GENERAL OVERVIEW OF RESEARCH IN REDESIGN OF THE CENSUS BUREAU'S DEMOGRAPHIC SURVEYS

R. Maurice Kniceley, Jr. and Leonard R. Baer, U.S. Bureau of the Census

1. INTRODUCTION

This paper[1] was prepared to provide the reader general awareness of the research that has been completed and that which remains in redesign of the Bureau of the Census' major demographic surveys for the 1980s. Research of both "operations" and "sample design" aspects are covered. The following is a list of the surveys that are scheduled to be redesigned and includes a very brief description of each survey as it now exists:

● Current Population Survey (CPS). A monthly labor force survey designed to provide current estimates of employment and unemployment and month-to-month and year-to-year change in those characteristics at national and selected subnational (states, SMSAs) levels. Sponsored, primarily, by the Bureau of Labor Statistics (BLS).

● Annual Housing Survey (AHS). An annual survey designed to produce national estimates of major components of current housing inventory, housing quality, characteristics of recent movers, and financial and general characteristics of housing. Primarily sponsored by the Department of Housing and Urban Development (HUD).

● Health Interview Survey (HIS). A survey with weekly and quarterly interviewing designed to produce national annual estimates of health conditions and health-related characteristics by age and sex. Sponsored by the National Center for Health Statistics (NCHS).

● National Crime Survey (NCS). A survey producing national annual estimates of personal crimes (rape, robbery, assault, and personal larceny) and household crimes (burglary, household larceny, and motor vehicle theft). Sponsored by the Bureau of Justice Statistics (BJS).

● Quarterly Housing Survey/Survey of Residential Alterations and Repairs (QHS/SORAR). A quarterly survey producing national estimates of expenditures for alterations and repairs of residences. Sponsored by the Bureau of the Census (BUCEN).

In addition to the five demographic surveys being redesigned, two survey programs are being established for the first time. Although these are not being redesigned, they are being treated as such for practical purposes. These are:

● Survey of Income and Program Participation (SIPP). This is to be a longitudinal survey where the sample person will be interviewed six times at 4-month intervals. Estimates of income and income change by source of income will be produced from main data elements such as income program participation, cash and noncash income, current labor force participation, household composition and personal history. Primarily sponsored by the Department of Health and Human Services (HHS).

● General Purpose Survey (GPS) Program. This will be one or more general purpose samples designed to produce national estimates for a wide range of characteristics. Sponsors needing a survey vehicle later in the decade but who may find that specific purpose designs are not adequate or who cannot afford the costs associated with the regular surveys may be able to use a GPS design. The actual survey structure(s) for these will not be decided upon until sponsors indicate the need.

Since very little research has been planned or conducted for these, GPS designs are not discussed further in this paper.

For the redesign it is desirable to conduct extensive research to determine if significant improvements can be made over the existing survey designs, to determine the feasibility of incorporating new technological developments and to find ways to account for any changes in sponsors' objectives since the last redesign. As examples of the latter, the BLS has requested that the CPS be state-based rather than national and the NCHS would like the design of their HIS to be all-area rather than the current multiframe structure.

Most of the research will be completed in fiscal year 1981. Even though many of the research recommendations may not be funded initially because of ongoing budget reductions, some very cost-effective ones will be incorporated in the redesigned surveys even though additional budget reductions may stop further redesign work. These proposals will be mentioned later in the paper with an indication of the estimated cost savings to be realized during implementation and/or operations phases of the surveys. The remainder of this paper is devoted entirely to a discussion of the major research planned (some completed) for the redesign.

It should be noted that the existing survey designs are basically the same as the CPS, i.e., they use the same primary sampling units or a subset of those selected for the CPS. For redesign, generally the same types of research will be conducted for the other surveys as for CPS but carried out independent of that for CPS. This will be done because of CPS's state-based sample requirement and earlier implementation date and in order to optimize efficiency for all surveys.

2. MAJOR RESEARCH COMPLETED OR PLANNED

The approach used herein for describing the research is to list the major survey design aspects from "Development of Sampling Frames" through "Implementation" and to discuss, within each, the relevant research projects.

