



University HealthSystem Consortium

**Together We Stand,
Collaborating We Excel**

UHC 2009 Quality and Safety Fall Forum

UHC 2009 Quality and Accountability Study

Scoring and Ranking Methodology

September 2009

Background

Why do some organizations succeed in consistently providing high-quality care? In 2005, UHC embarked on a watershed project, the Quality and Accountability Study, to identify structures and practices that are associated with high performance in quality and safety across a wide variety of patient populations. To distinguish high-performing organizations from the rest, a scoring and ranking model for academic medical centers was developed. The study ultimately identified 5 key attributes of high-performing organizations:

- **A shared sense of purpose**
- **Leadership style**
- **An accountability system**
- **A focus on results**
- **A culture of collaboration**

The full details of the study were published in *Academic Medicine* in December 2007. Over the past several years, UHC has conducted many member retreats to explain the methodology used to score and rank performance and, more importantly, to discuss the factors that the study has shown to be critical to organizational success. UHC has also conducted additional site visits to validate and refine its understanding of the links between leadership and quality. UHC continues to expand upon the original 2005 study and is currently researching characteristics associated with organizations that have transformed themselves into high performers.

UHC has continued to develop the scoring and ranking methodology so that organizations can compare their performance with that of other academic medical centers. This document outlines the development, methodology, and results of the 2009 Quality and Accountability Study.

For more information about the UHC Quality and Accountability Study and its methodology, contact Raj Krishnan, manager, Product Development, at (630) 954-4898 or krishnan@uhc.edu.

Methods

Principles of Structural Development

As in 2005, the model for the 2009 study was designed to encompass as broad a spectrum of patient activity as possible. The Institute of Medicine's 6 domains of care (safety, timeliness, effectiveness, efficiency, equity, and patient centeredness—commonly referred to as STEEEP) were again used as a guide in structuring the performance categories, and measures of mortality, safety, effectiveness, equity, and patient centeredness were specifically identified and included to determine rankings.

Metrics for efficiency are also provided on organizations' scorecards to give an additional perspective on organizational success; however, these were not factored into the overall institutional rankings.

Timeliness data, focusing on organizations' ability to schedule and provide services in a timely manner, are embedded in some of the measures of effectiveness; however, more routinely collected measures are needed in this area.

To allow accurate comparisons between organizations, only full UHC members were used to establish normative performance; 93 member institutions were included in this analysis. Source data were obtained from UHC's Clinical Data Base (CDB), Operational Data Base (ODB), Core Measures Data Base, and publicly reported Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) data. To reduce variations in quality measures and facilitate understanding of the results, nationally recognized and accepted measure definitions were used as much as possible. UHC's selection and weighting of measures was overseen by members of the Clinical Evaluative Sciences Council steering committee and member experts in analysis of performance data. (Members of the Quality and Accountability Study Steering Committee are listed in Appendix A.)

Data Sources, Domains, and Measures

Institutional performance metrics were grouped into 6 domains: Mortality, Effectiveness, Safety, Equity, Patient Centeredness, and Efficiency. The first 5 domains were used to calculate each hospital's overall score and rank; efficiency data were scored and reported on the scorecard but not included in the final score calculations. (See Appendix B for aggregated performance data for all 6 domains.)

To evaluate sustained performance and to minimize the effect of seasonal fluctuations on the results, a full year of data was used for all domains. For the Mortality, Effectiveness, Safety, and Efficiency domains, CDB and Core Measures data from the most recent year of available data were used (i.e., Q3 2008 through Q2 2009 for CDB and Q2 2008 through Q1 2009 for Core Measures and ODB). The most recent HCAHPS data available from the Hospital Compare Web site (Q4 2007 through Q3 2008) were used for the Patient Centeredness domain.

Mortality

The 2009 Mortality domain was scored using a hybrid approach to account for both system-level and product line-level performance. The rationale for this approach is that factors affecting the risk of death occur at both the product-line level and the system level. The Mortality domain score has 2 equal components: an aggregate mortality score and a composite of individually scored product lines. The aggregate mortality score is composed of 30 UHC product lines; however, because of the overlap of diagnosis-related group (DRG) codes, 2 of the 30, “heart transplant or implant of heart assist system” and “lung transplant,” were combined into a single product line, “heart/lung transplant.” The final 29 product lines scored for the aggregate mortality component were:

