Correlation of Inpatient Experience Survey Items and Domains With Overall Hospital Rating

Kyle Kemp, MSc[1,2], Brandi McCormack, MSc[1], Nancy Chan, BA[1], Maria J Santana, PhD[2], and Hude Quan, PhD[2]

Abstract

Objective: To determine which individual patient experience questions and domains were most correlated with overall inpatient hospital experience. **Methods:** Within 42 days of discharge, 27 639 patients completed a telephone survey based upon the Hospital-Consumer Assessment of Healthcare Systems and Processes instrument. Patients rated their overall experience on a scale of 0 (worst care) to 10 (best care). Correlation coefficients were calculated to assess the relationships between individual survey questions and domains with overall experience. **Results:** Questions on provider coordination and nursing care were most correlated with overall experience. Hospital cleanliness, quietness, and discharge information questions showed poor correlation. Correlation with overall experience was strongest for the "communication with nurses" domain. **Conclusions:** Our individual question results are novel, while the domain-based findings replicate those of US-based providers, results which had not yet been reported in the Canadian context—one with universal health care coverage. Our results suggest that our large health care organization may attain initial inpatient experience improvements by focusing upon personnel-based initiatives, rather than physical attributes of our hospitals.

Keywords

inpatient experience, HCAHPS, correlation, domains

Introduction

Inpatient experience is a patient-reported outcome which assesses the perceived quality of health care interactions and services which are delivered over the course of a given hospital stay. In the United States, the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey was introduced to measure hospital experience in a rigorous, systematic fashion. As such, this validated survey allows for meaningful comparison between multiple hospitals, something that was previously not possible with the use of ad-hoc, in-house instruments which varied between institutions (1–4). On a larger scale, HCAHPS results in the United States now play a crucial role in the value-based purchasing program introduced under the Affordable Care Act of 2010 (5). As such, patient experience results now directly affect a portion of hospital funding, resulting in a clear incentive to not only collect patient experience data, but also to act upon it.

The HCAHPS survey contains over 30 questions and touches upon 9 different domains (communication with doctors, communication with nurses, responsiveness of hospital staff, pain management, communication about medicines, discharge information, cleanliness of the hospital environment, quietness of the hospital environment, and transition of care) (1, 6). With respect to the US-based data, the Centers for Medicare & Medicaid Services (central repository for HCAHPS data) reports correlation data between each of these domains, as well as overall experience (7), which is asked of patients as per the following statement:

> We want to know your overall rating of your stay at <HOSP>. This is the stay that ended around <DDATE>. Please do not include any other hospital stays in your answer. Using any number from 0 to 10, where 0 is the worst hospital possible and 10 is the best hospital possible. What number would you use to rate this hospital during your stay?

[1] Primary Data Support, Alberta Health Services, Calgary, Alberta, Canada
[2] Department of Community Health Sciences, University of Calgary, Calgary, Alberta, Canada

Corresponding Author:
Kyle Kemp, Primary Data Support, Analytics (DIMR), 4520—16th Ave. NW, Suite 200, Calgary, Alberta, Canada T3B 0M6.
Email: Kyle.Kemp@albertahealthservices.ca

By determining which area(s) may provide the most benefit to overall care experience, this type of correlational analysis overcomes one of the perceived challenges in trying to implement organizational change from HCAHPS. Simply said, the results may inform the end-user as to the specific domains which when improved would theoretically provide the greatest gains in overall patient experience (8, 9). However, the reported data do not examine individual questions nor do it address these comparisons within a Canadian setting, one which employs a universal health care model (10). Therefore, the purposes of this project were to assess which (a) individual questions and (b) HCAHPS domains are most correlated with overall inpatient hospital experience in our Canadian data set.

Methods

Survey Instrument

Our organization's province-wide inpatient hospital experience survey has been administered on a continuous basis since 2009. The overall rating of care question is one of 16 publicly-reported performance measures (11). The survey is comprised of 51 questions, which includes 32 core HCAHPS items, as well as 19 other items which address organization-specific policies and procedures. Surveys are administered by a trained team of health research interviewers using computer-assisted telephone interview (CATI) software (Voxco (Voxco version 1.10); Montreal, Canada). Potential respondents are contacted Monday to Friday from 9 AM to 9 PM and on Saturdays from 9 AM to 4 PM. To ensure standardization, 10% of all calls are monitored for quality assurance and training purposes.

