B. Collection of Information Employing Statistical Methods

1. Respondent Universe and Sampling Methods

The proposed *Follow-up Study* entails follow-up interviews by telephone with subjects who participated in the *Baseline Survey* in three segments of the Georgia population: metropolitan (represented by DeKalb and Fulton Counties), urban (represented by Bibb County, which contains the city of Macon, and the nearby city of Warner Robins, in Houston County), and rural (represented by counties surrounding Macon). All subjects agreed to be contacted for a follow-up study.

Exhibit B.1.1 presents the *Follow-up Study* sample assumptions. It begins with the 5,623 subjects who completed baseline interviews. Respondents who had temporary or permanent medical and psychiatric exclusions have been removed from this sample. Respondents who declined to be contacted for future studies also have been removed. CDC expects 3,587 respondents to be eligible for follow-up telephone interviews. An 80 percent response rate is expected—2,870 completed interviews.[1]

[1] In the *Baseline Survey*, telephone interviews were completed with 64.9% of the respondents who were selected. In the *Follow-up Study*, a higher response rate is expected because all eligible respondents completed baseline interviews and agreed to be contacted for follow-up.

Exhibit B.1.1. Sample Assumptions for *Follow-up Study*

Completed baseline telephone interviews	5,623
Medical and psychiatric exclusions (20.7%)	(1,164)
Age exclusion (over age 59 at anticipated start of data collection, only for respondents who did not complete baseline clinical evaluations)	(174)
Declined to be contacted for future studies (16.2% of remaining sample)	(698)
Follow-up Study telephone interview sample (63.8% of baseline telephone interview completes)	3,587
Follow-up Study telephone interview completes (80.0% of sample)	2,870

Exhibit B.1.2 presents demographic information of the 3,587 respondents who are eligible for follow-up telephone interviews.

Exhibit B.1.2. Demographic Characteristics of *Follow-up Study* Sample (n=3,587)

	Number	Percent
Sex		
Male	1,260	35.1
Female	2,327	64.9
Age in years		
18-19	24	0.7
20-24	274	7.6
25-29	353	9.8
30-34	382	10.6
35-39	430	12.0
40-44	540	15.0
45-49	552	15.4
50-54	524	14.6
55-59	464	12.9
60-64	33	0.9
Age undetermined	11	0.3
Race/Ethnicity		
Black	1,133	31.6
White/Other	2,454	68.4
Hispanic/Latino	120	3.3

2. Procedures for Collection of Information

The goal of the present study is to build on the *Baseline Survey* and identify risk factors for and biomarkers of CFS so as to improve identification, clinical evaluation, diagnosis, and management of the illness. Participants are drawn from the population-based surveillance cohort that participated in the *Baseline Survey* and who agreed to participate in future studies. The *Follow-up Study* is a modification of the *Baseline Survey* and utilizes most of the baseline instruments, with some modifications. Information will be incorporated into a national health care provider education program (Contract #200-2002-00793) and into a national public awareness effort (Contract #200-2004-09722). Data will also be used to develop a targeted regional provider education project.

a. Statistical Methodology for Stratification and Sample Selection

As described in Section B.1 above, the proposed *Follow-up Study* entails follow-up interviews by telephone with subjects who participated in the *Baseline Survey* in the metropolitan, urban and rural segments of the Georgia population.

b. Estimation Procedure

Each of the persons who completed detailed interviews during the *Baseline Survey* received a baseline sampling weight, which reflects the probability that the person was selected for a detailed interview. The baseline sampling weights also incorporate adjustments for nonresponse (for example, interviews that could not be conducted and households for which the screening questionnaire was not completed). Each person completing the *Follow-up Study* will be assigned a nonresponse-adjusted weight (their baseline sampling weight with additional adjustments for nonresponse to the *Follow-up Study*). These weights will compensate for nonresponse by applying weighting-class adjustments. Within each cell in a set of cells, the initial interview weight (that is, the baseline sampling weight) of each respondent will be multiplied by the ratio of the total weight for respondents and nonrespondents to the total weight for respondents. These cells will be based on geographic stratum (i.e., metropolitan, urban, rural), fatigue status, race/ethnicity, sex, and age (as in the Georgia *Baseline Survey*).