- Bone marrow transplant
- Burns
- Cardiology
- Cardiothoracic surgery
- Gastroenterology
- Gynecology
- Gynecologic oncology
- Heart/lung transplant
- HIV
- Kidney/pancreas transplant
- Liver transplant
- Medical oncology
- Medicine, general
- Neonatology
- Neurology
- Neurosurgery
- Obstetrics
- Orthopedics
- Otolaryngology
- Pediatrics
- Plastic surgery
- Rheumatology
- Surgical oncology
- Surgery, general
- Trauma
- Urology
- Vascular surgery
- Ventilator support
- Spinal surgery

To obtain a composite of individually scored product lines for the second part of the score, distributions of observed-to-expected (O/E) mortality ratios among UHC members for each of the 29 product lines listed above were reviewed and evaluated. The committee found that several very large product lines with significant mortality appeared to be the best indicators of performance across the membership. Prior years’ experience showed that deaths in some smaller product lines and those with generally very low mortality rates can have an exaggerated negative affect on individual members’ scores, even when carefully determined volume thresholds are incorporated into the scoring system. The 7 product lines selected to be the best for scoring are those services considered to be the “bread-and-butter” services of

an academic medical center; therefore, they provide a good opportunity to evaluate performance across members at the product-line level. These 7 product lines are:

- Cardiology
- Medicine, general
- Cardiothoracic surgery
- Gastroenterology
- Neurology
- Surgery, general
- Medical oncology

Both the aggregate O/E mortality ratio and the composite of individually scored product line O/E mortality ratios used UHC's risk-adjustment models, which are based on Medicare severity DRGs (MS-DRGs).

Effectiveness

The Effectiveness domain includes readmission rates and Joint Commission Hospital Core Measures performance scores for 4 patient groups: acute myocardial infarction (AMI), heart failure (HF), pneumonia (PN), and Surgical Care Improvement Project (SCIP). The metrics in detail are:

- **Readmission rate:** The percentage of admitted patients who return for a related reason to the hospital within 30 days of discharge. *Related readmission* is defined as same DRG, same all-patient refined (APR)-DRG, related principal diagnosis, related primary procedure, or a complication—that is, this definition includes pairs of encounters for which the DRG, the clinical classification scheme (CCS) category of the principal diagnosis, the CCS category of the primary procedure or the APR-DRG match, *or* the principal diagnosis for the second encounter (readmission) is a complication code (diagnosis codes 99600-99999). Expected readmissions for chemotherapy, radiation therapy, and rehabilitation are excluded from the numerator of the metric. Through careful exploration of the data, UHC identified additional case types with expected readmissions within 30 days that should be excluded from evaluation for the effectiveness domain: obstetrics readmissions following a related index admission and routine inpatient dialysis cases. These cases were removed from the numerator of the readmission rate calculation. In previous years, these exclusions were applied to both the denominator and numerator. However, after careful deliberation, UHC decided to remove only deaths from the denominator of readmission calculations; the exclusions described above are therefore only applied to the numerator (readmissions).

- **Joint Commission Hospital Core Measures performance score:** The percentage of patients who received all care for which they were eligible, as determined by measure definitions. This model “bundles” all of the required elements of care for each measure set and evaluates hospital performance at the patient level. This represents a more stringent performance requirement than had been used in past reporting by The Joint Commission and the Centers for Medicare & Medicaid Services (CMS), which reviewed hospital performance for each measure rather than accessing each patient’s care according to the standard. The specific measures are:
 - Hospital Quality Alliance (HQA) Acute Myocardial Infarction Composite (AMI-1, AMI-2, AMI-3, AMI-4, AMI-5, AMI-6, AMI-7a, and AMI-8a)
 - HQA Heart Failure Composite (HF-1, HF-2, HF-3, and HF-4)
 - HQA Pneumonia Composite (PN-2, PN-3a, PN-3b, PN-4, PN-5c, PN-6, and PN-7)
 - HQA Surgical Care Improvement Project Composite (SCIP-Inf-1a, SCIP-Inf-2a, SCIP-Inf-3a, SCIP-Inf-4, SCIP-Inf-6, SCIP-Inf-7, SCIP-Card-2, SCIP-VTE-1, and SCIP-VTE-2)

Safety

The Safety domain is based on the Patient Safety Indicators (PSIs) developed by the Agency for Healthcare Research and Quality (AHRQ). The rate distributions for the 23 PSIs among UHC members were reviewed and the 8 that showed sufficient variation and incidence within the rates were selected for inclusion in the 2009 Safety domain scoring. This method prevented a single event from negatively affecting an institution’s score. The PSIs used in the Safety domain for 2009 are:

- PSI-3: Decubitus ulcer
- PSI-6: Iatrogenic pneumothorax
- PSI-7: Selected infections due to medical care
- PSI-9: Postoperative hemorrhage and hematoma
- PSI-11: Postoperative respiratory failure
- PSI-12: Postoperative pulmonary embolism or deep vein thrombosis
- PSI-15: Accidental puncture or laceration
- PSI-17: Birth trauma
- PSI-18: Obstetric trauma—vaginal with instrument
- PSI-19: Obstetric trauma—vaginal without instrument

This selection method was a departure from that used in previous years, when the selection of the measures was based on the metrics’ signal ratios as determined by AHRQ. UHC’s experience has shown that PSIs with a high signal ratio were still subject to high false-positive rates; recent work completed by

UHC has confirmed this for a few measures. UHC believes that as members' use of the present-on-admission flag improves, the PSIs will become better indicators of true performance and a larger number will be able to be included in the scoring. Therefore, UHC will revisit the selection of the individual PSIs to be included in the Safety domain each year.

Because all 3 obstetric PSIs remained on the list even though the overall number of PSIs remains reduced, these 3 PSIs were scored at one-third the weight of the other PSIs. Risk-adjusted rates were used based on AHRQ's PSI version 3.2 methodology, which uses the available present-on-admission flags.

Equity

Equity was measured using the same 4 clinical core measures used for Effectiveness. For each clinical area, hospitals' bundled core measures results were reviewed to identify statistically significant differences in performance rates in each of 3 dimensions: gender, race (white versus nonwhite), and socioeconomic status (payer classification of Medicaid, county medically indigent, charity, self-pay/uninsured, and Title V maternal/child health versus all other payer types).

Patient Centeredness

Question 21 on the HCAHPS survey—"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?"—served as the source for the Patient Centeredness metric. The measure was the percentage of respondents answering 9 or 10. To take advantage of the risk and mode adjustments made by CMS before these data are reported publicly, UHC used the data available for download on the Department of Health and Human Services Hospital Compare Web site (www.hospitalcompare.hhs.gov). The most recent 12 months of data available from this site were for the period Q4 2007 through Q3 2008.

Efficiency

Domain scores for Efficiency are shown on the Quality and Accountability Scorecard; however, these metrics were not used in calculating the rankings because they are not consistently available for a majority of UHC members submitting clinical data to the CDB.

Efficiency metrics focused on per-case performance on cost and length of stay (LOS). Measures include:

- Total expense per case mix index (CMI)-adjusted discharge net bad debt (wage index adjusted)
- Labor expense per CMI-adjusted discharge (wage index adjusted)
- Supply expense per CMI-adjusted discharge
- LOS observed/expected ratio (excluding LOS outliers and early deaths)

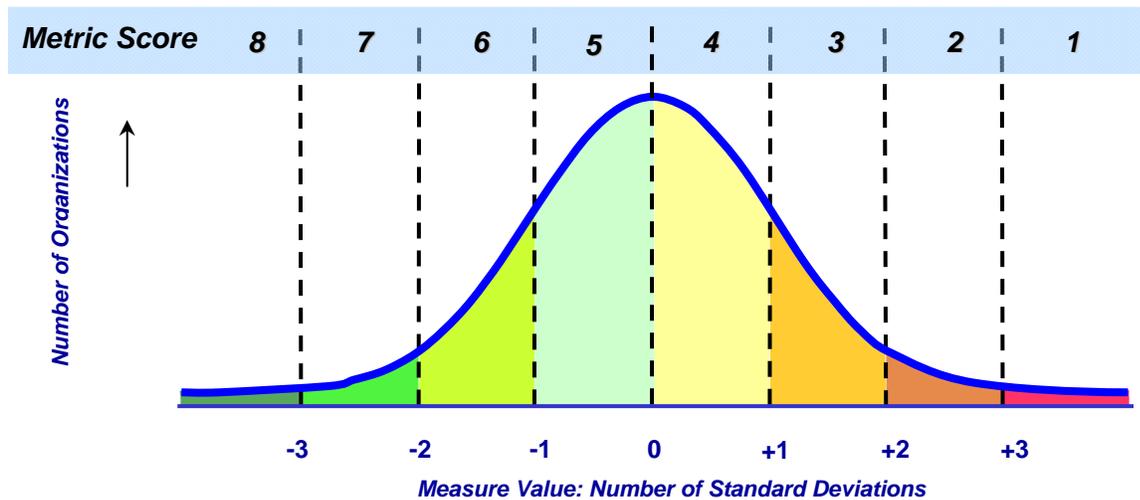
Scoring and Ranking

Score Calculations for Mortality, Safety, Efficiency, and Patient Centeredness

The scores for Mortality, Safety, Patient Centeredness, and Efficiency were determined as follows:

