

### THREE SURVEY FIELD TESTS LINKED TO THE NATIONAL HEALTH INTERVIEW SURVEY

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#### Introduction

Several years ago, the National Center for Health Statistics (NCHS) embarked on a long-range program to integrate the designs of its national household sample surveys. This strategy appears to offer opportunities for substantial gain in the overall efficiency of the integrated surveys. The basic concept of the proposed integrated design strategy is that the National Health Interview Survey (NHIS) sample serve as the sampling frame for other NCHS household surveys.

Sirken and Greenberg [1983] described NCHS's Integrated Survey Design (ISD) program in more detail. Waksberg and Northrup [1985] and Cox, et al. [1986] respectively presented provisional effect estimates of design strategy alternatives, based on statistical modeling, for linking the National Survey of Family Growth (NSFG) and the National Medical Expenditure Survey (NMES) with the NHIS.

The ISD encompasses the concept of a Targeted Followup Survey (TFS) where particular subsets of NHIS respondents are identified and recontacted for additional information. Epidemiological studies, cohort analyses, case studies, and studies of selected target populations are feasible under the TFS concept. The first TFS, the Longitudinal Survey on Aging (LSOA) is based on a 1984 NHIS current health topic on the health and health care of the aging population. For all linked surveys, linkage to the NHIS facilitates sample selection, reduces costs, and enriches the analytic data base.

To date, four linked survey designs have undergone field testing. White and Mathiowetz [1985], Bercini, et al. [1985], Snowden [1985], and Kovar and Fitti [1985] describe linked survey field tests for, respectively: the NMES, the NSFG, a Linked Telephone Survey (LTS), and the LSOA. Some results from the NMES, NSFG, and the LSOA linkage tests are presented by Mathiowetz, et al. [1986], and Berk, et al. [1986]. This paper is also concerned with those three tests.

The biggest potential roadblock to the ISD strategy would be a low response rate to the linked survey. One of the primary goals of each ISD field test has been to examine the probable response rates of a variety of subpopulations under a variety of survey conditions.

During the first weeks of field work for the NMES linkage experiment, interviewers reported an unexpected degree of resistance from respondents. Although part of this resistance was in the form of tentative or initial refusals in cases with a reasonable probability of conversion in the early field results suggested that the linked NMES was not being received as readily as had been the case with two earlier studies that tested the linked approach.

Linked sampling had been previously tested in a field trial of procedures for the National Survey of Family Growth and in a pretest of the Longitudinal Survey On Aging. Both of these studies provided encouraging evidence that

respondents who cooperated in the NHIS would cooperate again if contacted for additional interviews. The early results from the NMES field trials were not so encouraging and prompted questions about the differences between the NMES on the one hand and the other two linked surveys on the other.

Note that this paper focuses on preliminary NMES results. In the weeks since the initial reports became available, the level of response to the NMES increased, and the final differences between the NMES and the other studies were not as dramatic as they first appeared. Note also that what follows documents a highly speculative process of hypothesis formation in the absence of complete information. This comparison explores the identification of factors that may have contributed to differences in early response rates; some differences between the surveys were clearly more likely to have had an effect than others, but early in the field period there were no solid grounds to justify going beyond the identification of possible contributing factors.

#### Prior Notice of Followup

One striking difference between the NMES and NSFG linkage field trials was that all households contacted for the NSFG linkage trials had signed waivers at the conclusion of the NHIS interview, granting permission for their names to be used in selecting respondents for a subsequent survey. No waivers were obtained from respondents for the NMES; at the conclusion of the NHIS interview, members of these households were simply told that they might be contacted again for further information and were given a letter of thanks, the last paragraph of which contained the statement: "The National Health Survey will be collecting information on other aspects of health, and it is possible that we may wish to ask you for further cooperation at some time in the future."

Overall, Census interviewers obtained signed waivers from 84.6 percent of the NHIS households. Although the NHIS respondents undoubtedly had a variety of reasons for refusing to sign the waivers needed for the NSFG linkage trials, it seemed likely that at least some of the households refused because they had found the NHIS interview to be an experience that, for whatever reason, they would prefer not to repeat. The 84.6 percent rate for obtaining the waivers probably overstates potential resistance to a followup survey. During the first quarter in which they requested them, Census interviewers were successful in obtaining the waivers in only 78.3 percent of the households. Their success rate improved in each of the succeeding three quarters, and reached 90.9 percent in the last quarter. This suggested that some portion of the initial reluctance to sign the waivers was due to procedural factors relating to the way in which the request was presented, rather than to genuine resistance to participation in a future survey.

