Supporting Statement – Part B for Statistical Methods

1. Respondent Universe and Sampling Methods

    The target population for this survey is all nursing homes in the 50 States and the District of Columbia. The total number of nursing homes in the population is approximately 15,700. There will be two waves of data collection approximately 12 months apart. For each a wave, it is planned to collect data from a nationally representative random sample of 2,100 nursing homes from the population.

    For the selection of the sample at each wave, the population of nursing homes will be stratified by size and CMS region. Three size groups will be created: 1) nursing homes with 50 or fewer beds will be classified as small; 2) nursing homes with between 50 and 149 beds will be classified as medium; and 3) nursing homes with 150 or more beds will be classified as large. The sample will be allocated to each stratum in proportion to the number of nursing homes in that stratum. Exhibit 5 shows the distribution of the population and sample by strata. The states that are included in each CMS region are shown in the table

Exhibit 5: Distribution of Population and Sample of Nursing Homes by Strata

| CMS Region | Bed Size | | | | | | Total | |
| | Small | | Medium | | Large | | | |
	Population	Sample	Population	Sample	Population	Sample	Population	Sample
CT, MA, ME, NH, RI, VT(1)	138	18	677	91	162	22	977	124
NJ, NY, PR, VI (2)	81	11	430	57	494	66	1,005	128
DE, DC, MD, PA, VA, WV (3)	193	26	897	120	318	42	1,408	179
AL, FL, GA, KY, MS, NC, SC, TN (4)	246	33	2,011	269	428	57	2,685	342
IL, IN, MI, OH, WI (5)	556	74	2,332	312	565	76	3,453	440
AR, LA, NM, OK, TX (6)	141	19	1,689	226	257	34	2,087	266
IA, KS, MO, NE (7)	334	45	1,059	142	130	17	1,523	195
CO, MT, ND SD, UT, WY (8)	173	23	399	53	57	8	629	80
AZ, CA, HI (9)	255	34	1,007	135	211	28	1,473	187
AK, ID, OR, WA (10)	95	13	331	44	34	5	460	59
Total	2,212	296	10,832	1,449	2,656	355	**15,700**	**2,100**

We expect to get a response rate of 65% to 70% the data collection effort. Therefore, a larger sample will be selected based on the expected response rate at the time of the survey.

2. Information Collection Procedures

In each stratum, we propose to select an equal probability systematic sample of nursing homes after sorting the list of nursing homes by for profit, non-profit, government and LLC to provide proportional representation to the various subgroups.

For producing population-based estimates, each nursing home in the sample that is a respondent to the survey will be assigned a sampling weight. This weight will combine a base sampling weight and an adjustment for nonresponse. The base weight is the inverse of the probability of selection of the responding nursing home. These weights will be used for all statistical analyses of the data obtained from the survey.

It is of interest to compare the difference between estimates between to two waves of data collection in addition to estimating various population parameters at each wave of data collection. With a sample of 2,100 nursing homes at each time period, we will be able to detect a difference of 4.4 percentage points in population percentages of a characteristic of interest with 80% power when we do a two-sided statistical test at 5% level of significance. For this computation, it is assumed that the population percentage at the first wave is 50%. If we are estimating population percentages at each wave, then with a sample of 2,100, the margin of error for the estimated percentage will be plus or minus 2.2 percentage points at 95% confidence level. Because the sample is a stratified sample, the precision could be higher than give above and depending on the homogeneity of the population within a stratum.

No specialized sampling procedures are required for the selection of nursing homes.

3. Methods to Maximize Response Rate

Plan for Distribution of QAPI Survey Materials

We have developed a multi-faceted "marketing" approach to the survey, which includes utilizing CMS partners, the CMS listserv, the QIES mailboxes and hard copy materials.

As a first step, CMS will ask their sponsor/partner groups (i.e., AHCA, LeadingAge, AMDA, etc.) to advertise the forthcoming QAPI survey via their newsletters, websites, etc. Advertising can commence any time after December 1, 2011 when it is expected that the OMB package will be well into the clearance process and the 60-day Federal Register notice is posted. Partners will be asked to continue to advertise the survey even as the web version is activated.

After OMB clearance is received and the web survey has been programmed, CMS will do a listserv "blast" to announce the survey to all 15,700 nursing home providers. This listserv blast will coincide with the mailing of the hard copy "invitation" letter to the 4,200 sampled providers. In addition to the listserv blast and the hard copy mailed version of the invitation letter, CMS will post the invitation letter in the QIES mailboxes of the 4,200 sampled providers who are being asked to participate in the QAPI survey.

The hard copy "invitation" letter from CMS to sampled nursing home providers will be mailed 2 days prior to activation of the internet version of the QAPI survey. The questionnaire information sheet with sponsor logos will be included with the CMS invitation letter.