Each survey typically requires 15 to 20 minutes to complete using a standard script with a list of standard prompts and responses to frequently asked questions. Responses to each survey question are Likert-type scales. Certain questions ask the respondent to rate aspects of their care on a scale of 0 (worst) to 10 (best), while other items employ categorical responses (eg, always, usually, sometimes, and never). Detailed information about the development, validity, and American results from HCAHPS is publicly available at www.hcahpsonline.org (1, 6).

Sample Derivation and Dialing Protocol

Across our province, acute care admission, discharge, and transfer information are captured in a series of clinical databases which are updated daily. On a biweekly basis, eligible discharges are extracted using a standard script. This script filters all inpatient records based on our survey exclusion criteria. These include age less than 18 years old, inpatient stay of less than 24 hours, death during hospital stay (no proxy surveys are permitted), any day surgery or ambulatory procedures, and any psychiatric unit or psychiatric physician service on record (12). For compassionate reasons, our organization also excludes any records containing any dilation and curettage procedures, as well as visits relating to still births, or those associated with a baby with length of stay greater than 6 days (eg, complication/neonatal intensive care unit stay). The 4 data extracts are combined into 1 complete provincial list, with duplicate entries (if present) being filtered out.

Once compiled, the complete list of eligible inpatient discharges is imported into the CATI software program and stratified at the hospital level. At the time of interview, random dialing is performed on the sample, until a quota of 5% of eligible discharges across all of our province's 94 acute care hospitals is met. Patients are contacted up to 42 days postdischarge. To maximize the potential for survey completion, each dialed number is called up to 9 times on varying days and times or until a definitive result (eg, survey completed, refusal, etc) is obtained.

Analysis

To account for differences in individual question response scales (eg, 3-point, 4-point, and 11-point), all inpatient experience responses were converted to a normalized scale of 0 (worst possible score) to 100 (best possible score). For example, for questions with a response scale of never, sometimes, usually, and always, scores were converted to 0, 33.33, 66.66, and 100, respectively. For the independent variable (overall rating of care), respondents were asked to rate the overall care that they received during their inpatient visit on an 11-point scale of 0 to 10.

These scores were converted to the 0 (worst possible) to 100 (best possible) score, where 1 equals 10, 2 equals 20, and so on. With respect to HCAHPS domains, mean scores were calculated using the following formula:

Sum of normalized question scores in the domain/Number of questions in the domain. For example, the mean domain score for nurse communication, which is comprised of 3 questions, was calculated by dividing the sum of the nurse respect, nurse listening, and nurse explanation normalized question scores by 3. This process was completed for each domain score. A listing of the domains with their corresponding questions is provided in Table 1.

The characteristics of the sample were generated using descriptive statistics. The relation between normalized individual questions and overall rating of care (objective a) was calculated using the Spearman correlation statistic. The relation between normalized domain scores and overall rating of care (objective b) was calculated using the Pearson correlation statistic. All analyses were performed using SAS Network Version 9.3 for Windows (Cary, North Carolina). *P* values of less than .05 were considered statistically significant for all comparisons.

Results

Over the 3-year study period (April 2011 to March 2014), 27 492 inpatient experience surveys were completed. One-hundred twenty-three patients did not provide a response

Table 1. Inpatient Survey Domains and Question Composition.

Domain	Questions
Communication from nurses	Nurse respect
	Nurse listening
	Explanations from nurses
Communication from doctors	Doctor respect
	Doctor listening
	Explanations from doctors
Responsiveness of hospital staff	Call button response
	Bathroom assistance
Pain management	Help with pain
	Pain control
Communication about medicines	New medicine purpose
	New medicine side effects
Cleanliness of hospital	Room cleanliness
Quietness of hospital	Room quietness
Discharge information	Help after discharge
	Symptoms after discharge

Table 2. Characteristics of Sample.[a]