- Raw scores/rates for the metrics within each domain were transformed using an iterative approach to achieve a normal distribution. A test of normalcy was performed on each metric using the Shapiro-Wilk test. Each metric was tested for normalcy after each of the following iterative data manipulations:
 - Exclusion of low volumes
 - Exclusion of outliers (± 3 standard deviations)
 - Transformation using natural logarithm, square root, or cube root
- Every metric could be normalized using this method.
- Once a measure was normally distributed, the mean and standard deviation were calculated for the hospital-level performance.
- A score between 1 and 8 was assigned for each metric, with a point awarded for each standard deviation of movement from the mean in a favorable direction (Figure 1).

Figure 1. Scoring Chart for a Measure for Which a Low Value Is Favorable



Score Calculation for Effectiveness

Although the measures used to evaluate Effectiveness were derived from the same Joint Commission Core Measures set used in previous years, in the 2009 study scores were based on actual performance instead of the transformed and normalized approach used in earlier studies. The continuing improvement

in core measures performance levels has led to clustering at high levels of compliance; therefore, since the target for these measures is 100% compliance, the core measures bundles for AMI, HF, PN, and SCIP were scored on a fixed scale for raw bundle performance instead of a normalized distribution: 8 points for > 90%, 7 points for > 80%, 6 points for > 70%, 5 points for > 60%, 4 points for > 50%, 3 points for > 40%, 2 points for > 30%, and 1 point for $\leq 30\%$. The 30-day related readmission rate was normalized and then scored on the 8-point scale as was done with mortality and safety.

Score Calculation for Equity

The scoring method for Equity for 2008 was applied again in 2009. Methodologies prior to 2008 were seen as either too liberal or too conservative. The purpose of the metric is to detect inequities in care in order to provide clear direction for efforts to resolve the inequities; however, because the measure is still experimental, efforts were made to prevent dramatic effects on members' overall rankings.

As in previous years, the Fisher exact test was used to identify statistically significant differences in compliance rates among members for each dimension of equity (gender, race, and socioeconomic status). An alpha level of 0.01, instead of the more common 0.05, was used to detect differences in core measure compliance by group. This more conservative threshold was chosen to reduce Type I errors in the detection of an inequity. For each equity dimension, 4 core measure sets were evaluated and 4 Fisher exact tests were performed to determine whether an inequity existed between the groups in that dimension. Each of the 3 equity dimensions was worth a total of 8 points, for a possible score of 24. Each Fisher exact test on each core measures set contributed 2 points—i.e., each Fisher exact test result with a *P* value < 0.01 resulted in a deduction of 2 points from the maximum possible of 24 points.

As was observed in 2008, the statistical testing for gender within the SCIP core measure revealed an unusually large number of disparities. In general, compliance with SCIP measures tends to be higher in the gynecology product line, which skews the performance scores for hospitals with either large or small volumes of gynecology cases. To eliminate skewing of results due to the effect of this gender-specific product line, the gynecology product line was removed from the analysis of gender equity in SCIP.

Missing Data/Low Volume

Instead of imputing data to the median for metrics in the Mortality and Safety domains for individual hospitals with volumes too low to be scored reliably, UHC identified a volume threshold for each metric individually based on the following calculation: $1/(\text{standard deviation of the hospital-level observed mortality or safety rates})$. This calculated threshold is the volume of cases at which 1 death or safety-related event would move a hospital 1 standard deviation from the mean. Since the scoring for each is based on standard deviations, volumes less than these thresholds were considered too low to score

reliably. The domain score was calculated using only the scores for metrics that met the volume thresholds and for which data were available.

Both the Effectiveness and Equity measures relied on available core measures data; however, 28 UHC members do not submit core measures data to UHC. On being invited to submit their data for inclusion in the scoring and ranking, 24 of the 28 did so. For the 4 that did not submit their data and in cases in which an organization did not have data for a specific measure set (1 for HF and 1 for SCIP), the median bundle rate for the entire cohort was assigned—8 for AMI, 7 for HF, 6 for PN, and 7 for SCIP. A rate of 100% (no disparities at $P < 0.01$) was imputed for the Equity domain, since the majority of hospitals had no disparities.

To take advantage of the risk and mode adjustment used by CMS in reporting HCAHPS results, data from the Hospital Compare Web site (Q4 2007 through Q3 2008) were used for the Patient Centeredness domain. All 93 institutions in the 2009 ranking submitted HCAHPS data for public reporting on Hospital Compare.

