RESULTS OF A FIELD TEST LINKING THE NATIONAL SURVEY OF FAMILY GROWTH TO THE NATIONAL HEALTH INTERVIEW SURVEY

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INTRODUCTION

The National Center for Health Statistics conducts four national household surveys, including the National Health Interview Survey (NHIS) and the National Survey of Family Growth (NSFG). In the past, the sample designs for these surveys have been independent. However, several years ago, the Center embarked on a long range research program to integrate or link the designs of the household surveys.[3]

The cornerstone of the integrated design program is that the NHIS, the largest of the Center's household surveys, will serve as the sampling frame for the other, smaller surveys. The NHIS is a continuous survey, whereas the others are conducted on a periodic basis. The next cycle of the NSFG is planned for 1987 and is the first of the periodic household surveys that will be linked to the NHIS.

Earlier theoretical research has shown that linking the designs of the NHIS and the NSFG would result in considerable cost savings and design efficiency.[4] The NSFG is a survey of the reproductive history and plans of women between the ages of 15 and 44. In order to select a sample of eligible women, past cycles of the survey required a household screening phase which yielded one selected woman for every four housing units sampled. By using household composition information from NHIS interviews to replace the household screening phase, screening costs could be vastly reduced.

Although the benefits of integrating the samples of the two surveys seemed clear in theory, the effects of linkage on response rates, costs, and operational feasibility still needed to be tested. This paper reports on the results of field trials which tested alternative design strategies for using the NHIS as the sampling frame for the NSFG.

SAMPLE DESIGN AND METHOD

The vehicle for the field trials was a twenty minute face-to-face interview called the Reproductive Health Survey (RHS). The RHS served as a surrogate for the much longer and more complex NSFG, but sampled the same population subdomain, women between the ages of 15 and 44. Similar to past NSFG's, the RHS also oversampled black women.

The sampling frame for the RHS consisted of about 2,200 NHIS housing units in ten NHIS Primary Sampling Units (PSU's) with relatively large black populations: two Los Angeles PSU's, three Washington, D.C. PSU's, and five southeastern PSU's including Memphis, Tennessee, Columbia, South Carolina, and rural areas of Virginia, Maryland and North Carolina. These households were interviewed for the NHIS between October 1983 and October 1984. The six month field period for the RHS began in August 1984.

All NHIS housing units in the sampling frame that contained an eligible woman, that is a woman between the age of 15 and 44, were sampled for the RHS, as well as 240 housing units with no eligible woman in residence. Of these 1,300 housing units, more than half were in the Los Angeles PSU's, a difficult interviewing area for most survey organizations. About one quarter of the sample consisted of black housing units.

For the field trials, two sampling unit options and two modes of initial contact were selected for study. In each case, a new method made possible by the linked design was compared, on the basis of response rates and level of effort, to a method somewhat similar to that used in past NSFG's.

Table 1 shows the combinations of design options tested and the sample sizes for each. Each option has potential strengths and weaknesses that were investigated in the field trials. The sampling unit comparison involved a sample of women versus a sample of housing units. The sample of 536 women was selected from NHIS household composition information so that the sampled women would be in the appropriate age range at the beginning of the RHS field period. The strength of this sampling option is that no costly screening interviews are needed. The corresponding weaknesses are that movers must be traced and, if possible, interviewed at their new addresses and that NHIS nonrespondents are eliminated from the sample frame. Not only are tracing costs incurred, but there is also the potential for sample loss with this option.

The sample of housing units, on the other hand, does not require that movers be traced. A sample of eligible women is selected from the residents at the NHIS addresses at the time of the second survey. The disadvantage of this option is that a screening interview is required to identify eligible women and select the sample. To avoid bias, both eligible households - that is, households containing an eligible woman at the time of the NHIS, and ineligible households - households containing no eligible woman - must be included in the sample of housing units. In a linked design, however, eligible units may be sampled at a much higher rate than ineligible units.

For both field trial sampling unit options, only one eligible woman per household was selected for the RHS interview. In households that contained more than one eligible woman, the youngest woman was sampled. Because younger women are more mobile and because parental consent was required for women under 18, we expected that a more youthful sample would provide more experience with difficult cases.

The second set of design options compares two modes of initial contact, by telephone and in person. Since the household telephone number is obtained in the NHIS interview, in a linked survey the telephone can be used for screening households and for making appointments to conduct the main interview. In the past, all NSFG screening interviews were conducted in person. The strength of the telephone as a mode of initial contact is its potential for reducing interviewing costs. Its weakness is the potential for higher refusal rates.

All sampled households and sampled women received an advance letter describing the RHS. Following the letter, a random half of both samples was contacted by telephone and the remaining half in person. For the housing unit sample, the initial contact by both modes included the screening interview during which an eligible woman (if one was in residence) was selected. If the contact was made in person, the interviewer attempted to conduct the extended interview on the same visit. For the sample of women, interviewers used the telephone contact to set up an appointment to conduct the extended interview in person. If the sampled woman had moved, the interviewer asked for tracing information.

