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**National Implementation of the Hospital Consumer
Assessment of Healthcare Providers and Systems
(HCAHPS) Survey**

CMS 10102

OMB Supporting Statement - Part B

Prepared by

Division of Consumer Assessment & Plan Performance
Centers for Medicare & Medicaid Services
7500 Security Boulevard
Baltimore, MD 21244

TABLE OF CONTENTS

Section	Page
Introduction.....	3
1. Respondent Universe and Sampling.....	3
2. Data Collection Procedures.....	5
a. Statistical Methodology for Stratification and Sample Selection.....	5
b. Estimation Procedures.....	6
c. Degree of Accuracy Needed for the Purpose Described in the Justification.....	6
d. Unusual Problems Requiring Specialized Sampling Procedures.....	7
e. Any Use of Periodic Data Collection Cycles to Reduce Burden.....	7
3. Maximizing Response Rates/Non-response and Issues of Accuracy, Reliability and Validity.....	7
4. Past and Ongoing Tests of Procedures, Training, and Quality Improvement Activities; Collaborator and Contractor Participation.....	16
5. Names and Telephone Numbers of Individuals Consulted on Statistical Aspects of the Survey and Implementation Design and Names of Agency Units, Contractor(s), Grantee(s), or Other Persons(s) who Collect and/or Analyze the Information for the Agency.....	23

TABLES

Table 1. Number of Participating HCAHPS Hospital per Year.....	5
Table 2. Number of Completed HCAHPS Surveys per Year.....	5
Table 3. HCAHPS Survey Response Rates per Year.....	5
Table 4. Hospital-Level Spearman-Brown Reliabilities of HCAHPS Top-Box Scores at 300 Completed Surveys, 3.1 Million Discharges, 2013.....	8
Table 5. Cronbach's Alphas of HCAHPS Composite Measures at 300 Completed Surveys, 3.1 Million Discharges, 2013.....	9

Table 6. Top-box Correlations for HCAHPS Measures at 300 Completed Surveys, 3.1 Million Discharges, Patient-Level, 2013.....	10
Table 7. Top-Box Correlations for HCAHPS Measures, ~4,000 Hospitals, Hospital Level, 2013.....	10
Table 8. Average Top-Box Inter-Item Correlations for Individual HCAHPS Items, 3.1 Million Discharges, Patient Level, 2013.....	11
Table 9. HCAHPS Top-Box Scores, ~4,000 Hospitals, 3.1 Million Discharges, 2013.....	12
Table 10. HCAHPS Survey Development and Implementation Timeline, 2002-2006.....	17

LIST OF ATTACHMENTS

Attachment A -- HCAHPS Survey Instrument (Mail) and Supporting Material (*included with Supporting Statement - Part A*)

OMB SUPPORTING STATEMENT – Part B: National Implementation of the Hospital CAHPS Survey

CMS-10102

Introduction

The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey is administered to a random sample of adult inpatients between 48 hours and six weeks after discharge. Patients admitted in the medical, surgical and maternity care service lines are eligible for the survey. HCAHPS is not restricted to Medicare patients. Hospitals may use an approved survey vendor or collect their own HCAHPS data, if approved by CMS to do so. HCAHPS can be implemented in four survey modes: mail, telephone, mail with telephone follow-up, or active interactive voice recognition (IVR), each of which requires multiple attempts to contact patients. Hospitals must survey patients throughout each month of the year. IPPS hospitals must achieve at least 300 completed surveys over four calendar quarters. HCAHPS is available in official English, Spanish, Chinese, Russian, Vietnamese, and Portuguese versions. The HCAHPS Survey sampling protocol promotes the following: 1) standardized administration of the HCAHPS Survey by hospital/survey vendors and 2) comparability of resulting data across all participating hospitals. The survey and its protocols for sampling, data collection, coding and submission can be found in the HCAHPS *Quality Assurance Guidelines* manual (Version 10.0, March 2015) on the official HCAHPS On-Line Web site, www.hcahponline.org.

1. Respondent Universe and Sampling

The HCAHPS Survey is broadly intended for patients of all payer types who meet the following criteria:

- Eighteen (18) years or older at the time of admission
- Admission includes at least one overnight stay in the hospital
- Non-psychiatric MS-DRG/principal diagnosis at discharge
- Alive at the time of discharge

There are a few categories of otherwise eligible patients who are excluded from the sample frame. These are:

- “No-Publicity” patients – Patients who request that they not be contacted
- Court/Law enforcement patients (i.e., prisoners); patients residing in halfway houses are included,
- Patients with a foreign home address (U.S. territories – Virgin Islands, Puerto Rico, Guam, American Samoa, and Northern Mariana Islands are not considered foreign addresses and are not excluded)
- Patients discharged to hospice care (Hospice-home or Hospice-medical facility)

- Patients who are excluded because of state regulations
- Patients discharged to nursing homes and skilled nursing facilities

Hospitals/Survey vendors must retain documentation that verifies all exclusions and ineligible patients for a minimum of three years. This documentation is subject to review.

Hospitals/Survey vendors participating in HCAHPS are responsible for generating complete, accurate, and valid sample frame data files each month that contain all administrative information on all patients who meet the eligible population criteria. The following steps must be followed when creating the sample frame:

- The sample frame for a particular month must include all eligible hospital discharges between the first and last days of the month (e.g., for January, any qualifying discharges between the 1st and 31st)
- If a hospital is conducting sampling at the end of each month, they must create the sample frame in a timely manner in order to initiate contact for all sampled patients within 42 days of discharge
- Patients with missing or incomplete addresses and/or telephone numbers must not be removed from the sample frame. Instead, every attempt must be made to find the correct address and/or telephone number.
- Patients whose eligibility status is uncertain must be included in the sample frame

The hospital/survey vendor must retain the sample frame (i.e., the entire list of eligible HCAHPS patients from which each hospital's sample is pulled) for 3 years. Confidentiality note: Patient-identifying information within the sample frame will not be part of the final data submitted to CMS, nor will any other PHI.

