

# Design and Operation of the 1995 National Survey of Family Growth

By William D. Mosher

The 1995 National Survey of Family Growth (NSFG) was conducted by the National Center for Health Statistics (NCHS) under a contract with the Research Triangle Institute (RTI) of Research Triangle Park, NC. The NSFG is conducted in response to a requirement of the Public Health Service Act that NCHS "collect statistics on ... family growth, formation, and dissolution." The survey complements the vital statistics—data on births, infant and fetal deaths, marriages and divorces—that NCHS collects. It also provides data needed by other federal agencies that relate to childbearing and reproductive health.

Cycle 5 of the NSFG, as the 1995 survey is known, represents both continuity with and major change from the previous cycles of the NSFG, which were conducted in 1973, 1976, 1982 and 1988. Those rounds were very useful for many purposes,<sup>1</sup> but Cycle 5 provides a much richer resource for theory-driven and policy research. Details on the findings, methods and procedures of the 1995 NSFG beyond those given in the articles in this issue may be found in three reports published by NCHS.<sup>2</sup>

## Planning and Content

Planning for Cycle 5 of the NSFG began in 1990 at a formal conference entitled "NSFG: Mission for the 1990s." At this meeting, at subsequent meetings and in informal consultations, NCHS sought advice on how to design a more effective and more useful NSFG.<sup>3</sup> As a result of this continuing consultation, the content of the questionnaire was expanded substantially, and the method of administering the survey was converted from paper-and-pencil interviewing to computer-assisted personal interviewing (CAPI), in which an interviewer enters the respondent's an-

swers into a laptop computer.

A revised questionnaire using CAPI was pretested between October and December 1993. About 800 eligible women were selected, and 500 were interviewed. The pretest was an experiment, which compared results for women who received incentives with results for women who did not. Incentives increased response rates, reduced costs and improved the reporting of sensitive information,<sup>4</sup> as previous literature had suggested.<sup>5</sup>

The 1993 pretest also tested the use of audio computer-assisted self-interviewing (audio CASI) for sensitive topics, such as abortion (some of which were also covered in the CAPI component). With audio CASI, the respondent hears the questions over a pair of headphones or reads them on the screen of a laptop computer, and enters her responses into the computer herself. Pretest respondents rated audio CASI very highly and reported more abortions using audio CASI than they reported to the interviewer.<sup>6</sup>

Given the results of the pretest, approval was sought and obtained to offer a \$20 incentive to respondents in the NSFG, and to use audio CASI to collect data on abortion and a few other sensitive items.<sup>7</sup> During 1994, revisions were made in the questionnaire, and the questionnaire was tested extensively and translated into Spanish.

The 1995 NSFG questionnaire covered the following (Table 1, page 44):

- *Event histories.* In the first section, the respondent was introduced to the Life History Calendar, an 11-by-17-inch form on which she was asked to enter the month and year of five or six events in her life that she remembered well. Then three major event histories were collected: when the woman lived with her mother, father and grandparents while growing up; her regular, vocational and GED education; and her work history.<sup>8</sup> None of these histories had been collected in previous cycles of the NSFG.

- *Pregnancy history and family formation.* The next section explored the woman's pregnancy and birth history, including questions about her smoking in each pregnancy. Data were collected on up to 15 pregnancies, including all outcomes (births, miscarriages, stillbirths, induced abortions and ectopic pregnancies). Data on adopted children, stepchildren and foster children were also collected in this section.

- *Partner history.* The woman was asked to provide a history of all of her marriages, all of her cohabiting relationships (i.e., when she lived with a man in a nonmarital sexual relationship) and her sexual relationships with noncohabiting male partners in 1991–1995. Demographic characteristics were also collected for the woman's first voluntary male partner, first and current (or most recent) husband, current cohabiting partner and all partners since January 1991. The full history of cohabitation and the sexual partner history were new in the 1995 NSFG. This section of the questionnaire also contained a series of new questions on the characteristics of the woman's male partner at her first voluntary sexual intercourse.\*