The UHC Operational Data Base was the data source for all but the LOS metric in the Efficiency domain. For hospitals that do not participate in the ODB, the median score was imputed (total cost, 5; labor cost, 4; supply cost, 4).

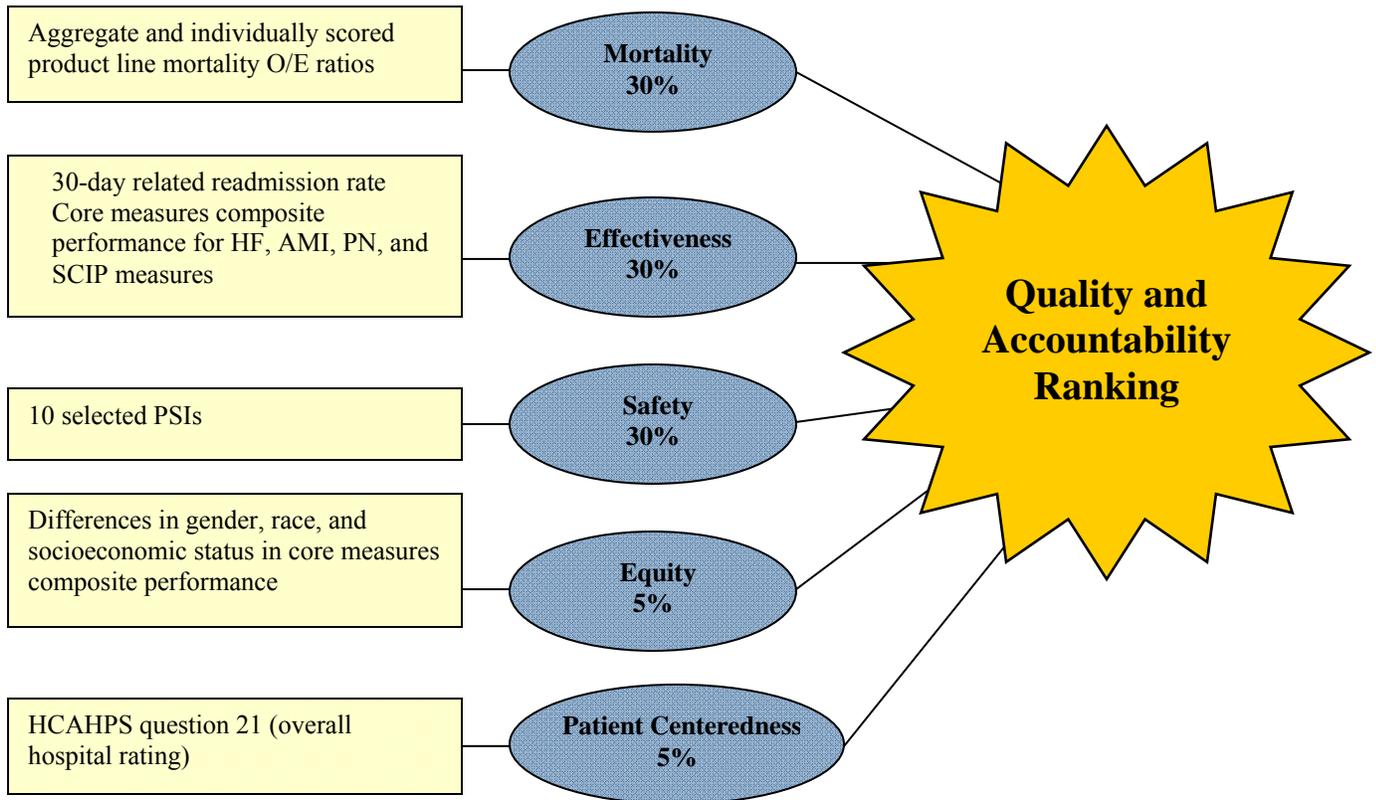
Summarizing Scores

The points awarded for each metric within the individual domains were added; the resulting total was divided by the maximum total points possible for those domains in which the institution had sufficient data. That percentage was the hospital's score for that domain. Ranks for each domain were created based on the hospital's percentage score; institutions could be tied in rank for a particular domain.