Hospitals must submit at least 300 completed HCAHPS Surveys in a rolling four-quarter period (unless the hospital is too small to obtain 300 completed surveys). The absence of a sufficient number of HCAHPS eligible discharges is the only acceptable reason for submitting fewer than 300 completed HCAHPS Surveys in a rolling four-quarter period. In that not all sampled patients who are contacted to complete the survey will actually do so, guidance is provided hospitals/survey vendors as to how many discharges are needed to reach the required 300 completed surveys per four rolling quarters of data (a 12-month reporting period).

Information on the number of hospitals participating in the HCAHPS Survey, the number of completed surveys, and the annual response rate, from 2008 through 2013, can be found in Table 1, Table 2, and Table 3, respectively. Information for 2014 is not yet complete.

Table 1. Number of Hospitals Participating in the HCAHPS Survey per Year

2008	2009	2010	2011	2012	2013
3,791	3,811	3,850	3,887	3,938	4,093

Table 2. Number of Completed HCAHPS Surveys per Year

2008	2009	2010	2011	2012	2013
2,326,696	2,561,603	2,739,257	2,900,161	3,126,350	3,099,832

Table 3. HCAHPS Survey Response Rates per Year

2008	2009	2010	2011	2012	2013
33.5	33.0	32.8	32.2	33.0	32.3

2. Data Collection Procedures

a. Statistical Methodology for Stratification and Sample Selection.

The basic sampling procedure for HCAHPS entails drawing a random sample of all eligible discharges from a hospital on a monthly basis. Sampling may be conducted either continuously throughout the month or at the end of the month, as long as a random sample is generated from the entire month. The HCAHPS sample must be drawn according to this uninterrupted random sampling protocol and not according to any “quota” system. Hospitals/Survey vendors must sample from every month throughout the entire 12-month reporting period and not stop sampling or curtail ongoing survey administration activities even if 300 completed surveys have been attained.

Sampling for HCAHPS is based on the eligible discharges (HCAHPS sample frame) for a calendar month. If every eligible discharge for a given month has the same probability of being sampled, then an equiprobable approach is being used. Stratified sampling is where eligible discharges are divided into non-overlapping subgroups, referred to as strata, before sampling.

There are three options for sampling patients for the HCAHPS Survey: Simple Random Sampling (SRS), Proportionate Stratified Random Sampling (PSRS), and Disproportionate Stratified Random Sampling

(DSRS). Once a sample type is used within a quarter, it must be maintained throughout that quarter; “Sample Type” can only be changed at the beginning of a quarter. For more information about HCAHPS sampling, please see HCAHPS Quality Assurance Guidelines, V10.0, pp. 49-70, at <http://www.hcahpsonline.org/qaguidelines.aspx>.

- **SRS: Simple Random Sampling** is the most basic sampling type; patients are randomly selected from all eligible discharges for a month. Strata are not used when employing SRS and each patient has equal opportunity of being selected into the sample, making SRS equiprobable. Census sampling is considered a form of simple random sampling.
- **PSRS: Proportionate Stratified Random Sampling** uses strata definitions and random sample selection from all strata at equal rates. Since the sampling rates of the strata are “proportionate,” PSRS is also considered equiprobable.
- **DSRS: Disproportionate Stratified Random Sampling** involves sampling within strata at different rates, and thus, DSRS requires information about the strata. By definition, DSRS is not an equiprobable sampling approach as DSRS allows for dissimilar sampling rates across strata. DSRS means that all eligible discharges do not have an equal chance of being selected for inclusion in the monthly sample. To account for this, CMS requires additional information from hospitals and survey vendors who choose to use DSRS as a sampling type. Hospitals/survey vendors must submit an Exceptions Request Form and then be approved to use DSRS.

b. Estimation Procedures.

Not applicable to the HCAHPS Survey.

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

IPPS hospitals are expected to achieve at least 300 completed surveys over a 12 month period, if possible, to attain the desired degree of accuracy; please see below. HCAHPS scores based on fewer than 100 or 50 completed surveys are publicly reported but the lower reliability of these scores is noted with an appropriate footnote in public reporting. IPPS hospitals must achieve at least 100 completed HCAHPS surveys during the 12 month Performance Period in order for a Patient and Caregiver Centered Experience of Care/Care Coordination domain score to be calculated in the Hospital Value-Based Purchasing program. The HCAHPS Quality Assurance Guidelines, V10.0, pp. 54-57, describe how to calculate the sample size necessary to attain at least 300 completed surveys, <http://www.hcahpsonline.org/qaguidelines.aspx>. Elliot, et al. provide additional information about the

validity and reliability of the HCAHPS Survey; see Elliott, Lehrman, et al. (2010). “Do Hospitals Rank Differently on HCAHPS for Different Patient Subgroups?” Medical Care Research and Review, 67(1):56-73.

d. Unusual Problems Requiring Specialized Sampling Procedures.

CMS recognizes that some small hospitals may not have 300 HCAHPS-eligible discharges in the course of a year and so are unable to obtain 300 completed surveys in a 12-month report period. In such cases, IPPS hospitals must sample all eligible discharges (that is, conduct a census) and attempt to obtain as many completes as possible

e. Any Use of Periodic Data Collection Cycles to Reduce Burden.

