

## DISCUSSION

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The chairman and speakers are to be congratulated for a very interesting and useful set of papers, covering several different practical aspects of sample surveys. We have heard papers on design and sampling problems, interviewer characteristics, quality control, and the pros and cons of continuous versus one-time surveys. In order to be as objective as possible in our discussion, we will comment on each paper in the order of presentation, referring to each paper by state.

California. This paper is an excellent example of the use of double sampling for improved stratification for the purpose of estimating a rare sub-population under study. A similar situation occurs in the NCHS National Survey of Family Growth in which initial screening is done in households to locate women in the childbearing ages. Specifically regarding this paper, however, a point concerning oversampling and the data in Table 2 is worthy of mention. As stated by the authors "... although the total number of cases increases, from the point of view of the precision of the data, there is very little to be gained by increasing the oversampling rate beyond 3.5..." times the original rate. The 3.5 is, of course, specific to this problem. The point is the authors had the necessary information to guide them, and they used it. It should be noted here that the notation in Table 2 is a bit confusing because what is really meant by "n" in the text is the sample size in the non-Asian stratum. Thus, the total sample size is then  $10n/7$ .

Concern was expressed over the ability to "... achieve an equal probability sample of the Black population of the desired size...", given oversampling in the Asian sub-population. This problem could be handled by also oversampling Blacks in order to obtain a specified sample size. In the NCHS Health and Nutrition Examination Survey, Cycle I, persons in four nutritionally high-risk sub-populations were oversampled - children, women in childbearing ages, the elderly, and persons with poverty level income. Although this would add some additional constraints to an already-complicated design, we believe the additional oversampling could be accomplished in any future applications.

Two comments about the estimation procedure are in order. First, the estimates of the population of California obtained from the first two stages of inflation were excellent. This points up the advantages to be gained from the rigorous application of probability sampling and estimation. Secondly, the post-stratification ratio adjustment to known subclass totals defined by age, color, and sex variables is extremely useful in sharpening the precision of the estimates.

A final concern about this paper which must be mentioned is the high nonresponse adjustment factor for the Asians shown in Table 5. After going to all the trouble and expense to locate the Asian households for this survey, one would hope to attain a higher response rate among these groups. The additional precision attained by successfully identifying these households is lost if they fail to respond to the survey.

Connecticut. The conclusion of the Connecticut paper, as humorously stated by the speaker, is that the best interviewers are not necessarily middle-aged women! We consider this a great step forward for men's liberation! But seriously, we found this paper to be a very interesting attempt at explaining interviewer performance from available data. It does not appear, however, that demographics and, to some extent, even training have as great an impact on response as was expected. We do not find this too surprising. Experience has shown (see, for example, NCHS Series 2, No. 26, 1968) that what really affects response is the rapport that is created between the interviewer and the respondent. Since this is basically a function of behavioral and attitudinal characteristics of the interviewers and respondents, we suggest a look at these kinds of variables in future studies.

Georgia. This paper gives a basic description of the sample design for the statewide survey and for a related smaller study in six rural counties. We have two comments.

(1) There are so many substrata (38) that a sample size of 1,000 households will probably be spread too thinly to allow for any analytical breakdowns by strata without some collapsing. One way to minimize this problem in future designs would be the use of controlled selection of households within strata. This is an ideal technique to use in selecting units when the sample size is small and the number of constraints is large.

(2) The problems of incorporating the extra sampling units from the Fort Valley Survey into the statewide survey could cause some bias due to oversampling in the Fort Valley counties. The problem is similar to one discussed by French, Sanchez, and Brock (1980). There are a number of possible alternative ways of incorporating these extra units into the Statewide survey in such a way as to minimize the bias while improving the precision of the state estimates. Incidentally, this type of consideration is becoming common among large surveys as small geographic units are beginning to "piggyback" survey efforts by larger governmental agencies. We should try to take advantage of these samples whenever possible.

Maryland. This paper discusses quality control of the collection process, an area that receives too little attention. We found very interesting the results on duplicated second and third blood pressure readings, terminal digit preference, and the clever device for measuring these quantities. We wonder if a relatively short training period for non-medically trained interviewers is sufficient for taking blood pressure readings in an unsupervised setting in a household. We also wonder if other states in this program have had similar experiences with terminal digits and/or duplicated second and third readings.

A second point concerns the sampling frames - there may be some overlap in the frame of older housing units and the frame developed from new construction. If there is overlap, it should be evaluated and taken into account in the estimation process.

A very important comment concerning the reinterview is that whether or not it is actually done, the fact that the interviewers know that it might be done is what makes the procedure really work.

South Carolina. This paper is interesting from the point of view of the continuing survey, which is more like the NCHS National Health Interview Survey than any of the other statewide surveys. One aspect in need of some clarification is the "simplified variance estimation" technique. If the "concurrent sample periods" are from different parts of the state, then what is being measured may be between stratum variance rather than total variance, but this was not clear to us.

Regarding the comparisons between Federal government surveys and statewide surveys with respect to periodicity, the differences are not really as great as one might expect. While national surveys do extend over a period of time, they are generally under pressure to make the data available to the public as soon as possible. A second point is that there is probably less flexibility in federal surveys than might be imagined. Once a survey operation is underway and functioning well, it is difficult to make changes. Finally, on the matter of

trend detection, we believe that this is going to depend - to a greater extent in the future - on the use of more sophisticated modelling techniques. Some recent developments in time-series analysis are being studied for the feasibility of their application to some of our data systems.

Once again, we wish to congratulate the chairman and speakers for an excellent session on statewide hypertension surveys. We wish all of you continued success in your future efforts in these studies.

#### REFERENCES

1. National Center for Health Statistics (1968). The Influence of Interviewer and Respondent Psychological and Behavioral Variables on the Reporting in Household Interviews. Vital and Health Statistics, Series 2 - No. 26, Washington, D.C., U.S. Government Printing Office.
2. French, D.K., Sanchez, M.J., and Brock, D.B. (1980). Incorporating Supplemental Sample Data into a National Survey. To appear in Proceedings of the American Statistical Association, Section on Survey Research Methods.