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Analysis Report for the Home Health Care CAHPS Survey Mode Experiment

Prepared for

Centers for Medicare & Medicaid Services
7500 Security Boulevard
Baltimore, MD 21244

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Research Triangle Park, NC 27709

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EXECUTIVE SUMMARY

RTI International is assisting the Centers for Medicare & Medicaid Services (CMS) with coordinating and implementing the national implementation of the Home Health Care CAHPS® (Consumer Assessment of Healthcare Providers and Systems) Survey, which will be administered by multiple independent survey vendors working under contract with Medicare-certified home health agencies (HHAs). One of the tasks under the original task order contract for this project was to design and implement a mode experiment to determine whether a mode adjustment is needed and to identify factors not in the control of the HHAs that affect Home Health Care CAHPS (HHCAHPS) Survey scores that will be publicly reported on the Home Health Compare Web site. RTI project staff conducted a mode experiment in 2009 to test the effect on survey responses of using three data collection modes: mail only, telephone only, and mixed mode (mail with telephone follow-up of nonrespondents). The results of the mode experiment will be used to make appropriate adjustments to survey results before they are publicly reported if the results suggest that the method of data collection has a significant effect on sample members' responses.

In addition, because some patients' assessment of the care they receive from HHAs may be influenced by patient characteristics that are beyond the HHAs' control, RTI project staff also analyzed data from the mode experiment to determine whether and to what extent patients' characteristics statistically affect their rating and assessment of the home care they receive. Data from the mode experiment were also analyzed to detect potential nonresponse bias. The results of these analyses will determine applicable statistical models and adjustments to be made on the HHCAHPS Survey data.

To conduct the mode experiment, RTI project staff selected and recruited a sample of HHAs that reflect home health industry characteristics, including size (defined as the number of patients served), for-profit/not-for-profit status, hospital-based versus freestanding, urban/rural status, and state. A total of 75 HHAs ultimately participated in the mode experiment by providing a monthly patient information file for patients served during one or more of the three sample months (August, September, and October 2009). The monthly patient information files were used to identify and select a random sample of patients who met survey eligibility criteria for the mode experiment sample.

The mode experiment patient sample consisted of 24,561 patients who had at least one skilled visit during a sample month (August, September, or October 2009) and who met other survey eligibility criteria. All eligible patients had to have had at least two skilled home care visits during the lookback period, which consisted of the sample month and the month immediately preceding the sample month. For each of three sample months, project staff selected a sample using simple random sampling and then randomly assigned each patient to one of the three data collection modes.

Data collection activities for the mode experiment were conducted between September 21, 2009, and January 5, 2010. Data collection for each sample month began approximately 21 days after the sample month closed and ended within a 6-week period after the survey was initiated. The overall response rate (for all three modes) was 45.7%. The response rate for the mail-only mode was lowest, at 39.7%, with the telephone-only response rate at 46.6% and the mixed-mode response rate at 52.0%.

After processing the survey data, more than half of the response records were not used in the mode experiment analysis because they were not covered by Medicare and/or Medicaid or the payer source was unknown,¹ the survey did not pass the completeness criteria, and/or the HHA did not provide data needed for the analysis. Therefore, the data file used in the mode experiment analysis contained data on approximately 5,500 patients for whom there was a survey response record and data needed for the analysis. Accounting for data missing at random on individual patients, descriptive statistics and multivariate regression analyses were performed on approximately 4,800 patients for Home Health Care CAHPS rating questions answered by all respondents.

To analyze the mode experiment data, RTI project staff performed a total of 19 patient-level regression models, accounting for mode assignment, demographic, health, and health system characteristics. After examining findings across all regression analyses, project staff developed decision rules to guide selection of potential candidate adjusters for use in impact analyses. After considering the results from the impact analyses, specific patient characteristics, including age, education, self-reported mental/emotional health status, proxy status, primary language spoken at home, whether a patient lived alone, the number of deficits in activities of daily living, and two mental health-related diagnoses were considered to have the strongest evidence for use as adjusters. Insufficient evidence was found for making adjustments based on response mode.

¹ After the Home Health Care CAHPS Survey Mode Experiment began, CMS changed the eligibility criteria such that only patients covered by Medicare and/or Medicaid were eligible for the survey.

1 INTRODUCTION

1.1 Overview

As part of the U.S. Department of Health and Human Services' (DHHS's) Initiative on Quality Reporting, the Centers for Medicare & Medicaid Services (CMS) are implementing the Home Health Care CAHPS® Survey to measure and publicly report patients' experiences with the care they receive from Medicare-certified home health agencies (HHAs). The Home Health Care CAHPS (HHCAHPS) Survey is designed to meet three broad goals. First, it is designed to produce comparable data on patients' perspectives that will allow objective and meaningful comparisons between HHAs on aspects of care that are important to consumers. Second, public reporting of survey results is designed to create incentives for agencies to improve their quality of care. Third, public reporting will serve to enhance public accountability in health care by increasing the transparency of the quality of care provided in return for public investment.

1.2 The Home Health Care CAHPS Survey Mode Experiment

The purpose of the HHCAHPS Survey mode experiment was to determine whether a mode adjustment is needed and to identify factors not in the control of the HHAs that affect the HHCAHPS scores that will be publicly reported on the Home Health Compare Web site. Medicare-certified HHAs participating in the HHCAHPS Survey can use one of three approved data collection modes: mail only, phone only, and mixed mode (mail with telephone follow-up of nonrespondents). As noted above, RTI project staff designed and implemented a mode experiment to test the effect of using three data collection modes on survey responses. In addition, because some patients' assessment of the care they receive from HHAs may be influenced by patient characteristics that are beyond the HHAs' control, data from the mode experiment were used to determine whether and to what extent patient characteristics affect survey results. Also, some patients may not respond to the survey; this may affect the accuracy and the comparability of survey results if nonrespondents differ from respondents on important characteristics. Therefore, data from the mode experiment were also used to determine applicable statistical adjustments to be made on data from the national implementation of the HHCAHPS Survey to adjust for mode, nonresponse, and patient mix.

The HHCAHPS Survey mode experiment involved selecting and recruiting a sample of HHAs to participate in the survey. The HHAs included in the mode experiment HHA sample represented varying characteristics, including number of patients served, the state's per capita use of home health care, urban versus rural, hospital based and freestanding, and profit versus nonprofit. Participating HHAs' role in the experiment was to provide a patient information file containing data needed for selecting the sample and fielding the survey and for data analysis for each of three sample months: August, September, and October 2009. RTI project staff selected and recruited a sample of HHAs in March through May 2009. A

sample of 24,561 patients were sampled from 75 participating HHAs and included in the mode experiment. Data collection for the mode experiment was conducted from September 21, 2009, through January 5, 2010.

1.3 Purpose of This Report

The purpose of this report is to describe the HHCAHPS Survey mode experiment and the results of the mode and patient-mix analyses that were conducted. Chapter 2 contains information about the methods used to select and recruit the HHAs that participated in the mode experiment and describes the patient sample and the data collection procedures and results. The methods used to analyze the data from the mode experiment and the results of the mode, nonresponse, and patient-mix adjustment analyses are described in Chapter 3. Recommendations for adjustments to be made to data in the national implementation of the Home Health Care CAHPS Survey based on the results of the mode experiment are also provided in Chapter 3.

2 THE HOME HEALTH CARE CAHPS SURVEY MODE EXPERIMENT

2.1 Overview

The Home Health Care CAHPS Survey is being administered by three modes: mail only, telephone only, and mixed mode (i.e., mail with telephone follow-up of nonrespondents). Responses differ by mode in some surveys, especially between self-administered survey and when the survey subject interacts with a person, either by phone or during a visit (Castle et al., 2005; Hays & Ware, 1986). Findings from prior research on CAHPS surveys of other patient populations also indicate that other factors, such as patient characteristics, may affect patients' ratings and assessment of the health care they received (Elliott et al., 2001; Hargraves et al., 2001; O'Malley et al., 2005). The patient-mix characteristics commonly found to affect survey responses are related to age and education. However, other patient characteristics may affect a patient's ratings of care received, including health status.

On the HHCAHPS Survey, HHAs must use one of the three approved modes of data collection. In addition, the home health patients of some HHAs will have different characteristics than those served by other HHAs. For example, those HHAs that serve patients whose health status is fair or poor may tend to rate the care received from their HHA more negatively than those served by an agency whose patients are in better health. Because the HHCAHPS Survey needs to produce comparative results, it is important to determine whether mode and patient characteristics have an effect on the survey results and, if so, to statistically adjust the results when reporting ratings of the health care provider whose patients differ in these characteristics. Because the results of the national implementation of the HHCAHPS Survey will be publicly reported on Home Health Compare on the <http://www.medicare.gov/default.aspx> Web site for consumers to use when choosing a health care provider, it is important that the ratings are comparable and not confounded by factors that are beyond the HHAs' control.

The HHCAHPS Survey mode experiment was conducted to determine which factors, if any, not under the direct control of HHAs affect survey responses and the direction and strength of the effects. The mode experiment's survey collected data from a sample of patients who received care from a sample of HHAs during the months of August, September, and October 2009. The major difference between the national implementation of the Home Health Care CAHPS Survey and the mode experiment is that instead of the HHAs sponsoring and administering the survey using an HHCAHPS Survey vendor, RTI served the role of the HHCAHPS Survey vendor. The same protocols and materials that are being used in the national implementation were used in the mode experiment. That is, the same patient survey eligibility criteria were used, the same survey instrument was used, and the protocols applying to the survey materials and the data collection in the national implementation were used. In addition, HHAs participating in the mode experiment were required to prepare and

submit monthly patient information files containing the patient information needed for sampling, fielding the survey, and for analysis. The mode experiment mirrors the national implementation in all aspects of administration and analysis.

This chapter describes the procedures used to sample and recruit HHAs for the mode experiment, the sampled agencies' role in the mode experiment, and the patient sample selection procedures. The data collection activities and the results of the mode experiment survey are also described in this chapter.

2.2 The Mode Experiment Survey—Sampling HHAs

The first step in conducting the mode experiment was to select and recruit a sample of HHAs with a variety of characteristics, including the following:

- the number of patients served
- for-profit/not-for-profit
- hospital-based/freestanding
- urban/rural
- state, as measured by per capita use of home health services

The initial goal was to sample and recruit 100 HHAs that spanned the above characteristics. The absolute number of agencies was less important than the size of the sample of patients that could be drawn from the agencies. As will be discussed in more detail below, the initial targeted patient sample size was about 23,000; this size was determined assuming a 30% response rate and to achieve statistical precision.

To obtain the patient sample size needed, project staff used the number of patients the HHA served as the principal characteristic. After examining the active HHA file and other files provided by CMS, project staff confirmed that there are far more very small agencies than large agencies. To obtain a sufficient number of larger agencies in the sample to yield the patient sample size needed, project staff initially stratified the population of agencies into five size strata. The size of agencies was estimated from the Medicare cost reports for HHAs. Other HHA characteristics were included in an extract from the Online Survey Certification and Reporting (OSCAR) System. Using information gleaned from the CMS administrative files, project staff constructed a sample frame consisting of all active HHAs; however, HHAs that serve only pediatric patients were excluded from the frame because patients under age 18 are not eligible to participate in the HHCAHPS Survey.

There were too many HHA characteristics to stratify on all of them simultaneously. With size as the most important stratification determinant, RTI project staff then sorted the agencies within each stratum by other characteristics during the sample selection process. With each size stratum, project staff then determined the number of agencies to be sampled in each stratum. The smallest stratum would have to be sampled at 100% and would still contribute

a small part of the sample. Using an iterative method, varying the number of agencies to be selected and the patient sampling rate within each stratum, project staff arrived at a balance that would yield the patient sample without sampling the larger agencies' patients at too high a rate. Because one of the exclusion criteria in sampling patients for the HHCAHPS Survey is that a patient can be sampled only once in 6 months, project staff members were careful to not deplete the eligible patients in the first of the three sample months.

Project staff selected the sample of HHAs for the mode experiment using the SAS procedure PROC SURVEYSELECT using a serpentine sort. Using a hierarchy of the HHA characteristics, the data were sorted by Unduplicated Patient Count, Geographic Rank of Utilization, Facility Type (Free-Standing versus Hospital), Control Type (For Profit versus Non-Profit), and Urbanicity Indicator (Urban versus Rural). Each sort was nested within the former sort. This method enabled the project team to select a “replicate” sample; that is, the nearest neighbors (HHAs) with similar or the same characteristics to be used as backup if the originally selected HHA could not participate in the mode experiment. It was necessary to have backup HHAs to replace the originally selected HHAs in the event that an HHA refused to participate in the mode experiment or could not participate for other reasons.

The target sample of 100 HHAs was distributed over 5 strata, as shown in **Table 2-1**. The estimated number of patients that each HHA served per month and the desired number of HHAs to be included in the sample from each strata are also shown in the table below.

Table 2-1. Number of HHAs Selected in Each Strata

Stratum Number	Estimated Number of Patients Served Per Month	Number of HHAs in Stratum	Number HHAs Selected from Stratum
1	15	4,899 HHAs in smallest stratum	18
2	35	1,584 in the next smallest stratum	16
3	50	1,577 in the next stratum	36
4	280	750 in the next stratum	25
5	Approximately 1,000	Stratum of largest agencies	5

2.3 Recruiting the HHA Sample

This section describes procedures for recruiting HHAs to participate in the mode experiment, including the recruiting materials, the recruiting process, and the results of recruiting sampled HHAs.

Recruiting Materials. To recruit HHAs, RTI project staff developed materials that described the purposes and objectives of the HHCAHPS Survey mode experiment, explained what

participation by HHAs would entail, and described the benefits of participating. The recruiting materials also included a list of the patient information variables that participating agencies would be asked to provide for each of the three sample months. The cover letter sent with the recruitment materials informed the agency that someone from RTI would call them to invite them to participate in the mode experiment. Project staff developed and sent an advance letter and Fact Sheet to each sampled agency and also included an endorsement letter from the National Association for Home Care & Hospice. A copy of these materials is included in **Appendix A**. The information package consisting of the cover letter, the Fact Sheet, and the draft HHCAHPS questionnaire was mailed to each sampled agency approximately 1 week before project staff called the sampled agency to answer any questions that they had about the mode experiment and to invite them to participate.

Recruiting Process. RTI project staff selected a sample of 100 HHAs from the universe of Medicare-certified HHAs, as described in Section 2.2. Six replacement replicates of 100 agencies each were also selected, which were “matched” to each of the original 100 as closely as possible on the dimensions listed above. As any of the first 100 agencies refused to participate, the agency in the next closest replicate was “released” for potential recruitment. Because the mode experiment survey could not begin until the HHCAHPS Survey was approved by the United States Office of Management and Budget (OMB) and the data collection schedule could not be established until OMB approval was received, the project team expected that some of the HHAs that agreed to participate during the recruitment period would not be able to do so after OMB approval was received. Therefore, the project team decided to recruit more than 100 HHAs to ensure that there were a sufficient number of HHAs participating to yield the desired number of completed surveys.

Prior to mailing the materials to the initial set of 100 HHAs, RTI project staff identified those agencies in the entire sample that could potentially be considered as part of a larger chain, meaning that they shared the same name or parent organization. These HHAs—each with a distinct CMS Certification Number (CCN)—were pulled from the sample and worked separately. RTI survey staff called each “chain” organization to request the name of the appropriate contact person to whom the recruiting materials should be sent. For all other agencies, the materials were addressed and sent to the “HHA Administrator.” The first set of letters (to the first 100 agencies) was mailed on March 11, 2009. Prior to the HHA recruiting effort, project staff posted an announcement about the mode experiment on the HHCAHPS Survey Web site and invited interested HHAs to register their interest in participating in the mode experiment. Five HHAs “volunteered” to participate in the mode experiment; this group of five agencies was included in the initial mailing to the HHAs.

On March 16, 2009, RTI project staff trained six telephone interviewers and supervisors to conduct the recruiting calls to HHAs that were not part of a chain. Staff developed and used a short computer-assisted telephone interview (CATI) program that contained a script for the interviewers to explain the purpose of the study and to verify whether the agency had

received the recruiting materials. If the agency had received the recruiting letter and materials, interviewers invited the agency to participate and then collected and entered in the CATI program contact information (name, telephone number, and e-mail address) for both the key point-of-contact for the survey and, if available, a data manager contact. Agencies that had not received the materials were offered the opportunity to have the information packet faxed or sent to them by e-mail message, with a follow-up telephone call placed a few days later. If agencies refused to participate, the next set of agencies in the next replicate was mailed a set of introductory letters and then called several days later. In this way, agencies were pulled into the sample from each of the successive replicates as needed.

Recruiting Results. Recruiting took place from March 17, 2009, through May 17, 2009, with a total of 140 HHAs agreeing to participate. During that time, project staff also kept the link open on the Home Health Care CAHPS Web site for HHAs to register if they were interested in participating in the mode experiment. An additional nine volunteer agencies were recruited in this way. From May through September 2009, when the actual survey began, in response to various e-mail messages sent to keep the recruited agencies apprised of next steps, more than 30 agencies withdrew their participation in the mode experiment. Reasons given for withdrawing included lack of staff/resources, insufficient data capabilities at that time to produce the requisite variables, or preparing the files was more work than they anticipated. A total of 75 agencies ultimately participated in the survey by providing a monthly patient information file for at least one of the three sample months. The number of HHAs submitting a patient information file for each sample month is shown in **Table 2-2**, below.

Table 2-2. HHA Monthly Patient Information File Submissions

HHA File Submission Status	Number	Percent
Submitted a file for all 3 sample months	50	66.7
Submitted a file for 2 sample months	17	22.7
Submitted a file for only 1 sample month	8	10.6
Total	75	100.0

The patient information that participating HHAs needed to include on the monthly patient information files for each of the three sample months fell into one of two categories: (1) the variables needed for determining survey eligibility, sampling and fielding the survey; and (2) the variables needed for analysis. Even though most of the data variables could be extracted from the Outcome and Assessment Information Set (OASIS) assessments, some of the participating agencies had difficulty producing and submitting the required data within a 2-week period after the sample month ended. It should be noted that for the national implementation, HHAs are aware of the participation requirements; therefore, in advance of beginning their participation, most HHAs have arranged with their data processing personnel and/or an outside firm to prepare programs to generate and submit the monthly patient information files to their approved Home Health Care CAHPS Survey vendor.

To give the agencies more time to provide the patient information needed for each sample month, the project team allowed them to submit two different files at different points in time. The first file, to be submitted within 2 weeks after the sample month ended, would contain the patient identifiers, contact information, date of birth, and the number of skilled visits in the sample month and prior month, etc. The second file, which would contain source of admission, diagnoses, activity of daily living (ADL) limitations, and other information needed for analysis, could be submitted within 6 weeks after the sample month ended. Submitting two separate files at different points in time allowed the project team to field the survey within 21 days after the close of the sample month and provided more time for the participating HHAs to prepare and submit the data needed for analysis. Although willing to participate in the mode experiment, some of the 75 HHAs could not submit the files needed in time for the survey to be fielded; consequently, the survey did not include sampled patients from those HHAs for all three sample months. In some instances, more than a few of the HHAs were able to submit the patient information needed for fielding the survey, but did not submit the data needed for analysis.

2.4 The Patient Sample

The patient eligibility criteria for the mode experiment were the same as those being used in the national implementation of the HHCAHPS Survey; however, after the mode experiment began, the patient eligibility criteria were changed to include only Medicare and/or Medicaid patients in the survey. When the mode experiment began, all patients 18 years old and older were eligible for inclusion in the survey if they met the following criteria:

- they were not known to be deceased;
- they had at least one skilled care home visit during the sample month and two such visits during the lookback period;
- the skilled care they received was not for routine maternity care;
- the patient was not currently receiving hospice care; and

- the patient did not request that the HHA not release his or her name to anyone other than agency personnel.

For purposes of both the mode experiment and national implementation, the basis for determination of a skilled visit is the classification of the agency employee who visited the patient and not the reason for the home health visit, with the exception of patients who receive routine maternity care or those who are discharged to hospice care. For a visit to be considered a “skilled visit,” the agency employee must be classified as one of the following: registered nurse (RN), licensed practical nurse (LPN), physical therapist, physical therapist assistant, occupational therapist, occupational therapist assistant, speech therapist, or speech therapist assistant. Skilled visits do not include visits made by any category of social worker, home health aide or personal care aide, or nursing aide. Patients who receive home health care for routine maternity care are not eligible to be included in the survey. Routine maternity care is defined as receiving a few visits for a normal delivery and would include, but not be limited to, assistance in breast feeding and other educational services. Patients must have had at least one skilled home care visit during the sample month and at least two skilled visits during the “lookback” period. The lookback period is defined as the sample month and the month immediately preceding the sample month.

The project team determined that approximately 6,000 completed surveys would be needed for the analysis of the Home Health Care CAHPS Survey mode experiment. Based on other surveys with populations similar to the home health care population, project staff estimated that the response rate would be less than 30% for some of the modes, especially the mail-only mode. The targeted number of completed surveys for the national implementation is 300 annually for each participating HHA; however, to achieve sufficient precision on average ratings for the mode experiment and on the estimated coefficients for mode and patient characteristics, a larger sample size for each participating HHA was needed. When designing the mode experiment, project staff considered the fact that the age groups of the home health care population vary, with older ages predominant, and the number of patients with various medical conditions also varies considerably. The project team estimated that approximately 2,000 completed surveys in each mode would be needed for the mode experiment, for a total of 6,000 completed surveys. Assuming an overall response rate of about 30%, project staff estimated that a minimum sample consisting of 23,000 patients would be needed for the mode experiment.

To obtain a sample size needed for the mode experiment, project staff sampled patients from the participating HHAs at different rates, depending on their size stratum. The sampling rates were determined by the actual HHAs participating and the actual number of patients in the sample frame for each sample month (see **Table 2-3**).

Table 2-3. Sampling Rates Used to Select the Patient Sample

Sample Month	HHAs with < 100 Patients on Frame	HHAs with 100 or More Patients on Frame
August	100%	20.0%
September	100%	32.0%
October	100%	37.5%

Project staff selected an additional 900 patients for the October month because the response rate from the September sample appeared to be lower than projected and because of the concern about obtaining the number of completed surveys with Medicare and Medicaid patients.

The sampling frame for the mode experiment was constructed from monthly patient information files submitted to RTI by the participating HHAs. Approximately 1 month before the mode experiment began, project staff developed and provided each participating HHA a template to use to submit the monthly patient information files to RTI, along with specifications for preparing the files. The template, which was a Microsoft Excel file, contained a column for each of the data variables needed for both sampling and fielding the survey and for analysis. The specifications provided to the HHAs contained a description of the variables needed for each patient, including possible sources of the information requested (particularly for diagnoses), sources of admission, payment, and ADLs.

The specifications that the participating HHAs used to prepare the monthly patient information files also contained instructions for using the template, a suggested file naming convention, and instructions for accessing and transmitting the files to RTI via a special Web site that was developed and used for the mode experiment. The specifications also contained a schedule by which the patient information files were needed for each sample month. Based on questions and comments received from participating HHAs prior to the due date of the monthly patient files for the first sample month, project staff revised the specifications to address some of the questions received via e-mail messages and telephone calls about file preparation. In addition, after examining the files received for the August sample month, the project team clarified some of the specifications and provided more information about preparation and submission of the monthly patient files via e-mail messages sent to the participating agencies.

CMS was in the process of responding to public comment about the proposed 2010 Home Health Care Prospective Payment System Rule during the second month of the data collection period. One of the concerns that the public expressed about the national implementation of the survey was possible difficulties that some Medicare-certified HHAs may have in providing some of the patient information needed for the survey, specifically

diagnoses and ADLs. Medicare-certified HHAs are required to report the same data being requested for the national survey to CMS via the OASIS for all patients whose care is paid for by Medicare and Medicaid, but not for patients whose home care is paid for by other sources. After considering the public comments about the proposed rule, CMS decided to limit the survey to only Medicare and/or Medicaid patients. However, at the time that this decision was made, the mode experiment had already begun. Therefore, participating HHAs provided monthly patient information files to the project team that included patient information for all patients who met the patient eligibility criteria, regardless of the source of payment.

As a result of the decision to include only Medicare and Medicaid patients in the Home Health Care CAHPS Survey, RTI project staff adjusted the sampling rates used for the October sample to ensure that a sufficient number of completed surveys would be received from Medicare and Medicaid patients. However, the respondent sample included some patients whose care was not paid for by Medicare and/or Medicaid; data from these respondents were not used in the mode experiment analysis. Based on the payer source information provided by the HHAs for the August and September sample months, the project team estimated that for some agencies approximately 30% of the patients sampled for the August and September sample months were not eligible for the survey because their home care was not paid for by Medicare and/or Medicaid; therefore, project staff increased the sampling rate for the October sample month for selected agencies based on the assumption that approximately 30% of the sample included in the August and September samples were non-Medicare and non-Medicaid patients. A total of 24,561 home health patients were ultimately included in the mode experiment sample.

2.5 Mode Experiment Data Collection

The mode experiment began with the selection of the August sample from participating HHAs, in mid-September 2009. After the sample was selected for each sample month, each sampled case was randomly assigned into one of the three data collection modes. The project team obtained updated mailing addresses and telephone numbers for each sampled case from the National Change of Address. Once address and telephone information was updated, a personalized cover letter and a questionnaire with a unique sample identification number were printed for each sampled case in the mail-only and mixed modes. Cases assigned to the phone-only mode were sent to RTI's Call Center in preparation for outbound call attempts. The first questionnaire mailing and first telephone call attempt began in late September for the August sample month. After 21 days, all nonresponding mail only cases were sent a second and final questionnaire package, and all nonresponding mixed-mode cases were assigned to RTI's Call Center for nonresponse telephone follow-up. This process was repeated with each successive monthly sample from the HHAs.

Prior to beginning telephone interviews with the August sample cases, RTI project staff conducted telephone interviewer training. The training was conducted on September 26, 2009, and a total of 16 interviewers were trained. Training consisted of project-specific information—including the purpose of the study, the study population, the survey instrument—and information designed to increase interviewer success, including refusal avoidance techniques, methods to obtain cooperation, and common challenges of interviewing an older population. Interviewers practiced the survey in role-play situations and were required to pass both a written and oral certification prior to starting telephone data collection calls. The same staff trained to conduct interviews with the August sample continued to work the additional telephone-only samples and the mixed-mode nonrespondent follow-up for the September and October sample cases. Telephone interviewing ended on January 5, 2010, for the October sample.

RTI project staff trained staff in RTI's Fulfillment and Data Receipt Operations Unit to assemble and mail the mail survey questionnaire packages and to receive and process returned questionnaires. Questionnaires with at least one question answered were logged into the HHCAHPS Survey Management System as received and sent forward for data scanning. Questionnaires returned with written comments or notes attached were set aside for project staff review in a "problem bin." Project staff reviewed problem bin cases regularly and made decisions regarding the best event or disposition code to assign each case. At the conclusion of the data collection period, scanned data were compared with the data collected through the CATI system, and any duplicates were resolved and final event codes assigned based on whether the case met the HHCAHPS completeness criteria.

Data collection on the Home Health Care CAHPS mode experiment resulted in obtaining an overall response rate of approximately 45.7% from sample members in all three modes. The response rate for the mail-only mode was lowest, at 39.7%, with the telephone-only response rate at 46.7% and the mixed-mode response rate at 52.0%. The response rates for the 75 HHAs that participated in the mode experiment ranged from a low of 16.4% to a high of 75.5%, but it was 50% or higher for approximately 37% of the participating HHAs. The response rates for the mode experiment were calculated as follows:

Ineligible cases were those that were reported as being deceased, those who did not speak the language in which the survey was offered, and sample members who were institutionalized and physically or mentally incapable of responding to the interview and no proxy respondent was available to respond to the survey on their behalf. As mentioned previously, the patient eligibility criteria for the HHCAHPS Survey changed after data collection for the mode experiment began; the response rates reported above are from all patients sampled, including those whose care was not covered by Medicare and/or Medicaid.

Note however, that survey response data from non-Medicare and non-Medicaid patients are not included in the mode, nonresponse, and patient-mix analyses that were conducted.

2.6 Data Cleaning and Preparation

The first step in the data cleaning process was to check to make sure there were no duplicate survey response cases in the data file. Typically on a mail survey, a respondent may complete and return both the initial questionnaire and a second questionnaire that was sent as part of the follow-up mailing to nonrespondents. On a mixed-mode survey, the sample member may participate in telephone follow-up with mail survey nonrespondents, even though he or she has already returned a completed survey. After de-duplicating the respondent data file, the next step in the data cleaning process was to run the completeness criteria on each survey response record. For HHCAHPS, a survey is considered to be “complete” if at least 50% of the questions applicable to all sample members (Questions 1-11, 15-21, and 24-25) are answered. Survey response data records that did not pass the completeness criteria were not included on the analysis file.

The next step in the data cleaning process was to merge the survey response data with the data needed for the analysis for each respondent data record. That is, to merge patient information provided by the HHAs, including demographic information (age and gender), number of skilled visits, payer source, source of admission, diagnoses, and ADL deficits. Because being a Medicare and/or Medicaid patient was not part of the eligibility criteria when the mode experiment began, the mode experiment sample included some patients who were not Medicare or Medicaid patients. Therefore, after merging the aforementioned data to the survey response data, the next step was to exclude non-Medicare and non-Medicaid patients from the data file. After completing these steps, project staff identified the data record for all respondents for whom the data record had all required data, including all of the data variables needed for analysis. A final data file was constructed by adding other survey administration variables, including the sample mode (mail only, phone only, mixed mode) and codes to indicate whether the survey was completed by a proxy respondent, the language in which the survey was conducted, and the date the survey was received (or telephone interview completed).

Table 2-4 shows the sample attrition based on sampled cases that were ineligible for the survey, survey response records that did not pass the completeness criteria, and/or the HHA did not provide the patient information needed for the analysis. Note that 50.5% of the sample did not respond to the survey.

Table 2-4. Sample Attrition

Sample Response Characteristics	Number	Percent	
Total patients selected	24,561	100.0	
Nonrespondents	12,410	50.5	
Responded—Ineligible	952	3.9	
Responded—Eligible	11,199	45.6	
Total		100.0	
Respondent Cases	Number	Remaining	Percent
Failed Home HHCAHPS completeness criteria	404	10,795	3.6
Could not match HHA supplied data needed for analysis to respondents	897	9,898	8.0
Cases for which lookback period visits are less than sample month visits	28	9,870	0.3
Payment source completely missing or payer is private/other	3,094	6,776	27.6
Identified as Medicare or Medicaid patient	6,776		60.5
Total respondents	11,199		100.0

2.7 Nonresponse Analysis

RTI project staff conducted an analysis to compare Home Health Care CAHPS mode experiment respondents to nonrespondents using demographic and other data the participating HHAs provided on the monthly information files. **Table 2-5** shows the proportion of the mode experiment sample with selected characteristics. This table reflects sample members (both respondents and nonrespondents) for whom the HHAs provided the payment source of Medicare and/or Medicaid.

As can be seen from **Table 2-5**, mode experiment respondents and nonrespondents have very similar characteristics. The younger and older populations were slightly less likely to respond to the survey. The admission source “Other” was not always understood by the participating HHAs and accounts for a very small proportion of sampled patients. There is some indication that sample members with greater debility, as indicated by the ADL measure, were slightly less likely to respond to the survey.

Table 2-5. Characteristics of Respondents and Nonrespondents

	Respondents	Nonrespondents
Number in group	6,782	7,428
	%	%
Age		
18-49	5.0	6.4
50-64	12.2	13.2
65-74	23.9	20.7
75-84	34.9	32.3
85+	24.0	27.4
Sex		
Missing	0.0	0.03
Female	63.9	63.8
Male	36.1	36.2
Admission Source		
Hospital	42.1	42.8
Inpatient rehab facility	4.6	4.2
Skilled nursing facility	8.1	8.7
Nursing home	0.4	0.5
Other inpatient	1.6	0.9
Community	34.2	33.8
Payer		
Medicare	89.8	88.5
Medicaid	13.0	14.5
(Some patients had both payers indicated)		
Number of ADL deficits		
Missing	13.7	17.0
0	8.3	7.5
1	11.0	9.2
2	11.0	9.5
3	8.6	7.6
4	16.5	15.4
5	30.9	33.9

Note: Other characteristics in the HHA files had a very high rate of missing and are not displayed here.

A study of the propensity to respond to the survey was also conducted. The determinants of response that could be analyzed were characteristics that were provided by the agencies for the sample. Characteristics found only in the survey were not available for nonrespondents. **Table 2-6** is a logistic regression predicting nonresponse as a function of available characteristics that had relatively few missing values. As can be seen in the following table, age, sex, admission source, payer and number of ADL deficits were used.

Table 2-6. Response Propensity Equation Logistic Regression with 5,171 Respondents, 5,398 Nonrespondents

Variable	Coefficient	Standard Error	Wald Chi-Square	Pr > Chi-square
Intercept	0.254	0.0609	17.416	<.0001
Age 18 to 49	-0.2987	0.0991	9.0835	0.0026
Age 50 to 64	-0.2545	0.0711	12.805	0.0003
Age 75 to 84	-0.0181	0.0528	0.1176	0.7316
Age 85 and older	-0.2378	0.0567	17.6053	<.0001
Male	-0.0196	0.0408	0.2314	0.6305
Admission source not community	-0.00856	0.041	0.0435	0.8347
Payer_Medicaid	-0.0503	0.0632	0.6314	0.4269
ADL_Deficits	-0.0497	0.0114	19.1067	<.0001

Note: Age 65-74, female, admission from the community, and Medicare payer are reference groups.

The significant predictors of response were the age groups and ADL deficits. Response for sample members in the 75 to 84 age group was not significantly different from the Age 65 to 74 reference group, but sample members in the other age groups were less likely to respond to the survey. The difference in response between males and females was not significant, nor was there a significant difference by payer. The number of ADLs for which the patient was not independent did impact the probability.

The coefficients of this model are not intuitively interpretable because they are in units of the log odds ratio. This can be converted to probability terms. The effect of each characteristic depends on the values of the other characteristics. Examples of the probability of response in this model were computed for most likely and least likely cases, as shown in **Table 2-7**. The 0 ADL deficit group was not used, as it is not that common with the home health care population. The average and maximum ADL counts were used.

