

Supporting Statement – Part B
Collection of Information Employing Statistical Methods

1. Respondent Universe and Sampling Methods

The purpose of this data collection is to gather data from healthcare providers who received services from the Centers for Medicare & Medicaid Services (CMS) through the Network of Quality Improvement and Innovation Contractors (NQIIC) plus those who are eligible but did not receive these services. The information collected will enable the Independent Evaluation Contractor (IEC) to answer the following core research questions: How satisfied are healthcare providers with NQIIC-provided services and resources? How do healthcare providers that do not engage with NQIIC contractors meet their quality improvement goals? What are the barriers to participation with NQIIC contractors?

Nursing homes (NH), hospitals, and outpatient clinicians are served by different types of contractors under the NQIIC contracts: NHs and outpatient clinicians are supported by Quality Innovation Network-Quality Improvement Organizations (QIN-QIOs) and hospitals are supported by Hospital Quality Improvement Contractors (HQICs). Furthermore, QIN-QIOs provided services to its enrolled NHs through three initiatives: Long-Term Care Nursing Home (LTC-NH), Targeted Response Quality Improvement Initiative (TR-QII) for COVID-19 infection control and vaccination referral, and Partnership for Community Health (PCH).

The IEC will recruit three distinct groups of healthcare providers for participation in the surveys: nursing home administrators, hospital administrators, and outpatient clinicians. The target samples for NH survey will be divided into three groups: 1) administrators of NHs that are not covered by any QIN-QIO services or only covered by one out of three QIN-QIO initiatives. 2) administrators of NHs that are covered by two out of three QIN-QIO initiatives. 3) administrators of NHs that are covered by all three QIN-QIO initiatives. The target samples for hospital and outpatient clinician surveys will be divided into two groups: 1) administrators of hospitals or outpatient clinicians that are supported by the CMS NQIIC contractors, and 2) administrators of hospitals or outpatient clinicians with no or low participation with these contractors.

a) Sampling Method

For Nursing Home and Hospital Surveys, the sample universe will be the nursing home and hospital administrators who are most familiar with the quality improvement initiatives of their organizations and who represent organizations that are qualified to participate in the quality improvement networks being evaluated. Currently, IEC estimates that 15,498 NHs and 2,638 hospitals qualify to participate in these programs. For the Outpatient Clinician Survey, the sample universe will be outpatient clinicians who provide services within the zip codes defining the 519 QIN-QIO enrolled communities (as of July 2021) and who are familiar with the the quality improvement

initiatives of their employment organizations. Currently, the IEC estimates that 671,535 individual healthcare providers are located within the 519 communities.¹

IEC maintains a list of all qualifying and enrolled nursing homes, hospitals, and outpatient clinicians provided by CMS or NQIIC contractors. Prior to sampling, IEC will utilize the most updated enrollment data and remove any individual outpatient clinician that have been deactivated or facilities that have been closed from the sample frame so that all nursing homes, hospitals, and outpatient clinicians in the sample will represent active billing facilities or providers.

Among the qualifying nursing homes and hospitals, a certain portion will not be enrolled in an NQIIC program. The size of this target subpopulation is small for nursing homes (84 nursing homes). Since non-enrollment is such a small proportion of qualified nursing homes (1.9%), this group will be combined with nursing homes that are enrolled in the program but have low or no participation. The determination of nursing homes with low participation with the QIN-QIOs will be made using updated participation data when the final sample is drawn.² The participation data for each nursing home enrolled by a QIN-QIO is continuously updated by the contractors in a dataset housed in CMS' host environment. The data describes each encounter between the QIN-QIO and nursing home and includes fields for time spent (in hours). Additional information on participation will be sourced from records of nursing home management and staff who completed training in a series of online modules focused on preventing and containing COVID-19 infections hosted by CMS and promoted by QIN-QIOs. For the hospital samples, there are 673 hospitals that are eligible for the program and are not enrolled, which is sufficient to meet the needs of the sample design. There is currently no data available that can be used to gauge the level of participation of enrolled hospitals, but level of engagement is measured in the survey questionnaire. Therefore, the sample that would be allocated to the low participation group was combined with the moderate to high participation group.

