AHRQ Quality Indicators

Detailed Release Changes: Approximation Error for Version 4.3

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Overview

This report provides empirical information on the magnitude of the numerical variance in the discharge-level predicted rate attributable to the Markov chain Monte Carlo (MCMC) integration used by the Prediction Module (PM) component of the AHRQ Quality Indicator (AHRQ QI) software Version 4.3. This variance is relevant only to users changing the default software option from "fixed" seed to "random" seed, as explained below. We refer to this variance as the "approximation error." The approximation error applies only to discharge data without the present on admission (POA) data element, which is used to define the outcome of interest (Y) and the factors used in the risk adjustment model (**X**). In discharge data with the POA data element, the approximation error is zero. For a technical description of the numerical variance, see "Quality Indicator Empirical Methods" (March, 2011).

When POA data are missing, the PM uses a simulation procedure to determine the most likely value of Y, P=0 (meaning Y not present on admission) and **X.** The results of the simulation procedure depend in part on the "seed" used as an initial condition. The default setting of the AHRQ QI software uses a "fixed" seed, meaning that given an identical input data set, the resulting predicted rates will be identical for every iteration of the software (i.e., every time a user runs the software the predicted rate is the same). However, the user may also elect to use a "random" seed as an initial condition, meaning that given an identical input data set, the resulting predicted rate will not be identical for every iteration of the software (i.e. every time a user runs the software the predicted rate is slightly different). The purpose of this document is to quantify through simulation the anticipated magnitude of the approximation error (i.e. the numerical variance) under the initial conditions of no POA data element, identical input data file and random seed option.

The practical consequence of the approximation error is in the computation of the expected rate, which is the hospital-level average of the discharge-level predicted rate. Therefore, this document also quantifies the magnitude of the impact of the approximation error on the expected rate for typical hospitals of different denominator sizes for each Inpatient Quality Indicator (IQI), Patient Safety Indicator (PSI) and Pediatric Quality Indicator (PDI) where the PM applies. While the focus here is on the expected rate, not that a change to the expected rate results in a change to the risk adjusted rate, smoothed and their respective confidence intervals.

Method

Estimating the Approximation Error

Data source. We used the population at risk for each indicator based on Version 4.3 of the AHRQ QI technical specifications and risk-adjustment models and a reference population from the 2008 State Inpatient Database (SID), Healthcare Cost and Utilization Project (HCUP). We ignored all POA data in order to simulate results assuming the maximum degree of "missingness" which results in the maximum magnitude of approximation error. The approximation error is reduced in an input data file with less than complete missing data, and as stated above, the approximation error is zero in an input data file with no missing data.

Simulation. The simulation study was run on five samples of 100 discharge records per sample selected randomly from the population at risk for each AHRQ QI where the PM applies. The predicted rate was computed repeatedly for the same discharge record by running the prediction module 100 times[1] using the random seed option. The sample of 100 discharge records was selected 5 times with replacement, meaning that there were a total of 50,000 (5x100x100) predicted rates estimated for each indicator.

Numerical Variance. The numerical variance and standard deviation of the predicted rates were computed for each discharge record based on the 100 observations of that record, and the average variance and standard deviation were computed across the five00 discharge records selected randomly (five samples of 100 discharges per sample). This simulation provides an estimate of the variance in the discharge-level predicted rate due to the integration procedure. The following section simulates the impact of the estimated variance and standard deviation on the hospital-level expected rate using denominator sizes calculated from the AHR Q QI reference population.

Impact on the Expected Rate

We estimated the magnitude of the impact on the expected rate by calculating the standard error of the numerical variance for hospitals of different denominator sizes (i.e. the square root of the numerical variance divide by the denominator size). We calculated the average denominator size by denominator size quintile for each indicator. This step reflects the fact that denominator size varies by AHRQ QI. Finally, we calculated the magnitude of the resulting standard error relative to the overall hospital-level expected rate (i.e. the overall average of the discharge-level predicted rates).

As the hospital denominator size increases, the resulting standard error declines, meaning that the magnitude of the approximation error relative the hospital-level expected rate also declines. Although the magnitude never reaches zero, for hospitals with a denominator size greater than some level the magnitude is small enough not to impact the expected rate at any reasonable definition of statistical significance[2]. For purposes of this document we highlight an approximation error that exceeds 0.5% of the overall hospital-level expected rate.