Table 2-7. Example of Results of Computing the Probability of Response for Characteristics of those Most and Least Likely to Respond to the Home Health Care CAHPS Survey

Characteristic	Probability of Response
Female: Age 70, 3 ADL deficits	52.6%
Female: Age 70, 5 ADL deficits	50.1%
Female: Age 30, 3 ADL deficits	45.2%
Female: Age 30, 5 ADL deficits	42.7%

Age is a relatively strong predictor, with about a 7 percentage point effect for the largest differences. The ADLs have about a 1.2 percentage point effect for a change in 1 ADL. Three ADLs is the average for the HHA population. These characteristics are candidates for the patient-mix adjusters for ratings. If included as adjusters, the effects on response will be of minor importance.

2.8 Item Nonresponse

RTI project staff also examined the quality of the survey response data by reviewing item nonresponse, specifically the items that were included in the mode experiment analysis. The percent of item nonresponse is shown in **Table 2-8**. Across the 19 dependent variables (top box Home Health Care CAHPS ratings) used in regressions, the percent of missing responses for the survey questions ranged from 0.5% to 2.6%. For the self-reported demographic and health-related data provided by survey respondents, missing responses ranged only from 1.1% to 1.8%. For gate or screening questions, survey response records that did not include a response for the gate question could not be used in the analysis, even though the follow-up questions that followed the screening questions were answered. Therefore, the resulting final analytic sample size in regressions on the Home Health Care CAHPS dependent variables not governed by a prior gate question ranged from 4,426 on Q2 to 4,816 on Question 19.

Table 2-8. Number and Proportion of Missing Responses by Assigned Mode

Home Health Care CAHPS Questions	Total Respondents (n=6,777)		Assigned Mail Mode (n=2,092)		Assigned Phone Mode (n=2,314)		Assigned Mixed Mode (n=2,371)	
	Missing	Percent	Missing	Percent	Missing	Percent	Missing	Percent
Care of Patients Composite								
Q9	382	5.6	82	3.9	163	7.0	137	5.8
Q16	80	1.2	26	1.2	26	1.1	28	1.2
Q19	41	0.6	22	1.1	6	0.3	13	0.5
Q24	121	1.8	59	2.8	13	0.6	49	2.1
Communication Composite								
Q2	80	1.2	26	1.2	26	1.1	28	1.2
Q15	76	1.1	21	1.0	27	1.2	28	1.2
Q17	81	1.2	29	1.4	20	0.9	32	1.3
Q18	81	1.2	28	1.3	26	1.1	27	1.1
Q22*	34	0.0	10	0.0	11	0.0	13	0.0
Q23*	33	0.0	7	0.0	12	0.0	14	0.0
Specific Care Issues Composite								
Q3	115	1.7	36	1.7	32	1.4	47	2.0
Q4	72	1.1	32	1.5	13	0.6	27	1.1
Q5	83	1.2	25	1.2	26	1.1	32	1.3
Q10	149	2.2	44	2.1	58	2.5	47	2.0
Q12*	82	0.0	21	0.0	34	0.0	27	0.0
Q13*	70	0.0	18	0.0	27	0.0	25	0.0
Q14*	98	0.0	21	0.0	49	0.1	28	0.0
Overall Rating								
Q20	164	2.4	57	2.7	49	2.1	58	2.4
Willingness to Recommend								
Q25	159	2.3	50	2.4	51	2.2	58	2.4
Remaining Home Health Care CAHPS Questions								
Q1	431	6.4	254	12.1	2	0.1	175	7.4
Q6	180	2.7	31	1.5	96	4.1	53	2.2
Q7	318	4.7	54	2.6	151	6.5	113	4.8
Q8	642	9.5	119	5.7	319	13.8	204	8.6
Q11	282	4.2	119	5.7	68	2.9	95	4.0
Q21	428	6.3	178	8.5	82	3.5	168	7.1
About You Questions								
Q26	135	2.0	52	2.5	33	1.4	50	2.1
Q27	119	1.8	48	2.3	30	1.3	41	1.7
Q28	101	1.5	63	3.0	9	0.4	29	1.2
Q29	222	3.3	77	3.7	75	3.2	70	3.0
Q30	237	3.5	88	4.2	63	2.7	86	3.6
Q31	361	0.1	91	0.0	140	0.1	130	0.1
Q32	146	2.2	72	3.4	12	0.5	62	2.6
Q33	3458	51.0	95	4.5	2314	100.0	1049	44.2

*Missing percentages are based on those who responded positively to the gate question. For Q12-Q14, the gate question was Q11. For Q22, the gate question was Q21. For Q23, the gate questions were Q21 and Q22.

3 MODE EXPERIMENT ANALYSIS

3.1 Overview

The purpose of the Home Health Care CAHPS Survey Mode Experiment is to determine whether a mode adjustment is needed and to identify factors not in the control of the HHAs that affect HHCAHPS scores that will be publicly reported on the Home Health Compare Web site. Two global ratings of care and three composite measures developed from individual survey questions will be adjusted using findings from the mode, patient mix, and response propensity analyses described in this report. The HHCAHPS Survey measures that will be publicly reported and the individual questions that comprise each of the three composite measures that will be publicly reported are shown in **Table 3-1**. This chapter describes the data and analysis methods used in the mode and patient mix analysis, the descriptive and multivariate regression results and impact analysis of using various adjusters, and the implications of the findings for selecting factors for adjustment. These analyses were generally conducted following the same analytic and adjustment methodologies used in the Hospital CAHPS Survey (Elliott, Zaslavsky, Goldstein, et al., 2009).

3.2 The Mode Experiment Analysis File

At the end of the mode experiment data collection period, RTI project staff constructed an analysis file consisting of survey administration data, survey response data, and patient information provided by the participating HHAs. Survey administrative information included respondent age and gender; the data collection mode to which a sample member was assigned (i.e., mail, telephone, or mixed mode); a code indicating the mode in which the survey was completed; a proxy indicator flag; and the language in which the survey was conducted. Survey responses include both respondent ratings of home health care received and selected self-reported demographic (e.g., education level, language spoken at home) and health-related (e.g., health status) information.

HHAs provided information on sample member's age, gender, the number of deficits in ADLs experienced by the respondent, diagnoses, source of admission, and payer type. As noted previously, the mode experiment sample included patients who met survey eligibility criteria regardless of whether they were covered by Medicare and/or Medicaid. However, the data file used for the mode experiment analysis only included Medicare and Medicaid patients. Not all HHAs that provided survey data were able to provide information on diagnoses, ADLs, and admission sources for their patients. **Table 3-2** identifies the number and characteristics of HHAs that supplied the required information on their patients so that their patients could be included in the analysis file.

Table 3-9. CAHPS Home Health Measures to be Reported on Home Health Compare

Overall Global Rating

- Q20. We want to know your rating of your care from this agency's home health providers. Using any number from 0 to 10, where 0 is the worst home health care possible and 10 is the best home health care possible, what number would you use to rate your care from this agency's home health providers?

Willingness to Recommend Agency Global Rating

- Q25. Would you recommend this agency to your family or friends if they needed home health care?

Care of Patient Composite Questions

- Q9. In the last 2 months of care, how often did home health providers from this agency seem informed and up-to-date about all the care or treatment you got at home?
- Q16. In the last 2 months of care, how often did home health providers from this agency treat you as gently as possible?
- Q19. In the last 2 months of care, how often did home health providers from this agency treat you with courtesy and respect?
- Q24. In the last 2 months of care, did you have any problems with the care you got through this agency?

Communication Between Providers and Patients Composite Questions

- Q2. When you first started getting home health care from this agency, did someone from the agency tell you what care and services you would get?
- Q15. In the last 2 months of care, how often did home health providers from this agency keep you informed about when they would arrive at your home?
- Q17. In the last 2 months of care, how often did home health providers from this agency explain things in a way that was easy to understand?
- Q18. In the last 2 months of care, how often did home health providers from this agency listen carefully to you?
- Q22. In the last 2 months of care, when you contacted this agency's office did you get the help or advice you needed?
- Q23. When you contacted this agency's office, how long did it take for you to get the help or advice you needed?

Specific Care Issues Composite Questions

- Q3. When you first started getting home health care from this agency, did someone from the agency talk with you about how to set up your home so you can move around safely?
- Q4. When you started getting home health care from this agency, did someone from the agency talk with you about all the prescription medicines you were taking?
- Q5. When you started getting home health care from this agency, did someone from the agency ask to see all the prescription medicines you were taking?
- Q10. In the last 2 months of care, did you and a home health provider from this agency talk about pain?
- Q12. In the last 2 months of care, did home health providers from this agency talk with you about the purpose for taking your new or changed prescription medicines?
- Q13. In the last 2 months of care, did home health providers from this agency talk with you about when to take these medicines?
- Q14. In the last 2 months of care, did home health providers from this agency talk with you about the important side effects of these medicines?
-

Table 3-10. Characteristics of HHAs in Final Analysis File With Complete Data (n=60)

	Count	Percent
Free-standing	44	73.3
Hospital based	16	26.7
Size—Very small (under 315)	12	20.0
Size—Small (315-624)	8	13.3
Size—Medium (625-1,760)	20	33.3
Size—Large (1,761-10,105)	15	25.0
Size—Very large (over 10,106)	5	8.3
Location by utilization rates—Low	4	6.7
Location by utilization rates—Medium	9	15.0
Location by utilization rates—High	16	26.7
Location by utilization rates—Very high	31	51.7
For-profit	31	51.7
Not-for-profit	29	48.3

Note: Size characteristics estimated from CMS cost reports.

3.3 Variable Construction

Dependent Variables. The RTI project statisticians and analysts developed both dependent and independent variables for use in regression analysis. First, 19 variables were created to serve as dependent variables coded as 0/1 “top box” dichotomous (dummy) variables. Following Hospital CAHPS analysis methodology, the variables for the composite measures were constructed following any skip patterns that were included in gate or screening questions. For example, respondents answering Question 12 in the survey about whether providers discussed the purpose for new or changed prescription medications should have responded “Yes” to the prior question (Question 11) regarding whether they began taking any new medications or changed medications in the past 2 months. Therefore, project staff analyzed only those responses in Question 12 for which the respondent answered “Yes” in Question 11. As a result, dependent variables created from such follow-up questions that are preceded by a prior gate question have lower frequency counts by design than its preceding gate question. The skip patterns in the survey that were followed in developing affected dependent variables are shown in **Table 3-3**.

Table 3-11. Skip Patterns in the Home Health Care CAHPS Survey Instrument

Gate Question	Follow-up Question(s)	Dependent Variable for Follow-up Question Coded 1 if...
Q11	Qs 12, 13, and 14	Q11=1
Q21	Q 22	Q21=1
Q21, Q22	Q 23	Both Q21 and Q22=1

Table 3-4 shows descriptive statistics for each of the 19 dependent variables used in the regression analyses. For 18 of 19 HHCAHPS Survey questions, the value of the variable that is coded 1 is the most positive response category regarding the home health care experienced as reported by the respondent. For the Overall Rating measure (0-10), values of 9 or 10 are coded as 1. If a question did not have a prior gate or screening question, sample sizes ranged from 3,978 to 4,780. Variables representing follow-up questions affected by a preceding gate question have a considerably smaller range (1,366 to 1,877). Generally, most variables have a mean proportion in the 80-90% range, meaning that respondents were generally pleased with the provision of care, but it could still be improved. The variable with the highest proportion (e.g., the dependent variable equals 1) is Question 22 (96.5%) pertaining to whether respondents received the help or advice they needed if they contacted the provider’s office. The variable with the smallest proportion (67.0%) is Question 14, concerning whether providers talked to respondents about important side effects of their prescription medications.

Independent Variables. After constructing the dependent variables, project staff developed survey administrative, demographic, health, and health system-related variables to serve as independent variables in the analyses. Characteristics selected as independent variables are similar to those used in the Hospital CAHPS Survey, with some additions considering the differences in the patients (greater disability) and setting of care (home). The descriptive statistics for these variables, shown in **Table 3-5**, pertain to the sample used in the single regression on the Overall Rating dependent variable. Descriptive statistics on only the sample responding to this measure are provided because the sample size is one of the largest in the analyses and the Overall Rating variable reflects the broad judgment of a respondent on provision of care. Variables in **Table 3-5** denoted as “omitted” served as the reference group for the other variables within the construct being modeled in regression analyses.

Table 3-12. Means of Mode/Patient Mix Regression Dependent Variables

CAHPS Question Number	n	Mean (%)	Standard Deviation (%)	Variable Description
Global Ratings—Q20_new	4,728	83.2	37.4	Overall Rating
Global Ratings—Q25_new	4,725	83.3	37.3	Willingness to recommend
Items in Care of Patients Composite—Q9_new	3,978	69.5	46.1	Providers informed/up to date
Items in Care of Patients Composite—Q16_new	4,777	90.8	29.0	Treat you as gently as possible
Items in Care of Patients Composite—Q19_new	4,780	94.1	23.6	Treat you with courtesy and respect
Items in Care of Patients Composite—Q24_new	4,752	95.8	20.0	Have any problems with care
Items in Communication Composite—Q2_new	4,393	95.1	21.7	Tell you what services you would get
Items in Communication Composite—Q15_new	4,774	80.5	39.6	Providers kept you informed about arrival time
Items in Communication Composite—Q17_new	4,778	82.7	37.8	Explained things in a way easy to understand
Items in Communication Composite—Q18_new	4,779	83.7	36.9	Listen carefully to you
Items in Communication Composite—Q22_new	1,442	96.5	18.5	Did you get help or advice needed
Items in Communication Composite—Q23_new	1,366	76.2	42.6	How long take to get help/ advice
Items in Specific Care Issues Composite—Q3_new	4,399	82.0	38.4	Talk about set up home to move around safely
Items in Specific Care Issues Composite—Q4_new	4,479	88.5	31.9	Talk with you about prescription medications you were taking
Items in Specific Care Issues Composite—Q5_new	4,418	84.7	36.0	Ask to see prescription medicines
Items in Specific Care Issues Composite—Q10_new	4,711	86.0	34.7	Talk about pain
Items in Specific Care Issues Composite—Q12_new	1,864	82.5	38.0	Talk about purpose for taking new or changed medications
Items in Specific Care Issues Composite—Q13_new	1,877	77.5	41.8	Talk about when to take meds
Items in Specific Care Issues Composite—Q14_new	1,842	67.0	47.0	Talk about side effects of medicines

Table 3-13. Means of Independent Variables in Overall Rating Regression (n=4,728)

Variable Category	Variable Name	Mean (%)	Standard Deviation (%)
Response mode	Mail (omitted group)	30.2	45.9
Response mode	Telephone	34.8	47.6
Response mode	Mixed mode	35.0	47.7
Proxy status	Had a proxy complete survey	13.2	33.9
Non English language	Non English primary language at home	4.8	21.3
Age	18-49	4.7	21.1
Age	50-64	11.3	31.6
Age	65-74 (omitted group)	24.3	42.9
Age	75-84	35.9	48.0
Age	85 plus	23.8	42.6
Gender	Male	36.5	48.2
Education	Less than 8th grade	13.1	33.7
Education	Some high school	15.3	36.0
Education	High-school graduate or GED (omitted group)	35.6	47.9
Education	Some college	21.3	41.0
Education	College graduate or more	14.7	35.4
Patient lived alone	Yes—lived alone	36.4	48.1
Self-reported health	Excellent/Very Good	21.5	41.1
Self-reported health	Good (omitted group)	28.5	45.2
Self-reported health	Fair/Poor	50.0	50.0
Mental/emotional status	Excellent/Very Good	40.5	49.1
Mental/emotional status	Good (omitted group)	32.1	46.7
Mental/emotional status	Fair/Poor	27.3	44.6
ADL deficits	Count of number of deficits	3.2	1.8
Admission source	Institutional admission	62.4	48.4
Admission source	Community (omitted group)	37.6	48.5
Payer status	Medicare (omitted group)	90.7	29.1
Payer status	Medicaid	11.8	32.3
Diagnoses	Dementia/cerebral degeneration	6.1	23.9
Diagnoses	Schizophrenia	0.5	7.3
Diagnoses	Diabetes/endocrine/metabolic issues	32.2	46.8
Diagnoses	Musculoskeletal/tissue/arthritis disorders	26.7	44.2
Diagnoses	Renal failure	5.1	22.0
Diagnoses	Urinary obstruction/incontinence	4.0	19.5
Diagnoses	Skin ulcers	7.2	25.9
Diagnoses	Complications of medical care/trauma	3.6	18.6
Diagnoses	Post-surgical/aftercare issues	15.0	35.7

The distribution of respondents answering follow-up questions governed by a preceding gate question may differ somewhat from the statistics presented in this table. For example, respondents answering questions regarding changes in their prescription drug regimen could potentially differ on health status variables from those presented in this table. Also, respondents seeking assistance from an HHA's office, as noted in Questions 22 and 23, may also differ on certain characteristics such as age or whether they lived alone.

For survey administrative variables, project staff developed three dummy variables for the three survey modes to which respondents were assigned (mail, telephone, and mixed mode). By design, the sample was divided into thirds and assigned to one of three survey modes (mail, telephone, mixed mode). The proportions of persons in the analytic file roughly reflect this distribution. Regarding demographic characteristics, five age group dummy variables were created from information from the HHAs representing age groups 18–49, 50–64, 65–74, 75–84, and age 85 and older. Project staff hypothesized that five age groups would be sufficient to account for differences in opinions of care according to age and to maintain a sufficient number of respondents in each age group for sufficient power in the analysis. As expected, few respondents were in the groups at the low end of the distribution, and given that the sample is largely of Medicare respondents, the plurality of respondents are in the age 75–84 reference group. Project staff also developed a variable for gender coded 1 if male, 0 if female.

In addition to age and gender, project staff created five dummy variables to reflect education status of respondents. These education categories were: (1) less than high school, (2) some high school, (3) high school diploma or GED, (4) some college, and (5) college graduate or more. Dummy variables reflecting a respondent's primary language spoken at home (coded 1 if non-English, and 0 if English), and whether the respondent lived alone (coded 1 if living alone, 0 if living with others) were also developed. In addition, a dummy variable was created to indicate whether the respondent was a proxy for the sample member, coded 1 if proxy, 0 if not. Only 13.2% of sample members had proxy respondents. No information was available from the survey regarding the relationship of proxies and sample members.

RTI project staff also developed two types of self-reported health variables—one for self-reported general health and one for self-reported mental health. These two variables may potentially measure different constructs. For example, one might report that their general health may be poor, but that their overall mental health is good. Together, these two characteristics provide subjective perspectives on how the respondent experiences their overall health. For each of these two characteristics, project staff developed three dummy variables, coded 1 or 0 for Excellent/Very Good, Good, and Fair/Poor.

Two types of health-related information were reported by HHAs. First, the OASIS or patient record contains information regarding the respondent's ADL deficits. For the Home Health

Care CAHPS Survey, HHAs report this information for each of five ADLs: the ability to (1) dress one's own upper body, (2) dress one's own lower body, (3) wash one's entire body, (4) get to and from the toilet, and (5) move from bed to chair, or to turn and position oneself in bed. HHAs report the level of independence for each ADL deficit, usually ranging from independent to totally dependent. Any respondent may or may not be completely independent on any or all of these five daily activities. To account for patient differences in these activities, project staff developed a single count variable ranging from 0 to 5, reflecting a respondent's number of ADL deficits (e.g., the number of these activities for which the respondent was not completely independent), with a mean of 3.2 ADL deficits. Project staff used this item as a measure of debility.

The second type of health information provided by HHAs was the International Classification of Disease Codes (ICD-9-CM) for the various diagnoses reported by the HHAs, describing the conditions of the respondent. HHAs could provide up to five ICD-9 codes from OASIS reflecting a patient's underlying diagnoses and comorbidities. Some codes reflect care, such as physical therapy, post-surgical aftercare, or attention to dressings or sutures. Project staff reviewed the ICD-9 codes submitted for respondents and grouped them into a set of 9 diagnosis groups pertaining to a respondent's conditions hypothesized to affect respondent ratings of care. Diagnoses groups included various physical (e.g., cancer, heart disease) and mental (e.g., dementia, schizophrenia) conditions. Low proportions of patients had any given assigned diagnosis.

Variables obtained from HHAs reflecting health system-related issues not in the control of the HHA were included to account for the admission source and payer of services for each respondent. Project staff created a single dummy variable to indicate whether a patient's admission source was an institutional setting. Institutional settings included in this dummy variable are inpatient (hospital), rehabilitation facility, and other institutions (e.g., skilled nursing facility, non-skilled nursing facility, other inpatient facility). Otherwise, patients were admitted from their community residence. Dummy variables to indicate whether a respondent had Medicare or Medicaid as the designated payer of home health care services were also created and used.

Although data were collected from HHAs on other characteristics, project staff chose not to use these data, either because of the high rates of missing data on the characteristics or because the data were not reliably reported. Variables with high rates of missing data were whether the patient was enrolled in an HMO (38% missing) and a count of the number of surgical discharges (44% missing). Variables that were not reliably reported were whether a patient was dually eligible for Medicare and Medicaid and whether the patient had end-stage renal disease (ESRD). Regarding dual eligibility status, data provided on the monthly patient information file submitted by the HHA for this variable did not reliably match with reports of Medicare and Medicaid status. In addition, the ESRD variable did not reliably match with ICD-9 codes that HHAs provided in other data fields.

3.4 Analysis Methods

RTI project staff conducted initial descriptive analyses of the respondent cases with nonmissing data to detect any problems before beginning regression analysis. First, the means and standard deviations of variables were reviewed to determine whether any particular variable lacked sufficient variation. Three dependent variables (Questions 2, 22, and 24) have low variation (roughly less than 5% of sample members coded as zero) for use in sensitivity analyses using logistic regression, but all three of these variables could be used in regression analysis using Ordinary Least Squares (OLS) analysis, although their results may need to be considered with caution because of the lack of variation. One other variable (Question 19 with a mean of 94.0%) also approached this 5% threshold, but no overt problems were identified in logistic regressions run in sensitivity analyses.

Project staff also conducted three types of correlation analysis on the data. Relatively high correlations across sample members on given characteristics may produce spurious regression results, but staff found no correlation problems in the data after considering pairwise correlations (none were above 0.7), variance inflation factor tests (no single variable exceeded a value of 1.5), and the condition indexes of the independent variable array (no value was more than 10).

Project staff initially estimated 19 patient-level regression models on the top box dependent variables included in **Table 3-4** using the same list of independent variables shown in **Table 3-5** in each regression. All models are estimated with “fixed effects” by including dummy variables for all HHAs except one, which served as the reference HHA. These variables isolated the effects of potential mode and patient-mix variables from the HHAs’ own characteristics of providing care. Project staff estimated both logistic and OLS regression models on each dependent variable.

When reviewing the distribution of the raw (unadjusted) Home Health Care CAHPS scores, project staff considered that logistic regression has some desirable features as compared to OLS regression. First, logistic methods are usually preferred when the proportions being modeled are concentrated toward the ends of the 0–1 range rather than the middle. The unadjusted Home Health Care CAHPS top box scores on the 19 ratings of care in the mode experiment data are generally located on the high end of the 0/1 continuum (between 80 and to 95 percent in the top rating). Generally, this makes them ideally suited for logistic regression, which has higher power than OLS to detect statistically significant differences in the regression variable coefficient estimates. Because the dependent variable is limited to the 0–1 range, the logistic function is desirable because predictions made using the estimated coefficients do not exceed the 0-1, whereas OLS predictions may exceed that range. The magnitude of the adjustment effects is larger when the dependent variable is near the middle of the range and reduces as the dependent variable approaches the extremes of 0 and 1. Further, although estimates from OLS models estimated on 0/1

dependent variables are unbiased, their variance estimates are not reliable. Therefore, project staff estimated both logistic and OLS models to compare the estimates of magnitude from each model.

RTI project staff estimated the OLS model twice, with and without the diagnosis groups, to determine if the model without the diagnosis groups resulted in other independent variables increasing in statistical significance. In initial testing of models with the diagnosis groups included, two diagnosis groups were statistically significant, both related to the mental status of patients—schizophrenia and dementia. The remaining seven diagnosis groups were only occasionally significant with smaller coefficient estimates. Therefore, project staff decided to evaluate these two diagnosis groups further during the subsequent impact analysis of potential adjustment factors on Home Health Care CAHPS scores and relative rankings.

In early specification testing, project staff also decomposed the effects of mode variables by separating mixed mode into its two separate components (mixed-mode mail and mixed-mode telephone), conducting regressions using only mode variables with HHA fixed effects and no other variables, and testing for proxy effects on mode. Project staff found that mixed-mode and mixed-mail effects were generally opposite signed, so when combined, the effect of the combined variable is muted. Generally, large effects for the proxy variable were found, particularly in relationship to other patient mix covariates.

Project staff conducted an impact analysis of subsets of potential mode and patient mix adjustment factors on HHCAHPS adjusted scores. The impact analysis was conducted in a series of six steps. Each step consisted of (1) estimating regression models on the 19 Home HHCAHPS top box scores, (2) applying the general form of an equation employed in Hospital CAHPS analyses for calculating adjusted scores; the coefficients used were HHCAHPS regression coefficients for potential adjusters being considered, and (3) calculating the adjusted HHCAHPS score based on these potential adjusters.

The first step estimated a fully specified regression model using the full set of independent variables shown in **Table 3-5**. Each successive step eliminated selected independent variables in the regression based on prior Hospital CAHPS experience and RTI analysts' sense of the relative contributions of each potential adjuster. The sixth step contained the fewest set of potential adjusters, which generally paralleled many of the adjusters used in the Hospital CAHPS.

The equation used to calculate the adjusted score using each step's adjustment factors is the following:

$$y' = y + a_1(h_1-m_1) + a_2(h_2-m_2) + \dots + a_n(h_n-m_n)$$

where

- y' is the patient-mix and mode-adjusted Home Health Care CAHPS score for a given rating
- y is the mode-adjusted HHA mean of an Home Health Care CAHPS rating
- a_1 - a_n are the individual-level patient mix adjustments, which are the oppositely signed from the regression coefficients
- h_1 - h_n are the proportions of patients, in the particular HHA, who have the characteristics on the respective patient mix adjustment variable.
- m_1 - m_n are the HHA-level means of patient mix variables from the mode experiment HHAs (e.g., the average HHA in the mode experiment). This mean corresponds to the mean of all HHAs on the respective patient mix variables in the National Implementation.

After calculating the adjusted HHCAHPS score resulting from each of the six steps above, project staff also calculated both the percentage point difference and the percent difference of the resulting adjusted score from the prior step's score to provide a measure of how much adjusted scores changed between steps as more variables were dropped from the regression model. Project staff developed table of impact analysis results that presents a count of the number of HHAs for which the adjusted scores moved a certain fixed amount of percentage points. For example, after each step above, project staff counted the number of HHAs for which the scores moved less than 1 percentage point, between 1 and 2 percentage points, between 2 and 5 percentage points, and more than 5 percentage points to show the relative impact of each successive step in the impact analysis. The recommendations for which adjustment factors to use in HHCAHPS Survey (described in a subsequent section of this chapter) are based on the results of the impact analysis.

3.5 Regression Analysis Results

The results from both the regression and impact analyses are described in this section. The regression analyses reported here highlight differences between potential adjusters in their magnitude of effect and statistical significance when **all** potential adjusters are included in the model (the fully specified “first” step regression mentioned in the prior section). Project staff used these results to conduct the impact analyses, which sequentially removed sets of potential adjusters from the fully specified regression model (Step 1) in sequence (Steps 2 through 6). Therefore, only the Step 1 OLS regression results are reported in this subsection. Impact analysis results, which convey the effects of removing sets of potential adjusters from the regression model, are reported in Section 3.7 of this chapter.

Table 3-6 provides a high-level view of how often each regression-independent variable was found statistically significant across the 19 regressions in Step 1, and when significant, how often the direction of the effect was positive or negative. R-square values across OLS

Table 3-14. Number of Times Variables Were Statistically Significant Across Regressions and Direction of Effect

Variable Category	Variable Name	Number of Times Significant	Number of Times Positive	Number of Times Negative
Proxy status	Had a proxy complete survey	10	9	1
Non English language	Non English primary language at home	4	0	4
Age	18-49	3	0	3
Age	50-64	4	0	4
Age	65-74 (omitted group)	—	—	—
Age	75-84	3	1	2
Age	85 plus	7	2	5
Education	Less than 8th grade	3	0	3
Education	Some high school	2	1	1
Education	High school graduate or GED (omitted)	—	—	—
Education	Some college	5	0	5
Education	College graduate or more	10	0	10
Mental/emotional status	Excellent and Very Good	8	8	0
Mental/emotional status	Good (omitted)	—	—	—
Mental/emotional status	Fair and Poor	5	0	5
Patient lived alone	Yes—lived alone	8	0	8
Response mode	Mail (omitted group)	—	—	—
Response mode	Telephone	8	1	7
Response mode	Mixed mode	3	0	3
ADL Deficits	Count of number of deficits	6	1	5
Diagnoses (mental)	Schizophrenia	5	0	5
Diagnoses (mental)	Dementia/cerebral degeneration	4	0	4
Gender	Male	3	2	1
Self-reported health	Excellent and Very Good	2	2	0
Self-reported health	Good (omitted)	—	—	—
Self-reported health	Fair and Poor	1	0	1

(continued)

Table 3-6. Number of Times Variables Were Statistically Significant Across Regressions and Direction of Effect (continued)

Variable Category	Variable Name	Number of Times Significant	Number of Times Positive	Number of Times Negative
Admission source	Institutional admission	4	4	0
Admission source	Community (omitted)	—	—	—
Payer status	Medicaid	0	0	0
Payer status	Medicare (omitted)	—	—	—
Diagnoses (physical)	Diabetes/endocrine/metabolic issues	1	1	0
Diagnoses (physical)	Musculoskeletal/tissue/arthritis disorders	0	0	0
Diagnoses (physical)	Renal failure	5	2	3
Diagnoses (physical)	Urinary obstruction/incontinence	2	0	2
Diagnoses (physical)	Skin ulcers	3	0	3
Diagnoses (physical)	Complications of medical care/trauma	3	3	0
Diagnoses (physical)	Post-surgical/aftercare issues	2	1	1
Intercept	Intercept	19	19	0
Home health agencies	Dummy variables	—	—	—

regressions ranged from as high as 0.08 in Question 23 to as low as 0.03 in Question 16. Most often, R-square values ranged from 0.04 to 0.05.

Proxy and Non-English Language. Two variables that reflect a patient's communication ability are whether a patient had a proxy complete their survey and whether English was the primary language spoken at home. As shown in **Tables 3-7 and 3-8**, which present more detailed results on the direction of statistically significant coefficients for each of the 19 regressions, the proxy variable was statistically significant 10 times (9 times with a positive sign, and once with a negative sign). It was not statistically significant in the two global ratings, but was statistically significant several times in regressions for items within each of the three composites. In addition, the variable denoting that the primary language spoken at home was not English was statistically significant 4 times and was always negatively signed. It was statistically significant in one of the two global ratings and in two of the three composites.