2.1 Development of Sampling Frames

Traditionally, the Bureau's demographic surveys have utilized multiframe designs for its household sample surveys. The sampling frames consist of a frame of census address lists (list frame), a frame of housing units constructed after the census address lists were established (new construction), a frame of area segments for areas where the quality of census addresses was questionable (area frame), and frames of special places and mobile homes that can appear in each of the larger frames but, generally, must be handled differently.

2.1.1 List Frame.

The major emphasis of the research is to determine availability, completeness, and quality of the census address registers. One concern is whether every line of every census address register has to be keyed or can we get by with updating the initial 1980 address file by keying only changes to produce the required "clean" file to be used for sampling purposes. It has been estimated that about 1/4th (approximately $350,000) of the cost of keying the address registers can be saved if only an updating is required. In

our present designs if 10 percent or more of the housing units in a sample ED in a census listing lack a street name and/or house number, the listing is considered incomplete, the ED is identified as an area ED, and segments selected from within it are treated as area segments. Otherwise, it is identified as an address (list) ED. The question is, "Is 10 percent incomplete addresses the logical classifier?"

Also of concern are units that were missed in the census that would not appear in either the census or new construction frames. With the current designs the other sampling frames were supplemented with a frame of census-missed units. Should that be done this time? Studies for the CPS and the AHS found that there was no significant impact of the inclusion of census misses on the total survey estimates for CPS for characteristics studied and an insufficient impact on AHS characteristics to justify the extra costs. NCS and HIS are similarly being studied.

2.1.2. New Construction Frame. The initial census address registers were prepared a few months prior to Census Day. Thus, any new construction becoming suitable for occupancy between that time and the time at which the sample units for redesigned surveys are interviewed will have no chance of being included unless a separate frame is created. Research will help establish from what sources to collect new construction data, how to develop a frame once we decide the source of the new construction, and whether it is feasible to computerize the sampling.

Currently, it seems the new construction will consist of two major components--a frame of residential building permits issued since the initial census address registers were prepared and a frame of public housing that was constructed within that same time frame.[2]

● Residential Building Permits. The source of privately-financed housing new construction has been records of building permits issued by the permit offices. In the current designs, samples of permit-issuing offices and permits issued have been selected to represent this component of new construction. Several problems are associated with using these as a frame. One major problem is permit availability. During the past decade it was found that in several offices permits were not available when the permit registers had to be sampled. One study [1] will identify "problem" offices, i.e., those in which permit data will not be available or will be difficult to obtain and determine feasibility of obtaining permit information via computerized input from the permit offices.

Another problem to be resolved is permit lag where permit lag is the amount of time elapsing from date of permit issuance until the housing structure is ready for occupancy [2]. The problem is to determine the optimum starting point (month and year) for sampling building permits issued prior to the census in an attempt (1) to minimize overlap with the census and (2) to minimize the number of units missed in the census which may also be missed in the surveys. No firm recommendation has come forth from an ongoing study.

Also of concern is "year built" reporting in the field. In some cases, respondents are asked in what year their residences were built as a

means of determining whether the units are truly new construction or should have been included in the census frame. It is believed that respondents telescope forward, reporting "year built" later than it actually was. Research on accuracy of "year built" reporting was started but because considerable feeling existed that gains from the study would not warrant its cost (approximately $750,000), it was decided to cancel the project during the first round of budget cuts for fiscal year 1981. Instead an attempt will be made to evaluate accuracy of year built reporting using existing data.

Another problem being studied deals with clustering of permits [2], once the addresses have been listed at the permit offices. Under the current system the addresses are assigned map grid coordinates which are then used as a basis for clustering the units prior to selecting a sample of the clusters. The study was to determine whether it would be more effective to assign Enumeration District (ED) numbers rather than grid coordinates to the addresses and, if so, whether the assignment should be made by the permit lister or computer. The tentative recommendation was for the permit lister to make the assignment to EDs. A final decision was to be based on a field test of the feasibility of this recommendation, a test that was delayed because of budgetary problems.

