the Census Bureau to conduct research on population undercoverage in SIPP, including simulation studies to assess the sensitivity of SIPP estimates to alternative procedures for adjusting for undercoverage.[16] The goal of such research should be to develop improved

[14] Clogg, Massagli, and Eliason (1986) review the potential impact of census coverage errors on direct and indirect uses of the data, such as weighting adjustments for sample surveys and denominators for vital rates, and cite several examples of important effects.

[15] Fay (1989) analyzed within-household undercoverage in the CPS relative to the decennial census, using a 1980 CPS-census match. His results are suggestive of ways in which weighting adjustments do not adequately compensate for household survey undercoverage. For example, he finds that about one-fourth of adult black men who are counted in the census but not in the CPS are household heads, whose households should be categorized as married-couple households in the CPS but instead are categorized as households headed by unmarried women.

[16] For an example of such a simulation, see Cohen et al. (1991), which compared estimates of the AFDC-eligible population using an unadjusted March CPS and a version in which crude adjustments to the weights were made for undercoverage on such characteristics as household income and marital status, age, and race of household head.

techniques for obtaining higher population coverage in the field as well as improved weighting adjustment procedures.[17]

Evaluation of the Redesign

It is not too early to begin planning the priority research that should be conducted after implementation of the SIPP redesign, with the goal of assessing its successes and identifying problem areas for timely correction. We briefly discuss below some of the topics that we believe will require careful study: attrition, length of recall period, phase-in of CAPI, and the effectiveness of changed questionnaire content. We urge that the Census Bureau continue a program of small-scale forward record-check studies, in which sampled cases receive the same interviews as cases in the main survey, to help evaluate the effects on data quality of various features of the redesign. Full record checks that match SIPP sample cases, including reporters and nonreporters, with administrative records to assess net reporting error, including both underreports and overreports, would also be useful to conduct periodically.[18]

The proposed redesign entails a significant extension in the length of SIPP panels—from 32 to 49 months. We do not expect that cumulative attrition will increase very much because the available evidence is that most attrition occurs in the first few waves of a panel. However, the evidence from longer panel surveys is not directly relevant to SIPP with its short intervals between waves. The attrition effects of the new design must therefore be carefully watched.

We urge the Census Bureau to plan a major assessment of the attrition from the redesigned panels. The Bureau should plan to monitor attrition rates on a continuing basis and to carry out timely studies of the characteristics of households and respondents who do and do not drop out of the sample. Such studies can make use of data that are available from earlier waves for households that drop out. Special follow-up studies of nonrespondents at early waves may also be useful. In addition, analysis of information from administrative records for cases that drop out, using a forward record-check sample, could prove helpful in assessing the causes and consequences of attrition.

[17] We note that some work in this area has, in fact, been started. See Cantor and Edwards (1992), who report on a small-scale test to determine the effects on coverage of household members in SIPP of the current and an alternative procedure to obtain household rosters.

[18] We believe that the Census Bureau should be able to greatly reduce the delays that adversely affected the analysis of the SIPP record-check study (see Marquis and Moore, 1990b), as more experience is gained with such studies, a new database management: system is implemented for SIPP, and greater coordination is achieved among the SIPP project staff (see Chapter 8).

Should attrition at early waves increase more than expected, the Census Bureau should have resources set aside to permit timely experimentation with ways to overcome the problem. Finally, as noted above, an important part of the research that is devoted to estimation issues will need to be the development of more effective weighting and imputation procedures to minimize the effects of differential attrition from the longer panels.

It is unlikely that sufficient information to determine the optimum recall period for SIPP will be obtained prior to the redesign; hence, the Census Bureau will need to continue research on this topic. Again, forward record-check samples can provide a vehicle for experimentation on recall effects. The Census Bureau will also need to plan a research program to assess the effects of the CAPI system that is implemented for SIPP versus paper-and-pencil techniques on the quality and comparability of the data across SIPP panels. Finally, the Census Bureau should plan studies of the quality of the data collected in response to new or modified questions in SIPP. Comparisons with other data sources should be helpful for this purpose, as should analysis of the information available in the forward record-check studies.

Quick-Response Capability

As we have noted, it will not be possible to anticipate every data quality problem or user need that may arise in SIPP after the redesign. It is important for the Census Bureau to have some reserve capability to conduct research and evaluation on new problems and concerns as they arise and to determine the best ways to respond. For example, evaluation of questionnaire changes introduced as part of the redesign may reveal unexpectedly serious problems that require timely experimentation with revised content, edits, or other procedures. Or shifting policy interests may require more detailed coverage of a topic in SIPP, and the Bureau will need the capacity for timely field testing of new or alternative questions. Or it may be necessary to take steps to deal with unexpectedly high rates of attrition. Hence, it is only prudent for the Census Bureau to have contingency plans to permit timely assessment and corrective action in the event that a serious problem occurs with the redesign.

Recommendation

We believe that methodological research and evaluation is needed to inform and assess the SIPP redesign. The magnitude of the changes that are proposed for the redesign together with the relative newness of SIPP and its undeniable scope and complexity argue for a strong, multifaceted program.

Recommendation 7-1: **The Census Bureau should support methodological research and evaluation for SIPP leading up to and following the survey redesign. The research program should include the following components:**

- **research to improve the format and wording of the questionnaire, making use of record-check studies and, to the extent possible, of findings from the current program of cognitively based questionnaire experimentation;**
- **research targeted to other aspects of the current redesign (and to possible design changes later on), including the length of the recall period, screening techniques to obtain larger sample sizes for subgroups of interest, and data collection modes (the best combination of computer-assisted personal and telephone interviewing and the possible role of centralized telephoning);**
- **research on issues of estimation and data use, taking into account the features of the redesign and including ways to improve cross-sectional and longitudinal weights, imputation procedures, and population coverage;**
- **research to evaluate the success of major elements of the redesign (e.g., the attrition effects of longer panels); and**
- **a quick-response capability to address unanticipated problems with the implementation of the redesign.**

CONTINUOUS ERROR MONITORING

With the focus on the upcoming redesign of SIPP, it is important that the Census Bureau not lose sight of the need for continuous monitoring of error levels in SIPP. Users need a constant flow of information about data quality as they seek to work with later panels and topical modules and to compare their results with work on earlier panels and other data sources. In this regard, we wholeheartedly support the plan of the Housing and Household Economic Statistics Division to compare income data from the March 1991 CPS and the 1990 SIPP panel. Many users will want to work with the 1990 SIPP panel because it offers the largest sample size of any SIPP panel yet fielded, and an in-depth comparison of SIPP and CPS data for 1990 will greatly benefit users.

Continuous monitoring, which is a vital source of information for the SIPP staff at the Census Bureau as well as outside users, covers a range of topics and methods. For example, internal analysis of SIPP data generates rates of attrition and of person and item nonresponse. Internal analysis also generates estimates of the extent to which transitions are reported between pairs of months on and off the scam. Analysis of reinterviews of subsamples

of SIPP respondents may also provide useful information on questions that are not well understood or reported.

Comparison of SIPP aggregates with aggregates from other sources is another form of monitoring, which may reveal differences that raise warning flags for users and SIPP staff. To be meaningful, such comparisons require detailed understanding both of SIPP and the alternative source. For example, aggregates from the National Income and Product Accounts (NIPA) often serve as a basis of comparison for income totals from surveys, but extensive manipulation is usually required to achieve a valid comparison. Substantial revisions to the NIPA are under way or being planned, and it is important that Census Bureau analysts keep abreast of these changes to the NIPA and their implications for evaluation of income data from SIPP and the March CPS.

Record-check studies can also make a significant contribution to assessing error levels in SIPP. The small-scale forward record checks that we recommend as part of the research leading up to and following the redesign should be helpful in this regard. Also, it would be very useful to periodically conduct reverse or full record-check studies based on matching SIPP panels with administrative records (e.g., tax returns or program case records). Reverse record checks that are based on probability samples of the entire SIPP universe are more expensive and time consuming to carry out, but they are the only way to obtain a full assessment of reporting errors, including false positives and false negatives. We note that the Census Bureau now has under way a match of the 1990 SIPP panel with an extract of the Individual Master File of tax returns from the Internal Revenue Service (IRS). Although the extract file contains a limited set of items, it can help evaluate certain types of income reports.

We also encourage the Census Bureau to further exploit an existing resource: the reverse record-check study that involved matching records for a number of federal and state assistance programs in four states with SIPP cases in the first two waves of the 1984 panel. The analyses of the matched file conducted to date have been useful (see, e.g., Marquis and Moore, 1989, 1990a), but they did not go far enough. Very little marginal cost would be required to carry out additional analyses, such as investigating biases in duration of spells and reports of benefit amounts, and we urge that these be done at an early date. Such studies would benefit users and could also contribute useful information for consideration of possible improvements to the questionnaire.[19]

[19] The staff who worked on the SIPP record-check study are now engaged with other projects. If Census Bureau staff are not available for further analysis of the data, the Bureau should consider inviting an outside researcher to carry out the work through a fellowship or other on-site arrangement that permits access to the data.

Another aspect of error monitoring relates to sampling error or variance. The Census Bureau needs to document for users the estimated sampling errors for estimates of subgroups from SIPP panels of different sizes and also consider innovative ways to reduce sampling error.[20] The redesign of SIPP will entail important changes in the sampling scheme—namely, an increase in overall panel size and the introduction of oversampling of lower income groups. The Census Bureau will need to thoroughly investigate the variance effects of the new design on estimates developed for subgroups of the oversampled, undersampled, and total population. Indeed, we urge the Census Bureau to plan an in-depth technical report for users on the variance implications of the new sample design.

Looking to the future, we expect that the introduction of new data collection and processing technology (namely, CAPI and a new database management system) should improve the efficiency of the monitoring function by making it possible for analysts to have hands-on access to the data at an earlier stage in the processing. Such access should make it possible for many of the results from monitoring to have an immediate, beneficial impact on survey operations (e.g., leading to changes in edit or imputation routines). We urge the Census Bureau to make improved access to SIPP data on the part of its analysts an important goal of its investment in new technology.

Finally, a critical part of the monitoring function is the provision of information to all users. For this purpose, it is important that the Census Bureau support such means of communication as the *SIPP Working Papers* and, most especially, regular updates to the *SIPP Quality Profile*. As in the past, these documents should include error analyses that originate from both Census Bureau staff and outside users.

Recommendation 7-2: **The Census Bureau should undertake continuous monitoring of error levels in present and future SIPP panels and regularly provide information on errors to users, in periodic updates of the *SIPP Quality Profile* and other publications.**

[20] One avenue for reducing variance that the Census Bureau is considering is to adjust the SIPP sample weights, using some type of raking or iterative proportional fitting procedure, so that weighted estimates match control totals from administrative records. Huggins and Fay (1988) conducted preliminary research on the feasibility of this approach to reduce the variance of income estimates from SIPP. In their study, the sample weights on a 12-month research file from the 1984 panel were adjusted to control totals derived from a 1 percent sample of individual income tax returns from the IRS. (Only the weights of SIPP cases that were successfully matched to a full IRS file were adjusted.) The results showed reduction of variance for such estimates as mean and median income.

COGNITIVE RESEARCH

Innovative data collection and processing technologies such as CAPI and a database management system can benefit SIPP (and other surveys) in many ways, including making possible substantial improvements in data quality. However, technology cannot substitute for appropriate understanding and motivation on the part of the survey respondents. To the extent that respondents do not understand the questions to mean what the survey designers intended or are not motivated to search their memories or consult records to the extent necessary to provide an accurate response, then the quality of the data will necessarily suffer.

A recent development in survey research has been the introduction of approaches from cognitive psychology to study in greater depth the ways in which respondents react to and interpret specific question wording. The results have often shown startling differences in perceptions between respondents and survey personnel (see Jabine et al., 1984). Federal statistical agencies, including the National Center for Health Statistics, the Bureau of Labor Statistics, and the Census Bureau, are now making considerable use of cognitive techniques for questionnaire research and experimentation, such as one-on-one sessions in which a researcher probes the respondent after each question to ask what he or she had in mind in answering.

Results

The Census Bureau recently began applying cognitive techniques to the task of improving SIPP measures of income and program participation (see Marquis, Moore, and Bogen, 1991). This work had its origins in the SIPP record-check study when analysis of the data did not produce clear findings for such phenomena as the seam problem or other response errors (although the analysis was limited). Specifically, there was little support for the forgetting theory of memory: that is, underreports of participation for most programs were no more likely to occur for 4 months prior to the interview than only 1 month.

Exploratory observational research conducted in fall 1989 suggested that respondents often use simple heuristic devices, combined with a few recalled facts, to construct 4-month income streams instead of making the effort to develop a detailed recall or to check their records (e.g., they may derive monthly values from annual amounts). This research also suggested that misunderstandings about the intent of particular questions often occur because respondents do not understand the goals of particular sections of the questionnaire (Marquis, 1990).[21]

[21] For this research, Census Bureau headquarters staff, who received special training in think-aloud and direct questioning techniques, accompanied SIPP interviewers, took notes on

Formal cognitive laboratory research conducted by Westat, Inc. (under contract to the Census Bureau) has begun to produce findings of relevance to understanding response errors in SIPP (see Cantor et al., 1991). The research involved recruiting 125 respondents, about one-half of whom were participants in some type of government program, to receive wave 1 and wave 2 SIPP interviews. At wave 1, half the respondents were administered the regular interview, and the other half were administered that interview and additional procedures. These procedures included asking the respondents to think-aloud during the interview, repeat questions back in their own words, and answer additional detailed questions designed to obtain a second measure of recipiency and amounts. At wave 2, the additional procedures were used for both groups.

Cantor et al. (1991:4–15) report some very provocative findings from the wave 1 interview on respondents' motivation, information storage, comprehension, and information retrieval and formulation. On motivation, the questionnaire, as currently structured, does not encourage respondents to be active participants in the interview or to do their best to provide accurate information. For example, the questionnaire does not allow acceptance of information that respondents volunteer out of sequence, and it bores respondents with long lists of income sources of which only a few are usually relevant.

Errors in reporting program information often result from the fact that participants do not know the name of the program or know it by another name than that used in the questionnaire. For example, elderly respondents in the Westat study often could not differentiate between social security, Medicare, and "medical assistance," which is the local Medicaid name in Maryland and the District of Columbia. In reporting earnings, many respondents think of net rather than gross pay, and they often have trouble aggregating weekly or biweekly paychecks to monthly units. Also, respondents often do not commit to memory the particular types of assets they hold, for example, whether they have a money market deposit account or a money market fund. Information on asset income amounts is even less frequently stored in memory.