Table 3-15. Variables Showing Statistical Significance and Direction of Effects Across Regressions (Global Ratings and Care of Patients and Communications Composites)

Variable Category	Variable Name	Global Items Q20. Overall Rating of Care	Global Items Q25. Willingness to Recommend HHA	Care of Patients Composite Q9. Providers Informed/ up to Date	Care of Patients Composite Q16. Treat You as Gently as Possible	Care of Patients Composite Q19. Treat you with Courtesy and Respect	Care of Patients Composite Q24. Have any Problems with Care	Communication Composite Q2. Tell You What Services You Would Get	Communication Composite Q15. Providers Kept You Informed about Arrival Time	Communication Composite Q17. Explained Things in a Way Easy to Understand	Communication Composite Q18. Listen Carefully to You	Communication Composite Q22. Did You Get Help or Advice Needed	Communication Composite Q23. How Long Take to Get Help/ Advice
Proxy status	Had a proxy complete survey	—	—	Positive	Positive	—	Negative	Positive	—	—	—	—	—
Non English language	Non English primary language at home	Negative	—	—	Negative	Negative	—	—	—	Negative	—	—	—
Age	18-49	—	Negative	Negative	—	Negative	—	—	—	—	—	—	—
Age	50-64	Negative	Negative	—	—	Negative	Negative	—	—	—	—	—	—
Age	65-74 (omitted group)	—	—	—	—	—	—	—	—	—	—	—	—
Age	75-84	—	—	Negative	—	—	Positive	—	—	—	—	—	—
Age	85+	—	Negative	Negative	—	—	Positive	—	Negative	—	—	—	—
Education	Less than 8th grade	—	—	—	—	—	—	Negative	—	—	—	—	Negative
Education	Some high school	—	Negative	—	—	—	—	—	—	—	—	—	—
Education	High school graduate or GED (omitted)	—	—	—	—	—	—	—	—	—	—	—	—
Education	Some college	Negative	Negative	—	—	—	—	—	—	Negative	Negative	—	—
Education	College graduate or more	Negative	Negative	—	Negative	Negative	Negative	—	Negative	—	Negative	—	—
Mental/emotional status	Excellent and Very Good	Positive	Positive	Positive	Positive	Positive	—	—	Positive	Positive	Positive	—	—

(continued)

Table 3-7. Variables Showing Statistical Significance and Direction of Effects Across Regressions (continued)

Variable Category	Variable Name	Global Items Q20. Overall Rating of Care	Global Items Q25. Willingness to Recommend HHA	Care of Patients Composite Q9. Providers Informed/ up to Date	Care of Patients Composite Q16. Treat You as Gently as Possible	Care of Patients Composite Q19. Treat you with Courtesy and Respect	Care of Patients Composite Q24. Have any Problems with Care	Communication Composite Q2. Tell You What Services You Would Get	Communication Composite Q15. Providers Kept You Informed about Arrival Time	Communication Composite Q17. Explained Things in a Way Easy to Understand	Communication Composite Q18. Listen Carefully to You	Communication Composite Q22. Did You Get Help or Advice Needed	Communication Composite Q23. How Long Take to Get Help/ Advice
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	—	—	—	—	Negative	—	Negative	Negative	—	Negative	—	—
Patient lived alone	Yes—lived alone	Negative	Negative	—	Negative	—	—	Negative	Negative	Negative	Negative	—	—
Response Mode	Mail (omitted group)	—	—	—	—	—	—	—	—	—	—	—	—
Response Mode	Telephone	—	—	Negative	—	—	Positive	Negative	—	—	—	Negative	Negative
Response Mode	Mixed mode	—	—	—	—	—	—	Negative	—	—	—	Negative	—
ADL Deficits	Count of number of deficits	—	Negative	—	—	Negative	—	—	—	Negative	Negative	—	—
Diagnoses (mental)	Schizophrenia	Negative	—	—	Negative	Negative	—	—	—	Negative	Negative	—	—
Diagnoses (mental)	Dementia/cerebral degeneration	Negative	Negative	Negative	—	—	—	—	—	—	—	—	—
Gender	Male	—	—	—	—	—	Positive	—	—	—	—	—	—
Self-reported health	Excellent and Very Good	—	—	—	—	Positive	—	—	—	—	—	—	—
Self-reported health	Good (omitted)	—	—	—	—	—	—	—	—	—	—	—	—
Self-reported health	Fair and Poor	Negative	—	—	—	—	—	—	—	—	—	—	—

(continued)

Table 3-7. Variables Showing Statistical Significance and Direction of Effects Across Regressions (continued)

Variable Category	Variable Name	Global Items Q20. Overall Rating of Care	Global Items Q25. Willingness to Recommend HHA	Care of Patients Composite Q9. Providers Informed/ up to Date	Care of Patients Composite Q16. Treat You as Gently as Possible	Care of Patients Composite Q19. Treat you with Courtesy and Respect	Care of Patients Composite Q24. Have any Problems with Care	Communication Composite Q2. Tell You What Services You Would Get	Communication Composite Q15. Providers Kept You Informed about Arrival Time	Communication Composite Q17. Explained Things in a Way Easy to Understand	Communication Composite Q18. Listen Carefully to You	Communication Composite Q22. Did You Get Help or Advice Needed	Communication Composite Q23. How Long Take to Get Help/ Advice
Admission source	Institutional admission	—	—	—	—	—	—	—	—	—	—	Positive	Positive
Admission source	Community (omitted)	—	—	—	—	—	—	—	—	—	—	—	—
Payer status	Medicaid	—	—	—	—	—	—	—	—	—	—	—	—
Payer status	Medicare (omitted)	—	—	—	—	—	—	—	—	—	—	—	—
Diagnoses (physical)	Diabetes/ endocrine/ metabolic issues	—	—	—	—	—	—	—	—	—	—	Positive	—
Diagnoses (physical)	Musculoskeletal/ tissue/arthritis disorders	—	—	—	—	—	—	—	—	—	—	—	—
Diagnoses (physical)	Renal failure	Negative	—	—	Negative	—	—	—	Negative	—	—	—	—
Diagnoses (physical)	Urinary obstruction/ incontinence	—	—	—	—	—	—	—	—	—	Negative	—	—
Diagnoses (physical)	Skin ulcers	Negative	—	—	—	—	—	—	—	—	—	—	—
Diagnoses (physical)	Complications of medical care/trauma	—	—	Positive	—	—	—	—	Positive	—	—	—	—
Diagnoses (physical)	Post-surgical/ aftercare issues	—	—	—	—	—	—	—	—	—	—	—	—
Intercept	Intercept	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive
Home health agencies	Dummy variables	—	—	—	—	—	—	—	—	—	—	—	—

Table 3-16. Statistical Significance and Direction of Effects Across Regressions (Specific Care Issues Items)

Variable Category	Variable Name	Specific Care Issues Composite Q3. Talk about Set Up Home to Move Around Safely	Specific Care Issues Composite Q4. Talk with You about Prescription Medications You Were Taking	Specific Care Issues Composite Q5. Ask to See Prescription Medicines	Specific Care Issues Composite Q10. Talk about Pain	Specific Care Issues Composite Q12. Talk about Purpose for Taking New or Changed Medications	Specific Care Issues Composite Q13. Talk about When to Take Meds	Specific Care Issues Composite Q14. Talk about Side Effects of Medicines
Proxy status	Had a proxy complete survey	Positive	Positive	Positive	Positive	Positive	Positive	—
Non English language	Non English primary language at home	—	—	—	—	—	—	—
Age	18-49	—	—	—	—	—	—	—
Age	50-64	—	—	—	—	—	—	—
Age	65-74 (omitted group)	—	—	—	—	—	—	—
Age	75-84	—	—	—	Negative	—	—	—
Age	85+	Positive	—	—	Negative	—	Negative	—
Education	Less than 8th grade	—	—	—	Negative	—	—	—
Education	Some high school	—	—	Positive	—	—	—	—
Education	High-school graduate or GED (omitted)	—	—	—	—	—	—	—
Education	Some college	—	—	Negative	—	—	—	—
Education	College graduate or more	Negative	Negative	Negative	—	—	—	—
Mental/emotional status	Excellent and Very Good	—	—	—	—	—	—	—
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	—	—	Negative	—	—	—	—
Patient lived alone	Yes—lived alone	Negative	—	—	—	—	—	—
Response mode	Mail (omitted group)	—	—	—	—	—	—	—
Response mode	Telephone	—	Negative	—	Negative	Negative	—	—
Response mode	Mixed mode	—	—	—	Negative	—	—	—
ADL deficits	Count of number of deficits	Pos	—	—	—	—	Negative	—

(continued)

Table 3-8. Statistical Significance and Direction of Effects Across Regressions (Specific Care Issues Items) (continued)

Variable Category	Variable Name	Specific Care Issues Composite Q3. Talk about Set Up Home to Move Around Safely	Specific Care Issues Composite Q4. Talk with You about Prescription Medications You Were Taking	Specific Care Issues Composite Q5. Ask to See Prescription Medicines	Specific Care Issues Composite Q10. Talk about Pain	Specific Care Issues Composite Q12. Talk about Purpose for Taking New or Changed Medications	Specific Care Issues Composite Q13. Talk about When to Take Meds	Specific Care Issues Composite Q14. Talk about Side Effects of Medicines
Diagnoses (mental)	Schizophrenia	—	—	—	—	—	—	—
Diagnoses (mental)	Dementia/cerebral degeneration	—	—	—	Negative	—	—	—
Gender	Male	—	—	Positive	Negative	—	—	—
Self-reported health	Excellent and Very Good	Positive	—	—	—	—	—	—
Self-reported health	Good (omitted)	—	—	—	—	—	—	—
Self-reported health	Fair and poor	—	—	—	—	—	—	—
Admission source	Institutional admission	—	—	—	—	Positive	Positive	—
Admission source	Community (omitted)	—	—	—	—	—	—	—
Payer status	Medicaid	—	—	—	—	—	—	—
Payer status	Medicare (omitted)	—	—	—	—	—	—	—
Diagnoses (physical)	Diabetes/endocrine/metabolic issues	—	—	—	—	—	—	—
Diagnoses (physical)	Musculoskeletal/tissue/arthritis disorders	—	—	—	—	—	—	—
Diagnoses (physical)	Renal failure	—	Positive	Positive	—	—	—	—
Diagnoses (physical)	Urinary obstruction/incontinence	—	—	—	—	Negative	—	—
Diagnoses (physical)	Skin ulcers	Negative	Negative	—	—	—	—	—
Diagnoses (physical)	Complications of medical care/trauma	—	—	—	Positive	—	—	—
Diagnoses (physical)	Post-surgical/aftercare issues	—	—	Negative	Positive	—	—	—
Intercept	Intercept	Positive	Positive	Positive	Positive	Positive	Positive	Positive
Home health agencies	Dummy variables	—	—	—	—	—	—	—

Demographic Variables. The results for demographic variables include age, education, whether the respondent lived alone, and gender. Among these four types of variables, age, education, and whether the respondent lived alone were much more frequently statistically significant across the 19 regressions than was the gender variable.

Age was modeled using two levels above and two levels below the reference group, which was the 65–74 age group. Age was often, but not always, a statistically significant predictor of Home Health Care CAHPS ratings, with all four age group levels statistically significant at least 3 times, with the oldest age group statistically significant 7 times. The age 85-plus group was statistically significant 3 of 7 times in the Specific Care Issues composite. Age coefficients were negatively signed 14 of the 17 times when the coefficient was statistically significant. Given that the omitted category, age 65 to 74, is the middle category, and that all four age level variables were generally negatively signed, age does not have a linear relationship with the HHCAHPS rating. This finding is different from the Hospital CAHPS, which did have a linear age relationship with ratings. Therefore, age-level categories are more appropriate for the HHCAHPS Survey instead of a single variable for linear age.

Education was modeled using four levels, with two levels above and two levels below the reference group (i.e., having a high school diploma or GED), which had a relative frequency of 35.6%. Each of the four education levels was statistically significant at least 2 times, with the highest level of education (i.e., being a college graduate or higher) statistically significant 10 times. Education levels were negatively signed 19 of the 20 times they were statistically significant across the 19 regressions, with the two higher levels (i.e., having some college, and college graduate or more) being statistically significant 15 of the 20 times any education level was statistically significant. Education levels were statistically significant in both global ratings and in each of the three composites.

The variable for whether a respondent lived alone was statistically significant 8 times across the 19 regressions and was always negatively signed, as expected. It was statistically significant in both global ratings and in all three composites. Gender, coded as being male, was seldom statistically significant (3 times). When statistically significant, it had mixed signs (twice positive, and once negative). It was never statistically significant in the two global ratings, and was statistically significant in only 2 of the 3 composites.

Health-related Variables. Three types of variables reflect the health status of respondents: self-reported mental/emotional health status, the count of ADL deficits reported by the HHA for each respondent, and self-reported overall health status. Of these three types of variables, self-reported mental health status and the count of ADL deficits were much more frequently statistically significant than was the self-reported overall health status variable.

Self-reported mental/emotional health status levels were modeled as one level above (Excellent/Very Good) and one level below (Fair/Poor) the reference group (Good status). At

least one of these two levels was statistically significant 13 times across the 19 regressions, with each level being statistically significant at least 5 times. The signs on the effects were consistent with what had been hypothesized, with Excellent/Very Good mental/emotional health status being positive every time, and Fair/Poor mental/emotional health status being negative every time. These variables were statistically significant in both global ratings and in all three composites.

The count of ADL deficits, which ranged from zero to five, is interpreted as the increase or decrease in a HHCAHPS rating for an increase of one ADL deficit. It was statistically significant 6 times, and was negatively signed each time, as expected, except for one question in the Specific Care Issues Composite. It was statistically significant in one of the two global ratings and in all three composites.

Self-reported health status levels were modeled similarly to self-reported mental/emotional health status (one level above and one level below the reference group [Good status]). These two levels were statistically significant only 3 times across the regressions, with Excellent/Very Good being positively signed twice, and Fair/Poor health status being negatively signed once when they were statistically significant.

Of the 9 diagnosis codes (two reflecting mental health diagnoses, and seven reflecting physical diagnoses), the two mental health diagnosis groups were generally more often statistically significant (schizophrenia 5 times and dementia 4 times) than the seven physical diagnosis groups, of which only renal failure was as many times statistically significant (5 times) as either of the two mental health diagnosis groups, although it had mixed signs (twice positive and three times negative), making its effect difficult to interpret. Each of the two mental health diagnosis groups was statistically significant in at least one of the global ratings and in two of the three composites. On the other hand, renal failure was statistically significant in only one of the global ratings and in each composite.

Response Mode Variables. The two mode variables (telephone and mixed mode) are compared to a reference (omitted) group of mail mode. Across 19 regressions, telephone was statistically significant 8 times (7 times with a negative sign, and once with a positive sign). It was never statistically significant in the two global ratings, but was statistically significant several times on regressions for items within each of the three composites. The coefficient size varied but generally was modest in size. On the other hand, mixed mode was seldom statistically significant (3 times) and was always negative. It was not significant in the two global ratings, and was statistically significant once in each of the three composites.

Health System Variables. Two types of variables comprise information about the health system for respondents: admission source and payer type. The admission source for a respondent entering home health care was coded as an institutional admission (i.e., inpatient hospital, rehabilitation facility, and any other institutional setting), with being admitted to home health care directly from their community residence as the reference

group, which had a relative frequency of 37.6%. Institutional admission source was significant only 4 times with a modest coefficient. Each time, the sign on the coefficient was positive (compared to being admitted from the community). It was statistically significant only in two of the three composites.

The payer type variables were Medicaid as the payer of home health care services, with Medicare as the reference group (relative frequency of 90.7%) in regressions. Because the sample only comprised Medicaid and Medicare respondents, there are no variables for private or other health insurance as payer types. The Medicaid variable was not statistically significant in any regression, which was not as expected given that Medicaid patients often have long-term care needs and may be different from patients with Medicare with short-term needs.

Tables B-1 through B-6 in **Appendix B** contain regression coefficients for each item-level regression. In addition to presenting the results for the 19 regressions in Step 1 in **Table B-1**, **Tables B-2 through B-6** present regression results for Steps 2 through 6, given that these regression results using subsets of the variables are also used in the impact analyses. Coefficients that were statistically significant at $p < 0.05$ appear in boldface type in the table.

In addition to these item-level regression results in Appendix B, **Table 3-9** presents regression coefficients related to the two HHCAHPS global ratings and the average of corresponding item-level coefficients for each of the three composite measures (Care of Patients, Communication, and Specific Care Issues). The coefficients shown are for the Step 2 model specification because this step retains the Telephone-only mode among the set of adjusters, whose effect was of specific interest for the analysis. The Step 2 specification excluded characteristics such as male gender that were found frequently not to be statistically significant in the Step 1 model specification.

The mean coefficient for each composite was developed using the sample of respondents who answered at least one of the items included in that composite. This approach of calculating mean coefficients for the composites differs from that of the item-level regression coefficients produced using only the sample of persons who provided a legitimate response to the item in question. Therefore, the HHA scores computed with mean coefficient values may differ somewhat from the HHA scores computed with item-level coefficients. The HHA scores depend on the respondents included or not included in the calculation of the score for a composite.

Table 3-17. Global- and Composite-level Coefficients Using Step 2 Adjusters

Variable Category	Variable Name	Overall rating	Willing to recommend	Care of Patients	Communication	Specific Care Issues
Proxy status	Had a proxy complete survey	-0.028	-0.023	0.012	0.005	0.050
Non English language	Non-English primary language at home	-0.060	-0.019	-0.052	-0.028	0.024
Age	18-49	-0.042	-0.052	-0.035	0.003	-0.003
Age	50-64	-0.076	-0.051	-0.033	-0.013	-0.007
Age	65-74 (reference group)					
Age	75-84	-0.006	-0.022	-0.015	0.002	-0.018
Age	85+	-0.005	-0.032	-0.017	-0.014	-0.035
Education	Less than 8th grade	0.027	0.026	-0.005	-0.033	-0.001
Education	Some high school	0.007	-0.052	-0.004	-0.011	0.006
Education	High-school graduate or GED (reference group)					
Education	Some college	-0.040	-0.030	-0.018	-0.019	-0.017
Education	College graduate or more	-0.062	-0.042	-0.032	-0.036	-0.047
Mental/emotional status	Excellent and Very Good	0.077	0.060	0.033	0.024	0.007
Mental/emotional status	Good (reference group)					
Mental/emotional status	Fair and Poor	-0.018	-0.028	-0.022	-0.024	-0.019
Patient lived alone	Yes-lived alone	-0.027	-0.050	-0.022	-0.031	-0.007
Response Mode	Mail and mixed (reference group)					
Response Mode	Telephone	-0.012	0.001	-0.009	-0.011	-0.032
ADL Deficits	Count of number of deficits	-0.004	-0.011	-0.004	-0.006	-0.002
Diagnoses (mental)	Schizophrenia	-0.139	-0.059	-0.090	-0.105	-0.109
Diagnoses (mental)	Dementia/ cerebral degeneration	-0.051	-0.099	-0.019	-0.009	-0.030

In Table 3-9 telephone mode is seen to have a negative mean effect for one global rating and the three composites. Across these measures, the coefficient for telephone mode was significant at the item level two out of four times in the Care of Patients Composite, two of six times in the Communications Composite, and four of seven times in the Specific Care Issues Composite. The sign is negative 7 out of the 8 times when significant. The coefficient for telephone is oppositely signed in the two global measures, but both are small and neither is statistically significant.

There are a number of points to consider in deciding whether to adjust for response mode. Considering the mean level results in Table 3-9, the sign on telephone mode is inconsistent with other surveys of this type. Substantively the negative effect is large in only one of the five measures—the Specific Care Issues Composite. At the item level, the sign of the coefficients is almost always negative, but whether the coefficient is statistically significant is inconsistent (only 8 of 19 times). In addition, telephone mode in the bellwether global

measures is oppositely signed with statistically nonsignificant coefficients. Although the composite-level mean coefficient values may be useful for comparing HHCAHPS Survey results with Hospital CAHPS results, the behavior of this potential adjuster considering both the mean and item-level coefficients has led us to remove it in the following steps and recommend not using it as an adjuster.

3.6 Discussion of Regression Results and Implications for Selection of Adjusters for Use in Impact Analyses

Predictive Power and Variance. Overall, across the 19 regressions on individual Home Health Care CAHPS Survey items in Step 1 regressions, predictive power in OLS regressions was low. At its highest, the R-square value was 0.08, but was most often between 0.04 and 0.05. R-square values changed little when estimating models with and without HHA fixed effects, which, in effect, control for differences in care across HHAs. This is not unexpected because the R-square at the individual level would not be expected to be strongly affected by the overall HHA effects. These variables are needed to isolate the mode and patient mix effects.

Sample size was not quite as large as project staff had hoped when designing the mode experiment. That said, generally there was enough predictive power to see some variation in statistical significance across mode and patient mix characteristics. Statistical significance is not the only criterion to be used in making choices; the magnitude of an effect may be small, even when significant.

Project staff found the average ratings to be very high for three of the Home Health Care CAHPS Survey questions (Questions 2, 22, and 24). The average ratings were greater than 95%, indicating little variability. Logistic regression models often fail with this small amount of variation, regardless of sample size. Because of this lack of variation, even though the OLS regression models ran to completion, subsequent results for these three items should be interpreted with caution. The fact that the variables found statistically significant in these regressions are similar to those found in regressions on the other HHCAHPS questions with more variation mitigates this concern.

Direction of Findings. Usually, the patient-mix variable categories that were hypothesized to be statistically significant predictors, based on results found in a previous literature review of CAHPS ratings, were shown to have statistical significance. Age, education, mental/emotional self-reported health status, whether a patient lived alone, higher levels of deficits in the activities of daily living, proxy status, and telephone mode were frequently significant predictors of Home Health Care CAHPS ratings (approximately one third of the time). The direction of the effects of these variables was also generally, but not always, consistently in the hypothesized direction. Variables for gender, overall self-reported health status, and admission source were only occasionally statistically significant. Payer was never statistically significant.

The fact that the direction on levels of some characteristics (e.g., age 85 and older) had mixed signs (e.g., five times negative and two times positive) is somewhat counterintuitive. On variables that were statistically significant one third or more of the time, other than the oldest-age category, the occurrence of mixed findings on the sign of a given variable occurred only once at most. The mixed signs, especially within a composite, seem to reflect that the HHCAHPS Survey questions reflect different aspects of the same general topic.

Sensitivity Analysis on Mode and Proxy Effects. In addition to coefficient signs in regressions not always being consistent across items, the sign most frequent on some variables was not as hypothesized. This finding occurred with both the mode and proxy variables. Telephone mode, in comparison to mail mode, was hypothesized to be positive, but instead was negative 7 of the 8 times that it was statistically significant. On the other hand, the proxy variable was positive 9 of the 10 times that it was statistically significant. Sensitivity analyses were conducted using both the mode and proxy variables separately and in combination. First, the mode variables (telephone and mixed mode) were estimated as the *only* independent variables, along with HHA fixed effects in the two global ratings, finding telephone to be negative in the Overall Rating and positive in the Willingness to Recommend rating. These findings on coefficient signs held up even after the proxy variable was included in these regressions. The sign on telephone mode in these two regressions on global ratings remained consistent after all patient mix variables were included in the regressions.

Project staff then developed descriptive statistics at the HHA level for the 2 global ratings and three important HHCAHPS questions (Overall Rating; Willingness to Recommend rating; Questions 10, 16, and 17), estimating the mean HHCAHPS rating by mode (telephone vs. mail) for each HHA (see **Table 3-10**). This analysis showed across these five items that the mean HHA-level telephone score was twice higher than mail (Overall Rating and Willingness to Recommend rating), twice lower than mail (Questions 10 and 17), and once the same as mail (Question 16). In the same table, when looking at individual HHAs, the mean telephone rating was lower the majority of the time for four out of five of the HHCAHPS items—only for the Willingness to Recommend rating was the mean for telephone mode higher than mail mode a majority of the time. These descriptive statistics do not contradict the regression findings of a negative coefficient on telephone.

The proxy variable was negative in the two global rating regressions with the mode variables included as the only other variables in the model, but was almost always positive when statistically significant when patient mix variables were included in the model. Effectively, controlling for patient mix backs out the characteristics that make proxy negative when it appears without the patient-mix variables included.

Table 3-18. HHA-Level CAHPS Ratings by Provider by Mode (Mixed Mode Excluded) on 5 CAHPS Items

Provider	Overall Rating			Willingness Recommend			Question 10			Question 16			Question 17		
	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-mail
ID57	0.750	0.500	0.250	0.750	0.500	0.250	0.500	1.000	-0.500	1.000	0.500	0.500	0.750	0.500	0.250
ID61	0.786	0.900	-0.114	0.828	0.800	0.028	0.724	0.800	-0.076	0.931	1.000	-0.069	0.862	0.900	-0.038
ID46	0.727	0.765	-0.037	0.667	0.833	-0.167	0.781	0.777	0.003	0.882	0.944	-0.062	0.765	0.889	-0.124
ID34	0.684	0.941	-0.257	0.700	0.888	-0.182	0.850	1.000	-0.150	0.850	0.888	-0.032	0.700	0.824	-0.124
ID42	0.790	0.829	-0.039	0.863	0.882	-0.019	0.823	0.877	-0.047	0.889	0.911	-0.021	0.741	0.795	-0.054
ID7	0.870	0.958	-0.089	0.909	1.000	-0.091	0.913	0.833	0.080	0.870	0.877	-0.005	0.870	1.000	-0.130
ID21	0.850	0.750	0.100	0.900	0.583	0.317	0.900	0.722	0.173	0.900	0.811	0.082	0.800	0.750	0.050
ID47	1.000	0.611	0.389	0.800	0.647	0.153	0.889	0.750	0.139	0.900	0.822	0.076	0.800	0.667	0.133
ID1	1.000	1.000	0.000	1.000	1.000	-1.000	1.000	1.000	0.000	1.000	1.000	0.000	1.000	1.000	0.000
ID27	0.818	0.909	-0.091	0.783	0.811	-0.036	0.696	0.822	-0.130	0.957	0.950	0.000	0.870	1.000	-0.130
ID4	1.000	0.800	0.200	0.813	0.733	0.079	0.813	0.922	-0.116	0.938	0.866	0.071	0.875	0.733	0.142
ID52	0.769	0.600	0.169	0.808	0.733	0.074	0.880	0.800	0.080	0.846	0.866	-0.021	0.769	0.667	0.103
ID20	1.000	0.600	0.400	0.833	0.600	0.233	0.833	1.000	-0.167	0.833	0.750	0.083	0.833	0.500	0.333
ID53	1.000	0.714	0.286	1.000	0.714	0.286	1.000	0.877	0.125	1.000	1.000	0.000	0.750	0.857	-0.107
ID25	0.833	0.871	-0.038	0.784	0.800	-0.023	0.889	0.900	-0.011	0.868	0.966	-0.099	0.842	0.833	0.009
ID32	0.900	0.929	-0.029	0.762	0.714	0.048	0.810	0.850	-0.048	0.905	0.850	0.048	0.857	0.857	0.000
ID41	0.771	0.848	-0.077	0.790	0.822	-0.032	0.871	0.866	0.004	0.836	0.850	-0.020	0.790	0.806	-0.016

Provider	Overall Rating			Willingness Recommend			Question 10			Question 16			Question 17		
	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-mail
ID36	0.818	0.827	-0.009	0.869	0.83 3	0.036	0.781	0.88 9	-0.108	0.894	0.91 7	-0.023	0.839	0.809	0.030
ID31	0.824	0.838	-0.014	0.834	0.82 4	0.010	0.832	0.85 1	-0.019	0.913	0.89 8	0.014	0.851	0.778	0.073
ID24	0.856	0.838	0.018	0.854	0.82 3	0.031	0.771	0.87 6	-0.105	0.902	0.91 5	-0.013	0.831	0.814	0.017
ID33	0.875	0.833	0.042	0.839	0.84 2	-0.003	0.733	0.89 5	-0.161	0.844	0.89 5	-0.051	0.781	0.895	-0.113
ID62	0.759	0.885	-0.126	0.690	0.84 6	-0.156	0.893	0.96 3	-0.070	0.897	0.92 6	-0.029	0.724	0.923	-0.199
ID22	0.778	0.955	-0.177	0.757	0.91 3	-0.156	0.757	0.95 8	-0.202	0.895	0.95 8	-0.064	0.763	0.957	-0.193
ID5	0.941	1.000	-0.059	0.882	1.00 0	-0.118	1.000	0.87 5	0.125	0.941	1.00 0	-0.059	0.941	1.000	-0.059
ID13	0.800	1.000	-0.200	0.800	0.75 0	0.050	0.667	0.85 7	-0.190	0.833	0.87 5	-0.042	0.833	1.000	-0.167
ID23	0.917	0.818	0.098	0.917	0.72 7	0.189	0.750	0.81 8	-0.068	1.000	0.81 8	0.182	1.000	0.909	0.091
ID14	0.667	1.000	-0.333	0.667	0.66 7	0.000	0.667	0.66 7	0.000	1.000	1.00 0	0.000	1.000	1.000	0.000
ID19	0.842	0.950	-0.108	0.889	0.85 0	0.039	0.889	0.95 0	-0.061	0.895	0.95 0	-0.055	0.737	0.800	-0.063

(continued)

Table 3-10. HHA-Level CAHPS Ratings by Provider by Mode (Mixed Mode Excluded) on 5 CAHPS Items (continued)

Provider	Overall Rating			Willingness Recommend			Question 10			Question 16			Question 17		
	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-mail
ID37	0.800	0.750	0.050	0.867	0.87 5	-0.008	0.933	1.00 0	-0.067	0.933	0.75 0	0.183	0.867	0.875	-0.008
ID28	0.848	0.806	0.042	0.824	0.79 7	0.027	0.813	0.90 9	-0.097	0.870	0.87 9	-0.009	0.783	0.831	-0.048
ID55	0.636	1.000	-0.364	0.636	1.00 0	-0.364	0.909	0.83 3	0.076	0.727	1.00 0	-0.273	0.727	1.000	-0.273

Provider	Overall Rating			Willingness Recommend			Question 10			Question 16			Question 17		
	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-mail
ID58	0.667	0.667	0.000	0.833	1.00 0	-0.167	0.667	0.66 7	0.000	0.833	0.66 7	0.167	0.667	0.667	0.000
ID44	0.750	1.000	-0.250	0.769	1.00 0	-0.231	0.667	0.75 0	-0.083	0.923	0.75 0	0.173	0.846	1.000	-0.154
ID3	1.000	0.882	0.118	0.920	0.88 2	0.038	0.808	0.70 6	0.102	0.962	1.00 0	-0.038	0.846	0.824	0.023
ID6	0.885	0.958	-0.074	0.923	0.91 7	0.006	0.920	0.91 7	0.003	1.000	0.96 0	0.040	0.885	0.880	0.005
ID63	1.000	1.000	0.000	1.000	1.00 0	0.000	1.000	0.00 0	1.000	1.000	1.00 0	0.000	1.000	1.000	0.000
ID50	0.800	0.667	0.133	0.600	0.66 7	-0.067	0.600	0.77 8	-0.178	0.400	1.00 0	-0.600	0.400	0.667	-0.267
ID43	0.773	0.778	-0.005	0.720	0.61 1	0.109	0.920	0.94 4	-0.024	0.880	0.88 9	-0.009	0.800	0.833	-0.033
ID39	0.889	0.760	0.129	0.821	0.56 0	0.261	0.679	1.00 0	-0.321	0.897	0.88 9	0.008	0.759	0.778	-0.019
ID18	0.950	0.636	0.314	0.895	1.00 0	-0.105	0.944	0.70 0	0.244	1.000	1.00 0	0.000	0.850	0.909	-0.059
ID11	0.826	1.000	-0.174	0.818	0.83 3	-0.015	0.913	0.92 3	-0.010	0.826	0.92 3	-0.097	0.826	0.769	0.057
ID64	0.781	0.879	-0.098	0.781	0.87 9	-0.098	0.900	0.97 0	-0.070	0.906	0.87 9	0.027	0.844	0.818	0.026
ID8	0.833	1.000	-0.167	1.000	1.00 0	0.000	0.600	0.66 7	-0.067	1.000	1.00 0	0.000	1.000	1.000	0.000
ID17	0.864	0.808	0.056	0.773	0.80 0	-0.027	0.857	0.92 3	-0.066	0.955	1.00 0	-0.045	0.909	0.880	0.029
ID16	0.850	0.864	-0.014	0.850	0.87 0	-0.020	0.850	0.87 5	-0.025	0.950	0.92 0	0.030	0.850	0.750	0.100
ID65	0.829	0.880	-0.051	0.806	0.84 0	-0.034	0.944	0.86 3	0.082	0.892	0.94 1	-0.049	0.757	0.902	-0.145
ID66	0.959	0.786	0.173	0.882	0.76 7	0.115	0.820	0.95 2	-0.132	0.981	0.93 2	0.049	0.885	0.837	0.047
ID45	0.760	0.800	-0.040	0.720	0.80 0	-0.080	0.960	0.86 7	0.093	0.920	1.00 0	-0.080	0.840	0.824	0.016
ID12	0.841	0.924	-0.083	0.850	0.85 7	-0.008	0.896	0.94 6	-0.051	0.933	0.92 6	0.007	0.857	0.890	-0.033

Provider	Overall Rating			Willingness Recommend			Question 10			Question 16			Question 17		
	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-mail
ID9	1.000	0.833	0.167	1.000	1.000	0.000	1.000	0.833	0.167	0.857	1.000	-0.143	1.000	1.000	0.000
ID29	0.867	0.800	0.067	0.867	0.667	0.200	1.000	0.900	0.100	0.933	1.000	-0.067	0.867	0.900	-0.033
ID35	0.733	0.850	-0.117	0.867	0.800	0.067	0.813	1.000	-0.188	0.813	1.000	-0.188	0.688	0.950	-0.263
ID2	1.000	1.000	0.000	1.000	1.000	0.000	0.667	1.000	-0.333	1.000	1.000	0.000	0.667	1.000	-0.333
ID38	0.667	0.800	-0.133	0.867	0.778	0.089	0.933	0.800	0.133	0.867	0.889	-0.022	0.800	0.778	0.022
ID26	0.793	0.929	-0.135	0.724	0.929	-0.204	0.900	0.783	0.114	0.839	0.857	-0.018	0.742	0.857	-0.115
ID56	0.714	0.686	0.029	0.857	0.690	0.163	0.756	0.833	-0.082	0.833	0.783	0.044	0.738	0.632	0.107

(continued)

Table 3-10. HHA-Level CAHPS Ratings by Provider by Mode (Mixed Mode Excluded) on 5 CAHPS Items (continued)

Provider	Overall Rating			Willingness Recommend			Question 10			Question 16			Question 17		
	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-mail
ID30	1.000	0.667	0.333	0.571	0.556	0.016	0.857	0.778	0.079	0.857	1.000	-0.143	0.714	0.556	0.159
ID48	0.611	0.824	-0.212	0.778	0.833	-0.056	0.889	0.944	-0.056	0.833	0.889	-0.056	0.889	0.722	0.167
ID10	0.933	0.833	0.100	1.000	0.750	0.250	0.800	0.911	-0.117	0.867	0.911	-0.050	0.867	0.833	0.033
ID54	0.750	0.667	0.083	0.667	0.500	0.167	0.818	0.750	0.068	1.000	0.750	0.250	1.000	0.500	0.500
ID60	0.643	0.500	0.143	0.643	0.750	-0.107	0.714	1.000	-0.286	0.929	0.750	0.179	0.714	0.500	0.214
ID51	0.909	0.846	0.063	0.909	0.923	-0.014	0.909	0.923	-0.014	1.000	0.923	0.077	0.818	0.923	-0.105
ID15	0.875	0.889	-0.014	0.938	0.938	0.006	0.879	0.911	-0.032	1.000	0.977	0.023	0.879	0.977	-0.098

Provider	Overall Rating			Willingness Recommend			Question 10			Question 16			Question 17		
	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-Mail	Phone	Mail	Phone-mail
ID49	0.773	0.625	0.148	0.864	0.706	0.158	1.000	0.882	0.118	0.909	0.824	0.086	0.864	0.765	0.099
ID59	0.526	0.643	-0.117	0.833	0.571	0.262	0.842	0.929	-0.086	0.895	0.893	0.002	0.737	0.679	0.058
ID40	1.000	0.500	0.500	0.917	0.500	0.417	1.000	1.000	0.000	0.917	0.750	0.167	0.750	1.000	-0.250
	Phone	Mail	Overall Rating	Phone	Mail	Willingness	Phone	Mail	Question 10	Phone	Mail	Question 16	Phone	Mail	Question 17
Average	0.833	0.821		0.824	0.803		0.838	0.860		0.902	0.902		0.820	0.833	
Phone/ Mail			1.014			1.027			0.974			1.000			0.984
# Times Phone < Mail			34			29			40			33			31
# Times Phone > Mail			28			32			22			25			28
# Times Phone = Mail			4			5			4			8			7
Total Providers			66			66			66			66			66

Note: One provider was removed from the analysis because all patients were switched into mail mode only.

Overall Sensitivity Analyses across Regressions. Project staff estimated each of the 19 mode/patient mix regression models two times—once using logistic regression (the form usually used with a 0/1 coded dependent variable) and once with OLS (the form used in the Hospital CAHPS). Generally, project staff found that the diagnosis groups were seldom significant, except for two groups pertaining to mental health issues. These two groups were not only statistically significant, but also negative in direction, even after controlling for self-reported mental/emotional health status. These two diagnosis groups may be valuable in helping address differences in patient populations, where specific HHAs serve almost exclusively patients with cognitive or mental disabilities. Schizophrenia, in particular, has a consistently strong effect.