For the nursing home survey, the IEC will collect 150 completed surveys from administrators of facilities that are not covered by any QIN-QIO services or only covered by one out of three QIN-QIO initiatives (LTC-NH, TR-QII, and PCH), 200 completed responses from administrators of NHs that are covered by two out of three QIN-QIO initiatives, an additional target of 150 completed surveys will be allocated to nursing homes that are covered by all three QIN-QIO initiatives. For hospitals, the IEC will seek a target of 280 completes among hospitals that are enrolled (regardless of participation level). An additional target of 220 completed surveys will be allocated to hospitals that qualify but are not enrolled. For outpatient clinicians, the IEC will collect 450 completed surveys annually from individual providers actively enrolled with QIN-QIOs through partnership for community health programs. An additional target of 450 completed

¹ CMS Medicare Physician & Other Practitioners by Provider and Service accessed December 2, 2021 at <https://data.cms.gov/provider-summary-by-type-of-service/medicare-physician-other-practitioners/medicare-physician-other-practitioners-by-provider-and-service>

² Because early encounters include administrative tasks and needs assessments program administrators have indicated that, programmatically, the threshold should be 1-2 hours before they would expect any benefit from the program to be realized.

surveys will be allocated to individual providers who are in the comparison group (i.e., not enrolled by a QIN-QIO).

Table 1a: Summary of Sample Targets for Nursing Homes by Strata

Strata	Nursing Homes	Description
Enrolled High Level of Participation	150	Enrolled with all three QIN-QIO initiatives
Enrolled Moderate Level of Participation	200	Enrolled with two out of three QIN-QIO initiatives
Enrolled Low Participation or Not Enrolled	150	Enrolled with only one out of three QIN-QIO initiatives or qualifying but not enrolled
Total	500	

Table 2b: Summary of Sample Targets for Hospitals by Strata

Strata	Hospitals	Description
Enrolled	280	Qualifying and enrolled facilities
Not Enrolled	220	Qualifying, but not enrolled
Total	500	

Table 3c: Summary of Sample Targets for Outpatient Clinician by Strata

Strata	Outpatient Clinician	Description
Enrolled	450	Providers within 519 QIN-QIO enrolled communities and recruited by QIN-QIOs
Not Enrolled	450	Providers within 519 QIN-QIO enrolled communities but not recruited by QIN-QIOs
Total	900	

For the nursing home and hospital surveys, we determined that a minimum of 1,250 base sample records of nursing homes and hospitals will be needed to achieve 500 completed responses with each survey. In addition to the base sample, IEC also designed three replicate groups with samples of 200 in each replicate. We will release and start the survey fielding with the 1,250 base sample. If we do not reach the required 500 completed response from the base sample, we will open up the sample using the replicate groups one block at a time. If less than 200 additional records are needed, the replicates can be broken into smaller lots. The survey will be halted once 500 completed surveys are verified. For the outpatient clinician survey, we determined that the base sample will consist of a minimum of 16,071 outpatient clinicians to achieve the 900 completed responses in each round of the survey with an anticipated 5.6% response rate. Similar to the nursing home and hospital sample design we will draw five additional replication groups (1,600 outpatient clinicians each). Upon finishing survey data collection, the IEC will compare the key characteristics (e.g., medically underserved, number of beds, rural/urban location, profit/non-profit ownership, hospital type, etc.) between the responses received promptly or deferred and the overall sample frame to check the covariate balance. If needed, matching or non-response weighting will be applied to ensure the validity of scaling survey findings to the study population.

b) Expected Response Rates

For the Nursing Home and Hospital Surveys, IEC expects to achieve a response rate of 40% among the nursing home administrators asked to participate because of difficulties scheduling and conducting telephone interviews during normal working hours. This anticipated response rate is based on similar surveys with this population conducted previously by the IEC team members. For hospital administrators, the IEC anticipates a somewhat lower response rate (35%) because there may be difficulties achieving this rate due to incomplete contact information, administrators having broader responsibilities, and less available staff among the hospitals eligible for the program. Response rates may vary by strata, particularly with nursing homes and hospitals not enrolled, which we expect will be difficult to recruit for these surveys because QIN-QIOs and HQICs cite difficulty in contacting these administrators as a primary barrier to recruiting these organizations.