There is no use of periodic (less frequent than annual) data collection cycles for the HCAHPS Survey. Great effort was expended considering how often HCAHPS data should be collected. We solicited and received much comment on this issue when the HCAHPS Survey was being developed. Two options for the frequency of data collection were suggested: once during the year or continuous sampling. The majority of hospitals/vendors suggested continuous sampling would be easier to integrate into their current data collection processes. Thus we decided to require sampling of discharges on a continuous basis (i.e., a monthly basis) and cumulate these samples to create rolling estimates based on 12-months of data. We chose to pursue the continuous sampling approach for the following reasons:

- It is more easily integrated with many existing survey processes used for internal improvement,
- Improvements in hospital care can be more quickly reflected in hospital scores (e.g., 12-month estimates could be updated on a quarterly or semi-annual basis),
- Hospital scores are less susceptible to unique events that could affect hospital performance at a specific point in time,
- It is less susceptible to gaming (e.g., hospitals being on their best behavior at the time of an annual survey), and
- There is less variation in time between discharge and data collection.

3. Maximizing Response Rates/Non-response and Issues of Accuracy, Reliability, and Validity

Implementation of the HCAHPS Survey according to the protocols contained in the current HCAHPS Quality Assurance Guidelines, V10.0, helps hospital to attain the greatest response rate. CMS examines hospital response rates every quarter and works with hospitals and survey vendors whose response rate is significantly below the national average. Among other tactics, CMS strongly encourages hospitals to offer the HCAHPS Survey in the language spoken at home by their patients (see 50966 Federal Register / Vol. 78, No. 160 / Monday, August 19, 2013 / Rules and Regulations, pp. 325-326).

Analysis of HCAHPS data indicates that the patient-mix adjustment applied to survey results adequately addresses the non-response bias that would exist without patient-mix adjustment; see “The Effects of Survey Mode, Patient Mix, and Nonresponse on CAHPS Hospital Survey Scores.” Elliott, Zaslavsky et al. (2009) Health Services Research, 44 (2): 501-518.

Information on statistical tests of the 27-item HCAHPS Survey can be found in the original 2006 OMB package. Here we focus on the most recent tests of the validity and reliability of the current, 32-item HCAHPS Survey at the recommended 300 completed surveys in a 12-month public reporting period.

In terms of hospital-level reliability, the signal-to-noise ratio indicates how much of what you measure is “signal” (true variation in performance), rather than “noise” (measurement error). Unit or hospital-level reliability (Spearman-Brown reliability) is the proportion of variance in hospital-level scores that reflect true variation among hospitals, not noise due to limited numbers of patient surveys; see Table 4.

Table 4: Hospital-Level Spearman-Brown Reliabilities of HCAHPS Top-Box Scores at 300 Completed Surveys, 3.1 million discharges, 2013.

Communication with Nurses	0.87
Communication with Doctors	0.85
Responsiveness of Hospital Staff	0.90
Pain Management	0.80
Communication about Medicines	0.82
Cleanliness	0.86
Quietness	0.93
Discharge Information	0.83
Overall Rating	0.90
Recommend Hospital	0.92
Care Transition	0.84

Generally accepted standards for reliability are: 0.7: Adequate (all HCAHPS measures exceed this); 0.8: Good (all exceed this); 0.85 Very good (7 of 11 reach this); and 0.9: Excellent (4 of 11 reach this level). It should be noted that at more than the recommended 300 completed surveys in 12 month reporting period, HCAHPS reliability is even higher.

Evidence of the internal consistency of the HCAHPS Survey can be found in Table 5, which displays the Cronbach’s Alpha statistics for the seven publicly reported HCAHPS composite measures, which are made up of two or three survey items.

Table 5: Cronbach’s Alphas of HCAHPS Composite Measures (composed from 2 or 3 survey questions) at 300 Completed Surveys, 3.1 million discharges, 2013.

Communication with Nurses	0.86
Communication with Doctors	0.88
Responsiveness of Hospital Staff	0.72
Pain Management	0.83
Communication about Medicines	0.67
Discharge Information	0.51
Care Transition	0.80

Criterion validity indicates the extent to which HCAHPS measures what it purports to measure: patient experience of care. The correlation of specific HCAHPS measures with “Rating” and “Recommendation” can be used to assess validity (criterion validity); see Table 6. We expect moderate, positive correlations of the other nine HCAHPS measures with patient experience of care constructs. If the correlations were too high, this may indicate redundancy or halo effect. If too low, would indicate lack of validity. We find moderate, positive correlations between specific HCAHPS measures and global measures (Rating and Recommendation). All correlations are between 0.22 and 0.50; 13 of 18 correlations exceed 0.33.

Table 6: Top-Box Correlations for HCAHPS Measures at 300 Completed Surveys, 3.1 million discharges, patient-level, 2013.

	Nurse	Doctor	Staff	Pain	RX Comm.	Clean	Quiet	Discharge	Rating	Recom md.	Care Trans.
Nurse	1										
Doctor	0.52	1									
Staff	0.48	0.35	1								
Pain	0.51	0.41	0.43	1							
RX Com.	0.48	0.42	0.38	0.42	1						
Clean	0.35	0.26	0.30	0.29	0.31	1					
Quiet	0.29	0.25	0.29	0.28	0.28	0.24	1				
Dischg.	0.24	0.24	0.16	0.21	0.29	0.15	0.10	1			
Rating	0.50	0.39	0.38	0.41	0.38	0.32	0.25	0.23	1		
Recom.	0.47	0.38	0.34	0.38	0.36	0.29	0.22	0.23	0.61	1	
Care Trans.	0.40	0.37	0.31	0.35	0.43	0.25	0.23	0.29	0.40	0.41	1

The correlations of the nine specific measures with the two global measures are larger at the hospital level than at the person level, in part because of the better measurement at the hospital level (as intended) than at the person level; see Table 7. These hospital-level correlations range from 0.39 to 0.76, with all but one exceeding 0.49.