- *Sterilization and fecundity.* As in past cy-

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William D. Mosher is a statistician with the Reproductive Statistics Branch of the National Center for Health Statistics, Hyattsville, MD. The 1995 National Survey of Family Growth (NSFG) was jointly planned and funded by three units of the U.S. Department of Health and Human Services: the National Center for Health Statistics (NCHS), the Office of Population Affairs, and the National Institute for Child Health and Human Development. Additional support was provided by the Administration for Children and Families. The fieldwork contractor for the NSFG was the Research Triangle Institute, Research Triangle Park, NC, Allen P. Duffer, Jr., project director. Data from the 1995 NSFG are publicly available on CD-ROM from the Government Printing Office, from NCHS (301-436-8500), on mainframe computer tape from the National Technical Information Service (accession no. PB 97-50154) for \$395 and from Sociometrics Corp. (800-846-DISK). The data are also available to member institutions of the Inter-University Consortium for Political and Social Research (<[www.icpsr.umich.edu](http://www.icpsr.umich.edu)>, study 6960).

\*For a discussion of the questions about first voluntary intercourse, see the article on page 12 of this issue.

**Table 1. Outline of the 1995 National Survey of Family Growth (NSFG) questionnaire**

<b>Event histories</b>
Education (college, vocational, GED)*
Periods of living with mother, father, grandparents during childhood*
Work (≤10 periods of working)*
<b>Pregnancy history and family formation</b>
Pregnancies and births (≤15 pregnancies)
Smoking in each pregnancy*
Adoption, stepchildren, foster children
<b>Partner history</b>
Marriages (≤5 marriages)
Cohabiting relationships (≤9 men)*
First intercourse; characteristics of first voluntary male partner*
Partner history, Jan. 1991–1995 (≤20 men)*
<b>Sterilization and fecundity</b>
Type, date and reasons for procedures and reversals
Impaired fecundity; impossible or difficult to get pregnant or carry to term
<b>Contraception and birth expectations</b>
All methods ever used, first method used, methods used each month, Jan. 1991–1995
Wantedness of pregnancies (old and new measures)
Births expected in the future
<b>Use of family planning and other medical services</b>
Family planning services
Title X-funded clinics, other types of clinics
Other medical services
Use of infertility services
Diseases related to infertility (pelvic inflammatory disease, sexually transmitted diseases, others)
HIV-related tests and behavior
<b>Demographic characteristics</b>
Residence
Religion
Race and ethnicity
Child care
Occupation
Income
Health insurance
<b>Audio CASI</b>
Abortion
Sexual partners
Forced intercourse*

\*New item in 1995 NSFG.

cles of the NSFG, information was collected on surgical procedures that resulted in the sterilization of the woman or her husband or cohabiting partner (hysterectomy, tubal ligation, vasectomy or other), including the reasons those procedures were performed. Information on fecundity impairments and infertility (physical inability to have a baby) was also collected here.\*

• *Contraception and birth expectations.* A detailed history of contraceptive use was collected, including use of methods for birth control and for disease prevention. To measure contraceptive effectiveness, a month-by-month history of contraceptive use was

\*For a discussion of the results on fecundity impairment, infertility and the use of infertility services, see the article on page 34 of this issue.

collected for the period 1991–1995. A number of new questions on contraception and on intended and unintended pregnancy were added in 1995.<sup>9</sup> A separate section contained a short series of questions about the number of children (births) the woman expected to have in the future.

• *Use of family planning and other medical services.* Data were collected on the use of family planning and other medical services in the 12 months preceding the survey, including what specific services were received and where they were obtained. Another section asked about the woman’s use of infertility services, whether she had been tested for HIV and HIV-related behaviors.

• *Demographic characteristics.* Next, data about additional background variables were collected, including religious affiliation and attendance at religious services, occupation, amount and sources of income, health insurance coverage and use of child care.