Further Analysis

Additional analysis might focus on changing some of the conditions and assumptions of this simulation. First, one might conduct a simulation assuming different degrees of missingness. The impact of the approximation error would be less, for example, in an input data file with 50% missingness. Second, the impact on the expected rate assumes that the numerical variance is independent from the expected rate of the hospital. That assumption could be tested, or relaxed. In addition, to the extent that there is a volume-outcome effect, the expected rate might vary by

[1] 100 iterations were chosen because it is typically considered an appropriate level to achieve consistent results, with more iterations leading to a diminished return.

[2] If the largest hospital has 50,000 discharges annually, then a change in the outcome of interest of 1 / 50,000 = 0.00002 (five significant digits) would be the largest change detectable.

hospital denominator size. One might calculate the relative magnitude of the approximation error using a quintile-specific expected rate. Finally, rather than using the threshold of 0.5% to highlight material impacts, one might recalculate the upper and lower bound of the hospital risk-adjusted rate or smoothed rate, and calculate the percentage of hospitals for whom the performance category changes (i.e. above average, average, below average) due to the approximation error.

Results

The results document the magnitude of the numeric variability for each AHRQ QI and the magnitude of the variability relative to the hospital-level expected rate. The impact results are presented by hospital denominator size quintile (see Tables 1a, 1b, and 1c). Generally, the impact of the approximation error is more material for the IQI than the PSI and the PDI. The impact is material for almost every IQI in the first quintile (the smallest denominator size); the percentage ranges from 1.83% (IQI #11) to 0.13% (IQI #31). There is a material impact in 12 of 15 indicators in the first quintile, 6 of 15 in the second quintile, 3 of 15 in the third quintile, 1 of 15 in the fourth quintile, and 0 of 15 in the fifth quintile. There are two reasons why the impact is more material in the IQI. First, the denominator sizes are much smaller, so that variation in the discharge level predicted rate has a larger impact on the hospital-level expected rate. Second, the prevalence of the outcome of interest Y and the resulting coefficients on the risk factors X on Y are much larger, so that a small change in the frequency of X has a larger effect on the predicted value of Y.

The impact of the approximation error is material for none of the PSI and only two of the PDI. For the PDI, there is a material impact in 2 of 12 indicators in the first quintile, 1 of 12 in the second and third quintile, and 0 of 12 in the third to fifth quintile. There are two reasons why the impact is less material in the PSI and PDI. First, the denominator sizes are much larger, so that variation in the discharge level predicted rate has a smaller impact on the hospital-level expected rate. Second, the prevalence of the outcome of interest Y and the resulting coefficients on the risk factors X on Y are much smaller, so that a small change in the frequency of X has a smaller effect on the predicted value of Y.

The results on the magnitude of the approximation error expressed as a variance and standard error hospital denominator size quintile (see Tables 2a, 2b, and 2c) provides a sense of the magnitude of the absolute change in the hospital-level expected rates to five significant digits.

The results on average denominator by hospital denominator size quintile (see Tables 3a, 3b, and 3c) suggest that the approximation error tends to be material when the hospital denominator size is less than about 20 cases.

Summary

When the input data file does not have the POA data element and the default option of “fixed” seed in the software is changed to “random” seed, multiple iterations of the software may

result in different expected rates, given the simulation procedure of the Prediction Module (PM). Overall, the impact is modest, ranging from 0.01% to 1.83%. However, for hospitals with fewer than 20 cases in the denominator and no POA data, users might exercise caution about assigning hospitals to a performance category if the upper or lower bound of the confidence interval on the risk-adjusted rate is within 2% of the benchmark rate.

Impact on Expected Rate

Table 1a. Inpatient Quality Indicator (IQI) Impact on Expected Rate by Hospital Denominator Size

		SE / Rate Percentage by Hospital Denominator Size Quintile				
AHRQ QI	Expected Rate	Q1 (Smallest)	Q2	Q3	Q4	Q5 (Largest)
IQI #07 Carotid Endarterectomy Volume	0.00489	0.13%	0.07%	0.05%	0.03%	0.02%
IQI #08 Esophageal Resection Volume	0.05477	1.29%	1.29%	0.91%	0.58%	0.30%
IQI #09 Pancreatic Resection Volume	0.04769	0.97%	0.69%	0.56%	0.40%	0.20%
IQI #11 Abdominal Aortic Aneurysm (AAA) Repair Volume	0.04335	1.83%	0.98%	0.67%	0.50%	0.32%
IQI #12 Coronary Artery Bypass Graft (CABG) Volume	0.02293	0.46%	0.31%	0.25%	0.21%	0.15%
IQI #13 Craniotomy Mortality Rate	0.05970	1.38%	0.69%	0.47%	0.33%	0.16%
IQI #14 Hip Replacement Mortality Rate	0.00072	0.46%	0.23%	0.16%	0.11%	0.07%
IQI #15 Acute Myocardial Infarction (AMI) Mortality Rate	0.06406	1.28%	0.59%	0.31%	0.18%	0.10%
IQI #16 Congestive Heart Failure (CHF) Mortality Rate	0.02765	0.53%	0.25%	0.16%	0.11%	0.07%
IQI #17 Acute Stroke Mortality Rate	0.09594	0.88%	0.39%	0.23%	0.15%	0.10%
IQI #18 Gastrointestinal Hemorrhage Mortality Rate	0.02106	1.08%	0.47%	0.30%	0.21%	0.16%
IQI #19 Hip Fracture Mortality Rate	0.02557	1.01%	0.48%	0.35%	0.27%	0.19%
IQI #20 Pneumonia Mortality Rate	0.03562	0.61%	0.30%	0.22%	0.17%	0.12%
IQI #30 Percutaneous Transluminal Coronary Angioplasty (PTCA) Rate	0.01008	0.77%	0.32%	0.22%	0.17%	0.11%
IQI #32 Acute Myocardial Infarction (AMI) without Transfer Cases	0.07263	1.19%	0.53%	0.30%	0.17%	0.11%