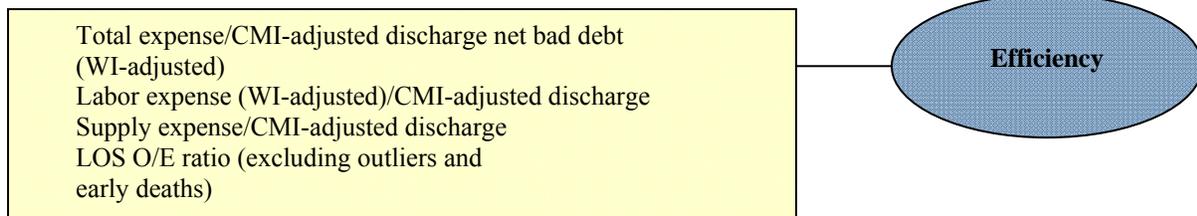
The Mortality, Effectiveness, and Safety domains were weighted equally. In previous years, to adjust for any potential PSI definitional issues or differences in coding practices, the Safety domain was weighted less. UHC feels that the use of the Patient Safety Indicators nationally continues to grow and that the availability of the present-on-admission flags improves the validity and accuracy of these metrics. The steering committee continues to feel that the PSIs are still not perfect indicators of safety performance, yet agree that the PSIs are currently the best safety metrics available. Thus the Safety domain was weighted the same as Mortality and Effectiveness.

The Equity domain, although still experimental, continues to be a focus of national debate; therefore, some weight was attached to this domain as well. Patient Centeredness, as a relatively new domain (this is the second year it has been used for ranking), was given some weight for the overall ranking. Figure 2 shows the ranking methodology used, including the relative weights given to the domains.

Figure 2. Domain Weighting Used for Organizational Score



Additional Measures of Organizational Success

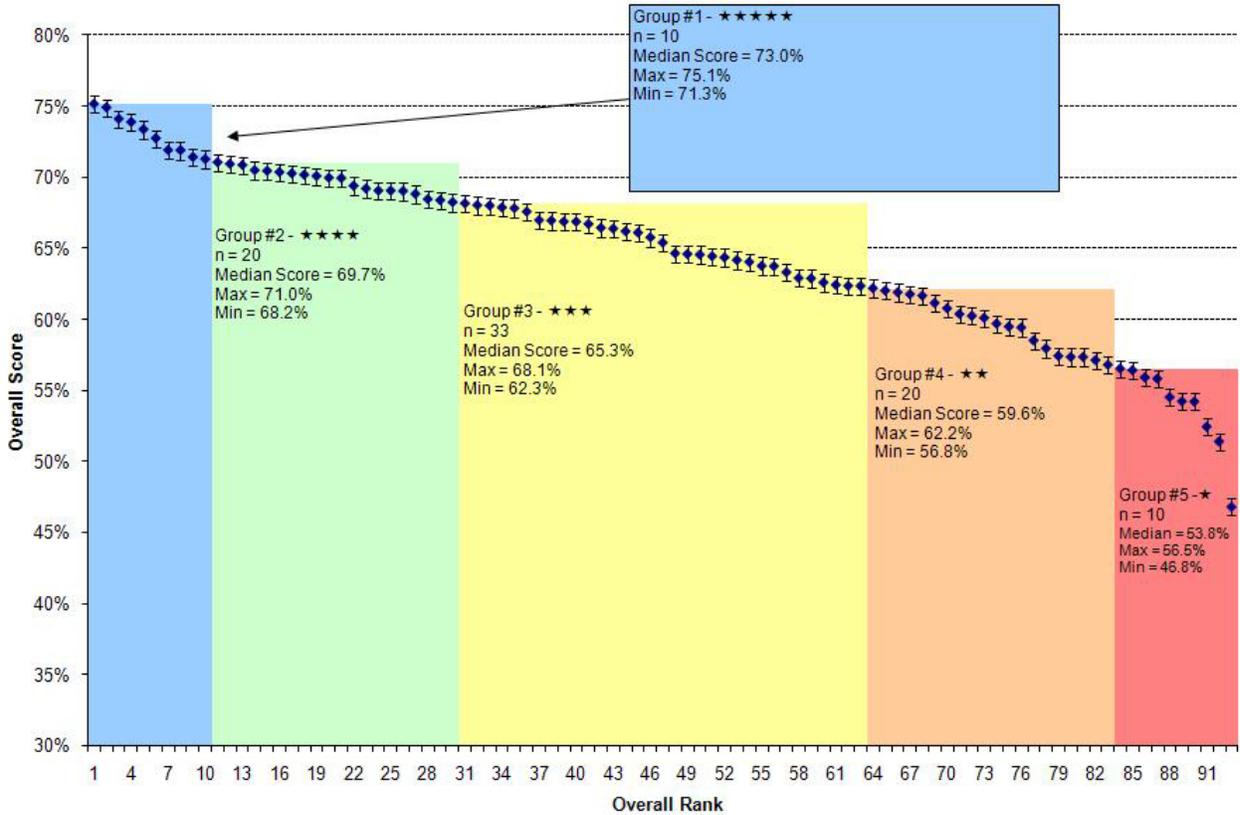


AMI = acute myocardial infarction; CMI = case mix index; HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems; HF = heart failure; LOS = length of stay; O/E = observed to expected; PN = pneumonia; PSI = Agency for Healthcare Research and Quality Patient Safety Indicator; SCIP = Surgical Care Improvement Project; WI = wage index.