Comprehension is clearly a problem: respondents find the labor force questions complex, with many qualifying phrases that make them hard to answer. Respondents often do not understand the distinction between earned or accrued and received income. (SIPP wants the latter amounts, including, for example, a current paycheck for work performed some time back, but

the interviews, interrupted at various points to ask respondents how they interpreted and answered questions, and prepared written summaries of their impressions and experiences. The interview sessions were also taped.

excluding, for example, interest on a certificate of deposit that has not yet matured.)

A common mistake is for respondents to think about the reference period up to the date of the interview, which leads to a number of problems with respect to anchoring time points and calculating total income. To recall earnings, respondents tend to use a simple heuristic strategy, such as retrieving paycheck amounts and calculating the number of paychecks in a month, or multiplying the number of hours worked by an hourly rate, or dividing annual salary by 12. Once they have calculated the amount for the most recent month, respondents tend to apply this figure to the other months. Many respondents in the Westat study made errors in reporting earnings—based on comparing responses to the SIPP questions with an additional detailed recall—most commonly because of misdating or miscounting paychecks.

Most respondents find it fairly easy to remember amounts for program participation, but very difficult to retrieve amounts for assets. They often guess at asset income—for example, calculating interest on the basis of the average balance in a savings account. Also, respondents find it too difficult and beyond their patience to develop accurate asset income amounts in response to the SIPP questions that require them to distinguish between separate and joint accounts, to aggregate across months, and to aggregate across asset types.

Preliminary findings from the wave 2 interviews confirm the findings from wave 1 about the kinds of errors typically made by respondents.[22] The results show evidence of the seam problem, particularly for amounts of asset income and wages. In many instances in which respondents report changes in amounts at the seam between the two interviews, it is because they make a fresh calculation at the wave 2 interview for the month prior to that interview and generalize the result to the other 3 months of the reference period.

Alternative Questionnaires and Interviewing Procedures

It must be kept in mind that the findings from both the exploratory observational research and the more formal cognitive procedures applied by Westat are based on limited samples. Nonetheless, there are strong indications that the current SIPP questionnaire may contribute to inaccurate responses for many income and program-related items.

[22] Of the 125 respondents at wave 1, 76 completed a wave 2 interview (personal communication, David Cantor, Westat, Inc.). The high nonresponse rate was due primarily to respondents' not returning phone calls or to their moving to a new address. Also, some of the wave 1 respondents were temporary residents of a homeless shelter and were no longer there at wave 2.

Staff of the Census Bureau's Center for Survey Methods Research are currently experimenting with an alternative set of questionnaires and interviewing procedures (Marquis, Moore, and Bogen, 1991; Bureau of the Census, 1992b). In brief, the alternative being tested relies much less on respondent recall and much more heavily on the use of records. At the first interview, the goal of the core questionnaire, namely to obtain complete and accurate information on all sources of family income during the reference period, is explained and respondents are asked to bring out payment records. Respondents who receive but do not ordinarily save records are given a folder in which to keep them for future interviews. Using records whenever possible, respondents are asked to help the interviewer fill out a worksheet for each income source that provides the amount and date of each payment. They can provide payment information for their income sources in any order (e.g., bank account interest before wages), and they do not have to compute monthly amounts. In other words, the respondents have the initiative in this portion of the interview, although the interviewers are trained to press respondents to think hard and not adopt a simple heuristic (e.g., reporting all paychecks from their job as the same).

To help ensure that no sources of income are overlooked, the interviewer next refers to flashcards that show about 50 sources of income and asks a short set of questions that are designed to jog respondents' memories. Income sources are grouped in ways that seem likely to make sense to respondents: for example, asking about money from the military, including veterans' payments, military retirement, National Guard pay, and GI bill benefits; or asking about "surprises," such as an inheritance, lottery winnings, profits from gambling, insurance settlements, and work-related bonuses or awards.

At subsequent interviews, to help reduce response errors, dependent interviewing techniques (reminding respondents of prior wave responses) are used. However, they are introduced late in the interview, in order to assist but not unduly influence respondents' recall. Also, the reference periods for pairs of interviews partly overlap, and differences in reported income sources and amounts are reconciled.[23] Finally, all of the respondents in a household are urged to answer the questions in a group setting, and (at least during the testing period) they are asked for permission to record the interview.

Preliminary results from initial small-scale field tests of these new methods are encouraging on some dimensions, although less so on others (Bureau of the Census, 1992b). On the positive side, much higher proportions of respondents used records than in regular SIPP interviews: for example, 65–80

[23] Specifically, the reference period for the first of two interviews extends up to the time of the interview, instead of, as now, stopping at the end of the month prior to the interview.

percent of income sources were supported by at least one record in the tests, compared with 20 percent in the regular SIPP interviews. Also, there was essentially no seam bias in reports of program participation: the ratio of transitions on or off all programs reported between waves 1 and 2 to transitions reported within a wave was about 1, compared with ratios of 2 to 6 for various programs in the regular SIPP interviews. Finally, most respondents were willing to have the interviews recorded, and most adult household members participated in a group interview.

On the negative side, the wave 1 interviews took longer—and hence were more costly—to complete, as respondents sought out their records. Also, the response rates were unacceptably low (64% after two waves), although the reasons for low response do not appear related to the new procedures, as most refusals occurred before the procedures were introduced. Rather, the causes appear to include the traditional problems of infrequent and inefficient call-backs to follow up nonresponse (e.g., too many daytime and too few evening calls to households). However, there remains the concern that the new interviewing procedures, by placing new demands on the interviewers, will require field personnel who are better trained and more highly skilled than is the case with the current procedures. Thus, there is the potential for interviewer variance and bias as well as increased costs of recruiting, training, and retaining interviewers who are able to consistently and accurately apply the new procedures.

The SIPP cognitive research staff are currently planning a larger evaluation of the new procedures and questionnaire format in Milwaukee, Wisconsin, to include two waves administered in fall 1992-winter 1993. A sample of 700 households will be obtained from administrative records for four programs and the records of a local employer, permitting evaluation of the quality of many of the survey items through a forward record-check approach. Half the sample will be interviewed using the regular SIPP format and half using the new format. The staff have also proposed adding a third wave, conducted by telephone, and a study to assess the ability to program the new questionnaire format into CAPI.

Looking to the Future

We are impressed with the effort that the Census Bureau has made to use cognitive research methods to understand and seek to improve the quality of SIPP responses. The promise for a very different way of relating to respondents that obtains high-quality responses seems strong. We were not in a position to comment on specific details of the current program of field testing and experimentation with alternative questionnaires and interviewing procedures because the program was in the very early stages at the time of our deliberations. We urge the Census Bureau to seek continued review

and guidance on this work from experts in the field (e.g., members of the ASA/SRM Working Group on Technical Aspects of SIPP).

Our major concern is how the research on alternative questionnaire design and interviewing fits in with the other planned improvements in SIPP data collection and processing technology and with the overall goal of implementing major changes in the 1995 or 1996 panel. Should the technique of free recall of income sources, using worksheets to record payment streams, prove effective in the field, its use will have major implications for SIPP data processing. It seems possible that the equivalent of worksheets could be built into a CAPI system and that the necessary computations to produce monthly incomes from the individual payment records could be made within a database management system. However, an extensive amount of reprogramming would be required, given that work is already in progress to develop CAPI and database management systems for SIPP that assume that a questionnaire close to the current fixed-format document will be in use.[24] It seems unlikely to us that such reprogramming could be accomplished and fully tested in time for the redesign.

In addition to the question of integration with the CAPI and database management system development, we are concerned about the time that will be required for rigorous evaluation of the new procedures, which differ greatly from current survey practice. We believe that the Census Bureau should have results from more than one full-scale test (as is planned for Milwaukee) in order to develop sufficiently reliable assessments of the cost, feasibility, and data quality implications before making these kinds of changes.

Overall, it seems very ambitious to attempt to carry out the necessary testing and evaluation of the new procedures and achieve a seamless integration with the CAPI and database management system development work prior to the SIPP redesign. But if the cognitive questionnaire research is treated entirely as an experimental program, the likely result is that it will be starved for resources and that any positive findings will have little impact on SIPP until at least the next major redesign in the year 2005.

There is no easy way out of this dilemma. We urge the Census Bureau to consider an approach whereby a team of systems and research staff work on a prototype of an integrated system that includes the CAPI and database management system programs that will be required for a new questionnaire. A firm schedule should be developed for design and testing of the prototype so that positive outcomes can lead to changes in SIPP without waiting until the next major redesign. (Also, as we urge above, the findings from the

[24] The SIPP CAPI staff, in discussions with the study panel, indicated that they are making changes to the current questionnaire that reflect some of the cognitive research findings (e.g., reordering and clarifying questions and simplifying skip patterns). However, they are not currently planning for any type of free format.

cognitive research program should be used to the extent possible to improve the standard questionnaire.) Furthermore, we encourage the Census Bureau to devote adequate resources to the field test program so that results can be obtained on a timely basis from reasonably large samples of respondents in more than one site. Finally, as planned for the upcoming evaluation study in Milwaukee, all tests should build in the means to evaluate fully the effects of the new procedures on costs and data quality.

Recommendation 7-3: **We strongly support the Census Bureau's program of cognitively based research and experimentation with the SIPP questionnaire, which could contribute to questionnaire improvements for the current redesign and perhaps, in the future, to a major revision of the questionnaire and interviewing procedures. The Bureau should subject the cognitive work to rigorous evaluation, including record- check studies to evaluate data quality.**

8

Management and Oversight

Many elements combine to make a cost-effective and efficient survey program that meets the needs of its users for relevant, high-quality, timely, and accessible information on the topics within its mandate. Some of these elements are well-designed questionnaires; motivated respondents; capable interviewers; talented systems staff; innovative experiments and evaluation studies; knowledgeable analysts; and state-of-the-art data collection, processing, and dissemination technology. Not usually considered in the review of a survey program is the management of the survey, including the means for obtaining feedback and advice from others. However, an effective management structure underpins all of the above elements and is a key component to a survey's success.

In this chapter we review the current management structure for SIPP at the Census Bureau, including the channels through which feedback from users and others outside the SIPP program is sought. Such feedback is essential to keep a survey program oriented to the concerns and needs of its users and also up to date with the latest improvements in survey design and methods.

We believe strongly that a different and more effective management structure is needed if SIPP is to achieve its full potential in the future. In our view, the Census Bureau should not treat SIPP as "just like any other Census Bureau survey" from a management perspective. SIPP is far more complex than the Bureau's other household surveys. More important, the Census Bureau has leadership, analysis, and dissemination responsibilities

for SIPP above and beyond its responsibilities for collecting and processing the data. In this regard, the Census Bureau's role for SIPP resembles its role for the decennial census and differs from its role for other household surveys: the Bureau both sponsors and operates the decennial census but typically conducts household surveys on behalf of an outside sponsor agency. The Census Bureau must manage SIPP in a manner that is commensurate with its responsibilities as the survey's sponsor and as the lead federal agency for analysis and publication of statistics on family and individual income. (The latter role also encompasses management of the March Current Population Survey (CPS) income supplement.)

MANAGEMENT STRUCTURE

Description

The responsibility for household surveys that are conducted by the Census Bureau (including SIPP, CPS, the Consumer Expenditure Survey, and others) is lodged with Demographic Programs—one of six major organizational units within the Bureau, each of which is headed by an associate director. (See Figure 8-1; subsequently, for clarity, we refer to Demographic Programs as the "Demographic Directorate.") The Demographic Directorate in turn is organized into six divisions, two divisions that deal with international programs and four that are involved with U.S. household surveys: Demographic Surveys Division (DSD), Housing and Household Economic Statistics (HHES), Population (POP), and Demographic Statistical Methods Division (DSMD).

DSD performs many functions for each survey, including general management and coordination, questionnaire design, and data processing. Staff of other divisions—both inside and outside the Demographic Directorate—also play important roles. Within the Demographic Directorate, DSMD staff are responsible for sample design and selection and most methodological research and evaluation, while HHES and POP staff are responsible for publications and liaison with users.[1] Outside the Demographic Directorate, the Field Division manages the interviewing staff, while the Center for Survey Methods Research and Statistical Research Division contribute to methodological research. Data User Services Division (DUSD) fills orders for public-use microdata products and documentation (primarily for SIPP and the March CPS, among the Bureau's household surveys). DUSD will also develop user products, such as users' guides, but only by request and with funding from another division.

[1] HHES and POP perform these functions for the March CPS as well as SIPP, but not generally for surveys that are conducted for other federal agencies.

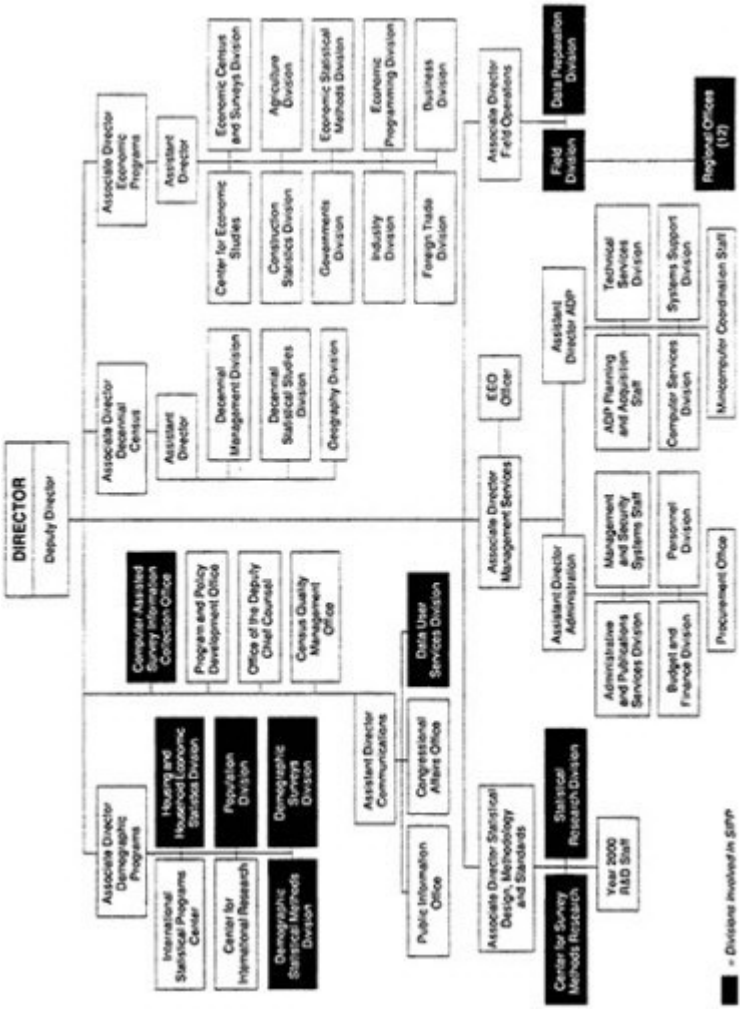

FIGURE 8-1 Census Bureau Organization Chart

The responsibility for coordinating the work and generally for "making the trains run" for each household survey is typically lodged with a branch chief in DSD. One of the branch chief's functions is to obtain budget requests from all divisions with involvement in the survey and funnel them to the head of DSD and, ultimately, the head of the Demographic Directorate, for review and adjudication.