Characteristic	n	Percentage of Sample
Sex		
Male	9665	35.3
Female	17 704	64.7
Age, in years		
18-24	1863	6.8
25-34	5028	18.4
35-44	2916	10.7
45-54	3439	12.6
55-64	4683	17.1
65-74	4424	16.2
75-79	2011	7.4
80 and older	3005	11.0
Birth location (n = 27 351)		
Canada	23 323	85.3
Outside Canada	4028	14.7
Primary language spoken at home (n = 27 338)		
English	24 728	90.5
Other	2610	9.5
Marital status (n = 27 203)		
Single (never married)	2811	10.3
Married/common-law/living with partner	18 886	69.4
Divorced/separated/widowed	5506	20.2
Maximum education level (n = 26 214)		
Elementary or junior high	3349	12.8
Senior high (some or complete)	8617	32.9
College/technical school (some or complete)	8602	32.8
Undergraduate level (some or complete)	4447	17.0
Postgraduate degree complete	1199	4.6
Length of hospital stay, days (n = 27 368)		
1.0-2.0	8149	29.8
2.01-4.0	9433	34.5
4.01-8.0	4866	17.8
Greater than 8.0	4920	18.0

[a]n = 27 369 unless otherwise stated.

to the "overall rating of care" question. These surveys were excluded from analysis, resulting in a final sample of 27 369 completed surveys (99.6% of original cohort). Characteristics of the final sample are provided in Table 2. Our survey cohort was primarily female (64.7%) and between 25 and 74 years of age (74.8%). The majority of respondents was born in Canada (85.3%) and primarily spoke English at home (90.5%). The mean age of the cohort was 53.8 ± 20.0 years (median = 56.0), and the mean length of stay was 5.4 ± 9.3 days (median = 3.0).

Correlation results between individual questions and the patients' overall rating of care are presented in Table 3. The ranked results, a brief description of the question, the possible answers, and the wording of each item (as read verbatim to the patient) are also presented. From this, the question pertaining to provider coordination was most correlated with overall rating of care (n = 27 258, $r = .54$, $P < .001$). Other top-5 ranking questions pertained to nurse follow-up (n = 26 533, $r = .46$, $P < .001$), nurse listening (n = 27 253, $r = .45$, $P < .001$), help with pain (n = 20 775, $r = .42$, $P < .001$), and nurse respect (n = 27 243, $r = .41$, $P < .001$). All nursing questions ranked within the top 7 questions, with the lowest-ranking nursing question being related to nurse explanations (n = 27 131, $r = .38$, $P < .001$). Items pertaining to physical attributes/environment of the hospital showed poor correlation with overall rating of care. These included room cleanliness (ranked 15th of 24; n = 26 944, $r = .35$, $P < .001$), and room quietness (ranked 18th of 24; n = 27 112, $r = .31$, $P < .001$). The two lowest-ranked questions were related to discharge information: help after discharge (n = 24 103, $r = .23$, $P < .001$), and symptoms after discharge (n = 24 826, $r = .16$, $P < .001$).

Patient-level domain correlation results are shown in Table 4. Communication with nurses was the domain most correlated with overall rating of care ($r = .60$, $P < .001$). Four domains showed similar correlation with overall rating of care. These included responsiveness of hospital staff ($r = .49$, $P < .001$), pain management ($r = .48$, $P < .001$), communication with doctors ($r = .43$, $P < .001$), and communication about medicines ($r = .42$, $P < .001$). Cleanliness of the hospital ($r = .35$, $P < .001$), quietness of the hospital ($r = .30$, $P < .001$), and discharge information ($r = .29$, $P < .001$) were the 3 domains that showed least correlation with overall rating of care.

Discussion

The present study provides novel information on the comparison of individual HCAHPS questions to overall rating of care in the inpatient setting, something that to our knowledge has not been done previously. Second, correlation results examining the comparison of HCAHPS domains to overall rating of care in the Canadian context are shown. Our main study finding was that in the inpatient setting, staff-based questions (eg, staff coordination, nurse follow-up, and nurse listening) and domains (eg, communication with nurses and responsiveness of hospital staff) were more

Table 3. Individual Item Correlations With Overall Hospital Experience.