Other problems studied are (1) how to develop sampling methods for permit offices having boundary problems so that the chances of including all new construction in the sampling frames without overlap between offices will be increased, and (2) how to treat Stratum I (those issuing more than 50 permits per year and that report monthly) and Stratum II (those issuing few permits and on an annual basis) permit offices in the sampling scheme. For the latter it has been decided that all Stratum I permit offices in a PSU will be in the permit universe but addresses will be listed for sample months only. Stratum II offices will be sampled on an annual basis using reports of activity as the Stratum II universe.

With respect to computerizing the sampling of new construction, it was recommended that the permit sampling operation be computerized. If everything proceeds satisfactorily on developing the computer system to handle the sampling operation, it is anticipated that over the decade the system will save 25 percent (approximately $¼ million) of the cost of doing the operation clerically.

● Public Housing. New construction public housing is new residential housing units for which construction is financed by federal funds. The purpose of the study regarding this component is to evaluate alternative ways of identifying new public housing so that it can be included in the sampling frame for the redesign without overlap with the permit new construction frame.

2.1.3. Area Frame. The research on area sampling frames can be divided into two major areas of concern. These are (1) consideration of using all area designs rather than the current multiframe systems, and (2) a group of smaller projects geared to improving the current area sampling methodology, particularly area segmenting.

● All Area. Part of the research on developing area frames was to consider alternatives to

the multiframe designs currently used in the Bureau's demographic surveys. Two which show most promise are an all-area design and an all-area design supplemented by a frame of new construction.

Until the 1960 redesign, the Bureau used an all-area design with the CPS and, consequently, with any surveys that were designed based on the CPS structure. At that time a change was made to the current multiframe approach. Because Statistics Canada has used an all-area design approach more recently than has the Bureau, we reviewed their Canadian Labour Force Survey experience. Their survey (and all-area designs that we might adopt[3]) consists of doing a listing well in advance of the first enumeration. The listing is keyed and then sampled via computer. A computer-printed list of sample units is prepared and given to the interviewer for enumeration.

The information gained from the Canadian survey experience was supplemented by Bureau field experiences, particularly with respect to costs of operation. It was found that both the all-area and all-area-with-new-construction alternatives have the advantages that they are less complex and are easier to control since they use only one (or two) frame(s) compared to the current seven frames. As to disadvantages, a major one is that the all-area approach requires an extra visit to the field to do the listing, an operation that is expensive. As one way to reduce this cost, the Bureau is investigating the possibility of not requiring updating of listing in areas where building permits are necessary for new residential construction.

At this time, the HIS is the only survey whose sponsor is seriously considering the all-area approach. It is assumed that the all-area plus permit new construction design would be used rather than the strictly all-area approach since the cost of using a separate permit frame is small relative to the gains in variance. However, until decisions regarding adequacy of the sponsor's budget have been made, a final decision on which approach(es) to implement will not be forthcoming.

● Others. Other research projects focus on improved sampling methodologies for area segments, particularly with respect to alternatives to the current area segmenting procedures. Description of two of these research projects follows:

RAV Area Segmenting. A time-consuming and, therefore, expensive part of preparing an area segment is allocating the units enumerated in the census to the part (chunk) of the map in which the units are physically located. A procedure devised for the 1978 Registration and Voting (RAV) survey consisted of using those housing units spotted on the map by the Census enumerator and allocating the unspotted housing equally to the land chunks. This method saved about 5/12 of the time necessary to use the traditional current survey method.

During an investigation to determine if the RAV method should replace the more usual procedures used in recurring surveys it was found that the RAV procedure does not result in more field work (subsegmenting) prior to the initial listing, contrary to earlier beliefs. The procedure will require approximately 8 percent more segments to yield the desired sample size. However, it is almost certain that all the surveys will adopt it for the redesign. Unless remaining research finds problems with the procedure, it is anticipated that approximately $1.0 million could be saved

during survey implementation by using the RAV method.