Table 7: Top-Box Correlations for HCAHPS Measures, ~4,000 Hospitals, hospital level, 2013.

	Nurse	Doctor	Staff	Pain	RX Comm.	Clean	Quiet	Discharge	Rating	Recom md.	Care Trans.
Nurse	1										
Doctor	0.75	1									
Staff	0.83	0.68	1								
Pain	0.75	0.62	0.68	1							
RX Comm.	0.75	0.64	0.69	0.64	1						
Clean	0.66	0.53	0.70	0.53	0.56	1					
Quiet	0.60	0.62	0.60	0.52	0.54	0.49	1				
Disch.	0.50	0.39	0.42	0.47	0.48	0.33	0.24	1			
Rating	0.78	0.61	0.66	0.68	0.64	0.59	0.54	0.56	1		
Recom.	0.65	0.48	0.51	0.58	0.52	0.46	0.39	0.49	0.88	1	
Care Trans.	0.73	0.59	0.63	0.61	0.63	0.53	0.47	0.52	0.76	0.72	1

Discriminant validity (specific measures assess specific aspects of patient experience construct, not just the general patient experience construct) is demonstrated by the higher inter-item correlations within the 7 composite measures than across (between) measures, as seen in Table 7. Table 8 displays mean patient-level inter-item correlations within composites (bottom row), which range from 0.47 to 0.58 except for Discharge at 0.28 (the Discharge composite is uniquely composed of two dichotomous items, which artificially suppresses correlations) and mean inter-item correlations between composites for items in different composites (which range from 0.13 to 0.38). The second-last row of the table contains the mean between-composite inter-item correlation involving the composite in the column (e.g. mean inter-item correlation is 0.50 within the Nurse Communication composite and 0.31 for correlations of Nurse Communication items with items in other composites). In all cases, the mean correlation within composites is much higher than those between composites, providing clear evidence of discriminant validity. This can also be demonstrated via factor analysis of HCAHPS results; see “Exploratory Factor Analyses of the CAHPS Hospital Pilot Survey Responses across and within Medical, Surgical, and Obstetric Services.” O’Malley, Zaslavsky, et al. (2005) Health Services Research, 40 (6): 2078-2095.

Table 8: Average Top-Box Inter-Item Correlations for Individual HCAHPS Items, 3.1 million discharges, patient level, 2013.

	Nurse	Doctor	Staff	Pain	RX Comm.	Discharge	Care Transition
Nurse	0.50						
Doctor	0.35	0.55					
Staff	0.37	0.27	0.47				
Pain	0.38	0.31	0.35	0.55			
RX Comm.	0.34	0.31	0.31	0.32	0.46		
Discharge	0.16	0.16	0.13	0.15	0.20	0.28	
Care Transition	0.28	0.27	0.25	0.27	0.32	0.20	0.58
Avg. Cross	0.31	0.28	0.28	0.30	0.30	0.17	0.26
Avg. Within	0.50	0.55	0.47	0.55	0.46	0.28	0.58

Three Care Transition questions were added to the HCAHPS Survey in January 2013. The Care Transition Measure was originally endorsed by the National Quality Forum as NQF #0288. In 2012, CMS tested the validity of the CTM as a part of the HCAHPS Survey in a mode experiment. Briefly, 20,670 inpatients discharged January 1, 2012 through March 31, 2012 were randomly assigned to each of the four HCAHPS survey modes: Mail only; Mixed mode (Mail with Telephone follow-up); Telephone

only (CATI); and Touch-tone IVR only (TT-IVR). With respect to validity of the CTM, we found Pearson correlations (linear scoring) with 10 existing HCAHPS measures ranging from 0.30 to 0.51. The highest correlations were with Recommend Hospital (0.51), Nurse Communication (0.50), Communication About Medicines (0.49), Overall Hospital Rating (0.48). The patient-mix adjustment the survey mode effect patterns were similar to other HCAHPS measures.

The 2012 mode experiment analysis provides support for the construct validity of the HCAHPS Survey, finding strong correlation of each of the composites and individual measures with the two overall measures and confirming the intended factor structure. Like all HCAHPS measures CTM has good psychometric properties. We found no evidence of a ceiling effect; there is substantial room for quality improvement. While there are strong links with Nurse Communication and Communication about Medicines, there was generally a lack of redundancy with HCAHPS measures. Results from the national implementation of the Care Transition Measure in 2013 indicate there is ample room for improvement on this aspect of patient experience, as compared with the ten original HCAHPS measures; see Table 9.

Table 9: HCAHPS Top-Box Scores, ~4,000 hospitals, 3.1 million discharges, 2013.

HCAHPS Composite	Mean	Std Dev
Communication with Nurses	79.12	5.68
Communication with Doctors	81.82	5.36
Responsiveness of Hospital Staff	67.85	9.12
Pain Management	70.88	5.98
Communication about Medicines	64.30	7.01
Cleanliness	73.61	7.86
Quietness	61.47	10.23
Discharge Information	85.73	4.45
Overall Rating	70.80	9.11
Recommend Hospital	71.12	10.08
Care Transition	51.27	7.23

Recent HCAHPS results that include the new Care Transition Measure continue to affirm the high level of reliability of the HCAHPS Survey; see above. These results demonstrate that all 11 HCAHPS measures reliably distinguish hospital performance and are sufficiently reliable for hospital-level public reporting and performance incentives at the recommended 300 completed surveys using top-box scoring.

The goal of HCAHPS is to collect information from patients using a standardized, national survey and to present the information based on those surveys to consumers, providers and hospitals. One of the

methodological issues associated with making comparisons between hospitals is the need to adjust appropriately for patient-mix differences. Patient-mix refers to patient characteristics that are not under the control of the hospital that may affect measures of patient experiences, such as demographic characteristics and health status. The basic goal of adjusting for patient-mix is to estimate how different hospitals would be rated if they all provided care to comparable groups of patients.