Rank	Item Description	Possible Answers	Wording of Question/Item	Spearman's r
1	Provider coordination	1: Excellent 2: Very good 3: Good 4: Fair 5: Poor	How would you describe how well all of the health care professionals coordinated their efforts to serve your needs?	0.54 (n = 27 258)
2	Nurse follow-up	1: Never 2: Sometimes 3: Usually 4: Always	How often did nurses follow-up on your concerns and observations?	0.46 (n = 26 533)
3	Nurse listening	1: Never 2: Sometimes 3: Usually 4: Always	How often did nurses listen carefully to you?	0.45 (n = 27 253)
4	Help with pain	1: Never 2: Sometimes 3: Usually 4: Always	How often did the hospital staff do everything they could to help you with your pain?	0.42 (n = 20 775)
5	Nurse respect	1: Never 2: Sometimes 3: Usually 4: Always	How often did nurses treat you with courtesy and respect?	0.41 (n = 27 243)
6	Physician follow-up	1: Never 2: Sometimes 3: Usually 4: Always	How often did doctors follow-up on your concerns and observations?	0.39 (n = 25 756)
7	Nurse explanations	1: Never 2: Sometimes 3: Usually 4: Always	How often did nurses explain things in a way that you could understand?	0.38 (n = 27 131)
8	Call button response	1: Never 2: Sometimes 3: Usually 4: Always	After you pressed the call button, how often did you get help as soon as you wanted it?	0.38 (n = 20 424)
9	New medicine side effects	1: Never 2: Sometimes 3: Usually 4: Always	Before giving you any new medicine, how often did hospital staff describe possible side effects in a way you could understand?	0.38 (n = 14 261)
10	Patient involvement in decisions	1: No, I wanted to be more involved 2: Yes, somewhat 3: Yes, definitely	Did you have enough involvement in decisions about your treatment?	0.38 (n = 25 588)
11	Patient preferences	1: Strongly disagree 2: Disagree 3: Agree 4: Strongly agree	The hospital staff took your preferences and those of your family or caregiver into account in deciding what your health care needs would be when you left the hospital.	0.37 (n = 25 431)
12	Bathroom assistance	1: Never 2: Sometimes 3: Usually 4: Always	How often did you get help getting to the bathroom or in using a bedpan as soon as you wanted?	0.36 (n = 11 545)
13	Physician listening	1: Never 2: Sometimes 3: Usually 4: Always	How often did doctors listen carefully to you?	0.35 (n = 26 945)
14	Pain control	1: Never 2: Sometimes 3: Usually 4: Always	How often was your pain well controlled?	0.35 (n = 20 729)

(continued)

Table 3. (continued)

Rank	Item Description	Possible Answers	Wording of Question/Item	Spearman's r
15	Room cleanliness	1: Never 2: Sometimes 3: Usually 4: Always	How often were your room and bathroom kept clean?	0.35 (n = 26 944)
16	Physician explanations	1: Never 2: Sometimes 3: Usually 4: Always	How often did doctors explain things in a way that you could understand?	0.33 (n = 27 008)
17	Physician respect	1: Never 2: Sometimes 3: Usually 4: Always	How often did doctors treat you with courtesy and respect?	0.32 (n = 27 073)
18	Room quietness	1: Never 2: Sometimes 3: Usually 4: Always	How often was the area around your room quiet at night?	0.31 (n = 27 112)
19	Patient discharge information	1: Strongly disagree 2: Disagree 3: Agree 4: Strongly agree	When you left the hospital, you had a clear understanding of the things that you were responsible for in managing your health.	0.31 (n = 27 003)
20	New medicine purpose	1: Never 2: Sometimes 3: Usually 4: Always	Before giving you any new medicine, how often did hospital staff tell you what the medicine was for?	0.30 (n = 14 620)
21	Patient discharge medications	1: Strongly disagree 2: Disagree 3: Agree 4: Strongly agree	When you left the hospital, you clearly understood the purpose for taking each of your medications.	0.27 (n = 25 438)
22	Family involvement	1: Not as much as I wanted 2: As much as I wanted 3: More than I wanted	During your hospital stay, how much did hospital staff include your family or someone close to you in decisions about your care?	0.26 (n = 19 719)
23	Help after discharge	1: Yes 2: No	During your hospital stay, did doctors, nurses or other hospital staff talk with you about whether you would have the help you needed when you left the hospital?	0.23 (n = 24 103)
24	Symptoms after discharge	1: Yes 2: No	During this hospital stay, did you get information, in writing, about what symptoms or health problems to look out for, after you left the hospital?	0.16 (n = 24 826)

[a]All correlations were significant at the $P < .01$ level.

correlated with overall rating of care, when compared to items/domains pertaining to physical features (eg, hospital cleanliness and hospital quietness) and care processes (eg, discharge information). The domains-based findings are similar to those observed in the United States, as published by the CMS (7). Similar results have also been reported in settings as remote as rural China (13), which speaks volumes as to the robustness of these findings.