Deming Open-Ended Segmenting. An alternative to the traditional method of area segmenting is a procedure developed by Dr. Edward Deming in which open-ended segments are used. In this procedure a land area, such as a census enumeration district, is visited to obtain information to be used to specify a path of travel within each land chunk and identify reference structures at the starting point and every 6 to 10 housing units thereafter. Whenever one of these "segments" of 6 to 10 units is selected for the sample, a lister visits the site and lists the appropriate reference structure and all other structures between the original reference structure and the next reference structure (or end of the segment).

Because investigation indicated that in our repetitive surveys this method would result in an increase in variance and little, if any, cost savings, the Deming open-ended segmenting method will not be used in the redesigned surveys.

2.1.4. Cumputer Address Segmenting. In the current methodology, a computer file of all sample addresses within address segment EDs is created. The file is sorted to put all units at the same street name and house number together. Then a "segmenting" program: (a) clusters those that are physically close to form segments of the prescribed size; (b) maximizes the number of addresses in which all units at a basic address are designated for the same survey and sample, i.e., to be interviewed simultaneously (there is less chance for missed housing units as the interviewer does not sample but "takes all"); and (c) minimizes the number of samples at a basic address (this minimizes the number of times an interviewer visits an address and minimizes the number of addresses that must be visited). A work group is reviewing the computer-segmenting methodology to see if it can be improved.

2.1.5. Special Place Frame. Some living quarters are not the typical house, apartment, or flat. Because special procedures are required to enumerate persons who live in these types of quarters, they are called special places and are identified in a separate frame. Some examples of special places are colleges, monasteries, rooming and board houses, and jails. Special places are enumerated in the census but, since they are not suitable for computerized sampling, a clerical sampling operation is used. A work group will investigate: (a) whether improvements can be made to the way special places are sampled, and (b) whether there is a way newly constructed special places can be added to the frame.

2.1.6. Coverage Improvement. To have complete coverage the sample units must represent all units in the survey population (universe). However, if the frames from which the sample units are to be selected do not include all the targeted units, if the population units exist in more than one frame, or if the population units exist more than once in a frame, coverage problems are inevitable. A necessary part of deciding upon which sampling frames to use is evaluating coverage of the frames and determining whether feasible methods to improve coverage can be devised if needed. Our research will devise the most efficient methods of unduplicating within and between frames in a survey and between surveys to limit the chances of

overcoverage where we have access to target units. For units which may have a chance of not appearing in any of the frames, concerted effort will be made to find ways, within budgetary and time-constraints, to include them.

2.2. Definition and Formation of Primary Sampling Units (PSUs)[4]. With past designs, a PSU was defined to consist of a Standard Metropolitan Statistical Area (SMSA) or a single county or group of contiguous counties (except in New England where minor civil divisions were used). They were categorized as self-representing (SR) if they were large (generally 250,000 or more population in 1970) or nonself-representing (NSR) otherwise. Self-representing means that all such PSUs were automatically in the sample while NSR PSUs were selected with probabilities proportionate to 1970 census population totals.

PSU definitions were established about 30 years ago for the CPS and have been used in all Bureau demographic surveys since. In deciding whether the definitions need to be changed, the major factor is size and cost constraints where the concern is to make the PSUs large enough in terms of population size to yield sufficient interviewer workloads throughout the decade but not so large in land area as to significantly increase interviewer travel costs. The research will establish PSU-size definitions with travel costs as a limiting factor.

2.3. Stratification of PSUs[5]

Restratification in the 1970s redesign started from the old strata definitions. Individual PSUs were reassigned between strata when characteristics had changed greatly in the preceding 10 years and in order to keep strata populations within acceptable bounds. Some completely new strata were formed. Stratification changes were kept at a minimum in order to maximize overlap of sample PSUs between the new and old designs. The cost of hiring and training new interviewers is not insignificant. Maximizing overlap in sample PSUs maximizes the number of interviewers retained and consequently reduces field costs during introduction of the redesign samples.