Although one could not assume that all of the 9.1 percent who refused the waiver during the

final quarter did so as a way of refusing participation in a further data collection activity, it seemed reasonable to assume that that was precisely the basis for some portion of these refusals. Some respondents who would likely have refused the linked NSFG interview were thus eliminated from the NSFG sample by the waiver procedure. Therefore, to obtain an appropriate figure for comparison with the NMES experiment, the 83.5 percent response rate achieved in the NSFG field trials required adjustment by a factor representing the refused waivers.

In the households who signed them, the waivers may have served a positive function in gaining cooperation during the NSFG field trials. The NSFG interviewers carried copies of the signed waivers and reported that their ability to show the respondent the document that had been signed for the household was often very helpful in gaining cooperation.

The results of the Census' followup study of older respondents in the LSOA pretest, however, seemed to undermine the significance of the signed waiver. The Bureau of the Census had conducted the original interviewing for the NHIS and no waivers were required for Census interviewers to recontact a sample of the NHIS households for the LSOA. Respondents for the LSOA pretest were selected from households interviewed during the second quarter of the 1983 NHIS; these households had not been told that they might be recontacted for a future survey. With no notice given at the time of the NHIS interview and without signed waivers, the Census Bureau interviewers obtained a 93.4 percent response rate in the followup LSOA.

Even more impressive was the fact that none of the nonresponse experienced during this pretest was attributable to refusals. Only 3 of the 350 persons selected for the comparable portions of this study refused the initial request for an interview, and these three cases were all subsequently converted to partial completes. There was, apparently, no significant resistance to participation in this study.

The results of the LSOA were particularly striking in contrast to the initial NMES results for households containing elderly members. The LSOA respondents were all age 55 or older. Households with members age 65 or older constituted about 30 percent of the NMES sample, and in the preliminary NMES results, these households with elderly members were cooperating at lower rates than other sample groups.

There may have been some advantage in the fact that, for the LSOA, the same organization that conducted the NHIS interviews conducted the followup. Perhaps of even greater advantage was the fact that the organization in question was the Bureau of the Census, which typically achieves higher response in rates than private survey research organizations.

### Advance Letters

There was a second way in which prior notice of followup could have affected the three studies in question. Respondents for all three surveys received advance letters notifying them that they had been selected for an additional data

collection effort and informing them that an interviewer would be contacting them in the near future. Letters to the NMES respondents were addressed to the "John Jones Family," the name inserted being that of the reference person identified during the NHIS interview. All letters to LSOA respondents, on the other hand, were addressed to a specific, named individual. If two persons in a household were selected, both received advance letters. This additional personalization, possible in a survey that was directed to individuals rather than to a family or other reporting group, may have had some impact.

In the report on the LSOA pretest, Kovar and Fittl [1986] cite the advance letters as an important factor contributing to the study's success. The notion that the degree of personalization in the advance letters may have had some effect is countered, however, by the results of the NSFG linkage experiments. For half of the NSFG sample -- the "sampled woman" group -- the advance letters were addressed to a specific individual. For the other half -- the "household" sample -- the letters were addressed as in the NMES field trials, to the "John Jones Family." The response rate for this latter group (those who received the less personalized letter), was slightly higher than that for the group receiving the more personalized version. The difference in response rate was quite small and was not statistically significant, but the absence of a difference suggested that it was not the degree of personalization in the respective advance letters that accounted for the difference between the LSOA and NMES trials.

The letters used in the three studies necessarily differed in content in a variety of ways, but there were several aspects of the letter used for the LSOA pretest that stood out in even a brief comparison with that used for NMES. The LSOA letter was noticeably shorter than the NMES letter; it was also more simply worded and contained none of the explanation of the two-staged sampling procedure that was in the NMES letter.

The LSOA letter also indicated a direct link in content between the NHIS and the coming followup study; "The information (obtained in the NHIS) helped us to learn more about the health of people 55 years old or over and how they handle their health problems. Now we need to find out how their health and living arrangements have changed ..." The advance letter for the NMES did not attempt to present the study as an extension or continuation of the earlier NHIS interview. This approach was taken, at least in part, to minimize the likelihood of questions about the nature of the confidentiality afforded the information given in the NHIS. Such questions were perhaps less likely to arise in the LSOA, in which data collection for both surveys was conducted by the same organization, the Bureau of the Census.

The NMES advance letter described the new study as one dealing with medical care and medical care costs; potential respondents may have seen little difference between these topics and those asked about in the NHIS. There was neither an apparent natural continuity or progression of subject matter from one study to the next, nor a clear indication that the followup study would address new or different subjects (such as reproductive

health). It may have been difficult for NMES respondents to see any connection between the NHIS and the NMES beyond the fact they had participated in the former and, having been found to be cooperative once, were now being asked to participate again.

The NMES letter provided an explanation of the fact that the households had been selected from the NHIS sample, an explanation that varied according to whether a reporting unit had been designated for treatment as a household or housing unit. The letter did not, however, attempt to justify the linked approach in terms of cost or sampling efficiencies.