• *Audio CASI.* Finally, using audio CASI, the woman was asked about her abortion history, her number of sexual partners and whether she had ever experienced forced intercourse.<sup>10</sup>

### Sample Design

Cycle 5 of the NSFG is based on a national sample of women who were 15–44 years of age on April 1, 1995, and lived in the civilian noninstitutionalized population of the United States. The sample was drawn from households that were interviewed in a larger NCHS survey, the 1993 National Health Interview Survey (NHIS), which had a response rate of about 95%.<sup>11</sup>

In all, 14,000 women were selected for the 1995 NSFG sample; of these, 13,795 women were considered eligible to participate (Table 2). Eligible women were sent a brochure about the survey, in which they were told that the average interview was expected to take about 90 minutes. (It turned out that the interviews took slightly longer than estimated—103 minutes, on average. Interviews with teenagers averaged about 60 minutes.) Primarily because of the length of the interview, 11% refused to participate (compared with 7% in previous NSFG cycles). Another 6% could not be located despite repeated attempts, 3% were not available despite several visits to the household by an interviewer and 2% were not interviewed for other reasons (e.g., mental or physical incapacity, or inability to complete an interview in either English or Spanish). Finally, 1% of eligible women were excluded because they were aged 15–17 and their parents refused

to consent to the interview. (Consent was sought if women aged 15–17 were living with their parents. The interviewer spoke with the parent, using a letter, brochure and parental consent form that described the content of the interview. If the parent agreed, the interviewer signed the form, gave the original to the parent and sent a copy to RTI. The parents of 7% of eligible minors refused to let their daughters be interviewed.)

Thus, 79% of the 13,795 eligible women (10,847 women) completed interviews, which took place between the middle of January and the end of October 1995. This response rate compares favorably with that of other major national surveys with long questionnaires. For example, the National Survey of Men had a response rate of 70%,<sup>12</sup> while the National Health and Social Life Survey’s response rate was 79%.<sup>13</sup> Participants in the 1995 NSFG included 1,553 Hispanic women, 2,446 non-Hispanic black women, 6,483 non-Hispanic white women and 365 women of other races. Response rates were about equal for Hispanic, black and white women (79% for each group).

The 1995 sample was larger than those in previous NSFG cycles (8,450 in 1988 and 7,969 in 1982); sample size increased substantially for both Hispanic and white women. Respondents were drawn from 198 large areas (primary sampling units), compared with 156 in 1988 and only 79 in 1982. This means that the sampling errors of statistics computed from the 1995 results are smaller than those from either the 1982 or the 1988 data.

### Quality Control

A number of measures were taken to ensure that the data were of the highest possible quality. First, the CAPI questionnaire was designed carefully and tested extensively, both before the pretest and before the main study. That testing included cog-

**Table 2. Number and percentage distribution of women eligible for the 1995 NSFG, by outcome**

Outcome	No.	%
Completed interview	10,847	78.6
Did not complete interview	2,948	21.4
Refused	1,542	11.2
Parent refused*	90	0.7
Not located	757	5.5
Located but not available	348	2.5
Other	211	1.5
Total	13,795	100.0

\*Parental consent was required for participation for women aged 15–17 who lived with their parents. Note: An additional 205 women originally selected for the sample were excluded because they did not meet the eligibility criteria of having been born between April 1, 1950, and March 31, 1980, and living in the civilian noninstitutionalized population of the United States.

nitive interviews in the survey methods laboratories at both NCHS and RTI, and test interviews and simulated interviews conducted by both NCHS and RTI staff. Designing a CAPI program to collect and edit the many event histories covered in the 1995 NSFG—work, education, parental, marital, cohabitation, sexual partners and contraceptive—was difficult, but it resulted in higher quality data and faster release of the results after data collection than in previous cycles of the survey, which were conducted with paper-and-pencil questionnaires.

Second, as respondents and interviewers attested, the Life History Calendar helped respondents remember, or figure out, the dates of events, by allowing them to relate the dates of one event to the dates of others they had already recorded. Interviewers reported that the calendar also made the interview more interesting for many respondents; some respondents chose to keep their calendar when the interview was over.

The third quality control measure was intensive interviewer training. Interviewers were trained for seven full days; the training was done in small groups, with individual attention for those who needed it. New interviewers, interviewers who had never used computers before and bilingual (English- and Spanish-speaking) interviewers were given additional training sessions.

Fourth, edits, or consistency checks, were programmed into the interview, so that interviewers would notice errors that they or the respondent had made and be able to correct them during the interview. These edits and other features of CAPI reduced item nonresponse to very low levels—less than 1% on most items.