However, it is less feasible to maintain similar strata definitions this time. Since the 1970 redesign, three major expansions of the CPS have been implemented to provide state and substate-level estimates resulting in stratum definitions being modified in an inefficient manner. As mentioned previously, the desire for the 1980s is to have CPS designed on a state basis which, unlike the current design, means that strata for CPS should be defined to fall completely within state boundaries.

Currently, stratification research is proceeding with stratum definitions being established independently by survey. Of first concern is to determine the optimum stratum size for each survey considering interviewer workload size constraints. A second concern is to determine the most effective way to assign PSUs to strata and to decide which of numerous variables can serve as stratification criteria. For the CPS and the AHS, variables of major interest are collected in the decennial censuses so that direct comparisons of different stratification variables and stratification methodology are relatively straightforward. However, this is not true for the NCS and the HIS. For these surveys multiple regression

models have been devised to determine the relationship between crime statistics and socioeconomic variables for NCS [3] and between health statistics and socioeconomic variables for HIS.

Various clustering algorithms are being evaluated for assigning PSUs to strata once the stratification variables have been chosen [4], [5]. At this writing, it seems the Friedman-Rubin algorithm will be chosen for CPS based on completed evaluations. For the other surveys, evaluation of various algorithms continues.

2.4. Selection of the Within-PSU Sample.

The units selected at the final stage of sample selection in existing survey designs were clusters of approximately four housing units (expected size) called ultimate sampling units (USUs). These were selected[6] from within sample census enumeration districts (EDs). (EDs are geographic areas consisting of approximately 350 housing units.) Sample EDs were selected through a process in which those within sample PSUs were sorted by degree of urbanization into four geographic categories, sorted within those four categories by identification number to pull together contiguous EDs, and selected from within each of the eight categories using probability proportionate to size where size was the expected number of USUs contained in the ED. Then it was determined whether area or list procedures would have to be used for the within ED sampling and USUs were selected using the relevant sampling procedures as described next.

For area EDs the sample EDs were each divided into segments (called blocks or chunks) using counts recorded on the ED maps by the census enumerators. These segments had to have identifiable boundaries and were to contain 8 to 20 housing units (2 to 5 USUs) each. The number of USUs expected to be in each segment was then recorded and one USU from each sample ED was randomly selected. The segment containing the sample USU became the sample segment; before such segments enter the sample for interviewing, enumerators visit them and list all housing units contained within. From this listing sample housing units are selected for interview.

For list EDs most of the sampling was computerized. Here the 1970 census housing unit records were first sorted by address within ED to produce a list such that computer constructed USUs would consist of contiguous housing units. The list was divided into regular and special place housing units. The computer segmentation process that followed formed clusters of approximately four contiguous housing units. The computer then identified sample USUs for the regular housing unit component of the list. Sample USUs for the special place portion were selected manually.

The preceding brief and simplified description of within-PSU sampling was presented to give an idea of what will come under review in the research. It should be noted before going into the ensuing discussion that research on within PSU sampling will be conducted independently for each of the surveys. Outcome of the research is expected to be quite different by survey. Some of several reasons for this are: the changes to state-based design for the CPS and all-area design for the HIS as were mentioned previously and some interest by BLS to improve the reliability of estimates of characteristics for blacks and

persons of Spanish origin in the CPS. [6]

2.4.1. Definition of Ultimate Sampling Units (USUs). The research should answer two questions about USUs. These are: "How many housing units should be included in a USU?" and "Should the sample housing units be contiguous (compact) or be selected systematically so that they are not adjacent (noncompact)?" An analysis of intraclass correlations in conjunction with administrative constraints is the basis of our research to establish USU size as well as whether clusters should be compact for each of the surveys.

2.4.2. Determination of First-Stage Sampling Unit and Sort Ordering Within Sample PSUs. Currently, EDs, census tracts, blocks, block groups, block faces, addresses, and housing units are being considered as the first-stage sampling unit within selected PSUs. Costs, timing, and complexity of the sampling operation are being evaluated. Some preliminary findings indicate that coverage and/or other problems will exist with use of tracts, blocks, block groups, or block faces which will limit their usefulness as sampling units. Also it has been estimated that, in comparing EDs with addresses as sampling units, it would cost approximately $5.4 million less to use EDs than addresses because only those addresses in sample, list EDs would have to be keyed. It will have to be decided whether the surveys use the same or different sampling units if budget and other operational constraints remain limiting factors.