For the Outpatient Clinician Survey, response rates with healthcare providers vary depending on the survey content and the type of provider contacted, making it difficult to estimate an expected response rate for this survey. Response rate may also vary by strata, and we expect completion by providers in the non-enrolled stratum will be particularly difficult. QIN-QIOs cite contacting outpatient clinicians as the main barrier to recruiting these providers. Based on IEC's experience with a similar online survey involving physicians and pharmacists, we expect to achieve a response rate of 5.6% for clinicians. We will be employing a number of strategies to maximize response rates among this group including identifying CMS as the survey sponsor, communicating the public policy benefit of participating in the survey, and using multiple reminders and contacts via calls and emails.

2. Procedures for the Collection of Information

a) Statistical Methodology for Stratification and Sample Selection

The IEC will conduct a stratified random sample for each survey (see Table 1a, 1b, and 1c above for targets).

Within each stratum, we will employ a systematic random selection that assures that the sample is well representative of the population. The selection process can include a number of balancing variables. These variables will include QIN-QIO/HQIC region, facility performance (star rating), facility characteristics (e.g., setting (urban/rural), size, etc.), participant entity type, health equity indicator (e.g., Area Deprivation Index, Social Vulnerability Index, and list of priority targeted zip code shared by CMS), NPI type (individual/organization), provider specialties, and program data (e.g., level of participation, qualification category, etc.). Before drawing the sample, the IEC will conduct an analysis to determine which balancing variables to use for each survey, the categories/number of categories most relevant for each variable while limiting small cells, and the optimal sort order prioritization. This methodology will produce samples that are more representative across the balancing variables categories.

b) Estimation Procedure

IEC's evaluation plan outlines the analytic method for each task's evaluation questions specific to goals to address the opinions of outpatient clinicians, and nursing home and hospital administrators about the QIN-QIO and HQIC initiatives and subjective importance of contractors' services for quality improvement efforts in their facilities. Our analysis will begin with descriptive statistics, including percentages and means in total for each survey sample and across subgroups. The IEC will employ appropriate statistical tests, including t-tests, chi-square tests, and analyses of variance (ANOVA).

c) Degree of Accuracy Needed for the Purpose Described in the Justification

For the Nursing Home and Hospital Surveys, the margins of error (MOEs) with 95% level of confidence for these surveys combined across strata (500 completes) is +/-4.3%. While both surveys have the same MOE, the calculation is different. The hospital survey gains precision due to the smaller population size but this gain is offset by a loss of precision due to the disproportionate sample design and the weight that will be required to correct it. Based on the most recent population data, we estimate the weight adjusted sample size to be 440 for the hospital survey.

Table 2a shows the planned MOEs for different levels of estimates under these sample plans for the total sample of 500 and for the subsample of participating and non-participating facilities. The MOEs are corrected for their finite populations. Due to the disproportional sampling for hospitals, a weight adjusted sample of 440 is used for the combined MOE. The maximum value is at 50% with a maximum margin of error of $\pm 4.3\%$ for both surveys when examining combined results. The MOEs do not take into account any correction for the design effect resulting from the balancing methodology or if IEC applies weights to correct for differential unit non-response.