In summary, some respondents may simply have seen no difference between what they had gone through for the NHIS and what they were being asked to go through again for the NMES. If their recollections of the NHIS were less than pleasant, their attitudes toward the prospective NMES were likely to be colored accordingly. Respondents who cooperate once out of a sense of civic responsibility or obligation may be less likely to continue to cooperate in new or essentially unrelated studies if they have no particular interest in the subject matter of the new study, have no unique role based on their earlier participation, and feel that the burden of civic responsibility ought to be more equally shared.

#### Respondent Burden

Respondent burden was substantially less in the NSFG and LSOA linkage studies than in the NMES. The NSFG linkage test interview required about 15 minutes and contained none of the more sensitive items asked in the full NSFG. The LSOA interviews required an average of only 6.5 minutes per respondent. The NMES interview, in contrast, frequently required more than an hour to complete and made substantial demands on respondents to recall the dates and other details of health care events. Although many refusals take place before an interviewer has had any opportunity to explain the nature and duration of the requested interview, whenever an interviewer gets beyond the first exchanges with a reluctant respondent there is considerable advantage in being able to say that the interview will take only a few minutes. The advance materials for the LSOA, moreover, mentioned specifically that the interview would be "short" and that it would take less than 10 minutes; the NMES letter made no mention of the length of the interview.

There were also differences in the household member targeted as respondent for the different linked surveys. Typically, the NMES interview required information on all household members, and the initial NMES contacts were directed to the person who responded to the NHIS interview. For the other surveys, this sometimes was not the case. The NSFG linkage study targeted a single respondent per household, a female of childbearing age. The LSOA targeted only individuals who were 55 or older. In the NSFG and LSOA households, therefore, the person contacted for the linked study could be different from the person who had provided answers during the NHIS interview. Recollection of the burden of the NHIS interview (which itself may take over

an hour to complete) by the person contacted for the new survey may therefore have been more of an obstacle to the NMES than to the other linkage studies.

Among those who initially refused the NMES interview, several respondents made comments to the effect that they had done their part before, that the earlier effort had been too great, or that they did not want to do it "again." These comments suggested that there was some carryover of the real or perceived burden of the NHIS to the prospective new survey.

Another aspect of respondent burden considered was the length of the interval between NHIS and the linked survey. The minimum interval between the NHIS and the LSOA pretest was approximately 14 months; for the NMES, in contrast, the minimum interval was about three months. An elapsed time experiment in the NSFG linkage study, however, found little or no effect associated with the interval between NHIS and the linked survey.

#### Samples

A major difference between the NMES and the other two linked studies was the nature of the samples selected for them. All respondents for the NSFG sample were women of childbearing age; blacks were oversampled, but there was no oversampling for low-income populations. For the LSOA, all respondents were age 55 or older and all resided in households that had provided a telephone number during the NHIS interview. Race and economic status were not used as a basis for sample selection in the LSOA pretest. The NMES linkage sample, in contrast, included heavy oversampling for black, Hispanic, elderly, and low-income households. In order to reach the desired sample sizes for the population groups of interest in the NMES, households were not excluded if respondents had failed to give a name or telephone number to the NHIS interviewer, as was the case with the LSOA.

Many of the households selected for the NMES, moreover, were in low-income inner city areas where personal interviewing is always difficult. Although in this respect the contrast between the NMES and the NSFG linkage study was somewhat muted because many of the NSFG respondents were also in inner city areas, the contrast between the NMES and LSOA did seem important. In inner city areas elderly respondents may be particularly reluctant to open their doors to a stranger. Gaining access to respondents in such areas was not a problem for the LSOA, which was conducted by telephone.

Although the "difficult areas" notion may help to explain differences in results obtained by phone and in person, nevertheless the NMES respondents living in these difficult areas had cooperated previously with the NHIS interviewer. The nature and quality of cooperation could vary tremendously, however. A skilled interviewer may have been able to draw a reluctant respondent through one interview, but if the interview was long and difficult (as an interview dealing with the health experiences of elderly respondents could be), the experience may have been one that the respondent would not repeat.

## Interviewer Skill

One other possible source of differences among the three linked studies was the skill and experience of the interviewers who participated in the data collection. The LSOA pretest report stressed the level of experience and motivation of the staff who conducted the telephone interviewing and pointed to these factors as important components in the survey's success. The field staff assembled for the NMES field trials was also highly skilled; as a group, these interviewers possessed a breadth of experience that would be difficult to match. Several of them had worked on the earlier NSFG linkage test as well as previous cycles of the full National Family Growth Survey, and others had experience with the earlier National Medical Care Expenditure Survey (NMCES) and National Medical Care Utilization and Expenditures Survey (NMCUES).

