VITAL & HEALTH STATISTICS

Linking the National Survey of Family Growth With the National Health Interview Survey

Analysis of Field Trials

This report presents the results of field experiments that tested and evaluated alternative strategies for using the National Health Interview Survey as the sampling frame for the National Survey of Family Growth. Several design factors were tested, including two types of sampling unit, two modes of initial contact, and length of elapsed time between the two surveys. The criteria used in the evaluation were response rates, level of effort, and costs associated with the different design factors. The findings indicate that the experimental variables had little impact on response rates but differed significantly in level of effort and associated costs.

Data Evaluation and Methods Research
Series 2, No. 103

DHHS Publication No. (PHS) 87–1377

U.S. Department of Health and Human Services
Public Health Service
National Center for Health Statistics
Hyattsville, Md.
September 1987

Suggested citation

National Center for Health Statistics, N. Mathiowetz, D. Northrup, S. Sperry, and J. Waksberg: Linking the National Survey of Family Growth with the National Health Interview Survey: Analysis of field trials. *Vital and Health Statistics.* Series 2, No. 103. DHHS Pub. No. (PHS) 87–1377. Public Health Service. Washington. U.S. Government Printing Office, Sept. 1987

Library of Congress Cataloging-in-Publication Data

Linking the National Survey of Family Growth with the National Health Interview Survey: Analysis of field trials.

(Series 2, Data evaluation and methods research ; no. 103) (DHHS publication ; no. (PHS) 87–1377)
"March 1986."
"Prepared for: National Center for Health Statistics, Hyattsville, Maryland."
Supt. of Docs. no.: HE20.6209:2/103
1. National Survey of Family Growth (U.S.) 2. National Health Interview Survey (U.S.) 3. Family size—United States—Statistical methods. 4. Fertility, Human—United States—Statistical methods. 5. Birth control—United States—Statistical methods. I. Mathiowetz, Nancy A. II. Westat, inc. III. National Center for Health Statistics (U.S.) IV. Series: Vital and health statistics. Series 2. Data evaluation and methods research ; no. 103. V. Series: DHHS publication ; no. (PHS) 87–1377. [DNLM: National Survey of Family Growth (U.S.) 2. National Health Interview Survey (U.S.) 3. Evaluation-Studies. 4. Family Planning—United States. 5. Health Surveys—United States. 6. Research Design. W2 A N148 vb no.103]
RA409.U45 no.103 362.1'0723 s 86–600390
[HQ766.5.U5] [306.8'5'0723]

Preface

This is the third report presenting results of research on the effects of integrating the designs of the National Center for Health Statistics (NCHS) national household sample surveys, which heretofore were designed as independent surveys. Design integration is accomplished by using the files of the National Health Interview Survey (NHIS), the largest and only continuous NCHS population survey, as the sampling frame for NCHS's other population surveys. Model-based predictions about linking the National Survey of Family Growth (NSFG) and the National Medical Expenditure (NMES) to the NHIS were presented in two earlier reports in this publication series.

Cycle IV of the National Survey of Family Growth, scheduled to begin in 1987, will be the first periodic household survey to use the NHIS as a sampling frame. The decision to link the two surveys was made on the basis of the findings presented in this report and the previous report, "Integration of Sample Design for the National Survey of Family Growth, Cycle IV, With the National Health Interview Survey," Series 2, No. 96. Through statistical modeling techniques, the earlier report indicated that significant economies would be realized by linking NSFG to NHIS because NSFG requires a substantial oversampling of households with black females. This report presents the results of a field experiment concerning the linkage of NSFG to NHIS in which the effects of several design options on response rates, level of effort, and associated costs were measured. The findings indicate that it is operationally feasible to link the two surveys and that selected design options will indeed result in significant cost efficiencies.

Dr. Monroe Sirken, Associate Director, Office of Research and Methodology, developed the Integrated Survey Design program at NCHS. I provided technical oversight to Westat, Inc., the contractor that performed this study. Sandra Sperry, Doris Northrup, Joseph Waksberg, Nancy Mathiowetz, and Susan Rieger of Westat did an excellent job on the theoretical, analytical, and operational aspects of this project. The success of the project was dependent on the cooperative efforts of several NCHS programs. I am grateful for the contributions of Robert Fuchsberg, former Director, Division of Health Interview Statistics; Dr. William Pratt, Chief, Family Growth Branch; Dr. Christine Bachrach, Family Growth Branch; and Patricia King, Data Preparation Branch. Robert Mangold, Chief, Health Survey Branch, U.S. Bureau of the Census, also deserves special recognition for enlisting and coordinating the participation of three regional offices of the U.S. Bureau of the Census.

Deborah Bercini
Statistician
Office of Research and Methodology

Symbols

- - -	Data not available
. . .	Category not applicable
-	Quantity zero
0.0	Quantity more than zero but less than 0.05
Z	Quantity more than zero but less than 500 where numbers are rounded to thousands
*	Figure does not meet standard of reliability or precision
#	Figure suppressed to comply with confidentiality requirements

Contents

Appendixes

Linking the National Survey of Family Growth With the National Health Interview Survey

by Nancy Mathiowetz, Doris Northrup, Sandra Sperry, and Joseph Waksberg

Chapter 1 Summary

Background

The National Survey of Family Growth (NSFG) is a periodic survey administered by the National Center for Health Statistics (NCHS) to provide a wide range of information on factors influencing trends and differentials in fertility, family size expectations and preferences, family planning practices, sources from which family planning services are received, and those aspects of maternal and child health that are very closely related to childbearing and family planning.

The design of the NSFG evolved from four surveys conducted from the mid-1950's to 1970, the Growth of American Families Surveys in 1955 and 1960 and the National Fertility Studies in 1965 and 1970. The first cycle of the NSFG was conducted in 1973 by the National Opinion Research Center with approximately 9,800 women in the childbearing ages, including ever-married women and single women with children of their own in the household. The second and third cycles were conducted by Westat, Inc., in 1976 and 1982–83, respectively. The second cycle again focused only on ever-married women and single women with their own children living with them. Cycle III of the NSFG introduced an important new approach to the national fertility surveys. For the first time, the sample included all women in the childbearing years, regardless of marital status; women who had never been married and had no children of their own living with them were included.

The limitation of the NSFG sample to women of childbearing age, defined as women 15–44 years of age, requires that the fieldwork begin with a large screening operation to identify eligible respondents for the survey. The sampling work to be completed during the screening operation is further affected by analytical requirements for specific population subgroups, which may result in oversampling of those groups of interest. Screening has had a great effect on the cost of conducting the NSFG studies. As a means of substantially reducing or eliminating the need for screening to identify eligible respondents, NCHS is investigating means by which the National Health Interview Survey (NHIS) can be used as the sample frame for the NSFG.

The NHIS is a continuous household interview survey that collects data from approximately 50,000 households in a calendar year. Until recently the sample design of the NHIS survey involved an area and list frame based on decennial census information. Because decennial census information is confidential, the NHIS sample could not be used as a sampling frame for the NSFG. The NHIS sample has been redesigned, allowing NCHS to investigate the potential effects of using the NHIS as the sampling frame for the NSFG survey design.

The purpose of this report is to present results from an experimental study designed to investigate several means to integrate the design of the two studies. Several alternative strategies are evaluated, including type of sampling unit, mode of initial contact, and length of elapsed time between the two surveys. The criteria used in the evaluation include levels of response rates, level of effort, and costs associated with the different design factors.

Methods

The design of the Reproductive Health Survey (RHS) includes three experimental factors: Type of sample unit (housing unit versus sampled woman), mode of initial contact, and length of time between the NHIS and RHS interviews. When a case was assigned to the housing unit sample, the housing unit was screened again for the RHS, and eligible women were chosen from the household enumeration at that time. The housing unit sample consisted of housing units that at the time of the NHIS interview included a woman eligible for the RHS (eligible housing units) and housing units with no eligible woman (ineligible housing units). Both types of unit were included in the sample to examine the effects of eligible women moving between the two survey field periods. When a case was assigned to the selected woman sample, an eligible woman from the NHIS was identified and interviewed regardless of whether she had moved since the time of the NHIS interview. Movers were traced, and attempts were made to interview them at the new location.

Mode of initial contact was randomly allocated within the type of sample unit with 50 percent of the cases initially contacted by telephone to complete the screener interview (housing unit sample only) or to set up an appointment. The remaining 50 percent were initially contacted in person by an interviewer.

All cases were sent a letter prior to any contact and all extended interviews were conducted in person. The final experimental measure, elapsed time between the NHIS and RHS interviews, is a continuous measure, ranging from 1 to 15 months.

Two demographic measures are used throughout the analysis to evaluate potential differential effects of the experimental factors on population subgroups. Race and marital status were designated as the two factors for which it was most important to understand the impact of different field procedures.

The dependent measure of primary interest for this analysis is response rates. Response rates are calculated differently for the housing unit sample and selected woman sample. The different calculations arise because all cases assigned to the housing unit sample are initially required to complete a screener interview to determine eligibility, whereas there is no such need in the person sample since eligibility is determined by the NHIS interview. Details concerning the calculations are presented in chapter 4 and definitions of terms are given in appendix I.

The two other measures used to evaluate the alternative designs are level of effort and costs. Level of effort analysis includes several measures, for example, total number of telephone calls and total number of personal visits, with particular emphasis given to the number of personal visits per completed interview. This measure, coupled with cost measures, provides a means for evaluating the most cost-efficient approach to integrating the two surveys.

Findings

The findings from this experimental study are presented in detail in chapter 5 and are outlined in the remainder of this chapter. There are several ways in which the RHS was different from a regular cycle of NSFG or from the procedures likely to be used for an NSFG design linked to NHIS. First, the sample for the RHS was drawn from NHIS households in which a household member had signed a waiver permitting release of sample information. This procedure was required because at the time of the RHS, the NHIS was still using the decennial census listings as its sample frame. Waivers will not be required in the future for an NSFG design linked to NHIS. Second, the RHS questionnaire was significantly shorter, less complicated, and contained fewer sensitive items than the NSFG questionnaires.

Although the first two differences might result in a higher response rate for the RHS than for a future linked NSFG, a third difference may have influenced the response rate for the experimental study in the opposite direction. The RHS was limited to 10 sample primary sampling units with a majority of the cases coming from the Los Angeles and Washington, D.C., metropolitan statistical areas. These traditionally are very difficult areas in which to interview and may result in lower response rates than would be expected for a national NSFG design.

Although differences between the RHS experiment and a future linked NSFG design should be considered when drawing inferences from the RHS, the differences are present for all experimental treatments and should not detract from comparing the results achieved with different treatments. The overall response rates for the housing unit sample and the selected person sample were not significantly different (83.5 versus 82.1 percent, respectively). However, the direction of the difference provides some indication that somewhat higher response rates would be achieved with a housing unit sample. The lower response rate for a selected person sample is, for the most part, the result of unlocatable movers. Weighted response rate calculations, using two sets of weights reflecting both the national population and a national NSFG sample, did not alter these findings. The higher response rate for the housing unit sample is not without costs. The cost of screening sample units in a housing unit sample appears to outweigh the costs associated with tracking, in the selected person sample, respondents who move between the time of the two surveys.

The mode of initial contact did not appear to affect response rates for either type of sample unit; it did, however, have an important effect on the overall level of effort and associated costs. The ratio of personal visits per completed interview was significantly lower for cases assigned to a telephone mode of initial contact than for cases initially contacted in person.

There were no clear findings with respect to the effects of elapsed time on response rates. It appears that the major impact of elapsed time would be seen in the level of tracing necessary for a selected person sample.

The findings do not lead to a definitive determination of the optimal design for integrating the two surveys; however, the findings do provide a researcher with a means by which to make informed choices.

Chapter 2
Introduction

Purpose of study

The National Center for Health Statistics regularly conducts four population-based surveys to collect data relating to the health of the U.S. population. These surveys include the following:

- National Health Interview Survey (NHIS).
- National Medical Care Utilization and Expenditure Survey (NMCUES).
- National Survey of Family Growth (NSFG).
- National Health and Nutrition Examination Survey (NHANES).

The NHIS is a continuous survey. The other three surveys are conducted on a periodic basis and have smaller samples than the NHIS. Furthermore, the NHIS always samples the entire civilian noninstitutionalized population, whereas the other surveys may sample particular age, sex, race, or ethnic subdomains.

Currently all four surveys have independent designs. Cycle IV of the NSFG will be fielded in 1987 using the NHIS as a sampling frame. The decision to integrate the designs of the two surveys and the selection of particular linkage options were influenced to a great extent by the results of this study.

Until recently the sample design for the NHIS survey involved an area and list frame based on decennial census information. Because decennial census information is confidential, the NHIS sample could not be used as a sampling frame for the other population-based surveys. The NHIS sample has been redesigned to consist of an area frame based entirely on geographical areas. By changing the sampling frame for the NHIS survey, the National Center for Health Statistics has the potential to link any of four population-based surveys by using the NHIS sample as the sampling frame for the NSFG, the NMCUES, or the NHANES.

A major disadvantage of the independently designed NSFG has been the amount of screening that must be completed to identify eligible respondents for the survey. Because the NSFG sample is limited to women of reproductive age, has oversampled teenagers and black women, and is restricted to selecting only one woman per household, in the NSFG, Cycle III, approximately four households were sampled for each woman selected for interviewing. Screening has had a great effect on the cost of conducting the NSFG, Cycles II and III, studies. By using the NHIS sample to identify eligible respondents, the number of screening interviews could be significantly reduced, or eliminated.

This report analyzes the results of research on linking the design of the NSFG to that of the NHIS. An earlier report[1] examined some of the conceptual and statistical issues involved. A third report[2] updates the earlier report with current knowledge of the design of the NHIS and revised U.S. Bureau of the Census projections of the 1987 population.

The research described in this report consists of an analysis of field trials to test and evaluate alternative strategies for linking the NSFG to the NHIS. For the field trials, the NHIS sampling frame was used to select a sample to be interviewed for the Reproductive Health Survey (RHS), a survey that was like the NSFG in that women 15–44 years of age were interviewed on topics related to reproductive health.

Design features of the field trials

To evaluate approaches to be used in linking the NSFG to the NHIS, two types of sample units were tested. One sample unit consisted of selecting an eligible woman (ages 15–44 years) from the NHIS household listing (with movers tracked and interviewed at their new residences). The second sample unit consisted of a housing unit where an eligible woman might be living. The housing unit sample included both eligible households (units where an eligible woman had lived at the time of the NHIS) and ineligible households (units that did not have an eligible woman from the NHIS).

Another set of strategies to be tested in the linkage experiment was the method of contact. All units in the sample were sent an advance letter. One-half of each group of sample units was then designated for contact by telephone and the other half was designated for contact in person. (All extended interviews were conducted in person.)

When the two types of linkage strategies were combined (sample unit and method of initial contact), four separate cate-

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[1]National Center for Health Statistics, J. Waksberg and D. R. Northrup: Integration of sample design for the National Survey of Family Growth, Cycle IV, with the National Health Interview Survey. *Vital and Health Statistics.* Series 2, No. 96. DHHS Pub. No. (PHS) 86–1370. Public Health Service. Washington. U.S. Government Printing Office, Dec. 1985.

[2]J. Waksberg and D. Northrup: Integration of Sample Design for the National Survey of Family Growth, Cycle IV, With the National Health Interview Survey, Report No. 2: Description of Sample Designs and Estimates of Number of Interviews, Screening Loads, Costs, and Response Rates When Alternate Subsets of NHIS are Available for NSFG. Contract No. 282–83–2116–NCHS. Rockville, Md. Westat, Inc., 1986.

gories were formed:

- Sample person initially approached by telephone.
- Sample person initially approached in person.
- Housing unit initially approached by telephone.
- Housing unit initially approached in person.

Another feature of the field test design was to vary the number of elapsed months between the NHIS and RHS interviews to evaluate the effects of elapsed time on response rates and costs. Interviewing assignments for the RHS were to be released in such a manner that all periods of elapsed time from 2 to 12 months were represented.

Chapter 3
Field test methodology

Sample

Sampling frame

The sample for the Reproductive Health Survey (RHS) was drawn from National Health Interview Survey (NHIS) interviews conducted over the course of a year, from the fourth quarter of 1983 through the third quarter of 1984. It was drawn from the following 10 NHIS primary sampling units (PSU's):

PSU	*Description of area*
511 ...	Washington, D.C.
541 ...	Virginia portion of the Washington, D.C., metropolitan statistical area (MSA)
542 ...	Maryland portion of the Washington, D.C., MSA
702 ...	Los Angeles City only
762 ...	Remainder of the Los Angeles MSA
505 ...	Memphis, Tenn., MSA
527 ...	Columbia, S.C., MSA
535 ...	Granville and Person Counties, N.C.
624 ...	Calvert, Charles, and St. Marys Counties, Md.
911 ...	Buckingham, Cumberland, and Fluvanna Counties, Va.

These sample PSU's were chosen because they represented large and small MSA's as well as rural areas, and because they contained sufficient black women for the study. The three PSU's in the Washington, D.C., MSA and the two sample PSU's in the Los Angeles MSA were certainty PSU's. The remaining five sample PSU's were noncertainty PSU's.

The NHIS interviews used to draw the sample for the RHS were conducted while the NHIS was using a sample frame based on confidential decennial census information; therefore, before NHIS information could be released for drawing the RHS sample, the NHIS respondents had to sign a respondent release form. (See figure 1.) Respondent release forms were presented to the NHIS respondents by the interviewer of the U.S. Bureau of the Census at the end of the NHIS core questionnaire. The release form could be signed by any household member, 18 years or older, who had participated in the core NHIS interview. All unrelated household members also had to sign a release form before data about the household could be used for the RHS sample. A total of 84.6 percent of the NHIS households signed waivers authorizing release of sample information.