Because SIPP involves staff in so many divisions in the Census Bureau—both inside and outside the Demographic Directorate—and because of its relative newness and complexity, several cross-cutting committee structures have been tried to improve communication and coordination of the work. Initially, the income surveys (SIPP) branch chief in DSD chaired a committee of representatives from each division that met frequently to keep everyone up to date. Also, the chief of POP (HHES did not yet exist) was delegated wide authority to monitor and guide the survey. Although not in charge of the survey's budget, he was instrumental in ensuring that a portion of the funding was available for methodological research and experimentation. He also played a deciding role in several key changes to the questionnaire (e.g., the decision to combine several scattered topical modules into a single personal history module administered early in each panel).

As problems developed (principally with data production and user liaison), it became clear that a stronger coordinating mechanism was needed. Staff committees were set up to address specific areas, such as user needs and methodological research. An executive committee, consisting of the chiefs of divisions with a major role in SIPP, was charged to review proposals from the staff committees and make major decisions for the survey. (The executive committee was chaired at times by the head of the Demographic Directorate and at times by a special assistant to the head.)

Some of the staff involved with SIPP work solely on the SIPP program—for example, the staff in the DSD income surveys branch and the DSMD SIPP branch.[2] However, SIPP analysts in HHES and POP typically have other responsibilities as well—for example, analyzing data from the decennial census and supplements to the CPS. Initially, POP included several staff with a strong focus on SIPP who also served as contact points for questions and problems from outside users and who initiated research and development projects for SIPP. Subsequently, some of these staff were attached to the associate director's office. Plans were made to put these and other staff in an expanded Center for Demographic Studies within the Demographic Directorate that would conduct analyses of longitudinal data from SIPP and other surveys, but those plans were dropped, and the Center was disbanded. At about the same time, several staff with a long association

[2] The DSD income surveys branch, despite its title, deals exclusively with SIPP and not also with the March CPS income supplement.

with SIPP left the Census Bureau or the SIPP program, and some of them were not replaced. Recently, a SIPP user liaison position was established in HHES, which is the division that analyzes the core income and program participation data from SIPP. However, no additional positions for user liaison or SIPP analysis have yet been allocated.

Assessment

The management structure for SIPP, as for other household surveys, follows well-established practice at the Census Bureau. Given the Bureau's long record of solid performance in many aspects of survey operations, we do not lightly offer criticisms. However, we believe that the structure does not serve SIPP well.

The basic decentralized staff organization for SIPP and other Census Bureau surveys follows a widely accepted model. Many agencies and firms that conduct surveys organize their staffs by function—for example, with the field staff in one division, the data processing staff in another, the survey and sample design people in another, and so on. This type of structure facilitates such important functions as staff training, mentoring, and career development. However, problems arise in taking the staffs from different divisions who are to participate in a particular survey project and turning them into a cohesive, efficient, well-focused team. Moreover, the work of the team must be driven first and foremost by the survey's goals, which are ultimately determined by the analysis and research needs of the users.[3]

Most survey organizations address this challenge by naming a project director or principal investigator for the survey who is a senior person with relevant substantive background and survey experience. (A variant structure is to have a subject-matter-oriented principal investigator paired with an operations-oriented survey director.) This individual is assigned overall budget and management authority for the project and is designated the leader of the team. Most other staff members on the team retain a "home base" in their own division but are responsible to the principal investigator for their work on the survey. Often, members of one team will also participate in teams for other survey projects. However, if a particular survey is big and complicated enough, there will typically be a core staff who work full time (or close to full time) on it. This core staff will include task leaders (e.g., a leader for data processing or survey design). It will also almost always include analysis staff who play a major role throughout the project—in

[3] See Scott (1987:Ch. 9) for a discussion of the challenges that organizations face in developing an appropriate division of labor for particular kinds of technical work and at the same time coordinating the efforts of multiple staff across divisions in order to carry out a project.

specifying questionnaire content and edits and imputations in addition to analyzing and reporting the survey results.

In contrast, the Census Bureau assigns general management responsibilities for its surveys to DSD staff at the level of a branch chief, which is several steps down in the hierarchy. As needed, committees are set up to facilitate communication and coordination of work across divisions. However, there is no equivalent of a principal investigator leading a designated team, and staff in different divisions often work at arm's length from each other (particularly analysts and data processing and other survey staff).

This mode of operation can work well for the household surveys that the Census Bureau conducts on behalf of an outside sponsor agency, since the sponsor agency provides the substantive focus and an impetus for coordination. Typically, that sponsor agency—whether it is the Bureau of Labor Statistics (BLS) for the Consumer Expenditure Survey and the main labor force portion of the CPS, the National Center for Health Statistics (NCHS) for the Health Interview Survey, or the National Center for Education Statistics (NCES) for the Schools and Staffing Survey—sets the survey goals and content, exercises authority over the budget, has substantial input on design issues, analyzes and evaluates the data, prepares publications and microdata products, and provides support services and liaison to users.

In the case of SIPP, the Census Bureau itself is the sponsor agency, with full budget authority and responsibility not only for survey operations, but also for the content, analysis, and user service functions. We believe that these added areas of responsibility necessitate strengthening and focusing the management of the program. Evidence for our assessment comes from examining the start-up problems that SIPP experienced, which were most severe precisely in those areas of responsibility: for example, the lag in developing a publication program for the core data on income and programs and the setbacks experienced in developing adequate microdata products, documentation, and other services for users. We recognize that many factors hindered SIPP at the outset, not least the externally imposed significant budget cuts. Nonetheless, we believe that a stronger, more focused management structure would have made it easier for the Bureau to operate so complex a survey and to respond more quickly and effectively to problems.

Looking to the future, the Census Bureau faces a major management challenge in planning for and implementing the redesign of SIPP in a timely and cost-effective manner. The redesign will affect all aspects of the survey—from content and design to collection and processing to analysis and dissemination. Moreover, the complexity and scope of the survey will continue to make it challenging to manage even after the redesign is in place. Finally, it is critical for the survey to restore its capacity for flexible response to changing social welfare policy and research data needs, but a decentralized structure makes it difficult to accommodate flexibility and

change and at the same time achieve operational efficiency. For all these reasons, we believe that it is imperative for the Census Bureau to change its management approach to SIPP.

As noted above, the Census Bureau has experimented with more structured coordination and decision-making arrangements for SIPP, indicating that it has not been completely comfortable with decentralized management of the survey. Currently, there is a SIPP executive committee comprised of relevant division chiefs and chaired by the head of the Demographic Directorate, with staff subcommittees on particular topics. An assistant division chief in DSD provides staff support to the executive committee. However, this structure is not the same as a dedicated SIPP team. Moreover, it is awkward to have a Bureau associate director who is acting, in effect, as the principal investigator or project director for SIPP, given the general management responsibilities of this position for all of the Census Bureau's demographic surveys and programs.[4]

Recommendation: A Different Approach

The panel considered alternative management arrangements for SIPP. One model would be to lodge the sponsorship with another agency and so make SIPP like the other household surveys conducted by the Census Bureau. The original Income Survey Development Program (ISDP) was a joint venture of the Office of the Assistant Secretary for Planning and Evaluation (ASPE) in the Department of Health and Human Services (DHHS) and the Census Bureau, and the original plan for SIPP was to have the Social Security Administration (SSA) serve as the sponsor agency and the Census Bureau as the operating agency.

However, it was the Census Bureau that came to the rescue of SIPP in the early 1980s, and it was then assigned full responsibility and budget authority for the program. To its credit, the Bureau successfully launched the survey, which, despite its problems, has provided invaluable data for critically important policy and research studies. Furthermore, the Census Bureau has a long history as the lead federal agency for analysis and publication of statistics on family and individual income—one of the two principal topic areas of SIPP. These are excellent reasons to keep SIPP at the Census Bureau.

Moreover, there is no other obvious candidate to serve as the sponsor agency. Responsibility for federal assistance programs—the other main topic area of SIPP—is divided among several operating and policy analysis

[4] Recently, the associate director delegated some planning and decision authority for the redesign to a committee comprising the division chiefs of DSD, HHES, POP, and DSMD. This group is meeting weekly to consider redesign issues and milestones.

agencies (ASPE, SSA, and the Administration for Children and Families in DHHS and the Food and Nutrition Service in the Department of Agriculture). None of these agencies is as well positioned as the Census Bureau to take a broad, objective view of the survey or to resist pressures for politicizing the program, and none of them is strong in survey methodology. Other statistical agencies, such as BLS, have limited experience in the topic areas covered by SIPP.

Given the strong arguments to continue the Census Bureau as both sponsor and operator of SIPP, the question is how to create an internal group that can provide the needed substantive focus and weld the survey staff into a cohesive, efficient, and committed team. There are undoubtedly several organizational arrangements that would serve this end, and the Census Bureau will have to weigh many factors in developing an organization scheme and operating plan to achieve the goal of a stronger and more focused management for SIPP.[5] However, there are several points that we believe are key to the success of the overall concept. Most important is the need for a project director with full management and budgetary authority for the Bureau's income surveys (SIPP and the March CPS income supplement). We include the March CPS because it has been the mainstay of the Census Bureau's income statistics program in the past and will continue to make an important contribution for some years to come.[6]

To be in the best position to serve as an effective sponsor for SIPP, the project director should be at a very senior level: most likely, within the Census Bureau's current organizational structure, an associate director or another position that reports directly to the deputy director. The project director should be someone who combines considerable substantive policy analysis or research experience on such topics as the distribution of income, poverty, and the dynamics of program participation with a strong background in management of complex projects involving original data collection. Finally, the project director needs to have sufficient resources for an analysis staff that is large enough to fulfill the Census Bureau's leadership

[5] One possibility would be for the Bureau to set up the equivalent of a "National Center for Income Statistics" within the Census Bureau, headed by a senior person reporting to the deputy director. The center could include the income and program analysis staff, as well as team leaders for the various staff groups (e.g., demographic surveys, field, statistical methods, etc).

[6] The March CPS income supplement (along with some demographic supplements to the CPS) is the only other household survey for which the Census Bureau serves as the sponsor as well as operating agency. However, the arrangement is not quite the same because the March supplement piggybacks on the main CPS, which is sponsored by BLS. Also, the March supplement is a much simpler data set than SIPP. Nonetheless, we believe that combining the overall responsibility for the March supplement and SIPP under the same project director will benefit both surveys and, more generally, the Bureau's income statistics program.

and dissemination responsibilities for income and program statistics from SIPP (and the March CPS).

We see important advantages from having a focused management structure for SIPP, headed by a project director who is oriented to income and program statistics issues and who has the necessary budget and management authority for the Bureau's income surveys. Such a structure would provide a strong source of substantive guidance and direction for SIPP and the March CPS. It would also facilitate full involvement of the analysis staff with the survey staff in many aspects of survey design and operations (e.g., questionnaire content and editing decisions). It would better position the staff—both analysts and survey people—to communicate on an equal footing with analysts in other agencies and with academic researchers about income and program concepts, data needs, measurement methods, and analysis techniques. Also, it would foster clear and effective channels for users to communicate problems, queries, and suggestions and obtain timely feedback. Finally, such a focused structure would facilitate the development of in-service training and other means for the staff to keep abreast of the latest conceptual and methodological developments related to income and program statistics—whether new methods to exploit the richness of SIPP longitudinal data for spell analysis or new techniques for improved measurement of asset income sources. In all of these ways, the new structure should enable SIPP to operate in a cost-effective manner and at the same time adapt in a timely manner to changing policy concerns and data needs.

We note that there are precedents within the Census Bureau for the type of dedicated management structure that we are proposing for SIPP. In the mid-1980s, a new associate director position was created to manage the 1990 decennial census, and a number of divisions were moved into this office. This step made sense, given that the census is not only the Bureau's largest operation, but also one for which it serves as the sponsor as well as the operating agency.

> ***Recommendation 8-1:*** **To be as effective as possible in carrying out its responsibilities to produce timely, comprehensive, relevant, high-quality, and analytically appropriate statistics on income and program participation, the Census Bureau should establish a senior-level position of project director for the Bureau's income surveys, SIPP and the March CPS income supplement. That position should include full management and budgetary authority for the income statistics program and sufficient resources to obtain the level of analysis staff that is needed to provide substantive guidance to the program, prepare reports, conduct analyses, and evaluate analytical concepts and methods. The person who fills this position should have recognized**

substantive expertise in topics related to income, poverty, and assistance programs, combined with strong survey management skills.

OVERSIGHT

Throughout SIPP's history, the Census Bureau has shown commendable initiative in seeking input from data users and survey experts on various aspects of the SIPP program. An array of advisory groups and input mechanisms has existed at one or another time, and these groups have made valuable contributions to the survey. Indeed, there is much in the SIPP advisory process that can serve as a model for other surveys. There are also ways in which the advisory mechanisms for SIPP can and should be improved.

We briefly describe past and present advisory mechanisms for SIPP and suggest ways to improve the oversight function in the future. We cannot stress enough the importance of obtaining and making the best use of outside advice and feedback to keep a complex operation such as SIPP on target and able to meet challenges and opportunities. An advantage of the focused management approach that we recommend is that it should facilitate the development of an improved advisory function for the Census Bureau's income statistics program.

Outside Input: Past Experience

The Census Bureau has sought advice on SIPP from federal agency users, academic researchers, survey methodologists, and experts in data access and use of microdata products.[7]

Federal Agency Users

The Census Bureau has used several mechanisms to obtain input on the content and other aspects of SIPP from the perspective of federal agencies that use SIPP data for policy analysis and research. A principal vehicle for input has been an interagency committee, chaired by the Statistical Policy Office of the U.S. Office of Management and Budget (OMB). The Census Bureau has also obtained agency input through requests to agency staff for written comments and discussions with the D.C. Users' Group, an informal

[7] The panel's description and assessment of advisory mechanisms for SIPP, particularly the interagency committee chaired by the Office of Management and Budget, draws on the interim report on SIPP of the Committee on National Statistics (1989). In addition, panel members and staff have participated in meetings and other activities of the various SIPP advisory groups.

group of SIPP users from executive and legislative branch agencies and contract research organizations in the Washington area who meet monthly to exchange views and hear reports of research using SIPP data.

The OMB interagency SIPP committee was established in 1983 and assisted in developing and revising the SIPP questionnaire, including the core and topical modules. Among other aspects of SIPP reviewed by that committee (or a series of its subcommittees) were file structures, longitudinal household definitions, self- versus proxy response, nonmetropolitan identification, plans for reducing the sample size, and comparability with the CPS.