The final design feature compares two elapsed time periods between the NHIS and the RHS, one to six months and seven to fifteen months. (Ninety-nine percent of cases were recontacted within one year of the NHIS interview.) The advantage of a longer elapsed time is that sufficient sample cases can be accumulated from the NHIS to permit a more compressed, efficient field period for the subsequent survey. However, longer elapsed times also allow for greater mobility among sampled women and more changes in household composition. Also, length of elapsed time may be related to respondents' willingness to participate in another health survey.

RESULTS

Response Rates

The design of this study has several features which limit inferences that can be drawn from the results. The sample was restricted to those NHIS households in which respondents signed waivers authorizing release of their names and addresses for a second survey.[1] About 15 percent of interviewed NHIS households refused to sign the waiver, raising the possibility that that the field trial sample was composed of compliant respondents more likely to participate in a second survey. A related limitation is that housing units which did not respond to the NHIS interview could not be included in the field trial sample. Lastly, the field trial sample was not a national sample, as noted earlier.

Later reports on this study will compare weighted field test response rates to those obtained in the last cycle of the NSFG and will project those response rates to a national linked sample. The data shown in tables 2-4 are unweighted. However, these response rates are useful for comparing the effects of the various design features and their options.

The response rates for the two types of sampling unit were calculated differently. For the housing unit sample, the reported response rate is the product of the screening interview response rate and the extended interview response rate, where the

$$\text{Screener Response Rate} = \frac{\text{Number of Completed Screening Interviews}}{\text{Total Sample - Vacant Housing Units - Nondwelling Units}}$$

and the

$$\text{Extended Interview Response Rate} = \frac{\text{Number of Completed Extended Interviews}}{\text{Households Identified as Containing Eligible Woman in Screening Interview}}$$

The response rate calculation for the sample of women is more straightforward since no screening interview was necessary:

$$\text{Interview Response Rate} = \frac{\text{Number of Completed Interviews}}{\text{Total Sample of Women}}$$

The data shown in Tables 2-4 indicate that overall, the design feature variants have little effect on response rates. From Table 2, it is evident that total response rates obtained in the housing unit sample and the sample of women are equivalent, 84% and 82% respectively. Response rates do not differ significantly by race, either within or across sampling unit types.

Within the housing unit sample, ineligible households, particularly nonblack households, achieved a low response rate of 60%. Some explanation of this finding is needed. Ninety-five percent of the 113 households in this cell completed the screener, but only eight of these households proved to contain an eligible woman. Five of the eight attempted extended interviews were completed. Given such a small sample size, the 60% response rate is not as alarming as it seems.

Of greater concern is the 61% response rate for movers in the sample of women. Of the original sample of 536 women, 97 (18%) had moved from the original NHIS address, and five women had moved twice. (According to Census Bureau figures, the annual mobility rate for this population subdomain is approximately 24%.)[1]

Of the 97 movers in the field test, 59 were located and interviewed. Eleven were located but refused or were classified as some other form of nonresponse. Another six women had moved outside of the United States and three more moved so far from the field test PSU's that it was too costly to pursue them. The most striking result is that 18 of the 97 movers could not be located at all either by the Westat field staff or by a tracing agency which searched Credit Bureau and Department of Motor Vehicle records. Certainly, in a national study it would be much more cost effective to pursue movers beyond the PSU's in which they originally resided. But the findings do suggest that tracing difficulties should not be underestimated.

Table 3 presents the response rates obtained when initial contact is made in person versus over the telephone. Traditionally, survey researchers have been wary of using the telephone to screen households or to make appointments for fear that response rates would suffer. The field test findings do not support this fear. For both types of sampling unit, response rates for each contact mode are virtually identical.

(Mathiowetz et. al., have examined these findings in greater detail).[2]

The third design feature, elapsed time between the NHIS and the RHS, also appears to have little influence on response rates, as shown in Table 4.

Level of Effort

We have seen that, overall, there have been only minor differences between the design options when response rates are the dependent measure. Table 5 gives the results for another dependent variable - level of effort. Here, level of effort is defined as the number of telephone calls and the number of personal visits made per completed interview. For both the housing unit sample and the sample of women, the average number of personal visits needed to complete an interview is reduced by about 50% when first contact is made by telephone. As expected, the number of phone calls per completed case is substantially higher for the cases assigned to the telephone contact treatment. But considering the relative costs of telephone calls versus personal visits in terms of interviewer hours and travel expenses, substantial savings could be achieved by using the telephone for screening households or for locating sampled women and making appointments for the main interview.

For the sample of women, movers required nearly twice as many personal visits per completed interview as nonmovers, across both modes of initial contact. For the housing unit sample, ineligible households have a high visits to completed interview ratio because of the low proportion of eligible women residing in these households at the time of recontact. However, use of the telephone to screen these households reduced the number of personal visits needed to complete an interview by 60%.