The purpose of estimating both logistic and OLS regressions on the same HHCAHPS rating was to compare whether variables that were previously significant in logistic regression would lose significance in OLS regression. Project staff found no particular pattern regarding changes in statistical significance between these two forms of regression. Indeed, it appeared that some variables significant in the OLS were not significant in the logistic model, and vice versa. Other differences in the methods are discussed in Section 3.7.

Selection of Adjusters for Impact Analyses. The fact that the pattern of mode and patient mix effects on the Home Health Care CAHPS Survey Mode Experiment data were sometimes not according to expectations and not the same or similar to the experience on CAHPS Surveys of other patient populations may say something about the nature of HHCAHPS Survey ratings generally, or about the population. In practice, individual item ratings may not particularly tell a unified story when considered as a whole. The fact that patient mix effects are not the same across all individual ratings within a composite suggests that these ratings have enough dissimilar properties that interpretation of them when combined in composites should be made with caution. Indeed, enough variability in findings across individual HHCAHPS Survey ratings was observed within composites to warrant concern in averaging results within them. Averaging ratings within a composite may not provide as much information as when they are considered separately. Still, developing average composite scores using mode experiment data is appropriate if CMS determines that adjuster coefficients will be announced and applied at the composite level. Continuing to analyze individual HHCAHPS Survey item ratings in terms of factors that influence them, particularly using additional data obtained during the national implementation of the HHCAHPS Survey, may be useful in assessing the validity of the current composites, and potentially reconfiguring them by removing or adding items to increase their validity. It also may be that the home health population, with a preponderance of older and frailer patients, is not as strongly subject to variation in mode and other selected characteristics.

After reviewing the findings from the Step 1 Ordinary Least Squares regressions, RTI project staff employed the following decision rules in the order specified to select how mode and patient mix adjusters should be used in the impact analyses:

1. Give the most weight for selection of adjusters to those variable categories (e.g., age, education) where individual levels of the category most frequently show statistical significance across regressions.
2. Next, give the most consideration to the magnitude of either individual coefficients in global ratings, or individual coefficients within a composite.
3. Consider the fact that some statistically significant findings may be small in magnitude and not worth using as an adjuster.
4. Assess the strength of the correlation between a recommended adjuster and the Home Health Care CAHPS rating.
5. Assess the HHA-level heterogeneity of recommended CAHPS adjusters.

RTI project staff implemented the first three decision rules to determine how mode and patient mix variables should be used in impact analyses. Then, if impact analyses were not conclusive, the last two decision rules (Decision Rules 4 and 5, above) were implemented to finalize recommended adjusters. The first three decision rules were used to create the six steps used in impact analyses, where adjusters in each group qualitatively differed on the strength of evidence for their candidacy.

After considering Decision Rules 1 through 3, above, the set of candidate adjusters with the strongest evidence for use in impact analysis (Group 1) were the following:

- Age;
- Education;
- Self-reported mental/emotional health status;
- English not the primary language used at home;
- Whether a patient lives alone; and
- Proxy status.

The six adjusters shown above were the ones most frequently statistically significant (at least 4 times), with effects of magnitude of more than 2 percentage points, and often higher. In addition, two mental health diagnoses (i.e., schizophrenia and dementia) had strong effects for the two global questions and may be important in adjusting scores for those HHAs disproportionately serving patients with mental impairments.

The next set of candidate adjusters with lesser evidence (Group 2) is telephone mode and ADL deficits. These two candidate adjusters, while frequently statistically significant (at least 6 times), have effect sizes generally no higher than 2 percentage points, so the adjustment would be nominal. A special case should be made for ADL score for inclusion as a final adjuster because of its prominence in the response propensity analysis. Including it as an adjuster would effectively account for any differences in response propensity not adequately addressed by other patient mix adjusters. Therefore, RTI project staff included it in most steps of the impact analysis.

The next set of candidate adjusters with even lesser evidence (Group 3) is institutional admission source, which was less frequently statistically significant than Group 2 (only 4 times), with effect size of generally no more than 2 percentage points.

The following potential adjusters were used in only the Step 1 regression in impact analyses, but not afterward because of the few times they were found statistically significant (3 or fewer times) in regressions, and generally low effect size (approximately no more than 2 percentage points):

- Mixed mode;
- Male gender;
- Overall self-reported health status (all levels);
- Medicaid, and
- Seven physical (as opposed to mental) diagnosis groups.

3.7 Impact Analysis Results

Overall, the impact analysis did not provide contradictory evidence regarding the findings from the initial Step 1 regression analysis. The set of Group 1 variables identified as the most important adjusters in the regression analysis generally were supported by the impact analysis results. The impact analysis helped refine the importance of some of the Group 2 adjusters identified in the regression analyses.

Table 3-11 presents summary findings of the relative effects of potential adjusters in six successive steps. The first step estimated is the fully specified regression model (Step 1). The sets of potential adjusters removed from the model in each successive step are shown in **Table C-1** in **Appendix C**. **Table 3-11** summarizes the effects of dropping potential adjuster sets by indicating how many HHAs had changes in their adjusted scores by magnitudes of less than 1 percentage point, 1 up to 2 points, 2 up to 5 points and 5 points or more.

The largest shifts in adjusted scores in terms of number of HHAs whose adjusted scores were affected by 2 or more percentage points occurred in Step 1, which was not surprising. The fully specified model attempts to account for as many theoretical differences for which data could be collected. In the global ratings, one-quarter (14) of HHAs in the Overall Rating and close to one-half (25) of the HHAs in the Willingness to Recommend rating had adjusted scores differ from their raw unadjusted scores by at least two percentage points. Among the composite measures, the Specific Care Issues composite had 36 HHAs with changes of more than 2 percentage points from their raw unadjusted score. There were 21 HHAs in the Communications composite and only seven in the Care of Patients composite that experienced such a large shift.

Table 3-19. Relative Effects of Impact Analyses on HHA CAHPS Scores

Percentage Point Changes	Model Change From Raw Score to Set 1	Model Change From Set 1 to Set 2	Model Change From Set 2 to Set 3	Model Change From Set 3 to Set 4	Model Change From Set 4 to Set 5	Model Change From Set 3 to Set 6
Overall Rating: <1	24	44	60	56	60	60
Overall Rating: 1-2	22	12	0	4	0	0
Overall Rating: 2-5	11	4	0	0	0	0
Overall Rating: >5	3	0	0	0	0	0
Willing to Recommend: <1	15	30	60	41	59	58
Willing to Recommend: 1-2	20	26	0	15	1	2
Willing to Recommend: 2-5	21	4	0	4	0	0
Willing to Recommend: >5	4	0	0	0	0	0
Care of Patients Composite: <1	36	56	60	58	60	60
Care of Patients Composite: 1-2	17	4	0	2	0	0
Care of Patients Composite: 2-5	6	0	0	0	0	0
Care of Patients Composite: >5	1	0	0	0	0	0
Communications Composite: <1	25	26	60	57	60	60
Communications Composite: 1-2	14	27	0	3	0	0
Communications Composite: 2-5	19	7	0	0	0	0
Communications Composite: >5	2	0	0	0	0	0
Specific Care Issues Composite: <1	7	24	14	57	60	60
Specific Care Issues Composite: 1-2	17	22	45	3	0	0
Specific Care Issues Composite: 2-5	32	14	1	0	0	0
Specific Care Issues Composite: >5	4	0	0	0	0	0

Notes: Table values are the number of HHAs whose CAHPS score changed as Mode/PMA variables were progressively removed from Model Set 1 to Model Set 6. Percentage point ranges may be positive or negative. Variable “sets” are listed in **Appendix C, Table C-1**.

The next-largest set of changes of two or more percentage points occurred in Step 2, which dropped a large set of variables that were usually not statistically significant in Step 1 (see **Table C-1 in Appendix C**), but the number of HHAs experiencing such a shift was far fewer than those affected by the use of the fully specified model in Step 1. Generally, RTI project staff expected this finding because variables that are not statistically significant and are of relatively small magnitude, when dropped from a regression, should not greatly change the predicted outcome (e.g., adjusted scores). Only in the Specific Care Issues composite did as many as one-fourth (14) of HHAs experience a shift in adjusted scores between Step 1 and Step 2 of two or more percentage points. Only 10% or fewer agencies in the four remaining measures (the two other composites and both global ratings) experienced such a shift.

Across all the remaining Steps (3–6), very few HHAs experienced a shift of as much as two or more percentage points in any of the five measures included in the impact analysis. In particular, when the variable for telephone mode was dropped in Step 3 (the single variable dropped in that step), only one HHA across the five measures shifted by two or more

percentage points. This occurred in the Specific Care Issues composite, where three-quarters of HHAs (45) did experience a shift of between one to two percentage points. In no other measure did any HHAs shift more than one percentage point when the telephone mode variable was dropped.

In Step 4 of the impact analysis, both the proxy and ADL deficit score variables were dropped. More HHAs shifted by greater amounts when these two variables were dropped than when the telephone-mode variable was dropped in the prior step. This larger relative change provides evidence that the proxy and ADL deficit score variables may be important for some agencies, particularly with atypical patient debility profiles. The ADL deficits were significant in the response propensity analysis as well.

In Step 5, the two mental health diagnosis groups were dropped. Adjusted scores changed less than one percentage point across most measures, with some greater change noted in the Willingness to Recommend measure.

Step 6 does not drop additional variables from the set of adjusters in Step 5. Instead, this step drops the two mental health variables directly from Step 3, which still contained the proxy and ADL deficit score variables as part of the variable set. Because dropping proxy and the ADL deficit score in Step 4 had a relatively pronounced effect on adjusted scores compared to Step 3, the two diagnosis groups were also directly dropped from the Step 3 variable set to obtain Step 6 adjusted scores. Again, little change in adjusted scores occurred. Although there are not a large number of patients with these two diagnoses, particularly schizophrenia, the coefficients on these adjusters are quite large on some measures, particularly the global ratings.

Appendix C contains detailed information regarding the actual adjusted scores calculated in each impact analysis step for each of the five Home Health Care CAHPS measures. This set of six tables presents for each Home Health Care CAHPS measure for **each** HHA in the analysis:

- the raw unadjusted score and rank of the HHA among the 60 in the analysis;
- the adjusted score after each step was implemented;
- the new rank of the HHA in that step;
- the percentage point change between the current and preceding step; and
- the percent change between the current and preceding step.

These tables are helpful in understanding impact analysis effects on individual HHAs and how much their adjusted score and relative ranking changes across the six steps. Generally, adjusted scores change by only a couple of percentage points between steps, and relative rankings change fewer than 5 rankings. Nonetheless, a few HHAs have large movements. For example, the HHA labeled ID17 in the first column of tables in **Appendix C** moved 8 to

13 places in the Overall Rating rankings, but only moved as much as 3.5 percentage points when doing so. Additionally, the HHA labeled ID26 moved about 6 percentage points. Because raw adjusted scores are so closely clustered together, even modest percentage point changes can potentially change HHA rankings considerably.

Generally, individual HHAs, small or large, seem to move very moderately as a result of adjustments across the five measures. Two small agencies ranked in the middle of the rankings on the Overall Rating measure (HHAs ID29 and ID30) had adjusted scores on each of the five measures move by only a couple of percentage points. Likewise, two very large HHAs (ID41 and ID42) experienced shifts of only a couple of percentage points in their adjusted scores between steps. **Table D-1** in **Appendix D** shows the size of HHAs in terms of their monthly patient counts.

One problem observed because of extremely high raw scores on the global rating measures is that the adjustment models predict some adjusted scores greater than 1.0 in most of the impact analysis steps. For example, regarding the impact analysis steps on the Overall Rating measure, the HHA labeled as ID2 in **Table C-2** in **Appendix C** has an adjusted score greater than 1.0 on all steps. This HHA started with a raw score of 1.0 and had adjusted scores larger than 1.0 as subsequent adjusters were dropped in impact analyses. In another example, for the Willingness to Recommend measure, two HHAs (ID8 and ID9 in **Appendix C, Table C-3**) have adjusted scores above 1.0 on some steps, again largely because both HHAs started with a raw score of 1.0.

When developing patient-mix adjusters using OLS coefficients, if an HHA's mean Home Health Care CAHPS score is relatively high (near 1.0 on the continuum from 0 to 1), then a positive adjustment may cause the adjusted Home Health Care CAHPS score to exceed 1.0. The linear regression models apply the same adjustment irrespective of the magnitude of the raw score. When raw scores are below 0.8, adjustment is very unlikely to raise a score by 20 points. When a raw score is higher than 0.9, the same adjuster can raise the score above 1.0. Consider the example shown in **Table 3-12**, below.

Table 3-20. Example of Changes in Mean Home Health Care CAHPS Scores

HHCAPHS Score	Sum of Coefficients	Formula for Marginal Effect	Adjustment Factor	Adjusted HHCAPHS Score
0.90	-0.15	-0.15	+0.15	1.05
0.60	-0.15	-0.15	+0.15	0.75

This phenomenon seldom occurred in the mode experiment data, but with many thousands of HHAs in the national implementation, this situation is likely to occur more frequently. It will be necessary to modify the adjusted score by truncating to 1.0 or using other more-

sophisticated means to address the problem. Even scores that start above 0.9, but do not exceed 1.0, are inflated by this phenomenon.

Patient-mix adjusters developed using logistic regression avoids the problem described above. Whereas the marginal effect of an adjuster in OLS is just the coefficient with the sign reversed, the marginal effect resulting from a logistic regression model is of the form

$$(\text{Coefficient}) \times (\text{CAHPS raw score}) \times (1 - \text{CAHPS raw score}),$$

or for all patient-mix coefficients

$$(\text{Sum of coefficients}) \times (\text{CAHPS raw score}) \times (1 - \text{CAHPS raw score}),$$

In effect, the percentage point marginal effect of a regression coefficient varies with the Home Health Care CAHPS score. As shown in the example provided in **Table 3-13**, the same adjustment coefficient produced a larger marginal effect (0.0360) for the lower raw score (0.60) than for the higher score (0.0135 for the raw score of 0.90). Therefore, adjustment factors are smaller the closer a CAHPS item gets to 1.0, preventing calculation of adjusted scores greater than 1.0.

Table 3-21. Example of How the Percentage Point Marginal Effect of a Regression Coefficient Can Vary with the Home Health Care CAHPS Score

HHCAHPS Score	Sum of Coefficients	Formula for Marginal Effect	Adjustment Factor	Adjusted HHCAHPS Score
0.90	-0.15	$(-0.15) \times (0.90) \times (1-0.90)$	+0.0135	0.9135
0.60	-0.15	$(-0.15) \times (0.60) \times (1-0.60)$	+0.0360	0.6360

3.8 Implications of Impact Analysis for Selection of Final Adjusters

Based on results from the impact analyses, RTI project staff considered two factors for developing a recommendation for adjustment variables to be used in the HHCAHPS Survey. These factors were: (1) statistical significance in regression models, and (2) magnitude of change on adjusted scores. Statistical significance depends on the number of observations being analyzed, as well as the magnitude of estimated regression coefficients. Statistical significance was the primary factor for determining the first set of variables to drop (e.g., male gender, mixed mode, overall health status, institutional admission source, Medicaid payer status, and physical, as opposed to mental, diagnosis groups) from the fully specified regression model in Step 1 to develop the adjusted scores in Step 2. These dropped variables were generally weaker in statistical significance than those retained (e.g., proxy, non-English language as the primary language spoken at home, age, education, self-

reported mental/emotional health status, whether a patient lived alone, telephone mode, ADL score, mental diagnosis groups), though not necessarily on all of the items.

In the impact analysis, dropping the set of variables identified above to obtain Step 2 adjusted scores contributed to larger shifts in HHA adjusted scores across the five Home Health Care CAHPS measures that will be publicly reported than did deletion of subsequent variable sets. The ADL variable appeared more robust in Step 2 scores because self-reported overall health status and seven physical diagnosis variables had been dropped to produce Step 2 adjusted scores. The set of Step 2 variables were either consistent with adjustment variables that had previously been used in the Hospital CAHPS (e.g., age, education, non-English language, admission source, telephone mode) or were reasonable given the mainly older and frail profile of the home health care population (e.g., proxy, patient lived alone, self-reported mental/emotional status, ADL score, mental health diagnosis groups).

The Hospital CAHPS found that admission source (e.g., emergency room) was an important adjuster, but institutional admission sources relevant for the home health setting (e.g., hospital, rehabilitation facilities, nursing homes) did not have many statistically significant effects (only 4) and modest effect sizes. Theoretically, admission source was an important construct to test, but these findings generally show it less important for the HHCAHPS Survey.

From this Step 2 set of candidate adjusters, project staff tested removing selected variables in Steps 3 to 6 to refine a recommendation of adjusters. Dropping these additional selected variables did not change most adjusted scores by large amounts; however, conducting these additional steps did help determine which of the remaining variables, with weaker evidence for their candidacy based on statistical significance and effect, could feasibly be dropped to reduce burden on HHAs in providing data.

Project staff dropped the telephone mode from the Step 2 variables to produce Step 3 adjusted scores. The telephone mode had been retained because CAHPS surveys of other patient populations, as well as other non-CAHPS surveys, had usually found a mode effect, with telephone mode producing more positive results. In these analyses, however, the telephone-mode effect, while statistically significant 8 of 19 times in Step 1 regression models, was generally small in magnitude across HHCAHPS items and was negative 7 out of 8 times it was statistically significant. Removing this variable had almost no effect (less than a one percentage point change on Step 3 adjusted scores) on four out of five Home Health Care CAHPS measures. Only in the Specific Care Issues Composite did it change a majority of Step 3 adjusted scores between 1 to 2 percentage points, with only 1 HHA having its Step 3 score change by 2 to 5 percentage points. Because of the negligible net effect and unusual negative direction of telephone mode, RTI project staff recommends that it would be reasonable to not use it as an adjuster for HHCAHPS Survey.

Step 4 adjusted scores were calculated after dropping two variables—proxy and the ADL deficit score. Removing these two variables produced a slightly larger shift in adjusted scores than the removal of telephone mode in the previous step. Proxy had a relatively strong effect in the data (average of 19 Step 1 coefficient scores of 2.9 percentage points), and it was statistically significant 10 of 19 times in Step 1 regressions. The ADL deficits score is a debility measure that seems to substitute for general health in the population. The ADL deficit score was also statistically significant in the response propensity analysis. Proxy and ADL deficit scores would seem to be related to each other in that persons with higher ADL deficit scores potentially may be more likely to have proxy respondents. Therefore, RTI project staff recommends that both of these variables should be included as adjusters in the HHCAHPS Survey.

The two mental health diagnosis variables (schizophrenia and dementia) were assessed using two different steps: (1) dropping them **after** proxy and the ADL deficit score had been dropped to calculate Step 5 adjusted scores and (2) dropping them **before** proxy and ADL deficit score had been dropped to calculate Step 6 adjusted scores. Both of these analyses were conducted to determine if the mental health diagnosis groups were closely related to proxy and ADL deficit score. The impact of dropping these two diagnosis groups was not large in either step. However, other factors should be considered in deciding whether to retain or drop these two mental health diagnosis groups. Factors that suggest retaining them as adjusters include the following:

- their regression coefficients were often large in size, particularly on the global rating measures (schizophrenia coefficients were 16 and 11 points on the Overall Rating and Willingness to Recommend measures, and dementia coefficients were 6 and 12, respectively);
- a few HHAs had a disproportionate number of patients with schizophrenia or dementia, and
- these two diagnoses have a place to be reported on the OASIS form and do not require going to other sources.

On the downside, diagnoses must be reported in OASIS as ICD-9 and ICD-10 codes, which could be revised in any given year. The analysis contractor will have to update the codes should there be changes over time. Collecting data from HHAs on these two mental health diagnoses will require the continued collection of all the diagnoses from the HHAs. Considering all these factors, RTI project staff suggest that it is important to retain these adjusters until there is further evidence to drop them.

Based on the evidence above, RTI project staff recommends the set of adjusters in Step 3 for use in the Home Health Care CAHPS. These adjusters are the following:

- Proxy
- Non-English language as the primary language spoken at home

- Age (five levels: 18-49, 50-64, 65-74, 75-84, and 85 plus)
- Education (five levels: less than 8th grade, 8th grade to less than high-school graduate, high-school graduate or GED, some college, and college graduate or more)
- Self-reported mental/emotional health status (three levels: Excellent/Very Good, Good, Fair/Poor)
- Whether a patient lives alone
- ADL deficit score, and
- Two mental health diagnosis groups (schizophrenia and dementia).

RTI staff will re-estimate regression and impact analyses during the Home Health Care CAHPS national implementation using data from a large number of HHAs to assess the stability of the evidence for these adjusters.

REFERENCES

- Castle, N. G., Brown, J., Hepner, K. A., & Hays, R. D. (2005). Review of the literature on survey instruments used to collect data on hospital patients' perception of care. *Health Services Research, 40*(6), 1996-2017.
- Elliott, M. N., Swartz, R., Adams, J., Spritzer, K. L., & Hays, R. D. (2001). Case-mix adjustment of the National CAHPS benchmarking data 1.0: A violation of model assumptions? *Health Services Research, 36*(3), 555-573.
- Elliott, M. N., Zaslavsky, A. M., Goldstein, E., Lehrman, W., Hambarsoomians, K., Beckett, M. K., & Giordano, L. (2009). Effects of survey mode, patient mix, and nonresponse on CAHPS Hospital Survey scores. *Health Services Research, 44*(2 Pt 1), 501-518.
- Hargraves, J. L., Wilson, I. B., Zaslavsky, A., James, C., Walker, J. D., Rogers, G., & Cleary, P. D. (2001). Adjusting for patient characteristics when analysing reports from patients about hospital care. *Medical Care, 39*, 635-641.
- Hays, R., & Ware, J. E. (1986). Social desirability and patient satisfaction ratings. *Medical Care, 24*, 519-525.
- O'Malley, A. J., Zaslavsky, A. M., Elliott, M. N., Zaborski, L., & Cleary, P. D. (2005). Case-mix adjustment of the CAHPS Hospital Survey. *Health Services Research, 40*(6 Pt 2), 2162-2181.

**APPENDIX A:
HOME HEALTH AGENCY RECRUITING MATERIALS**

DEPARTMENT OF HEALTH & HUMAN SERVICES

Centers for Medicare & Medicaid Services
7500 Security Boulevard, Mail Stop C1-25-05
Baltimore, Maryland 21244-1850



March 2009

Dear Administrator/Director:

The Centers for Medicare & Medicaid Services (CMS) is planning a national implementation of the Home Health Care CAHPS[®] Survey to measure the experiences of people who receive home health care from Medicare-certified home health agencies. The Home Health Care CAHPS Survey is designed to produce comparable data on patients' perspectives on care that will allow objective and meaningful comparisons between home health agencies on domains important to consumers. Public reporting of survey results is designed to help consumers and their advocates choose among home health agencies, thereby creating incentives for agencies to improve their quality of care. More information is available at <https://homehealthcahps.org>.

RTI International, a not-for-profit research organization located in Research Triangle Park, North Carolina, is assisting CMS with developing and finalizing protocols for the national implementation of the Home Health Care CAHPS Survey. In preparation for national implementation, RTI will be conducting a "mode experiment." The mode experiment is essentially a test run of the full CAHPS Survey with a sample of home health care patients from a small number of volunteer home health agencies. Results from the mode experiment will be used to determine whether patients respond differently to the survey based on different data collection methods (mail and telephone) allowed under national implementation and to support development of appropriate adjustments to control for this effect. Data from the mode experiment will also be used to determine whether ratings of home health care vary by patient characteristics and whether additional adjustments for these characteristics are needed prior to public reporting of the national survey findings.

Your agency, along with 100 other home health care agencies across the United States, is invited to help us test the procedures that will be used for the national implementation. Your participation in this effort will ensure that we have enough data to assess the effectiveness and differences of the methods of survey administration that will be used in the national survey. The enclosed **Fact Sheet** contains additional information about the mode experiment, which is being funded by CMS. Your agency's role, should you agree to help with this effort, would be to provide an electronic file each month during a 3-month data collection period that contains patient information and data needed to conduct the survey and for data analysis.

An RTI staff member will contact you via telephone within the next few weeks to answer any questions that you may have about the Home Health Care CAHPS Survey mode experiment. If you have any questions in the meantime, please contact Judith Lynch or Anne Kenyon at RTI toll-free at 1-866-354-0985. We hope that you will consider helping us with this important project.

Sincerely,

A handwritten signature in black ink that reads "Elizabeth Goldstein". The signature is written in a cursive, flowing style.

Elizabeth Goldstein, Ph.D.
Director, Division of Consumer
Assessment and Plan Performance

Enclosures

The National Implementation of the Home Health Care CAHPS Survey Fact Sheet

What is the Home Health Care CAHPS Survey?

CMS is sponsoring the Home Health Care CAHPS Survey to measure the experiences of people receiving home health care from Medicare-certified home health agencies. The Home Health Care CAHPS Survey is designed to meet three broad goals:

- It will produce comparable data on the patient's perspective that will allow objective and meaningful comparisons between home health agencies on domains that are important to consumers.
- Public reporting of survey results is designed to create incentives for agencies to improve their quality of care.
- Public reporting will serve to enhance public accountability in health care by increasing the transparency of the quality of care provided in return for public investment.

National implementation of the Home Health Care CAHPS Survey is voluntary and is planned for the summer of 2009 among Medicare-certified home health care agencies. CMS plans ongoing data collection with quarterly data submission (and updates), such that the publicly reported data will always reflect one year's worth of data.

What is the Home Health Care CAHPS Mode Experiment?

CMS is working with RTI International, a not-for-profit research organization located in Research Triangle Park, North Carolina, to develop a coordination strategy for the national administration of the Home Health Care CAHPS Survey. For the national implementation, home health agencies will be expected to contract with a CMS-approved survey vendor, which will use standardized sampling and data collection protocols to collect and submit data to RTI.

As part of the process of finalizing the protocols for the national implementation, CMS has asked RTI to conduct a mode experiment, which will involve surveying a sample of patients who have received home health care from Medicare-certified agencies. The mode experiment is essentially a test run of the full CAHPS survey with a sample of home health care patients from a small number of volunteer home health agencies. Results from the mode experiment will be used to determine if patients respond differently based on the data collection method (mail or telephone) and by patient characteristics and to support development of appropriate adjustments to control for any effects noted.

Data collection for the mode experiment will take place during a 3-month period (anticipated June–August 2009) using the three survey collection methods envisioned as options under national implementation: telephone-only surveys, mail-only surveys, and a combination of a mail survey with telephone follow-up. Patients from the home health agencies participating in the mode experiment will be randomly assigned to one of these three methods of data collection. RTI will compare survey responses to determine whether adjustments are needed to ensure that the method of data collection does not influence the results. RTI expects to recruit approximately 100 home health agencies to participate in the mode experiment.

What will Participation in the Mode Experiment Entail?

The home health agency's role in the Home Health Care CAHPS Mode Experiment is limited to providing an electronic file containing patient information that RTI will need to sample and

survey home health care patients. RTI will select a monthly sample for each of the 3 months in the data collection period. Participating home health agencies will be asked to prepare and submit to RTI an electronic file with information about each patient 18 years of age and older who received home health care the preceding month, including patients who were discharged from home health care during that month. RTI will provide detailed written instructions on how to extract and prepare the electronic files and will be available by telephone and e-mail to answer any questions about file creation and transmission during the survey period.

When will the Mode Experiment be Conducted?

As noted above, CMS anticipates that the mode experiment will be conducted from June through August 2009. However, at this time, the Home Health Care CAHPS Survey is being reviewed by the National Quality Forum (NQF) and the U.S. Office of Management and Budget (OMB). Data collection for the mode experiment will begin shortly after NQF and OMB reviews have been completed. If the reviews are completed earlier than anticipated, the mode experiment will start before June 2009.

How do I notify RTI About My Agency's Interest in Participating in the Mode Experiment?

A RTI representative will call each home health agency that is invited to participate in the mode experiment within the next few weeks. If the agency is willing to participate in the mode experiment, the representative will collect contact information during that call for the person within your organization who will serve as the primary point of contact with RTI during the mode experiment. The RTI representative will also collect contact information for the home health agency staff person who will be responsible for creating and providing the three monthly electronic files containing patient information. After that call, RTI will send all participating agencies a follow-up e-mail message describing the types of patient data that will be needed for the mode experiment and instructions on how to create and send the monthly files to RTI.

What are the Costs and Benefits for our Agency?

CMS will bear the costs of surveying your patients and processing and analyzing the data collected. Your agency's role in the mode experiment will be to prepare and send a monthly file containing patient information that RTI will need for contacting and surveying the patients, following protocols that RTI will send to you before the mode experiment begins. To ensure the integrity of the mode experiment, RTI project staff will work with each participating home health agency to prepare a test file before the mode experiment begins. After data from the mode experiment have been analyzed, RTI will prepare and send to each participating home health agency a summary report of the survey results. By participating in the Home Health Care CAHPS mode experiment, your agency will gain an early look at how your patients perceive the quality of care that your agency delivers, prior to the start of the national implementation of the Home Health Care CAHPS Survey.



Michele A. Quirolo, MS, RN, CHCE
Chairman of the Board

NATIONAL ASSOCIATION FOR HOME CARE & HOSPICE
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Val J. Halamandaris, JD
President

March 2009

Dear Home Health Agency Administrator,

The Centers for Medicare & Medicaid Services (CMS) has asked RTI International—a nonprofit research organization—to conduct a mode experiment as part of the National Implementation of the Home Health Care CAHPS Survey, which will start in Summer 2009. CMS will use the results from the mode experiment to determine whether the data collection mode and patient characteristics affect patients' ratings and assessment of the care they receive and to develop adjustment rules for the national survey data. Adjusting the survey results will ensure a level playing field for all home health agencies participating in the national implementation of the Survey.

To ensure that the data collected are representative, RTI needs approximately 100 home health agencies of varying characteristics to participate in the mode experiment. Your agency has been selected via a random selection process as one of these 100 agencies. Because CMS is funding the mode experiment, your agency will not have to pay for the costs of collecting, processing, and analyzing data from the mode experiment. However, as noted in the enclosed materials, you would need to provide RTI with three separate monthly patient sample files so that RTI can survey patients who receive home health care from your agency. **On behalf of the National Association for Home Care and Hospice, I encourage you to participate in the mode experiment to support the national implementation of the Home Health Care CAHPS Survey.**

The national implementation of the Survey is expected to begin in the summer of 2009, with voluntary participation of home health agencies. The results of the national survey will be posted on the Medicare Home Health Compare website to assist patients in selecting a home health care agency. In addition, home health agencies can use the survey results in their quality improvement initiatives. As a participant in the mode experiment, you will gain an early perspective on the Home Health Care CAHPS survey process. Results from the mode experiment will **not** be publicly reported.

Please consider participating in this important effort to help CMS and our industry better understand patients' experiences with home health care and their perceptions of the quality of care they receive.

Sincerely,

A handwritten signature in black ink that reads "Val J. Halamandaris". The signature is written in a cursive style with a long horizontal flourish at the end.