At present, the OMB SIPP committee has no regular meeting schedule. It has experienced long periods of inactivity—for example, the committee did not meet from July 1986 until June 1989. This situation was due in part to constrained resources and other problems affecting the statistical coordination function within OMB and in part to a narrow perspective on the part of the Census Bureau of the committee's role. The Bureau has viewed the OMB committee as having a primary role in specifying the content of the variable topical modules in SIPP that are designed to respond to agency needs for data on emerging policy concerns, but as having a more advisory role with regard to the content of the core and fixed topical modules (e.g., on assets) or other features of SIPP.

Academic Researchers

The Social Science Research Council (SSRC) provided funding from 1982 through 1988 for a committee on SIPP that included members of the academic research community with an interest in longitudinal data for social welfare policy analysis and research. The SSRC committee was initially set up following a conference in fall 1982 on the technical, conceptual, and administrative lessons of the ISDP, sponsored by the SSRC Center for Coordination of Research on Social Indicators (David, 1983).

The SSRC committee hosted several symposia (e.g., see David, 1985b) in which contributors addressed ways in which SIPP could be enhanced to better serve academic research needs in a variety of topic areas, including family structure, income distribution, labor markets, education, women and children, minorities. The committee later obtained Census Bureau funding for a conference on individuals and families in transition, which featured papers using SIPP and other panel surveys for longitudinal analysis (Bureau of the Census, 1988a). The committee met two or three times a year with Census Bureau staff in 1983–1988 to discuss various aspects of the SIPP program.

The SSRC committee clearly played a very important role in making the research community aware of SIPP and encouraging use of the data (see

Appendix A). The committee and its symposia and conferences were also fertile sources of ideas for improvements to the SIPP design and content. However, the committee's relationship with the Census Bureau was not always smooth. The Bureau necessarily had an operational perspective on SIPP and a primary concern with running the survey and meeting deadlines. Suggestions from academics about content or design changes were often viewed as impractical, needlessly complicating an already complex operation, or outside the survey's original mandate. The Census Bureau's decision in late 1987 to freeze the core questionnaire brought into question the contribution that the SSRC committee could make. Having achieved many useful goals, the SSRC disbanded the committee in 1988. Since then, there have been no formalized channels for input to SIPP from the academic research community.

Survey Methodologists

In the first years of SIPP, the survey was often featured at the semiannual sessions of the Census Bureau advisory committees of the American Statistical Association (ASA) and American Economic Association (AEA). However, the committee members found it difficult to provide useful commentary on complex methodological issues for SIPP because their time was so limited and their charge covered so many other Census Bureau programs. In spring 1986 the ASA committee recommended that the Census Bureau sponsor an advisory group of methodologists solely for SIPP. (The SSRC SIPP committee concurred and supported this development.) The Survey Research Methods (SRM) Section of ASA subsequently established the ASA/SRM Working Group on Technical Aspects of SIPP, which held its first meeting in fall 1986.

The ASA/SRM working group continues to meet about twice a year to discuss such issues as maximum telephone versus personal interviewing, longitudinal weighting concepts and techniques, and the results of record-check studies and other evaluations of the quality of SIPP data. As noted in Chapter 7, the group was a major instigator of the *SIPP Quality Profile*. The group has developed good working relationships with Census Bureau staff and has helped guide priorities for the SIPP methodological research and evaluation program.

Experts in Data Access and Use of Microdata Products

Problems with data files and documentation surfaced early on in the SIPP program. For several years, the Census Bureau obtained user input on improvements to the microdata products through informal means, for example, consulting with the D.C. Users' Group and listening to individual

SIPP users who had complaints and suggestions. The Association of Public Data Users (APDU) became aware of SIPP users' problems and proposed a joint user-Census committee to address issues involving the design and content of SIPP microdata products, documentation, access mechanisms (such as an on-line extract capability), and means to improve communication between users and Census Bureau staff.

The APDU committee, which includes data librarians, microdata users, and systems analysts, along with key Census Bureau data processing and user services staff, first met in January 1989 and has since met once or twice a year. The APDU effort also involves publication of a supplement to the APDU newsletter, mailed to everyone on the Census Bureau's list of inquirers about SIPP, that provides minutes of the APDU committee meetings, notices of documentation and data file changes, and other articles of interest to SIPP users.

The APDU committee helped specify a more accessible person-month format for the SIPP data files, which was recently implemented for wave files from the 1990 and later panels. The committee has also made numerous suggestions related to documentation, conventions for coding missing data, and similar matters. Only limited progress, however, has been made in responding to many of these suggestions, such as providing descriptions of edits and imputations in the documentation. And in spite of the committee's recommendation to increase the resources devoted to user liaison activities, there are fewer staff addressing this area now than 2 years ago, when several staff members who worked most closely with users left the SIPP program.[8]

Other Sources of Advice

Formal advisory groups have not been (and should not be) the only source of input to SIPP. Other channels for Census Bureau staff to interact with others, encourage use of the data, and obtain feedback and ideas (see Chapter 6) have included: sessions at professional association meetings that featured SIPP-based research or methodological work; the ASA/Census research fellowship program, which attracted a number of researchers who used SIPP data on-site at the Census Bureau and provided their views on the program; and presentations and training sessions about SIPP given by Census Bureau staff (e.g., as part of the summer program of the Inter-university Consortium for Political and Social Research). Publication se

[8] A SIPP Data Products Process Action Team, consisting of staff from several Census Bureau divisions, was recently established to develop priorities for improvements in data products, documentation, and other user services that could be funded with the expected savings from the recent switch to maximum telephone interviewing in SIPP.

ries, including volumes of SIPP-based papers presented at ASA meetings and the *SIPP Working Paper* series, have also served to build the SIPP user community and encourage interchange among users and Census Bureau staff. Indeed, since SIPP was initiated, the Bureau staff have shown exceptional initiative in developing these kinds of communication channels. However, users have expressed concern that there are not sufficient resources at the Census Bureau to further these activities now that there is only a single SIPP liaison position in HHES.

Observations and Directions for the Future

We have a number of general observations about the experience with outside advice for SIPP. First, it appears that the advisory process that has worked best is the ASA/SRM working group. The Census Bureau has a long tradition of seeking input on technical issues related to survey research and evaluation, and the staff are comfortable in working with outside experts in such areas as questionnaire design, sampling, weighting, and imputation. The ASA/SRM group is largely made up of survey methodologists who are not themselves data users and hence have no particular interest in steering SIPP in any particular direction. The group's members and the Census Bureau methodological staff have been able to develop a collegial working relationship built around a common goal of finding ways to improve the quality of the SIPP data.

Other SIPP advisory groups have had somewhat less success in developing strong working relationships with the Census Bureau. Different perspectives—for example, the viewpoints of outside researchers or policy analysts and Census Bureau operations people—have been a problem in some instances. Limited progress in such areas as documentation (whether due to resource constraints or other factors) has been another source of tensions.

Finally, there are some gaps in the advisory structure for SIPP. Currently, there are no formal channels for input from academic researchers, who are important users of SIPP and important resources for keeping SIPP abreast of the state of the art in many areas. Also, there has never been an advisory group on technical issues relating to the *analysis* of SIPP cross-sectional and longitudinal data—for example, such issues as the definition and measurement of spells of poverty or program participation or appropriate ways to broaden the definition of income. (The ASA/SRM working group has considered weighting and imputation strategies but not other estimation issues.)

We commend the Census Bureau's initiatives in seeking input on SIPP from a broad range of perspectives, but we conclude that the Bureau could usefully strengthen and clarify the advisory process in a number of respects. We believe that success in this regard depends, first, on adopting a focused

management structure for the program as a whole. Such a structure would foster improved internal communications and cohesion among the various staff groups that work on SIPP, which, in turn, would make it easier to provide timely feedback to users. Also, strengthening the analytical aspects of the Census Bureau's income statistics program would put the staff in a better position to interact productively with outside researchers about content issues and technical matters relating to data analysis and presentation.

With regard to specific improvements to the SIPP advisory function, we emphasize that there is no single best way to organize the input process and that informal as well as formal mechanisms have a role. In particular, we are concerned that the Census Bureau not assume that the only way to fill gaps is to create additional expert review groups. We urge the Bureau to think creatively about the advice mechanisms and structures that are likely to be most cost-effective, particularly in the context of a new management approach for SIPP.

Broadly speaking, the Census Bureau needs to obtain two kinds of input for SIPP on a continuing basis: advice from policy analysts, researchers, and other users on issues of goals, direction, overall design, and content; and advice from technical experts on matters related to survey methodology, analysis, and data products and dissemination. In addition, as noted in other chapters, the Bureau needs mechanisms to ensure that all of the staff—analysts, survey methodologists, and operations and data processing people—have opportunities for regular in-service training to update their skills and knowledge as well as to learn from outside peers. Finally, as we note in Chapter 6, the Bureau needs to continue to encourage the use of SIPP data through a variety of means and to improve its communications with individual users about their problems and successes in working with the data products.

Advice on Goals, Content, and Basic Design

Federal agencies concerned with social welfare policy are obviously key constituents of the SIPP program, and the Census Bureau must regularly consult their views. Hence, it is important that the OMB interagency committee continue to function. The Census Bureau should work actively with the OMB staff to put the operations of the committee on a sounder basis by planning its agenda for a 1- or 2-year period and scheduling meetings at least twice a year (more often, as needed). The Census Bureau should consult the committee, if this has not already been done, about key aspects of the proposed survey redesign.

The Census Bureau should also consult regularly with academic researchers and other users outside the federal government about SIPP because SIPP is important to the development of new knowledge in the social

sciences (which is ultimately the basis for advances in policy analysis and information for decision-making) and because federal agencies frequently commission researchers to carry out SIPP-based policy studies on their behalf. It could be very useful to organize an advisory group of nonfederal agency users, on the model of the SSRC committee, that could coordinate input from researchers about priorities for topical modules and provide other guidance about the content and direction of SIPP. It could also be useful, as an added or alternative means of obtaining input, to organize periodic conferences to receive advice and feedback; such conferences could also feature research uses of SIPP.[9]

Whatever the means chosen, we urge the Census Bureau to be very clear about the type and extent of advice that is being sought (and to provide sufficient time for thoughtful input): for example, advice on content changes for a major redesign can be more expansive than advice on content changes over the next couple of years. Also, we urge the Bureau to maintain a process to inform the people who provide input about the fate of their suggestions. Such steps can help bridge the different perspectives and develop more productive working relationships between researchers and Bureau staff.

Advice on Technical Issues

The ASA/SRM working group has functioned effectively to date in providing outside review of the Census Bureau's research and evaluation program related to survey methods and data quality in SIPP. It seems very useful for the group to continue.

Building on this model, we recommend that a parallel working group be established to advise the SIPP analysis staff. For this area, we believe that an additional group is needed because of the difficult issues that the Census Bureau must wrestle with in developing appropriate income statistics from the complex SIPP longitudinal data. We see no reason that an analytically focused group would not function in a similarly collegial manner as the survey-methods-focused ASA/SRM group. Such an analytical group might be sponsored jointly by the AEA and the ASA and include economists, statisticians, and survey analysts with conceptual and analytical expertise related to income statistics. As part of its activities, the group could periodically review the analytical content of the Census Bureau's income statistics publications, including those in the research series.

Finally, we believe it is important to continue to have some type of mechanism, such as the APDU SIPP committee, for obtaining regular ad

[9] The Conference on the Future of SIPP sponsored by our study panel might serve as a useful model; see Chapter 2.

vice and feedback on the Census Bureau's microdata products and data access systems for SIPP. We urge the Census Bureau to recognize, however, that more resources and coordinated staff attention will be needed to respond to the issues that such an advisory group will raise. We urge the Census Bureau, in rethinking its management structure for SIPP, to place more emphasis on this important area.

Recommendation

> ***Recommendation 8-2:*** **We support the Census Bureau's efforts to obtain outside advice about the SIPP program and encourage the Bureau to further strengthen its advisory mechanisms. The Bureau should regularly seek advice about the content, overall design, and goals of SIPP from federal agency users and from other users, including academic researchers. The Bureau should also regularly seek advice about technical matters from experts in the field. Working groups should be formed or continued in three main areas: (1) survey methods and evaluation of ways to improve data quality; (2) conceptual and analytical issues in the development of appropriate income and program statistics from complex longitudinal data; and (3) microdata products, documentation, and means of data access.**

As a concluding note, we have been impressed throughout our evaluation with the careful thought and attention that everyone we consulted has given to the question of the future of SIPP. Clearly, the many policy analysts, researchers, and survey methodologists who have been involved with SIPP, as well as the SIPP staff at the Census Bureau, support the program and are anxious to see it improve. We urge the Census Bureau to change its approach to the survey in ways that will take full advantage of the interest and commitment of the SIPP community and enable SIPP to fully realize its promise to improve the nation's statistics on income and program participation.

References

NOTE: *SIPP Working Papers* are distributed by Data User Services Division, Bureau of the Census, Washington, D.C. 20233. The authors include Census Bureau staff and analysts in other agencies and organizations.

Aaron, Henry 1985 Comments on "Evaluation of Census Bureau Procedures for the Measurement of Noncash Benefits and the Incidence of Poverty," by Barry Chiswick. Pp. 57–62 in Bureau of the Census, *Proceedings of the Conference on the Measurement of Noncash Benefits*. Vol. I. Washington, D.C.: U.S. Department of Commerce.

Allin, Susan, and Doyle, Pat 1990 *Analysis of the Quality of SIPP as It Pertains to the Food Stamp Program*. Final report to the Food and Nutrition Service, U.S. Department of Agriculture. Washington, D.C.: Mathematica Policy Research, Inc.

Anderson, Margo J. 1988 *The American Census: A Social History*. New Haven: Yale University Press.

Bailar, Barbara A. 1989 The design of panel surveys. In D. Kasprzyk, G. Duncan, G. Kalton, and M. P. Singh, eds., *Panel Surveys*. New York: J. W. Wiley and Sons, Inc.

Bane, Mary Jo, and Ellwood, David T. 1983 *The Dynamics of Dependence: The Routes to Self-Sufficiency*. Report to the U.S. Department of Health and Human Services. Cambridge, Mass.: Urban Systems Research and Engineering, Inc.

Becketti, Sean, Gould, William, Lillard, Lee, and Welch, Finis 1988 The PSID after fourteen years: an evaluation. *Journal of Labor Economics* 6(4):472–492.

Bethlehem, J. G., and Keller, W. J. 1991 The Blaise system for integrated survey processing. *Survey Methodology* 17(1):43–56.

Bianchi, Suzanne M. 1990 *America's Children: Mixed Prospects*. Population Bulletin. Vol. 45, No. 1. Washington, D.C.: Population Reference Bureau, Inc.