Selection

All NHIS households from the time periods and sample PSU's noted above with signed respondent release forms were included in the sample frame for the RHS. Basic information about the location and composition of the households was transcribed from the NHIS interview schedules by U.S. Bureau of the Census and National Center for Health Statistics personnel. The transcription sheets (see figure 2) were then sent to Westat, Inc., to be used for the RHS.

Early evaluation of the sample yield indicated that to achieve the sample sizes of women 15–44 years desired for the RHS, all NHIS households that included women in this age range had to be included in the RHS sample. To meet the goal of approximately 200 ineligible households (that is, households without women 15–44 years of age), all black ineligible households were selected and one out of six nonblack ineligible households was selected.

All NHIS households with eligible women were selected for the RHS sample and assigned to type of sample unit, that is, sample person versus housing unit, on an alternating basis. All ineligible households sampled for the RHS were included in the housing unit sample.

In those households assigned to the sample person treatment, the youngest eligible woman in the household was designated as the sample woman. This procedure was used to increase the number of younger women because younger women tend to be more mobile and would, therefore, tend to provide more experience with movers in the field trials. When more than one eligible woman was present in a household assigned to the housing unit sample, the youngest woman was also selected for the RHS interview.

Within each type of sample unit, housing unit versus sample person, cases were then assigned to mode of initial contact, that is, telephone versus in person, on an alternating basis.

Sizes

The total sample for the RHS included 1,315 cases selected from the NHIS. Of these, 1,075 cases included an eligible woman, that is, a woman who would be 15–44 years of age at the beginning of the RHS. These constituted all households in the sample frame that included an eligible woman at the time of the NHIS. The remaining 240 cases were selected from ineligible households, that is, households that did not include an eligible woman at the time of the NHIS.

Table 1 shows the distribution of RHS sample cases across areas, eligibility status, and race. Race of the household was determined by the race of person 01 in the NHIS household listing. Cases where race was unknown are included with non-

O.M.B. No. 0937-0125: Approval Expires January 31, 1985

FORM **HIS-701(X)**
(9-13-83)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

NATIONAL HEALTH INTERVIEW SURVEY
RESPONDENT RELEASE CERTIFICATION

IDENTIFICATION OF CONTACT IN CASE YOU MOVE	The National Center for Health Statistics or its contractor may wish to contact your household again to obtain additional health related information. Could you please give me the name, address, and telephone number of a close relative or friend who would know where you could be reached, if you should move? Please give me the name of someone who is not currently living with you.

Name	Relationship	Telephone number

Address

INTERVIEWER INTRODUCTION	In order to turn over survey information to the organization that will conduct the survey, we need you to read and sign the certification statement.
CERTIFICATION	**"I authorize the Bureau of the Census to release information from this survey, including my name and address, to the representatives of the National Center for Health Statistics. I understand that all information provided is confidential by Federal law and will be used for statistical purposes only."**

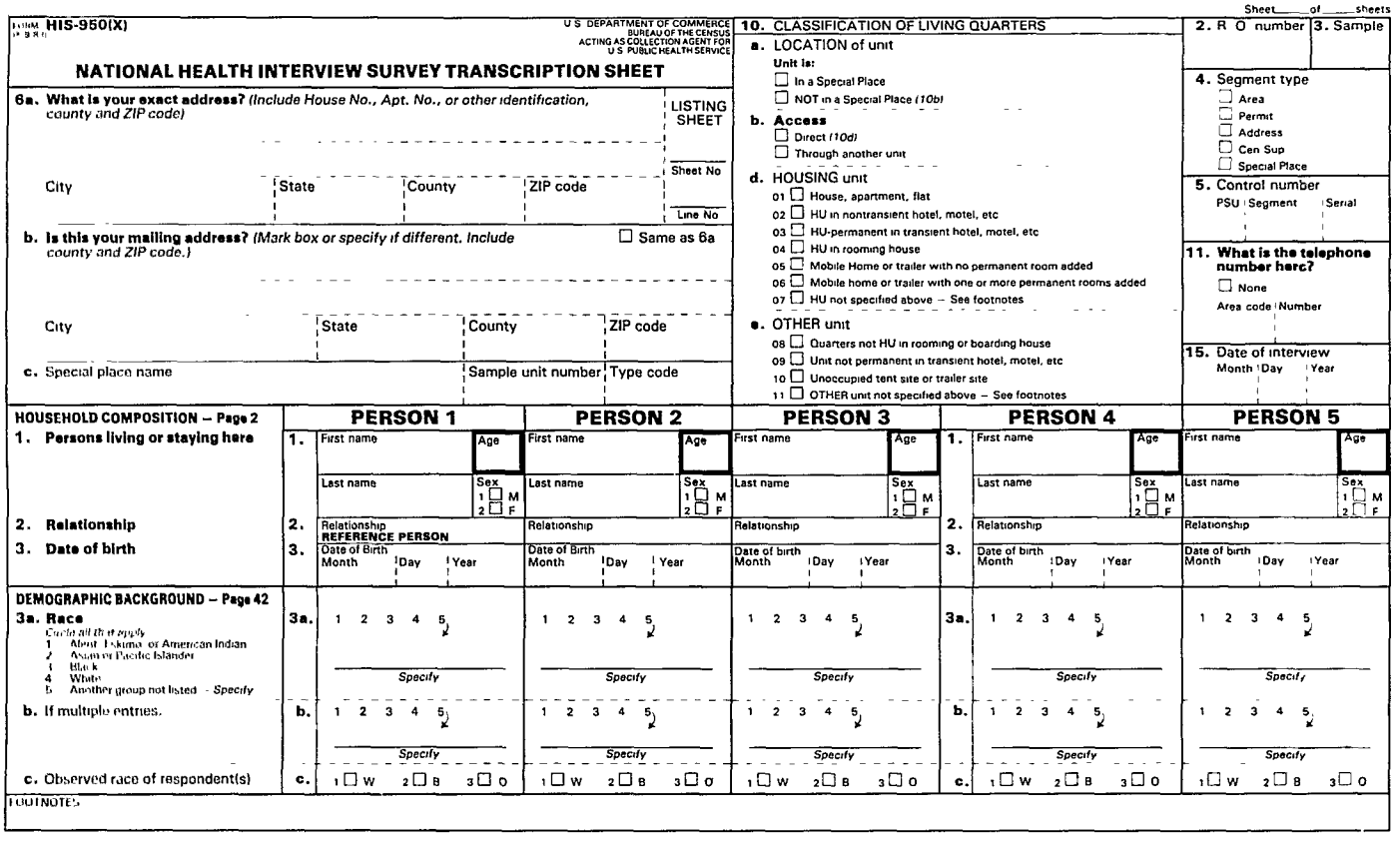
Signature of respondent (or guardian)	Date

OFFICE USE

Respondent's name	Sample number	Control number			
		PSU	Segment	Serial	Person No.

Copy distribution: **WHITE** – NCHS Contractor **YELLOW** – NCHS/RTP **PINK** – Regional Office

Figure 1. Respondent release form



NHIS-950(X)

U S DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
ACTING AS COLLECTION AGENT FOR
U S PUBLIC HEALTH SERVICE

Sheet ____ of ____ sheets

NATIONAL HEALTH INTERVIEW SURVEY TRANSCRIPTION SHEET

6a. What is your exact address? (Include House No., Apt. No., or other identification, county and ZIP code)

LISTING SHEET

Sheet No

Line No

City | State | County | ZIP code

b. Is this your mailing address? (Mark box or specify if different. Include county and ZIP code.) ☐ Same as 6a

City | State | County | ZIP code

c. Special place name | Sample unit number | Type code

10. CLASSIFICATION OF LIVING QUARTERS

a. LOCATION of unit
Unit is:
☐ In a Special Place
☐ NOT in a Special Place (10b)

b. Access
☐ Direct (10d)
☐ Through another unit

d. HOUSING unit
01 ☐ House, apartment, flat
02 ☐ HU in nontransient hotel, motel, etc
03 ☐ HU-permanent in transient hotel, motel, etc
04 ☐ HU in rooming house
05 ☐ Mobile Home or trailer with no permanent room added
06 ☐ Mobile home or trailer with one or more permanent rooms added
07 ☐ HU not specified above – See footnotes

e. OTHER unit
08 ☐ Quarters not HU in rooming or boarding house
09 ☐ Unit not permanent in transient hotel, motel, etc
10 ☐ Unoccupied tent site or trailer site
11 ☐ OTHER unit not specified above – See footnotes

2. R O number | 3. Sample

4. Segment type
☐ Area
☐ Permit
☐ Address
☐ Cen Sup
☐ Special Place

5. Control number
PSU | Segment | Serial

11. What is the telephone number here?
☐ None
Area code | Number

15. Date of interview
Month | Day | Year

HOUSEHOLD COMPOSITION – Page 2	PERSON 1	PERSON 2	PERSON 3	PERSON 4	PERSON 5
1. Persons living or staying here	1. First name / Age; Last name / Sex 1 ☐ M 2 ☐ F	First name / Age; Last name / Sex 1 ☐ M 2 ☐ F	First name / Age; Last name / Sex 1 ☐ M 2 ☐ F	1. First name / Age; Last name / Sex 1 ☐ M 2 ☐ F	First name / Age; Last name / Sex 1 ☐ M 2 ☐ F
2. Relationship	2. Relationship REFERENCE PERSON	Relationship	Relationship	2. Relationship	Relationship
3. Date of birth	3. Date of Birth Month / Day / Year	Date of Birth Month / Day / Year	Date of birth Month / Day / Year	3. Date of birth Month / Day / Year	Date of birth Month / Day / Year
DEMOGRAPHIC BACKGROUND – Page 42					
3a. Race (Circle all that apply. 1 American Indian, Alaskan or Aleut; 2 Asian or Pacific Islander; 3 Black; 4 White; 5 Another group not listed – Specify)	3a. 1 2 3 4 5 Specify	1 2 3 4 5 Specify	1 2 3 4 5 Specify	3a. 1 2 3 4 5 Specify	1 2 3 4 5 Specify
b. If multiple entries.	b. 1 2 3 4 5 Specify	1 2 3 4 5 Specify	1 2 3 4 5 Specify	b. 1 2 3 4 5 Specify	1 2 3 4 5 Specify
c. Observed race of respondent(s)	c. 1 ☐ W 2 ☐ B 3 ☐ O	1 ☐ W 2 ☐ B 3 ☐ O	1 ☐ W 2 ☐ B 3 ☐ O	c. 1 ☐ W 2 ☐ B 3 ☐ O	1 ☐ W 2 ☐ B 3 ☐ O

FOOTNOTES

Figure 2. Transcription sheet

black. As noted in the previous section, all households that were black at the time of the NHIS were included in the RHS, yielding a total of 366 black households in the sample.

Table 2 shows the distribution of cases by area among the experimental treatments, that is, sample unit and mode of initial contact. Eligible households from the NHIS were divided evenly between the housing unit and person samples. Ineligible households were, of necessity, always assigned to the housing unit sample. The housing unit sample was, therefore, larger than the person sample. Because cases were assigned to the mode of contact methods on an alternating basis, the sample was almost evenly divided between those treatments.

Distribution of elapsed times

Another purpose of the RHS was to test the effects of varying the elapsed time between the NHIS and the RHS. The schedule for the release of interviewing assignments for the RHS was designed to achieve a wide variety of elapsed times and a reasonably efficient flow of work to the interviewing force. To achieve both, RHS interviewing in the certainty PSU's was scheduled over a period of four months, August through November 1984, and interviewing in the noncertainty PSU's for the month of November 1984. Nonresponse conversion in all PSU's was to continue during the month of December and, in fact, in some areas nonresponse conversion was continued in the month of January 1985.

To achieve a wide distribution of elapsed times, it was determined in advance that interviews conducted in a particular month for the NHIS would be released for interviewing in a particular month during the RHS. Therefore, when cases were received from the NHIS and sampled for the RHS, month of assignment was automatically determined. The distribution of cases by elapsed months as determined by month of release for RHS interviewing is shown in table 3.

In the actual conduct of any data collection effort, the time at which an assignment of cases is released to an interviewer for work is not necessarily the time at which an interview is conducted. Factors that can influence the time at which the interview is actually conducted include both the interviewer's and the respondent's availability. An interviewer may be unable to work on an assignment immediately for a number of reasons, including personal illness, family problems, and incomplete work from an earlier assignment. Even when an interviewer begins work on an assignment immediately, contact is not necessarily made with the assigned respondent or household immediately, because respondents can be out of town, ill, or unavailable for other reasons.

A number of different points in time could be chosen to determine the actual elapsed time between the NHIS and the RHS. Times that could be used include the time a case is released for interviewing, the time an interviewer makes a first attempt to contact a respondent or household, the time a respondent or household member is first contacted, or the time at which an interview is conducted or a case is closed out as a nonresponse case.

For the analysis presented in later sections of this report, the time used to determine elapsed time between the NHIS and the RHS is the time at which an interview is conducted or a

case is closed out as a nonresponse case. Elapsed times are grouped into categories of 3 months (that is, 1–3 months, 4–6 months, and so forth) to yield cells that are large enough for meaningful analysis. Table 4 shows the distribution of the RHS sample across elapsed time periods and by sample unit treatments.

Data collection

Data collection materials and procedures for the RHS were designed to resemble as closely as possible those materials and procedures that would be used for the National Survey of Family Growth (NSFG) if it were linked to the NHIS. For this reason, the introductory materials used for the RHS included an advance letter and a pamphlet, both of which were modeled after those used for the NSFG in earlier cycles. In addition, written parental consent was required before a selected woman 15–17 years of age could be interviewed; parental consent materials and procedures were almost identical to those used for the NSFG, Cycle III.

Screening procedures for the RHS, of necessity, were different from those used on past cycles of the NSFG but are comparable to those that would be used on future cycles if the NSFG is linked to the NHIS. The screeners used for sample persons were designed to locate and make an interviewing appointment with the sampled woman. Screeners for the housing unit sample were very similar to those used in earlier NSFG cycles. They included a household enumeration and sample selection procedures for choosing one eligible woman per household. For the RHS, however, the screener included a listing of the household enumeration from the NHIS and procedures for updating that enumeration if there had been changes in household composition since the NHIS.

The most important differences between the RHS and the NSFG materials related to the questionnaire. To facilitate Office of Management and Budget clearance, the RHS was designed to be a much shorter questionnaire; it did not include questions on many of the sensitive topics included in the NSFG questionnaires. The basic subject matter was similar in the two surveys, making it possible to use comparable materials for introducing the survey to selected respondents, but the actual questionnaires for the RHS were shorter, less complicated, and included less sensitive questions than the questionnaires used for the NSFG.

Inference limitations

There were several ways the RHS was different from a regular cycle of the NSFG. These differences should be taken into consideration when trying to use the results of the RHS to draw inferences about costs and response rates for an NSFG linked to the NHIS.

The first difference between the RHS and any future linked cycle of the NSFG was the need for signed waivers from NHIS respondents before an NHIS household was eligible for inclusion in the RHS. (This procedure is described in the Sampling frame section.) As noted earlier, the overall rate for obtaining signed waivers was 84.6 percent. Because any future cycle of the NSFG linked to the NHIS will use an NHIS sampling frame not subject to the confidentiality rules of the decennial census, signed waivers will not be required.

Although the women who were selected for interviewing in the RHS may not have signed the waiver (waivers were signed by any household member, 18 years and over, who had participated in the NHIS core questionnaire), it is reasonable to hypothesize that a sample drawn from households where at least one member was willing to sign a waiver is likely to be a somewhat more cooperative sample than one that was not drawn from such a frame. Therefore, the overall response rate might be somewhat higher than could be expected in future cycles of the NSFG.

In addition, there were differences between the RHS and NSFG questionnaires that may have resulted in a higher overall response rate for the RHS. As noted in the previous section, although the introductory materials for the RHS were similar to those used for the NSFG, the questionnaires were considerably shorter (averaging 10–15 minutes to administer as opposed to 1 hour). In addition, the RHS questionnaire was easy for interviewers to administer whereas the NSFG questionnaires were complex and difficult to learn. Finally, the RHS questionnaire did not include questions on many of the more sensitive topics included in the NSFG questionnaires.

A final difference between the RHS and the NSFG may have influenced the overall response rate in the opposite direction. To obtain the sample sizes desired for the RHS, a higher proportion of cases was drawn from Los Angeles and Washington, D.C., than was originally planned. Eighty percent of the RHS sample was in these two locations. These areas typically are difficult areas in which to interview and yield lower response rates than are obtained for the entire NSFG sample. Concentrating the RHS sample in these two areas may have lowered the overall response rates.

The differences between the RHS and the NSFG should be considered when trying to draw conclusions about total response rate to be obtained in an NSFG that uses a linked design. These limitations do not, however, influence comparisons among the design options to be analyzed in this report. The limitations are present for all experimental treatments and should affect all design features equally. Therefore, the limitations do not detract from any conclusions drawn about the relative merits of the different approaches being tested in the linkage experiment.