Note: Data Source: 2008 State Inpatient Databases (SID) using Version 4.3 of the AHRQ QI Software. Highlighted cells are where the standard error on the approximation error is more than 0.5% of the overall expected rate.

Table 1b. Patient Safety Indicator (PSI) Impact on Expected Rate by Hospital Denominator Size

		SE / Rate Percentage by Hospital Denominator Size Quintile				
AHRQ QI	Expected Rate	Q1 (Smallest)	Q2	Q3	Q4	Q5 (Largest)
PSI #02 Death in Low-Mortality Diagnosis Related Groups (DRGs)	0.00026	0.03%	0.01%	0.01%	0.00%	0.00%
PSI #03 Pressure Ulcer Rate	0.00544	0.09%	0.03%	0.02%	0.01%	0.01%
PSI #04 Death among Surgical Inpatients with Serious Treatable Complications	0.13180	0.21%	0.09%	0.06%	0.04%	0.02%
PSI #06 Iatrogenic Pneumothorax Rate	0.00035	0.02%	0.01%	0.01%	0.00%	0.00%
PSI #07 Central Venous Catheter—Related Blood Stream Infection	0.00064	0.03%	0.01%	0.01%	0.01%	0.00%
PSI #08 Postoperative Hip Fracture Rate	0.00003	0.06%	0.02%	0.01%	0.01%	0.00%
PSI #09 Postoperative Hemorrhage or Hematoma Rate	0.00234	0.02%	0.01%	0.00%	0.00%	0.00%
PSI #10 Postoperative Physiologic and Metabolic Derangement Rate	0.00059	0.16%	0.05%	0.03%	0.02%	0.01%
PSI #11 Postoperative Respiratory Failure Rate	0.00779	0.14%	0.04%	0.02%	0.02%	0.01%
PSI #12 Postoperative Pulmonary Embolism or Deep Vein Thrombosis Rate	0.00497	0.15%	0.05%	0.02%	0.02%	0.01%
PSI #13 Postoperative Sepsis Rate	0.01028	0.27%	0.10%	0.06%	0.04%	0.02%
PSI #14 Postoperative Wound Dehiscence Rate	0.00096	0.09%	0.03%	0.02%	0.01%	0.01%
PSI #15 Accidental Puncture or Laceration Rate	0.00352	0.01%	0.00%	0.00%	0.00%	0.00%

Note: Data Source: 2008 State Inpatient Databases (SID) using Version 4.3 of the AHRQ QI Software. Highlighted cells are where the standard error on the approximation error is more than 0.5% of the overall expected rate.

Table 1c. Pediatric Quality Indicator (PDI) Impact on Expected Rate by Hospital Denominator Size