The weighted scores for each domain were added to arrive at the overall score, and then each institution was assigned a rank based on this overall score. Because the final score is a composite, it is possible for an institution to have a high overall score but still show considerable opportunity for improvement in a particular domain.

Organizations were grouped by score into 5 arbitrary categories—10 organizations in group 1, 20 in group 2, 33 in group 3, 20 in group 4, and 10 in group 5. A summary of the data for each group is shown in Figure 3.

Figure 3. Quality and Accountability Scores: Distributions and Characteristics



Discussion

- The approach of normalizing the data continues to make it extremely difficult for any institution to obtain a perfect score; to achieve 100%, performance for each metric would need to be at least 3 standard deviations from the mean in a favorable direction.
- The changes in methodology over the past few years, especially the adoption of the 8-point scoring scale, have resulted in a more linear distribution of the overall scores, compared with the S-shaped line observed in 2005. Additionally, the difference between the median scores of group 1 and group 5 is 18.6 points, more than 7 points greater than in 2005. This shows that the current methodology yields a more effective performance monitoring scale, in contrast to the original 2005 methodology, which was designed primarily to identify the top performers.

- A subset of the full list of Patient Safety Indicators was used for the scoring. As AHRQ and other organizations, including UHC, continue to assess the reliability and sensitivity of the PSIs, other measures are expected to mature to a level where scoring is appropriate. Continued improvement in the use of the present-on-admission flag should help in this respect. Other PSIs are expected to be included in future iterations of the study as their sensitivity improves.
- UHC recognizes that the methodology for the Quality and Accountability Study changes each year. The steering committee debated the extent of these changes, finally agreeing that a careful balance should be maintained between keeping the methodology consistent over time to allow for performance monitoring and improving the methodology to better capture true differences in quality and safety performance. Each year when the methodology for the study is finalized, UHC applies the revised methodology to previous periods to evaluate changes in performance over time and shares this information with interested organizations.

Limitations of the Model

- This model is designed to compare organizations' performance on selected measures, with scoring distinctions based on standard deviations from a given mean. Therefore an organization may have made notable performance improvements from one year to the next and yet still remain within a standard deviation band and achieve the same overall score; this is particularly true for institutions scoring in the middle range (± 1 SD) on a metric.
- The ability to accurately gauge Effectiveness and Equity performance depends on the availability of patient-level core measures data. Four organizations did not submit their data to UHC; therefore these organizations' ranks may not accurately reflect their true position among UHC members since data had to be imputed. On the other hand, 2 more organizations submitted core measures data this year than in 2008; these 2 organizations may have displaced other organizations that were previously higher performers in the domain, if their actual core measures data were significantly better than their previously imputed scores.
- The population base for the study was limited to full UHC members that are active in UHC's Clinical Data Base (including several members new to UHC and/or the CDB). The optimal combination of measures, domains, and weights may be different for nonacademic community medical centers as well as for affiliate hospitals associated with UHC member institutions; therefore, this methodology may not be applicable to nonmembers or associate members.
- AHRQ's Patient Safety Indicators were developed with a view to face validity (agreement that they represent an important component of quality and safety) and construct validity (consistency with

other available measures of quality and safety). Most have not been tested extensively for sensitivity and specificity. False positives may occur because of failure to distinguish between complications of care and comorbidities present at hospital admission. False negatives may occur because of failure to capture or document the complications in question. Rates may vary because of differences in coding practices or requirements from state to state and hospital to hospital. Despite these caveats, the AHRQ PSIs remain the best measures of safety currently available from administrative data sets.

UHC will continue to examine and refine its methods, based on feedback from member organizations, the emergence of new performance measures and domains, and the maturation of long-standing measures that lead to performance coalescing in a narrow range.

For more information about UHC's Quality and Accountability Study, visit the UHC Web site at www.uhc.edu or contact Julie Cerese, vice president, Quality and Patient Safety, at (630) 954-6016 or cerese@uhc.edu, or Mark Keroack, vice president and chief medical officer, Clinical Practice Advancement Center, at (630) 954-2436 or keroack@uhc.edu.