Table 1. Distribution of Reproductive Health Survey sample cases by area, household eligibility status from the National Health Interview Survey, and race

Primary sampling unit or area	Total			Household eligibility					
				Eligible			Ineligible		
	Total	Black	Nonblack	Total	Black	Nonblack	Total	Black	Nonblack
	Number								
Total	1,315	366	949	1,075	241	834	240	125	115
Los Angeles, Calif.	713	121	592	603	81	522	110	40	70
Washington, D.C.	340	128	212	270	84	186	70	44	26
Memphis, Tenn.	76	47	29	60	34	26	16	13	3
Columbia, S.C.	51	25	26	38	16	22	13	9	4
Granville and Person Counties, N.C.	35	13	22	28	9	19	7	4	3
Calvert, Charles, and St. Marys Counties, Md.	54	11	43	48	8	40	6	3	3
Buckingham, Cumberland, and Fluvanna Counties, Va.	46	21	25	28	9	19	18	12	6

Table 2. Distribution of Reproductive Health Survey sample cases by area, sampling unit, and mode of initial contact

Primary sampling unit or area	Total			Type of sampling unit					
				Housing unit sample			Selected person sample		
	Total	In-person contact	Telephone contact	Total	In-person contact	Telephone contact	Total	In-person contact	Telephone contact
	Number								
Total	1,315	658	657	778	390	388	537	268	269
Los Angeles, Calif.	713	356	357	412	206	206	301	150	151
Washington, D.C.	340	173	167	205	104	101	135	69	66
Memphis, Tenn.	76	39	37	46	25	21	30	14	16
Columbia, S.C.	51	25	26	32	15	17	19	10	9
Granville and Person Counties, N.C.	35	16	19	21	10	11	14	6	8
Calvert, Charles, and St. Marys Counties, Md.	54	26	28	30	14	16	24	12	12
Buckingham, Cumberland, and Fluvanna Counties, Va.	46	23	23	32	16	16	14	7	7

Table 3. Distribution of sample cases by area and elapsed time between National Health Interview Survey interview and release for assignment in the Reproductive Health Survey

Elapsed time	Total	Area						
		Los Angeles	Washington, D.C.	Memphis	South Carolina	North Carolina	Southern Maryland	Virginia
				Number				
Total	1,315	713	340	76	51	35	54	46
1 month	55	27	14	1	13	-	-	-
2 months	208	112	56	8	-	17	15	-
3 months	123	62	47	5	-	-	-	9
4 months	193	134	58	-	-	-	1	-
5 months	92	55	23	14	-	-	-	-
6 months	171	61	44	-	18	4	21	23
7 months	107	58	38	7	-	-	4	-
8 months	110	72	14	10	11	-	-	3
9 months	97	61	19	10	-	2	-	5
10 months	95	56	15	3	-	12	9	-
11 months	25	-	-	9	9	-	1	6
12 months	39	15	12	9	-	-	3	-

Table 4. Number of Reproductive Health Survey sample cases by sample type, eligibility, and elapsed time between National Health Interview Survey interview and the last contact on the Reproductive Health Survey

Elapsed time	Total	Housing unit sample			Selected person sample
		Total	Eligible[1]	Ineligible[1]	
			Number		
Total	1,315	778	538	240	537
1–3 months	213	133	82	51	80
4–6 months	447	269	192	77	178
7–9 months	387	230	156	74	157
10–12 months	227	124	92	32	103
13–15 months	41	22	16	6	19

[1] Eligibility refers to how households were classified at the time of the National Health Interview Survey interview.

Chapter 4
Analytical measures

The first two sections of this chapter contain a description of the independent and dependent measures used in the analysis presented in chapter 5. The third section discusses the sampling errors used for the levels of significance when comparing differences among design features or demographic subgroups.

Independent measures

The independent measures used in the analysis consist of those factors related to the experimental design and two demographic measures: Race and marital status.

Experimental independent measures

As noted in chapter 2, the design of the Reproductive Health Survey (RHS) included three experimental factors: Type of sample unit, mode of initial contact, and length of time between the National Health Interview Survey (NHIS) and RHS interviews. Two types of sample units were selected—a housing unit and a sample person unit. Each NHIS case was assigned to one of the two types of sample units.

Initially, all NHIS cases were classified as eligible (at least one woman, 15–44 years of age) or ineligible. Selected ineligible cases were assigned to the housing unit sample. Eligible cases were randomly assigned to the housing unit sample or the person sample. Because respondents may move between the time of the NHIS interview and the RHS interview, some housing unit cases changed eligibility status by the time of the RHS interview. Throughout the analysis discussed in chapter 5, results are presented separately for housing units originally classified as eligible and those originally classified as ineligible.

Sample person cases were classified by the age and marital status of each woman 15–44 years of age who was included in the NHIS interview. For households with more than one eligible woman, the youngest eligible woman was selected for the RHS sample. Interviews were attempted with all women selected in the person sample, including those who had moved since the time of the NHIS interview. (The tracing and interviewing of women who moved between the times of the two interviews have been described in detail.[3]) Women included in the sample person group have been classified according to their mobility between the two studies. Because it is useful to understand the impact on response rates and level of effort associated with interviewing movers, results for the sample person treatment are presented by mobility classification between NHIS and RHS interviews.

The mode-of-initial-contact experiment consisted of two procedures designed to measure the potential reduction in costs and the effect on response rates associated with using the telephone to contact respondents. As noted in chapter 2, all respondents were sent an advance letter describing the RHS. Following the letter, a random half sample were next contacted by telephone. In housing unit cases, a screener interview was conducted by telephone to determine whether the household contained an eligible woman, in which case an appointment for an interview was made. In sample person cases, mobility status was determined and if the respondent had not moved, an appointment to complete the extended interview was scheduled. The remaining half sample were contacted in person following the advance letter; the screening to determine mobility status and to schedule the extended interview was conducted in person. Both response rates and level of effort measures are evaluated according to mode of initial contact to determine whether use of the telephone had a deleterious effect on response rates and what its effect was on costs.

The final experimental measure, elapsed time between the NHIS and RHS interviews, is a continuous measure, ranging from 1 to 15 months. However, to simplify the discussion and presentation of results, the length-of-time measure has been collapsed into several cells to form a categorical variable.

Demographic independent measures

Two demographic measures are used throughout the analysis to evaluate potential differential effects of the experimental factors on population subgroups. Race and marital status were designated as the two population subgroups for which it was most important to understand the impact of different field procedures. It is important to note that the race and marital status classifications used in this analysis are based on the NHIS interview. Such classification is necessary to permit response rates to be categorized by race and marital status; however, such classification has several implications. Marital status does not apply to ineligible housing units, because they did not include an eligible woman. Because the majority of these housing units remain ineligible, this does not constitute a major analytical problem. Second, marital status may change between the two studies, resulting in a classification difference. The marital status

[3] S. Rieger: *NHIS-NSFG Linkage Experiment Final Report on Field Trial Procedures.* Contract No. 282–83–2116–NCHS. Rockville, Md. Westat, Inc., 1985.

change affects the housing unit and the selected woman sample. Third, race for the housing unit sample is based on the reference person for NHIS, who will not necessarily be the RHS respondent. Once again, the result could lead to a classification error. However, the classification error for marital status and race for respondents who completed the RHS interview was such that misclassification affected less than 5 percent of the cases.

Dependent measures

Two measures—response rate and level of effort—are used throughout chapter 5 to evaluate the effects of the design features and assess the potential impact of each design factor for a national study.

Response rates

Response rates are calculated differently for the housing unit sample and the selected woman sample. The need for different calculations arises from the fact that all cases assigned to the housing unit sample are initially required to complete a screener interview to determine eligibility, whereas there is no such need in the person sample because eligibility is determined by the NHIS interview.

Housing unit sample response rates—The response rate for the housing unit (HU) sample is calculated as the product of the screener response rate and the extended interview response rate. The screener response rate is defined as follows:

$$\frac{\text{Number of completed screeners}}{\text{Total sample} - \text{vacant HU's} - \text{nondwelling units}}$$

The extended interview response rate is defined as follows:

$$\frac{\text{Number of completed extended interviews}}{\text{Total number of HU's with an eligible woman}}$$

A definition of each of the terms used in these formulas is presented in appendix I.

Selected person sample response rates—The response rate calculation for the person sample consists of only one formula because no screener interview is conducted. The response rate for the selected woman sample is as follows:

$$\frac{\text{Number of completed extended interviews}}{\text{Total sample} - \text{women found to be ineligible}}$$

A definition of each of these terms can be found in appendix I.

Issues related to response rate analysis—Several issues related to the calculation and discussion of response rates are important to note at this point. These factors primarily are caused by the fact that the experimental study could not replicate exactly the conditions that will apply when the NSFG is expected to take place. (This is a common situation for such experimental studies.) The main issues to be considered are as follows:

- Signing of waivers by NHIS respondents.
- Nonresponse rates for NHIS.
- Use of unweighted versus weighted response rates.

As noted in the Sampling frame section, only respondents from households with a signed waiver permitting release of their names were eligible for the RHS study. To the extent that these respondents are more likely to cooperate than the general population of NHIS respondents, the response rates noted in chapter 5 may be higher than would be expected in a linked design where waivers are not required.[4] However, to adjust the response rates in these tables by the cooperation rate of signing waivers would result in rates that are artificially biased downward.

A second source of uncertainty in making inferences about response rates in a linked design is the absence of adjustment for NHIS nonresponse. Assuming a 5-percent NHIS nonresponse rate (the actual rate as reported by the U.S. Bureau of the Census for the first half of 1985 was 4.3 percent (2.9 percent of eligible housing units)), the appropriate response rate is the product of the rates presented in tables 5–14 and the NHIS response rate 0.95. This parallels the calculation of the overall response rate in which there is a screener and an extended interview component. However, in a linked design for a national study in which the sample units were housing units, nonrespondents from NHIS would be included in the sample, thereby eliminating the need for NHIS nonresponse adjustment. A sample of selected persons, however, would not include NHIS nonrespondents, thereby necessitating nonresponse adjustment.

Both issues discussed above relate to the best method of using the response rate data from the experimental study to project the effects of alternative design options for a national study. It is also useful to examine response rates weighted to adjust for the composition of a national sample. The distribution of the NSFG, Cycle III, population (prior to the oversampling of teenagers in NSFG, Cycle III) and the expected distribution of women in 1987 were used to develop the weights to estimate the response rates for the national population and subgroups of interest. Details concerning these weights are presented in chapter 5.

Level of effort

The level-of-effort analysis includes several measures (for example, total number of telephone calls and total number of personal visits) with particular emphasis on two measures—number of personal visits per completed interview and costs. The number of personal visits per completed interview appears to be the most useful measure for comparing design options; the actual cost data are probably subject to greater uncertainty in projecting the results to a national survey.

Number of personal visits per interview—The source of a large proportion of interviewing costs is not in conducting the actual interview, but in the time and travel costs associated

[4]Beginning in 1985, the area probability sample of NHIS permits release of respondents' names without the need for signed waivers.

with the number of visits needed to contact the designated respondent. These costs far outweigh the costs of screening a household or setting up an appointment by telephone. Although the level-of-effort analysis includes counts of the total number of telephone contacts, the major emphasis in the analysis is the ratio of the total number of personal visits (for a specific design feature) to the total number of completed interviews for the same cell. This measure slightly overestimates the relative savings from a telephone contact procedure because it ignores the cost (labor and local toll charges) of the telephone calls. However, the bias is not expected to be large.

Costs—Detailed cost information (interviewer time, mileage, and other costs) was only collected for one design feature—mode of initial contact. The collection of cost data requires that assignments to an interviewer include only one design feature. The interviewer can thus complete an entire assignment and submit cost data associated with that assignment. All costs for that assignment can then be associated with the one design feature. To collect cost data across more than one design feature would have resulted in very small interviewer assignments, thus resulting in inefficiencies and inflated cost data.

Sampling errors

The emphasis of the analysis presented in chapter 5 is the comparison of different design features (for example, housing unit versus selected person and in-person versus telephone mode of initial contact). The design of the experimental study, in which all design features were randomized within primary sampling units (PSU's) and within segments, allows us to ignore between-PSU and between-segment variance components in calculating sampling errors. The sampling error for the difference between two proportions or means is, therefore,

$$\sigma^2(x_1 - x_2) = \sigma^2 x_1 + \sigma^2 x_2 - 2\rho\sigma x_1 \sigma x_2$$

where $\sigma^2 x_1$ = variance for the estimator x_1

$\sigma^2 x_2$ = variance for the estimator x_2

ρ = measure of the covariance of x_1 and x_2

In general, one would expect ρ to be positive within both PSU's and segments, thereby reducing the sampling errors from those in simple random samples. An upper and lower bound value of $\sigma^2(x_1 - x_2)$ will be calculated using values of ρ equal to 0 and 0.20.

Response rate comparisons will also be made between the present study and similar PSU's in NSFG, Cycle III. These comparisons will be limited to within-PSU contrasts; tests of significance will be based on simple random sample assumptions.

Chapter 5
Analytical findings

The analyses presented in this chapter address a number of issues concerning the optimal design of a linked survey. These issues include the following:

- What are the ramifications of using a selected person sample rather than a housing unit sample with respect to response rates and level of effort?
- Does the use of a telephone to initially contact respondents result in a significant reduction in costs without importantly affecting response rates?
- How does the proximity in time of the two surveys affect the willingness of respondents to participate in a second study? How are tracking efforts affected by the length of elapsed time?
- Do the experimental factors have different effects on various demographic subdomains?

As noted in chapter 4, the primary analytical variables to be used in this discussion are response rates and several level-of-effort measures. The remainder of this chapter will be divided into three sections: Response rates, level of effort (including cost models), and conclusions (including implications for a linked design).

Response rates

The analysis of response rates examines the effects of each of the experimental treatments. However, given the different natures of the housing unit and selected person samples, the findings are presented separately for each. The sample is further classified by eligibility at the time of the National Health Interview Survey (NHIS) or mobility between NHIS and Reproductive Health Survey (RHS) so that each comparison consists of the following four sample classifications:

- Housing unit sample—eligible at time of NHIS.
- Housing unit sample—ineligible at time of NHIS.
- Selected person sample—nonmover.
- Selected person sample—moved between the NHIS and RHS interviews.

Each set of response rate comparisons is further classified by race. As noted in chapter 4, race refers to the race of the reference person in the NHIS interview. Only two categories of race are used: Black and nonblack. For the selected person sample, cases were further classified according to the individual's marital status at the time of NHIS. This factor also consists of two categories: Never married and ever married.

The basic data on the number of completed interviews and nonrespondents, by reason for nonresponse and for each type of sample classification, are contained in the tables in appendix II. Tables I and II present the final dispositions for the screener and extended interview components of the housing unit sample. The dispositions are further classified by eligible or ineligible housing units, race, and marital status at the time of the NHIS interview. Tables III and IV present parallel data for the selected person sample, with dispositions reported separately for movers and nonmovers.

The remaining tables in appendix II are the response rate components (screener and extended interview) used to calculate the overall response rate for the housing unit survey. Thus the overall response rates for the housing unit sample presented in table 5 were obtained by multiplying the appropriate cells in tables V and VI. For example, the overall response rate for the total housing unit sample cited in table 5 is 83.5 percent, which is the product of the screener response rate found in table V (94.8 percent) and the extended interview response rate in table VI (88.1 percent).

The data in appendix II have been summarized in tables 5–14, which are convenient for analytic purposes. The analyses made and conclusions drawn are based primarily on the response rates shown in this set of tables.

Sample unit

Tables 5 and 6 present response rates for the housing unit sample and the selected person sample, respectively. (See appendix IV, Technical notes, for discussion of sample sizes.) The differences between the total overall response rates for the two types of sampling units—that is, the response rates for all cases assigned to the housing unit sample and all cases assigned to the selected person sample (83.5 and 82.1 percent, respectively)—are not statistically significant based on a two-tailed Z score, $p < 0.05$, using standard errors reflecting the main features of the sample design as described in the Sampling errors section of chapter 4. (This test is used throughout this chapter to determine significance.) In addition, there are no significant differences in the response rates for black (87.0 versus 84.9 percent) and nonblack women (82.5 versus 81.3 percent). However, within type of sample unit a number of significant differences should be noted.

Within the housing unit sample, the difference between the response rate for eligible housing units and ineligible housing units appears to be large (83.9 versus 71.2 percent), due com-

pletely to the large difference in response rates for the nonblack population (82.9 percent response rate for eligible housing units versus 59.8 percent for ineligible housing units). The low overall response rate for nonblack women is a result of an extended interview response rate of 62.5 percent. This rate, however, is subject to a very high sampling error because it is based on only eight cases. This problem of unstable estimates arises throughout this report for the ineligible housing unit sample. The number of housing units that change classification is small, resulting in very small cell sizes for the extended interview response rate.

The response rate for nonmovers in the selected person sample differs significantly from the rate for movers (86.8 versus 60.8 percent, respectively). This is not a surprising finding, given the difficulty of tracking and interviewing movers. Most of the losses in the sample for movers were persons who could not be located or who had moved overseas. (See table III.) There were a few additional losses of persons who moved to locations so distant from the sample primary sampling units (PSU's) that it was not practical to send an interviewer to collect the data. These losses occurred in the black and the nonblack samples.

The substantially lower response rates for movers seem to be inconsistent with the earlier statement that the rates for the housing unit and person samples were about the same. The study actually showed a slightly higher response rate for the housing unit sample: 83.5 versus 82.1 percent for the person sample. However, the two rate values agree within the bounds of sampling error. In addition, other qualifications in the study should inhibit one from drawing major conclusions from small differences, as is the case here. Nevertheless, the higher housing unit response rate resulting from the relatively low response rate for movers does indicate some support for the prediction, based on experience in other panel surveys, that the person sample will result in a slightly lower response rate. A 1- or 2-percentage-point loss is thought to be likely. Although the study results do not provide strong evidence for this expectation, they also do not contradict it.

Mode of initial contact

Tables 5 and 6 also present the response rates by mode of initial contact within each sample type. Prior to the field trials, there was a concern that use of a telephone, either to screen households to determine eligibility or to make an appointment with a respondent, might result in lower response rates. (All respondents were mailed a letter prior to the "initial" contact by phone or in person.) Such reductions in response rates for the telephone sample did not show up for totals or for major subgroups. This is an important finding, indicating that potential savings arising from telephone use do not come at the expense of response rates. The level of effort associated with mode of initial contact is discussed in a later section.

There were significant mode-of-initial-contact effects for a few subgroups, however. There was a large difference in the housing unit sample for cases initially classified as ineligible. However, the direction of the difference was in contrast to the original hypothesis; lower response rates were experienced for those cases that were initially contacted in person (65.9 versus 79.7 percent). This pattern was consistent for both racial subgroups.