The data from clinical evaluations of persons whose responses to the telephone interviews classify them as CFS-like or chronically unwell will permit estimation of the incidence of CFS. Each CFS-like or chronically unwell person who has a completed clinical evaluation will receive an additional weight, equal to the person's nonresponse-adjusted interview weight multiplied by a further adjustment for nonresponse on the clinical evaluation. Estimates of incidence of CFS will be weighted percentages of the sample (using these additional weights). Estimates of incidence of CFS-like illness will require only the nonresponse-adjusted interview weights.

c. Level of Accuracy

As its primary objective, the *Follow-up Study* aims to produce estimates of morbidity and clinical course for CFS and CFS-like illness. The expected sample size of 3,587 eligible respondents is expected to provide adequate precision for these estimates and to detect differences that would be important for establishing public health policies. The exact precision of the resulting estimates will depend on the observed changes in morbidity over time, which are unknown. This study also aims to begin to estimate incidence of CFS. The incidence estimates will be developed to calculate the weighted percentage of the interview sample that are newly diagnosed CFS cases, either overall or within particular demographic subgroups. As in earlier surveys, the demographic subgroups will be based on sex, age, race, and household income (both singly and in selected combinations). In addition, the sample design will allow estimation of incidence for the metropolitan, urban, and rural strata. For a demographic subgroup, each geographic stratum will yield an incidence estimate. These estimates can be studied separately (though the sample is not designed to yield stratum-specific estimates of high precision for subgroups), and they can be combined to obtain an *overall* estimate (from all three strata).

d. Use of Periodic Data Collection Cycles To Reduce Burden

Follow-up Study respondents will be asked to complete a single telephone interview. Use of periodic data collection cycles would have no effect on respondent burden.

e. Data Collection Protocol

CDC is requesting OMB review of the telephone data collection protocol for the *Follow-up Study*. Detailed interviews will be administered using computer-assisted telephone interviewing (CATI). Prior to calling selected telephone numbers, advance letters will be sent to all respondents. These letters remind respondents of their prior participation in the *Survey of*

Chronic Fatigue Syndrome and Chronic Unwellness in Georgia, notify them of the follow-up survey, explain its purpose and sponsor, and alert respondents to expect an interviewer to call. A copy of the advance letter appears as Attachment 7.

All telephone interviews will be conducted by professional interviewers with special training in administering these survey instruments. The script that the telephone interviewers will use to contact respondents and conduct the interviews is included in the questionnaire (Attachment 3).

Potential respondents who are initially reluctant to cooperate may be sent follow-up letters, emphasizing the importance of their participation in the study and giving them a toll-free telephone number to call to schedule or complete interviews. Two separate follow-up letters were designed for this study. The first letter is directed to respondents whom we have been unable to reach by telephone. The second letter is directed to respondents who are reluctant to complete detailed interviews. These letters are included as Attachments 8A and 8B, respectively.

In-person interviews will be scheduled and completed if target response rates cannot be achieved with telephone interviews. The telephone center supervisor will carefully screen uncontacted respondents to ensure that only appropriate cases are given to the field—respondents for whom we believe we have correct addresses but which we have not been able to reach by telephone. A field interviewer will first try to contact the respondent by telephone, and will then visit the respondent's home and try to persuade the respondent to call the Telephone Center to complete the interview. If the respondent prefers, field interviewers will conduct the interview on the spot.

Quality control measures include monitoring of telephone interviews by supervisory staff using Abt Associates' monitoring system. Abt Associates' Telephone Centers are equipped with separate monitoring rooms that allow unobtrusive monitoring of interviewers. Interviewers will not know when they will be monitored. The monitoring supervisor will listen to the telephone interview while observing the interviewer's data entry on a computer monitor that mirrors the interviewer's screen.