CMS applies patient-mix adjustment to control for patient characteristics that affect ratings and that are differentially distributed across hospitals. Most of the patient-mix items are included in the “About You” section of the instrument, while others are taken from administrative records. Based on the mode experiment, and consistent with previous studies of patient-mix adjustment in CAHPS and in previous hospital patient surveys, we employ the following variables in the patient-mix adjustment model:

- Self-reported general health status (specified as a linear variable)
- Education (specified as a linear variable)
- Type of service (medical, surgical, or maternity care)
- Age (specified as a categorical variable)
- Admission through emergency room (discontinued in 2010)
- Lag time between discharge and survey
- Age by service line interaction
- Language other than English spoken at home

Once the data are adjusted for patient-mix, there is a fixed adjustment for each of the reported measures for mode of administration (discussed in detail below). The patient-mix adjustment employs a regression methodology, also referred to as covariance adjustment.

On the survey there are two items that capture the race and ethnicity of the respondent. These items are not included in the patient-mix adjustment model but used as analytic variables to support two congressionally-mandated reports: “The National Healthcare Disparities Report” and “The National Healthcare Quality Report.” These reports provide annual, national-level breakdowns of HCAHPS scores by race and ethnicity. Many hospitals collect information on race and ethnicity through their administrative systems, but coding is not standard. Thus it was determined that administrative data are not adequate to support the analyses needed for the reports and the items should be included in the questionnaire.

CMS added five new items to the HCAHPS Survey beginning with July 2012 discharges on a voluntary basis. These items officially became a required part of the HCAHPS Survey beginning with January 2013

discharges; results were publicly reported for the first time in December 2014. Three new items (survey questions 23, 24 and 25) were added to the ‘core’ of the survey in order to create the new Care Transition Composite measure, which became the seventh HCAHPS composite measure. Two new items (survey questions 26 and 28) were added to the “About You” section of the survey: one concerning emergency room admission, and one concerning self-reported overall mental health.

The three-item Care Transition Measure (CTM) assesses patients’ perspectives on the coordination of hospital discharge care. The CTM was developed by Dr. Eric A. Coleman of the University of Colorado, a leading researcher in the area of care transitions, and has been endorsed by the NQF as a voluntary consensus standard, NQF #0228. The new CTM items complement the two existing HCAHPS discharge questions, provide detailed information on the transition to post-hospital care, and incentivize quality improvement in this critical aspect of care.

In 2013, CMS also added two new survey items to the “About You” section of the HCAHPS Survey. The first asks patients whether they entered the hospital through the emergency room. The second asks patients about their overall mental health. Each of these items conforms to CAHPS standards and had been tested in the HCAHPS Three-State Pilot Study in 2003. Neither item was adopted in the national implementation of HCAHPS, primarily to keep the survey as short as possible. At that time, emergency room admission information could be obtained from hospital administrative data, and patients’ overall mental health status was found to have relatively little impact on patient-mix adjustment in the Three-State Pilot Study. In response to requests from users and stakeholders, CMS added these items to the HCAHPS Survey. CMS does not publicly report the results of these two items.

From 2006 to 2010, “emergency room admission” as a point of origin for hospital patients was an administrative code that was provided by hospitals. CMS employed this administrative code as a patient-mix adjustment for HCAHPS scores. However, effective July 1, 2010, the “Point of Origin for Admission or Visit” code for Emergency Room (code 7) was discontinued for use by Medicare Systems and thus became unavailable for HCAHPS. CMS has been unable to find any other hospital administrative variable or code that could be used to reliably capture admission through the emergency room. The best alternative CMS has found is a patient-reported item that had been developed for HCAHPS and was tested in 2003. This patient-reported emergency room admission item was added to the “About You” section of the HCAHPS Survey in July 2012 on a voluntary basis; it became a required survey item in January 2013.

Although we chose not to add a survey item about patient’s overall mental health status in the national implementation of HCAHPS in 2006, we continued to receive inquiries and requests from hospitals and researchers on this topic. Some researchers claim that mental health status is an important factor in how patients respond to HCAHPS survey items. The continuing interest in this topic, coupled with the direct impact of HCAHPS performance on hospital payments beginning October 2012, led us to decide to add an overall mental health item to the HCAHPS Survey. The overall mental health survey item we have chosen very closely resembles the Overall General Health item in the HCAHPS Survey, has been extensively tested, and is currently included in several other CAHPS surveys. CMS added the overall mental health item to the “About You” section of the HCAHPS Survey in July 2012 on a voluntary basis; it became a required survey item in January 2013. We provided a copy of the revised HCAHPS Survey in our 2012 OMB package. There have been no changes to the HCAHPS Survey since then.

The addition of five new items in 2012 necessitated a new mode experiment to investigate how each survey mode (mail, telephone, mail with telephone follow-up, and active Interactive Voice Response) affects responses to the new Care Transition Measure items. This mode experiment, called HCAHPS Mode Experiment 3, closely resembled the original HCAHPS mode experiment. HCAHPS Mode Experiment 3 was conducted from January to March 2012 and encompassed 47 hospitals from around the USA that represented key hospital characteristics. Briefly, a sample of 20,670 patients discharged during that period was randomly assigned in equal numbers to the four HCAHPS modes. Survey results were compared and mode effects were estimated to adjust for their impact on survey response. The CMS HCAHPS subcontractors RAND and Health Services Advisory Group conducted the mode experiment and analyzed the data. We found strong evidence for the reliability and validity of the Care Transition Measure:

- CTM composite score
 - o Top-box: 46%
 - o Middle-box: 46%
 - o Bottom-box : 8%
 - o
- Cronbach’s alpha
 - o 0.82 (Linear scoring)
 - o 0.80 (top-box scoring)
 - o
- Hospital-level reliability (Spearman-Brown), at 300 or more completed surveys
 - o 0.88 (linear scoring)
 - o 0.84 (top-box scoring)
 - o
- Pearson correlations (linear scoring) with 10 existing HCAHPS measures

- Range 0.30 to 0.51
- Patient-mix adjustment and survey mode effects are similar to other HCAHPS measures

In summary, the Care Transition Measure displays strong psychometric properties; there is ample room for quality improvement (top-box score is lower than the other 10 HCAHPS measures; see Table 8); no evidence of a ceiling effect; CTM is not redundant with existing HCAHPS measures; and the relatively strong correlation with Nurse Communication and Communication about Medicines suggests the importance of care coordination in those areas.

To implement the expanded survey, CMS began training participating hospitals and survey vendors on the new items in 2012 and updated the survey materials, telephone scripts, and file specifications for these items. The Care Transition Measure became the seventh HCAHPS composite publicly reported on the Hospital Compare Web site in December 2014.

In the FY 2013 Inpatient Prospective Payment System rule, CMS added the new HCAHPS Survey items to the Annual Payment Update (APU) requirements of IPPS hospitals. CMS will propose adding the Care Transition Measure as the ninth dimension in the Patient Experience of Care Domain in the Hospital Value-Based Purchasing program for IPPS hospitals in the 2015 Inpatient Prospective Payment System Proposed Rule.

4. Past and Ongoing Tests of Procedures, Trainings, and Quality Improvement Activities; Collaborator and Contractor Participation (collaborators and contractors are **bolded**).

Hospitals began using the HCAHPS Survey in 2006 under the auspices of the **Hospital Quality Alliance**, a private/public partnership that includes CMS and the **American Hospital Association**, the **Federation of American Hospitals**, and the **Association of American Medical Colleges**; the **Joint Commission on Accreditation of Healthcare Organizations**; the **National Quality Forum**; **AARP**; and CMS' **Agency for Healthcare Research and Quality (AHRQ)**.

Beginning in 2002, HCAHPS has undertaken extensive research, planning, development and testing activities. CMS originally partnered with **AHRQ** to develop a standard instrument and data collection and reporting procedures that capture patients' perspectives of their hospital care. AHRQ is a leader in developing instruments for measuring patient perspectives on health care. Table 10 summarizes the

process of creating and implementing the HCAHPS survey throughout the period starting July 2002 through the first public reporting of HCAHPS results in March of 2008.

Table 10: HCAHPS Survey Development and Implementation Timeline, 2002-2008.

Activity	Timeframe
Published a “call for measures” in the <i>Federal Register</i> and received 7 submissions from Avatar, Edge Health Care Research Healthcare Financial Management Association, Jackson Organization, Press Ganey Associates, National Research Corporation, Peace Health, Professional Research Consultants, and SSM Health Care.	July 2002
Completed literature review.	Sept-Nov 2002
Held a Web chat to answer questions about HCAHPS.	Oct 2002
Provided draft domains to CMS.	Oct 2002
Reviewed measures submitted in response to Federal Register Notice FRN	Nov 2002
Held Stakeholders Meeting to solicit suggestions and comments.	Nov 2002
Held vendors meeting to solicit suggestions and comments.	Nov 2002
AHRQ delivered 66 item draft survey to CMS for use in pilot test.	Jan 2003
Developed data collection and sampling methods, and developed analysis plan.	Jan-Feb 2003
Published FRN soliciting comments on draft HCAHPS.	Feb 2003
Completed hospital recruitment for pilot.	Mar 2003
Began data collection for CMS 3-state pilot test.	June 2003
Published a FRN soliciting comments on draft HCAHPS and asked for input about implementation issues.	June 2003
Analyzed data from CMS pilot test.	Sept–Nov 2003
Review of instrument by CAHPS Cultural Comparability team.	Fall 2003
Began CT pilot test of the HCAHPS instrument.	Fall 2003
Held HCAHPS Stakeholders’ Meeting at AHRQ.	Nov 2003
Revised HCAHPS instrument to 32 items.	Nov 2003
AHRQ submitted revised 32-items HCAHPS Instrument to CMS.	Dec 2003
Published a FRN soliciting input for 32-item HCAHPS instrument and implementation strategy.	Dec 2003-Feb 2004
Started coordination of national implementation with HSAG, the AZ QIO.	January 2004
Completed CT pilot test of HCAHPS.	Jan 2004
AHRQ submitted Analysis Report of the CMS 3-state pilot to CMS.	Jan 2004
Continued discussions with hospitals, vendors, consumers to follow-up on FRN comments from February.	March – Sept 2004
Revised 25-item HCAHPS Instrument submitted by AHRQ to CMS.	Oct 2004
Submitted HCAHPS to NQF for its consensus development process.	November 2004

Started developing training documents for national implementation.	December 2004
Started discussions regarding data transmission via QNET & other issues with the IFMC, the IA QIO.	April 2005
Formed the Data Integrity Group.	June 2005
Received endorsement for 27-item HCAHPS from the National Quality	May 2005
Modified survey instrument and protocol as 27-items.	May 2005
Abt Associates, Inc. receives OMB approval for cost-benefit analysis.	June 2005
Established the Data Submission and Reporting Group.	July 2005
Abt Associates, Inc. submits final report of the cost-benefit analysis.	October 2005
Published FRN soliciting comments on draft CAHPS Hospital Survey.	November 2005
Received final approval.	December 2005
Mode Experiment.	February – May 2006
National Implementation begins.	October 2006
HCAHPS participation linked to RHQDAPU program (“ <i>pay for reporting</i> ”).	July 2007
First public reporting of HCAHPS results.	March 2008