An equally striking difference exists for the never-married group. For never-married black and nonblack women in the person sample and in the housing unit sample, the telephone contact procedure generated higher response rates than in-person contacts. It is likely that the higher rates were partly due to the ability to make more callbacks with the telephone procedure. Whether mode of contact has any effect on response rates for ever-married women is not clear. For this subgroup, the data show higher response rates with a telephone contact for black nonmovers in the person sample, lower rates with a telephone contact for nonblack movers in the person sample and nonblack eligible households in the housing unit sample, and approximately equal rates for telephone and in-person contacts for the other subgroups. The differences do not follow any obvious pattern.

Elapsed time

The effect of elapsed time (between the NHIS and RHS interviews) on response rate is subject to opposing factors. On one hand, as the length of time increases, the probability that a respondent will move also increases. For the selected person sample, the result will be an increase in the number of respondents to track and an associated decline in response rates—most surveys report lower response rates for movers in panel studies. However, increasing the length of time between studies may result in higher response rates, if respondents feel an increased burden when two time-consuming interviews are scheduled within a few months of one another.

Tables 7 and 8 present the response rates for the housing unit sample and the selected person sample by length of elapsed time between NHIS and RHS. The study did not show any clear pattern related to the length of elapsed time, with the exception of the 13–15 month elapsed time period. Tables 7 and 8 report lower response rates for cases completed 13–15 months following the date of the NHIS interview. Although the number of cases closed out during this time period is quite small (a total of 38 cases across all treatment groups), the lower response rates are fairly consistent among groups: They include total eligible housing units (59.2 percent); nonblack eligible housing units (55.6 percent); nonblack movers in the selected person sample (30.0 percent); and nonblack nonmovers in the selected person sample (60.0 percent).

The lower response rates for cases completed in the 13–15 month elapsed time period can be explained by the interaction between the approach to nonresponse conversion efforts in the RHS and the approach used to calculate elapsed time for these analyses. As noted under Distribution of elapsed times in chapter 3, there are several points during the RHS data collection effort for a particular case that could be used to calculate elapsed time. For these analyses, the date of last contact (that is, the date at which an interview was completed or the case was closed out as nonresponse) was used.

For the RHS (as for the National Survey of Family Growth (NSFG)), when a case is nonresponse (refusal, not at home, out of town, and so forth) after the initial interviewing work is completed, the case is reassigned to another interviewer to work

on nonresponse conversion. The time at which a case is reassigned for nonresponse conversion depends on the availability of a suitable second interviewer. This means that, at a minimum, several weeks will elapse between the completion of initial work on a case and its reassignment for nonresponse conversion. Particularly difficult cases may be reassigned more than once, resulting in more elapsed time between initial work on a case and the final contact.

Nonresponse conversion efforts were carried out throughout the RHS field period. Therefore, all elapsed time periods shown in the analysis tables include some nonresponse conversion cases. However, because none of the RHS assignments were released for initial work during the 13–15 month time period (see table 3 for distribution of elapsed times by release of assignments), all cases that had a final contact during that period were cases being worked for nonresponse conversion. The response rates for this elapsed time period are not particularly low for nonresponse conversion work.

Lower response rates were also evident among nonmover blacks for whom the elapsed time since NHIS was 4–6 months (73.5 percent response rate for this group). There is no clear explanation as to why this group of respondents experienced higher rates of nonresponse. It is doubtful that it is due to some peculiar aspect of a 4–6-month elapsed time period.

The results thus indicate that the number of elapsed months has little effect on response rates for both types of sample units.

Primary sampling unit (PSU) groups

The sample of housing units and the sample of selected persons were drawn from NHIS respondents in 10 PSU's. The 10 PSU's can be grouped into three categories: Los Angeles (2 PSU's), Washington, D.C. (3 PSU's), and lower density areas (5 PSU's). This last category includes mostly rural counties in the south as well as the Columbia, S.C., and Memphis metropolitan statistical areas (MSA's).

Tables 9 and 10 present the response rates for the housing unit and selected person samples by PSU group and mode of initial contact. An examination of the total columns within each PSU group indicates that there are no statistically significant differences between Los Angeles and Washington, D.C., but important differences do exist between these two large metropolitan areas and the lower density PSU's.

Within the housing unit sample, the response rate for black women in the lower density PSU's is significantly higher than the black response rate in either Los Angeles or Washington, D.C. (94.3 versus 84.5 and 83.0 percent, respectively). This finding is repeated in the selected person sample where the response rates for black women are 94.7 percent in the lower density areas, 82.5 percent in Los Angeles, and 78.0 percent in Washington, D.C. Most findings from survey literature indicate that respondents in rural areas and small towns and cities tend to be more cooperative than respondents from large urban areas. The RHS experience is a little different in that a significantly increased cooperation rate is evident only in the black sample.

Examination of data by the PSU groupings does not reveal any differences between experimental modes that are inconsistent with results discussed previously. There are no statistically significant differences by type of sample unit within the PSU's. Some erratic differences show up by type of initial contact; for example, higher response rates among black women in Los Angeles with an initial telephone contact, but lower response rates for nonblack women. However, there are no clear-cut patterns and it is unlikely that these differences reflect any underlying tendencies. Basically, they support the earlier findings that there are no important differences for types of sampling unit or mode of initial contact.

It can be noted that Los Angeles and Washington, D.C., accounted for about 80 percent of the total sample in this study. In a national survey, large metropolitan areas such as Los Angeles and Washington, D.C., will only account for about one-third of the sample. The overall response rates in this study, therefore, probably understate by several percentage points what would have come out of a larger, more representative sample of PSU's. However, because there do not seem to be any patterns of differences between experimental modes among the areas, it is unlikely that this shortcoming has any important influence on the analysis of the experimental features.

Three-way design interactions

Tables 11–14 present the response rates by sample unit, mode of initial contact, and elapsed time. These tables were designed to determine whether any specific pattern of interactions exists. The number of potential comparisons among these cells is quite large and, therefore, it is not surprising to find a few differences that appear to be statistically significant. However, in reviewing these tables no pattern emerges.

Weighted response rates

The data shown in tables 5–14 and the accompanying discussion previously in this chapter concern the response rates that were experienced in the study. However, the comparisons of the different treatments are influenced by the fact that the sample compositions of the various treatments are not quite identical. Furthermore, inferences as to what would happen in a national study are also affected by the fact that the proportion of women in major population subgroups in this study do not accurately reflect the sample distribution that would occur in a national study. To the extent that there are basic differences in response rates among subgroups (as happens, for example, in the case of ever-married and never-married women), the analysis of treatment effects are confounded by the fact that they also reflect sample differences.

It thus seems useful to reexamine the response rates after adjusting the data to eliminate the effect of unplanned differences in the sample compositions. This has been done by reweighting population subgroups in each design option to simulate the results of a national sample in 1987 carried out with the sample distribution of the NSFG, Cycle III, survey. Appendix III presents the weights and the distributions for the 1987 population and the NSFG, Cycle III, sample used in calculating the weights.

With the weight adjustments that make the sample resemble the distribution of the U.S. population in 1987, the housing unit and the selected person sample yield a response rate of about 83 percent. (However, note the earlier comment that a slightly lower response rate is expected for the person sample.) Within the housing unit sample, the in-person mode of initial

contact appears to produce a slightly higher response rate than the telephone mode of initial contact (85 versus 83 percent); however, the telephone mode of initial contact is more successful for the selected person sample (84 versus 82 percent). Neither of these differences is statistically significant at even the 65-percent confidence level. In the housing unit sample and the selected person sample, the projected response rate is higher among black women; 88 versus 82 percent for nonblack women in the housing unit sample and 84 versus 83 percent, respectively, for the selected person sample.

Similar results are obtained with weights associated with the NSFG, Cycle III, distribution. The housing unit response rate would be 84 versus 82 percent for the selected person sample. The mode-of-initial-contact response rates for the housing unit sample would be 85 percent for in-person contact versus 83 percent for telephone contact. The corresponding rates for the selected person sample would be 81 versus 84 percent. As with the population adjustments, higher response rates would be expected among black women (87 versus 82 percent in the housing unit sample; 83 versus 82 percent in the selected person sample).

The weighted data thus confirm the findings reported previously, that there are no important differences in response rates by sample unit or method of contact. This suggests that an optimal design should be based on issues other than response rates.

Comparisons with NSFG, Cycle III

The comparison of weighted response rates presented in the previous section provides some guidelines for predicting the effects of alternative design options on a national survey. Another useful analysis involves comparing response rates achieved in the NSFG, Cycle III, with the experimental study response rates. Because the experimental linkage study was limited to 10 PSU's, the comparison will be restricted to those areas in which both studies were fielded.

Table 15 presents the response rates for five of the field areas for the linkage study (comprising 8 of the 10 PSU's) and six comparable areas from the NSFG, Cycle III, study. Overall, the response rates achieved in the experimental study are higher than those reported in NSFG, Cycle III. This is, of course, encouraging in that adverse effects of linking do not seem to exist. However, whether the results imply that a linked design would actually result in higher response rates than NSFG, Cycle III, is uncertain. First, as pointed out earlier, the study was restricted to households that signed waivers and are expected to be more cooperative than a completely random sample. Second, NSFG, Cycle III, oversampled teenagers who had substantially lower response rates than older women.

Level of effort

As noted in the previous section on Response rates, the various design factors had little effect on response. This fact suggests that the basis for choosing an optimal data collection procedure for a linked survey should not be response rates but costs or level of effort.

The primary variable used in the analysis of level of effort is the number of personal calls per completed interview. Figures on number of telephone calls are also presented; however, given the relative cost of telephone contacts compared with personal visits, the cost of the telephone contacts is marginal.

The organization of this section parallels the discussion presented in the previous section. Level-of-effort measures are presented for each design feature and a number of interactions are examined. Estimates are also presented separately by PSU group. In the final section, a cost model is developed to estimate potential cost reductions associated with alternative design options.

Sample unit

Table 16 presents several level-of-effort measures by type of sample unit—specifically, eligible and ineligible housing units, and nonmovers and movers in the sample person procedure. The table includes the total number of cases originally assigned to the design feature, the number of completed interviews, the total number of telephone calls used in completing the cases, the number of telephone calls that were nonproductive (ring—no answer, busy, or disconnected), the total number of personal visits, and the number of personal visits per completed interview. The final row is obtained by dividing the total number of personal visits by the number of completed interviews.

The findings presented in table 16 are not surprising. As expected, the number of personal visits per completed interview is much larger for ineligible housing units than for eligible housing units. The number of personal visits per completed interview included visits for screening as well as for conducting the extended interview. Because the ineligible housing units included a small number of women selected for extended interview, the number of visits was divided by a very small number of completed interviews.

The number of personal visits per completed interview is also greater for movers than nonmovers in the selected person sample. Once again, this difference is not surprising.

Mode of initial contact

Table 17 presents the number of telephone calls and personal visits by mode of initial contact and type of sample unit. The findings are consistent across each type of sample unit—use of the telephone as a mode of initial contact significantly reduces the number of personal visits. As expected, the number of telephone calls made for cases assigned to the telephone mode sharply increases. However, the wide disparity between the cost of a telephone contact and a personal visit suggests there will be important reductions in cost with a telephone procedure regardless of the increase in number of telephone calls (see Costs and cost models section in this chapter).

The reduction in the number of personal visits per completed interview ranges from a 60-percent reduction for ineligible housing units to a 30-percent reduction for movers within the person sample. The two groups for which the field operation is similar, eligible housing units and nonmovers in the selected person sample, experienced similar reductions in level of effort—46 and 47 percent, respectively.

These results confirm the hypothesis at the start of the study that the largest impact on level of effort is the mode of initial contact. Specifically, it was thought that the use of the telephone, to screen housing units and to set up appointments in the selected person sample, would significantly reduce the number of personal visits necessary to complete the interview. The reduction was expected to be most noticeable among the ineligible housing units, because a majority of these cases would not require a personal visit to conduct an extended interview. The study results agree closely with the expectations.

Elapsed time

Table 18 summarizes the data on level of effort associated with the varying lengths of elapsed time by type of sample unit. The number of months of elapsed time are categorized in three groups: 0–5, 6–11, and 12 months or more.

For eligible housing units and for women in the person sample who did not move between the two surveys, the number of personal visits per completed interview declined as the number of months increased. The data do not provide a clear explanation of why this decline took place. One possibility is that the higher number of personal visits for the shortest interval is due to reluctance by these respondents to participate, resulting in an increased number of contacts for "soft" refusal conversions. However, this explanation is not consistent with the higher nonresponse rates obtained in the longer time intervals.

The pattern for the ineligible housing units is even more puzzling, with the lowest number of personal visits per completed interview evidenced for those respondents interviewed 6–11 months after NHIS. These estimates are unstable because of the small number of completed interviews in each cell, and they should not be cited as conclusive of any specific pattern.

The pattern for movers is similar to that for the eligible housing units and nonmovers in the person sample. However, the decline in number of contacts per completed interview is sharp, dropping from 16.5 for interviews conducted 0–5 months after NHIS to approximately 4.5 for longer elapsed time periods. Once again, these figures are based on a small number of completed interviews per cell and, therefore, should be viewed cautiously. However, this pattern does support a hypothesis suggested by some analysts that movers are easier to track if enough time has elapsed for them to establish new locating markers such as telephone service or credit records.

Examining the data separately by sample type may distort some of the effects of elapsed time. For example, as mentioned previously, there appears to be a downward progression over time of the average number of personal visits per completed cases for nonmovers and movers in the person sample. However, higher proportions of movers occur as the length of time increases. (The first line of table 18 shows that 5 percent of the 0–5 month cases, 25 percent of the 6–11 month cases, and 35 percent of the 12 month or more cases are movers.) When movers and nonmovers are combined, the results are affected by the average number of visits per interview within each type and by the proportions of cases in each type.

Combining mover and nonmover data for the person sample, average personal visits per completed interviews are 4.0 for 0–5 months, 3.2 for 6–11 months, and 2.3 for 12 months or more. Similarly, for the housing unit sample, the data are 5.2 for 0–5 months, 3.4 for 6–11 months, and 3.5 for 12 months or more. The general pattern still seems to exist, but the reductions are somewhat dampened.

PSU groups

As previously noted, the field trials for the experimental linkage study were limited to 10 PSU's in 7 distinct areas. The mix of urban and rural cases does not reflect the composition one would expect in a national study. For this reason, it is useful to examine the level-of-effort measures associated with mode of initial contact and sample type separately for Los Angeles, Washington, D.C., and the remaining PSU's.

Tables 19 and 20 show the number of telephone calls and in-person visits by mode of initial contact for the housing unit and selected person samples, respectively. There is a reduction in number of personal visits per completed interview associated with the telephone mode of initial contact in all PSU's. Within the eligible housing unit sample, the reduction is approximately 45 percent for each PSU group, whereas the reduction varies within the selected person sample (nonmovers) from about 60 percent in Washington, D.C., to 34 percent in the lower density PSU's.

Costs and cost models

The average number of personal visits per completed interview is, of course, an important indicator of the relationship of the costs for various procedures. However, although the number of visits can be expected to show the direction of the difference in cost between two procedures, it probably does not provide an accurate picture of the amount of the difference.

The method used to allocate the sample cases among the various data collection methods permits the accumulation of cost data for comparisons between telephone and in-person contact. Unfortunately, it was not feasible to obtain direct measures of the costs for each of the two types of sample unit. This lack occurred because one of the goals of the experimental design was to create interviewers' work assignments that simulated, as closely as possible, the assignments that would be used in a national survey. (Otherwise, an artificial relationship between the cost of interviewing, travel, and other activities would have been introduced.) This goal made it inadvisable to make up work assignments exclusively devoted to one of the four experimental procedures; the assignments would have been too small for efficient data collection. The interviewer work assignments were made separately for the telephone and in-person contact method, but not by type of sample unit.

Cost data associated with labor and travel are presented in table 21. Interviewer hours and costs are broken down by mode of contact and PSU. The cost of the telephone procedure was substantially lower than that of the in-person contact procedure; this difference is, of course, consistent with the earlier findings on number of personal visits. The cost reductions with telephone contact range from 20 to 30 percent among the PSU groups.

To estimate the difference in costs of housing unit and sample person procedures, a cost model was developed. The same model can also be used to examine the sources of improvement in the telephone contact method, as well as the re-

lationship of costs of alternative sample designs. The cost model is based on several assumptions:

1. The cost structure is the same for nonmovers in the person sample and eligible units in the housing unit sample.
2. The distribution of interviewer salaries between travel and within-segment time is the same as the distribution of interviewer hours.
3. The travel costs are directly related to the number of personal visits.
4. The major savings related to using a telephone for initial contact are in travel costs.

The second, third, and fourth assumptions are fairly obvious. The first is probably only approximately true but seems reasonable considering the fact that the interviewers' efforts are similar in the two situations. Also, the number of personal visits per completed interview (shown in table 17) is similar between nonmovers in the person sample and eligible units in the housing unit sample.

Using these assumptions and the data in table 21, some basic parameters of costs have been presented in table 22. The first row of the table, cost of travel as a percent of total costs, was estimated using the cost data in table 21 and data on the number of personal visits per extended interview shown in earlier tables. For example, in the Los Angeles PSU and for in-person mode of initial contact, travel hours accounted for 56 percent of the total interviewing hours (and thus 56 percent of wages) and the majority of mileage and other costs. Thus, the cost of travel was actually \$4,779 (total wages $\times 0.56$) plus \$4,426 (mileage and related costs), or approximately \$9,205. This represents 71 percent of the total cost of conducting the in-person interviews in Los Angeles. Because the workload contained a mix of sample units, with a lower number of personal visits required for eligible housing units and nonmovers than for ineligible housing units and movers, it was estimated that the cost of travel as a percent of total costs was 65 percent for the eligibles and nonmovers, 80 percent for movers, and 90 percent for ineligible housing units.