Bianchi, Suzanne, and McArthur, Edith 1991 *Family Disruption and Economic Hardship: The Short-Run Picture for Children*. Current Population Reports, Household Economic Studies, Series P-70, No. 23. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Biemer, Paul 1991 SIPP Six-Month Reference Period Research. Unpublished memorandum. Research Triangle Institute, Research Triangle Park, N.C.

Blossfeld, H. P., Hamerle, A., and Mayer, K. U. 1989 *Event History Analysis*. Hillsdale, N.J.: Lawrence Erlbaum.

Bowie, Chester E. 1988 Household Survey Profile for the Survey of Income and Program Participation. Prepared for the Task Force on Household Survey Redesign, U.S. Office of Management and Budget. Bureau of the Census, Washington, D.C.

1991 SIPP Household Sample Loss: 1984–1990 Panels. Unpublished memorandum. Bureau of the Census, Washington, D.C.

Bowie, Chester, and Kasprzyk, Daniel 1987 *A Review of the Use of Administrative Records in the Survey of Income and Program Participation*. SIPP Working Paper No. 8721. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Bradford, David 1986 *Untangling the Income Tax*. 20th Century Fund. Cambridge: Harvard University Press.

Buhmann, Brigitte, Rainwater, Lee. Schmaus, Guenther, and Smeeding, Timothy M. 1988 Equivalence scales, well-being, inequality, and poverty: sensitivity estimates across ten countries using the Luxembourg Income Study (LIS) database. *Review of Income and Wealth* 34(June):115–142.

Bureau of the Census 1982 *Alternative Methods for Valuing Selected In-Kind Transfer Benefits and Measuring Their Effects on Poverty*. Technical Paper No. 50. Washington, D.C. : U.S. Department of Commerce.

1985a *Proceedings of the Conference on the Measurement of Noncash Benefits*. Vol. I. Washington, D.C.: U.S. Department of Commerce.

1985b *Economic Characteristics of Households in the United States: Third Quarter 1984*. Current Population Reports, Household Economic Studies, Series P-70, No. 5. Washington, D.C.: U.S. Department of Commerce.

1987 *Survey of Income and Program Participation User's Guide*. Washington, D.C.: U.S. Department of Commerce.

1988a *Individuals and Families in Transition: Understanding Change Through Longitudinal Data*. Papers presented at the Social Science Research Council Conference in Annapolis, Md. Washington, D.C.: U.S. Department of Commerce.

1988b *Measuring the Effect of Benefits and Taxes on Income and Poverty: 1986*. Current Population Reports, Consumer Income, Series P-60, No. 164-RD-1. Washington, D.C.: U.S. Department of Commerce.

1989a *Money Income of Households, Families, and Persons in the United States: 1987*. Current Population Reports, Consumer Income, Series P-60, No. 162. Washington, D.C.: U.S. Department of Commerce.

1989b *Spells of Job Search and Layoff . . . and Their Outcomes*. Current Population Reports, Household Economic Studies, Series P-70, No. 16-RD-2. Washington, D.C.: U.S. Department of Commerce.

1990a *Measuring the Effect of Benefits and Taxes on Income and Poverty: 1989*. Current Population Reports, Consumer Income, Series P-60, No. 169-RD. Washington, D.C.: U.S. Department of Commerce.

1990b *Measuring the Effect of Benefits and Taxes on Income and Poverty: 1987–88*. Current Population Reports, Consumer Income, Series P-60, No. 170-RD. Washington, D.C.: U.S. Department of Commerce.

1991a Improving the Census Bureau's Income Statistics Program. Paper prepared for the Panel to Evaluate the Survey of Income and Program Participation, Committee on National Statistics, National Research Council, Washington, D.C.

1991b *Measuring the Effect of Benefits and Taxes on Income and Poverty: 1990*. Current Population Reports, Consumer Income, Series P-60, No. 176-RD. Washington, D.C.: U.S. Department of Commerce.

1991c SIPP On Call—Data Extraction System. Draft. Washington, D.C.

1991d *Statistical Abstract of the United States—1991*. 111th Edition. Washington, D.C.: U.S. Department of Commerce.

1991e *Survey of Income and Program Participation User's Guide*. 2nd edition. Washington, D.C.: U.S. Department of Commerce.

1991f Untitled. Materials provided by CASIC program manager to Panel to Evaluate the Survey of Income and Program Participation, Committee on National Statistics, National Research Council, Washington, D.C.

1991g *What's Available from SIPP*. September 1991. Washington, D.C.: U.S. Department of Commerce.

1992a CAPI Research for the Survey of Income and Program Participation (SIPP). Paper prepared for the American Statistical Association/Survey Research Methods Section Working Group on Technical Aspects of SIPP. Washington, D.C.

1992b SIPP Cognitive Research: Project Update and Discussion of Evaluation Study Issues. Prepared for ASA/SRM Working Group Meeting. Washington, D.C.

no date Redesigning the Survey of Income and Program Participation. Paper prepared for the Panel to Evaluate the Survey of Income and Program

Participation, Committee on National Statistics, National Research Council, Washington, D.C.

Burkhauser, Richard, and Duncan, Greg 1989 Economic risks of gender roles: income loss and life events over the life course. *Social Science Quarterly* 70(1):3–23.

Bushery, J. 1981 Recall biases for different reference periods in the National Crime Survey. Pp. 238–243 in *Proceedings of the Section on Survey Research Methods*. Washington, D.C.: American Statistical Association.

Cantor, David, Brandt, Sylvia, Green, James, Moessinger, Kerstin, and Rose, Paul 1991 Results of First Wave of SIPP Interviews. Unpublished memorandum to Chet Bowie. Westat, Inc., Rockville, Md.

Cantor, David, and Edwards, Colleen 1992 *Testing Alternative Household Roster Questions for the Survey of Income and Program Participation*. Final report to the Bureau of the Census. Rockville, Md.: Westat, Inc.

Center for Human Resource Research 1998 *1987 NLS Bibliography Update*. Columbus: Ohio State University.

Chu, Adam, Lannom, Linda, Morganstein, David, and Waksberg, Joseph. 1989 *NHANES III Methods Research*. Final report to the National Center for Health Statistics. Rockville, Md.: Westat, Inc.

Chu, Adam, Eisenhower, Donna, Hay, Michael, Morganstein, David, Neter, John, and Waksberg, Joseph 1992 Measuring the recall error in self-reported fishing and hunting activities. *Journal of Official Statistics* 8(1):19–39.

Citro, Constance F. 1990 Suggested Tables for the SIPP Report Series on Characteristics of Persons Receiving Benefits from Major Assistance Programs. Unpublished memorandum. Panel to Evaluate the Survey of Income and Program Participation, Committee on National Statistics, National Research Council, Washington, D.C.

1991a Databases for microsimulation: A comparison of the March CPS and SIPP. Pp. 11–61 in Constance F. Citro and Eric A. Hanushek, eds., *Improving Information for Social Policy Decisions: The Uses of Microsimulation Modeling. Vol. II, Technical Papers*. Panel to Evaluate Microsimulation Models for Social Welfare Programs, Committee on National Statistics, National Research Council. Washington, D.C.: National Academy Press.

1991b Suggested Tables for the SIPP Report Series on Income and Poverty. Unpublished memorandum to Enrique Lamas. Panel to Evaluate the Survey of Income and Program Participation, Committee on National Statistics, National Research Council, Washington, D.C.

Citro, Constance F., and Cohen, Michael L., eds. 1985 *The Bicentennial Census: New Directions for Methodology in 1990*. Panel on Decennial Census Methodology, Committee on National Statistics, National Research Council. Washington, D.C.: National Academy Press.

Citro, Constance F., and Hanushek, Eric A., eds. 1991a *Improving Information for Social Policy Decisions: The Uses of Microsimulation Modeling. Vol. I, Review and Recommendations*. Panel to Evaluate Microsimulation Models for Social Welfare Programs, Committee on National Statistics, National Research Council. Washington, D.C.: National Academy Press.

1991b *Improving Information for Social Policy Decisions: The Uses of Microsimulation Modeling. Vol. II, Technical Papers*. Panel to Evaluate Microsimulation Models for Social Welfare Programs, Committee on National Statistics, National Research Council. Washington, D.C.: National Academy Press.

Citro, Constance F., Hernandez, Donald J., and Moorman, Jeanne E. 1986 Longitudinal household concepts in SIPP. In *Proceedings of the Social Statistics Section*. Washington, D.C.: American Statistical Association.

Citro, Constance F., and Watts, Harold W. 1986 *Patterns of Household Composition and Family Status Change*. SIPP Working Paper No. 8609. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Clogg, Clifford, Massagli, Michael, and Eliason, Scott 1986 Population undercount as an issue in social research. Pp. 335–343 in *Proceedings of the Bureau of the Census Second Annual Research Conference*. Washington, D.C.: U.S. Department of Commerce.

Codd, E. F. 1985 Is your database really relational? *Computer world* October:ID1–ID9.

Coder, John F. 1988 Explaining the quality of data from the 1984 SIPP panel file. Pp. 417–436 in *Individuals and Families in Transition: Understanding Change Through Longitudinal Data*. Papers presented at the Social Science Research Council Conference in Annapolis, Md. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

1990 Exploring Nonsampling Errors in the Wage and Salary Income Data from the March Current Population Survey. Paper presented to the Allied Social Sciences Association/Society of Government Economists meeting. Bureau of the Census, Washington, D.C.

1991 Improving and Integrating March CPS and SIPP Income Statistics. Paper presented to the Census Advisory Committees of the American Economic Association, the American Marketing Association, the American Statistical Association, and on Population Statistics. Bureau of the Census, Washington, D.C.

Coder, John, and Ruggles, Patricia 1988 *Welfare Recipiency as Observed in the SIPP*. SIPP Working Paper No. 8818. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Cohen, Michael L., Billard, Lynne, Betson, David M., and Ericksen, Eugene P. 1991 A validation experiment with TRIM2. Pp. 276–304 in Constance F. Citro and Eric A. Hanushek, eds., *Improving Information for Social*

Policy Decisions: The Uses of Microsimulation Modeling. Vol. II, Technical Papers. Panel to Evaluate Microsimulation Models for Social Welfare Programs, Committee on National Statistics, National Research Council. Washington, D.C.: National Academy Press.

Committee on National Statistics 1989 *The Survey of Income and Program Participation—An Interim Assessment*. Commission on Behavioral and Social Sciences and Education, National Research Council. Washington, D.C.: National Academy Press.

Congressional Research Service 1991 *Cash and Noncash Benefits for Persons with Limited Income: Eligibility Rules, Recipient and Expenditure Data, FY 1988–90*. CRS Report for Congress. Compiled by Vee Burke, Education and Public Welfare Division. Washington, D.C.: U.S. Government Printing Office.

Curtin, Richard T., Juster, F. Thomas, and Morgan, James N. 1989 Survey estimates of wealth: an assessment of quality. In Robert E. Lipsey and Helen Stone Tice, eds., *The Measurement of Savings, Investment and Wealth*. National Bureau of Economic Research, Studies of Income and Wealth, Vol. 52. Chicago: University of Chicago Press.

Czajka, John L., and Citro, Constance F. 1982 Analysis of household income and poverty statistics under alternative measures of household and family composition. In *Proceedings of the Social Statistics Section*. Washington, D.C.: American Statistical Association.

Danziger, Sheldon, van der Gaag, Jacques, Taussig, Michael K., and Smolensky, Eugene 1984 The direct measurement of welfare levels: how much does it cost to make ends meet? *Review of Economics and Statistics* 66(3):500–505.

Date, C. J. 1987 *An Introduction to Database Systems*. 2 vols. 4th ed. Reading, Mass.: Addison-Wesley Publishing Company.

David, Martin H., ed. 1983 *Technical, Conceptual, and Administrative Lessons of the Income Survey Development Program (ISDP): Papers Presented at a Conference* . New York: Social Science Research Council.

David, Martin H. 1985a The distribution of income in the United States: implications for the design of the SIPP panel. *Journal of Economic and Social Measurement* 13(3–4):305–317 (Special issue: Survey of Income and Program Participation).

1985b Introduction: the design and development of SIPP. *Journal of Economic and Social Measurement* 13(3–34):215–224 (Special issue: Survey of Income and Program Participation).

1989 Comment on year-apart estimates of net worth from SIPP: the measurement of savings, investment, and wealth. In Robert E. Lipsey and Helen Stone Tice, eds., *The Measurement of Savings, Investment and Wealth*. National Bureau of Economic Research, Studies of Income and Wealth, Vol. 52. Chicago: University of Chicago Press.

1991 The science of datasharing: documentation. Pp. 91–115 in Joan E. Sieber, ed., *Sharing Social Science Data: Advantages and Challenges*. Newbury Park, Calif: Sage Publications.

David, Martin H., and Flory, Thomas S. 1988 Change in marital status and short-term dynamics. In *Proceedings of the Survey Research Methods Section*. Alexandria, Va.: American Statistical Association.

David, Martin, and Robbin, Alice 1989 Database design for large-scale complex data. In *Computing Science and Statistics: Proceedings of the 21st Symposium on the Interface*. Alexandria, Va.: American Statistical Association.

1990 Computation using information systems for complex data. In *Proceedings of the Conference on Advanced Computing for the Social Sciences*. Oak Ridge, Tenn.: Oak Ridge National Laboratories.

1992 *Building New Infrastructures for the Social Science Enterprise: Final Report to the National Science Foundation on the SIPP ACCESS Project*. 2 vols. Madison: The University of Wisconsin.

DeAre, Diana 1990 Longitudinal migration data from the Survey of Income and Program Participation. Pp. 13–23 in *Perspectives on Migration Analysis*. Current Population Reports, Special Studies, Series P-23, No. 166. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Deaton, A. S., and Muellbauer, J. 1986 On measuring child costs: with applications to poor countries. *Journal of Political Economy* 94(4):720–744.

Doyle, Pat 1992 Future of SIPP for modeling program eligibility under needs-tested programs. *Journal of Economic and Social Measurement* 18(1–4):303–334.

Doyle, Pat, Citro, Constance, and Cohen, Robert 1987 *Feasibility Study of Long-Term Access to SIPP*. 3 vols. Final report to the Food and Nutrition Service, U.S. Department of Agriculture . Washington, D.C.: Mathematica Policy Research, Inc.

Doyle, Pat, and Cohen, Robert 1992 *The Census Bureau's Data Extraction System: An Evaluation for FNS Use of SIPP*. Report to the Food and Nutrition Service, U.S. Department of Agriculture. Washington, D.C.: Mathematica Policy Research, Inc.

Doyle, Pat, Czajka, John, Boldin, Paul, Beebout, Harold, and Hirabayashi, Sharon 1987 *Conceptual Studies of SIPP-Based Simulation of the Food Stamp Program, Part I. Uniform Eligibility Measures*. Final report to the Food and Nutrition Service, U.S. Department of Agriculture. Washington, D.C.: Mathematica Policy Research, Inc.