All telephone interviewers will be routinely monitored at selected time intervals. They will be given active coaching and immediate feedback, both positive and negative, on their performance so that success can be rewarded and reinforced, while problems are identified and corrected. The monitoring system is also used to evaluate performance patterns across interviewers to identify any problematic areas or items in the questionnaire. If individual interviewers need to improve, retraining will focus on the specific problems. If these interviewers fail to improve after remedial training, they will be replaced.

As an additional quality control measure, project staff will review questionnaire item frequencies, as well as interview length, numbers of completed interviews, and similar information, to identify any potential for interviewer falsification; correct skip pattern errors; and detect any other anomalies in the data.

The full study protocol is included as Attachment 4.

3. Methods to Maximize Response Rates and Deal with Non-response

The success of any survey in achieving high response rates depends on the strategy that is used to encourage respondents to participate and on the energy with which this strategy is pursued. CDC and Abt Associates have considerable experience conducting data collection efforts using methods and modes similar to those proposed for the *Follow-up Study*. Experience with the *San Francisco Study, Sedgwick County Studies,* the *National Pilot Survey for Chronic Fatigue Syndrome,* and the *Survey of Chronic Fatigue Syndrome and Chronic Unwellness in Georgia* provides insights into the most effective strategies to maximize response rates for both fatigued and non-fatigued individuals. Based on this experience, the target response rate for the proposed study is 80 percent.

Procedures that will be used to maximize response rates for the *Follow-up Study* reflect best practices in the survey industry.

- Mailing advance letters to selected respondents prior to attempting to contact them by telephone. Advance letters introduce the study to potential respondents and increase cooperation with telephone interviews.

- Using trained, professional telephone interviewers who understand the study and who are skilled at gaining cooperation from respondents.

- Conducting telephone interviews primarily during evening and weekend hours, when respondents are most likely to be at home.

- Allowing respondents to schedule telephone interviews at their convenience.

- Employing specially trained refusal conversion interviewers to contact respondents who are initially reluctant to participate in the study. Before telephoning initially reluctant respondents, refusal conversion interviewers review the history of contacts with specific respondents and, if necessary, consult with supervisors to determine the best refusal conversion strategy.

- Sending refusal conversion letters to respondents who are difficult to reach by telephone or who are initially reluctant to participate. Some respondents are more likely to participate if they receive requests by mail.

- Sending trained interviewers into the field persuade reluctant and hard-to-reach respondents to call the Telephone Center for the Detailed Interview. Field interviewers will have mobile telephones for respondents who have no landline.

a. Procedures for Dealing with Nonresponse

Minimizing non-response is part of each step in the *Follow-up Study*. Procedures are described below.

- Using a call management system that tracks and manages the sample of telephone numbers so that telephone numbers are called at different times on different days, appointments with respondents are kept, and callbacks are made at the appropriate times.

- Maintaining a sufficient staff of interviewers so that respondents are called in an efficient and timely manner—respondents must be called within two weeks of the advance letter mailing; appointments and callbacks must occur at the correct times even during peak calling hours.

- Training interviewers in refusal aversion techniques to prevent initial refusals.

- Performing on-line monitoring of 5 percent of all calls placed so that action can be taken to correct poor interviewing practices.

- Identifying best interviewing practices and sharing them with the entire interviewing staff through regular project meetings, interviewer debriefings, and refresher training.

- Arranging ongoing training for interviewers and supervisors to improve their skills and alert them to protocol changes and revisions.

- In-person follow-up by field interviewers with reluctant or hard-to-reach respondents (as described above).

b. Response Rates

The target response rate for the *Follow-up Study* is 80 percent. The rate will be calculated as follows:

$$\frac{\text{Completed Interviews}}{\text{Initial Sample} - \text{Ineligibles}}$$

Although it is well-known that response rates, in general, are declining, especially in telephone surveys, Abt Associates (CDC's contractor for this study) has a proven record of maintaining high response rates over time. Abt expects to achieve the targeted response rate of 80 percent, which is consistent with other follow-up studies that Abt Associates has conducted. In the *Longitudinal Studies of CFS in Sedgwick County, Kansas*, Abt Associates achieved a 73 percent detailed telephone interview response rate in the first follow-up. Abt Associates achieved similarly high response rates on the National Osteoporosis Risk Assessment (N.O.R.A.) Study, a large observational registry of over 200,000 US women aged 50 and older. The N.O.R.A. survey used a multi-modal (mail with telephone follow-up) methodology in which respondents were contacted approximately every other year. In the first follow-up survey, the study achieved an overall response rate of 82 percent. An 80 percent response rate was achieved in the second and third follow-up surveys.