The next factor shown is the reduction in the travel cost component associated with use of the telephone. This estimate, row 2 of table 22, is based on the reductions in level of effort noted in table 17, modified to make the results consistent with those in table 21. For example, in the eligible housing unit sample, the number of personal visits per completed interview was reduced by approximately 45 percent when the telephone was used; table 21, however, does not show as large a reduction in interviewer travel time or costs. Cost savings are estimated, therefore, to be approximately 30 percent. The other estimates presented in row 2 are similarly derived from table 17.

The total reduction in travel costs associated with the telephone are presented in row 3 of table 22. These estimates are the product of rows 1 and 2 (for example, 65 percent $\times$ 30 percent = 20 percent). As expected, these are important cost reductions, especially for the ineligible housing units.

Interviewing costs account for the majority of the remaining costs. "Other costs" (for example, editing, shipping questionnaires to the home office, and discussions with supervisor) are estimated to account for 5–7 percent of total costs. The remaining costs are attributed to interviewing (row 4 of table 22). Use of the telephone is expected to have little effect on the within-segment costs. However, table 21 indicates a slight reduction in interviewing hours for telephone mode of initial contact (for example, 198 versus 225 hours for interviewing in the lower density PSU's). This reduction is reflected in the 8 percent reduction shown in row 5 of table 22. The total reduction in within-segment costs associated with each sample type is given in row 6. These reductions are small compared with the cost reductions for travel.

The estimated net reductions in costs are presented in the last row of table 22. The cost savings associated with the telephone are substantial, regardless of the type of sample unit. These estimates, coupled with the lack of significant response rate differences, provide support for use of the telephone as a means to contact respondents in a national study.

Estimates of the relationship of the costs of alternative data collection procedures are presented in table 23. These estimates have been prepared by using the data in table 22 with the sample distribution of eligible and ineligible units for the housing unit sample and the proportions of movers and nonmovers for the person sample. The latter two sets of data are derived from data in tables XX and XXI of appendix V.

The field costs of the research study do not, by themselves, provide accurate estimates of the data collection costs of a national study. However, it is believed they can be used to show the relationships of the costs of the various procedures. The method used to compare costs is described below.

Let C denote the within-segment cost of a single extended interview of a nonmover in the selected person sample with an in-person contact. C is also the within-segment cost of a single extended interview in an eligible unit in the housing unit sample with an in-person contact and approximately the same for a mover in the selected person sample. The within-segment cost per completed extended interview in the ineligible units is higher, because of the considerable screening workload. The cost is estimated to be $2C$.

Lines 1 and 4 of table 22 can then be used to estimate the travel costs associated with an extended interview. For example, in eligible housing units the travel cost associated with an extended interview is $(65/28)C = 2.32C$. Carrying out similar calculations for the four interview types (eligible and ineligible housing units and movers and nonmovers), and using the cost reductions for the telephone contact method in table 22 produces the data in table 24.

The sample sizes for the total number of extended interviews shown in table XXII of appendix V, with the data on the proportion of movers in the selected person sample and the proportion of extended interviews in eligible housing units, have been used to estimate total costs. The results are summarized in table 23.

The results of the effect of telephone contacts essentially confirm the costs indicated in table 21, but are more specific. Telephone contact sharply reduces the cost of all sample unit procedures, but with much greater savings for the housing unit samples. The selected person samples cost less than housing unit samples for both telephone and in-person contact procedures, but the differences are much greater with an in-person

sample. With a housing unit sample, a subsampling rate of one-third of the ineligibles is close to an optimum design. The difference between subsampling at rates of one-third and one-half is small with a telephone contact but significant with an in-person contact.

Conclusions

The experimental linkage study was designed to address key issues related to linking the NSFG to the NHIS sample. The findings presented in this chapter provide guidelines on the most efficient data collection procedure for a linked design, with respect to the three major design factors that were studied—type of sampling unit, mode of initial contact, and elapsed time. The major findings are summarized as follows.

- Although the difference between the overall response rate for the housing unit sample and the selected person sample (83.5 versus 82.1 percent) was not statistically significant, the direction of the difference supports expectations that somewhat higher response rates would be achieved with a housing unit sample. The weighted response rate calculations, using weights that reflect the national population and a national sample, also indicate somewhat higher response rates for a housing unit sample. The lower response rate for a person sample is, for the most part, the result of unlocatable movers. Approximately 19 percent of the respondents who moved between the NHIS and RHS were unlocatable. If the time between the two surveys is approximately 1 year, approximately 18 percent of the sample would be expected to move. Given this mobility rate, coupled with a 19-percent unlocatable rate, the response rate would be approximately 3 percentage points lower for a person sample than for a housing unit sample.

  The higher response rate for the housing unit sample does not come without cost. As noted in an earlier report,[1] the direct cost of data collection of a selected person sample is about 10–15 percent lower than the direct costs of the housing unit sample. This reduction in cost is due to the elimination of the screening needed to determine eligibility, because the NHIS questionnaire will function as the screener instrument. The cost of screening sample units in a housing unit sample appears to outweigh the costs associated with tracking respondents in the selected person sample who move between the time of the two interviews.

  Thus, there is no single "best" procedure. The tradeoff between increased response rates and reductions in cost makes the decision as to the optimal type of sample unit a subjective judgment.
- The mode of initial contact does not appear to affect response rates for either a selected person sample or a housing unit sample. However, the mode of initial contact does have an important effect on the overall level of effort and associated costs. As noted in tables 19 and 20, the ratio of personal visits per completed interview was significantly lower for cases assigned to a telephone mode of initial contact for both a housing unit and selected person sample. The related cost reductions, presented in tables 22 and 23, suggest savings in direct costs of approximately 20 percent with telephone contact.
- There are no clear findings with respect to the effects of elapsed time on response rate. The small cell sizes lead to unstable estimates and suggest that other information be used to analyze the impact of elapsed time. In addition, U.S. Bureau of the Census information concerning the proportion of movers should be used to estimate the impact of elapsed time on response rates for the selected person sample.
- Comparisons of response rates for similar areas in the linkage study and NSFG, Cycle III, indicate somewhat higher response rates in the linked design. The fact that persons from households that did not sign waivers were excluded from the linkage study and that teenage women were oversampled in NSFG, Cycle III, makes this outcome somewhat uncertain.

Table 5. Overall response rate for housing unit sample by household eligibility at time of the National Health Interview Survey (NHIS), mode of initial contact, race, and marital status

Race and marital status	Total	Household eligibility					
		Eligible			Ineligible		
		Total	In-person contact	Telephone contact	Total	In-person contact	Telephone contact
		Percent					
All races	83.5	83.9	84.6	83.6	71.2	65.9	79.7
	(753)	(517)	(255)	(262)	(236)	(121)	(115)
Black	87.0	87.2	86.6	88.0	82.5	80.3	95.0
	(238)	(115)	(54)	(61)	(123)	(63)	(60)
Never married	...	90.2	87.5	92.5	...	...	...
		(52)	(24)	(28)			
Ever married	...	85.0	86.0	84.2	...	...	...
		(63)	(30)	(33)			
Nonblack	82.5	82.9	84.0	81.8	59.8	31.6	77.1
	(515)	(402)	(201)	(201)	(113)	(58)	(55)
Never married	...	84.2	79.0	89.7	...	...	...
		(126)	(65)	(61)			
Ever married	...	82.4	86.5	78.5	...	...	...
		(276)	(136)	(140)			

NOTES: Overall response rate is the product of the screener response rate and the extended interview response rate (see appendix IV, Technical notes).

Numbers in parentheses are the screener sample sizes. For ineligible housing units, the extended interview response rates are based on much smaller samples; of the 236 ineligible units (households in which a woman 15–44 years did not reside at the time of the NHIS interview) that were recontacted for the Reproductive Health Survey (RHS), only 16 contained a woman 15–44 years at the time of the RHS contact.

Table 6. Interview response rate for selected person sample by mobility, mode of initial contact, race, and marital status

Race and marital status	Total	Mobility					
		Mover			Nonmover		
		Total	In-person contact	Telephone contact	Total	In-person contact	Telephone contact
		Percent					
All races	82.1	60.8	62.2	59.6	86.8	85.1	88.5
	(536)	(97)	(45)	(52)	(439)	(222)	(217)
Black	84.9	56.3	57.1	55.6	89.3	86.5	92.2
	(119)	(16)	(7)	(9)	(103)	(52)	(51)
Never married	85.7	50.0	50.0	50.0	90.0	87.5	94.4
	(56)	(6)	(2)	(4)	(50)	(32)	(18)
Ever married	84.1	60.0	60.0	60.0	88.7	85.0	90.9
	(63)	(10)	(5)	(5)	(53)	(20)	(33)
Nonblack	81.3	61.7	63.2	60.5	86.0	84.7	87.3
	(417)	(81)	(38)	(43)	(336)	(170)	(166)
Never married	76.6	61.6	55.0	68.4	82.4	76.4	89.2
	(141)	(39)	(20)	(19)	(102)	(56)	(46)
Ever married	83.7	61.9	72.2	54.2	87.6	88.6	86.7
	(276)	(42)	(18)	(24)	(234)	(114)	(120)

NOTE: Numbers in parentheses are the sample sizes used as denominators in calculating the response rates (see appendix IV, Technical notes).

Table 7. Overall response rate for housing unit sample by household eligibility at time of the National Health Interview Survey (NHIS), elapsed time between NHIS interview and the last contact on the Reproductive Health Survey (RHS), race, and marital status

Race and marital status	Total	Household eligibility											
		Eligible						Ineligible					
		Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months	Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months
		Percent											
All races	83.5	83.9	85.7	83.1	86.1	84.0	59.2	71.2	92.2	68.6	57.5	96.8	[1]
	(753)	(517)	(79)	(190)	(150)	(85)	(13)	(236)	(51)	(76)	(72)	(31)	(6)
Black	87.0	87.2	95.8	84.2	76.0	100.0	75.0	82.5	[1]	73.3	94.1	100.0	[1]
	(238)	(115)	(26)	(38)	(28)	(19)	(4)	(123)	(28)	(44)	(34)	(12)	(5)
Never married	...	90.2	100.0	77.7	100.0	100.0	66.7	...	...	...	...	...	...
		(52)	(7)	(18)	(13)	(11)	(3)						
Ever married	...	85.0	94.7	90.0	55.1	100.0	[1]	...	...	...	...	...	...
		(63)	(19)	(20)	(15)	(8)	(1)						
Nonblack	82.5	82.9	80.9	82.7	88.2	79.8	55.6	59.8	95.7	62.6	32.4	94.7	[1]
	(515)	(402)	(53)	(152)	(122)	(66)	(9)	(113)	(23)	(32)	(38)	(19)	(1)
Never married	...	84.2	100.0	92.3	91.4	60.9	0.0	...	...	...	...	...	...
		(126)	(8)	(56)	(35)	(24)	(3)						
Ever married	...	82.4	77.8	77.3	86.9	90.3	83.3	...	...	...	...	...	...
		(276)	(45)	(96)	(87)	(42)	(6)						

[1] No cases eligible for the extended interview.

NOTES: Overall response rate is the product of the screener response rate and the extended interview response rate (see appendix IV, Technical notes).

Numbers in parentheses are the screener sample sizes. For ineligible housing units, the extended interview response rates are based on much smaller samples; of the 236 ineligible units (households in which a woman 15–44 years did not reside at the time of the NHIS interview) that were recontacted for the RHS, only 16 contained a woman 15–44 years at the time of the RHS contact.

Table 8. Interview response rate for selected person sample by mobility, elapsed time between National Health Interview Survey interview and the last contact on the Reproductive Health Survey, race, and marital status

Race and marital status	Total	Mobility											
		Mover						Nonmover					
		Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months	Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months
		Percent											
All races	82.1	60.8	66.7	60.0	57.1	75.0	86.4	86.8	93.5	81.5	90.2	86.7	75.0
	(536)	(97)	(3)	(20)	(35)	(28)	(11)	(439)	(77)	(157)	(122)	(75)	(8)
Black	84.9	56.3	50.0	0.0	60.0	66.7	100.0	89.3	96.0	73.5	95.8	100.0	100.0
	(119)	(16)	(2)	(2)	(5)	(6)	(1)	(103)	(25)	(34)	(24)	(17)	(3)
Never married	85.7	50.0	100.0	0.0	50.0	50.0	...	90.0	100.0	76.5	90.0	100.0	100.0
	(56)	(6)	(1)	(1)	(2)	(2)	(-)	(50)	(12)	(17)	(10)	(10)	(1)
Ever married	86.9	75.0	0.0	0.0	66.6	75.0	100.0	88.7	92.3	70.6	100.0	100.0	100.0
	(61)	(10)	(1)	(1)	(3)	(4)	(1)	(53)	(13)	(17)	(14)	(7)	(2)
Nonblack	81.3	61.7	100.0	66.7	56.7	77.3	30.0	86.0	92.3	83.7	88.8	82.8	60.0
	(417)	(81)	(1)	(18)	(30)	(22)	(10)	(336)	(52)	(123)	(98)	(58)	(5)
Never married	76.6	61.5	100.0	37.5	60.0	83.3	33.3	82.4	92.3	80.6	88.3	73.3	50.0
	(141)	(39)	(1)	(8)	(15)	(12)	(3)	(102)	(13)	(36)	(34)	(15)	(4)
Ever married	83.7	61.9	...	90.0	53.3	70.0	28.6	87.6	92.3	85.1	89.1	86.0	100.0
	(276)	(42)	(-)	(10)	(15)	(10)	(7)	(234)	(39)	(87)	(64)	(43)	(1)

NOTE: Numbers in parentheses are the sample sizes used as denominators in calculating the response rates (see appendix IV, Technical notes).

Table 9. Overall response rate for housing unit sample by primary sampling unit, mode of initial contact, race, and marital status

Race and marital status	Total	Primary sampling unit								
		Los Angeles			Washington, D.C.			Lower density areas		
		Total	In-person contact	Telephone contact	Total	In-person contact	Telephone contact	Total	In-person contact	Telephone contact
					Percent					
All races	83.5	82.2	83.5	80.9	82.2	82.6	81.8	89.1	86.2	92.0
	(753)	(398)	(199)	(199)	(203)	(102)	(101)	(152)	(75)	(77)
Black	87.0	84.5	75.6	94.6	83.0	90.6	74.6	94.3	93.3	95.0
	(238)	(77)	(40)	(37)	(86)	(44)	(42)	(75)	(33)	(42)
Never married	90.2	86.7	75.0	100.0	84.1	90.0	77.9	100.0	100.0	100.0
	(52)	(15)	(8)	(7)	(21)	(10)	(11)	(16)	(6)	(10)
Ever married	84.2	82.1	72.9	93.3	81.6	89.6	72.2	89.5	88.9	90.0
	(186)	(62)	(32)	(30)	(65)	(34)	(31)	(59)	(27)	(32)
Nonblack	82.5	82.1	85.5	79.0	82.2	78.6	85.6	85.2	82.1	89.0
	(515)	(321)	(159)	(162)	(117)	(58)	(59)	(77)	(42)	(35)
Never married	84.2	84.6	84.5	85.0	87.9	73.8	100.0	76.7	66.7	100.0
	(126)	(81)	(40)	(41)	(27)	(13)	(14)	(18)	(12)	(6)
Ever married	82.0	81.2	86.0	76.6	80.2	80.2	80.2	88.8	91.2	86.5
	(389)	(240)	(119)	(121)	(90)	(45)	(45)	(59)	(30)	(29)

NOTES: Overall response rate is the product of the screener response rate and the extended interview response rate (see appendix IV, Technical notes).
Numbers in parentheses are the screener sample sizes.

Table 10. Interview response rate for selected person sample by primary sampling unit, mode of initial contact, race, and marital status

Race and marital status	Total	Primary sampling unit								
		Los Angeles			Washington, D.C.			Lower density areas		
		Total	In-person contact	Telephone contact	Total	In-person contact	Telephone contact	Total	In-person contact	Telephone contact
					Percent					
All races	82.1	81.4	78.7	84.1	79.9	82.4	77.3	87.1	87.8	86.5
	(536)	(301)	(150)	(151)	(134)	(68)	(66)	(101)	(49)	(52)
Black	84.9	82.5	80.0	85.2	78.0	73.7	81.8	94.7	95.0	94.4
	(119)	(40)	(20)	(20)	(41)	(19)	(22)	(38)	(20)	(18)
Never married	85.7	89.5	91.6	85.7	76.4	70.0	85.7	90.0	91.7	87.5
	(56)	(19)	(12)	(7)	(17)	(10)	(7)	(20)	(12)	(8)
Ever married	84.1	76.2	62.5	84.6	79.2	77.8	80.0	100.0	100.0	100.0
	(63)	(21)	(8)	(13)	(24)	(9)	(15)	(18)	(8)	(10)
Nonblack	81.3	81.2	78.5	84.0	80.6	85.7	75.0	82.5	82.8	82.4
	(417)	(261)	(130)	(131)	(93)	(49)	(44)	(63)	(29)	(34)
Never married	76.6	78.3	72.0	87.9	70.9	77.8	61.5	77.8	50.0	89.5
	(141)	(83)	(50)	(33)	(31)	(18)	(13)	(27)	(8)	(19)
Ever married	83.7	82.6	82.5	82.7	85.5	90.3	80.6	86.1	95.2	73.3
	(276)	(178)	(80)	(98)	(62)	(31)	(31)	(36)	(21)	(15)

NOTE: Numbers in parentheses are the sample sizes used as denominators in calculating the response rates.