Our study results are timely. With the introduction of the Affordable Care Act, hospital reimbursement, in part, now focuses upon the quality of services delivered, as opposed to volume. The HCAHPS performance is now directly tied to a portion of hospital funding, providing a clear incentive to improve the care that is delivered to patients. Poor performance on the HCAHPS and other CMS programs, such as the Readmissions Reduction Program (14, 15) and the Hospital-Acquired Condition Reduction Program (16, 17),

now result in financial penalties to poor-performing hospitals. Although hospitals that use the HCAHPS instrument may routinely obtain reports of their results from their survey vendor (such as Press Ganey and Deidre Mylod, Personal communication, April 16, 2015), the information and methodology contained within these reports has yet to be available within the public domain. As such, we suggest that publicly-reported results not only explore the correlations between domains and overall ratings of care but should also include the results of individual questions. Additionally, the methodology in the current manuscript presents an analytic plan that may allow organizations who conduct their own survey to reliably assess the key survey items that drive the overall experience scores of their inpatients.

Although somewhat intuitive given the "first face" role that nurses represent with their patients, our findings document the importance of nursing questions and domains in

Table 4. Patient-Level Domain Correlations.

	Communication with Nurses	Communication with Doctors	Responsiveness of Hospital Staff	Pain Management	Communication About Medicines	Cleanliness of Hospital	Quietness of Hospital	Discharge Information	Overall Hospital Rating	Recommend the Hospital
Communication with nurses	—	0.43	0.56	0.52	0.45	0.30	0.23	0.28	0.60	0.54
Communication with doctors		—	0.32	0.34	0.38	0.18	0.16	0.29	0.43	0.41
Responsiveness of hospital staff			—	0.47	0.37	0.28	0.26	0.22	0.49	0.43
Pain management				—	0.35	0.23	0.22	0.24	0.48	0.43
Communication about medicines					—	0.23	0.20	0.37	0.42	0.37
Cleanliness of hospital						—	0.25	0.11	0.35	0.28
Quietness of hospital							—	0.08	0.30	0.22
Discharge information								—	0.29	0.29
Overall hospital rating									—	0.68
Recommend the hospital										—

Abbreviation: HCAHPS, Hospital Consumer Assessment of Healthcare Providers and Systems.
[a]Patient-level Pearson correlations of rescaled linear means of HCAHPS measures for patients discharged between April 2011 and March 2014 (27 369 surveys). All correlations are significant at the $P < .001$ level.

contributing to the overall rating of care. In addition to communication among providers, nurse listening, follow-up, respect, and explanations all figured prominently in our correlational analysis. Simply said, if a patient has a good experience with their nurse(s), they tend to report a pleasant overall hospital experience in our inpatient setting. Recognizing this powerful relationship, strategies to engage nurses are a means of improving the patient experience.

A primary study limitation is that our survey was conducted by telephone. As such, our results may not apply when other modes such as mail-outs or interactive voice response are used. Prior to organization-wide inception, we conducted a pilot study which found differences in response rates and response patterns between mail and phone survey modes. This finding has been replicated in other health surveys (including HCAHPS), where telephone respondents typically rate their care experience more positively, when compared to paper-based questionnaires (18–22). For this very reason, the CMS employs a mode adjustment algorithm when comparing survey results from varying modes (23, 24).

A secondary limitation pertains to the study location. As the study was conducted in Canada, a country with universal health care coverage, a similar investigation in the United States may be warranted due to inherent differences in the funding structure. Additionally, a potential limitation may be that prospective participants with a strongly negative opinion of their inpatient care may have refused to take the survey. Given the low percentage of outright refusals obtained over the study period (approximately 5% of all dialed numbers), we feel this to be of minimal concern.