c. Analysis of Non-response

Although a variety of methods will be used to maximize response, some degree of non-response is inevitable. Weighted estimates of demographic characteristics (age, sex, race, and ethnicity) from the *Baseline Survey* were compared with estimates from the 2000 Census, to determine how closely the weighted study population mirrors the general population. Overall comparisons were made, as were comparisons for the metropolitan, urban, and rural strata. Some systematic differences between persons selected for detailed interviews and the Census were found. In all three strata, the younger age groups (18-39 years) and blacks were under-represented, and the age group 40-59 years and white/other were over-represented. Males were under-represented in the Metropolitan and Rural strata. Hispanics were under-represented in the Metropolitan stratum and slightly over-represented in the Urban and Rural strata.

Male respondents, black respondents, and respondents who were aged 18-39 constituted a smaller proportion of detailed interview respondents than of the Census population in all three strata. Respondents reporting Hispanic ethnicity appeared to be under-represented only in the Metropolitan stratum. In most categories the nonresponse adjustment reduced the difference between the respondents and the Census, by amounts that range from slight to substantial. The general pattern remained, however. In all three strata the respondents to the detailed interview had lower percentages than the Census who are aged 18-39 or Black. The Metropolitan and Rural strata had lower percentages of males. The Metropolitan stratum had a lower percentage of Hispanics, but the Urban stratum had a higher percentage.

Comparisons between respondents and nonrespondents were also performed. In all three strata, as expected, a higher proportion of nonrespondents were male or from the age group 18-39 years. In the Metropolitan and Urban strata, a higher proportion of nonrespondents were Black; but in the Rural stratum the percentage of Blacks among respondents was higher than among nonrespondents (27.46% and 25.74%, respectively).

Similar analyses will be completed for the *Follow-up Study*.

4. Tests of Procedures or Methods to be Undertaken

The instrument and procedures for the proposed *Follow-up Study* have been used in four CDC CFS public health research program studies previously approved by OMB: the *San Francisco Study* (OMB #0920-0336); the *Sedgwick County Studies* (OMB #0920-0401); the *National Pilot Survey for Chronic Fatigue Syndrome* (OMB #0920-0498); and, most recently, the *Survey of Chronic Fatigue Syndrome and Chronic Unwellness in Georgia* (OMB #0920-0638).

Because of this experience and the fact that revisions to the detailed interview questionnaire are quite minor (primarily text revisions to reflect the fact that this is a follow-up interview and deletion of items that were required only at baseline), CDC does not believe additional testing of the survey instrument or procedures is necessary.

5. Individuals Consulted on Statistical Aspects and Individuals Collecting and/or Analyzing Data

The contractor, Abt Associates Inc., developed the statistical design for the study. Abt Associates also worked closely with CDC staff to develop the survey and instrument designs and will collect all data and participate in some data analysis. The project director, Scott Royal, oversees Abt Associates' staff. The names, roles, and telephone numbers for Abt staff are included in Exhibit B.5.1 below.

Exhibit B.5.1. Names, Roles and Telephone Numbers for Abt Associates Staff

Activity	Abt Staff Member	Telephone Number
Sample Design	David C. Hoaglin, PhD	(617) 349-2814
Survey and Instrument Design	Rebecca Devlin Marjorie Morrissey Johnny Blair	(312) 867-4037 (312) 867-4061 (301) 634-1825
Data Collection	Scott Royal, PhD	(703) 919-0189

Two CDC personnel are responsible for receiving and approving materials prepared by Abt Associates. William Reeves, M.D., is CDC's principal investigator and can be contacted at (404) 639-0221. Joann House is CDC's project officer and can be reached at (404) 639-3748.

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