Table 11. Overall response rate for eligible housing unit sample by mode of initial contact, elapsed time between National Health Interview Survey interview and the last contact on the Reproductive Health Survey, race, and marital status

Race and marital status	Total	Mode of initial contact											
		In-person contact						Telephone contact					
		Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months	Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months
		Percent											
All races	83.9	84.6	83.5	86.3	85.0	87.5	50.0	83.3	87.5	79.5	87.0	80.6	75.0
	(517)	(255)	(37)	(97)	(72)	(41)	(8)	(262)	(42)	(93)	(78)	(44)	(5)
Black	87.2	86.6	88.9	90.9	71.8	100.0	(1)	88.0	100.0	75.0	78.9	100.0	100.0
	(115)	(54)	(9)	(22)	(13)	(9)	(1)	(61)	(17)	(16)	(15)	(10)	(3)
Never married	92.3	87.5	100.0	83.3	100.0	100.0	(1)	96.4	100.0	66.6	100.0	100.0	100.0
	(52)	(24)	(1)	(12)	(6)	(4)	(1)	(28)	(6)	(6)	(7)	(7)	(2)
Ever married	85.0	86.0	87.5	100.0	51.4	100.0	...	84.2	100.0	79.9	58.4	100.0	(1)
	(63)	(30)	(8)	(10)	(7)	(5)	(-)	(33)	(11)	(10)	(8)	(3)	(1)
Nonblack	82.9	84.0	81.9	84.8	87.5	84.4	57.2	81.8	80.0	80.5	88.7	75.2	50.0
	(402)	(201)	(28)	(75)	(59)	(32)	(7)	(201)	(25)	(77)	(63)	(34)	(2)
Never married	84.2	79.0	100.0	89.6	81.3	55.6	0.0	89.7	100.0	95.7	100.0	64.3	...
	(126)	(65)	(6)	(31)	(16)	(9)	(3)	(61)	(2)	(25)	(19)	(15)	(-)
Ever married	82.4	86.5	77.3	81.5	90.0	95.7	100.0	78.5	78.3	73.2	83.7	83.5	50.0
	(276)	(136)	(22)	(44)	(43)	(23)	(4)	(140)	(23)	(52)	(44)	(19)	(2)

[1]No cases eligible for the extended interview.

NOTES: Overall response rate is the product of the screener response rate and the extended interview response rate (see appendix IV, Technical notes).

Numbers in parentheses are the screener sample sizes.

Table 12. Overall response rate for ineligible housing unit sample by mode of initial contact, elapsed time between National Health Interview Survey (NHIS) interview and the last contact on the Reproductive Health Survey (RHS), race, and marital status

Race and marital status	Total	Mode of initial contact											
		In-person contact						Telephone contact					
		Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months	Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months
		Percent											
All races	71.2	68.5	(1)	69.8	72.8	62.2	(1)	76.6	92.6	100.0	0.0	100.0	(1)
	(236)	(121)	(24)	(43)	(35)	(15)	(4)	(115)	(27)	(33)	(37)	(16)	(2)
Black	82.5	80.3	(1)	71.8	94.7	100.0	(1)	95.0	(1)	(1)	(1)	100.0	(1)
	(123)	(63)	(13)	(23)	(19)	(5)	(3)	(60)	(15)	(21)	(15)	(7)	(2)
Never married	...	...	...	...	...	...	...	...	...	...	...	...	...
Ever married	...	...	...	...	...	...	...	...	...	...	...	...	...
Nonblack	59.8	47.4	(1)	(1)	50.0	45.0	(1)	72.3	91.7	100.0	0.0	100.0	...
	(113)	(58)	(11)	(20)	(16)	(10)	(1)	(55)	(12)	(12)	(22)	(9)	(-)
Never married	...	...	...	...	...	...	...	...	...	...	...	...	...
Ever married	...	...	...	...	...	...	...	...	...	...	...	...	...

[1]No cases eligible for the extended interview.

NOTES: Overall response rate is the product of the screener response rate and the extended interview response rate (see appendix IV, Technical notes).

Numbers in parentheses are the screener sample sizes. For ineligible housing units, the extended interview response rates are based on much smaller samples; of the 236 ineligible units (households in which a woman 15–44 years did not reside at the time of the NHIS interview) that were recontacted for the RHS, only 16 contained a woman 15–44 years at the time of the RHS contact.

Table 13. Interview response rate for mover portion of selected person sample by mode of initial contact, elapsed time between National Health Interview Survey interview and the last contact on the Reproductive Health Survey, race, and marital status

Race and marital status	Total	Mode of initial contact											
		In-person contact						Telephone contact					
		Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months	Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months
							Percent						
All races	60.8	62.2	0.0	71.4	62.5	78.6	28.6	59.6	100.0	53.8	52.6	71.4	50.0
	(97)	(45)	(1)	(7)	(16)	(14)	(7)	(52)	(2)	(13)	(19)	(14)	(4)
Black	62.5	57.1	0.0	...	100.0	60.0	...	66.7	100.0	0.0	25.0	100.0	100.0
	(16)	(7)	(1)	(-)	(1)	(5)	(-)	(9)	(1)	(2)	(4)	(1)	(1)
Never married	50.0	50.0	...	...	...	50.0	...	50.0	100.0	0.0	50.0	...	...
	(6)	(2)	(-)	(-)	(-)	(2)	(-)	(4)	(1)	(1)	(2)	(-)	(-)
Ever married	60.0	60.0	0.0	...	100.0	66.7	...	60.0	...	0.0	50.0	100.0	100.0
	(10)	(5)	(1)	(-)	(1)	(3)	(-)	(5)	(-)	(1)	(2)	(1)	(1)
Nonblack	61.7	63.2	...	71.4	60.0	88.9	28.6	60.5	100.0	63.6	53.3	69.2	33.3
	(81)	(38)	(-)	(7)	(15)	(9)	(7)	(43)	(1)	(11)	(15)	(13)	(3)
Never married	61.5	55.0	...	33.3	44.4	83.3	50.0	68.4	100.0	40.0	83.3	83.3	0.0
	(39)	(20)	(-)	(3)	(9)	(6)	(2)	(19)	(1)	(5)	(6)	(6)	(1)
Ever married	61.9	72.2	...	100.0	83.3	100.0	20.0	54.2	...	83.3	33.3	57.1	50.0
	(42)	(18)	(-)	(4)	(6)	(3)	(5)	(24)	(-)	(6)	(9)	(7)	(2)

NOTE: Numbers in parentheses are the sample sizes used as denominators in calculating the response rates (see appendix IV, Technical notes).

Table 14. Interview response rate for nonmover portion of selected person sample by mode of initial contact, elapsed time between National Health Interview Survey interview and the last contact on the Reproductive Health Survey, race, and marital status

Race and marital status	Total	Mode of initial contact											
		In-person contact						Telephone contact					
		Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months	Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months
							Percent						
All races	86.8	85.1	92.5	78.2	90.5	85.3	71.4	88.5	94.6	84.8	89.8	87.8	100.0
	(439)	(222)	(40)	(78)	(63)	(34)	(7)	(217)	(37)	(79)	(59)	(41)	(1)
Black	89.3	86.5	90.0	73.7	91.7	100.0	100.0	92.2	100.0	73.3	100.0	100.0	100.0
	(103)	(52)	(11)	(19)	(12)	(8)	(2)	(51)	(14)	(15)	(12)	(9)	(1)
Never married	90.0	87.4	100.0	76.9	85.7	100.0	100.0	94.4	100.0	75.0	100.0	100.0	...
	(50)	(32)	(6)	(13)	(7)	(5)	(1)	(18)	(6)	(4)	(3)	(5)	(-)
Ever married	88.7	85.0	80.0	66.7	100.0	100.0	100.0	90.9	100.0	72.7	100.0	100.0	100.0
	(53)	(20)	(5)	(6)	(5)	(3)	(1)	(33)	(8)	(11)	(9)	(4)	(1)
Nonblack	86.0	84.7	93.1	79.7	90.2	80.8	60.0	87.3	91.3	87.5	87.2	84.4	...
	(336)	(170)	(29)	(59)	(51)	(26)	(5)	(166)	(23)	(64)	(47)	(32)	(-)
Never married	82.4	76.8	80.0	80.0	85.0	57.1	50.0	89.2	100.0	81.2	92.1	87.5	...
	(102)	(56)	(5)	(20)	(20)	(7)	(4)	(46)	(8)	(16)	(14)	(8)	(-)
Ever married	87.2	88.6	95.8	79.5	93.5	89.5	100.0	86.7	86.7	89.6	84.8	83.3	...
	(234)	(114)	(24)	(39)	(31)	(19)	(1)	(120)	(15)	(48)	(33)	(24)	(-)

NOTE: Numbers in parentheses are the sample sizes used as denominators in calculating the response rates (see appendix IV, Technical notes).

Table 15. Response rate comparison between the National Survey of Family Growth, Cycle III, and the experimental linkage study

Area for NHIS[1] and NFSG[2] linkage	*Response rate[3]*	*Area for NSFG[2]—Cycle III*	*Response rate[4]*
	Percent		Percent
Los Angeles and Long Beach, Calif. (MSA[5])	84.5	Los Angeles and Long Beach, Calif. (SMSA[6])	77.7
Washington, D.C. (MSA[5])	84.3	Washington, D.C. (SMSA[6])	77.8
Columbia, S.C. (MSA[5])	85.7	Darlington, Dillon, and Marlboro, S.C.	87.3
Calvert, Charles, and St. Marys Counties, Md.	82.7	Calvert, Charles, and St. Marys Counties, Md.	84.8
Buckingham, Cumberland, and Fluvanna Counties, Va.	95.5	Carolina, Fredericksburg City, King George, Spotsylvania, and Stafford Counties, Va.	86.4
		Danville City, Henry, Martinsville City, and Pittsylvania Counties, Va.	86.0

[1]NHIS = National Health Interview Survey.
[2]NSFG = National Survey of Family Growth.
[3]Response rate calculated across all design options.
[4]Response rate calculated as weighted overall response rate, where weights are used to adjust for nonresponse subsampling. The overall response rate is calculated as the product of the screener and extended interview response rate (see appendix IV, Technical notes).
[5]MSA = Metropolitan statistical area.
[6]SMSA = Standard metropolitan statistical area.

NOTE: Comparison limited to those areas in which subsampling for nonresponse followup was completed in NSFG, Cycle III (see appendix IV, Technical notes).

Table 16. Number of cases, completed interviews, telephone calls, and personal visits, by type of sampling unit, eligibility, and mobility

Respondent contact summary	*Type of sampling unit*					
	Housing unit sample			*Selected person sample*		
	Total	*Eligible[1]*	*Ineligible[1]*	*Total*	*Movers[2]*	*Nonmovers[2]*
	Number					
Cases	778	538	240	536	97	439
Completed interviews	421	409	12	440	59	381
Telephone calls[3]	1,294	987	307	1,450	449	1,001
Nonproductive telephone calls[4]	411	311	100	448	139	309
Personal visits[3]	1,733	1,411	322	1,509	341	1,168
Personal visits per completed extended interview	4.12	3.45	26.83	3.43	5.78	3.07

[1]Eligibility refers to how households were classified at the time of the National Health Interview Survey (NHIS) interview.
[2]Movers and nonmovers refer to whether respondents moved between the time of the NHIS interview and the Reproductive Health Survey interview.
[3]Telephone calls and personal visits for the housing unit sample include calls and visits for screening as well as for conducting the extended interview.
[4]Nonproductive telephone calls refers to the telephone calls with the disposition of ring—no answer, busy, and disconnected number.

Table 17. Number of cases, completed interviews, telephone calls, and personal visits, by type of sampling unit, eligibility, and mode of initial contact

Respondent contact summary	*Type of sampling unit*							
	Housing unit sample				*Sample person sample*			
	Eligible[1]		*Ineligible[1]*		*Mover[2]*		*Nonmover[2]*	
	In-person contact	*Telephone contact*	*In-person contact*	*Telephone contact*	*In-person contact*	*Telephone contact*	*In-person contact*	*Telephone contact*
	Number							
Cases	269	269	121	119	45	52	222	217
Completed interviews	204	205	7	5	28	31	189	192
Telephone calls[3]	162	825	40	267	127	322	182	819
Nonproductive telephone calls[4]	48	263	12	88	22	117	46	263
Personal visits[3]	913	498	251	71	198	143	757	411
Personal visits per completed interview	4.48	2.43	35.86	14.20	6.75	4.61	4.01	2.14

[1]Eligibility refers to how households were classified at the time of the National Health Interview Survey (NHIS) interview.
[2]Movers and nonmovers refer to whether respondents moved between the time of the NHIS interview and the Reproductive Health Survey interview.
[3]Telephone calls and personal visits for the housing unit sample include calls and visits for screening as well as for conducting the extended interview.
[4]Nonproductive telephone calls refers to the telephone calls with the disposition of ring—no answer, busy, and disconnected number.

Table 18. Number of cases, completed interviews, telephone calls, and personal visits, by type of sampling unit, eligibility, mobility, and elapsed time

Respondent contact summary	Type of sampling unit											
	Housing unit sample						Selected person sample					
	Eligible[1]			Ineligible[1]			Mover[2]			Nonmover[2]		
	0–5 months	6–11 months	12 months or more	0–5 months	6–11 months	12 months or more	0–5 months	6–11 months	12 months or more	0–5 months	6–11 months	12 months or more
	Number											
Cases	210	297	31	102	121	17	10	73	14	195	219	26
Completed interviews	165	224	20	4	7	1	6	47	6	171	189	21
Telephone calls[3]	484	470	29	145	145	15	122	275	50	444	519	32
Nonproductive telephone calls[4]	166	136	7	36	54	8	43	76	20	138	151	14
Personal visits[3]	702	660	49	178	118	25	99	215	27	605	528	34
Personal visits per completed interview	4.25	2.95	2.45	44.50	16.86	25.00	16.50	4.57	4.50	3.54	2.79	1.62

[1]Eligibility refers to how households were classified at the time of the NHIS interview.
[2]Movers and nonmovers refer to whether respondents moved between the time of the NHIS interview and the RHS interview.
[3]Telephone calls and personal visits for the housing unit sample include calls and visits for screening as well as for conducting the extended interview.
[4]Nonproductive telephone calls refers to the telephone calls with the disposition of ring—no answer, busy, and disconnected number.

NOTE: Elapsed time refers to the number of months between the National Health Interview Survey (NHIS) interview and the last contact on the Reproductive Health Survey (RHS).

Table 19. Number of cases, completed interviews, telephone calls, and personal visits for housing unit sample, by primary sampling unit, mode of initial contact, and eligibility

Respondent contact summary	Primary sampling unit: Los Angeles, In-person contact[1]	Los Angeles, Telephone contact[1]	Washington, D.C., In-person contact[1]	Washington, D.C., Telephone contact[1]	Lower density areas, In-person contact[1]	Lower density areas, Telephone contact[1]
Eligible[2]			Number			
Cases	151	151	68	67	50	51
Completed interviews	115	114	52	50	37	40
Telephone calls	59	434	67	237	36	154
Nonproductive telephone calls[3]	11	151	24	72	20	40
Personal visits	552	296	206	105	155	97
Personal visits per completed interview	4.8	2.6	4.0	2.1	4.2	2.4
Ineligible[2]						
Cases	55	55	36	34	30	30
Completed interviews	3	3	2	2	2	0
Telephone calls	12	141	14	64	14	62
Nonproductive telephone calls[3]	2	44	8	23	2	21
Personal visits	120	45	66	15	65	11
Personal visits per completed interview[4]	40.0	15.0	33.0	7.5	32.5	...

[1]Telephone calls and personal visits include calls and visits for screening as well as for conducting the extended interview.
[2]Eligibility refers to how households were classified at the time of the National Health Interview Survey interview.
[3]Nonproductive telephone calls refers to the telephone calls with the disposition of ring—no answer, busy, and disconnected number.
[4]The high number of personal visits per completed interview for the ineligible housing unit sample reflects the low number of households with eligible respondents.

Table 20. Number of cases, completed interviews, telephone calls, and personal visits for selected person sample, by primary sampling unit, mode of initial contact, and mobility

Respondent contact summary	Primary sampling unit: Los Angeles, In-person contact	Los Angeles, Telephone contact	Washington, D.C., In-person contact	Washington, D.C., Telephone contact	Lower density areas, In-person contact	Lower density areas, Telephone contact
Mover[1]			Number			
Cases	29	31	8	7	8	14
Completed interviews	16	20	6	2	6	9
Telephone calls	98	165	14	57	15	100
Nonproductive telephone calls[2]	19	61	0	26	3	30
Personal visits	132	108	28	6	38	29
Personal visits per completed interview	8.3	5.4	4.6	3.0	6.3	3.2
Nonmover[1]						
Cases	121	120	61	59	41	38
Completed interviews	102	107	50	49	37	36
Telephone calls	51	391	83	255	48	173
Nonproductive telephone calls[2]	12	136	31	72	3	55
Personal visits	446	261	191	73	120	77
Personal visits per completed interview[4]	4.4	2.4	3.8	1.5	3.2	2.1

[1]Movers and nonmovers refer to whether respondents moved between the time of the National Health Interview Survey interview and the Reproductive Health Survey interview.
[2]Nonproductive telephone calls refers to the telephone calls with the disposition of ring—no answer, busy, and disconnected number.

Table 21. Interviewer hours and costs, by primary sampling unit and mode of initial contact

Survey expenditure	Primary sampling unit					
	Los Angeles		Washington, D.C.		Lower density areas	
	In-person contact	Telephone contact	In-person contact	Telephone contact	In-person contact	Telephone contact
Interviewer time	Hours					
Total	1,625.50	1,384.25	522.50	405.75	535.25	388.75
Travel time[1]	915.50	669.25	243.00	168.00	229.50	125.75
Within-segment time[2]	563.75	547.00	217.25	181.50	224.75	197.75
Other time	146.25	168.00	62.25	56.25	81.00	65.25
Interviewing cost	Dollars					
Total	12,960	10,267	4,209	3,249	4,215	2,992
Mileage and related costs[3]	4,426	3,459	1,466	1,119	1,405	951
Wages	8,534	7,267	2,743	2,130	2,810	2,041

[1]Travel to and from segment and from segment to segment.
[2]Screening and interviewing, and calls within segment.
[3]Does not include car rental costs for traveling interviewers or time or travel between primary sampling units.