A final limitation lies within the interpretation of our results. Despite showing a poor correlation with overall experience, some items/domains may still provide excellent opportunities for quality improvement. In our own analysis, hospital cleanliness was not correlated with overall experience scores. However, we do not advocate simply discounting hospital cleanliness, as it would be foolish to not consider it a priority. Patients view hospital cleanliness as a marker of quality, one that has been associated with hospital-acquired infections (25). Qualitative reports of what patients deem important may provide additional value.

In summary, our findings replicate those of the US-based HCAHPS-reporting hospitals, which showed that staff-based domains were most correlated with overall hospital experience. Our investigation has delved one level deeper by examining the relationships between individual questions and the overall rating of care. As with the domains, staff-based items, particularly those relating to staff coordination and nursing care, were most correlated with overall rating of care. Interestingly, hospital cleanliness, quietness, and questions pertaining to discharge planning did not have a high degree of correlation with overall rating of care. Our results provide excellent opportunities for targeted quality improvement initiatives in our jurisdiction as well as the broader Canadian context. Based on our findings, we advocate that our health care organization should aim to improve overall

inpatient care by commencing with initiatives to improve staff-related items (eg, staff coordination and interactions with patients), as these were most correlated with the overall rating. Perhaps most importantly, other organizations may use our methodology to determine additional areas in which to focus their quality improvement efforts.

Acknowledgments

Declaration of Conflicting Interests

Funding

References

1. Centers for Medicare and Medicaid Services. HCAHPS Fact Sheet [Internet]. Baltimore, MD; 2013 [cited 2014 Feb 10]. Available from: http://www.hcahpsonline.com/files/August%202013%20HCAHPS%20Fact%20Sheet2.pdf.

2. Hays RD, Nelson EC, Rubin HR, Ware JE Jr, Meterko M. Patient judgments of hospital quality: report of a pilot study. Med Care. 1990;28(9 Suppl):S29-S38.

3. Abramowitz S, Cote AA, Berry E. Analyzing patient satisfaction: a multianalytic approach. Qual Rev Bull. 1987;13(4):122-30.

4. Goldstein E, Farquhar M, Crofton C, Darby C, Garfinkel S. Measuring hospital care from the patients' perspective: an overview of the CAHPS Hospital Survey development process. Health Serv Res. 2005;40(6 Pt 2):1977-95.

5. Centers for Medicare and Medicaid Services. HCAHPS: patients perspectives of care survey [Internet]. Baltimore, MD; 2014 [cited 2014 Feb 10]. Available from: http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/HospitalHCAHPS.html.

6. Centers for Medicare and Medicaid Services. CAHPS® Hospital Survey [Internet]. Baltimore, MD; 2014 [cited 2014 Feb 10]. Available from: http://www.hcahpsonline.org.

7. Centers for Medicare and Medicaid Services. HCAHPS Patient Level Correlations [Internet]. Baltimore, MD; 2014 [cited 2014 Dec 17]. Available from: http://hcahpsonline.com/Files/HCAHPSReport_April_2014_Corrs.pdf.

8. Picker Institute Europe. Core Domains for Measuring Inpatients' Experience of Care. Oxford, UK: Picker Institute, King's Mead House; 2009.

9. Bleich SN, Ozaltin E, Murray CK. How does satisfaction with the health-care system relate to patient experience? Bull World Health Organ. 2009;87(4):271-8.

10. Health Canada. Health Care System [Internet]. Ottawa, ON; 2014 [cited 2015 Jan 16]. Available from: http://www.hc-sc.gc.ca/hcs-sss/index-eng.php.

11. Alberta Health Services. Strategic measures: report on performance [Internet]. Edmonton, AB; 2014 [cited 2014 Mar 3]. Available from: http://www.albertahealthservices.ca/performance.asp.

12. Centers for Medicare and Medicaid Services. Introduction to HCAHPS survey training [Internet]. Baltimore, MD; 2014 [cited 2014 Dec 17]. Available from: http://hcahpsonline.com/Files/March%202014%20HCAHPS%20Introduction%20Training%20Slides%20Session%20I_3_3_14.pdf.

13. Sipsma H, Liu Y, Wang H, Zhu Y, Xue L, Alpern R, et al. Patient experiences with inpatient care in rural China. Int J Qual Health Care. 2013;25(4):452-8.

14. US Federal Register. Volume 77 [Internet]. Washington, DC; 2012 [cited 2015 Jan 31]. Available from: http://www.gpo.gov/fdsys/pkg/FR-2012-08-31/html/2012-19079.htm.