Appendix A. Quality and Accountability Study Steering Committee

UHC would like to thank the members of the steering committee, who provided oversight of the development of the methodology for the 2009 Quality and Accountability Study, for their invaluable time and insight.

Chair

William Bornstein, MD, PhD, chief quality officer, Emory Healthcare

Members

Vinita Bahl, DMD, director, Clinical Information and Decision Support Services, University of Michigan Hospitals & Health Centers

William Barron, MD, MMM, vice president, Quality and Patient Safety, Boston Medical Center

Ingrid Connerney, PhD, RN, director of quality and safety, University of Maryland Medical System

Bruce Davidson, PhD, MPH, director, Resource and Outcomes Management, Cedars-Sinai Medical Center

Andrew Gaffney, MD, Professor of Medicine (Cardiology), Vanderbilt University Medical Center

Victoria Jordan, PhD, director, Quality Measurement & Engineering, The University of Texas M.D. Anderson Cancer Center

Elizabeth Mort, MD, MPH, vice president, Quality & Safety, and associate chief medical officer, Massachusetts General Hospital

Martha Radford, MD, chief quality officer, NYU Langone Medical Center

Allison Sabel, MD, PhD, MPH, director, Biostatistics & Clinical Data Warehouse, Denver Health

Stephen Smith, MD, chief medical officer, The Nebraska Medical Center

Appendix B. Metric Performance for the Mortality, Effectiveness, Safety, Equity, Patient Centeredness, and Efficiency Domains

Table 1. Mortality

Metric	Observed/Expected Ratio			
	Mean	Median	Minimum	Maximum
Aggregate of 29 selected product lines	0.95	0.93	0.67	1.54
Cardiology	0.93	0.89	0.47	1.69
Cardiothoracic surgery	1.02	0.96	0.49	2.10
Gastroenterology	0.92	0.91	0.38	1.97
Medical oncology	0.93	0.91	0.30	2.40
Medicine, general	0.96	0.96	0.60	1.72
Neurology	0.95	0.93	0.56	2.02
Surgery, general	0.96	0.92	0.55	2.25

Table 2. Effectiveness

Metric	Percentage of Patients Receiving All Elements of the Bundle			
	Mean	Median	Minimum	Maximum
Core measures bundle: acute myocardial infarction	91.3	93.3	40.0	100.0
Core measures bundle: heart failure	82.3	85.2	25.0	100.0
Core measures bundle: pneumonia	74.6	74.7	39.8	100.0
Core measures bundle: surgical care improvement project	80.3	82.2	22.2	100.0
Percentage of Patients Readmitted				
30-day related readmission rate	4.8	4.8	1.6	8.6

Table 3. Safety

Metric	Risk-Adjusted Rate per 1,000 Cases			
	Mean	Median	Minimum	Maximum
Decubitus ulcer	8.64	7.46	2.02	34.34
Iatrogenic pneumothorax	0.90	0.87	0.15	2.22
Selected infections due to medical care	1.53	1.44	0	5.92
Postoperative hemorrhage and hematoma	3.45	3.33	0	5.92
Postoperative respiratory failure	10.35	9.53	3.30	21.48
Postoperative pulmonary embolism or deep vein thrombosis	10.60	10.11	3.78	20.41
Accidental puncture or laceration	4.85	4.66	1.21	11.01
Birth trauma	2.42	1.80	0.43	8.84
Obstetric trauma—vaginal with instrument	148.88	139.31	28.31	316.61
Obstetric trauma—vaginal without instrument	24.59	21.87	5.29	60.94

Table 4. Equity

Metric	Number of Institutions With Statistically Significant Differences in Performance ($P < 0.01$)		
	Gender	Race	Socio-economic Status
Core measures bundle: acute myocardial infarction	0	0	0
Core measures bundle: heart failure	3	5	0
Core measures bundle: pneumonia	1	6	2
Core measures bundle: surgical care improvement project	8	9	2

Table 5. Patient Centeredness

Metric	Percentage of Respondents Giving Overall Hospital Rating of 9 or 10			
	Mean	Median	Minimum	Maximum
HCAHPS question 21	64.9	66.0	47.0	77.0

Table 6. Efficiency

Metric	Mean	Median	Minimum	Maximum
Length of stay observed/expected ratio	1.01	1.01	0.84	1.26
Total cost per case mix index–adjusted discharge net bad debt	\$9,557	\$9,222	\$5,414	\$14,655
Supply cost per case mix index–adjusted discharge	\$2,144	\$2,163	\$1,184	\$3,273
Labor cost per case mix index–adjusted discharge	\$4,696	\$4,622	\$2,888	\$7,054