Table 22. Cost model for estimating cost reductions associated with mode of initial contact by type of sampling unit, eligibility, and mobility

Survey expenditure	Type of sampling unit			
	Housing unit sample		Selected person sample	
	Eligible[1]	Ineligible[1]	Mover	Nonmover
	Percent			
Estimated total reduction	22	55	9	22
Travel cost				
Cost of travel as percent of total cost for in-person contact[2]	65	90	80	65
Reduction in travel cost with telephone[3]	30	60	10	30
Total reduction in cost with telephone[4]	20	55	8	20
Within-segment cost				
Within-segment cost as percent of total with in-person contact	28	5	13	28
Reduction in within-segment cost with telephone contact	8	8	8	8
Total reduction in cost with telephone[4]	2	0.5	1	2

[1]Eligibility refers to how households were classified at the time of the National Health Interview Survey interview.
[2]This percent is calculated as mileage cost plus traveltime cost divided by total cost.
[3]Estimated reduction based on using table 16 for comparison of number of personal visits per completed extended interview.
[4]Product of previous 2 lines. Rounding of components for presentation may result in somewhat different products than those presented here.

Table 23. Relationship of costs of alternative data collection procedures by mode of initial contact and type of sample

Sample type	Mode of initial contact: Telephone contact — Total cost	Telephone contact — Cost per extended interview	Telephone contact — Number of extended interviews	In-person contact — Total cost	In-person contact — Cost per extended interview	In-person contact — Number of extended interviews
SELECTED PERSON SAMPLE						
Total	35,171*C*	...	10,672	42,788*C*	...	10,672
Nonmover	22,665*C*	2.59*C*	8,751	29,053*C*	3.32*C*	8,751
Mover	12,506*C*	6.51*C*	1,921	13,735*C*	7.15*C*	1,921
HOUSING UNIT SAMPLE[1]						
With $r = 1/2$						
Total	39,876*C*	...	11,060	63,562*C*	...	11,060
Eligible	26,416*C*	2.59*C*	10,286	34,150*C*	3.32*C*	10,286
Ineligible	13,235*C*	17.10*C*	774	29,412*C*	38.00*C*	774
With $r = 1/3$						
Total	38.396*C*	...	11,581	58,529*C*	...	11,581
Eligible	28,495*C*	2.59*C*	11,002	36,527*C*	3.32*C*	11,002
Ineligible	9,901*C*	17.10*C*	579	22,002*C*	38.00*C*	579

[1] r = rate at which households ineligible at time of the National Health Interview Survey are subsampled for the National Survey of Family Growth.

NOTE: C = within-segment cost of a single extended interview of a nonmover in the selected person sample with an in-person initial contact.

Table 24. Cost per extended interview by sample type, and mode of initial contact

Sample type	Cost per extended interview: In-person contact — Total cost	In-person contact — Within-segment cost	In-person contact — Travel cost	Telephone contact
Housing unit sample				
Eligible[1]	3.32*C*	*C*	2.32*C*	2.59*C*
Ineligible[1]	38.00*C*	2*C*	36.00*C*	17.10*C*
Selected person sample				
Mover	7.15*C*	*C*	6.15*C*	6.51*C*
Nonmover	3.32*C*	*C*	2.32*C*	2.59*C*

[1] Eligibility refers to how households were classified at the time of the National Health Interview Survey interview.

NOTE: C = within-segment cost of a single extended interview of a nonmover in the sample person sample with an in-person initial contact.

Appendixes

Contents

List of appendix tables

Appendix I
Definitions of response rate terms

Number of completed screeners—All cases in which a screener was completed, including screeners completed with no eligible respondent and screeners completed in housing units with eligible respondents.

Total sample—All cases originally assigned to a particular treatment.

Vacant housing units—Housing units that were occupied at the time of the National Health Interview Survey (NHIS) interview but vacant at the time of the Reproductive Health Survey (RHS) interview.

Nondwelling units—Buildings classified as residential at the time of the NHIS interview but that changed status prior to the RHS interview.

Number of completed extended interviews—Cases in which the RHS interview was completed for the designated respondent.

Total number of housing units with an eligible woman—All cases (housing units) having an eligible woman, as determined by the screener interview.

Women found to be ineligible—For the selected person sample, cases in which the selected woman was ineligible because of age, a result of error on the part of the NHIS interviewer or in the transcription sheets.

Appendix II
Screener and extended interview final dispositions and response rates

Table I. Screener disposition for housing unit sample by household eligibility at time of the National Health Interview Survey by race and marital status

Screener disposition	Household eligibility									
		Eligible								
		Total		Black		Nonblack		Ineligible[1]		
	Total	Ever married	Never married	Ever married	Never married	Ever married	Never married	Total	Black	Nonblack
	Number									
Total	778	354	184	69	53	285	131	240	125	115
Vacant	23	14	6	6	1	8	5	3	1	2
Not a dwelling unit	2	1	-	-	-	1	-	1	1	-
No eligible screener respondent at home	19	9	3	1	1	8	2	7	3	4
Screener refused	16	10	3	2	3	8	-	3	2	1
Other nonresponse	4	-	2	-	-	-	2	2	2	-
Completed screener										
No eligible respondent—due to wrong sex	60	10	2	3	2	7	-	48	32	16
No eligible respondent—due to wrong age	176	6	10	1	3	5	7	160	76	84
Eligible respondent	478	304	158	56	43	248	115	16	8	8

[1]Marital status in the National Health Interview Survey was not recorded for ineligible housing units.

Table II. Extended interview disposition for housing unit sample by household eligibility at time of the National Health Interview Survey, race, and marital status

Extended interview disposition	Household eligibility									
		Eligible								
		Total		Black		Nonblack		Ineligible[1]		
	Total	Ever married	Never married	Ever married	Never married	Ever married	Never married	Total	Black	Nonblack
	Number									
Total	478	304	158	56	43	248	115	16	8	8
Respondent not home	8	6	1	2	-	4	1	1	1	-
Respondent refused	30	23	7	3	-	20	7	-	-	-
Parent refused	4	-	3	-	1	-	2	1	-	1
Other nonresponse	15	8	5	1	-	7	5	2	-	2
Completed interview	421	267	142	50	42	217	100	12	7	5

[1]Marital status in the National Health Interview Survey was not recorded for ineligible housing units.

Table III. Extended interview disposition for mover selected person sample by race and marital status

Extended interview disposition	Race					
	All races		Black		Nonblack	
	Never married	Ever married	Never married	Ever married	Never married	Ever married
	Number					
Total	45	52	6	10	39	42
Respondent not locatable	10	8	2	3	8	5
Respondent moved[1]	1	8	-	-	1	8
Respondent not at home	4	-	-	-	4	-
Respondent refused	1	2	-	-	1	2
Parent refused	1	-	-	-	1	-
Other nonresponse	1	2	1	1	-	1
Ineligible woman	-	-	-	-	-	-
Completed interview	27	32	3	6	24	26

[1] Respondents who moved overseas and a few who moved to primary sampling units far from the ones in the field trials were not interviewed (see appendix IV, Technical notes).

Table IV. Extended interview disposition for nonmover selected person sample by race and marital status

Extended interview disposition	Race					
	All races		Black		Nonblack	
	Never married	Ever married	Never married	Ever married	Never married	Ever married
	Number					
Total	148	288	50	53	98	235
Respondent not at home	5	12	1	3	4	9
Respondent refused	10	21	3	3	7	18
Parent refused	1	-	1	-	-	-
Other nonresponse	3	2	-	-	3	2
Ineligible woman	-	1	-	-	-	1
Completed interview	129	252	45	47	84	205

Table V. Screener response rate for housing unit sample by household eligibility at time of the National Health Interview Survey, mode of initial contact, race, and marital status

Race and marital status	Total	Household eligibility					
		Eligible			Ineligible[1]		
		Total	In-person contact	Telephone contact	Total	In-person contact	Telephone contact
				Percent			
All races	94.8	94.8	93.7	96.2	94.9	94.2	95.7
	(753)	(517)	(255)	(262)	(236)	(121)	(115)
Black	94.1	93.9	92.6	95.1	94.3	93.7	95.0
	(238)	(115)	(54)	(61)	(123)	(63)	(60)
Never married	...	92.3	87.5	96.4	...	...	...
		(52)	(24)	(28)			
Ever married	...	95.2	96.7	93.9	...	...	...
		(63)	(30)	(33)			
Nonblack	95.1	95.0	94.0	96.0	95.6	94.8	96.4
	(515)	(402)	(201)	(201)	(113)	(58)	(55)
Never married	...	96.8	93.8	100.0	...	...	...
		(126)	(65)	(61)			
Ever married	...	94.2	94.1	94.3	...	...	...
		(276)	(136)	(140)			

[1]Marital status in the National Health Interview Survey was not recorded for ineligible housing units.

NOTE: Numbers in parentheses are the screener sample sizes.

Table VI. Extended interview response rate for housing unit sample by household eligibility at time of the National Health Interview Survey, mode of initial contact, race, and marital status

Race and marital status	Total	Household eligibility					
		Eligible			Ineligible[1]		
		Total	In-person contact	Telephone contact	Total	In-person contact	Telephone contact
				Percent			
All races	88.1	88.5	90.3	86.9	75.0	70.0	83.3
	(478)	(462)	(226)	(236)	(16)	(10)	(6)
Black	92.5	92.9	93.5	92.5	87.5	85.7	100.0
	(107)	(99)	(46)	(53)	(8)	(7)	(1)
Never married	...	97.7	100.0	95.8	...	...	...
		(43)	(19)	(24)			
Ever married	...	89.3	88.9	89.7	...	...	...
		(56)	(27)	(29)			
Nonblack	86.8	87.3	89.4	85.2	62.5	33.3	80.0
	(371)	(363)	(180)	(183)	(8)	(3)	(5)
Never married	...	87.0	84.2	89.7	...	...	...
		(115)	(57)	(58)			
Ever married	...	87.5	91.9	83.2	...	...	...
		(248)	(123)	(125)			

[1]Marital status in the National Health Interview Survey was not recorded for ineligible housing units.

NOTE: Numbers in parentheses are the numbers of women eligible for an extended interview.

Table VII. Screener response rate for housing unit sample by household eligibility at time of the National Health Interview Survey, elapsed time between the National Health Interview Survey interview and the last contact on the Reproductive Health Survey, race, and marital status

Race and marital status	Total	Household eligibility											
		Eligible						Ineligible[1]					
		Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months	Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months
							Percent						
All races	94.8	94.8	94.9	94.2	94.7	97.6	84.6	94.9	92.2	96.1	95.8	96.8	83.3
	(753)	(517)	(79)	(190)	(150)	(85)	(13)	(236)	(51)	(76)	(72)	(31)	(6)
Black	94.1	93.9	100.0	89.5	92.9	100.0	75.0	94.3	89.3	97.7	94.1	100.0	80.0
	(238)	(115)	(26)	(38)	(28)	(19)	(4)	(123)	(28)	(44)	(34)	(12)	(5)
Never married	...	92.3	100.0	83.3	100.0	100.0	66.7	...	...	...	...	...	...
		(52)	(7)	(18)	(13)	(11)	(3)						
Ever married	...	95.2	100.0	95.0	86.7	100.0	100.0	...	...	...	...	...	...
		(63)	(19)	(20)	(15)	(8)	(1)						
Nonblack	95.1	95.0	92.5	95.4	95.1	97.0	88.9	95.6	95.7	93.8	97.4	94.7	100.0
	(515)	(402)	(53)	(152)	(122)	(66)	(9)	(113)	(23)	(32)	(38)	(19)	(1)
Never married	...	96.8	100.0	98.2	97.1	95.8	66.7	...	...	...	...	...	...
		(126)	(8)	(56)	(35)	(24)	(3)						
Ever married	...	94.2	91.1	93.8	94.3	97.6	100.0	...	...	...	...	...	...
		(276)	(45)	(96)	(87)	(42)	(6)						

[1]Marital status in the National Health Interview Survey was not recorded for ineligible housing units.

NOTE: Numbers in parentheses are the screener sample sizes.

Table VIII. Extended interview response rate for housing unit sample by household eligibility at the time of the National Health Interview Survey, elapsed time between the National Health Interview Survey interview and the last contact on the Reproductive Health Survey, race, and marital status

Race and marital status	Total	Household eligibility											
		Eligible						Ineligible[1]					
		Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months	Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months
							Percent						
All races	88.1	88.5	90.3	88.2	90.9	86.1	70.0	75.0	100.0	71.4	60.0	100.0	...
	(478)	(462)	(72)	(169)	(132)	(79)	(10)	(16)	(1)	(7)	(5)	(3)	(-)
Black	92.5	92.9	95.8	94.1	81.8	100.0	100.0	87.5	...	75.0	100.0	100.0	...
	(107)	(99)	(24)	(34)	(22)	(17)	(2)	(8)	(-)	(4)	(2)	(2)	(-)
Never married	...	97.7	100.0	93.3	100.0	100.0	100.0	...	...	...	...	...	...
		(43)	(5)	(15)	(11)	(10)	(2)						
Ever married	...	89.3	94.7	94.7	63.6	100.0	...	...	...	...	...	...	...
		(56)	(19)	(19)	(11)	(7)	(-)						
Nonblack	86.8	87.3	87.5	86.7	92.7	82.3	62.5	62.5	100.0	66.7	33.3	100.0	...
	(371)	(363)	(48)	(135)	(110)	(62)	(8)	(8)	(1)	(3)	(3)	(1)	(-)
Never married	...	87.0	100.0	94.0	94.1	63.6	0.0	...	...	...	...	...	...
		(115)	(7)	(50)	(34)	(22)	(2)						
Ever married	...	87.5	85.4	82.4	92.1	92.5	83.3	...	...	...	...	...	...
		(248)	(41)	(85)	(76)	(40)	(6)						

[1]Marital status in the National Health Interview Survey was not recorded for ineligible housing units.

NOTE: Numbers in parentheses are the numbers of women eligible for an extended interview.

Table IX. Screener response rate for housing unit sample by primary sampling unit, mode of initial contact, race, and marital status

Race and marital status	Total	Primary sampling unit								
		Los Angeles			Washington, D.C.			Lower density areas		
		Total	In-person contact	Telephone contact	Total	In-person contact	Telephone contact	Total	In-person contact	Telephone contact
					Percent					
All races	94.8	93.7	92.0	95.5	94.6	95.1	94.1	98.0	97.3	98.7
	(753)	(398)	(199)	(199)	(203)	(102)	(101)	(152)	(75)	(77)
Black	94.1	89.6	85.0	94.6	93.0	95.4	90.5	100.0	100.0	100.0
	(238)	(77)	(40)	(37)	(86)	(44)	(42)	(75)	(33)	(42)
Never married	92.3	86.7	75.0	100.0	90.5	90.0	90.9	100.0	100.0	100.0
	(52)	(15)	(8)	(7)	(21)	(10)	(11)	(16)	(6)	(10)
Ever married	94.6	90.3	87.5	93.3	93.8	97.1	90.3	100.0	100.0	100.0
	(186)	(62)	(32)	(30)	(65)	(34)	(31)	(59)	(27)	(32)
Nonblack	95.1	94.7	93.7	95.7	95.7	94.8	96.6	96.1	95.2	97.1
	(515)	(321)	(159)	(162)	(117)	(58)	(59)	(77)	(42)	(35)
Never married	96.8	97.5	95.0	100.0	96.3	92.3	100.0	94.4	91.7	100.0
	(126)	(81)	(40)	(41)	(27)	(13)	(14)	(18)	(12)	(6)
Ever married	94.6	93.8	93.3	94.2	95.6	95.6	95.6	96.6	96.6	96.6
	(389)	(240)	(119)	(121)	(90)	(45)	(45)	(59)	(30)	(29)

NOTE: Numbers in parentheses are the screener sample sizes, including eligible and ineligible housing units.

Table X. Extended interview response rate for housing unit sample by primary sampling unit, mode of initial contact, race, and marital status

Race and marital status	Total	Primary sampling unit								
		Los Angeles			Washington, D.C.			Lower density areas		
		Total	In-person contact	Telephone contact	Total	In-person contact	Telephone contact	Total	In-person contact	Telephone contact
					Percent					
All races	88.1	87.7	90.8	84.7	86.9	86.9	86.9	90.9	88.6	93.2
	(470)	(268)	(131)	(137)	(122)	(61)	(61)	(88)	(44)	(44)
Black	92.5	94.3	88.9	100.0	89.2	95.0	82.4	94.3	93.3	95.0
	(107)	(35)	(18)	(17)	(37)	(20)	(17)	(35)	(15)	(20)
Never married	97.7	100.0	100.0	100.0	92.9	100.0	85.7	100.0	100.0	100.0
	(43)	(13)	(6)	(7)	(14)	(7)	(7)	(16)	(6)	(10)
Ever married	89.1	90.9	83.3	100.0	87.0	92.3	80.0	89.5	88.9	90.0
	(64)	(22)	(12)	(10)	(23)	(13)	(10)	(19)	(9)	(10)
Nonblack	86.8	86.7	91.2	82.5	85.9	82.9	88.6	88.7	86.2	91.7
	(371)	(233)	(113)	(120)	(85)	(41)	(44)	(53)	(29)	(24)
Never married	87.0	86.8	88.9	85.0	91.3	80.0	100.0	81.3	72.7	100.0
	(115)	(76)	(36)	(40)	(23)	(10)	(13)	(16)	(11)	(5)
Ever married	86.7	86.6	92.2	81.3	83.9	83.9	83.9	91.9	94.4	89.5
	(256)	(157)	(77)	(80)	(62)	(31)	(31)	(37)	(18)	(19)

NOTE: Numbers in parentheses are the numbers of women eligible for an extended interview, including eligible and ineligible housing units.