Fifth, data from the pretest showed that the \$20 incentive paid to respondents increased response rates by about seven percentage points and improved the completeness of reporting of some sensitive behaviors. The experience of the pretest further showed that incentives paid for themselves by saving interviewers' time and travel expenses.<sup>14</sup> Experience with the NSFG and other surveys shows that incentives also increase the interest of both respondents and interviewers, and help to communicate the importance of the interview to those who otherwise may not have understood its significance.<sup>15</sup>

### Sampling Weights

The purpose of the NSFG is to produce statistical estimates that are nationally representative—not just data that describe a

sample. National estimates are produced by devising a “sampling weight” for each respondent that equals the number of women in the population that she represents. The articles in this issue, and all NCHS reports, show weighted data—national estimates from the sample.

The weights for the 1995 NSFG were calculated by starting with the weight from the 1993 NHIS for each household and adjusting it as follows: First, the NHIS weight was adjusted to reflect that Hispanic women and non-Hispanic black women were selected at higher rates than others. Second, the weight was adjusted to reflect the survey staff's inability to locate some eligible women. Third, the weight was adjusted for nonresponse among those who were located. Fourth, it was “post-stratified”—adjusted to agree with Census Bureau estimates of the female population by five-year age-group, marital status (ever- vs. never-married), race and ethnicity (Hispanic, black and other), and parity (zero, one, two, three, or four or more). These adjustments were specific to each age-and-race group (e.g., non-Hispanic black women 20–24 years of age). These subgroups were further broken down and adjusted by marital status and parity, as sample sizes permitted. The weights were calculated using state-of-the-art procedures described in detail elsewhere.<sup>16</sup>

### Sampling Errors

Statistics from any sample survey have sampling errors that measure the variation of the data caused by interviewing a sample instead of the whole population. (Sampling errors would be zero in a census, although any real census does have an incomplete count, or coverage error.) Formulas found in standard introductory statistics textbooks and in many software packages assume that the sample is a “simple random sample.” However, the 1995 NSFG (like most large national surveys) is not a simple random sample, because different groups of women were selected and responded at different rates; the sampling errors used in the articles in this issue take into account that the survey is based on a complex sample.

**Table 3. Standard errors (in percentage points) for estimated percentages of women in the 1995 NSFG, by race, ethnicity and sample size**

Race, ethnicity and sample size	Weighted no.	50%	40%	30%	20%	10%
<b>Hispanic</b>						
500	2,158,000	2.52	2.56	2.40	2.02	1.35
1,000	4,315,000	1.81	1.84	1.73	1.46	0.97
1,553	6,702,000	1.47	1.49	1.40	1.18	0.79
<b>Non-Hispanic black</b>						
500	1,678,000	2.68	2.66	2.52	2.21	1.66
1,000	3,356,000	1.92	1.91	1.81	1.59	1.20
1,600	5,370,000	1.54	1.53	1.45	1.27	0.96
2,446	8,210,000	1.26	1.25	1.18	1.04	0.78
<b>All women and white women</b>						
1,000	5,550,000	1.74	1.71	1.59	1.38	1.03
3,000	16,650,000	1.05	1.04	0.97	0.84	0.62
6,000	33,300,000	0.77	0.76	0.71	0.61	0.45
10,847	60,201,000	0.59	0.58	0.54	0.47	0.35

Note: These standard errors were estimated by formulas. For more detailed tables for percentages of women, estimates for percentages of pregnancies and instructions on how to compute standard errors directly using SUDAAN, see Potter FJ et al., 1997 (reference 2).

There are two valid methods of estimating the sampling errors: by using special software (SUDAAN, WesVarPC or others) or by using generalized formulas.<sup>17</sup> Table 3 presents standard errors for selected estimated percentages, based on generalized formulas.

### Conclusion

The articles in this issue, and in the three reports that NCHS has published to date, only begin to make use of the potential of the 1995 NSFG results. Much more remains to be done. We hope that these articles will be used widely and will encourage others to make use of this valuable resource for research on the formation, growth and dissolution of families in the United States.

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