		SE / Rate Percentage by Hospital Denominator Size Quintile				
AHRQ QI	Expected Rate	Q1 (Smallest)	Q2	Q3	Q4	Q5 (Largest)
PDI #01 Accidental Puncture or Laceration Rate	0.00084	0.03%	0.01%	0.00%	0.00%	0.00%
PDI #02 Pressure Ulcer Rate	0.00167	0.12%	0.06%	0.04%	0.02%	0.01%
PDI #05 Iatrogenic PneumothoraxRate	0.00016	0.01%	0.00%	0.00%	0.00%	0.00%
PDI #06 Pediatric Heart Surgery Mortality Rate	0.03440	0.18%	0.11%	0.05%	0.02%	0.01%
PDI #08 Postoperative Hemorrhage or Hematoma Rate	0.00225	0.08%	0.05%	0.03%	0.02%	0.01%
PDI #09 Postoperative Respiratory Failure Rate	0.00870	0.51%	0.30%	0.21%	0.14%	0.04%
PDI #10 Postoperative Sepsis Rate	0.01907	0.48%	0.34%	0.24%	0.14%	0.03%
PDI #11 Postoperative Wound Dehiscence Rate	0.00051	1.34%	0.77%	0.55%	0.36%	0.12%
PDI #12 Central Venous Catheter Related Blood Stream Infection Rate	0.00125	0.17%	0.06%	0.03%	0.02%	0.01%
NQI #01 Neonatal Iatrogenic Pneumothorax Rate	0.00018	0.38%	0.19%	0.12%	0.07%	0.04%
NQI #02 Neonatal Mortality Rate	0.00414	0.01%	0.00%	0.00%	0.00%	0.00%
NQI #03 Neonatal Blood Stream Infection Rate	0.01728	0.20%	0.10%	0.06%	0.03%	0.01%

Note: Data Source: 2008 State Inpatient Databases (SID) using Version 4.3 of the AHRQ QI Software. Highlighted cells are where the standard error on the approximation error is more than 0.5% of the overall expected rate.

Approximation Error

Table 2a. Inpatient Quality Indicator (IQI) Approximation Error by Hospital Denominator Size

AHRQ QI	Numerical Variance	Standard Error by Hospital Denominator Size Quintile				
		Q1 (Smallest	Q2	Q3	Q4	Q5 (Largest)
IQI #07 Carotid Endarterectomy Volume	0.000013	0.00001	0.00000	0.00000	0.00000	0.00000
IQI #08 Esophageal Resection Volume	0.000706	0.00071	0.00071	0.00050	0.00032	0.00017
IQI #09 Pancreatic Resection Volume	0.000462	0.00046	0.00033	0.00027	0.00019	0.00009
IQI #11 Abdominal Aortic Aneurysm (AAA) Repair Volume	0.001121	0.00079	0.00042	0.00029	0.00022	0.00014
IQI #12 Coronary Artery Bypass Graft (CABG) Volume	0.000781	0.00010	0.00007	0.00006	0.00005	0.00003
IQI #13 Craniotomy Mortality Rate	0.001646	0.00082	0.00041	0.00028	0.00020	0.00010
IQI #14 Hip Replacement Mortality Rate	0.000007	0.00000	0.00000	0.00000	0.00000	0.00000
IQI #15 Acute Myocardial Infarction (AMI) Mortality Rate	0.001423	0.00082	0.00038	0.00020	0.00011	0.00006
IQI #16 Congestive Heart Failure (CHF) Mortality Rate	0.000546	0.00015	0.00007	0.00004	0.00003	0.00002
IQI #17 Acute Stroke Mortality Rate	0.001897	0.00085	0.00037	0.00023	0.00015	0.00010
IQI #18 Gastrointestinal Hemorrhage Mortality Rate	0.000599	0.00023	0.00010	0.00006	0.00004	0.00003
IQI #19 Hip Fracture Mortality Rate	0.000684	0.00026	0.00012	0.00009	0.00007	0.00005
IQI #20 Pneumonia Mortality Rate	0.001001	0.00022	0.00011	0.00008	0.00006	0.00004
IQI #30 Percutaneous Transluminal Coronary Angioplasty (PTCA) Rate	0.000389	0.00008	0.00003	0.00002	0.00002	0.00001
IQI #32 Acute Myocardial Infarction (AMI) without Transfer Cases	0.001503	0.00087	0.00039	0.00021	0.00013	0.00008

Note: Data Source: 2008 State Inpatient Databases (SID) using Version 4.3 of the AHRQ QI Software. Highlighted cells are where the standard error on the approximation error is more than 0.5% of the overall expected rate.

Table 2b. Patient Safety Indicator (PSI) Approximation Error by Hospital Denominator Size