Throughout the HCAHPS development process, CMS solicited and received a great deal of public input. As a result, the HCAHPS questionnaire and methodology went through several iterations prior to national implementation. The accumulated lessons learned from the pilot testing, public comments, input from stakeholders, numerous team discussions, and the **National Quality Forum’s** review and endorsement (NQF #0166) through their consensus development process led to the national implementation in 2006 of the 27-item HCAHPS Survey and the HCAHPS data collection protocol that allows hospitals to integrate their own supplemental questions. The resulting core questionnaire is comprised of questions in several dimensions of primary importance to the target audience: doctor communication, responsiveness of hospital staff, cleanliness of the hospital environment, quietness of the hospital environment, nurse communication, pain management, communication about medicines, and discharge information. The HCAHPS Survey was re-endorsed by the NQF in 2012 and 2015.

In response to numerous requests from within CMS, the Department of Health and Human Services, and external stakeholders, the HCAHPS Survey was expanded for the first time by the addition of five new items, which began with July 2012 discharges and on a voluntary basis. These 5 new items officially became a required part of the HCAHPS Survey beginning with January 2013 discharges; results were publicly reported for the first time in December 2014. Three new items were added to the ‘core’ of the survey in order to create the new Care Transition Composite measure, which became the seventh

HCAHPS composite measure, and two new items were added to the “About You” section of the survey: one concerning emergency room admission, and one concerning self-reported overall mental health. The five new items raised the total number of items to 32. The 32-item HCAHPS Survey currently in use can be found in Attachment A – HCAHPS Survey Instrument (Mail) and Supporting Materials.

The HCAHPS implementation plan changed significantly as a result of the public input we received prior to national implementation. CMS made the following major changes in the implementation approach, which have served to lessen the burden on hospitals/survey vendors:

- reduced the number of mailings for the “mail only” survey protocol from three to two;
- reduced the number of follow-up phone calls for the “telephone only” survey protocol from ten to five;
- added active interactive voice response (IVR) as a mode of survey administration;
- eliminated the 50% response rate requirement;
- reduced the number of patient discharges to be surveyed.

Since national implementation began in 2006, CMS has continually refined and clarified HCAHPS survey protocols, created new translations of the mail version of the survey in Chinese, Russian, Vietnamese, and Portuguese in addition to the original English and Spanish versions (in the telephone and IVR modes, the HCAHPS Survey is available in both English and Spanish), added five new survey items, including three items that form the new composite measure, Care Transition, annually updated the HCAHPS *Quality Assurance Guidelines* (currently version 10.0), improved the appearance and accessibility of HCAHPS results on the Hospital Compare website (<http://www.medicare.gov/hospitalcompare/search.html>), and made information about HCAHPS quickly and easily available through its official HCAHPS On-Line website, www.hcahponline.org. There has been steady and significant improvement in HCAHPS scores since national implementation; see Elliott, Lehrman, Goldstein et al. (2010), “Hospital Survey Shows Improvements in Patient Experience.” *Health Affairs*, 29 (11): 2061-2067. The HCAHPS Project Team has published a number of analyses of HCAHPS results in peer-reviewed scientific journals and made numerous presentations at professional conferences; a bibliography of the publications can be found at <http://www.hcahponline.org/home.aspx>.

Since public reporting of hospitals HCAHPS results was inaugurated in March 2008, a growing number of healthcare, consumer and professional organizations, state governments, media outlets and others have adopted or incorporated HCAHPS scores, in part or in whole, for their own purposes. These activities, external to CMS, have had the effect of extending knowledge about HCAHPS and increasing the impact

of survey results. The content of the HCAHPS Survey, its methodology and administration protocols, and its ambition to measure and publicly report consumers' experiences in a uniform and standardized manner have influenced other surveys developed within CMS as well as those undertaken by hospitals and healthcare systems in the United States and abroad.

There are distinct roles for **hospitals or their survey vendors** and the federal government in the national implementation of HCAHPS. The **federal government** is responsible for support and public reporting, including:

- conducting training on data collection and submission procedures,
- providing on-going technical assistance,
- ensuring the integrity of data collection,
- accumulating HCAHPS data from individual hospitals,
- producing patient-mix adjusted hospital-level estimates,
- conducting research on the presentation of data for public reporting, and
- publicly reporting the comparative hospital data.

Hospitals or their survey vendors are responsible for data collection, including: developing a sampling frame of relevant discharges, drawing the sample of discharges to be surveyed, collecting survey data from sampled discharges, and submitting HCAHPS data to CMS in a standard format. We have formatted the data files so hospitals/vendors will submit to CMS de-identified data files following 45 CFR Section §164.514. Hospitals maintain business associate agreements with their contracted survey vendors to collect and submit HCAHPS survey data through the secure **QualityNet Exchange** portal and data warehouse.

CMS began its collaboration with the **Health Services Advisory Group (HSAG)** in 2003 to coordinate the national implementation of the Hospital CAHPS Survey. HSAG's role is to provide technical assistance and training for vendors and hospitals, data validation, data processing, analysis, and adjustment, and oversight of self-administering hospitals and survey vendors. HSAG also produces electronic data files and a hospital level extract file for public reporting of the HCAHPS scores.