Indeed, the comments offered by these interviewers on the difficulty of their assignment and the resistance of some respondents to further participation seemed at the time of this review to be the strongest evidence that it was the nature of the NMES sample with heavy oversamples of low-income residents of the inner city areas of Los Angeles, Chicago, and Detroit that was the major factor in the level of nonresponse experience in the early part of the field period.

## Field Procedures

In addition to testing the basic concept of linked sampling, both the NMES and the NSFG field trials tested several different methods of identifying sample units and of making initial contacts with them. In efforts to estimate the costs associated with these different procedures, the interviewer assignments for both surveys were organized so that all cases in a given assignment were of the same type. For the NSFG linkage test, there were two assignment types, based on whether a case was to be contacted by telephone or in-person. For the NMES, there were four assignment types, based both on mode of contact and sample unit designation. One consequence of these groupings for the NMES was an increased demographic heterogeneity within assignments and a decrease in the extent to which interviewers and their intended respondent could be matched on characteristics such as race or Hispanic origin.

Several of the early refusals in the NMES field trials occurred in situations in which the interviewer and respondent were of different races and it was possible that this difference may have contributed to the refusals. To minimize the possible impact of such differences, cases were subsequently reassigned, where possible, to achieve a better matching of interviewer and respondent.

## Summary

The discussion above is intentionally somewhat rambling. It presents an accurate picture of one aspect of survey management; that of a priori formation of hypotheses to provide explanations for unexpected preliminary survey results.

The result of this exercise was the identification of eight major potential explanatory factors for low early response in the NMES linked survey field test. These factors are listed in Figure 1 and compared by survey in Table 1. Also, the last column of Table 1 presents the potential explanatory power assigned to each factor at the time of the comparison exercise described above.

### **Figure 1. Potential Explanatory Factors**

1. Prior notice of followup
2. Data collection agent
3. Advance letters
  - a. Addressee
  - b. Length
  - c. NHIS complement
  - d. New topic
4. Respondent burden
  - a. Length of interview
  - b. Respondent
  - c. Sample unit
  - d. Followup interval after NHIS
5. Target population characteristics
6. Chief mode of interview
7. Interviewer skill
8. Number of interviewer assignment types

Finally, Table 2 shows the raw and adjusted overall response rates from all three surveys. From Table 2 with the benefit of hindsight, we have arrived at the following conclusions:

- 1) The assumption that both the NSFG and the LSOA tests had yielded response rates substantially higher than the early NMES linkage test was incorrect. In fact the NSFG rate, when properly adjusted for both original NHIS nonresponse and waiver refusals, was 69 percent.
- 2) In spite of having a positive influence on conditional response, the waiver process turned out to actually harm the final adjusted response rate. This is a reasonable and unsurprising effect.
- 3) The low initial response rates in the NMES test were probably due to some combination of the factors in Figure 1, however, these effects were not strong enough to preclude successful refusal conversion efforts.

## References

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**Table 1. SUMMARY OF POTENTIAL EXPLANATORY FACTORS BY SURVEY**

Factor	Linked Field Test			Potential Explanatory Power†
	NSFG	LSOA	NMES	
Prior notice of followupt††	vague	signed waivers	none	very high
Data collection agent	Westat	Census	Westat	high
Advance letters				
Addressee	individual or family	individual	family	low
Length	average	short	long	medium
NHIS complement	yes	yes	no	high
New topic	yes	no	no	high
Respondent burden				
Length of interview	15 min. selected	6.5 min. selected	60+ min. NHIS	low
Respondent	individual	individual(s)	respondent	medium
Sample unit	individual	individual(s)	household	medium
Followup interval	varied	14 months	3 months	low
Target population characteristics				very high
Black oversample	yes	no	yes	*
Hispanic oversample	no	no	yes	*
Age target	15-44	55+	65+ over-sampled	*
Sex target	female	both	both	*
Poor oversample	no	no	yes	*
Urban oversample	yes	no	yes	*
Telephone required	no	yes	no	*
Chief mode of interview	personal	telephone	personal	low
Interviewer skill	high	high	high	low
Number of interviewer assignment types	2	1	4	medium

†Subjectively assigned.

††At the time of the NHIS interview.

\*Individual components not evaluated.

**Table 2. FINAL ADJUSTED RESPONSE RATE BY SURVEY**

Factor	Linked Field Test		
	NSFG	LSOA	NMES
Raw response	.84	.93	.84
NHIS Adjustment <sup>1</sup>	.96	.96	.96
Waiver Adjustment <sup>2</sup>	.85	0	0
Adjusted response	.69	.89	.81

<sup>1</sup>Adjustment for NHIS 4% nonresponse rate.

<sup>2</sup>Adjustment for 15% of selected NHIS respondents who refused to sign the NSFG waiver when asked.