A hard copy "reminder" post card (Appendix D) will be sent to non-respondents approximately one week after the initiation of the web survey. Hard copy mail surveys will be sent to all internet non-responders beginning approximately two weeks after the activation of the web survey. The hard copy surveys will be sent in official CMS envelopes, and the CMS "invitation" letter and information sheet will also be included in the hard copy mail packets. The internet site will remain open/available throughout the entire data collection period in case sampled providers decide to complete the survey electronically rather than via hard copy.

A second hard copy mail survey (including invitation letter and information sheet) will be mailed to all sampled providers who have not responded to the questionnaire either via internet or hard copy. Approximately three weeks after the second hard copy survey is mailed to non-respondents, telephone reminders will begin. Non-responders to the web and hard copy surveys will be the target for the telephone reminders. Up to 12 attempts will be made to reach the Administrator of non-responding providers.

Non-Response Bias Analysis

Non-response bias is a function of the non-response rate and the difference between the responding and non-responding ALFs on the variables of interest. This is typically represented by the following formula:

$$Bias(\bar{y}_1) = \left(\frac{M}{N}\right)(\bar{Y}_1 - \bar{Y}_m)$$

where:

Bias $(\bar{y}_r)$ = the nonresponse bias of the unadjusted respondent mean;
$\bar{y}_r$ = the unadjusted mean of the respondents in a sample of the target population;

$\bar{Y}_r$ = the mean of the respondents in the target population;

$\bar{Y}_m$ = the mean of the non-respondents in the target population;

M = the number of non-respondents in the target population; and

N = the total number in the target population

We will track response rates by region and size of nursing homes to assess whether nursing homes in certain regions or in certain bed size groups have more difficulty in completing the questionnaire. We will also examine possible reasons for nonresponse by comparing the frame characteristics of respondents and non-respondents to assess whether there is any difference between the two groups with regard to frame characteristics. This may provide some information on the formation of weighting classes for adjusting the weights of respondents for nonresponse. We also plan to compare the characteristics of those who are early respondents and those responding later after reminders to identify whether late responders are more similar to non-responders and then will use the formula above to assess the nonresponse bias.

4. Tests of Procedures

The questionnaire was developed over a period of nearly six months, and recently completed the pre-testing phase. There were four objectives of the cognitive interview pretesting:
1. Identify problems with the *Nursing Home Quality Improvement Questionnaire*, invitation letter from CMS, and data collection information sheet;

2. Determine reasons and collect suggestions for any identified problems

3. Determine the length of time to complete the questionnaire

4. Gain insights from respondents' reaction to the overall questionnaire data collection plan

A total of nine cognitive interviews were conducted with nursing facilities in Colorado. Participants were located in a geographically preferable region, to avoid extensive travel. The nine facilities included in the pilot test were of varying size, profit status, and chain affiliation.

A hard copy of the CMS invitation letter, information sheet and the questionnaire were mailed to the administrator at the pretest facilities, along with an introductory letter and instructions for completing the questionnaire during the pretesting phase. The instructions included explicit instructions for recording the amount of time to complete the questionnaire.

The invitation letter, information sheet, and each section of the questionnaire was discussed during the pretest interview. The respondents were asked to provide their overall reaction to the questions when first reading them, as well as specific issues with the individual questions. The cognitive interviewer followed-up on respondent comments, administered probes about the questions, and worked with the respondent to assess question clarity, response wording or task difficulty, and any other aspects of the questionnaire. Staff from CFMC conducted the interviews onsite in the pretest facilities, with staff from Abt Associates joining by telephone for some of the interviews.

Respondents were required to read and sign a consent form at the start of the interview session. The consent document included a description of the project in general, what the respondent was going to be asked to do, any risks or benefits to the respondent as a result of participating in the pretest, and the respondent's rights as research subjects. The consent document also included language about confidentiality of the information being collected.

The purpose of the questionnaire pretesting was conveyed to the cognitive testing participants at the beginning of the interview. This discussion included the following points:

1. The questionnaire was designed to be completed by nursing home administrators and designees. Some sections of the questionnaire may need assistance from other staff within the nursing home.

2. The objective of the questionnaire is to collect information on current quality improvement activities, challenges, and areas where TA will benefit nursing homes.

3. The questionnaire is intended to be completely self-explanatory, although contact information for any needed assistance or questions is readily available.

4. The questionnaire is intended to be appropriate for all types and sizes of nursing facilities.

5. Individuals Consulted on Statistical Aspects of Design

    Individuals consulted on the statistical aspects of the design for this questionnaire and data collection include:

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The data will be collected by Abt SRBI, Inc. Jamie Munjack will serve as the Survey Director. The data will be analyzed at Abt Associates by Alan White, Ph.D. and Brant Morefield, Ph.D. Laura Palmer from CFMC will also participate in the data analysis. Below is the contact information for these staff:

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