Val J. Halamandaris
President

**APPENDIX B:
REGRESSION RESULTS FROM IMPACT ANALYSES**

Table B-1. Step 1 Regression Results

Variable Category	Variable Name	Overall n=4,728 Co- efficient	Willing n=4,725 Co- efficient	Q9 n=3,978 Co- efficient	Q16 n=4,777 Co- efficient	Q19 n=4,780 Co- efficient	Q24 n=4,752 Co- efficient
Proxy status	Had a proxy complete survey	-0.012	-0.011	0.049	0.032	0.013	-0.020
Non English language	Non English primary language at home	-0.063	-0.012	-0.073	-0.066	-0.066	-0.021
Age	18-49	-0.047	-0.075	-0.087	-0.028	-0.046	-0.018
Age	50-64	-0.072	-0.040	-0.022	-0.013	-0.032	-0.040
Age	65-74 (omitted group)	—	—	—	—	—	—
Age	75-84	-0.004	-0.022	-0.064	-0.003	0.003	0.016
Age	85 plus	-0.008	-0.035	-0.088	-0.006	0.002	0.023
Education	Less than 8th grade	0.029	0.018	-0.027	-0.014	-0.003	0.017
Education	Some High School	0.009	-0.049	-0.005	-0.015	-0.001	0.014
Education	High school grad or GED (omitted)	—	—	—	—	—	—
Education	Some college	-0.044	-0.038	-0.032	-0.013	-0.009	-0.010
Education	College grad or more	-0.056	-0.042	-0.038	-0.040	-0.029	-0.018
Mental/emotional status	Excellent and Very Good	0.080	0.060	0.073	0.032	0.017	0.010
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.001	-0.027	-0.032	-0.015	-0.032	-0.006
Patient lived alone	Yes—lived alone	-0.027	-0.046	-0.031	-0.022	-0.012	-0.004
Response mode	Mail (omitted group)	—	—	—	—	—	—
Response mode	Telephone	-0.006	0.012	-0.045	-0.017	-0.009	0.014
ADL deficits	Count of number of deficits	-0.005	-0.010	-0.007	-0.004	-0.006	-0.002
Diagnoses (mental)	Schizophrenia	-0.171	-0.110	-0.168	-0.162	-0.114	-0.030
Diagnoses (mental)	Dementia/Cerebral degeneration	-0.062	-0.118	-0.066	-0.017	0.014	0.004
Gender	Male	-0.014	-0.021	0.007	-0.014	0.005	0.013
Self-reported health	Excellent and Very Good	0.012	0.018	0.039	-0.001	0.021	0.008
Self-reported health	Good (omitted group)	—	—	—	—	—	—
Self-reported health	Fair and Poor	-0.033	-0.002	0.005	-0.004	0.012	-0.003
Response mode	Mixed Mode	0.017	0.019	-0.017	-0.003	-0.009	0.005
Admission source	Institutional admission	0.010	0.018	0.016	0.014	0.009	0.001
Admission source	Community (omitted)	—	—	—	—	—	—
Payer status	Medicaid	0.011	0.021	0.013	-0.002	0.007	-0.006
Payer status	Medicare (omitted)	—	—	—	—	—	—
Diagnoses (physical)	Diabetes/Endocrine/Metabolic Issues	0.006	-0.016	-0.020	0.002	0.001	0.008
Diagnoses (physical)	Musculoskeletal/Tissue/Arthritic Disorders	0.016	-0.013	0.008	0.013	0.012	0.003
Diagnoses (physical)	Renal failure	-0.049	0.017	0.031	-0.041	-0.018	-0.013
Diagnoses (physical)	Urinary obstruction/Incontinence	-0.047	-0.052	-0.001	-0.032	0.006	-0.011
Diagnoses (physical)	Skin ulcers	-0.045	-0.009	0.014	0.010	0.003	-0.010
Diagnoses (physical)	Complications of medical care/Trauma	0.032	-0.012	0.083	0.032	0.010	0.014
Diagnoses (physical)	Post-surgical/Aftercare Issues	-0.019	-0.021	-0.010	-0.004	-0.002	-0.007
Intercept	Intercept	0.884	0.926	0.768	0.948	0.968	0.969
Home health agencies	Dummy variables	—	—	—	—	—	—

(continued)

Table B-1. Step 1 Regression Results (continued)

Variable Category	Variable Name	Q2 n=4,393 Co- efficient	Q15 n=4,774 Co- efficient	Q17 n=4,778 Co- efficient	Q18 n=4,779 Co- efficient	Q22 n=1,442 Co- efficient	Q23 n=1,366 Co- efficient
Proxy status	Had a proxy complete survey	0.026	0.031	-0.017	0.030	-0.008	0.017
Non English language	Non English primary language at home	-0.019	-0.055	-0.103	-0.050	0.015	-0.003
Age	18-49	-0.017	-0.059	-0.019	0.001	-0.007	0.066
Age	50-64	-0.015	0.006	-0.015	-0.024	-0.006	0.032
Age	65-74 (omitted group)	—	—	—	—	—	—
Age	75-84	-0.008	0.009	-0.028	-0.017	-0.003	0.060
Age	85 plus	-0.003	-0.040	-0.029	-0.029	0.022	0.000
Education	Less than 8th grade	-0.033	-0.017	-0.029	-0.017	-0.011	-0.107
Education	Some High School	0.002	-0.027	-0.009	0.020	-0.010	-0.048
Education	High school grad or GED (omitted)	—	—	—	—	—	—
Education	Some college	0.003	-0.018	-0.031	-0.036	-0.008	-0.042
Education	College grad or more	0.007	-0.054	-0.010	-0.076	-0.025	-0.046
Mental/emotional status	Excellent and Very Good	-0.015	0.042	0.056	0.039	-0.003	-0.003
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.022	-0.035	-0.022	-0.043	-0.006	-0.034
Patient lived alone	Yes—lived alone	-0.017	-0.059	-0.050	-0.037	-0.019	0.005
Response mode	Mail (omitted group)	—	—	—	—	—	—
Response mode	Telephone	-0.039	-0.004	0.010	-0.005	-0.035	-0.060
ADL deficits	Count of number of deficits	0.001	-0.005	-0.014	-0.009	-0.003	-0.008
Diagnoses (mental)	Schizophrenia	-0.096	-0.154	-0.251	-0.165	-0.100	0.001
Diagnoses (mental)	Dementia/Cerebral degeneration	-0.004	0.002	0.007	-0.041	-0.004	0.044
Gender	Male	-0.012	0.005	-0.014	-0.005	0.003	0.008
Self-reported health	Excellent and Very Good	0.015	-0.012	0.013	0.013	-0.002	0.021
Self-reported health	Good (omitted group)	—	—	—	—	—	—
Self-reported health	Fair and Poor	-0.006	-0.017	-0.018	-0.015	0.011	0.048
Response mode	Mixed Mode	-0.018	-0.019	0.014	-0.011	-0.027	-0.054
Admission source	Institutional admission	0.010	0.016	0.017	0.017	0.025	0.053
Admission source	Community (omitted)	—	—	—	—	—	—
Payer status	Medicaid	0.017	0.015	0.004	0.013	-0.014	-0.020
Payer status	Medicare (omitted)	—	—	—	—	—	—
Diagnoses (physical)	Diabetes/Endocrine/Metabolic Issues	-0.011	-0.001	0.006	-0.002	0.026	-0.002
Diagnoses (physical)	Musculoskeletal/Tissue/Arthritic Disorders	-0.007	0.014	0.023	0.010	0.008	-0.014
Diagnoses (physical)	Renal failure	0.013	-0.072	-0.026	-0.028	-0.014	-0.057
Diagnoses (physical)	Urinary obstruction/Incontinence	0.018	-0.046	-0.049	-0.071	0.010	-0.069
Diagnoses (physical)	Skin ulcers	-0.014	0.013	-0.009	0.003	-0.004	0.027
Diagnoses (physical)	Complications of medical care/Trauma	0.010	0.063	0.000	0.006	0.007	0.088
Diagnoses (physical)	Post-surgical/Aftercare Issues	0.020	0.000	0.020	-0.012	-0.002	0.001
Intercept		0.977	0.894	0.897	0.922	0.978	0.726
Home health agencies	Dummy variables	—	—	—	—	—	—

(continued)

Table B-1. Step 1 Regression Results (continued)

Variable Category	Variable Name	Q3 n=4,399 Co- efficient	Q4 n=4,479 Co- efficient	Q5 n=4,418 Co- efficient	Q10 n=4,711 Co- efficient	Q12 n=1,864 Co- efficient	Q13 n=1,877 Co- efficient	Q14 n=1,842 Co- efficient
Proxy status	Had a proxy complete survey	0.062	0.067	0.046	0.046	0.060	0.073	0.065
Non English language	Non English primary language at home	0.003	0.032	0.022	-0.030	0.005	0.072	0.074
Age	18-49	-0.019	0.024	0.038	-0.028	0.011	-0.051	-0.011
Age	50-64	0.004	0.001	0.021	-0.008	-0.020	-0.032	0.000
Age	65-74 (omitted group)	—	—	—	—	—	—	—
Age	75-84	0.014	-0.002	-0.008	-0.048	-0.030	-0.029	-0.037
Age	85 plus	0.041	-0.024	-0.025	-0.083	-0.044	-0.064	-0.059
Education	Less than 8th grade	-0.008	0.012	0.032	-0.037	0.028	0.018	-0.014
Education	Some High School	0.018	0.012	0.036	-0.025	-0.041	0.005	-0.002
Education	High school grad or GED (omitted)	—	—	—	—	—	—	—
Education	Some college	-0.026	-0.012	-0.037	0.004	-0.011	-0.008	-0.029
Education	College grad or more	-0.046	-0.031	-0.125	-0.023	-0.022	-0.034	-0.051
Mental/emotional status	Excellent and Very Good	-0.011	0.008	-0.023	0.007	0.008	0.009	-0.003
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.028	-0.015	-0.037	-0.021	-0.007	-0.008	-0.034
Patient lived alone	Yes--lived alone	-0.042	-0.012	0.012	-0.021	-0.009	0.038	-0.017
Response mode	Mail (omitted group)	—	—	—	—	—	—	—
Response mode	Telephone	-0.016	-0.061	-0.010	-0.057	-0.114	-0.033	-0.018
ADL deficits	Count of number of deficits	0.014	-0.004	0.000	0.000	-0.004	-0.013	-0.011
Diagnoses (mental)	Schizophrenia	-0.171	-0.088	-0.028	-0.137	-0.138	-0.231	-0.094
Diagnoses (mental)	Dementia/Cerebral degeneration	-0.034	-0.018	0.031	-0.078	-0.022	-0.038	-0.048
Gender	Male	0.009	0.008	0.022	-0.023	-0.018	-0.015	-0.018
Self-reported health	Excellent and Very Good	0.048	-0.004	0.013	0.008	-0.006	0.013	0.047
Self-reported health	Good (omitted group)	—	—	—	—	—	—	—
Self-reported health	Fair and Poor	0.011	0.000	0.025	0.022	-0.034	-0.040	-0.026
Response mode	Mixed Mode	0.008	-0.019	0.002	-0.027	-0.042	-0.039	-0.051
Admission source	Institutional admission	0.022	0.010	0.021	-0.003	0.061	0.069	0.020
Admission source	Community (omitted)	—	—	—	—	—	—	—
Payer status	Medicaid	0.012	-0.010	0.022	0.010	-0.004	0.014	0.040
Payer status	Medicare (omitted)	—	—	—	—	—	—	—
Diagnoses (physical)	Diabetes/Endocrine/Metabolic Issues	-0.023	0.000	-0.008	-0.002	0.019	-0.008	0.008
Diagnoses (physical)	Musculoskeletal/Tissue/Arthritic Disorders	0.016	0.002	-0.013	0.024	0.018	-0.007	0.009
Diagnoses (physical)	Renal failure	0.049	0.043	0.055	0.006	0.009	0.067	0.082
Diagnoses (physical)	Urinary obstruction/Incontinence	-0.011	-0.046	-0.009	-0.048	-0.101	-0.014	-0.073
Diagnoses (physical)	Skin ulcers	-0.046	-0.047	-0.011	0.015	0.028	-0.003	0.012
Diagnoses (physical)	Complications of medical care/Trauma	-0.036	0.018	-0.008	0.067	0.010	0.001	0.041
Diagnoses (physical)	Post-surgical/Aftercare Issues	-0.001	0.007	-0.046	0.037	0.020	0.018	0.049
Intercept	Intercept	0.735	0.904	0.796	0.892	0.863	0.822	0.747
Home health agencies	Dummy variables	—	—	—	—	—	—	—

Note: **Bolded** values are statistically significant at p<0.05.

Table B-2. Step 2 Regression Results

Variable Category	Variable Name	Overall n=5,346 Co- efficient	Willing n=5,339 Co- efficient	Q9 n=4,502 Co- efficient	Q16 n=5,402 Co- efficient	Q19 n=5,406 Co- efficient	Q24 n=5,369 Co- efficient
Proxy status	Had a proxy complete survey	-0.028	-0.023	0.037	0.023	0.010	-0.021
Non English language	Non English primary language at home	-0.060	-0.019	-0.073	-0.054	-0.059	-0.022
Age	18-49	-0.042	-0.052	-0.055	-0.021	-0.041	-0.025
Age	50-64	-0.076	-0.051	-0.024	-0.024	-0.047	-0.039
Age	65-74 (omitted group)	—	—	—	—	—	—
Age	75-84	-0.006	-0.022	-0.065	-0.009	-0.001	0.016
Age	85 plus	-0.005	-0.032	-0.090	-0.003	0.004	0.021
Education	Less than 8th grade	0.027	0.026	-0.023	-0.017	0.003	0.015
Education	Some High School	0.007	-0.052	-0.005	-0.018	-0.002	0.010
Education	High school grad or GED (omitted)	—	—	—	—	—	—
Education	Some college	-0.040	-0.030	-0.035	-0.018	-0.008	-0.012
Education	College grad or more	-0.062	-0.042	-0.039	-0.042	-0.029	-0.018
Mental/emotional status	Excellent and Very Good	0.077	0.060	0.083	0.029	0.014	0.008
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.018	-0.028	-0.030	-0.016	-0.032	-0.011
Patient lived alone	Yes—lived alone	-0.027	-0.050	-0.042	-0.023	-0.016	-0.007
Response mode	Mail (omitted group)	—	—	—	—	—	—
Response mode	Telephone	-0.012	0.001	-0.035	-0.015	0.000	0.013
ADL deficits	Count of number of deficits	-0.004	-0.011	-0.005	-0.003	-0.006	-0.002
Diagnoses (mental)	Schizophrenia	-0.139	-0.059	-0.091	-0.153	-0.109	-0.008
Diagnoses (mental)	Dementia/Cerebral degeneration	-0.051	-0.099	-0.074	-0.017	0.012	0.003
Intercept	Intercept	0.879	0.924	0.774	0.954	0.990	0.971
Home health agencies	Dummy variables	—	—	—	—	—	—

(continued)

Table B-2. Step 2 Regression Results (continued)

Variable Category	Variable Name	Q2 n=4,947 Co- efficient	Q15 n=5,400 Co- efficient	Q17 n=5,404 Co- efficient	Q18 n=5,405 Co- efficient	Q22 n=1,655 Co- efficient	Q23 n=1,564 Co- efficient
Proxy status	Had a proxy complete survey	0.022	0.020	-0.024	0.017	-0.015	0.011
Non English language	Non English primary language at home	-0.024	-0.041	-0.079	-0.035	0.003	0.008
Age	18-49	-0.003	-0.044	-0.009	0.018	-0.015	0.069
Age	50-64	-0.014	-0.003	-0.031	-0.031	0.000	0.000
Age	65-74 (omitted group)	—	—	—	—	—	—
Age	75-84	-0.011	-0.001	-0.026	-0.018	0.003	0.065
Age	85 plus	-0.001	-0.046	-0.027	-0.026	0.017	0.001
Education	Less than 8th grade	-0.034	-0.013	-0.028	-0.010	-0.011	-0.105
Education	Some High School	0.005	-0.029	-0.013	0.016	-0.011	-0.033
Education	High school grad or GED (omitted)	—	—	—	—	—	—
Education	Some college	0.003	-0.012	-0.029	-0.027	-0.021	-0.027
Education	College grad or more	0.006	-0.056	-0.016	-0.074	-0.017	-0.061
Mental/emotional status	Excellent and Very Good	-0.005	0.040	0.064	0.044	0.003	0.000
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.023	-0.040	-0.024	-0.041	0.001	-0.017
Patient lived alone	Yes—lived alone	-0.018	-0.068	-0.046	-0.036	-0.015	-0.002
Response mode	Mail (omitted group)	—	—	—	—	—	—
Response mode	Telephone	-0.031	0.012	-0.005	-0.002	-0.022	-0.022
ADL deficits	Count of number of deficits	0.001	-0.006	-0.013	-0.009	0.000	-0.008
Diagnoses (mental)	Schizophrenia	-0.078	-0.082	-0.251	-0.169	-0.072	0.020
Diagnoses (mental)	Dementia/Cerebral degeneration	0.002	0.000	0.000	-0.037	-0.008	-0.012
Intercept	Intercept	0.974	0.897	0.916	0.915	0.976	0.781
Home health agencies	Dummy variables	—	—	—	—	—	—

(continued)

Table B-2. Step 2 Regression Results (continued)

Variable Category	Variable Name	Q3 n=4,970 Co- efficient	Q4 n=5,064 Co- efficient	Q5 n=4,995 Co- efficient	Q10 n=5,325 Co- efficient	Q12 n=2,133 Co- efficient	Q13 n=2,144 Co- efficient	Q14 n=2,110 Co- efficient
Proxy status	Had a proxy complete survey	0.051	0.056	0.045	0.033	0.046	0.065	0.052
Non English language	Non English primary language at home	0.008	0.017	0.019	-0.028	0.012	0.070	0.066
Age	18-49	-0.001	0.019	0.060	-0.036	-0.003	-0.051	-0.012
Age	50-64	-0.002	0.000	0.034	-0.008	-0.035	-0.037	-0.005
Age	65-74 (omitted group)	—	—	—	—	—	—	—
Age	75-84	0.013	0.005	-0.002	-0.050	-0.029	-0.023	-0.040
Age	85 plus	0.044	-0.018	-0.018	-0.086	-0.046	-0.063	-0.058
Education	Less than 8th grade	0.001	0.006	0.030	-0.050	0.010	0.013	-0.013
Education	Some High School	0.016	0.014	0.033	-0.026	-0.032	0.021	0.015
Education	High school grad or GED (omitted)	—	—	—	—	—	—	—
Education	Some college	-0.026	-0.018	-0.040	0.006	0.001	-0.012	-0.027
Education	College grad or more	-0.044	-0.028	-0.123	-0.022	-0.025	-0.035	-0.049
Mental/emotional status	Excellent and Very Good	-0.001	0.003	-0.026	0.005	0.016	0.028	0.022
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.025	-0.017	-0.026	-0.009	-0.008	-0.015	-0.032
Patient lived alone	Yes—lived alone	-0.046	-0.016	0.012	-0.011	-0.002	0.040	-0.025
Response mode	Mail (omitted group)	—	—	—	—	—	—	—
Response mode	Telephone	-0.022	-0.046	-0.009	-0.046	-0.088	-0.022	0.010
ADL deficits	Count of number of deficits	0.015	-0.004	0.000	0.002	0.000	-0.010	-0.012
Diagnoses (mental)	Schizophrenia	-0.219	-0.083	-0.032	-0.104	-0.069	-0.147	-0.106
Diagnoses (mental)	Dementia/Cerebral degeneration	-0.039	-0.009	0.023	-0.090	-0.020	-0.034	-0.042
Intercept	Intercept	0.770	0.899	0.818	0.896	0.873	0.845	0.756
Home health agencies	Dummy variables	—	—	—	—	—	—	—

Note: **Bolded** values are statistically significant at $p < 0.05$.

Table B-3. Step 3 Regression Results

Variable Category	Variable Name	Overall n=5,346 Co- efficient	Willing n=5,339 Co- efficient	Q9 n=4,502 Co- efficient	Q16 n=5,402 Co- efficient	Q19 n=5,406 Co- efficient	Q24 n=5,369 Co- efficient
Proxy status	Had a proxy complete survey	-0.030	-0.023	0.031	0.021	0.010	-0.019
Non English language	Non English primary language at home	-0.061	-0.019	-0.073	-0.054	-0.059	-0.021
Age	18-49	-0.041	-0.052	-0.053	-0.020	-0.041	-0.026
Age	50-64	-0.077	-0.051	-0.024	-0.024	-0.047	-0.039
Age	65-74 (omitted group)	—	—	—	—	—	—
Age	75-84	-0.005	-0.023	-0.063	-0.008	-0.001	0.015
Age	85 plus	-0.005	-0.032	-0.088	-0.002	0.004	0.020
Education	Less than 8th grade	0.027	0.026	-0.022	-0.017	0.003	0.015
Education	Some High School	0.007	-0.052	-0.005	-0.019	-0.002	0.010
Education	High school grad or GED (omitted)	—	—	—	—	—	—
Education	Some college	-0.040	-0.030	-0.035	-0.018	-0.008	-0.012
Education	College grad or more	-0.062	-0.042	-0.040	-0.042	-0.029	-0.018
Mental/emotional status	Excellent and Very Good	0.077	0.060	0.083	0.028	0.014	0.008
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.019	-0.028	-0.031	-0.016	-0.032	-0.011
Patient lived alone	Yes—lived alone	-0.028	-0.050	-0.043	-0.024	-0.016	-0.006
ADL deficits	Count of number of deficits	-0.004	-0.011	-0.005	-0.003	-0.006	-0.002
Diagnoses (mental)	Schizophrenia	-0.139	-0.059	-0.090	-0.153	-0.109	-0.009
Diagnoses (mental)	Dementia/Cerebral degeneration	-0.051	-0.099	-0.072	-0.016	0.012	0.002
Intercept	Intercept	0.875	0.924	0.763	0.950	0.990	0.975
Home health agencies	Dummy variables	—	—	—	—	—	—

(continued)

Table B-3. Step 3 Regression Results (continued)

Variable Category	Variable Name	Q2 n=4,947 Co- efficient	Q15 n=5,400 Co- efficient	Q17 n=5,404 Co- efficient	Q18 n=5,405 Co- efficient	Q22 n=1,655 Co- efficient	Q23 n=1,564 Co- efficient
Proxy status	Had a proxy complete survey	0.017	0.022	-0.025	0.017	-0.018	0.009
Non English language	Non English primary language at home	-0.025	-0.041	-0.079	-0.035	0.001	0.005
Age	18-49	-0.001	-0.044	-0.008	0.018	-0.016	0.067
Age	50-64	-0.015	-0.002	-0.031	-0.031	-0.001	-0.001
Age	65-74 (omitted group)	—	—	—	—	—	—
Age	75-84	-0.009	-0.002	-0.026	-0.018	0.004	0.066
Age	85 plus	0.001	-0.046	-0.027	-0.026	0.018	0.001
Education	Less than 8th grade	-0.033	-0.013	-0.028	-0.010	-0.010	-0.104
Education	Some High School	0.004	-0.029	-0.013	0.016	-0.011	-0.033
Education	High school grad or GED (omitted)	—	—	—	—	—	—
Education	Some college	0.003	-0.012	-0.029	-0.027	-0.020	-0.026
Education	College grad or more	0.005	-0.056	-0.016	-0.074	-0.017	-0.062
Mental/emotional status	Excellent and Very Good	-0.005	0.040	0.064	0.044	0.002	-0.001
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.025	-0.039	-0.024	-0.041	0.000	-0.017
Patient lived alone	Yes—lived alone	-0.018	-0.068	-0.047	-0.036	-0.015	-0.002
ADL deficits	Count of number of deficits	0.001	-0.006	-0.013	-0.009	0.000	-0.008
Diagnoses (mental)	Schizophrenia	-0.080	-0.081	-0.251	-0.169	-0.074	0.019
Diagnoses (mental)	Dementia/Cerebral degeneration	0.005	0.000	0.000	-0.037	-0.006	-0.010
Intercept	Intercept	0.964	0.901	0.915	0.915	0.971	0.777
Home health agencies	Dummy variables	—	—	—	—	—	—

(continued)

Table B-3. Step 3 Regression Results (continued)

Variable Category	Variable Name	Q3 n=4,970 Co- efficient	Q4 n=5,064 Co- efficient	Q5 n=4,995 Co- efficient	Q10 n=5,325 Co- efficient	Q12 n=2,133 Co- efficient	Q13 n=2,144 Co- efficient	Q14 n=2,110 Co- efficient
Proxy status	Had a proxy complete survey	0.047	0.049	0.044	0.025	0.029	0.061	0.054
Non English language	Non English primary language at home	0.007	0.015	0.019	-0.030	0.008	0.070	0.066
Age	18-49	-0.001	0.022	0.061	-0.033	-0.003	-0.051	-0.012
Age	50-64	-0.003	0.000	0.034	-0.009	-0.036	-0.037	-0.004
Age	65-74 (omitted group)	—	—	—	—	—	—	—
Age	75-84	0.014	0.007	-0.002	-0.047	-0.023	-0.021	-0.041
Age	85 plus	0.045	-0.016	-0.018	-0.083	-0.039	-0.062	-0.058
Education	Less than 8th grade	0.001	0.007	0.030	-0.049	0.010	0.012	-0.013
Education	Some High School	0.016	0.013	0.033	-0.027	-0.037	0.020	0.016
Education	High school grad or GED (omitted)	—	—	—	—	—	—	—
Education	Some college	-0.026	-0.018	-0.040	0.006	-0.002	-0.013	-0.027
Education	College grad or more	-0.044	-0.028	-0.124	-0.023	-0.027	-0.035	-0.048
Mental/emotional status	Excellent and Very Good	-0.001	0.002	-0.026	0.004	0.012	0.027	0.022
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.026	-0.020	-0.027	-0.011	-0.017	-0.017	-0.031
Patient lived alone	Yes—lived alone	-0.047	-0.017	0.012	-0.012	-0.007	0.039	-0.025
ADL deficits	Count of number of deficits	0.015	-0.004	0.000	0.002	0.000	-0.010	-0.012
Diagnoses (mental)	Schizophrenia	-0.220	-0.084	-0.032	-0.103	-0.042	-0.141	-0.109
Diagnoses (mental)	Dementia/Cerebral degeneration	-0.037	-0.006	0.023	-0.088	-0.015	-0.032	-0.043
Intercept	Intercept	0.763	0.885	0.815	0.882	0.849	0.839	0.759
Home health agencies	Dummy variables	—	—	—	—	—	—	—

Note: **Bolded** values are statistically significant at p<0.05.

Table B-4. Step 4 Regression Results

Variable Category	Variable Name	Overall n=6,201 Co- efficient	Willing n=6,202 Co- efficient	Q9 n=5,217 Co- efficient	Q16 n=6,270 Co- efficient	Q19 n=6,275 Co- efficient	Q24 n=6,229 Co- efficient
Non English language	Non English primary language at home	-0.070	-0.031	-0.109	-0.068	-0.044	-0.023
Age	18-49	-0.036	-0.054	-0.024	-0.033	-0.043	-0.020
Age	50-64	-0.054	-0.028	0.000	-0.026	-0.035	-0.032
Age	65-74 (omitted group)	—	—	—	—	—	—
Age	75-84	0.000	-0.019	-0.047	-0.006	0.002	0.016
Age	85 plus	-0.008	-0.030	-0.066	-0.001	0.005	0.019
Education	Less than 8th grade	0.027	0.029	-0.019	-0.011	0.002	0.013
Education	Some High School	0.001	-0.050	-0.008	-0.023	-0.007	0.006
Education	High school grad or GED (omitted)	—	—	—	—	—	—
Education	Some college	-0.041	-0.027	-0.043	-0.016	-0.012	-0.014
Education	College grad or more	-0.057	-0.044	-0.048	-0.040	-0.031	-0.021
Mental/emotional status	Excellent and Very Good	0.074	0.054	0.078	0.024	0.014	0.009
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.012	-0.027	-0.019	-0.014	-0.027	-0.012
Patient lived alone	Yes—lived alone	-0.017	-0.036	-0.055	-0.025	-0.017	-0.003
Diagnoses (mental)	Schizophrenia	-0.111	-0.049	-0.080	-0.108	-0.075	-0.025
Diagnoses (mental)	Dementia/Cerebral degeneration	-0.067	-0.103	-0.080	-0.021	0.003	-0.010
Intercept	Intercept	0.855	0.875	0.753	0.945	0.971	0.964
Home health agencies	Dummy variables	—	—	—	—	—	—

(continued)

Table B-4. Step 4 Regression Results (continued)

Variable Category	Variable Name	Q2 n=5,757 Co- efficient	Q15 n=6,269 Co- efficient	Q17 n=6,270 Co- efficient	Q18 n=6,273 Co- efficient	Q22 n=1,907 Co- efficient	Q23 n=1,797 Co- efficient
Non English language	Non English primary language at home	-0.033	-0.061	-0.073	-0.042	0.006	0.001
Age	18-49	-0.003	-0.026	0.009	0.006	-0.006	0.076
Age	50-64	-0.011	0.002	-0.012	-0.019	-0.004	0.000
Age	65-74 (omitted group)	—	—	—	—	—	—
Age	75-84	-0.003	-0.003	-0.021	-0.018	0.008	0.060
Age	85 plus	0.009	-0.043	-0.033	-0.026	0.013	-0.021
Education	Less than 8th grade	-0.033	-0.005	-0.036	-0.005	-0.012	-0.106
Education	Some High School	0.004	-0.032	-0.019	0.013	-0.010	-0.029
Education	High school grad or GED (omitted)	—	—	—	—	—	—
Education	Some college	0.004	-0.016	-0.030	-0.030	-0.017	-0.033
Education	College grad or more	0.002	-0.061	-0.021	-0.075	-0.032	-0.065
Mental/emotional status	Excellent and Very Good	-0.006	0.039	0.063	0.044	-0.004	0.000
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.018	-0.034	-0.022	-0.037	0.001	-0.024
Patient lived alone	Yes—lived alone	-0.021	-0.061	-0.036	-0.035	-0.015	-0.012
Diagnoses (mental)	Schizophrenia	-0.119	-0.088	-0.261	-0.160	-0.159	0.035
Diagnoses (mental)	Dementia/Cerebral degeneration	-0.001	-0.021	-0.023	-0.039	-0.006	-0.079
Intercept	Intercept	0.966	0.886	0.870	0.890	0.977	0.770
Home health agencies	Dummy variables	—	—	—	—	—	—

(continued)

Table B-4. Step 4 Regression Results (continued)

Variable Category	Variable Name	Q3 n=5,786 Co- efficient	Q4 n=5,875 Co- efficient	Q5 n=5,784 Co- efficient	Q10 n=6,172 Co- efficient	Q12 n=2,486 Co- efficient	Q13 n=2,499 Co- efficient	Q14 n=2,459 Co- efficient
Non English language	Non English primary language at home	0.024	0.013	0.028	-0.030	0.000	0.091	0.088
Age	18-49	-0.007	0.030	0.069	-0.037	0.002	-0.030	-0.012
Age	50-64	-0.006	-0.006	0.038	-0.009	-0.034	-0.030	-0.010
Age	65-74 (omitted group)	—	—	—	—	—	—	—
Age	75-84	0.012	0.007	0.006	-0.046	-0.019	-0.020	-0.033
Age	85 plus	0.052	-0.007	-0.001	-0.080	-0.022	-0.043	-0.040
Education	Less than 8th grade	0.002	0.013	0.039	-0.044	0.000	0.011	-0.013
Education	Some High School	0.015	0.012	0.036	-0.015	-0.034	0.037	0.034
Education	High school grad or GED (omitted)	—	—	—	—	—	—	—
Education	Some college	-0.033	-0.015	-0.042	0.002	-0.015	-0.012	-0.022
Education	College grad or more	-0.055	-0.022	-0.120	-0.027	-0.033	-0.026	-0.048
Mental/emotional status	Excellent and Very Good	-0.007	-0.001	-0.031	-0.007	0.005	0.024	0.019
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.011	-0.007	-0.016	-0.005	-0.022	-0.020	-0.027
Patient lived alone	Yes—lived alone	-0.057	-0.027	0.006	-0.019	-0.009	0.038	-0.030
Diagnoses (mental)	Schizophrenia	-0.287	-0.079	-0.055	-0.155	-0.059	-0.105	-0.061
Diagnoses (mental)	Dementia/Cerebral degeneration	-0.012	-0.005	0.009	-0.075	0.005	-0.012	-0.059
Intercept	Intercept	0.850	0.880	0.839	0.907	0.878	0.804	0.724
Home health agencies	Dummy variables	—	—	—	—	—	—	—

Note: **Bolded** values are statistically significant at $p < 0.05$.

Table B-5. Step 5 Regression Results

Variable Category	Variable Name	Overall n=6,201 Co- efficient	Willing n=6,202 Co- efficient	Q9 n=5,217 Co- efficient	Q16 n=6,270 Co- efficient	Q19 n=6,275 Co- efficient	Q24 n=6,229 Co- efficient
Non English language	Non English primary language at home	-0.071	-0.030	-0.108	-0.069	-0.044	-0.023
Age	18-49	-0.038	-0.053	-0.024	-0.036	-0.046	-0.020
Age	50-64	-0.053	-0.025	0.002	-0.026	-0.036	-0.032
Age	65-74 (omitted group)	—	—	—	—	—	—
Age	75-84	-0.002	-0.023	-0.050	-0.007	0.002	0.015
Age	85 plus	-0.013	-0.038	-0.074	-0.002	0.006	0.018
Education	Less than 8th grade	0.027	0.029	-0.020	-0.011	0.002	0.013
Education	Some High School	0.001	-0.049	-0.008	-0.022	-0.007	0.006
Education	High school grad or GED (omitted)	—	—	—	—	—	—
Education	Some college	-0.041	-0.027	-0.043	-0.016	-0.012	-0.014
Education	College grad or more	-0.058	-0.044	-0.049	-0.040	-0.031	-0.022
Mental/emotional status	Excellent and Very Good	0.075	0.057	0.080	0.024	0.014	0.009
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.018	-0.035	-0.026	-0.016	-0.027	-0.013
Patient lived alone	Yes—lived alone	-0.014	-0.032	-0.052	-0.024	-0.017	-0.002
Intercept	Intercept	0.853	0.872	0.750	0.944	0.970	0.964
Home health agencies	Dummy variables	—	—	—	—	—	—

(continued)

Table B-5. Step 5 Regression Results (continued)

Variable Category	Variable Name	Q2 n=5,757 Co- efficient	Q15 n=6,269 Co- efficient	Q17 n=6,270 Co- efficient	Q18 n=6,273 Co- efficient	Q22 n=1,907 Co- efficient	Q23 n=1,797 Co- efficient
Non English language	Non English primary language at home	-0.033	-0.062	-0.074	-0.043	0.004	-0.001
Age	18-49	-0.007	-0.028	-0.001	0.001	-0.011	0.079
Age	50-64	-0.013	0.002	-0.015	-0.020	-0.004	0.002
Age	65-74 (omitted group)	—	—	—	—	—	—
Age	75-84	-0.003	-0.004	-0.021	-0.019	0.008	0.055
Age	85 plus	0.009	-0.045	-0.034	-0.028	0.013	-0.030
Education	Less than 8th grade	-0.033	-0.005	-0.036	-0.005	-0.010	-0.106
Education	Some High School	0.005	-0.031	-0.019	0.014	-0.009	-0.027
Education	High school grad or GED (omitted)	—	—	—	—	—	—
Education	Some college	0.005	-0.015	-0.030	-0.030	-0.017	-0.033
Education	College grad or more	0.003	-0.061	-0.021	-0.075	-0.031	-0.065
Mental/emotional status	Excellent and Very Good	-0.007	0.039	0.063	0.045	-0.005	0.000
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.019	-0.036	-0.024	-0.041	-0.001	-0.032
Patient lived alone	Yes—lived alone	-0.021	-0.060	-0.035	-0.033	-0.015	-0.008
Intercept	Intercept	0.966	0.886	0.869	0.889	0.977	0.769
Home health agencies	Dummy variables	—	—	—	—	—	—

(continued)

Table B-5. Step 5 Regression Results (continued)

Variable Category	Variable Name	Q3 n=5,786 Co- efficient	Q4 n=5,875 Co- efficient	Q5 n=5,784 Co- efficient	Q10 n=6,172 Co- efficient	Q12 n=2,486 Co- efficient	Q13 n=2,499 Co- efficient	Q14 n=2,459 Co- efficient
Non English language	Non English primary language at home	0.023	0.013	0.027	-0.030	-0.001	0.090	0.088
Age	18-49	-0.016	0.027	0.066	-0.041	0.000	-0.033	-0.012
Age	50-64	-0.010	-0.007	0.037	-0.009	-0.035	-0.030	-0.008
Age	65-74 (omitted group)	—	—	—	—	—	—	—
Age	75-84	0.013	0.007	0.006	-0.049	-0.019	-0.020	-0.035
Age	85 plus	0.052	-0.007	0.000	-0.086	-0.021	-0.043	-0.046
Education	Less than 8th grade	0.003	0.014	0.039	-0.045	0.001	0.011	-0.013
Education	Some High School	0.015	0.012	0.036	-0.014	-0.034	0.037	0.034
Education	High school grad or GED (omitted)	—	—	—	—	—	—	—
Education	Some college	-0.032	-0.014	-0.042	0.002	-0.015	-0.012	-0.022
Education	College grad or more	-0.055	-0.022	-0.120	-0.028	-0.033	-0.025	-0.047
Mental/emotional status	Excellent and Very Good	-0.007	-0.001	-0.031	-0.005	0.005	0.024	0.020
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.013	-0.008	-0.015	-0.011	-0.022	-0.022	-0.032
Patient lived alone	Yes—lived alone	-0.057	-0.027	0.006	-0.016	-0.010	0.038	-0.028
Intercept	Intercept	0.849	0.880	0.839	0.904	0.878	0.804	0.723
Home health agencies	Dummy variables	—	—	—	—	—	—	—

Note: **Bolded** values are statistically significant at p<0.05.