Doyle, Pat, and Dalrymple, Robert 1987 The impact of imputation procedures on distributional characteristics of the low income population. Pp. 483–508 in *Proceedings of the Bureau of the Census Third Annual Research Conference*. Washington, D.C.: U.S. Department of Commerce.

Doyle, Pat, and Long, Sharon 1988 *The Impact of the Unit of Analysis on Measures of Serial Multiple Program Participation*. SIPP Working Paper No. 8801. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Doyle, Pat, and Trippe, Carole 1989 *Validation of the Food Stamp Microsimulation Model*. Final report to the Food and Nutrition Service, U.S. Department of Agriculture. Washington, D.C.: Mathematica Policy Research, Inc.

Duncan, Greg J., and Hill, Martha S. 1985 Conceptions of longitudinal households: fertile or futile? *Journal of Economic and Social Measurement* 13(3–4):361–375.

Duncan, Greg, Juster, F. Thomas, and Morgan, James N. 1984 The role of panel studies in a world of scarce resources. Pp. 301–328 in S. Sudman and M. A. Spaeth, eds., *The Collection and Analysis of Economic and Consumer Behavior Data*. Bureau of Economic and Business Research. Champaign: University of Illinois.

Eargle, Judith 1990 *Household Wealth and Asset Ownership: 1988*. Current Population Reports, Household Economic Studies, Series P-70, No. 22. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Ellwood, David T. 1986 *Targeting "Would Be" Long-Term Recipients of AFDC*. Report to the U.S. Department of Health and Human Services. Washington, D.C.: Mathematica Policy Research, Inc.

Ernst, L., and Gillman, D. 1988 *Excluding Sample that Misses Some Interviews from SIPP Longitudinal Estimates*. SIPP Working Paper No. 8825. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Fay, Robert E. 1989 An analysis of within-household undercoverage in the Current Population Survey. Pp. 156–175 in *Proceedings of the Bureau of the Census Fifth Annual Research Conference* . Washington, D.C.: U.S. Department of Commerce.

Fay, Robert E., Passel, Jeffrey S., and Robinson, Gregory J. 1988 *The Coverage of the Population in the 1980 Census*. 1980 Census of Population and Housing Evaluation Research Report No. PHC80-E4. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Fein, David 1989 The Social Sources of Census Omission: Racial and Ethnic Differences in Omission Rates in Recent U.S. Censuses. Dissertation submitted to Sociology Department, Princeton University.

Ferber, Robert 1964 Does a panel operation increase the reliability of survey data: the case of consumer savings. Pp. 210–216 in *Proceedings of the Social Statistics Section*. Washington, D.C.: American Statistical Association.

Fischer, Donald P. 1992 Handout for the ASA/SRM Working Group Meeting. Unpublished memorandum to Rajendra P. Singh. Bureau of the Census, Washington, D.C.

Fitzgerald, John 1991 Welfare durations and the marriage market: evidence from SIPP. *Journal of Human Resources* Summer 1991.

1992 A Hazard Model for Welfare Durations with Unobserved Location-Specific Effects. Paper prepared for the American Statistical Association Annual Meeting. Bowdoin College, Brunswick, Maine.

Flory, Thomas S., Martini, Alberto P., and Robbin, Alice 1988 Spells of AFDC receipt in the 1984 SIPP panel. In *Proceedings of the Social Statistics Section* . Alexandria, Va.: American Statistical Association.

Fronczek, Peter J., and Savage, Howard A. 1991 *Who Can Afford to Buy a House?* Current Housing Reports, H121/91-1. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Gbur, Philip M., Cantwell, Patrick J., and Petroni, Rita J. 1990 Effect of maximum telephone interviewing on SIPP topical module and longitudinal estimates. In *Proceedings of the Section on Survey Research Methods*. Alexandria, Va.: American Statistical Association.

Gbur, Philip M., and Petroni, Rita J. 1989 Preliminary evaluation of maximum telephone interviewing on the SIPP. In *Proceedings of the Section on Survey Research Methods.* Alexandria, Va.: American Statistical Association.

Gogan, Harlene C. 1988 The relationship between (re)marriage and exits from the AFDC program among female-headed families: a longitudinal examination. In *Proceedings of the Social Statistics Section*. Alexandria, Va.: American Statistical Association.

Goldberg, Joseph P., and Moye, William T. 1985 *The First Hundred Years of the Bureau of Labor Statistics*. BLS Bulletin 2235. Washington, D.C.: U.S. Department of Labor.

Goldfield, Edwin D. 1958 Decennial census and Current Population Survey data on income. Pp. 39–63 in *An Appraisal of the 1950 Census Income Data*. Studies in Income and Wealth, Vol. 23, ed. George Garvy. Conference on Research in Income and Wealth, National Bureau of Economic Research. Princeton: Princeton University Press.

Gray, Peter 1984 *Logic, Algebra, and Databases*. New York: J. W, Wiley and Sons, Inc.

Hagstrom, Paul 1991 The joint food stamp participation and labor supply decisions of married couples. In Maurice McDonald and Martin H. David, *Final Report on Food Stamp Eligibility, Labor Supply, and Program Participation*. Prepared for the Food and Nutrition Service, U.S. Department of Agriculture. Madison: University of Wisconsin.

Harpine, Cynthia J., McNeil, John M., and Lamas, Enrique J. 1990 *The Need for Personal Assistance with Everyday Activities: Recipients and Caregivers*. Current Population Reports, Household Economic Studies, Series P-70, No. 19. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Herriot, Roger A. 1988 A Procedure for Producing an Integrated Set of Adjusted Income Statistics. Unpublished memorandum to William P. Butz. Bureau of the Census, Washington, D.C.

Hill, Daniel 1987 Response errors around the seam: analysis of change in a panel with overlapping reference periods. Pp. 210–215 in *Proceedings of the Section on Survey Research Methods*. Washington, D.C.: American Statistical Association.

1989 A Poisson model of response and procedural error analysis of SIPP reinterview data. In *Proceedings of the Section on Survey Research Methods*. Alexandria, Va.: American Statistical Association. (Also available as SIPP Working Paper No. 8913.)

Hill, Martha 1992 *The Panel Study of Income Dynamics: A User's Guide*. Part of the series, *Guides to Major Social Science Data Bases*. Newbury Park, Calif.: Sage Publications, Inc.

Huggins, Vicki, and Fay, Robert 1988 Use of administrative data in SIPP longitudinal estimation. Pp. 354–359 in *Proceedings of the Section on Survey Research Methods*. Alexandria, Va.: American Statistical Association.

Hunt, Morton 1985 *Profiles of Social Research: The Scientific Study of Human Interactions*. New York: Russell Sage Foundation.

Jabine, Thomas B., King, Karen E., and Petroni, Rita J. 1990 *Survey of Income and Program Participation: Quality Profile*. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Jabine, Thomas B., and Scheuren, Fritz 1987 Statistical uses of administrative records in the United States: Where are we and where are we going? Pp. 43–72 in *Proceedings of the International Symposium on Statistical Uses of Administrative Data*. Ottawa: Statistics Canada.

Jabine, Thomas B., Straf, Miron L., Tanur, Judith M., and Tourangeau, Roger, eds.

1984 *Cognitive Aspects of Survey Methodology: Building a Bridge Between Disciplines*. Advanced Research Seminar on Cognitive Aspects of Survey Methodology, Committee on National Statistics, National Research Council . Washington, D.C.: National Academy Press.

Jean, Anne C., and McArthur, Edith K. 1987 *Tracking Persons Over Time*. SIPP Working Paper No. 7801. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Jennings, Jerry T., and Bennefield, Robert L. 1992 *Who's Helping Out? Support Networks Among American Families:*

1988. Current Population Reports, Household Economic Studies, Series P-70, No. 28. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Juster, F. Thomas, and Kuester, Kathleen A. 1991 Differences in the measurement of wealth, wealth inequality and wealth composition obtained from alternative U.S. wealth surveys. *The Review of Income and Wealth* 37(1):33–62.

Kalton, Graham, Kasprzyk, Daniel, and McMillen, David B. 1989 Nonsampling errors in panel surveys. Pp. 249–270 in D. Kasprzyk, G. Duncan, G. Kalton, and M. P. Singh, eds., *Panel Surveys*. New York: J. W. Wiley and Sons, Inc.

Kalton, Graham, and Miller, Michael E. 1991 The seam effect with social security income in the Survey of Income and Program Participation. *Journal of Official Statistics* 7(2):235–245.

Kalton, Graham, Miller, David P., and Lepkowski, James 1992 Analyzing Spells of Program Participation in the SIPP. Draft final report to the Bureau of the Census. Survey Research Center, University of Michigan, Ann Arbor.

Kasprzyk, Daniel 1983 Social security number reporting, the use of administrative records, and the multiple frame design in the Income Survey Development Program. Pp. 123–141 in Martin H. David, ed., *Technical, Conceptual, and Administrative Lessons of the Income Survey Development Program (ISDP): Papers Presented at a Conference*. New York: Social Science Research Council.

1988a Outline of Questions in Committee on National Statistics Proposal to Evaluate the Survey of Income and Program Participation. Unpublished memorandum to Margaret Martin. Bureau of the Census, Washington, D.C.

1988b Research issues in the Survey of Income and Program Participation. *Survey Methodology* 14 (1):45–58.

King, Karen E., Chou, S. Patricia, McCormick, Maryann K., and Petroni, Rita J. 1990 Investigations of the SIPP's cross-sectional noninterview adjustment method and variables. In *Proceedings of the Survey Research Methods Section*. Alexandria, Va.: American Statistical Association.

King, Karen, Petroni, Rita, and Singh, Rajendra 1987 *Quality Profile for the Survey of Income and Program Participation* . SIPP Working Paper No. 8708. Bureau of the Census. Washington, D.C. : U.S. Department of Commerce.

Koo, Helen P., and Gogan, Harlene C. 1988 The process of change in families and households. Pp. 203–230 in *Individuals and Families in Transition: Understanding Change Through Longitudinal Data*. Papers presented at the Social Science Research Council Conference in Annapolis, Md. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Lamas, Enrique J., and McNeil, John M. 1986 *Household Wealth and Asset Ownership: 1984*. Current Population

Reports, Household Economic Studies, Series P-70, No. 7. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

1987 An analysis of the SIPP asset and liability feedback experiment. In *Proceedings of the Social Statistics Section*. Washington, D.C.: American Statistical Association.

Lazear, Edward P., and Michael, Robert T. 1980 Family size and the distribution of real per capita income. *American Economic Review* 70(1):91–107.

1988 *Allocation of Income Within the Household*. Chicago: University of Chicago Press.

Lepkowski, James M., Kalton, Graham, and Kasprzyk, Daniel 1990 Measurement Errors in Panel Surveys. Paper prepared for the International Conference on Measurement Errors in Surveys, Tucson, Ariz. Institute for Social Research, University of Michigan, Ann Arbor, Mich.

Levitan, Sar A., and Gallo, Frank 1989 *Workforce Statistics: Do We Know What We Think We Know —And What Should We Know*? Prepared for the Joint Economic Committee, U.S. Congress. Washington, D.C.: U.S. Government Printing Office.

Little, Roderick J.A., and Rubin, Donald B. 1987 *Statistical Analysis with Missing Data*. New York: J. W. Wiley and Sons, Inc.

Logan, Weltha J., Kasprzyk, Daniel, and Cavanaugh, Roger 1988 *A Methodological Study Using Administrative Records: The Special Frames Study of the Income Survey Development Program*. SIPP Working Paper No. 8814. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Manski, Charles F. 1991 Prepared statement. Pp. 127–129 in *Welfare Dependency—Hearings before the Subcommittee on Social Security and Family Policy of the Committee on Finance, United States Senate*. Washington, D.C.: U.S. Government Printing Office.

Marquis, Kent H. 1990 Report of the SIPP Cognitive Interviewing Project. Bureau of the Census, Washington, D.C.

Marquis, Kent H., and Moore, Jeffrey C. 1989 Response errors in SIPP: preliminary results. Pp. 515–536 in *Proceedings of the Bureau of the Census Fifth Annual Research Conference.* Washington, D.C.: U.S. Department of Commerce.

1990a Measurement errors in SIPP program reports. Pp. 721–745 in *Proceedings of the Bureau of the Census Sixth Annual Research Conference*. Washington, D.C.: U.S. Department of Commerce.

1990b SIPP Record Check Final Report. Draft. Bureau of the Census, Washington, D.C.

Marquis, Kent H., Moore, Jeffrey C., and Bogen, Karen E. 1991 A Cognitive Approach to Redesigning Measurement in the Survey of Income and Program Participation. Draft background paper prepared for the American Statistical Association/Survey Research Methods Sec

tion Working Group on Technical Aspects of SIPP. Bureau of the Census, Washington, D.C.

Matthew Greenwald & Associates, Inc. 1991 *The Data Guidebook: A Reference Guide to Data from National Surveys of Mid-Life and Older Americans*. Prepared for the Public Policy Institute. Washington, D.C.: American Association of Retired Persons.

McArthur, Edith, Short, Kathleen, and Bianchi, Suzanne 1986 *Following Children in the Survey of Income and Program Participation*. SIPP Working Paper No. 8612. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

McBride, Timothy, and Swartz, Katherine 1990 *Spells Without Health Insurance: What Affects Spell Duration and Who Are the Chronically Uninsured*? SIPP Working Paper No. 9033. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

McCormick, Maryann K., Butler, Derrick M., and Singh, Rajendra P. 1992 Investigating Time in Sample Effect for the Survey of Income and Program Participation. Paper prepared for the American Statistical Association Annual Meeting. Bureau of the Census, Washington, D.C.

McMillen, David B. 1990 Redesigning the SIPP public use data files. *SIPP Supplement to the Association of Public Data Users (APDU) Newsletter* 2(2):1–2,4.

McNeil, John 1991 Quarterly Estimates from SIPP. Unpublished memorandum. Bureau of the Census, Washington, D.C.

1992 *Trends in Relative Income: 1964–1989*. Current Population Reports, Consumer Income, Series P-60, No. 177. Washington, D.C.: U.S. Department of Commerce.

McNeil, John, and Lamas, Enrique 1989 Year-apart estimates of household net worth from the Survey of Income and Program Participation. Pp. 431–472 in Robert E. Lipsey and Helen Stone Tice, eds., *The Measurement of Savings, Investment and Wealth*. National Bureau of Economic Research, Studies of Income and Wealth, Vol. 52. Chicago: University of Chicago Press.

Miller, Esther, and Martini, Alberto 1992 *The Quality of the Data Collected in the Recipiency History Topical Module of SIPP*. Final report to the Food and Nutrition Service, U.S. Department of Agriculture. Washington, D.C.: Mathematica Policy Research, Inc.