CONCLUSIONS

Decisions have not yet been made as to the best combination of design options for linking the NSFG to the NHIS. As discussed above, the study design has several limitations which restrict inferences about the results that would be obtained in a national linked study. We can, however, note the following.

- Among households previously interviewed in the NHIS, response rates for a subsequent survey on reproductive health appear to be robust, varying little by type of sampling unit, mode of initial contact, or length of time between interviews.
- Use of the telephone to screen households and to make interview appointments does not adversely affect response rates and substantially reduces the level of effort required to complete an interview.
- Movers that can be located are as willing to participate in a second interview as nonmovers. However, a significant proportion of movers could not be located, despite the fact that the average elapsed time between the NHIS interview and the RHS was less than one year.

[1] This restriction was required because the NHIS sample was drawn from listings based on decennial census information. The redesigned NHIS sample, implemented in 1985, is an area sample. Respondent waivers will not be needed for future linked surveys.

REFERENCES

[1] Bureau of the Census, Series P-21, Nos. 305, 320, 321, 353, 368.

[2] Mathiowetz, N., Northrup, D., Sperry, S. and Bercini, D., "An Evaluation of Mode of Initial Contact for Personal Interviews," paper presented at the annual AAPOR meeting, May 1985.

[3] Sirken, M.G., and Greenberg, M.S., "Redesign and Integration of a Population Based Health Survey Program," Contributed Paper, 44th Session of the International Statistical Institute, Madrid, Spain, 1983.

[4] Waksberg, J., and Northrup, D., "Integration of Sample Design for National Survey of Family Growth Cycle IV with National Health Interview Survey," Final Report under contract 233-79-2024, prepared for Department of Health and Human Services, Public Health Service, National Center for Health Statistics, June 1983.

Table 1. Sample Sizes for Design Option Combinations

Sampling Unit	Mode of Initial Contact		Elapsed Time Between NHIS & RHS		Total
	In-person	Telephone	1-6 Months	7-15 Months	
Sample of NHIS Housing Units[1]	**376**	**377**	**396**	**357**	**753**
Eligible households	255	262	269	248	517
Ineligible households	121	115	127	109	236
Sample of Eligible Women	**267**	**269**	**257**	**279**	**536**

[1] The sample sizes shown for the NHIS housing unit sample do not include 25 units that proved to be vacant or non-dwelling units at the time of the RHS.

Table 2. Response Rates by Type of Sampling Unit and Race

Race	Housing Unit Sample[1]			Sample of Women		
	Eligible households	Ineligible households	Total	Nonmovers	Movers	Total
Total	84.1 (N=517)	71.2 (N=236)	83.7	86.8 (N=439)	60.8 (N=97)	82.1
Black	87.2 (N=115)	82.5 (N=123)	87.0	89.3 (N=103)	56.3 (N=16)	84.9
Nonblack	82.9 (N=402)	59.8 (N=113)	82.5	86.0 (N=336)	61.7 (N=81)	81.3

Table 3. Response Rates by Type of Sampling Unit and Mode of Initial Contact

Mode of Initial Contact	Housing Unit Sample[1]			Sample of Women		
	Eligible households	Ineligible households	Total	Nonmovers	Movers	Total
In-Person	84.6 (N=255)	65.9 (N=121)	83.6	85.1 (N=222)	62.2 (N=45)	81.3
Telephone	83.6 (N=262)	79.7 (N=115)	83.3	88.5 (N=217)	59.6 (N=52)	82.9

Table 4. Response Rates by Type of Sampling Unit and Length of Time Between NHIS and RHS

Time Between NHIS & RHS	Housing Unit Sample[1]			Sample of Women		
	Eligible households	Ineligible households	Total	Nonmovers	Movers	Total
1-6 months	83.8 (N=269)	70.9 (N=127)	83.4	85.5 (N=234)	60.9 (N=23)	83.3
7-15 months	84.0 (N=248)	71.6 (N=109)	83.6	88.3 (N=205)	67.6 (N=74)	82.8

[1]The response rates shown for the housing unit sample are the product of the screener interview response rate and the extended interview response rate. The sample sizes shown for the housing unit sample are the total number of housing units sampled minus 25 units that proved to be vacant or non-dwelling units at the time of the RHS.

Table 5. Number of Telephone Calls and Number of Personal Visits by Type of Sampling Unit and Mode of Initial Contact.

	Housing Unit Sample				Sample of Women			
	Eligible Households		Ineligible Households		Nonmovers		Movers	
	In-Person Contact	Telephone Contact	In-Person Contact	Telephone Contact	In-Person Contact	Telephone Contact	In-Person Contact	Telephone Contact
Number of Telephone Calls	162	825	40	267	182	819	127	322
Number of Personal Visits	913	498	251	71	757	411	198	143
Number of Completed Interviews	204	205	7	5	189	192	28	31
Number of Visits per Completed Interview	4.5	2.4	35.8	14.2	4.0	2.1	7.1	4.6