If the unit chosen as the sampling unit is larger than a housing unit or address, it may be desirable to have two stages of sorting to provide the desired level of clustering within PSU. For example, if the ED is chosen as the first-stage sampling unit within selected PSUs, it may be desirable to sort EDs on the basis of geography and then sort housing units within sample EDs on the basis of specified demographic characteristics prior to selecting sample housing units.

With respect to the most efficient sort ordering, various clustering algorithms are being evaluated. As with PSU stratification, the Friedman-Rubin algorithm is being investigated. The clustering variables being considered include race (such as percent white), percent urban, income related variables (such as percent low income), type of census form (long or short) received, and geography.

2.4.3. Coordination of Sampling Activities Among Surveys and Establishment of Sampling Methodology. Although independent sets of sampling procedures may have to be written for within-PSU sampling because of the differences in requirements of the surveys, a greater concern is establishment of a system whereby the sampling operation is sufficiently coordinated among the surveys so that sample selection costs will not be excessive.

If, in the end, the surveys share a common design, the problem of coordination will not exist. However, if the first-stage sampling units within PSU and the sort ordering differ by survey, what would be the best approach to use? The final recommendation was to select samples sequentially, sorting and selecting sample units for one survey, then resorting and selecting from remaining sampling units for the next survey. If the sorting unit decided upon is larger than a housing unit, only the selected housing units would be deleted prior to resorting for the next survey. A final decision has not been made.

Once decisions have been made regarding sampling units and sorting to use within-PSUs, that information will be considered in conjunction with sample size/reliability/cost requirements in establishing methodology for selecting the within PSU samples. Also, research will be conducted on how to improve reliability of "minority" estimates, particularly for blacks and Hispanics, with oversampling in areas having higher concentrations of the relevant demographic subgroups [6], as a possibility.

2.4.4. Determination of Rotation Schemes. An important feature of the CPS, QHS, and NCS designs is a scheme whereby a partial replacement of sample USUs occurs at each interview period. This reduces respondent reporting burden resulting from continued panel participation. How the replacement is to occur throughout the decade was determined at the time of initial sample selection through a random assignment of sample USUs to rotation groups. When a sample USUs housing units have been interviewed a designated number of times, the USU rotates out of sample and is replaced by one sequenced to come into sample at that time.

For the CPS it has been decided to retain the 4-8-4 rotation scheme whereby housing units within sample units are interviewed for 4 consecutive months, are excluded from interview for the next 8 consecutive months, and come back in for interview for the next 4 consecutive months. For the others no decisions have been made but for the NCS a study [7] comparing 3-month and 12-month reference periods with the current 6-month one and, for the AHS, emphasis on 2-year change estimates and interviewing sample units in alternating years, may have considerable bearing on decisions for those surveys.

2.5 Phase-in of Sample

Phase-in is the orderly introduction over time of new sample units into the field for interview and is designed to provide new interviewers a period of seasoning. To date only phase-in of CPS is being worked on because it will be implemented at least 1 year earlier than all the others. The objective is to determine the optimum method for introducing the new sample and dropping the old sample in PSUs common to both surveys. It also covers phase-out of present sample in PSUs that will not be in the redesigned sample and phase-in of new sample in new PSUs.

2.6 Collection of Data

Research planned deals primarily with the interviewing phase of the survey. The major topics are frequency of interview, where the AHS units may be interviewed at 2-year rather than 1-year intervals with no change anticipated for the other surveys; mode of interview, where the emphasis is on increased use of telephoning and research to date has found no effect of use of telephoning on estimates of unemployed for CPS [8]; and type of respondent where the concern is with the differences between proxy and self-response.