Table 4a: Sample Size, Estimated MOE¹ at Given Proportion for Nursing Home and Hospital Surveys

Survey	Population	Estimated Population	Sample Size	50%	40%/60%	30%/70%	20%/80%	10%/90%	5%/95%
Hospitals	Full Sample	2,638	500	4.3%	4.2%	3.9%	3.4%	2.6%	1.9%
	Enrolled	1,963	280	5.4%	5.3%	5.0%	4.3%	3.3%	2.4%
	Not Enrolled	675	220	5.4%	5.3%	5.0%	4.3%	3.3%	2.4%
Nursing Homes	Full Sample	15,498	500	4.3%	4.2%	4.0%	3.5%	2.6%	1.9%
	High Participation	4,300	150	7.9%	7.7%	7.2%	6.3%	4.7%	3.4%
	Moderate Participation	6,594	200	6.8%	6.7%	6.3%	5.5%	4.1%	3.0%
	Low Participating or Not Enrolled	4,604	150	7.9%	7.7%	7.2%	6.3%	4.7%	3.4%

¹ Use of balancing methodology in the sample (described above) will result in slightly lower MOEs to the extent that the balancing criteria are predictors of survey responses.

For the Outpatient Clinician Survey, the sample of 450 for each stratum will be proportionate, yielding an MOE of +/- 4.6%. Due to the large population of providers in each stratum, a population size adjustment has an inconsequential effect on the results. Table 2b shows the planned MOEs for different levels of estimates under these

sample plans for the total sample of 900 and for the subsample of participating and non-participating providers. The MOEs are corrected for their finite populations. Due to the disproportional sampling for providers, a weight adjusted sample of 491 is used for the combined MOE. The maximum value is at 50% with a maximum margin of error of $\pm 4.4\%$ for both surveys when examining combined results. The MOEs do not take into account any correction for the design effect resulting from the balancing methodology or if IEC applies weights to correct for differential unit non-response.

Table 2b: Sample Size, Estimated MOE¹ for Outpatient Clinician Survey

Survey	Population	Estimated Population	Sample Size	50%	40%/60%	30%/70%	20%/80%	10%/90%	5%/95%
Outpatient Clinician	Full Sample	671,535	900	4.42%	4.33%	4.05%	3.54%	2.65%	1.93%
	Enrolled	29,238	450	4.58%	4.49%	4.20%	3.67%	2.75%	2.00%
	Not Enrolled	642,297	450	4.62%	4.52%	4.23%	3.69%	2.77%	2.01%

¹ Use of balancing methodology in the sample (described above) will result in slightly lower MOEs to the extent that the balancing criteria are predictors of survey responses.

The sample sizes for each survey also provide sufficient power for testing between groups within the responses. Table 3 shows that for the sample size of 500 nursing home or hospital administrators, we will have a level of power of 0.92 for an effect size of 0.15 (between a small to medium effect size) with Type I probability of 5%, and for the outpatient clinician survey with the sample size of 900 clinicians, we will have a level of power of 0.96 for an effect size of 0.13 (between a small to medium effect size) with Type I probability of 5%. In other words, the sample size will differentiate between smaller size differences between groups.

Table 3: Sample Size, Power and Effect Size (*f*--ANOVA Effect and Interaction)

Sample	Error	Small								Medium
		0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	
500	0.05	0.39	0.61	0.80	0.92	0.97	0.99	1.00	1.00	
550	0.05	0.42	0.65	0.83	0.94	0.98	1.00	1.00	1.00	
600	0.05	0.45	0.69	0.86	0.96	0.99	1.00	1.00	1.00	
650	0.05	0.48	0.72	0.89	0.97	0.99	1.00	1.00	1.00	
700	0.05	0.51	0.75	0.91	0.98	1.00	1.00	1.00	1.00	
750	0.05	0.54	0.78	0.93	0.98	1.00	1.00	1.00	1.00	
800	0.05	0.56	0.81	0.94	0.99	1.00	1.00	1.00	1.00	
850	0.05	0.59	0.83	0.95	0.99	1.00	1.00	1.00	1.00	
900	0.05	0.61	0.85	0.96	0.99	1.00	1.00	1.00	1.00	

d) Unusual problems requiring specialized sampling procedures.

IEC does not foresee any unusual problems that require specialized sampling procedures.

e) Any use of periodic (less frequent than annual) data collection cycles to reduce burden.