Table B-6. Step 6 Regression Results

Variable Category	Variable Name	Overall n=5,346 Co- efficient	Willing n=5,339 Co- efficient	Q9 n=4,502 Co- efficient	Q16 n=5,402 Co- efficient	Q19 n=5,406 Co- efficient	Q24 n=5,369 Co- efficient
Proxy status	Had a proxy complete survey	-0.037	-0.037	0.021	0.018	0.011	-0.019
Non English language	Non English primary language at home	-0.062	-0.018	-0.073	-0.056	-0.060	-0.022
Age	18-49	-0.045	-0.052	-0.055	-0.026	-0.045	-0.026
Age	50-64	-0.077	-0.048	-0.023	-0.025	-0.048	-0.039
Age	65-74 (omitted group)	—	—	—	—	—	—
Age	75-84	-0.007	-0.026	-0.065	-0.008	-0.001	0.015
Age	85 plus	-0.007	-0.038	-0.092	-0.002	0.005	0.020
Education	Less than 8th grade	0.028	0.027	-0.022	-0.017	0.003	0.015
Education	Some High School	0.007	-0.050	-0.005	-0.019	-0.002	0.010
Education	High school grad or GED (omitted)	—	—	—	—	—	—
Education	Some college	-0.040	-0.030	-0.035	-0.018	-0.008	-0.012
Education	College grad or more	-0.063	-0.043	-0.041	-0.042	-0.029	-0.018
Mental/emotional status	Excellent and Very Good	0.077	0.061	0.083	0.029	0.014	0.008
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.022	-0.035	-0.036	-0.018	-0.032	-0.011
Patient lived alone	Yes—lived alone	-0.027	-0.048	-0.042	-0.023	-0.016	-0.007
ADL deficits	Count of number of deficits	-0.004	-0.012	-0.005	-0.003	-0.006	-0.002
Intercept	Intercept	0.875	0.926	0.764	0.949	0.989	0.974
Home health agencies	Dummy variables	—	—	—	—	—	—

(continued)

Table B-6. Step 6 Regression Results (continued)

Variable Category	Variable Name	Q2 n=4,947 Co- efficient	Q15 n=5,400 Co- efficient	Q17 n=5,404 Co- efficient	Q18 n=5,405 Co- efficient	Q22 n=1,655 Co- efficient	Q23 n=1,564 Co- efficient
Proxy status	Had a proxy complete survey	0.017	0.022	-0.026	0.011	-0.018	0.008
Non English language	Non English primary language at home	-0.025	-0.042	-0.082	-0.036	0.000	0.005
Age	18-49	-0.004	-0.047	-0.018	0.012	-0.018	0.068
Age	50-64	-0.016	-0.003	-0.033	-0.032	-0.001	-0.001
Age	65-74 (omitted group)	—	—	—	—	—	—
Age	75-84	-0.009	-0.002	-0.025	-0.019	0.004	0.065
Age	85 plus	0.001	-0.046	-0.026	-0.028	0.018	0.000
Education	Less than 8th grade	-0.033	-0.013	-0.028	-0.010	-0.009	-0.104
Education	Some High School	0.004	-0.029	-0.013	0.016	-0.011	-0.033
Education	High school grad or GED (omitted)	—	—	—	—	—	—
Education	Some college	0.003	-0.011	-0.029	-0.027	-0.020	-0.026
Education	College grad or more	0.005	-0.056	-0.016	-0.074	-0.016	-0.062
Mental/emotional status	Excellent and Very Good	-0.005	0.041	0.064	0.044	0.002	-0.001
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.025	-0.040	-0.025	-0.044	-0.001	-0.018
Patient lived alone	Yes—lived alone	-0.019	-0.068	-0.047	-0.036	-0.015	-0.001
ADL deficits	Count of number of deficits	0.001	-0.005	-0.013	-0.009	0.000	-0.008
Intercept	Intercept	0.963	0.900	0.913	0.914	0.970	0.777
Home health agencies	Dummy variables	—	—	—	—	—	—

(continued)

Table B-6. Step 6 Regression Results (continued)

Variable Category	Variable Name	Q3 n=4,970 Co- efficient	Q4 n=5,064 Co- efficient	Q5 n=4,995 Co- efficient	Q10 n=5,325 Co- efficient	Q12 n=2,133 Co- efficient	Q13 n=2,144 Co- efficient	Q14 n=2,110 Co- efficient
Proxy status	Had a proxy complete survey	0.042	0.047	0.047	0.013	0.027	0.058	0.050
Non English language	Non English primary language at home	0.006	0.014	0.018	-0.030	0.008	0.068	0.065
Age	18-49	-0.008	0.019	0.059	-0.036	-0.003	-0.054	-0.014
Age	50-64	-0.004	-0.001	0.033	-0.008	-0.035	-0.037	-0.004
Age	65-74 (omitted group)	—	—	—	—	—	—	—
Age	75-84	0.014	0.007	-0.001	-0.050	-0.024	-0.022	-0.042
Age	85 plus	0.044	-0.016	-0.016	-0.088	-0.040	-0.064	-0.061
Education	Less than 8th grade	0.002	0.007	0.030	-0.048	0.010	0.013	-0.012
Education	Some High School	0.016	0.013	0.032	-0.026	-0.037	0.019	0.016
Education	High school grad or GED (omitted)	—	—	—	—	—	—	—
Education	Some college	-0.026	-0.018	-0.040	0.006	-0.002	-0.014	-0.027
Education	College grad or more	-0.045	-0.028	-0.124	-0.024	-0.027	-0.035	-0.048
Mental/emotional status	Excellent and Very Good	-0.001	0.002	-0.026	0.005	0.012	0.028	0.023
Mental/emotional status	Good (omitted group)	—	—	—	—	—	—	—
Mental/emotional status	Fair and Poor	-0.029	-0.020	-0.025	-0.016	-0.018	-0.020	-0.034
Patient lived alone	Yes—lived alone	-0.047	-0.017	0.012	-0.011	-0.007	0.038	-0.024
ADL deficits	Count of number of deficits	0.015	-0.004	0.000	0.001	0.000	-0.011	-0.013
Intercept	Intercept	0.762	0.885	0.815	0.883	0.849	0.839	0.760
Home health agencies	Dummy variables	—	—	—	—	—	—	—

Note: **Bolded** values are statistically significant at $p < 0.05$.

APPENDIX C: IMPACT ANALYSES

Table C-1. Key to Variables in Impact Analyses

Variable	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6
Proxy status: Had a proxy complete survey	X	X	X			X
Non English language: Non English primary language at home	X	X	X	X	X	X
Age: Age 18-49	X	X	X	X	X	X
Age: Age 50-64	X	X	X	X	X	X
Age: Age 65-74 (omitted group)						
Age: Age 75-84	X	X	X	X	X	X
Age: Age 85 plus	X	X	X	X	X	X
Education: Less than 8th grade	X	X	X	X	X	X
Education: Some high school	X	X	X	X	X	X
Education: High school graduate or GED (omitted)						
Education: Some college	X	X	X	X	X	X
Education: College graduate or more	X	X	X	X	X	X
Mental/emotional status: Excellent and Very Good	X	X	X	X	X	X
Mental/emotional status: Good (omitted)						
Mental/emotional status: Fair and Poor	X	X	X	X	X	X
Patient lived alone: Yes—lived alone	X	X	X	X	X	X
Response mode: Telephone mode	X	X				
ADL Deficits: Count of number of deficits	X	X	X			X
Diagnoses (mental): Schizophrenia	X	X	X	X		
Diagnoses (mental): Dementia/cerebral degeneration	X	X	X	X		
Gender: Male	X					
Self-reported health: Excellent and Very Good	X					
Self-reported health: Good (omitted)						
Self-reported health: Fair and Poor	X					

(continued)

Table C-1. Key to Variables in Impact Analyses (continued)

Variable	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6
Response mode: Mixed mode	X					
Response mode: Mail mode (omitted group)						
Admission source: Institutional admission	X					
Admission source: Community (omitted)						
Payer status: Medicaid	X					
Payer status: Medicare (omitted)						
Diagnoses (physical): Diabetes/endocrine/metabolic issues	X					
Diagnoses (physical): Musculoskeletal/tissue/arthritis disorders	X					
Diagnoses (physical): Renal failure	X					
Diagnoses (physical): Urinary obstruction/incontinence	X					
Diagnoses (physical): Skin ulcers	X					
Diagnoses (physical): Complications of medical care/trauma	X					
Diagnoses (physical): Post-surgical/aftercare issues	X					

Note: Variables included in each of the regression model “sets” of adjustment variables used in impact analyses.

Table C-2. Overall Rating Impact Analysis Results

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 1	Rank of HHA with Adj Set 1	Point Change from Raw	Percent Change from Raw	Scores with Adj Set 2	Rank of HHA with Adj Set 2	Point Change from Set 1	Percent Change from Set 1	Scores with Adj Set 3	Rank of HHA with Adj Set 3	Point Change from Set 2	Percent Change from Set 2
ID1	1.000	1	0.936	4	-0.064	-6.4%	0.959	2	0.023	2.4%	0.957	2	-0.003	-0.3%
ID2	1.000	1	1.039	1	0.039	3.9%	1.054	1	0.014	1.4%	1.049	1	-0.004	-0.4%
ID3	0.943	3	0.942	3	-0.001	-0.1%	0.947	3	0.005	0.5%	0.941	3	-0.006	-0.6%
ID4	0.930	4	0.889	9	-0.041	-4.4%	0.905	9	0.015	1.7%	0.900	9	-0.005	-0.5%
ID5	0.919	5	0.889	10	-0.030	-3.3%	0.905	8	0.016	1.8%	0.900	8	-0.005	-0.6%
ID6	0.919	6	0.914	6	-0.005	-0.5%	0.920	5	0.006	0.6%	0.916	5	-0.003	-0.4%
ID7	0.915	7	0.869	16	-0.045	-5.0%	0.881	15	0.012	1.4%	0.878	15	-0.003	-0.4%
ID8	0.900	8	0.955	2	0.055	6.1%	0.926	4	-0.029	-3.1%	0.918	4	-0.007	-0.8%
ID9	0.900	8	0.920	5	0.020	2.2%	0.913	6	-0.007	-0.7%	0.908	6	-0.004	-0.5%
ID10	0.897	10	0.898	8	0.001	0.1%	0.908	7	0.010	1.1%	0.904	7	-0.004	-0.5%
ID11	0.896	11	0.882	12	-0.014	-1.6%	0.889	12	0.007	0.8%	0.884	13	-0.006	-0.6%
ID12	0.891	12	0.888	11	-0.003	-0.3%	0.894	11	0.006	0.7%	0.890	11	-0.004	-0.4%
ID13	0.889	13	0.865	18	-0.024	-2.7%	0.875	16	0.010	1.1%	0.871	16	-0.003	-0.4%
ID14	0.889	13	0.877	14	-0.012	-1.4%	0.872	17	-0.005	-0.6%	0.868	17	-0.004	-0.5%
ID15	0.885	15	0.879	13	-0.006	-0.6%	0.888	13	0.009	1.1%	0.885	12	-0.003	-0.3%
ID16	0.882	16	0.874	15	-0.008	-0.9%	0.869	18	-0.005	-0.6%	0.866	18	-0.004	-0.4%
ID17	0.875	17	0.839	30	-0.036	-4.2%	0.858	22	0.019	2.3%	0.854	22	-0.003	-0.4%
ID18	0.870	18	0.860	19	-0.010	-1.1%	0.869	19	0.009	1.1%	0.864	19	-0.005	-0.6%
ID19	0.869	19	0.866	17	-0.003	-0.3%	0.882	14	0.015	1.8%	0.878	14	-0.003	-0.4%
ID20	0.867	20	0.852	20	-0.014	-1.7%	0.853	24	0.000	0.0%	0.848	24	-0.005	-0.6%
ID21	0.863	21	0.851	23	-0.012	-1.3%	0.867	20	0.016	1.9%	0.862	20	-0.004	-0.5%
ID22	0.862	22	0.839	29	-0.023	-2.7%	0.853	23	0.014	1.7%	0.848	23	-0.005	-0.6%
ID23	0.857	23	0.851	22	-0.006	-0.7%	0.859	21	0.008	0.9%	0.856	21	-0.003	-0.4%
ID24	0.855	24	0.840	28	-0.015	-1.7%	0.848	29	0.007	0.9%	0.844	28	-0.004	-0.4%
ID25	0.853	25	0.847	24	-0.005	-0.6%	0.851	25	0.004	0.5%	0.847	26	-0.005	-0.6%
ID26	0.845	26	0.899	7	0.054	6.4%	0.904	10	0.005	0.6%	0.900	10	-0.005	-0.5%
ID27	0.845	27	0.836	31	-0.009	-1.0%	0.843	30	0.007	0.8%	0.838	30	-0.005	-0.5%
ID28	0.845	28	0.832	33	-0.012	-1.4%	0.851	26	0.019	2.3%	0.847	25	-0.004	-0.5%
ID29	0.844	29	0.841	27	-0.003	-0.3%	0.841	32	0.000	0.0%	0.836	33	-0.006	-0.7%
ID30	0.840	30	0.822	34	-0.018	-2.2%	0.829	34	0.007	0.9%	0.826	34	-0.003	-0.4%

(continued)

Table C-2. Overall Rating Impact Analysis Results (continued)

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 1	Rank of HHA with Adj Set 1	Point Change from Raw	Percent Change from Raw	Scores with Adj Set 2	Rank of HHA with Adj Set 2	Point Change from Set 1	Percent Change from Set 1	Scores with Adj Set 3	Rank of HHA with Adj Set 3	Point Change from Set 2	Percent Change from Set 2
ID31	0.838	31	0.834	32	-0.005	-0.6%	0.842	31	0.009	1.0%	0.838	31	-0.004	-0.5%
ID32	0.831	32	0.846	25	0.015	1.8%	0.848	28	0.003	0.3%	0.844	27	-0.004	-0.5%
ID33	0.830	33	0.842	26	0.012	1.5%	0.841	33	-0.001	-0.1%	0.836	32	-0.005	-0.5%
ID34	0.825	34	0.813	37	-0.012	-1.5%	0.821	36	0.008	0.9%	0.817	36	-0.004	-0.5%
ID35	0.824	35	0.810	39	-0.013	-1.6%	0.817	38	0.007	0.8%	0.813	38	-0.004	-0.5%
ID36	0.820	36	0.805	41	-0.015	-1.9%	0.812	40	0.008	0.9%	0.808	39	-0.004	-0.5%
ID37	0.811	37	0.789	46	-0.022	-2.7%	0.801	45	0.013	1.6%	0.797	45	-0.005	-0.6%
ID38	0.811	37	0.815	36	0.004	0.5%	0.811	41	-0.004	-0.5%	0.806	41	-0.005	-0.6%
ID39	0.810	39	0.817	35	0.007	0.9%	0.824	35	0.007	0.8%	0.820	35	-0.004	-0.5%
ID40	0.810	40	0.852	21	0.042	5.2%	0.850	27	-0.002	-0.2%	0.843	29	-0.007	-0.8%
ID41	0.807	41	0.811	38	0.004	0.5%	0.820	37	0.008	1.0%	0.815	37	-0.004	-0.5%
ID42	0.806	42	0.799	43	-0.007	-0.9%	0.808	42	0.008	1.0%	0.804	42	-0.004	-0.5%
ID43	0.793	43	0.775	48	-0.018	-2.2%	0.780	48	0.005	0.6%	0.776	48	-0.004	-0.6%
ID44	0.792	44	0.808	40	0.017	2.1%	0.812	39	0.004	0.5%	0.807	40	-0.005	-0.6%
ID45	0.790	45	0.782	47	-0.008	-1.0%	0.796	46	0.013	1.7%	0.791	46	-0.004	-0.6%
ID46	0.787	46	0.803	42	0.017	2.1%	0.804	43	0.001	0.1%	0.799	44	-0.006	-0.7%
ID47	0.784	47	0.795	44	0.011	1.4%	0.802	44	0.007	0.8%	0.799	43	-0.003	-0.4%
ID48	0.768	48	0.758	49	-0.010	-1.2%	0.758	51	-0.001	-0.1%	0.754	51	-0.004	-0.5%
ID49	0.765	49	0.794	45	0.029	3.8%	0.794	47	0.000	0.0%	0.790	47	-0.004	-0.5%
ID50	0.762	50	0.753	50	-0.009	-1.2%	0.761	50	0.009	1.1%	0.758	49	-0.003	-0.4%
ID51	0.758	51	0.746	54	-0.012	-1.6%	0.750	54	0.004	0.5%	0.746	54	-0.004	-0.5%
ID52	0.754	52	0.743	56	-0.012	-1.5%	0.748	55	0.006	0.8%	0.743	55	-0.005	-0.7%
ID53	0.750	53	0.750	51	0.000	0.0%	0.757	52	0.006	0.8%	0.754	52	-0.003	-0.4%
ID54	0.733	54	0.747	53	0.014	1.9%	0.762	49	0.015	2.0%	0.758	50	-0.005	-0.6%
ID55	0.731	55	0.750	52	0.019	2.6%	0.751	53	0.001	0.1%	0.746	53	-0.005	-0.7%
ID56	0.726	56	0.746	55	0.019	2.6%	0.737	56	-0.008	-1.1%	0.733	56	-0.004	-0.6%
ID57	0.714	57	0.707	57	-0.007	-1.0%	0.714	57	0.007	1.0%	0.710	57	-0.004	-0.5%
ID58	0.667	58	0.644	59	-0.023	-3.4%	0.665	59	0.021	3.3%	0.660	59	-0.005	-0.7%
ID59	0.667	58	0.666	58	0.000	-0.1%	0.693	58	0.027	4.1%	0.690	58	-0.003	-0.4%
ID60	0.625	60	0.631	60	0.006	1.0%	0.640	60	0.009	1.4%	0.634	60	-0.006	-0.9%

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Table C-2. Overall Rating Impact Analysis Results (continued)

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 4	Rank of HHA with Adj Set 4	Point Change from Set 3	Percent Change from Set 3	Scores with Adj Set 5	Rank of HHA with Adj Set 5	Point Change from Set 4	Percent Change from Set 4	Scores with Adj Set 6	Rank of HHA with Adj Set 6	Point Change from Set 3	Percent Change from Set 3
ID1	1.000	1	0.966	2	0.009	0.9%	0.969	2	0.004	0.4%	0.959	2	0.002	0.2%
ID2	1.000	1	1.032	1	-0.018	-1.7%	1.038	1	0.006	0.6%	1.054	1	0.005	0.5%
ID3	0.943	3	0.939	3	-0.003	-0.3%	0.935	3	-0.004	-0.4%	0.938	3	-0.003	-0.4%
ID4	0.930	4	0.906	6	0.006	0.7%	0.907	6	0.001	0.1%	0.900	9	0.001	0.1%
ID5	0.919	5	0.903	9	0.003	0.3%	0.905	7	0.002	0.2%	0.901	7	0.001	0.2%
ID6	0.919	6	0.914	5	-0.002	-0.2%	0.916	5	0.002	0.2%	0.918	5	0.002	0.2%
ID7	0.915	7	0.890	11	0.012	1.4%	0.890	11	0.000	0.0%	0.877	14	0.000	-0.1%
ID8	0.900	8	0.918	4	0.000	0.0%	0.922	4	0.004	0.4%	0.923	4	0.005	0.5%
ID9	0.900	8	0.903	8	-0.005	-0.6%	0.903	8	0.000	0.0%	0.908	6	0.000	0.0%
ID10	0.897	10	0.904	7	0.000	0.0%	0.899	9	-0.004	-0.5%	0.900	8	-0.003	-0.3%
ID11	0.896	11	0.880	14	-0.003	-0.4%	0.883	13	0.002	0.3%	0.886	12	0.003	0.3%
ID12	0.891	12	0.889	12	-0.001	-0.1%	0.889	12	0.000	0.0%	0.890	11	0.000	0.0%
ID13	0.889	13	0.869	18	-0.002	-0.2%	0.870	17	0.001	0.1%	0.873	16	0.002	0.2%
ID14	0.889	13	0.876	16	0.008	1.0%	0.875	15	-0.001	-0.1%	0.867	18	-0.001	-0.1%
ID15	0.885	15	0.883	13	-0.002	-0.2%	0.881	14	-0.002	-0.2%	0.884	13	-0.001	-0.2%
ID16	0.882	16	0.865	20	-0.001	-0.1%	0.867	19	0.002	0.2%	0.868	17	0.002	0.2%
ID17	0.875	17	0.859	21	0.005	0.6%	0.859	21	0.000	0.0%	0.853	22	-0.001	-0.1%
ID18	0.870	18	0.869	17	0.005	0.6%	0.866	20	-0.003	-0.4%	0.860	20	-0.004	-0.5%
ID19	0.869	19	0.880	15	0.001	0.2%	0.873	16	-0.007	-0.8%	0.873	15	-0.005	-0.6%
ID20	0.867	20	0.843	29	-0.005	-0.6%	0.847	25	0.004	0.5%	0.851	23	0.004	0.4%
ID21	0.863	21	0.866	19	0.004	0.4%	0.867	18	0.000	0.1%	0.863	19	0.000	0.0%
ID22	0.862	22	0.850	24	0.002	0.2%	0.847	24	-0.003	-0.3%	0.846	24	-0.002	-0.3%
ID23	0.857	23	0.855	22	-0.001	-0.1%	0.857	22	0.002	0.2%	0.857	21	0.002	0.2%
ID24	0.855	24	0.848	25	0.004	0.5%	0.847	23	0.000	0.0%	0.843	27	-0.001	-0.1%
ID25	0.853	25	0.847	26	0.001	0.1%	0.847	26	-0.001	-0.1%	0.846	25	-0.001	-0.1%
ID26	0.845	26	0.898	10	-0.002	-0.2%	0.892	10	-0.006	-0.7%	0.896	10	-0.004	-0.4%
ID27	0.845	27	0.839	30	0.001	0.1%	0.841	30	0.002	0.2%	0.839	30	0.001	0.1%
ID28	0.845	28	0.852	23	0.004	0.5%	0.844	27	-0.007	-0.8%	0.840	29	-0.007	-0.9%
ID29	0.844	29	0.830	33	-0.005	-0.6%	0.834	32	0.004	0.4%	0.839	31	0.003	0.4%
ID30	0.840	30	0.828	34	0.002	0.2%	0.831	33	0.003	0.4%	0.828	34	0.002	0.2%

(continued)

Table C-2. Overall Rating Impact Analysis Results (continued)

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 4	Rank of HHA with Adj Set 4	Point Change from Set 3	Percent Change from Set 3	Scores with Adj Set 5	Rank of HHA with Adj Set 5	Point Change from Set 4	Percent Change from Set 4	Scores with Adj Set 6	Rank of HHA with Adj Set 6	Point Change from Set 3	Percent Change from Set 3
ID31	0.838	31	0.845	28	0.007	0.9%	0.842	29	-0.004	-0.4%	0.835	32	-0.003	-0.3%
ID32	0.831	32	0.846	27	0.002	0.2%	0.844	28	-0.003	-0.3%	0.841	28	-0.003	-0.4%
ID33	0.830	33	0.834	32	-0.003	-0.3%	0.829	34	-0.005	-0.6%	0.832	33	-0.004	-0.5%
ID34	0.825	34	0.820	35	0.003	0.4%	0.819	35	-0.001	-0.1%	0.816	37	-0.001	-0.1%
ID35	0.824	35	0.809	39	-0.004	-0.5%	0.813	38	0.004	0.4%	0.816	36	0.003	0.3%
ID36	0.820	36	0.816	37	0.008	1.0%	0.814	37	-0.002	-0.2%	0.807	41	-0.002	-0.2%
ID37	0.811	37	0.797	44	0.001	0.1%	0.795	44	-0.002	-0.2%	0.796	44	-0.001	-0.1%
ID38	0.811	37	0.803	41	-0.003	-0.4%	0.805	40	0.002	0.3%	0.808	40	0.002	0.2%
ID39	0.810	39	0.817	36	-0.003	-0.3%	0.818	36	0.000	0.1%	0.820	35	0.000	0.0%
ID40	0.810	40	0.836	31	-0.008	-0.9%	0.837	31	0.001	0.1%	0.844	26	0.001	0.1%
ID41	0.807	41	0.812	38	-0.003	-0.4%	0.811	39	-0.001	-0.2%	0.814	38	-0.001	-0.1%
ID42	0.806	42	0.805	40	0.001	0.1%	0.805	41	0.000	0.0%	0.803	42	-0.001	-0.1%
ID43	0.793	43	0.780	48	0.005	0.6%	0.778	48	-0.002	-0.3%	0.774	48	-0.002	-0.2%
ID44	0.792	44	0.795	45	-0.013	-1.6%	0.799	42	0.004	0.5%	0.812	39	0.005	0.6%
ID45	0.790	45	0.790	46	-0.001	-0.2%	0.788	46	-0.001	-0.1%	0.791	47	0.000	0.0%
ID46	0.787	46	0.798	43	-0.001	-0.1%	0.798	43	0.000	0.1%	0.799	43	0.000	0.1%
ID47	0.784	47	0.800	42	0.001	0.1%	0.795	45	-0.005	-0.6%	0.796	45	-0.003	-0.4%
ID48	0.768	48	0.754	52	0.000	0.0%	0.753	51	-0.001	-0.1%	0.753	51	0.000	0.0%
ID49	0.765	49	0.784	47	-0.006	-0.7%	0.787	47	0.003	0.4%	0.792	46	0.002	0.3%
ID50	0.762	50	0.762	49	0.004	0.5%	0.760	50	-0.003	-0.3%	0.756	50	-0.003	-0.3%
ID51	0.758	51	0.756	50	0.010	1.3%	0.761	49	0.005	0.7%	0.749	53	0.003	0.4%
ID52	0.754	52	0.747	53	0.003	0.4%	0.749	53	0.002	0.3%	0.745	55	0.001	0.2%
ID53	0.750	53	0.754	51	0.000	0.1%	0.751	52	-0.002	-0.3%	0.752	52	-0.002	-0.2%
ID54	0.733	54	0.746	54	-0.012	-1.6%	0.745	54	-0.001	-0.2%	0.758	49	0.000	0.1%
ID55	0.731	55	0.743	55	-0.003	-0.5%	0.742	55	-0.001	-0.1%	0.746	54	0.000	0.0%
ID56	0.726	56	0.735	56	0.002	0.3%	0.735	56	0.000	0.0%	0.734	56	0.000	0.1%
ID57	0.714	57	0.716	57	0.005	0.7%	0.720	57	0.004	0.6%	0.713	57	0.002	0.3%
ID58	0.667	58	0.656	59	-0.004	-0.6%	0.658	59	0.002	0.3%	0.663	59	0.003	0.4%
ID59	0.667	58	0.690	58	0.000	0.0%	0.686	58	-0.004	-0.6%	0.687	58	-0.004	-0.5%
ID60	0.625	60	0.642	60	0.007	1.2%	0.646	60	0.005	0.7%	0.639	60	0.005	0.7%

Note: Changes in HHA scores as Mode/PMA variables are removed from the analysis model.

Table C-3. Willingness to Recommend Impact Analysis Results

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 1	Rank of HHA with Adj Set 1	Point Change from Raw	Percent Change from Raw	Scores with Adj Set 2	Rank of HHA with Adj Set 2	Point Change from Set 1	Percent Change from Set 1	Scores with Adj Set 3	Rank of HHA with Adj Set 3	Point Change from Set 2	Percent Change from Set 2
ID1	1.000	1	0.977	3	-0.023	-2.3%	0.979	3	0.001	0.1%	0.979	3	0.000	0.0%
ID8	1.000	1	1.004	1	0.004	0.4%	1.006	1	0.002	0.2%	1.006	1	0.001	0.1%
ID9	1.000	1	0.990	2	-0.010	-1.0%	1.005	2	0.015	1.6%	1.005	2	0.000	0.0%
ID7	0.927	4	0.866	11	-0.061	-6.6%	0.875	11	0.009	1.0%	0.875	11	0.000	0.0%
ID3	0.925	5	0.931	4	0.006	0.7%	0.937	4	0.007	0.7%	0.938	4	0.001	0.1%
ID10	0.923	6	0.902	5	-0.021	-2.3%	0.923	5	0.022	2.4%	0.924	5	0.000	0.0%
ID18	0.911	7	0.890	8	-0.021	-2.3%	0.909	8	0.019	2.1%	0.910	8	0.000	0.0%
ID15	0.899	8	0.900	7	0.000	0.1%	0.911	7	0.012	1.3%	0.912	7	0.000	0.0%
ID19	0.898	9	0.880	9	-0.019	-2.1%	0.917	6	0.037	4.2%	0.917	6	0.000	0.0%
ID5	0.892	10	0.850	15	-0.042	-4.7%	0.865	14	0.015	1.8%	0.865	14	0.000	0.1%
ID16	0.886	11	0.870	10	-0.016	-1.8%	0.877	10	0.007	0.8%	0.877	10	0.000	0.0%
ID12	0.865	12	0.865	12	-0.001	-0.1%	0.866	13	0.001	0.1%	0.866	13	0.000	0.0%
ID37	0.865	13	0.848	17	-0.017	-2.0%	0.860	15	0.013	1.5%	0.861	15	0.000	0.1%
ID38	0.861	14	0.862	13	0.001	0.1%	0.872	12	0.010	1.1%	0.872	12	0.000	0.0%
ID57	0.857	15	0.836	18	-0.022	-2.5%	0.849	18	0.014	1.6%	0.850	18	0.000	0.0%
ID58	0.857	15	0.833	19	-0.024	-2.8%	0.848	19	0.015	1.8%	0.849	19	0.000	0.1%
ID51	0.848	17	0.797	37	-0.051	-6.1%	0.814	34	0.017	2.2%	0.815	34	0.000	0.0%
ID24	0.848	18	0.828	21	-0.020	-2.4%	0.837	23	0.009	1.1%	0.838	23	0.000	0.0%
ID21	0.843	19	0.826	22	-0.017	-2.0%	0.843	20	0.016	2.0%	0.843	20	0.000	0.0%
ID36	0.841	20	0.812	30	-0.029	-3.5%	0.822	29	0.010	1.2%	0.822	29	0.000	0.0%
ID42	0.841	21	0.819	26	-0.021	-2.5%	0.839	22	0.020	2.4%	0.840	22	0.000	0.0%
ID44	0.840	22	0.853	14	0.013	1.6%	0.850	17	-0.003	-0.4%	0.851	17	0.000	0.1%
ID4	0.837	23	0.760	45	-0.077	-9.2%	0.787	42	0.027	3.5%	0.787	42	0.000	0.1%
ID6	0.837	23	0.817	27	-0.020	-2.4%	0.831	25	0.014	1.7%	0.831	25	0.000	0.0%
ID31	0.837	25	0.823	23	-0.013	-1.6%	0.834	24	0.011	1.3%	0.834	24	0.000	0.0%
ID52	0.836	26	0.802	34	-0.034	-4.1%	0.816	33	0.014	1.7%	0.816	33	0.000	0.1%
ID2	0.833	27	0.902	6	0.068	8.2%	0.906	9	0.005	0.5%	0.907	9	0.000	0.0%
ID32	0.831	28	0.822	25	-0.008	-1.0%	0.827	27	0.005	0.6%	0.828	27	0.000	0.0%
ID33	0.830	29	0.849	16	0.019	2.3%	0.855	16	0.006	0.7%	0.855	16	0.000	0.0%
ID22	0.830	29	0.807	32	-0.022	-2.7%	0.818	31	0.011	1.3%	0.818	31	0.000	0.1%

(continued)

Table C-3. Willingness to Recommend Impact Analysis Results (continued)