In the spring of 2006, CMS conducted a large-scale experiment to assess the impact of mode of survey administration, patient characteristics and patient non-response on HCAHPS results. This first mode experiment was based on a nationwide random sample of short-term acute care hospitals. Hospitals from each of CMS' ten geographic regions participated in the Mode Experiment. A hospital's probability of being selected for the sample was proportional to its volume of discharges, which guaranteed that each

patient would have an equal probability of being sampled for the experiment. The participating hospitals contributed patient discharges from a four-month period: February, March, April, and May 2006. Within each hospital, an equal number of patients was randomly assigned to each of the four modes of survey administration. Sample selection and surveying were conducted by the **National Opinion Research Center of the University of Chicago**, and the data was analyzed by the **RAND Corporation**.

A randomized mode experiment of 27,229 discharges from 45 hospitals was used to develop adjustments for the effects of survey mode (Mail Only, Telephone Only, Mixed mode, or Active Interactive Voice Response) on responses to the HCAHPS Survey. In general, patients randomized to the Telephone Only and Active Interactive Voice Response provided more positive evaluations than patients randomized to Mail Only and Mixed (Mail with Telephone follow-up) modes. These mode effects varied little by hospital, and were strongest for global items (rating and recommendation), and the Cleanliness & Quiet, Responsiveness, Pain Management, and Discharge Information composites. Adjustments for these mode effects are necessary to make the reported scores independent of the survey mode that was used. These adjustments are applied to HCAHPS results before they are publicly reported on the Hospital Compare website. The mode adjustments can be found in the “Mode Adjustment” section of the HCAHPS website, www.hcahpsonline.org.

The Mode Experiment also provided valuable information on the impact of salient patient characteristics and non-response bias on HCAHPS results. This analysis was needed because hospitals do not provide care for comparable groups of patients but, as demonstrated in the HCAHPS Three-State Pilot Study, some patient characteristics may affect measures of patient experiences of care. The goal of patient-mix adjustment, which is also known as case-mix adjustment, is to estimate how different hospitals would be rated if they provided care to comparable groups of patients. As suggested by the Three-State Pilot Study, a set of patient characteristics not under control of the hospital was selected for analysis. In summary, the most important patient-mix adjustment items were patients’ self-reported health status, education, service line (maternity, medical or surgical care) and age. In addition, after mode and patient-mix adjustments have been made, non-response effects were found to be negligible. A report on patient-mix and non-response adjustments, as well as the mode adjustments and current and past patient-mix adjustments, is available on the HCAHPS On-Line website, <http://www.hcahpsonline.org/modeadjustment.aspx>. We also looked at the extent to which each domain contributes to measurement in priority areas established by an independent, expert body on quality measurement, the **National Quality Forum (NQF)**. The HCAHPS domains “communication with doctors,” “communication with nurses,” “communication about

medications” contribute to the NQF’s priority on improving care coordination and communication. The HCAHPS “pain control” domain contributes to the NQF’s pain management priority, while the HCAHPS “discharge information” domain contributes to the priority on improving self-management and health literacy.

CMS, with assistance from HSAG and its sub-contractor, the **National Committee on Quality Assurance (NCQA)**, has developed and conducted annual training sessions for self-administering hospitals and survey vendors participating in the HCAHPS Survey, as well as others interested in this program. HCAHPS Introductory Training was first offered at the CMS headquarters in January 2006, and then by webinar in January and April 2006. Since then, HCAHPS Introductory Training has been held annually, by webinar. In addition, CMS developed the HCAHPS Update Training program. HCAHPS Update Training was first offered in May 2007 and has been offered annually by webinar since then. HCAHPS Introductory Training is required for self-administering hospitals and survey vendors that wish to join HCAHPS. HCAHPS Update Training provides information on important changes to the HCAHPS program and is required for all self-administering hospitals and survey vendors participating in HCAHPS.

As part of an initiative to add five-star quality ratings to its Compare Web sites, CMS will add HCAHPS Star Ratings to the Hospital Compare Web site in April 2015. Star ratings will make it easier for consumers to use the information on the Compare Web sites and spotlight excellence in healthcare quality. Twelve HCAHPS Star Ratings will appear on Hospital Compare: one for each of the 11 publicly reported HCAHPS measures, plus the new HCAHPS Summary Star Rating. HCAHPS Star Ratings will be the first star ratings to appear on Hospital Compare. CMS plans to update the HCAHPS Star Ratings each quarter. In preparation for the addition of HCAHPS Star Ratings to Hospital Compare, we have posted documents on the HCAHPS On-Line Web site that explain the calculation of the star ratings and address frequently asked questions; see <http://www.hcahponline.org/StarRatings.aspx>.

Mode effects can be addressed with precise analytic adjustments developed in large-scale mode experiments. These adjustments are specific to the administered survey items. A mode experiment was conducted in 2012 to develop adjustments for newly added HCAHPS care transition items. In 2016, CMS will conduct another mode experiment of sufficient scale to examine and identify changes in mode effects since the last mode experiment and if necessary, provide precise adjustment estimates for use with the current 32-item HCAHPS survey. The purpose of the planned HCAHPS mode experiment (Document Identifier: CMS Form Number CMS-10542: HCAHPS Mode Experiment) is to conduct a

mode experiment of sufficient sample and scale to determine if the mode adjustments currently employed for the 32-item HCAHPS core survey need revision. An additional goal is to collect empirical evidence on the effect of the number of additional supplemental items, added by hospitals, on survey response rate and patterns of response to the HCAHPS core demographic items (known as “About You” items).

5. Names and telephone numbers of individuals consulted on statistical aspects of the survey and implementation design and names of agency units, contractor(s), grantee(s), or other persons(s) who collect and/or analyze the information for the agency.

Marc N. Elliott, PhD
Distinguished Chair in Statistics; Senior Principal Researcher
RAND Corporation
(310) 393-0411, x7931
Marc_Elliott@rand.org

Christopher Cohea, MS.
Senior Research Analyst
Health Services Advisory Group, Inc.
(602) 471-3673
christopher.cohea@hcqis.org