Table XI. Screener response rate for eligible housing unit sample by mode of initial contact, elapsed time between the National Health Interview Survey interview and the last contact on the Reproductive Health Survey, race, and marital status

Race and marital status	Total	Mode of initial contact											
		In-person contact						Telephone contact					
		Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months	Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months
		Percent											
All races	94.8	93.7	91.9	92.8	95.8	97.6	75.0	95.8	97.6	95.7	93.6	97.7	100.0
	(517)	(255)	(37)	(97)	(72)	(41)	(8)	(262)	(42)	(93)	(78)	(44)	(5)
Black	93.9	92.6	100.0	90.9	92.3	100.0	(0.0)	95.1	100.0	87.5	93.3	100.0	100.0
	(115)	(54)	(9)	(22)	(13)	(9)	(1)	(61)	(17)	(16)	(15)	(10)	(3)
Never married	92.3	87.5	100.0	83.3	100.0	100.0	(0.0)	96.4	100.0	83.3	100.0	100.0	100.0
	(52)	(24)	(1)	(12)	(6)	(4)	(1)	(28)	(6)	(6)	(7)	(7)	(2)
Ever married	95.2	95.7	100.0	100.0	85.7	100.0	...	93.9	100.0	90.0	87.5	100.0	100.0
	(63)	(30)	(8)	(10)	(7)	(5)	(-)	(33)	(11)	(10)	(8)	(3)	(1)
Nonblack	95.0	94.0	89.3	93.3	96.6	96.9	85.7	96.0	96.0	97.4	93.7	97.1	100.0
	(402)	(201)	(28)	(75)	(59)	(32)	(7)	(201)	(25)	(77)	(63)	(34)	(2)
Never married	96.8	93.8	100.0	96.8	93.8	88.9	66.7	100.0	100.0	100.0	100.0	100.0	...
	(126)	(65)	(6)	(31)	(16)	(9)	(3)	(61)	(2)	(25)	(19)	(15)	(-)
Ever married	94.2	94.1	86.4	90.9	96.7	100.0	100.0	94.3	95.7	96.2	90.9	94.7	100.0
	(276)	(136)	(22)	(44)	(43)	(23)	(4)	(140)	(23)	(52)	(44)	(19)	(2)

NOTE: Numbers in parentheses are the screener sample sizes.

Table XII. Screener response rate for ineligible housing unit sample by mode of initial contact, elapsed time between the National Health Interview Survey interview and the last contact on the Reproductive Health Survey, and race

Race	Total	Mode of initial contact											
		In-person contact						Telephone contact					
		Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months	Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months
		Percent											
All races	94.9	94.2	91.7	93.0	97.1	93.3	100.0	95.7	92.6	100.0	94.6	100.0	50.0
	(236)	(121)	(24)	(43)	(35)	(15)	(4)	(115)	(27)	(33)	(37)	(16)	(2)
Black	94.3	93.7	84.6	95.7	94.7	100.0	100.0	95.0	93.3	100.0	93.3	100.0	50.0
	(123)	(63)	(13)	(23)	(19)	(5)	(3)	(60)	(15)	(21)	(15)	(7)	(2)
Nonblack	95.6	94.8	100.0	90.0	100.0	90.0	100.0	96.4	91.7	100.0	95.5	100.0	...
	(113)	(58)	(11)	(20)	(16)	(10)	(1)	(55)	(12)	(12)	(22)	(9)	(-)

NOTES: Numbers in parentheses are the screener sample sizes.

Marital status in the National Health Information Survey was not recorded for ineligible housing units.

Table XIII. Extended interview response rate for eligible housing unit sample by mode of initial contact, elapsed time between the National Health Interview Survey interview and the last contact on the Reproductive Health Survey, race, and marital status

Race and marital status	Total	Mode of initial contact											
		In-person contact						Telephone contact					
		Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months	Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months
							Percent						
All races	88.5	90.3	90.0	93.0	88.7	89.7	66.7	86.9	89.7	83.1	92.9	82.5	75.0
	(462)	(226)	(33)	(86)	(62)	(39)	(6)	(236)	(39)	(83)	(70)	(40)	(4)
Black	92.9	93.5	88.9	100.0	77.8	100.0	...	92.5	100.0	85.7	84.6	100.0	100.0
	(99)	(46)	(9)	(20)	(9)	(8)	(-)	(53)	(15)	(14)	(13)	(9)	(2)
Never married	100.0	100.0	100.0	100.0	100.0	100.0	...	100.0	100.0	80.0	100.0	100.0	100.0
	(43)	(19)	(1)	(10)	(4)	(4)	(-)	(24)	(4)	(5)	(7)	(6)	(2)
Ever married	89.3	88.9	87.5	100.0	60.0	100.0	...	89.7	100.0	88.8	66.7	100.0	...
	(56)	(27)	(8)	(10)	(5)	(4)	(-)	(29)	(11)	(9)	(6)	(3)	(-)
Nonblack	87.3	89.4	91.7	90.9	90.6	87.1	66.7	85.2	83.3	82.6	94.7	77.4	50.0
	(363)	(180)	(24)	(66)	(53)	(31)	(6)	(183)	(24)	(69)	(57)	(31)	(2)
Never married	87.0	84.2	100.0	92.6	86.7	62.5	0.0	89.7	100.0	95.7	100.0	64.3	...
	(115)	(57)	(5)	(27)	(15)	(8)	(2)	(58)	(2)	(23)	(19)	(14)	(-)
Ever married	87.5	91.9	89.5	89.7	92.1	95.7	100.0	83.2	81.8	76.1	92.1	88.2	50.0
	(248)	(123)	(19)	(39)	(38)	(23)	(4)	(125)	(22)	(46)	(38)	(17)	(2)

NOTE: Numbers in parentheses are the number of women eligible for an extended interview.

Table XIV. Extended interview response rate for ineligible housing unit sample by mode of initial contact, elapsed time between the National Health Interview Survey interview and the last contact on the Reproductive Health Survey, and race

Race	Total	Mode of initial contact											
		In-person contact						Telephone contact					
		Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months	Total	1–3 months	4–6 months	7–9 months	10–12 months	13–15 months
		Percent											
All races	75.0	72.7	...	75.0	75.0	66.7	...	80.0	100.0	100.0	0.0	100.0	...
	(16)	(11)	(-)	(4)	(4)	(3)	(-)	(5)	(1)	(1)	(1)	(2)	(-)
Black	87.5	85.7	...	75.0	100.0	100.0	...	100.0	...	...	...	100.0	...
	(8)	(7)	(-)	(4)	(2)	(1)	(-)	(1)	(-)	(-)	(-)	(1)	(-)
Nonblack	62.5	50.0	...	...	50.0	50.0	...	75.0	100.0	100.0	0.0	100.0	...
	(8)	(4)	(-)	(-)	(2)	(2)	(-)	(4)	(1)	(1)	(1)	(1)	(-)

NOTES: Numbers in parentheses are the numbers of women eligible for an extended interview.

Marital status in the National Health Interview Survey was not recorded for ineligible housing units.

Appendix III
1987 population projections and population subgroup response rate weights for NSFG, Cycle III

Table XV. Expected number of women and never-married women, 15–44 years of age, by race and age: 1987

Age	Race			
	Black		Nonblack	
	Women	Never married[1]	Women	Never married[1]
	Number in thousands	Percent	Number in thousands	Percent
15–17 years	798	99.2	4,551	98.0
18–19 years	530	93.9	3,022	85.7
20–24 years	1,461	75.3	8,368	52.2
25–29 years	1,510	42.6	9,488	21.8
30–34 years	1,352	27.2	9,144	10.9
35–39 years	1,152	16.4	8,318	6.1
40–44 years	868	12.8	7,082	4.2

[1]U.S. Bureau of the Census: *Current Population Reports.* Series P–20, No. 389. Washington. U.S. Government Printing Office, Mar. 1983.

SOURCE: U.S. Bureau of the Census: *Current Population Reports.* Series P–25, No. 952. Washington. U.S. Government Printing Office, May 1984.

Table XVI. Weights for comparing housing unit and selected person samples by race, age, and marital status, with adjustments for 1987 population

Race, age, and marital status	Type of sample		
		Sample person sample	
	Housing unit sample	Mover[1]	Nonmover
Total	1.0000	0.1362	0.8638
Black	0.1331	0.0244	0.1087
15–17 years	0.0138	0.0019	0.0119
18 years and over, never married	0.0505	0.0081	0.0424
18 years and over, ever married	0.0688	0.0144	0.0544
Nonblack	0.8669	0.1118	0.7551
15–17 years	0.0790	0.0071	0.0719
18 years and over, never married	0.1878	0.0207	0.1671
18 years and over, ever married	0.6001	0.0840	0.5161

[1]Length of time between the National Health Interview Survey and the National Survey of Family Growth was assumed to be 9 months for blacks and 6 months for nonblacks. The mobility rates used for this table were as follows: black, 15–17 years, 0.14; black, 18 years and over, never married, 0.16; black, 18 years and over, ever married, 0.21; nonblack, 15–17 years, 0.09; nonblack, 18 years and over, never married, 0.11; nonblack, 18 years and over, ever married, 0.14.

Table XVII. Weights for comparing response rates by race, age, marital status, and mobility, with adjustments for 1987 population

Race, age, and marital status	Total	Mobility	
		Mover	Nonmover
Black	1.0000	0.1837	0.8163
15–17 years	0.1037	0.0145	0.0892
18 years and over, never married	0.3794	0.0607	0.3187
18 years and over, ever married	0.5169	0.1085	0.4084
Nonblack	1.0000	0.1289	0.8710
15–17 years	0.0911	0.0082	0.0829
18 years and over, never married	0.2166	0.0238	0.1928
18 years and over, ever married	0.6922	0.0969	0.5953

Table XVIII. Weights for comparing housing unit and selected person samples by race and marital status, linked design, same precision as in the National Survey of Family Growth, Cycle III

Race and marital status	Housing unit sample, r = 1/3[1]	Sample person sample	
		Total	Mover	Nonmover
Total	1.0000	1.0000	0.1703	0.8297
Black	0.4099	0.4074	0.0932	0.3142
Ever married	0.2534	0.2518	0.0529	0.1989
Never married	0.1565	0.1556	0.0403	0.1153
Nonblack	0.5901	0.5926	0.0771	0.5155
Ever married	0.3944	0.3986	0.0558	0.3428
Never married	0.1957	0.1940	0.0213	0.1727

[1]r = rate at which households ineligible at the time of the National Health Interview Survey are subsampled for the National Survey of Family Growth.

Table XIX. Weights for comparing response rates by race, marital status, and type of sample, linked design, same precision as in the National Survey of Family Growth, Cycle III

Race and marital status	Type of sample		
	Housing unit sample, r = 1/3[1]	Sample person sample	
		Mover	Nonmover
Black	1.0000	0.2287	0.7712
Ever married	0.6182	0.1298	0.4882
Never married	0.3818	0.0989	0.2830
Nonblack	1.0000	0.1301	0.8699
Ever married	0.6684	0.0942	0.5785
Never married	0.3316	0.0359	0.2914

[1]r = rate at which households ineligible at the time of the National Health Interview Survey are subsampled for the National Survey of Family Growth.

Appendix IV
Technical notes

Although the Reproductive Health Survey sample consisted of 1,315 cases, only 1,289 cases were used in the analysis of response rates. Twenty-five of the housing unit cases with a final disposition code of "vacant" or "nondwelling unit" were eliminated from the analysis of response rates. Similarly, the one case in the selected person sample that was discovered to be an ineligible case was also eliminated.

The overall response rate for the housing unit sample is the product of the screener response rate and the extended interview response rate. For example, if the screener response rate was 90 percent and the extended interview response rate was 88 percent, the overall response rate would be 79.2 percent. The sample sizes reported in the cells are the total number of nonvacant housing units assigned to that cell.

The total number of movers for this study is actually 98, not 97 as noted in table III. The additional mover (an evermarried woman) was discovered during final data processing and editing stages of the project. This case is correctly documented in the Field Operations Report.[3]

In the National Survey of Family Growth, Cycle III, field work, after all efforts to obtain an interview by the local interviewer assigned to each sample household had been exhausted, further attempts were made by an elite corps of traveling interviewers and assistant supervisors. To keep the cost of this operation within reasonable bounds, a 50-percent subsample of nonresponse cases was selected for the intensive followup effort.

Cluster sampling was used in the selection of the 50-percent subsample to control the travel costs. In several large-city primary sampling units (PSU's) in which there was a reasonably large number of nonresponse cases to follow up, the nonresponses were grouped by segment, the segments were sequenced by number of followup cases in descending order, and a systematic sample of one-half the segments was selected. For other PSU's, the grouping and sequencing were done by PSU, and a 50-percent systematic sample of PSU's was selected. Nonresponses that appeared to be "hard-core" refusals were excluded from this operation. No further attempts at followup were made for such sample units.

Appendix V
Estimated data on sample sizes used to calculate data collection costs for chapter 5

Table XX. Total field workload by sample option and design assuming entire National Survey of Family Growth available from the National Health Interview Survey

Sample option[1] and design	Total		Race			
			Black		Nonblack	
	Interviewed women[2]	Screened households[3]	Interviewed women[2]	Screened households[3]	Interviewed women[2]	Screened households[3]
	Number					
Unlinked Cycle III sample design	14,000	54,000	6,200	16,000	7,800	38,000
Linked sample option 1:						
Sample person	10,672	10,672	4,520	4,520	6,152	6,152
Housing unit,[4] $r = 1/2$	10,971	20,608	4,701	8,217	6,270	12,391
Housing unit,[4] $r = 1/3$	11,431	19,305	4,926	7,829	6,505	11,476
Linked sample option 2:						
Sample person	10,669	10,669	4,517	4,517	6,152	6,152
Housing unit,[4] $r = 1/2$	10,930	20,536	4,660	8,145	6,270	12,391
Housing unit,[4] $r = 1/3$	11,314	19,119	4,809	7,643	6,505	11,476
Linked sample option 3:	11,018	11,018	4,517	4,517	6,501	6,501
Sample person						
Housing unit,[4] $r = 1/2$	11,279	21,225	4,660	8,145	6,619	13,080
Housing unit,[4] $r = 1/3$	11,664	19,736	4,809	7,643	6,855	12,093

[1]Sample options 1–3 refer to specific subsets of the National Health Interview Survey sample that could be used as the sampling frame for the National Survey of Family Growth (NSFG).
[2]Number of interviewed women equals the number of households eligible at the time of the NSFG.
[3]Number of screened households equals the number of sampled eligible households plus the number of subsampled ineligible households.
[4]r = rate at which households ineligible at time of the National Health Interview Survey are subsampled for NSFG.

Table XXI. Percent of movers in the National Survey of Family Growth, Cycle IV, for selected person sample by sample option, race, and marital status

Sample option[1]	NHIS[2] sample needed	Time NHIS[2,3] needed	Average time from NHIS[2] to NSFG[4] interview[5]	Total sample needed	Movers[6]		Movers in total sample	
					Total	Long distance	Total	Long distance
Option 1[7]	Percent	Months	Months	Number	Percent			
Black, never married	85	14	10	1,750	19	7	19	7
Black, ever married	100	18	12	2,770	26	9		
Nonblack, never married	70	11	9	2,059	18	7		
Nonblack, ever married	49	6	7	4,093	16	6		
Option 2[7]								
Black, never married	100	12	10	1,759	19	7	17	6
Black, ever married	100	12	10	2,758	24	8		
Nonblack, never married	52	6	7	2,059	14	6		
Nonblack, ever married	37	4	6	4,093	14	5		
Option 3[7]								
Black, never married	100	12	10	1,759	19	7	18	7
Black, ever married	100	12	10	2,758	24	8		
Nonblack, never married	72	9	8	2,124	16	7		
Nonblack, ever married	53	6	7	4,377	16	6		

[1]Sample options 1–3 refer to specific subsets of the National Health Interview Survey (NHIS) sample that could be used as the sampling frame for the National Survey of Family Growth (NSFG).
[2]NHIS = National Health Interview Survey.
[3]Number of months is the number of calendar months leading up to the end of the NHIS period used.
[4]NSFG = National Survey of Family Growth.
[5]Assumes period of enumeration for NSFG is centered at October 1987 for option 1 and at May for options 2 and 3. Weighted average used for option 1 takes into account the fact that half of the NHIS sample is for January–June 1987 and the other half is for 1986.
[6]Annual mobility rates used were as follows: Ever married—total 26 percent, long distance 9 percent; never married—total 21 percent, long distance 7.5 percent. (Source: U.S. Bureau of the Census: *Current Population Reports.* Series P–20, Nos. 305, 320, 331, 353, and 368. U.S. Government Printing Office, 1977, 1978, 1979, 1980, and 1981.)
[7]Four quarters of 1986 NHIS data were available for options 1, 2, and 3. For option 1, half of NHIS data was available in 2 quarters of 1987.

Table XXII. Total field workload by sample design and race

Sample design	Number of years NHIS[1]	Total		Race			
				Black		Nonblack	
		Interviewed women[2]	Screened households[3]	Interviewed women[2]	Screened households[3]	Interviewed women[2]	Screened households[3]
		Number					
Unlinked Cycle III sample design[4]	...	14,000	54,000	6,200	16,000	7,800	38,000
Sample person sample							
Number of years[5]	...	...	...	0.85/1.12	...	0.25/0.35	...
Workload	...	10,672	10,672	4,520	4,520	6,152	6,152
Housing unit sample[6]							
$r = 1/2$	1	11,060	20,784	4,701	8,217	6,359	12,567
$r = 1/3$	1	11,581	19,570	4,926	7,829	6,655	11,741
$r = 1/4$	2	12,234	19,837	5,263	8,207	6,971	11,630

[1]NHIS = National Health Interview Survey.
[2]Number of interviewed women equals the number of households eligible at the time of the National Survey of Family Growth (NSFG).
[3]Number of screened households equals the number of sampled eligible households plus the number of subsampled ineligible households.
[4]The number of screened households is based on the NSFG, Cycle III, proposal.
[5]The 2 numbers shown in each column are the number of years NHIS needed for ever-married and never-married women.
[6]r = rate at which households ineligible at time of NHIS are subsampled for NSFG.

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DHHS Publication No. (PHS) 87–1377, Series 2, No. 103