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 1	Rank of HHA with Adj Set 1	Point Change from Raw	Percent Change from Raw	Scores with Adj Set 2	Rank of HHA with Adj Set 2	Point Change from Set 1	Percent Change from Set 1	Scores with Adj Set 3	Rank of HHA with Adj Set 3	Point Change from Set 2	Percent Change from Set 2
ID41	0.828	31	0.828	20	0.000	0.0%	0.841	21	0.013	1.5%	0.841	21	0.000	0.0%
ID35	0.824	32	0.810	31	-0.013	-1.6%	0.830	26	0.020	2.4%	0.831	26	0.000	0.0%
ID27	0.820	33	0.816	28	-0.004	-0.4%	0.821	30	0.005	0.6%	0.821	30	0.000	0.1%
ID25	0.813	34	0.801	35	-0.011	-1.4%	0.809	36	0.008	1.0%	0.809	36	0.000	0.1%
ID17	0.810	35	0.779	41	-0.032	-3.9%	0.790	41	0.012	1.5%	0.791	41	0.000	0.0%
ID40	0.810	36	0.822	24	0.013	1.6%	0.824	28	0.002	0.2%	0.824	28	0.001	0.1%
ID29	0.806	37	0.804	33	-0.002	-0.3%	0.808	37	0.003	0.4%	0.808	37	0.001	0.1%
ID28	0.802	38	0.783	40	-0.019	-2.3%	0.799	40	0.015	1.9%	0.799	40	0.000	0.0%
ID20	0.800	39	0.792	39	-0.008	-1.0%	0.802	38	0.010	1.3%	0.803	38	0.000	0.1%
ID23	0.800	39	0.778	42	-0.022	-2.7%	0.783	44	0.005	0.7%	0.784	44	0.000	0.0%
ID56	0.798	41	0.815	29	0.017	2.1%	0.810	35	-0.005	-0.6%	0.810	35	0.000	0.0%
ID48	0.789	42	0.771	44	-0.018	-2.3%	0.780	45	0.009	1.1%	0.780	45	0.000	0.0%
ID13	0.778	43	0.748	49	-0.030	-3.9%	0.763	48	0.015	2.1%	0.763	48	0.000	0.0%
ID14	0.778	43	0.755	47	-0.023	-3.0%	0.766	46	0.011	1.5%	0.766	46	0.000	0.0%
ID26	0.778	43	0.800	36	0.022	2.8%	0.816	32	0.017	2.1%	0.817	32	0.000	0.1%
ID49	0.775	46	0.795	38	0.020	2.6%	0.801	39	0.007	0.9%	0.802	39	0.000	0.0%
ID34	0.769	47	0.753	48	-0.016	-2.1%	0.759	49	0.005	0.7%	0.759	49	0.000	0.0%
ID55	0.769	47	0.778	43	0.008	1.1%	0.784	43	0.007	0.9%	0.785	43	0.000	0.1%
ID11	0.766	49	0.741	50	-0.025	-3.2%	0.749	51	0.008	1.0%	0.749	51	0.001	0.1%
ID45	0.758	50	0.756	46	-0.002	-0.3%	0.764	47	0.008	1.1%	0.765	47	0.000	0.1%
ID53	0.750	51	0.728	54	-0.022	-3.0%	0.744	52	0.017	2.3%	0.745	52	0.000	0.0%
ID46	0.743	52	0.726	55	-0.018	-2.4%	0.741	54	0.015	2.1%	0.741	54	0.001	0.1%
ID39	0.741	53	0.728	53	-0.013	-1.8%	0.751	50	0.023	3.2%	0.751	50	0.000	0.0%
ID50	0.727	54	0.733	51	0.005	0.7%	0.742	53	0.009	1.2%	0.742	53	0.000	0.0%
ID54	0.710	55	0.728	52	0.018	2.6%	0.738	55	0.010	1.4%	0.738	55	0.000	0.1%
ID60	0.708	56	0.687	58	-0.021	-3.0%	0.702	57	0.015	2.1%	0.702	57	0.001	0.1%
ID47	0.694	57	0.707	56	0.012	1.7%	0.708	56	0.001	0.2%	0.708	56	0.000	0.0%
ID30	0.692	58	0.690	57	-0.003	-0.4%	0.694	58	0.005	0.7%	0.695	58	0.000	0.0%
ID43	0.672	59	0.663	60	-0.009	-1.3%	0.662	60	-0.001	-0.1%	0.663	60	0.000	0.1%
ID59	0.652	60	0.676	59	0.024	3.6%	0.676	59	0.001	0.1%	0.677	59	0.000	0.0%

(continued)

Table C-3. Willingness to Recommend Impact Analysis Results (continued)

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 4	Rank of HHA with Adj Set 4	Point Change from Set 3	Percent Change from Set 3	Scores with Adj Set 5	Rank of HHA with Adj Set 5	Point Change from Set 4	Percent Change from Set 4	Scores with Adj Set 6	Rank of HHA with Adj Set 6	Point Change from Set 3	Percent Change from Set 3
ID1	1.000	1	0.987	3	0.009	0.9%	0.995	2	0.008	0.8%	0.984	3	0.006	0.6%
ID8	1.000	1	1.009	1	0.002	0.2%	1.013	1	0.005	0.5%	1.014	1	0.008	0.8%
ID9	1.000	1	0.992	2	-0.013	-1.3%	0.986	3	-0.007	-0.7%	1.000	2	-0.006	-0.6%
ID7	0.927	4	0.902	9	0.027	3.0%	0.902	8	0.001	0.1%	0.874	12	-0.001	-0.2%
ID3	0.925	5	0.933	4	-0.005	-0.5%	0.930	4	-0.003	-0.4%	0.935	4	-0.003	-0.3%
ID10	0.923	6	0.928	5	0.004	0.4%	0.920	5	-0.007	-0.8%	0.917	5	-0.007	-0.8%
ID18	0.911	7	0.920	6	0.010	1.1%	0.917	6	-0.002	-0.3%	0.906	9	-0.004	-0.4%
ID15	0.899	8	0.905	8	-0.006	-0.7%	0.902	9	-0.003	-0.4%	0.909	7	-0.003	-0.3%
ID19	0.898	9	0.914	7	-0.003	-0.3%	0.903	7	-0.011	-1.2%	0.906	8	-0.011	-1.2%
ID5	0.892	10	0.874	11	0.009	1.0%	0.877	11	0.003	0.3%	0.867	13	0.002	0.2%
ID16	0.886	11	0.871	12	-0.005	-0.6%	0.875	12	0.003	0.4%	0.880	10	0.004	0.4%
ID12	0.865	12	0.867	13	0.000	0.1%	0.867	13	0.000	0.0%	0.866	14	0.000	0.0%
ID37	0.865	13	0.856	15	-0.005	-0.6%	0.853	16	-0.003	-0.3%	0.860	15	-0.001	-0.1%
ID38	0.861	14	0.861	14	-0.011	-1.3%	0.863	14	0.003	0.3%	0.874	11	0.002	0.3%
ID57	0.857	15	0.855	16	0.005	0.6%	0.861	15	0.006	0.8%	0.854	17	0.005	0.5%
ID58	0.857	15	0.845	18	-0.004	-0.5%	0.847	19	0.002	0.3%	0.853	18	0.004	0.5%
ID51	0.848	17	0.843	21	0.028	3.5%	0.851	18	0.008	0.9%	0.820	30	0.005	0.6%
ID24	0.848	18	0.842	23	0.005	0.5%	0.842	22	0.000	0.0%	0.837	23	-0.001	-0.1%
ID21	0.843	19	0.853	17	0.010	1.1%	0.853	17	0.001	0.1%	0.842	20	-0.001	-0.1%
ID36	0.841	20	0.840	25	0.017	2.1%	0.837	25	-0.002	-0.2%	0.819	31	-0.003	-0.4%
ID42	0.841	21	0.844	19	0.004	0.5%	0.844	20	0.000	0.0%	0.840	22	0.000	0.0%
ID44	0.840	22	0.838	26	-0.013	-1.5%	0.842	21	0.005	0.6%	0.859	16	0.009	1.0%
ID4	0.837	23	0.807	37	0.020	2.6%	0.809	35	0.001	0.2%	0.788	42	0.000	0.1%
ID6	0.837	23	0.831	28	0.000	0.1%	0.833	27	0.002	0.2%	0.833	25	0.002	0.3%
ID31	0.837	25	0.843	20	0.009	1.1%	0.839	23	-0.004	-0.5%	0.831	26	-0.004	-0.4%
ID52	0.836	26	0.827	29	0.011	1.4%	0.830	29	0.002	0.3%	0.817	32	0.001	0.1%
ID2	0.833	27	0.883	10	-0.024	-2.6%	0.892	10	0.009	1.1%	0.917	6	0.010	1.1%
ID32	0.831	28	0.840	24	0.013	1.5%	0.839	24	-0.002	-0.2%	0.824	28	-0.003	-0.4%
ID33	0.830	29	0.842	22	-0.013	-1.5%	0.835	26	-0.007	-0.8%	0.849	19	-0.006	-0.7%
ID22	0.830	29	0.819	30	0.001	0.1%	0.816	33	-0.004	-0.5%	0.814	33	-0.004	-0.5%

(continued)

Table C-3. Willingness to Recommend Impact Analysis Results (continued)

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 4	Rank of HHA with Adj Set 4	Point Change from Set 3	Percent Change from Set 3	Scores with Adj Set 5	Rank of HHA with Adj Set 5	Point Change from Set 4	Percent Change from Set 4	Scores with Adj Set 6	Rank of HHA with Adj Set 6	Point Change from Set 3	Percent Change from Set 3
ID41	0.828	31	0.832	27	-0.009	-1.1%	0.831	28	-0.001	-0.2%	0.841	21	-0.001	-0.1%
ID35	0.824	32	0.818	31	-0.013	-1.6%	0.823	30	0.005	0.7%	0.836	24	0.005	0.7%
ID27	0.820	33	0.817	32	-0.004	-0.4%	0.821	31	0.004	0.4%	0.824	29	0.003	0.4%
ID25	0.813	34	0.811	35	0.001	0.2%	0.811	34	0.000	0.0%	0.810	38	0.000	0.0%
ID17	0.810	35	0.801	39	0.010	1.3%	0.802	38	0.001	0.1%	0.791	40	0.000	0.0%
ID40	0.810	36	0.816	33	-0.008	-1.0%	0.817	32	0.001	0.1%	0.825	27	0.001	0.1%
ID29	0.806	37	0.801	38	-0.007	-0.8%	0.806	36	0.005	0.6%	0.813	34	0.005	0.6%
ID28	0.802	38	0.811	34	0.012	1.5%	0.804	37	-0.007	-0.9%	0.791	41	-0.008	-1.1%
ID20	0.800	39	0.789	42	-0.014	-1.7%	0.795	42	0.006	0.8%	0.810	37	0.008	1.0%
ID23	0.800	39	0.783	43	0.000	0.0%	0.785	43	0.002	0.2%	0.786	43	0.002	0.3%
ID56	0.798	41	0.799	40	-0.011	-1.4%	0.799	40	-0.001	-0.1%	0.811	36	0.001	0.1%
ID48	0.789	42	0.775	45	-0.005	-0.7%	0.774	45	-0.001	-0.2%	0.780	45	-0.001	-0.1%
ID13	0.778	43	0.760	49	-0.004	-0.5%	0.761	48	0.001	0.2%	0.766	46	0.002	0.3%
ID14	0.778	43	0.772	46	0.005	0.7%	0.770	46	-0.001	-0.1%	0.765	47	-0.002	-0.2%
ID26	0.778	43	0.808	36	-0.008	-1.0%	0.801	39	-0.008	-1.0%	0.811	35	-0.006	-0.7%
ID49	0.775	46	0.791	41	-0.010	-1.3%	0.795	41	0.004	0.5%	0.806	39	0.004	0.5%
ID34	0.769	47	0.767	47	0.008	1.0%	0.766	47	-0.001	-0.1%	0.756	49	-0.003	-0.4%
ID55	0.769	47	0.779	44	-0.006	-0.8%	0.777	44	-0.001	-0.1%	0.785	44	0.000	0.0%
ID11	0.766	49	0.747	52	-0.003	-0.3%	0.750	51	0.003	0.5%	0.754	50	0.005	0.7%
ID45	0.758	50	0.765	48	0.000	0.0%	0.761	49	-0.004	-0.6%	0.761	48	-0.004	-0.5%
ID53	0.750	51	0.752	50	0.007	1.0%	0.746	52	-0.005	-0.7%	0.738	54	-0.006	-0.9%
ID46	0.743	52	0.744	53	0.003	0.4%	0.743	53	-0.001	-0.2%	0.740	52	-0.002	-0.2%
ID39	0.741	53	0.751	51	0.000	0.0%	0.753	50	0.002	0.3%	0.752	51	0.001	0.2%
ID50	0.727	54	0.740	54	-0.002	-0.3%	0.732	54	-0.008	-1.1%	0.733	55	-0.009	-1.1%
ID54	0.710	55	0.721	55	-0.017	-2.4%	0.719	55	-0.002	-0.3%	0.739	53	0.000	0.0%
ID60	0.708	56	0.711	56	0.009	1.2%	0.717	56	0.006	0.8%	0.710	56	0.008	1.1%
ID47	0.694	57	0.705	57	-0.003	-0.5%	0.699	57	-0.005	-0.8%	0.704	57	-0.004	-0.6%
ID30	0.692	58	0.691	58	-0.003	-0.5%	0.697	58	0.006	0.8%	0.699	58	0.004	0.6%
ID43	0.672	59	0.669	59	0.006	1.0%	0.666	59	-0.003	-0.5%	0.659	60	-0.004	-0.6%
ID59	0.652	60	0.667	60	-0.010	-1.5%	0.660	60	-0.007	-1.0%	0.669	59	-0.007	-1.1%

Note: Changes in HHA scores as Mode/PMA variables are removed from the analysis model.

Table C-4. Care of Patients Composite Impact Analysis Results

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 1	Rank of HHA with Adj Set 1	Point Change from Raw	Percent Change from Raw	Scores with Adj Set 2	Rank of HHA with Adj Set 2	Point Change from Set 1	Percent Change from Set 1	Scores with Adj Set 3	Rank of HHA with Adj Set 3	Point Change from Set 2	Percent Change from Set 2
ID8	0.969	1	0.981	1	0.012	1.3%	0.973	1	-0.008	-0.8%	0.966	1	-0.006	-0.6%
ID9	0.947	2	0.956	2	0.010	1.0%	0.951	2	-0.005	-0.6%	0.948	2	-0.003	-0.4%
ID4	0.942	3	0.917	8	-0.025	-2.7%	0.921	7	0.004	0.4%	0.917	6	-0.004	-0.4%
ID6	0.940	4	0.942	3	0.002	0.2%	0.937	3	-0.005	-0.5%	0.935	3	-0.002	-0.3%
ID18	0.926	5	0.931	4	0.005	0.6%	0.928	4	-0.003	-0.3%	0.925	4	-0.004	-0.4%
ID51	0.925	6	0.925	7	0.000	0.0%	0.918	8	-0.007	-0.8%	0.915	8	-0.003	-0.3%
ID15	0.919	7	0.927	5	0.008	0.9%	0.923	5	-0.004	-0.4%	0.921	5	-0.002	-0.2%
ID1	0.917	8	0.898	17	-0.018	-2.0%	0.911	10	0.013	1.4%	0.910	10	0.000	-0.1%
ID3	0.915	9	0.927	6	0.012	1.3%	0.921	6	-0.005	-0.6%	0.917	7	-0.004	-0.5%
ID17	0.913	10	0.906	13	-0.007	-0.8%	0.904	14	-0.002	-0.3%	0.901	13	-0.003	-0.3%
ID35	0.903	11	0.915	11	0.013	1.4%	0.907	11	-0.008	-0.9%	0.904	11	-0.003	-0.3%
ID7	0.902	12	0.882	30	-0.020	-2.2%	0.880	26	-0.002	-0.3%	0.877	26	-0.003	-0.3%
ID22	0.902	13	0.902	15	0.000	0.0%	0.901	16	-0.002	-0.2%	0.897	16	-0.004	-0.4%
ID11	0.900	14	0.888	25	-0.012	-1.3%	0.889	21	0.000	0.1%	0.885	22	-0.004	-0.5%
ID5	0.898	15	0.888	24	-0.010	-1.1%	0.888	22	0.000	-0.1%	0.883	23	-0.005	-0.5%
ID29	0.898	16	0.909	12	0.011	1.2%	0.905	13	-0.004	-0.4%	0.901	14	-0.004	-0.4%
ID12	0.897	17	0.906	14	0.009	1.0%	0.902	15	-0.004	-0.4%	0.899	15	-0.003	-0.3%
ID37	0.896	18	0.893	20	-0.003	-0.3%	0.891	19	-0.002	-0.3%	0.887	19	-0.004	-0.4%
ID27	0.893	19	0.902	16	0.009	1.0%	0.896	17	-0.006	-0.7%	0.893	17	-0.003	-0.4%
ID20	0.889	20	0.894	19	0.005	0.5%	0.888	23	-0.006	-0.7%	0.885	21	-0.002	-0.3%
ID10	0.889	21	0.889	23	-0.001	-0.1%	0.889	20	0.001	0.1%	0.886	20	-0.004	-0.4%
ID16	0.887	22	0.889	21	0.002	0.2%	0.883	25	-0.006	-0.7%	0.880	25	-0.003	-0.3%
ID32	0.887	23	0.898	18	0.012	1.3%	0.896	18	-0.003	-0.3%	0.893	18	-0.003	-0.3%
ID31	0.883	24	0.889	22	0.006	0.7%	0.886	24	-0.003	-0.3%	0.883	24	-0.003	-0.4%
ID24	0.879	25	0.880	31	0.001	0.1%	0.876	30	-0.004	-0.4%	0.874	30	-0.003	-0.3%
ID45	0.877	26	0.884	27	0.007	0.7%	0.880	27	-0.004	-0.5%	0.877	28	-0.003	-0.4%
ID2	0.875	27	0.917	9	0.042	4.8%	0.915	9	-0.002	-0.2%	0.911	9	-0.003	-0.4%
ID25	0.872	28	0.876	35	0.004	0.4%	0.871	32	-0.004	-0.5%	0.868	32	-0.004	-0.4%
ID48	0.870	29	0.872	36	0.002	0.3%	0.863	39	-0.009	-1.0%	0.860	39	-0.003	-0.3%
ID19	0.867	30	0.887	26	0.020	2.3%	0.880	28	-0.007	-0.8%	0.877	27	-0.003	-0.3%

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Table C-4. Care of Patients Composite Impact Analysis Results (continued)

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 1	Rank of HHA with Adj Set 1	Point Change from Raw	Percent Change from Raw	Scores with Adj Set 2	Rank of HHA with Adj Set 2	Point Change from Set 1	Percent Change from Set 1	Scores with Adj Set 3	Rank of HHA with Adj Set 3	Point Change from Set 2	Percent Change from Set 2
ID21	0.866	31	0.867	39	0.001	0.1%	0.865	38	-0.001	-0.2%	0.862	38	-0.003	-0.4%
ID36	0.866	32	0.866	41	0.000	-0.1%	0.861	41	-0.005	-0.6%	0.857	41	-0.003	-0.4%
ID38	0.865	33	0.880	32	0.014	1.7%	0.869	34	-0.011	-1.2%	0.865	36	-0.004	-0.5%
ID14	0.865	34	0.864	43	-0.001	-0.1%	0.869	35	0.005	0.6%	0.866	34	-0.003	-0.3%
ID33	0.863	35	0.879	33	0.015	1.8%	0.874	31	-0.005	-0.5%	0.871	31	-0.003	-0.4%
ID44	0.863	36	0.883	29	0.020	2.3%	0.870	33	-0.012	-1.4%	0.866	33	-0.004	-0.4%
ID53	0.862	37	0.870	37	0.008	0.9%	0.867	37	-0.003	-0.3%	0.866	35	-0.002	-0.2%
ID54	0.862	38	0.883	28	0.022	2.5%	0.879	29	-0.005	-0.6%	0.875	29	-0.004	-0.5%
ID43	0.860	39	0.859	44	0.000	0.0%	0.853	47	-0.006	-0.7%	0.849	46	-0.004	-0.4%
ID23	0.857	40	0.858	45	0.001	0.1%	0.853	45	-0.004	-0.5%	0.851	45	-0.003	-0.3%
ID28	0.857	41	0.856	47	-0.001	-0.1%	0.860	42	0.004	0.4%	0.856	42	-0.003	-0.4%
ID30	0.856	42	0.866	40	0.010	1.2%	0.858	44	-0.008	-0.9%	0.856	43	-0.002	-0.3%
ID52	0.855	43	0.852	51	-0.002	-0.3%	0.849	49	-0.003	-0.4%	0.845	50	-0.004	-0.5%
ID26	0.854	44	0.916	10	0.062	7.3%	0.906	12	-0.011	-1.2%	0.902	12	-0.004	-0.4%
ID55	0.851	45	0.865	42	0.014	1.6%	0.859	43	-0.006	-0.7%	0.855	44	-0.004	-0.4%
ID41	0.848	46	0.868	38	0.019	2.3%	0.863	40	-0.005	-0.6%	0.859	40	-0.003	-0.4%
ID46	0.847	47	0.857	46	0.010	1.2%	0.853	46	-0.004	-0.4%	0.849	47	-0.004	-0.5%
ID49	0.846	48	0.877	34	0.031	3.7%	0.868	36	-0.009	-1.0%	0.865	37	-0.003	-0.3%
ID47	0.845	49	0.854	48	0.009	1.1%	0.849	50	-0.005	-0.6%	0.846	49	-0.003	-0.3%
ID42	0.840	50	0.847	53	0.006	0.7%	0.842	53	-0.004	-0.5%	0.839	53	-0.003	-0.3%
ID39	0.836	51	0.853	50	0.017	2.0%	0.847	52	-0.006	-0.7%	0.844	51	-0.003	-0.4%
ID59	0.836	52	0.847	52	0.010	1.2%	0.850	48	0.003	0.4%	0.847	48	-0.002	-0.3%
ID13	0.830	53	0.832	54	0.002	0.3%	0.825	55	-0.007	-0.8%	0.822	55	-0.003	-0.4%
ID34	0.829	54	0.832	55	0.003	0.4%	0.829	54	-0.003	-0.3%	0.826	54	-0.003	-0.4%
ID40	0.824	55	0.853	49	0.029	3.5%	0.848	51	-0.005	-0.6%	0.842	52	-0.006	-0.7%
ID60	0.814	56	0.819	57	0.004	0.5%	0.815	57	-0.003	-0.4%	0.811	57	-0.004	-0.5%
ID58	0.811	57	0.807	58	-0.004	-0.5%	0.806	58	0.000	0.0%	0.803	58	-0.003	-0.4%
ID56	0.806	58	0.823	56	0.018	2.2%	0.815	56	-0.008	-1.0%	0.812	56	-0.003	-0.4%
ID50	0.783	59	0.787	59	0.004	0.6%	0.788	59	0.000	0.0%	0.785	59	-0.002	-0.3%
ID57	0.766	60	0.769	60	0.003	0.4%	0.767	60	-0.002	-0.2%	0.764	60	-0.003	-0.4%

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Table C-4. Care of Patients Composite Impact Analysis Results (continued)

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 4	Rank of HHA with Adj Set 4	Point Change from Set 3	Percent Change from Set 3	Scores with Adj Set 5	Rank of HHA with Adj Set 5	Point Change from Set 4	Percent Change from Set 4	Scores with Adj Set 6	Rank of HHA with Adj Set 6	Point Change from Set 3	Percent Change from Set 3
ID8	0.969	1	0.977	1	0.010	1.0%	0.978	1	0.002	0.2%	0.969	1	0.002	0.2%
ID9	0.947	2	0.941	2	-0.006	-0.6%	0.941	2	0.000	-0.1%	0.947	2	0.000	0.0%
ID4	0.942	3	0.925	5	0.008	0.8%	0.925	5	0.000	0.0%	0.918	6	0.000	0.0%
ID6	0.940	4	0.934	3	-0.001	-0.1%	0.935	3	0.001	0.1%	0.936	3	0.001	0.1%
ID18	0.926	5	0.928	4	0.004	0.4%	0.926	4	-0.002	-0.2%	0.922	4	-0.002	-0.3%
ID51	0.925	6	0.922	6	0.007	0.8%	0.924	6	0.002	0.2%	0.916	7	0.001	0.2%
ID15	0.919	7	0.918	7	-0.003	-0.3%	0.917	7	-0.001	-0.1%	0.920	5	-0.001	-0.1%
ID1	0.917	8	0.910	9	0.000	-0.1%	0.912	9	0.002	0.2%	0.912	10	0.001	0.1%
ID3	0.915	9	0.917	8	0.000	0.0%	0.915	8	-0.002	-0.2%	0.915	8	-0.002	-0.2%
ID17	0.913	10	0.903	11	0.002	0.3%	0.903	11	0.000	-0.1%	0.900	13	-0.001	-0.1%
ID35	0.903	11	0.899	14	-0.005	-0.6%	0.900	13	0.002	0.2%	0.905	11	0.001	0.1%
ID7	0.902	12	0.885	23	0.008	0.9%	0.885	24	0.000	0.0%	0.877	26	0.000	0.0%
ID22	0.902	13	0.896	17	-0.001	-0.2%	0.894	17	-0.001	-0.1%	0.896	16	-0.001	-0.1%
ID11	0.900	14	0.884	24	0.000	0.0%	0.885	23	0.001	0.1%	0.886	21	0.001	0.1%
ID5	0.898	15	0.886	22	0.002	0.3%	0.887	20	0.001	0.1%	0.884	23	0.001	0.1%
ID29	0.898	16	0.897	15	-0.004	-0.4%	0.899	15	0.001	0.2%	0.902	12	0.001	0.1%
ID12	0.897	17	0.899	13	0.000	0.0%	0.899	14	0.000	0.0%	0.899	15	0.000	0.0%
ID37	0.896	18	0.888	19	0.000	0.1%	0.887	19	-0.001	-0.1%	0.887	19	0.000	0.0%
ID27	0.893	19	0.891	18	-0.002	-0.2%	0.891	18	0.001	0.1%	0.893	17	0.000	0.0%
ID20	0.889	20	0.881	25	-0.004	-0.4%	0.883	25	0.002	0.2%	0.886	20	0.001	0.1%
ID10	0.889	21	0.887	21	0.002	0.2%	0.886	22	-0.002	-0.2%	0.885	22	-0.001	-0.1%
ID16	0.887	22	0.877	26	-0.002	-0.3%	0.878	26	0.001	0.1%	0.880	25	0.001	0.1%
ID32	0.887	23	0.897	16	0.004	0.5%	0.895	16	-0.002	-0.2%	0.890	18	-0.002	-0.2%
ID31	0.883	24	0.887	20	0.005	0.5%	0.886	21	-0.001	-0.2%	0.881	24	-0.001	-0.2%
ID24	0.879	25	0.875	29	0.001	0.1%	0.874	29	0.000	0.0%	0.873	30	0.000	-0.1%
ID45	0.877	26	0.876	28	-0.001	-0.1%	0.876	27	0.000	0.0%	0.877	27	0.000	0.0%
ID2	0.875	27	0.903	12	-0.008	-0.9%	0.906	10	0.003	0.3%	0.913	9	0.002	0.2%
ID25	0.872	28	0.868	32	0.001	0.1%	0.868	32	0.000	-0.1%	0.867	33	-0.001	-0.1%
ID48	0.870	29	0.857	41	-0.003	-0.4%	0.857	40	0.000	0.0%	0.860	39	0.000	0.0%
ID19	0.867	30	0.877	27	0.000	0.0%	0.875	28	-0.002	-0.2%	0.876	28	-0.001	-0.1%

(continued)

Table C-4. Care of Patients Composite Impact Analysis Results (continued)

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 4	Rank of HHA with Adj Set 4	Point Change from Set 3	Percent Change from Set 3	Scores with Adj Set 5	Rank of HHA with Adj Set 5	Point Change from Set 4	Percent Change from Set 4	Scores with Adj Set 6	Rank of HHA with Adj Set 6	Point Change from Set 3	Percent Change from Set 3
ID21	0.866	31	0.865	36	0.003	0.4%	0.866	35	0.001	0.1%	0.863	38	0.001	0.1%
ID36	0.866	32	0.864	37	0.006	0.8%	0.863	37	-0.001	-0.1%	0.857	41	-0.001	-0.1%
ID38	0.865	33	0.860	39	-0.005	-0.6%	0.861	39	0.001	0.1%	0.866	35	0.001	0.1%
ID14	0.865	34	0.869	31	0.003	0.3%	0.868	31	-0.001	-0.1%	0.866	37	-0.001	-0.1%
ID33	0.863	35	0.866	33	-0.005	-0.5%	0.864	36	-0.002	-0.2%	0.869	31	-0.002	-0.2%
ID44	0.863	36	0.866	35	-0.001	-0.1%	0.868	33	0.002	0.2%	0.869	32	0.002	0.3%
ID53	0.862	37	0.866	34	0.000	0.0%	0.867	34	0.001	0.1%	0.867	34	0.001	0.2%
ID54	0.862	38	0.870	30	-0.005	-0.6%	0.869	30	-0.001	-0.1%	0.874	29	0.000	0.0%
ID43	0.860	39	0.851	45	0.002	0.3%	0.851	45	-0.001	-0.1%	0.849	47	0.000	0.0%
ID23	0.857	40	0.849	47	-0.002	-0.2%	0.850	47	0.001	0.1%	0.851	45	0.001	0.1%
ID28	0.857	41	0.860	40	0.004	0.4%	0.856	41	-0.004	-0.4%	0.853	44	-0.004	-0.4%
ID30	0.856	42	0.852	44	-0.003	-0.4%	0.854	44	0.001	0.2%	0.856	42	0.001	0.1%
ID52	0.855	43	0.848	48	0.003	0.3%	0.848	48	0.001	0.1%	0.846	49	0.001	0.1%
ID26	0.854	44	0.905	10	0.003	0.3%	0.902	12	-0.003	-0.3%	0.900	14	-0.002	-0.2%
ID55	0.851	45	0.855	43	0.000	0.0%	0.854	43	0.000	0.0%	0.855	43	0.000	0.0%
ID41	0.848	46	0.857	42	-0.003	-0.3%	0.856	42	-0.001	-0.1%	0.859	40	-0.001	-0.1%
ID46	0.847	47	0.850	46	0.002	0.2%	0.851	46	0.000	0.0%	0.849	46	0.000	0.0%
ID49	0.846	48	0.861	38	-0.004	-0.5%	0.862	38	0.001	0.1%	0.866	36	0.001	0.1%
ID47	0.845	49	0.847	49	0.001	0.1%	0.844	50	-0.002	-0.3%	0.845	50	-0.001	-0.2%
ID42	0.840	50	0.841	52	0.002	0.2%	0.841	52	0.000	0.0%	0.839	53	0.000	0.0%
ID39	0.836	51	0.844	50	0.000	0.0%	0.845	49	0.000	0.0%	0.844	51	0.000	0.0%
ID59	0.836	52	0.843	51	-0.004	-0.5%	0.842	51	-0.002	-0.2%	0.846	48	-0.002	-0.2%
ID13	0.830	53	0.823	55	0.001	0.1%	0.824	56	0.001	0.1%	0.823	55	0.001	0.1%
ID34	0.829	54	0.827	54	0.001	0.1%	0.827	54	0.000	0.0%	0.825	54	0.000	0.0%
ID40	0.824	55	0.839	53	-0.003	-0.4%	0.840	53	0.001	0.1%	0.843	52	0.000	0.0%
ID60	0.814	56	0.822	56	0.011	1.4%	0.824	55	0.002	0.2%	0.813	56	0.002	0.2%
ID58	0.811	57	0.803	58	0.000	0.0%	0.804	58	0.001	0.1%	0.804	58	0.001	0.2%
ID56	0.806	58	0.808	57	-0.004	-0.6%	0.808	57	0.000	0.0%	0.812	57	0.000	0.0%
ID50	0.783	59	0.784	59	-0.002	-0.2%	0.781	59	-0.002	-0.3%	0.783	59	-0.002	-0.3%
ID57	0.766	60	0.763	60	-0.001	-0.1%	0.765	60	0.002	0.2%	0.765	60	0.001	0.1%

Note: Changes in HHA scores as Mode/PMA variables are removed from the analysis model.