Moeller, John F., and Mathiowetz, Nancy A. 1990 Problems of screening for poverty status. In *Proceedings of the Survey Research Methods Section*. Alexandria, Va.: American Statistical Association.

Moffitt, Robert, and Wolfe, Barbara R. 1990 *The Effect of the Medicaid Program on Welfare Participation and Labor Supply*. IRP Discussion Paper No. 909–90. Institute for Research on Poverty. Madison: University of Wisconsin.

Moon, Marilyn 1977 *The Measurement of Economic Welfare: Its Application to the Aged Poor*. New York: Academic Press.

Mooney, H. W. 1962 *Methodology in Two California Health Surveys*. Public Health Monograph No. 70. Washington, D.C.: U.S. Department of Health, Education, and Welfare.

Moore, Jeffrey, and Kasprzyk, Daniel 1984 Month-to-month recipiency turnover in the ISDP. Pp. 726–731 in *Proceedings of the Section on Survey Research Methods*. Washington, D.C.: American Statistical Association.

National Center for Health Statistics and Bureau of the Census 1988 *Report of the 1987 Automated National Health Interview Survey Feasibility Study: An Investigation of Computer Assisted Personal Interviewing*. Report Number 32. Washington, D.C.: U.S. Department of Health and Human Services.

Nelson, Dawn D., Bowie, Chet, and Walker, Annetta 1987 *Survey of Income and Program Participation (SIPP) Sample Loss and the Efforts to Reduce It*. SIPP Working Paper No. 8709. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Neter, John, and Waksberg, Joseph 1964 A study of response errors in expenditures data from household surveys. *Journal of the American Statistical Association* 59:18–55.

1965 *Response Errors in Collection of Expenditures Data by Household Interviews: An Experimental Study*. Technical Paper No. 11. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

O'Connell, Martin 1990 Maternity leave arrangements: 1961–85. Pp. 11–57 in *Work and Family Patterns of American Women*. Current Population Reports, Special Studies, Series P-23, No. 165. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

O'Connell, Martin, and Bachu, Amara 1990 *Who's Minding the Kids? Child Care Arrangements: Winter, 1986–87* . Current Population Reports, Household Economic Studies, Series P-70, No. 20. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Olsen, Randall J. 1992 The Effects of Computer Assisted Interviewing on Data Quality. Center for Human Resource Research, Ohio State University, Columbus.

Olsen, Randall J., Bradburn, Norman M., Hunt, Edwin, Ingels, Julia, Schoua-Glusberg, Alisu, and Wojcik, Mark

1990 *Final Report to BLS on CAPI*. Center for Human Resource Research. Columbus: Ohio State University.

Pechman, Joseph A. 1985 *Who Paid the Taxes, 1966–1985?* Washington, D.C.: Brookings Institution.

Pennell, Steven G., and Lepkowski, James M. 1992 Panel Conditioning Effects in the Survey of Income and Program Participation. Paper prepared for the American Statistical Association Annual Meeting. Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, Mich.

Petroni, Rita J., Huggins, Vicki J., and Carmody, Thomas J. 1989 Research and evaluation conducted on the Survey of Income and Program Participation. Pp. 308–338 in *Proceedings of the Bureau of the Census Fifth Annual Research Conference*. Washington, D.C.: U.S. Department of Commerce.

Petroni, Rita J., and King, Karen E. 1988 Evaluation of the Survey of Income and Program Participation's cross-sectional noninterview adjustment methods. Pp. 342–347 in *Proceedings of the Section on Survey Research Methods*. Washington, D.C.: American Statistical Association.

Robinson, Gregory J. 1990 Preliminary Estimates of the United States Resident Population on April 1, 1990, Based on Demographic Analysis. Paper presented to the Census Advisory Committee of the American Statistical Association and the Census Advisory Committee on Population Statistics. Bureau of the Census, Washington, D.C.

Ruggles, Patricia 1989 *Welfare Dependency and Its Causes: Determinants of the Duration of Welfare Spells*. SIPP Working Paper No. 8908. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

1990a *Drawing the Line: Alternative Poverty Measures and Their Implications for Public Policy*. Washington, D.C.: The Urban Institute Press.

1990b *Longitudinal Analysis of Federal Survey Data*. SIPP Working Paper No. 9007. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Ruggles, Patricia, and Williams, Roberton 1987 *Transitions In and Out of Poverty: New Data from the Survey of Income and Program Participation*. SIPP Working Paper No. 8716. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

1989 Longitudinal measures of poverty: accounting for income and assets over time. *Review of Income and Wealth* 35(3):225–243.

Scardamalia, Robert 1978 *Improving the Measurement of Poverty*. Project Report 78–10. Washington, D.C.: Mathematica Policy Research, Inc.

Scheuren, Fritz 1975 ORS Management of the HEW Income Security Survey—Some Administrative Issues. Unpublished memorandum. Office of Research and Statistics, Social Security Administration, Washington, D.C.

Scott, W. R. 1987 *Organizations: Rational, Natural, and Open Systems*. Englewood Cliffs, N.J.: Prentice-Hall.

Shapiro, Gary, and Kostanich, Donna 1988 High response error and poor coverage are severely hurting the value of household survey data. Pp. 443–448 in *Proceedings of the Section on Survey Research Methods*. Alexandria, Va.: American Statistical Association.

Shaw, Tom, and Guthrie, Patricia 1992 An Alternative Enumeration of a Heterogeneous Population in a San Francisco Housing Project. Report #13. Center for Survey Methods Research, Bureau of the Census, Washington, D.C.

Short, Kathleen S., and Littman, Mark S. 1990 *Transitions in Income and Poverty Status: 1985–86*. Current Population Reports, Household Economic Studies, Series P-70, No. 18. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Short, Kathleen, and Shea, Martina 1991 *Transitions in Income and Poverty Status: 1987–88*. Current Population Reports, Household Economic Studies, Series P-70, No. 24. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Silberschatz, Avi, Stonebraker, Michael, and Ullman, Jeffrey D., eds. 1990 *Database Systems: Achievements and Opportunities*. The "Lagunita" Report of the NSF Invitational Workshop on the Future of Database Systems Research, Palo Alto, Calif. Austin: University of Texas Department of Computer Science.

Singh, Rajendra P. 1987 Reservations about ISDP Site Report on Recall Effect. Unpublished memorandum to Gary M. Shapiro. Bureau of the Census, Washington, D.C.

1991 SIPP: Oversampling the Low Income Population for 1990 Redesign Samples. Unpublished memorandum for SIPP Oversampling Work Group. Bureau of the Census, Washington, D.C.

Singh, Rajendra, Huggins, Vicki, and Kasprzyk, Daniel 1990 *Handling Single Wave Nonresponse in Panel Surveys*. SIPP Working Paper No. 9009. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Singh, Rajendra, Weidman, Lynn, and Shapiro, Gary 1988 Quality of SIPP estimates. Pp. 301–332 in *Individuals and Families in Transition: Understanding Change Through Longitudinal Data*. Papers presented at the Social Science Research Council Conference in Annapolis, Maryland. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce. (Also available as SIPP Working Paper No. 8901.)

Slater, Courtenay 1991 Comments on Tim Smeeding's Paper, "Priorities for Improving Income Data from Survey and Administrative Records." Unpublished memorandum to Connie Citro. Slater Hall Information Products, Washington, D.C.

Smeeding, Timothy M. 1992 Priorities for improving data on income and well-being from survey and

administrative records: a role for SIPP. *Journal of Economic and Social Measurement* 18 (1–4):334–374.

Smeeding, Timothy M., and Holden, Karen 1989 The Poor, the Rich, and the Insecure Elderly Caught In Between. Paper prepared for the Allied Social Science Associations Annual Meeting. Metropolitan Studies Program, Syracuse University, Syracuse, N.Y.

Smith, Karen E. 1989 *Methods of Processing Unit Data Longitudinally on the SIPP*. SIPP Working Paper No. 8910. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Speare, Alden, Jr., Avery, Roger, and Goldscheider, Frances 1990 *An Analysis of Leaving Home Using Data from the 1984 Panel of the SIPP*. SIPP Working Paper No. 9002. Bureau of the Census, Washington, D.C.: U.S. Department of Commerce.

Sperry, Sandra 1991 CAPI and the Medicare Current Beneficiary Survey. Paper prepared for the U.S. Bureau of the Census Committee on Computer Assisted Survey Information Collection. Westat, Inc., Rockville, Md.

Sperry, Sandra, Bittner, Deborah, and Branden, Laura no date Computer-Assisted-Personal-Interviewing on the Current Beneficiary Survey. Westat, Inc., Rockville, Md.

Subcommittee on Computer Assisted Survey Information Collection 1990 *Computer Assisted Survey Information Collection*. Statistical Policy Working Paper 19. Federal Committee on Statistical Methodology, Statistical Policy Office, Office of Information and Regulatory Affairs, Office of Management and Budget. Washington, D.C.: U.S. Government Printing Office.

Survey Research Center 1986 *A Panel Study of Income Dynamics: Procedures and Tape Codes 1984 Interview Year*. Institute for Social Research. Ann Arbor: University of Michigan.

Swartz, Katherine, and McBride, Timothy 1990 *Spells Without Health Insurance: Distributions of Durations and Their Link to Point-in-Time Estimates of the Uninsured*. SIPP Working Paper No. 9034. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Traugott, M.W., and Katosh, J. P. 1979 Response validity in surveys of voting behavior. *Public Opinion Quarterly* 43:359–377.

Tuma, Nancy B., and Hannan, Michael T. 1984 *Social Dynamics: Models and Methods*. New York: Academic Press.

U.S. General Accounting Office 1991 *Nutrition Monitoring: Mismanagement of Nutrition Survey Has Resulted in Questionable Data*. Washington, D.C.: U.S. Government Printing Office.

U.S. House of Representatives 1991 *Overview of Entitlement Programs: 1991 Green Book*. Background

Material and Data on Programs Within the Jurisdiction of the Committee on Ways and Means. Washington, D.C.: U.S. Government Printing Office.

Van der Gaag, Jacques, and Smolensky, Eugene 1982 True household equivalence scales and characteristics of the poor in the United States. *Review of Income and Wealth* 28 (March):1728.

Vaughan, Denton R. 1988 Reflections on the income estimates from the initial panel of the Survey of Income and Program Participation. Pp. 333–414 in *Individuals and Families in Transition: Understanding Change Through Longitudinal Data*. Papers presented at the Social Science Research Council Conference in Annapolis, Md. Bureau of the Census. Washington, D.C.: U.S. Department of Commerce.

Waksberg, Joseph 1973 The effect of stratification with differential sampling rates on attributes of subsets of the population. Pp. 429–434 in *Proceedings of the Social Statistics Section*. Washington, D.C.: American Statistical Association.

Watts, Harold 1991 Comments on Smeeding Paper for NAS SIPP Panel. Department of Economics, Columbia University, New York City.

Weidman, L., King, K., and Williams, T. 1988 Evaluation of the SIPP Asset Feedback Experiment. Pp. 337–341 in *Proceedings of the Section on Survey Research Methods*. Alexandria, Va.: American Statistical Association.

Weinberg, Daniel H., and Lamas, Enrique J. 1992 The history and current issues of U.S. poverty measurement. Pp. 173–199 in *Poverty Measurement for Economies in Transition in Eastern European Countries*. International Scientific Conference, Warsaw, October 1991. Warsaw, Poland: Polish Statistical Association and Polish Central Statistical Office.

Weisbrod. Burton A., and Hansen, Lee W. 1968 An income-net worth approach to measuring economic welfare. *American Economic Review* 58 (December): 1315–1329.

Welniak, Edward J., Jr. 1990 Effects of the March Current Population Survey's new processing system on estimates of income and poverty. In *Proceedings of the Business and Economic Statistics Section*. Alexandria, Va.: American Statistical Association.

Williams, Roberton, and Ruggles, Patricia 1987 Determinants of change in income status and welfare program participation. In *Proceedings of the Social Statistics Section*. Washington, D.C.: American Statistical Association.

Woltman, H., and Bushery, J. 1975 A panel bias study in the National Crime Survey. Pp. 159–167 in *Proceedings of the Social Statistics Section*. Washington, D.C.: American Statistical Association.

Yamaguchi, Kazuo 1991 *Event History Analysis*. Newbury Park, Calif.: Sage Publications.

Ycas, Martynas A., and Lininger, Charles A. 1983 The Income Survey Development Program: design features and initial findings. Pp. 25–36 in Martin H. David, ed., *Technical, Conceptual, and Administrative Lessons of the Income Survey Development Program (ISDP): Papers Presented at a Conference*. New York: Social Science Research Council.

Appendix A

Use of SIPP for Research and Policy Analysis

In assessing the cost-effectiveness of a survey such as SIPP, it is important to ask to what extent the data are being used outside the sponsor agency for research and policy analysis purposes. Immediate use will not follow initiation of a complex survey because of a time lag until data files become publicly available and a further time lag until users complete and publish their analyses. David and Robbin (1991:62–66, 78–79, 84–88) examine publication activity for SIPP during the first 6 years after the data files from the 1984 panel became available (1985–1990), comparing it with the publication activity over a comparable period (1971–1976) in the history of the Panel Study of Income Dynamics (PSID) and the National Longitudinal Surveys of Labor Market Experience (NLS).

Table A-1 provides counts of research and policy analysis papers by users of SIPP and NLS (excluding methodological papers and those prepared by the survey staff) for years 1 to 6. The SIPP counts are from Committee on National Statistics (1989:Table 3-1) and panel staff; the NLS counts are from bibliographies obtained and analyzed by David and Robbin (1991:Table 3.10).[1] SIPP exhibits a rate of increase in use of the data over the first 6 years that compares well with the NLS. (Conferences sponsored

[1] The publication counts developed by David and Robbin for the PSID are not shown because they are not entirely comparable with those for SIPP and NLS: the PSID counts are limited to papers published in refereed journals, while the SIPP and NLS counts also include working papers and professional association presentations.

by the Social Science Research Council account for the relatively large number of SIPP papers in 1985 and 1988.)

TABLE A-1 Papers Produced from SIPP and NLS Data Over a 6-Year Period

Year	SIPP (1985–1990)	NLS (1971–1976)
1	17	12
2	10	14
3	16	18
4	69	36
5	50	51
6	56	57
Total	218	188

NOTES: SIPP, Survey of Income and Program Participation; NLS, National Longitudinal Surveys of Labor Market Experience. The period for each survey represents the first 6 years after data files became widely available.
SOURCE: Data from Committee on National Statistics (1989:Table 3-1) for years 1–4 for SIPP; compilation by panel staff for years 5-6 for SIPP; David and Robbin (1991:Table 3.10) for NLS. David and Robbin (1991:Table 3.10) also provide counts of papers from SIPP, including those using data from the SIPP ACCESS system at the University of Wisconsin and those using data obtained directly from the Census Bureau or other sources. However, the bibliography they developed to obtain the latter counts is known to include duplicates and may also include methodological papers, as the combined totals appear unrealistically high for most years. The David and Robbin SIPP totals are as follows: 1985, 39; 1986, 21; 1987, 26; 1988, 68; 1989, 67; 1990, 74 (based upon part-year bibliography).