15. Centers for Medicare and Medicaid Services. Readmissions Reduction Program [Internet]. Baltimore, MD; 2012 [cited 2015 Jan 31]. Available from: http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html.

16. US Federal Register. Volume 78 [Internet]. Washington, DC; 2012 [cited 2015 Jan 31]. Available from: http://www.gpo.gov/fdsys/pkg/FR-2013-08-19/html/2013-18956.htm.

17. Jarrett N, Holt S, LaBresh K. Evidence-based guidelines for selected and previously considered hospital acquired conditions [Internet]. Baltimore, MD; 2013 [cited 2015 Jan 23. 31]. Available from: http://www.cms.gov/Medicare/Medicare-Fee-for-Service- Payment/HospitalAcqCond/Downloads/Evidence-Based-Guidelines.pdf.

18. Burroughs TE, Waterman BM, Cira JC, Desikan R, Claiborne-Dunagan W. Patient satisfaction measurement strategies: a comparison of phone and mail methods. Jt Comm J Qual Improv. 2001;27(7):349-61.

19. de Vries H, Elliott MN, Hepner KA, Keller SD, Hays RD. Equivalence of mail and telephone responses to the CAHPS® hospital survey. Health Serv Res. 2005;40(6 Pt 2):2120-39.

20. Fowler FJ Jr, Gallagher PM, Nederend S. Comparing telephone and mail responses to the CAHPS™ survey instrument. Med Care. 1999;37(3 Suppl):MS41-MS49.

21. Fowler FJ Jr, Roman AM, Di ZX. Mode effects in a survey of medicare prostate surgery patients. Public Opin Quar 1998; 62(1):29-46.

22. O'Cathain A, Knowles E, Nicholl J. Testing survey methodology to measure patients' experiences and views of the emergency and urgent care system: telephone versus postal survey. BMC Med Res Methodol. 2010;10:52-61.

23. Centers for Medicare and Medicaid Services. Mode and patient-mix adjustment of the CAHPS® hospital survey (HCAHPS) [Internet]. Baltimore, MD; 2008 [cited 2014 Jul 3]. Available from: http://www.hcahpsonline.org/files/Final%20Draft%20Description%20of%20HCAHPS%20Mode%20and%20PMA-20with%20bottom%20box%20modedoc%20April%2030,%202008.pdf.

24. Centers for Medicare and Medicaid Services. HCAHPS survey mode adjustments of top box and bottom box percentages (after PMA) to adjust other modes to a reference of mail [Internet]. Baltimore, MD; 2014 [cited 2014 Jul 3]. Available from:

http://www.hcahpsonline.org/Files/HCAHPS_Survey_Mode_Adjustments_Oct2014.pdf.

25. Mylod D.Keeping score on cleanliness. How to improve your HCAHPS ratings. Interview by Bob Kehoe. Health Facil Manage. 2013;26(5):9-11.

Author Biographies

Kyle Kemp is Consultant with Alberta Health Services, and is currently completing his PhD studies at the University of Calgary. His research focuses on the relationship between patient experience, health outcomes, and health utilization patterns in the Canadian system.

Brandi McCormack is the Director of Primary Data Support at Alberta Health Services. Her team provides methodological expertise to quality improvement teams and captures patient-reported measures across the health system.

Nancy Chan is the Lead of Alberta Health Services' inpatient experience survey project. She is responsible for the day-to-day administration of the survey.

Maria J Santana is an Assistant Research Professor at the University of Calgary, W21C Research and Innovation Centre, O'Brien Institute of Public Health and the Department of Community Health Sciences. She received her PhD in Clinical Epidemiology from the University of Alberta and is a patient-reported outcome measures methodologist.

Hude Quan is a Professor at the Department of Community Health Sciences at the University of Calgary and Director of the World Health Organization Collaborating Centre in Classification, Terminology and Standards at the O'Brien Institute for Public Health. Dr. Quan is the Lead for Alberta's Strategies for Patient Oriented Research SUPPORT Unit Methods Support & Development Platform. He has published over 250 papers in peer reviewed journals, and in 2014 and 2015, Thomson Reuters listed him as one of the world's highly cited researchers.