2.7 Estimation

Research required to devise the estimators and the measures of reliability required for each will be conducted in 1982 and future years for the surveys. The intent will be to account for changes to previous designs (such as CPS being state rather than national based) and/or to incorporate

218

improved estimation methodology where possible. Research is ongoing on evaluating the current noninterview adjustment procedures for each survey, on finding ways to improve the current imputation for item nonresponse procedures used by each survey, on evaluating the current composite estimation procedure for the CPS with certain alternatives [9], and on evaluating the use of time series estimation to produce more timely estimates for the NCS.

2.8 Evaluation

This section deals with redesign of the reinterview program and research into certain other problems of a recurring nature. The reinterview program continually evaluates interviewer performance as well as some other aspects of field activities. The major question to be resolved was whether the reinterview program should be designed for interviewer control, for measuring response error, or both. It was decided that the interviewer control is most important and should be reflected in the redesign. The other projects are (1) to determine how to improve measures of the number of persons changing from one employment status category to another in consecutive months (gross change) for the CPS; (2) to determine which rotation scheme would have the greatest potential for minimizing bias resulting from continued panel participation (rotation group bias) for each survey considering rotation of sample; and (3) to determine the reasons for differences in rental vacancy rates as estimated by the Housing Vacancy Survey (HVS) and the Annual Housing Survey.

2.9 Implementation

Most of the research must be completed prior to the implementation of the sample selection. The choice of an all-area-plus-new construction frame or our present multiframe will be made. The new construction sampling system will be computerized to the extent feasible. These and other investigatory topics will have been researched and decisions reached. Still to be decided will be the methodology of the implementation. The methodology will most likely be quite similar to that used in the 1970 redesign. In some cases modifications will improve operating procedures or eliminate problems experienced previously.

3. SUMMARY

The Bureau is in the process of redesigning five major demographic surveys and establishing for the first time designs for two other survey programs. Currently, at least through fiscal year 1981, plans call for a full redesign. This means that research on every aspect of survey processes should be conducted covering development of the sampling frames through implementation of the surveys in the field. However, the Bureau and all the sponsoring agencies are experiencing serious budgetary problems for fiscal years 1982 and 1983 which may forestall implementation of the redesign.

The majority of research deals (or has dealt) with developing sampling frames. Major research on stratification, PSU definition and formation, within-PSU sampling, estimation, evaluation, and implementation is either underway and will be completed in FY 1981 or will occur in FY'82 and early FY'83. This paper described the majority of the

research within each of the survey facets above, and gave a report on the status of several of the projects.

REFERENCES

NOTE: The references that follow are Bureau of the Census papers presented at the 1981 Joint Statistical Meetings in Detroit.

[1] Abramson, Florence H., Heacock, Stephen, and Kostanich, Donna, "Effects of the Unavailability of Building Permit Information on the Bureau of the Census' Demographic Surveys."

[2] Statt, Ronald; Vacca, E. Ann; Wolters, Charles; and Hernandez, Rosa; "Problems Associated with Using Building Permits as a Frame of Post-Census Construction: Permit Lag and ED Identification."

[3] Alexander, Charles H. and Kobilarcik, Edward L., "Selection of Stratifiers for the National Crime Survey Redesign."

[4] Judkins, David R. and Singh, Rajendra P., "Using Clustering Algorithms to Stratify Primary Sampling Units."

[5] Kostanich, Donna; Singh, Rajendra; Judkins, David, and Schautz, Mindi, "Modification of Friedman-Rubin's Clustering Algorithm for Use in Stratified PPS Sampling."

[6] Lorah, Debra J., Singh, Rajendra P., and Tegels, Robert J., "Efforts to Improve the Reliability of Minority Estimates in the Redesign of the Current Population Survey."

[7] Bushery, John, "Recall Biases for Different Reference Periods in the National Crime Survey."

[8] Roman, Anthony M., "Results from the Methods Development Survey (Phase I)."

[9] Huang, Elizabeth T. and Ernst, Lawrence R., "Comparison of an Alternate Estimator to the Current Composite Estimator in CPS."