The Nursing Home, Hospital, and Outpatient Clinician Surveys are intended to measure attitudes annually between calendar year 2022 and 2024. The surveys will collect cross-sectional data, so the IEC will not request information from the same participants more

than once within the same calendar year. Each year we will re-draw a new sample using the same systematic random selection method adopted in the first round of data collection with the same set of strata variables, prior to the systematic sampling, and data will be sorted randomly each year with a different random seed.

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

a) Methods to Maximize Response Rates

Pre-survey notification letters that provide more information on a study increase respondent confidence in the validity and the importance of the study, resulting in higher response rates.³ The IEC will use a pre-survey notification letter to introduce and explain this data collection effort for the Nursing Home and Hospital Surveys. The content of these pre-notification letters can be viewed in Appendices D.1 for nursing homes, D.3 for hospitals, and D.5 for outpatient clinicians.

Based on IEC's experience in conducting surveys among health care professionals, we have found that leaving a voicemail message on the first and second call attempt has positive results on response rates, but that leaving additional messages does not lead to increased responses. The IEC's survey partner, The Henne Group (THG), will leave one voice mail message for any respondent for whom we receive an answering machine message and provide a toll-free number for these respondents to call back to complete a survey. These follow-up calls will be made two or three days after the previous attempt by live interviewers. THG won't use any robocall or pre-recorded messages to contact respondents.

For participants from nursing homes and hospitals, if a respondent is unable to complete the survey at the time of the initial call, our interviewers will arrange for a best date and time to make a second attempt and will record this information in the call record. Interviewers will not attempt to contact the respondent again until the specified date and time. Interviewers will be able to accommodate respondents who need to abandon the survey before its completion. They will schedule a callback for a date and time of the respondent's preference, and then code the record as "incomplete." When the callback time arrives, the interviewer will continue from the last completed item, and the respondent will finish the survey. Because of the high number of phone numbers for gatekeepers, and alternative phone numbers found, we anticipate that interviewers will need to make multiple attempts to each telephone number before that number is taken out of our sample. Even though it is difficult to set a maximum number of attempts, callers will monitor reaction from respondents to avoid creating any burden for participants. IEC will work with CMS and its subcontractor, Data Validation and Administration (DVA) contractor to create webpages in NQIIC awardee website to allow survey respondent to validate the legitimacy of the survey data collection. THG will explore and test new applications to streamline the survey scheduling process. If these new

³ Dykema J, Stevenson J, Day B, Sellers SL, Bonham VL. Effects of incentives and prenotification on response rates and costs in a national web survey of physicians. *Eval Health Prof.* 2011;34(4):434-447. doi:10.1177/0163278711406113

processes are found beneficial for respondents without creating additional burden for the data collection team nor compromising data integrity, then THG will implement them.

For outpatient clinicians participating in the online survey, multiple reminders will be sent to those who launch, but do not complete the survey. Email reminders will be sent on the day of opening the survey, as well as a voicemail reminder for non-respondents. Additional emails will be sent after launch for respondents with incomplete surveys. IEC will work closely with our COR and survey partner to closely monitor the response rate and sample release status to decide the maximum number of email reminder to avoid creating burden for outpatient clinicians.

Multiple email follow-ups will be employed inviting non-respondents to take the surveys. The email invitations will be CMS-sponsored, prominently displaying their logo to increase confidence in the content and importance of the study. The content of messages is available in Appendices D.2 for nursing homes, D.4 for hospitals, and D.6 for outpatient clinicians.

Since CMS is using widely accepted data collection techniques and is devoting substantial resources to efforts designed to minimize non-response, we expect the response rate to this survey to be comparable or better than that achieved for other healthcare administrator surveys conducted by the IEC team members in the past. Furthermore, IEC has conducted numerous surveys on a variety of topics that have achieved response rates comparable to, or exceeding, the response rate estimated for this survey.

b) Methods to Deal with Issues of Non-Response

Should a respondent refuse to complete the survey, the refusal will be classified into two groups: hard refusals and soft refusals. Hard refusals are defined as situations where respondents adamantly state that they do not wish to be called again. Records coded with this disposition do not reappear in call or email queues for the remainder of the project.