Table C-5. Communications Composite Impact Analysis Results

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 1	Rank of HHA with Adj Set 1	Point Change from Raw	Percent Change from Raw	Scores with Adj Set 2	Rank of HHA with Adj Set 2	Point Change from Set 1	Percent Change from Set 1	Scores with Adj Set 3	Rank of HHA with Adj Set 3	Point Change from Set 2	Percent Change from Set 2
ID9	0.944	1	0.958	1	0.014	1.5%	0.947	2	-0.011	-1.2%	0.943	1	-0.005	-0.5%
ID5	0.935	2	0.941	4	0.006	0.6%	0.928	5	-0.013	-1.4%	0.921	5	-0.006	-0.7%
ID29	0.933	3	0.958	2	0.025	2.7%	0.948	1	-0.011	-1.1%	0.942	2	-0.006	-0.6%
ID8	0.933	4	0.934	6	0.001	0.1%	0.935	3	0.001	0.1%	0.933	3	-0.002	-0.2%
ID10	0.933	5	0.942	3	0.010	1.0%	0.933	4	-0.009	-1.0%	0.929	4	-0.004	-0.5%
ID6	0.926	6	0.936	5	0.010	1.1%	0.924	6	-0.012	-1.3%	0.921	6	-0.003	-0.4%
ID15	0.909	7	0.933	7	0.024	2.7%	0.920	7	-0.013	-1.4%	0.916	7	-0.004	-0.4%
ID7	0.908	8	0.904	13	-0.004	-0.5%	0.883	16	-0.021	-2.3%	0.879	16	-0.004	-0.5%
ID4	0.901	9	0.880	24	-0.021	-2.3%	0.878	19	-0.002	-0.2%	0.874	17	-0.004	-0.4%
ID12	0.891	10	0.911	11	0.021	2.3%	0.904	9	-0.008	-0.9%	0.900	9	-0.004	-0.4%
ID16	0.890	11	0.899	15	0.009	1.0%	0.890	13	-0.009	-1.0%	0.887	12	-0.003	-0.3%
ID35	0.890	12	0.912	10	0.023	2.5%	0.897	10	-0.015	-1.6%	0.894	10	-0.003	-0.3%
ID27	0.887	13	0.912	9	0.025	2.8%	0.891	12	-0.021	-2.3%	0.886	13	-0.005	-0.6%
ID23	0.880	14	0.881	23	0.001	0.1%	0.874	22	-0.006	-0.7%	0.871	21	-0.003	-0.4%
ID19	0.878	15	0.904	12	0.026	3.0%	0.897	11	-0.008	-0.8%	0.893	11	-0.004	-0.4%
ID32	0.878	16	0.892	18	0.014	1.6%	0.887	15	-0.005	-0.6%	0.883	14	-0.004	-0.4%
ID2	0.875	17	0.928	8	0.053	6.0%	0.913	8	-0.015	-1.6%	0.909	8	-0.004	-0.4%
ID3	0.874	18	0.902	14	0.028	3.2%	0.887	14	-0.015	-1.6%	0.881	15	-0.006	-0.7%
ID25	0.873	19	0.889	20	0.016	1.8%	0.879	18	-0.010	-1.1%	0.874	19	-0.005	-0.6%
ID18	0.873	20	0.891	19	0.019	2.2%	0.879	17	-0.012	-1.3%	0.874	18	-0.005	-0.6%
ID13	0.871	21	0.864	31	-0.007	-0.8%	0.861	29	-0.003	-0.3%	0.859	29	-0.002	-0.2%
ID17	0.867	22	0.875	25	0.008	0.9%	0.857	30	-0.018	-2.1%	0.854	30	-0.003	-0.4%
ID45	0.865	23	0.875	26	0.010	1.1%	0.866	27	-0.009	-1.0%	0.861	27	-0.005	-0.6%
ID44	0.865	24	0.893	17	0.028	3.2%	0.877	20	-0.016	-1.7%	0.873	20	-0.004	-0.5%
ID14	0.863	25	0.872	28	0.009	1.0%	0.876	21	0.004	0.5%	0.871	22	-0.005	-0.6%
ID21	0.863	26	0.872	27	0.009	1.0%	0.865	28	-0.007	-0.8%	0.860	28	-0.005	-0.5%
ID38	0.859	27	0.894	16	0.034	4.0%	0.869	25	-0.025	-2.8%	0.863	26	-0.005	-0.6%
ID51	0.856	28	0.860	33	0.004	0.4%	0.847	35	-0.013	-1.5%	0.844	33	-0.003	-0.4%
ID33	0.854	29	0.886	22	0.032	3.7%	0.868	26	-0.017	-2.0%	0.865	24	-0.003	-0.3%
ID40	0.852	30	0.871	29	0.019	2.3%	0.871	23	0.000	-0.1%	0.867	23	-0.004	-0.4%

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Table C-5. Communications Composite Impact Analysis Results (continued)

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 1	Rank of HHA with Adj Set 1	Point Change from Raw	Percent Change from Raw	Scores with Adj Set 2	Rank of HHA with Adj Set 2	Point Change from Set 1	Percent Change from Set 1	Scores with Adj Set 3	Rank of HHA with Adj Set 3	Point Change from Set 2	Percent Change from Set 2
ID24	0.849	31	0.851	39	0.003	0.3%	0.847	36	-0.004	-0.5%	0.843	34	-0.003	-0.4%
ID36	0.848	32	0.856	34	0.008	0.9%	0.842	38	-0.013	-1.6%	0.838	38	-0.004	-0.5%
ID11	0.842	33	0.843	44	0.002	0.2%	0.832	46	-0.011	-1.3%	0.826	47	-0.006	-0.7%
ID55	0.840	34	0.864	32	0.023	2.8%	0.852	31	-0.012	-1.3%	0.847	31	-0.005	-0.6%
ID31	0.839	35	0.852	38	0.013	1.6%	0.841	39	-0.011	-1.3%	0.838	39	-0.003	-0.3%
ID48	0.838	36	0.836	50	-0.002	-0.3%	0.833	44	-0.003	-0.3%	0.829	44	-0.004	-0.5%
ID53	0.837	37	0.850	40	0.013	1.6%	0.839	40	-0.011	-1.3%	0.836	40	-0.003	-0.4%
ID59	0.834	38	0.852	37	0.018	2.2%	0.848	33	-0.005	-0.5%	0.841	36	-0.006	-0.7%
ID58	0.833	39	0.840	45	0.007	0.8%	0.822	51	-0.018	-2.2%	0.820	51	-0.002	-0.2%
ID57	0.833	40	0.855	35	0.022	2.7%	0.847	34	-0.008	-1.0%	0.842	35	-0.006	-0.7%
ID54	0.833	41	0.852	36	0.019	2.3%	0.848	32	-0.004	-0.5%	0.844	32	-0.004	-0.4%
ID28	0.832	42	0.833	52	0.001	0.1%	0.835	42	0.002	0.2%	0.831	42	-0.004	-0.5%
ID37	0.832	43	0.840	46	0.008	1.0%	0.833	45	-0.007	-0.9%	0.829	45	-0.004	-0.5%
ID42	0.831	44	0.848	42	0.016	1.9%	0.834	43	-0.013	-1.6%	0.830	43	-0.004	-0.4%
ID46	0.830	45	0.850	41	0.020	2.4%	0.839	41	-0.011	-1.3%	0.833	41	-0.005	-0.6%
ID22	0.829	46	0.836	49	0.007	0.8%	0.827	50	-0.009	-1.1%	0.822	50	-0.005	-0.6%
ID1	0.828	47	0.790	59	-0.038	-4.6%	0.811	55	0.021	2.6%	0.810	54	-0.001	-0.1%
ID26	0.825	48	0.887	21	0.062	7.5%	0.869	24	-0.018	-2.1%	0.865	25	-0.004	-0.5%
ID43	0.823	49	0.834	51	0.011	1.3%	0.819	53	-0.015	-1.8%	0.814	53	-0.005	-0.6%
ID30	0.821	50	0.838	48	0.017	2.0%	0.827	49	-0.010	-1.2%	0.824	49	-0.004	-0.4%
ID49	0.821	51	0.864	30	0.043	5.3%	0.844	37	-0.021	-2.4%	0.839	37	-0.005	-0.6%
ID41	0.816	52	0.845	43	0.029	3.6%	0.832	47	-0.013	-1.5%	0.828	46	-0.004	-0.5%
ID20	0.816	53	0.838	47	0.023	2.8%	0.830	48	-0.008	-1.0%	0.825	48	-0.005	-0.6%
ID34	0.812	54	0.810	56	-0.002	-0.2%	0.811	54	0.001	0.1%	0.807	56	-0.004	-0.5%
ID47	0.808	55	0.816	54	0.008	0.9%	0.808	56	-0.008	-0.9%	0.807	55	-0.001	-0.2%
ID39	0.807	56	0.833	53	0.026	3.2%	0.820	52	-0.013	-1.5%	0.818	52	-0.003	-0.3%
ID52	0.794	57	0.799	58	0.005	0.6%	0.787	59	-0.012	-1.4%	0.782	59	-0.005	-0.6%
ID50	0.790	58	0.799	57	0.009	1.1%	0.795	57	-0.005	-0.6%	0.792	57	-0.002	-0.3%
ID56	0.777	59	0.815	55	0.038	4.9%	0.791	58	-0.024	-3.0%	0.787	58	-0.004	-0.5%
ID60	0.768	60	0.782	60	0.013	1.7%	0.760	60	-0.021	-2.7%	0.755	60	-0.005	-0.6%

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Table C-5. Communications Composite Impact Analysis Results (continued)

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 4	Rank of HHA with Adj Set 4	Point Change from Set 3	Percent Change from Set 3	Scores with Adj Set 5	Rank of HHA with Adj Set 5	Point Change from Set 4	Percent Change from Set 4	Scores with Adj Set 6	Rank of HHA with Adj Set 6	Point Change from Set 3	Percent Change from Set 3
ID9	0.944	1	0.936	2	-0.007	-0.7%	0.935	3	-0.001	-0.1%	0.943	2	0.000	0.0%
ID5	0.935	2	0.924	5	0.003	0.3%	0.925	5	0.001	0.1%	0.922	5	0.001	0.1%
ID29	0.933	3	0.936	1	-0.005	-0.6%	0.939	1	0.002	0.2%	0.943	1	0.001	0.1%
ID8	0.933	4	0.935	3	0.002	0.2%	0.937	2	0.002	0.2%	0.934	3	0.001	0.1%
ID10	0.933	5	0.930	4	0.002	0.2%	0.930	4	-0.001	-0.1%	0.929	4	0.000	0.0%
ID6	0.926	6	0.919	6	-0.001	-0.2%	0.920	6	0.001	0.1%	0.922	6	0.001	0.1%
ID15	0.909	7	0.912	7	-0.004	-0.4%	0.913	7	0.001	0.1%	0.916	7	0.000	0.0%
ID7	0.908	8	0.889	12	0.010	1.2%	0.889	11	0.001	0.1%	0.879	16	0.000	0.0%
ID4	0.901	9	0.884	15	0.009	1.1%	0.884	15	0.000	0.0%	0.875	17	0.000	0.0%
ID12	0.891	10	0.901	8	0.001	0.1%	0.901	8	0.000	0.0%	0.900	9	0.000	0.0%
ID16	0.890	11	0.883	17	-0.004	-0.5%	0.883	16	0.001	0.1%	0.887	12	0.000	0.0%
ID35	0.890	12	0.887	13	-0.007	-0.8%	0.888	13	0.002	0.2%	0.895	10	0.000	0.1%
ID27	0.887	13	0.884	14	-0.002	-0.2%	0.885	14	0.000	0.0%	0.886	13	0.000	0.0%
ID23	0.880	14	0.868	21	-0.003	-0.3%	0.870	22	0.001	0.2%	0.872	20	0.001	0.1%
ID19	0.878	15	0.893	10	0.000	0.1%	0.893	10	-0.001	-0.1%	0.893	11	0.000	0.0%
ID32	0.878	16	0.892	11	0.009	1.0%	0.889	12	-0.003	-0.3%	0.881	14	-0.002	-0.2%
ID2	0.875	17	0.898	9	-0.011	-1.2%	0.900	9	0.002	0.2%	0.910	8	0.001	0.1%
ID3	0.874	18	0.882	18	0.001	0.1%	0.880	17	-0.002	-0.2%	0.880	15	-0.002	-0.2%
ID25	0.873	19	0.873	20	-0.001	-0.1%	0.872	20	-0.002	-0.2%	0.872	19	-0.001	-0.2%
ID18	0.873	20	0.884	16	0.009	1.1%	0.878	18	-0.005	-0.6%	0.872	21	-0.003	-0.3%
ID13	0.871	21	0.857	30	-0.003	-0.3%	0.858	28	0.001	0.1%	0.860	29	0.001	0.1%
ID17	0.867	22	0.858	29	0.004	0.5%	0.856	30	-0.001	-0.1%	0.853	30	-0.001	-0.1%
ID45	0.865	23	0.861	26	0.000	0.0%	0.861	25	0.000	0.0%	0.862	27	0.001	0.1%
ID44	0.865	24	0.868	22	-0.004	-0.5%	0.871	21	0.002	0.3%	0.874	18	0.001	0.2%
ID14	0.863	25	0.880	19	0.010	1.1%	0.878	19	-0.002	-0.2%	0.870	22	-0.001	-0.1%
ID21	0.863	26	0.867	23	0.007	0.8%	0.867	23	0.000	0.0%	0.861	28	0.000	0.0%
ID38	0.859	27	0.859	28	-0.005	-0.6%	0.860	27	0.001	0.1%	0.864	24	0.001	0.1%
ID51	0.856	28	0.853	31	0.010	1.1%	0.854	31	0.000	0.1%	0.844	33	0.001	0.1%
ID33	0.854	29	0.860	27	-0.006	-0.6%	0.857	29	-0.002	-0.3%	0.864	26	-0.002	-0.2%
ID40	0.852	30	0.863	24	-0.004	-0.4%	0.864	24	0.001	0.1%	0.868	23	0.000	0.1%

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Table C-5. Communications Composite Impact Analysis Results (continued)

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 4	Rank of HHA with Adj Set 4	Point Change from Set 3	Percent Change from Set 3	Scores with Adj Set 5	Rank of HHA with Adj Set 5	Point Change from Set 4	Percent Change from Set 4	Scores with Adj Set 6	Rank of HHA with Adj Set 6	Point Change from Set 3	Percent Change from Set 3
ID24	0.849	31	0.845	34	0.002	0.2%	0.845	34	0.000	0.0%	0.843	34	0.000	0.0%
ID36	0.848	32	0.847	32	0.009	1.1%	0.846	32	-0.001	-0.1%	0.838	38	0.000	0.0%
ID11	0.842	33	0.825	46	-0.001	-0.1%	0.827	44	0.001	0.2%	0.827	47	0.000	0.1%
ID55	0.840	34	0.845	33	-0.001	-0.2%	0.845	33	0.000	0.0%	0.847	31	0.000	0.0%
ID31	0.839	35	0.844	35	0.006	0.7%	0.841	36	-0.003	-0.3%	0.837	40	-0.001	-0.1%
ID48	0.838	36	0.826	45	-0.002	-0.3%	0.826	46	0.000	0.0%	0.829	43	0.000	0.0%
ID53	0.837	37	0.836	40	0.000	0.0%	0.838	38	0.002	0.2%	0.838	39	0.002	0.2%
ID59	0.834	38	0.837	39	-0.005	-0.6%	0.837	39	0.001	0.1%	0.841	36	0.000	0.0%
ID58	0.833	39	0.817	52	-0.003	-0.4%	0.818	52	0.001	0.1%	0.821	51	0.001	0.1%
ID57	0.833	40	0.842	36	0.000	0.0%	0.842	35	0.000	0.0%	0.842	35	0.000	0.0%
ID54	0.833	41	0.839	38	-0.006	-0.7%	0.840	37	0.001	0.1%	0.845	32	0.001	0.1%
ID28	0.832	42	0.839	37	0.008	0.9%	0.834	41	-0.005	-0.6%	0.828	45	-0.003	-0.4%
ID37	0.832	43	0.827	44	-0.001	-0.1%	0.826	45	-0.001	-0.1%	0.828	44	0.000	0.0%
ID42	0.831	44	0.834	42	0.003	0.4%	0.833	42	-0.001	-0.1%	0.830	42	-0.001	-0.1%
ID46	0.830	45	0.835	41	0.001	0.2%	0.835	40	0.001	0.1%	0.834	41	0.000	0.0%
ID22	0.829	46	0.821	48	-0.001	-0.1%	0.821	48	0.000	0.0%	0.822	50	0.000	0.0%
ID1	0.828	47	0.812	54	0.002	0.2%	0.815	54	0.003	0.4%	0.810	54	0.001	0.1%
ID26	0.825	48	0.862	25	-0.002	-0.3%	0.860	26	-0.002	-0.2%	0.864	25	-0.001	-0.1%
ID43	0.823	49	0.817	53	0.003	0.3%	0.815	53	-0.002	-0.2%	0.814	53	0.000	0.0%
ID30	0.821	50	0.820	49	-0.004	-0.4%	0.820	50	0.000	0.0%	0.824	49	0.000	0.0%
ID49	0.821	51	0.832	43	-0.006	-0.8%	0.832	43	0.000	0.0%	0.839	37	0.001	0.1%
ID41	0.816	52	0.824	47	-0.004	-0.5%	0.823	47	-0.001	-0.1%	0.827	46	-0.001	-0.1%
ID20	0.816	53	0.819	50	-0.006	-0.8%	0.820	49	0.002	0.2%	0.825	48	0.000	0.0%
ID34	0.812	54	0.811	55	0.004	0.5%	0.811	55	0.000	0.0%	0.807	55	0.000	0.0%
ID47	0.808	55	0.809	56	0.002	0.2%	0.805	56	-0.004	-0.5%	0.806	56	-0.001	-0.1%
ID39	0.807	56	0.818	51	0.000	0.0%	0.818	51	0.000	0.0%	0.817	52	-0.001	-0.1%
ID52	0.794	57	0.786	58	0.004	0.6%	0.787	58	0.001	0.1%	0.783	59	0.001	0.1%
ID50	0.790	58	0.792	57	0.000	0.0%	0.792	57	0.000	0.0%	0.792	57	-0.001	-0.1%
ID56	0.777	59	0.781	59	-0.006	-0.8%	0.781	59	0.001	0.1%	0.787	58	0.000	0.0%
ID60	0.768	60	0.768	60	0.013	1.7%	0.771	60	0.003	0.4%	0.757	60	0.001	0.2%

Note: Changes in HHA scores as Mode/PMA variables are removed from the analysis model.

Table C–6. Specific Care Issues Composite Impact Analysis Results

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 1	Rank of HHA with Adj Set 1	Point Change from Raw	Percent Change from Raw	Scores with Adj Set 2	Rank of HHA with Adj Set 2	Point Change from Set 1	Percent Change from Set 1	Scores with Adj Set 3	Rank of HHA with Adj Set 3	Point Change from Set 2	Percent Change from Set 2
ID20	0.917	1	0.937	2	0.020	2.2%	0.923	3	-0.014	-1.5%	0.911	3	-0.012	-1.3%
ID48	0.916	2	0.929	3	0.013	1.4%	0.923	2	-0.006	-0.6%	0.914	1	-0.009	-1.0%
ID40	0.910	3	0.940	1	0.030	3.3%	0.931	1	-0.009	-1.0%	0.912	2	-0.019	-2.0%
ID13	0.901	4	0.920	4	0.019	2.2%	0.904	4	-0.016	-1.8%	0.887	4	-0.017	-1.9%
ID38	0.880	5	0.906	5	0.026	2.9%	0.885	7	-0.021	-2.3%	0.871	7	-0.014	-1.5%
ID15	0.874	6	0.904	6	0.029	3.3%	0.887	6	-0.017	-1.9%	0.879	5	-0.008	-0.9%
ID37	0.872	7	0.901	7	0.029	3.4%	0.889	5	-0.012	-1.4%	0.875	6	-0.014	-1.6%
ID17	0.864	8	0.892	8	0.027	3.2%	0.869	9	-0.023	-2.6%	0.859	8	-0.009	-1.0%
ID6	0.861	9	0.869	16	0.008	1.0%	0.859	15	-0.010	-1.1%	0.851	13	-0.008	-1.0%
ID10	0.860	10	0.872	12	0.012	1.4%	0.868	10	-0.004	-0.5%	0.857	10	-0.011	-1.3%
ID26	0.860	11	0.863	18	0.003	0.3%	0.855	17	-0.008	-0.9%	0.843	17	-0.012	-1.4%
ID21	0.859	12	0.881	9	0.023	2.6%	0.869	8	-0.012	-1.4%	0.858	9	-0.011	-1.2%
ID5	0.858	13	0.872	13	0.014	1.6%	0.867	11	-0.005	-0.6%	0.853	11	-0.014	-1.6%
ID16	0.855	14	0.871	15	0.016	1.9%	0.862	12	-0.009	-1.0%	0.852	12	-0.010	-1.2%
ID12	0.854	15	0.871	14	0.018	2.1%	0.860	13	-0.011	-1.3%	0.850	14	-0.011	-1.2%
ID55	0.844	16	0.878	10	0.033	4.0%	0.858	16	-0.019	-2.2%	0.846	15	-0.012	-1.4%
ID45	0.844	17	0.862	19	0.018	2.1%	0.850	21	-0.012	-1.4%	0.839	20	-0.012	-1.4%
ID3	0.843	18	0.862	21	0.019	2.3%	0.860	14	-0.002	-0.2%	0.844	16	-0.016	-1.9%
ID39	0.841	19	0.862	20	0.021	2.5%	0.851	19	-0.011	-1.2%	0.840	19	-0.011	-1.3%
ID35	0.840	20	0.875	11	0.035	4.2%	0.852	18	-0.022	-2.6%	0.842	18	-0.010	-1.2%
ID29	0.833	21	0.848	26	0.015	1.8%	0.837	24	-0.011	-1.3%	0.823	25	-0.014	-1.6%
ID41	0.833	22	0.858	22	0.024	2.9%	0.844	23	-0.014	-1.6%	0.832	22	-0.012	-1.4%
ID32	0.830	23	0.853	24	0.022	2.7%	0.851	20	-0.002	-0.3%	0.838	21	-0.012	-1.4%
ID19	0.824	24	0.825	35	0.001	0.1%	0.832	27	0.006	0.8%	0.822	26	-0.009	-1.1%
ID9	0.820	25	0.848	25	0.028	3.4%	0.835	25	-0.014	-1.6%	0.825	24	-0.010	-1.2%
ID43	0.820	26	0.855	23	0.035	4.3%	0.833	26	-0.022	-2.6%	0.820	27	-0.012	-1.5%
ID4	0.817	27	0.820	36	0.003	0.4%	0.822	30	0.001	0.2%	0.811	29	-0.011	-1.3%
ID27	0.816	28	0.869	17	0.053	6.5%	0.845	22	-0.024	-2.8%	0.830	23	-0.014	-1.7%
ID22	0.815	29	0.831	31	0.016	2.0%	0.823	29	-0.008	-1.0%	0.811	30	-0.012	-1.5%
ID7	0.814	30	0.847	27	0.033	4.0%	0.821	31	-0.026	-3.1%	0.810	31	-0.010	-1.3%

(continued)

Table C–6. Specific Care Issues Composite Impact Analysis Results (continued)

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 1	Rank of HHA with Adj Set 1	Point Change from Raw	Percent Change from Raw	Scores with Adj Set 2	Rank of HHA with Adj Set 2	Point Change from Set 1	Percent Change from Set 1	Scores with Adj Set 3	Rank of HHA with Adj Set 3	Point Change from Set 2	Percent Change from Set 2
ID28	0.813	31	0.820	37	0.007	0.8%	0.825	28	0.005	0.6%	0.813	28	-0.011	-1.4%
ID34	0.812	32	0.826	34	0.014	1.7%	0.819	34	-0.007	-0.8%	0.809	33	-0.010	-1.3%
ID53	0.811	33	0.810	40	0.000	0.0%	0.811	37	0.000	0.0%	0.801	37	-0.010	-1.2%
ID58	0.805	34	0.799	46	-0.006	-0.8%	0.805	38	0.006	0.8%	0.795	38	-0.010	-1.2%
ID33	0.804	35	0.838	29	0.034	4.2%	0.820	32	-0.017	-2.1%	0.810	32	-0.010	-1.3%
ID18	0.803	36	0.827	33	0.024	3.0%	0.820	33	-0.007	-0.9%	0.808	34	-0.012	-1.5%
ID49	0.797	37	0.844	28	0.048	6.0%	0.816	36	-0.029	-3.4%	0.804	35	-0.011	-1.4%
ID46	0.797	38	0.831	32	0.034	4.3%	0.818	35	-0.012	-1.5%	0.802	36	-0.016	-1.9%
ID52	0.791	39	0.803	41	0.011	1.4%	0.794	42	-0.009	-1.1%	0.781	42	-0.013	-1.6%
ID44	0.787	40	0.802	44	0.015	1.9%	0.780	46	-0.022	-2.7%	0.769	45	-0.012	-1.5%
ID42	0.787	41	0.813	38	0.027	3.4%	0.799	40	-0.014	-1.8%	0.789	39	-0.009	-1.2%
ID24	0.783	42	0.801	45	0.018	2.3%	0.797	41	-0.004	-0.5%	0.786	40	-0.010	-1.3%
ID8	0.781	43	0.836	30	0.055	7.0%	0.805	39	-0.031	-3.7%	0.782	41	-0.023	-2.8%
ID25	0.776	44	0.791	47	0.015	1.9%	0.792	43	0.001	0.2%	0.778	43	-0.014	-1.7%
ID11	0.772	45	0.789	48	0.017	2.2%	0.784	45	-0.005	-0.7%	0.767	46	-0.017	-2.2%
ID36	0.771	46	0.803	42	0.032	4.2%	0.784	44	-0.018	-2.3%	0.774	44	-0.011	-1.4%
ID23	0.768	47	0.787	49	0.019	2.5%	0.773	49	-0.014	-1.8%	0.761	49	-0.011	-1.5%
ID31	0.766	48	0.786	50	0.020	2.6%	0.775	48	-0.011	-1.4%	0.764	48	-0.011	-1.5%
ID2	0.748	49	0.803	43	0.055	7.3%	0.778	47	-0.025	-3.1%	0.764	47	-0.014	-1.8%
ID59	0.745	50	0.813	39	0.068	9.1%	0.765	51	-0.048	-5.9%	0.758	50	-0.006	-0.8%
ID47	0.744	51	0.781	51	0.038	5.1%	0.767	50	-0.014	-1.8%	0.757	51	-0.009	-1.2%
ID54	0.720	52	0.752	52	0.032	4.5%	0.732	52	-0.021	-2.8%	0.719	52	-0.012	-1.7%
ID30	0.704	53	0.727	54	0.023	3.3%	0.715	53	-0.012	-1.6%	0.705	53	-0.011	-1.5%
ID51	0.693	54	0.731	53	0.039	5.6%	0.708	54	-0.024	-3.3%	0.699	54	-0.009	-1.2%
ID60	0.678	55	0.703	55	0.025	3.7%	0.684	56	-0.019	-2.7%	0.670	56	-0.014	-2.1%
ID14	0.667	56	0.688	57	0.021	3.2%	0.694	55	0.006	0.9%	0.682	55	-0.012	-1.7%
ID50	0.654	57	0.689	56	0.035	5.3%	0.675	57	-0.014	-2.0%	0.668	58	-0.007	-1.1%
ID57	0.640	58	0.683	58	0.043	6.7%	0.659	59	-0.024	-3.5%	0.643	59	-0.016	-2.4%
ID1	0.638	59	0.663	59	0.025	3.9%	0.673	58	0.010	1.5%	0.669	57	-0.004	-0.7%
ID56	0.607	60	0.633	60	0.026	4.3%	0.625	60	-0.009	-1.4%	0.614	60	-0.011	-1.7%

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Table C–6. Specific Care Issues Composite Impact Analysis Results (continued)

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 4	Rank of HHA with Adj Set 4	Point Change from Set 3	Percent Change from Set 3	Scores with Adj Set 5	Rank of HHA with Adj Set 5	Point Change from Set 4	Percent Change from Set 4	Scores with Adj Set 6	Rank of HHA with Adj Set 6	Point Change from Set 3	Percent Change from Set 3
ID20	0.917	1	0.911	3	0.000	0.0%	0.912	3	0.001	0.1%	0.913	2	0.002	0.2%
ID48	0.916	2	0.915	1	0.001	0.1%	0.914	1	-0.001	-0.1%	0.913	1	-0.001	-0.1%
ID40	0.910	3	0.913	2	0.001	0.1%	0.913	2	0.000	0.0%	0.912	3	0.000	0.0%
ID13	0.901	4	0.894	4	0.006	0.7%	0.894	4	0.001	0.1%	0.888	4	0.001	0.1%
ID38	0.880	5	0.869	7	-0.002	-0.3%	0.870	7	0.001	0.2%	0.873	7	0.002	0.2%
ID15	0.874	6	0.878	5	0.000	-0.1%	0.877	5	-0.001	-0.1%	0.878	5	-0.001	-0.1%
ID37	0.872	7	0.877	6	0.002	0.2%	0.875	6	-0.001	-0.2%	0.874	6	-0.001	-0.2%
ID17	0.864	8	0.860	8	0.000	0.0%	0.859	8	0.000	-0.1%	0.859	8	0.000	0.0%
ID6	0.861	9	0.855	11	0.004	0.5%	0.855	11	0.001	0.1%	0.851	13	0.001	0.1%
ID10	0.860	10	0.858	9	0.002	0.2%	0.857	9	-0.001	-0.1%	0.855	10	-0.001	-0.2%
ID26	0.860	11	0.842	17	-0.001	-0.1%	0.840	18	-0.002	-0.2%	0.841	17	-0.001	-0.1%
ID21	0.859	12	0.857	10	-0.001	-0.2%	0.857	10	0.000	0.0%	0.858	9	0.000	0.0%
ID5	0.858	13	0.855	12	0.002	0.2%	0.855	12	0.001	0.1%	0.854	11	0.001	0.1%
ID16	0.855	14	0.851	14	-0.001	-0.1%	0.853	13	0.001	0.1%	0.853	12	0.001	0.2%
ID12	0.854	15	0.849	15	0.000	-0.1%	0.849	15	0.000	0.0%	0.849	14	0.000	0.0%
ID55	0.844	16	0.852	13	0.005	0.6%	0.851	14	-0.001	-0.1%	0.846	15	-0.001	-0.1%
ID45	0.844	17	0.838	20	0.000	0.0%	0.839	19	0.001	0.1%	0.839	20	0.000	0.0%
ID3	0.843	18	0.847	16	0.003	0.4%	0.844	16	-0.003	-0.4%	0.841	18	-0.003	-0.3%
ID39	0.841	19	0.841	18	0.001	0.1%	0.841	17	0.000	0.0%	0.841	19	0.000	0.1%
ID35	0.840	20	0.837	21	-0.005	-0.6%	0.838	20	0.001	0.2%	0.843	16	0.002	0.2%
ID29	0.833	21	0.824	24	0.000	0.0%	0.825	24	0.002	0.2%	0.825	24	0.002	0.2%
ID41	0.833	22	0.830	22	-0.002	-0.3%	0.829	22	-0.001	-0.1%	0.831	22	-0.001	-0.1%
ID32	0.830	23	0.839	19	0.001	0.1%	0.838	21	-0.002	-0.2%	0.837	21	-0.001	-0.2%
ID19	0.824	24	0.821	26	-0.001	-0.1%	0.819	28	-0.001	-0.2%	0.820	26	-0.002	-0.3%
ID9	0.820	25	0.822	25	-0.002	-0.3%	0.822	25	-0.001	-0.1%	0.823	25	-0.001	-0.2%
ID43	0.820	26	0.821	27	0.000	0.0%	0.820	26	0.000	-0.1%	0.820	27	-0.001	-0.1%
ID4	0.817	27	0.819	28	0.008	1.0%	0.820	27	0.001	0.1%	0.812	28	0.001	0.2%
ID27	0.816	28	0.828	23	-0.002	-0.3%	0.828	23	0.000	0.0%	0.831	23	0.001	0.1%
ID22	0.815	29	0.809	31	-0.002	-0.2%	0.808	31	-0.001	-0.1%	0.810	30	-0.001	-0.1%
ID7	0.814	30	0.812	30	0.002	0.2%	0.812	29	0.000	0.0%	0.810	29	0.000	0.0%

(continued)

Table C–6. Specific Care Issues Composite Impact Analysis Results (continued)

HHA ID	Raw UnAdj Score	Rank of HHA with Raw Score	Scores with Adj Set 4	Rank of HHA with Adj Set 4	Point Change from Set 3	Percent Change from Set 3	Scores with Adj Set 5	Rank of HHA with Adj Set 5	Point Change from Set 4	Percent Change from Set 4	Scores with Adj Set 6	Rank of HHA with Adj Set 6	Point Change from Set 3	Percent Change from Set 3
ID28	0.813	31	0.813	29	0.000	–0.1%	0.809	30	–0.004	–0.5%	0.809	31	–0.004	–0.5%
ID34	0.812	32	0.808	33	–0.001	–0.1%	0.808	32	0.000	0.0%	0.808	32	–0.001	–0.1%
ID53	0.811	33	0.802	36	0.001	0.2%	0.803	36	0.001	0.1%	0.802	37	0.001	0.1%
ID58	0.805	34	0.804	35	0.009	1.2%	0.805	33	0.001	0.1%	0.797	38	0.002	0.2%
ID33	0.804	35	0.808	34	–0.002	–0.2%	0.805	34	–0.003	–0.3%	0.807	33	–0.003	–0.4%
ID18	0.803	36	0.809	32	0.001	0.1%	0.804	35	–0.005	–0.6%	0.802	36	–0.006	–0.7%
ID49	0.797	37	0.799	38	–0.005	–0.6%	0.801	38	0.001	0.2%	0.806	34	0.002	0.2%
ID46	0.797	38	0.801	37	–0.001	–0.1%	0.801	37	0.000	0.0%	0.803	35	0.000	0.0%
ID52	0.791	39	0.784	43	0.003	0.4%	0.785	43	0.001	0.2%	0.783	42	0.002	0.2%
ID44	0.787	40	0.786	41	0.017	2.3%	0.788	41	0.002	0.2%	0.772	45	0.003	0.4%
ID42	0.787	41	0.791	40	0.002	0.2%	0.790	40	–0.001	–0.1%	0.789	39	0.000	0.0%
ID24	0.783	42	0.786	42	–0.001	–0.1%	0.786	42	0.000	0.0%	0.786	40	0.000	0.0%
ID8	0.781	43	0.793	39	0.011	1.4%	0.794	39	0.002	0.2%	0.784	41	0.002	0.3%
ID25	0.776	44	0.780	44	0.001	0.2%	0.779	44	–0.001	–0.1%	0.778	43	0.000	0.0%
ID11	0.772	45	0.772	46	0.005	0.6%	0.772	46	0.001	0.1%	0.768	46	0.002	0.2%
ID36	0.771	46	0.774	45	0.001	0.1%	0.774	45	–0.001	–0.1%	0.773	44	–0.001	–0.1%
ID23	0.768	47	0.761	48	0.000	0.0%	0.763	48	0.001	0.2%	0.763	49	0.001	0.2%
ID31	0.766	48	0.767	47	0.003	0.4%	0.765	47	–0.002	–0.2%	0.763	48	–0.001	–0.1%
ID2	0.748	49	0.757	49	–0.007	–0.9%	0.759	49	0.002	0.3%	0.767	47	0.003	0.4%
ID59	0.745	50	0.752	51	–0.006	–0.8%	0.750	51	–0.002	–0.3%	0.755	50	–0.003	–0.4%
ID47	0.744	51	0.753	50	–0.004	–0.5%	0.750	50	–0.003	–0.4%	0.754	51	–0.003	–0.4%
ID54	0.720	52	0.723	52	0.004	0.5%	0.723	52	0.000	0.0%	0.720	52	0.001	0.1%
ID30	0.704	53	0.699	53	–0.006	–0.8%	0.700	53	0.001	0.1%	0.706	53	0.001	0.1%
ID51	0.693	54	0.697	54	–0.002	–0.3%	0.699	54	0.002	0.2%	0.701	54	0.002	0.2%
ID60	0.678	55	0.675	56	0.005	0.7%	0.677	55	0.002	0.4%	0.673	56	0.003	0.4%
ID14	0.667	56	0.677	55	–0.005	–0.8%	0.677	56	0.000	0.0%	0.683	55	0.000	0.1%
ID50	0.654	57	0.664	57	–0.004	–0.6%	0.662	57	–0.002	–0.2%	0.665	58	–0.002	–0.3%
ID57	0.640	58	0.640	59	–0.003	–0.5%	0.641	59	0.001	0.2%	0.644	59	0.001	0.2%
ID1	0.638	59	0.654	58	–0.015	–2.2%	0.656	58	0.002	0.4%	0.671	57	0.003	0.4%
ID56	0.607	60	0.609	60	–0.005	–0.8%	0.609	60	0.000	0.0%	0.613	60	0.000	–0.1%

Note: Changes in HHA scores as Mode/PMA variables are removed from the analysis model.

**APPENDIX D:
COUNTS OF PATIENTS IN EACH HHA IN IMPACT ANALYSES**

Table D-1. Counts of Patients in Each HHA in Impact Analyses

HHA	Number of Patients
1	6
2	6
3	54
4	43
5	37
6	87
7	84
8	13
9	21
10	40
11	50
12	341
13	19
14	9
15	131
16	72
17	80
18	46
19	61
20	15
21	51
22	91
23	35
24	869
25	98
26	74
27	62
28	204
29	32
30	26
31	605
32	60
33	89
34	65
35	52
36	792
37	37
38	37
39	85

(continued)

Table D-1. Counts of Patients in Each HHA in Impact Analyses (continued)

HHA	Number of Patients
40	22
41	576
42	257
43	61
44	25
45	67
46	77
47	37
48	57
49	70
50	22
51	34
52	61
53	17
54	31
55	26
56	111
57	15
58	15
59	69
60	24
Total	6,253

Notes: HHAs appear in the order displayed in **Appendix C, Table C-2**, Overall Rating Impact Analysis Results. The impact scores are based on fewer patients in each HHA because patients may be missing data for some analysis variables.