Table A-2 shows the number of dissertations by year that used data from the SIPP ACCESS system at the University of Wisconsin (which David and Robbin managed), the NLS, and the PSID. SIPP compares favorably on this dimension of data use with the PSID. The higher dissertation output of the NLS results from a Department of Labor grant program that supported dissertation research with the NLS data.

Turning to the subject areas for which SIPP data have been used in research and policy analysis studies, Table A-3 classifies SIPP papers issued in 1989 and 1990 by topic. Percentages add up to more than 100 because some papers were assigned to more than one category. Papers of Census Bureau staff as well as outside analysts are included.

TABLE A-2 Dissertations Produced from SIPP, PSID, and NLS Over a 6-Year Period

Year	SIPP (1985–1990)	PSID (1971–1976)	NLS (1971–1976)
1	0	2	1
2	1	0	3
3	3	2	3
4	1	1	8
5	4	1	8
6	4	4	11
Total	13	10	34

NOTE: SIPP, Survey of Income and Program Participation; PSID, Panel Study of Income Dynamics; NLS, National Longitudinal Surveys of Labor Market Experience.
SOURCE: David and Robbin (1991:Table 3.11). SIPP counts are of dissertations using data from the SIPP ACCESS system at the University of Wisconsin.

TABLE A-3 SIPP Papers Issued in 1989–1990 by Topic Area(s)

	Papers	
Topic	Number	Percent
Assets, wealth	18	14.4
Child care, children	15	12.0
Disability	10	8.0
Education	2	1.6
Elderly	20	16.0
Family change, living arrangements	19	15.2
Health care, insurance	10	8.0
Income, poverty	32	25.6
Jobs, welfare-labor supply decisions	30	24.0
Long-term care	4	3.2
Migration	3	2.0
Program participation	27	21.6
Race, ethnicity	7	5.6
Rural population	1	0.8
Veterans	2	1.6
Total number of studies	125	

NOTES: Numbers of papers add to more than 125 and percentages add to more than 100 because papers were assigned to more than one category as appropriate. Papers include those issued by Census Bureau staff and outside analysts.
SOURCE: Compilation by panel staff.

Appendix B

Conference on the Future of SIPP: Topics and Participants

The Conference on the Future of SIPP was organized by the panel as part of its work to evaluate SIPP and obtain the widest possible range of information about SIPP data and how they are being used and might be used in the future. The conference was held in Washington, D.C., in April 1991. The papers have been published as a 1992 special issue of the *Journal of Economic and Social Measurement* (Vol. 18, Nos. 1–4). The paper topics, the authors, and the discussants who participated in the conference are listed below. (Affiliations listed are as of April 1991.)

"Alternative Scientific Designs for SIPP"

Author: Martin David, University of Wisconsin

"The Future of SIPP for Analyzing Labor Market Behavior"

Authors: Glen Cain, University of Wisconsin Marilyn Manser, Bureau of Labor Statistics

Discussants: Gary Burtless, The Brookings Institution Alberto Martini, Mathematica Policy Research, Inc.

"The Future of SIPP for Analyzing Interactions of Family Composition and Income Change"

Author: Martha Hill, University of Michigan

Discussant: Douglas Wolf, The Urban Institute

"The Future of SIPP for Analyzing Disability and Health"

Authors: Michele Adler, Department of Health and Human Services

Mitchell LaPlante, University of California, San Francisco

Discussants: Mary Grace Kovar, National Center for Health Statistics

Barbara Wolfe, University of Wisconsin

"Using SIPP to Understand Poverty and Economic Need"

Co-authors: Rebecca Blank, Northwestern University, and Patricia Ruggles, The Urban Institute

Discussant: John Fitzgerald, Bowdoin College

"The Future of SIPP for Analyzing Extended Measures of Well-Being"

Author: Harold Watts, Columbia University

Discussant: Timothy Smeeding, Syracuse University

"SIPP and the Measurement of Income Transitions Among the Elderly"

Author: Karen Holden, University of Wisconsin

Discussants: Susan Grad, Social Security Administration Jan Mutchler, State University of New York, Buffalo

"The Future of SIPP for Analyzing Child Care and Child Support"

Authors: Rachel Connelly, Bowdoin College

Sharon McGroder, Department of Health and Human Services

Linda Mellgren, Department of Health and Human Services

Discussants: Sandra Hofferth, The Urban Institute Christine Nord, Child Trends, Inc.

"Using SIPP for the Study of Program Participation"

Authors: Robert Moffitt, Brown University

Roberton Williams, Congressional Budget Office

Discussant: Sharon Long, The Urban Institute

"The Future of SIPP for Modeling Program Eligibility"

Author: Pat Doyle, Mathematica Policy Research, Inc.

Discussant: Denton Vaughan, Social Security Administration

Appendix C

Biographical Sketches of Panel Members and Staff

GRAHAM KALTON (*Chair*) is senior statistician and vice president of Westat, Inc., in Rockville, Maryland. Previously he was research scientist in the Survey Research Center and professor of biostatistics at the University of Michigan. Prior to that he was professor of social statistics at the University of Southampton and reader in social statistics at the London School of Economics. His research interests are in survey sampling and general survey methodology. He received a B.Sc. degree in economics and an M.Sc. degree in statistics from the University of London and a Ph.D. degree in survey methodology from the University of Southampton. He is a fellow of the American Statistical Association and of the American Association for the Advancement of Science and is the current president of the International Association of Survey Statisticians. He has been a member of the Committee on National Statistics; served as a member of its Panel to Evaluate the National Center for Education Statistics and of the Panel on the National Health Care Survey; and was the chair of the Panel to Study the NSF Scientific and Technical Personnel Data System.

PAUL P. BIEMER is principal scientist and manager of the Survey Methodology Staff at Research Triangle Institute in Research Triangle Park, North Carolina. Before joining RTI in 1991, he was chair of the Department of Experimental Statistics and director of the University Statistics Center at New Mexico State University. Prior to that, Biemer was assistant chief of the Statistical Research Division at the Bureau of the Census in Washing

ton, D.C., and has held various positions within the Census Bureau since 1978. In 1985 the Bureau of the Census awarded him its bronze medal for superior federal service. Biemer is also currently chair of the Survey Research Methods Section and serves on the Committee on Energy Statistics of the American Statistical Association. He serves as an associate editor for the *Journal of Official Statistics* . He is a fellow of the American Statistical Association. His research interests involve the design and estimation of nonsampling error in sample surveys, survey methodology, and quality management for survey operations. He received a B.S. degree in mathematics and a Ph.D. in statistics from Texas A&M University.

GORDON J. BRACKSTONE is assistant chief statistician responsible for statistical methodology, computing, and geography at Statistics Canada. From 1982 to 1985 he was the director-general of the Methodology Branch at Statistics Canada, and previously he was responsible for surveys and data acquisition in the Central Statistical Office of British Columbia. His professional work has been in survey methodology, particularly the assessment of the quality of survey data. He is a fellow of the American Statistical Association and an elected member of the International Statistical Institute. He received B.Sc. and M.Sc. degrees in statistics from the London School of Economics.

CONSTANCE F. CITRO (*Study Director*) is a member of the staff of the Committee on National Statistics. She is a former vice president and deputy director of Mathematica Policy Research, Inc., and was an American Statistical Association/National Science Foundation (NSF) research fellow at the Bureau of the Census. For the Committee on National Statistics, she has served or is currently serving as study director for the Panel on Poverty and Family Assistance, the Panel to Study the NSF Scientific and Technical Personnel Data System, the Panel on Decennial Census Methodology, the Panel on Statistics on Supply and Demand for Precollege Science and Mathematics Teachers, and the Panel to Evaluate Microsimulation Models for Social Welfare Programs. Her research has focused on the usefulness and accessibility of large, complex microdata files, as well as analysis related to income measurement and demographic change. She is a fellow of the American Statistical Association. She received a B.A. degree from the University of Rochester and M.A. and Ph.D. degrees in political science from Yale University.

CLIFFORD C. CLOGG is professor of sociology and statistics at the Pennsylvania State University. He is a fellow of the American Statistical Association and the Sociological Research Association. He has been the editor of *Sociological Methodology* and the coordinating and applications editor of

the *Journal of the American Statistical Association*. He has served on the Board of Directors of the American Statistical Association and the Population Association of America. His research interests include the demography of the labor force and statistical methods for categorical data. He received a B.A. degree in sociology from Ohio University and an M.S. degree in statistics and a Ph.D. in sociology from the University of Chicago.

MARTIN HEIDENHAIN DAVID is professor of economics at the University of Wisconsin-Madison. His research has explored a variety of problems relating to taxation and transfer programs. Investigating those topics with data on individuals and families has led him to become expert in problems of managing complex data, including the design of information systems to support such data. Together with Alice Robbin and Tom Flory, he designed an integrated system that served as a national facility for research on the Survey of Income and Program Participation. PC-SIPPTEST and its accompanying manual, *Analyzing Complex Data*, provide a personal computer subsample of the data for exploratory learning and development of research queries. He serves as adviser to the Statistics of Income Division of the Internal Revenue Service and is a member of the Committee on National Statistics and the Advisory Board of the German Socioeconomic Panel Study. He is a fellow of the American Statistical Association and received a B.A. degree from Swarthmore and M.A. and Ph.D. degrees in economics from the University of Michigan.

GREG J. DUNCAN is program director at the Survey Research Center and professor of economics at the University of Michigan. His research areas are in income distribution and poverty as well as methodological issues associated with household panel studies. For the past 10 years he has been codirector of the Panel Study of Income Dynamics project, which has conducted annual interviews with a representative sample of U.S. households since 1968. He received a B.A. degree from Grinnell College and a Ph.D. from the University of Michigan.

RALPH E. FOLSOM is chief scientist for Survey and Computing Sciences at the Research Triangle Institute. From 1985 to 1988 he was acting director of RTI's Center for Research in Statistics, in which he held various positions since 1970. His area of expertise is the design and analysis of complex probability samples. In addition to his innovative work on many of the complex survey efforts conducted by RTI, he has made significant contributions to the development of RTI's computer software for survey data analysis. These contributions include sample design-based modes of estimation and inference for linear and logistic regression coefficients. Re

cently he collaborated with RTI colleagues in the implementation of software for fitting continuous time "Cox Proportional Hazards" models to survey data. His recent work on generalized raking has led to efficient software for survey weight adjustments. He is a member of the Working Group on Technical Aspects of SIPP of the Survey Research Methods Section of the American Statistical Association and of the Board of Governors for the Panel Study of Income Dynamics. He received a B.S. degree from Texas A&M University in wildlife management, an M.S. in statistics from Iowa State University, and a Ph.D. in biostatistics from the University of North Carolina.

ROBERT M. HAUSER is Vilas research professor of sociology and director of the Institute for Research on Poverty at the University of Wisconsin-Madison, where he has been on the faculty since 1969. He has also held a faculty appointment at Brown University and visiting appointments at the Institute for Advanced Study in Vienna and at the University of Bergen. He received a B.A. degree from the University of Chicago and a Ph.D. degree from the University of Michigan. His doctoral thesis was chosen for publication in the Rose Monograph Series of the American Sociological Association, and he has won the Paul F. Lazarsfeld award in research methods from the American Sociological Association. He is a member of the National Academy of Sciences, the Commission on Behavioral and Social Sciences and Education, and the Committee on National Statistics. He is a fellow of the American Association for the Advancement of Science, the American Statistical Association, and the American Academy of Arts and Sciences. His publications related to education and social inequality include five books and numerous articles. His current research interests include trends in educational progression and social mobility in the United States among racial and ethnic groups, the effects of families on social and economic inequality, and changes in socioeconomic standing, health, and well-being across the life course.

V. JOSEPH HOTZ is associate professor in the Irving B. Harris School of Public Policy Studies at the University of Chicago. He serves as the director of the Population Research Center at the University of Chicago and the National Opinion Research Center, Inc.; is a research associate at the Institute for Research on Poverty at the University of Wisconsin-Madison; and is a coeditor of the *Journal of Labor Economics* . He also is a member of the Department of Health and Human Services Advisory Committee on the JOBS Evaluation. His primary research interests are in the areas of labor force and population dynamics, the econometrics of dynamic choice models, and the evaluation of social programs. His most recent work has inves

tigated the use of nonexperimental methods in the evaluation of job training programs and the importance of child care regulations and other factors on the demand for and cost of child care in the United States. He received a B.A. degree from the University of Notre Dame and a Ph.D. in economics from the University of Wisconsin.

RANDALL J. OLSEN is professor of economics and director of the Center for Human Resource Research at Ohio State University. He also serves as principal investigator on the National Longitudinal Surveys of Labor Market Experience. He is an associate editor for applications and case studies for the *Journal of the American Statistical Association* and serves on the social science and population study section for the National Institutes of Health. His primary research interests are in applied econometrics, economic demography, and labor economics with some recent work on survey methodology. He received a B.A. degree in economics and mathematics from Ripon College and M.A. and Ph.D. degrees in economics from the University of Chicago.

PATRICIA RUGGLES is a senior research associate at the Urban Institute, where she has been a staff member since 1984. She has written extensively on poverty, the distribution of income, and public income support programs. She has also directed a number of studies for the Food and Nutrition Service of the Department of Agriculture and for the Department of Health and Human Services, among others. In 1989–1990 she served as a senior economist with the Joint Economic Committee of the U.S. Congress while on leave from the Institute. In 1987–1988 she was an American Statistical Association/National Science Foundation research fellow at the Bureau of the Census, where she studied determinants of the durations of poverty and welfare spells. She is the author of a book on alternatives in measuring poverty and numerous papers and articles, and has considerable experience in working with the SIPP data. Before joining the Urban Institute, she spent four years as an analyst at the Congressional Budget Office, where she was responsible for analyses of social security and means-tested transfer programs. At CBO she completed a series of studies of the distributional impacts of tax and transfer program changes and directed a major study of legislative changes in human resources programs. She received a B.A. from Yale University and did graduate work in economics at Harvard University. Her dissertation examined the effects of taxes and program expenditures on households of different types.

TERENCE SPEED is professor and chair in the Department of Statistics at the University of California at Berkeley. Prior to that, he was chief of the CSIRO Division of Mathematics and Statistics in Canberra, Australia, and

he has held academic posts in Australia and the United Kingdom. He received a Ph.D. from Monash University in Australia in mathematics, and he has published research in probability theory and theoretical statistics and in a number of applied areas. He is a fellow of the American Statistical Association and of the Institute of Mathematical Statistics.

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