Soft refusals include situations where respondents do not respond to the online survey invitation or simply hang up on a telephone interviewer or refuse the initial contact in a less aggressive manner. These cases are still considered “active,” but are placed on hold and re-contacted as necessary as the number of respondents in the viable sample dwindles.

IEC will conduct a thorough non-response analysis upon completion of the data collection. This analysis will examine if there are systematic patterns in non-response that lead to the under and/or over representation of particular subpopulations. If such distortions are detected, IEC will apply non-response weights sparingly to address the distortions while managing the design effect of weights.

c) Generalizing to the Universe Studied

Since IEC is conducting a stratified random sample, we expect that the information collected will yield reliable data that can be generalized to the universe studied. We will create a weight to allow for projections to the total universe of nursing homes, hospitals,

or outpatient clinicians eligible for NQIC programs based on the characteristics of those organizations in the sample frame.

4. Test of Procedures or Methods to be Undertaken

As part of developing the survey instruments, IEC and our survey partner, The Henne Group, have already conducted internal beta-testing of the programming and pre-tested with a small number of respondent candidates for all three surveys to assess the hour burden per respondent and to ensure the questions and responses are readily understandable and skip patterns are logical.

Respondents for pre-testing the telephone surveys were contacted and those who agreed to participate were given an opportunity to schedule a telephone interview. Once the interviews were completed, we solicited these respondents' feedback about possible improvements that could be made to the survey and the survey administration process. Participants in the pre-tests for the Outpatient Clinician Survey were provided a link to the online instrument and completed the survey before a scheduled cognitive interview.

A total of 15 interviews (5 nursing homes/5 hospitals/5 outpatient clinicians) were conducted in February and March 2022. In general, all fifteen pretest respondents felt that the pretest questions were clear, concise, to the point, and for the most part understandable and easy to answer. No respondents felt overly burdened by the amount of time it took to take the pretest survey, or thought the time deviated in any way from how it was represented to them. The IEC team analyzed the comments to ascertain if questions were clear and made changes as needed based on challenges interviewees encountered with certain questions and their associated response items. In some cases, clear patterns emerged where multiple interviewers noted similar problems with specific questions. Findings from the cognitive interviews informed revisions to improve overall quality and reliability of all three surveys.

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

Table 4 provides names and affiliation for those consulted on the statistical aspects of the survey design and who will collect or analyze the information.

Table 4: Individuals Consulted on Statistical Aspects
and Performing Data Collection & Analysis

Name	Affiliation
Ping Yu, PhD	Booz Allen Hamilton
Sandy Lesikar, PhD	Booz Allen Hamilton
Kathryn Schulke, BSN	Booz Allen Hamilton
Elyse Levine, PhD	Independent Consultant
Stephen Tregear, PhD	Booz Allen Hamilton
Kevin Shang	Booz Allen Hamilton
Xiaoying Xiong	Booz Allen Hamilton

Name	Affiliation
Jia Zhao, PhD	Booz Allen Hamilton
Dominic Shehtanian	Booz Allen Hamilton
Dave Cederquist	Booz Allen Hamilton
Frank Assaro	Booz Allen Hamilton
Nathan Jacobs	Booz Allen Hamilton
McCall Glover	Booz Allen Hamilton
Janaki Panchal	Booz Allen Hamilton
Jia Shen, PhD	Booz Allen Hamilton
Jeffrey C. Henne	The Henne Group
Sergio Garcia	The Henne Group
Nyree Young	The Henne Group
Scott Schwartz	The Henne Group
Key Sibby	The Henne Group

Table 5 shows the names of the CMS staff members who advised on the survey design.

Table 5: CMS Staff Member Who Advised on Survey Design

Name	Affiliation
Nancy Sonnenfeld, PhD	Center for Clinical Standards and Quality
Kurt Herzer, MD, PhD	Center for Clinical Standards and Quality
Geoffrey Berryman	Center for Clinical Standards and Quality
Jeff Mokry	Center for Clinical Standards and Quality
Girlyn A. Cachaper	Center for Clinical Standards and Quality
Ian Craig	Center for Clinical Standards and Quality