		Standard Error by Hospital Denominator Size Quintile				
AHRQ QI	Numerical Variance	Q1 (Smallest	Q2	Q3	Q4	Q5 (Largest)
PSI #02 Death in Low-Mortality Diagnosis Related Groups (DRGs)	0.000000	0.00000	0.00000	0.00000	0.00000	0.00000
PSI #03 Pressure Ulcer Rate	0.000030	0.00000	0.00000	0.00000	0.00000	0.00000
PSI #04 Death among Surgical Inpatients with Serious Treatable Complications	0.000469	0.00027	0.00012	0.00007	0.00005	0.00003
PSI #06 Iatrogenic Pneumothorax Rate	0.000001	0.00000	0.00000	0.00000	0.00000	0.00000
PSI #07 Central Venous Catheter—Related Blood Stream Infection	0.000002	0.00000	0.00000	0.00000	0.00000	0.00000
PSI #08 Postoperative Hip Fracture Rate	0.000000	0.00000	0.00000	0.00000	0.00000	0.00000
PSI #09 Postoperative Hemorrhage or Hematoma Rate	0.000003	0.00000	0.00000	0.00000	0.00000	0.00000
PSI #10 Postoperative Physiologic and Metabolic Derangement Rate	0.000003	0.00000	0.00000	0.00000	0.00000	0.00000
PSI #11 Postoperative Respiratory Failure Rate	0.000040	0.00001	0.00000	0.00000	0.00000	0.00000
PSI #12 Postoperative Pulmonary Embolism or Deep Vein Thrombosis Rate	0.000038	0.00001	0.00000	0.00000	0.00000	0.00000
PSI #13 Postoperative Sepsis Rate	0.000062	0.00003	0.00001	0.00001	0.00000	0.00000
PSI #14 Postoperative Wound Dehiscence Rate	0.000003	0.00000	0.00000	0.00000	0.00000	0.00000
PSI #15 Accidental Puncture or Laceration Rate	0.000004	0.00000	0.00000	0.00000	0.00000	0.00000

Note: Data Source: 2008 State Inpatient Databases (SID) using Version 4.3 of the AHRQ QI Software. Highlighted cells are where the standard error on the approximation error is more than 0.5% of the overall expected rate.

Table 2c. Pediatric Quality Indicator (PDI) Approximation Error by Hospital Denominator Size

		Standard Error by Hospital Denominator Size Quintile				
AHRQ QI	Numerical Variance	Q1 (Smallest	Q2	Q3	Q4	Q5 (Largest)
PDI #01 Accidental Puncture or Laceration Rate	0.000001	0.00000	0.00000	0.00000	0.00000	0.00000
PDI #02 Pressure Ulcer Rate	0.000002	0.00000	0.00000	0.00000	0.00000	0.00000
PDI #05 Iatrogenic PneumothoraxRate	0.000000	0.00000	0.00000	0.00000	0.00000	0.00000
PDI #06 Pediatric Heart Surgery Mortality Rate	0.000064	0.00006	0.00004	0.00002	0.00001	0.00000
PDI #08 Postoperative Hemorrhage or Hematoma Rate	0.000002	0.00000	0.00000	0.00000	0.00000	0.00000
PDI #09 Postoperative Respiratory Failure Rate	0.000045	0.00004	0.00003	0.00002	0.00001	0.00000
PDI #10 Postoperative Sepsis Rate	0.000091	0.00009	0.00006	0.00005	0.00003	0.00001
PDI #11 Postoperative Wound Dehiscence Rate	0.000007	0.00001	0.00000	0.00000	0.00000	0.00000
PDI #12 Central Venous Catheter Related Blood Stream Infection Rate	0.000005	0.00000	0.00000	0.00000	0.00000	0.00000
NQI #01 Neonatal Iatrogenic Pneumothorax Rate	0.000001	0.00000	0.00000	0.00000	0.00000	0.00000
NQI #02 Neonatal Mortality Rate	0.000002	0.00000	0.00000	0.00000	0.00000	0.00000
NQI #03 Neonatal Blood Stream Infection Rate	0.000035	0.00003	0.00002	0.00001	0.00001	0.00000

Note: Data Source: 2008 State Inpatient Databases (SID) using Version 4.3 of the AHRQ QI Software. Highlighted cells are where the standard error on the approximation error is more than 0.5% of the overall expected rate.

Hospital Denominator Size

Table 3a. Inpatient Quality Indicator (IQI) Average Denominator by Hospital Denominator Size

AHRQ QI	Number of Hospitals	Average Hospital Denominator by Hospital Denominator Size Quintile				
		Q1 (Smallest	Q2	Q3	Q4	Q5 (Largest)
IQI #07 Carotid Endarterectomy Volume	1102	4	16	33	59	130
IQI #08 Esophageal Resection Volume	449	1	1	2	5	18
IQI #09 Pancreatic Resection Volume	478	1	2	3	6	24
IQI #11 Abdominal Aortic Aneurysm (AAA) Repair Volume	892	2	7	15	27	67
IQI #12 Coronary Artery Bypass Graft (CABG) Volume	501	56	118	183	272	532
IQI #13 Craniotomy Mortality Rate	771	4	16	34	70	288
IQI #14 Hip Replacement Mortality Rate	1433	5	20	43	89	236
IQI #15 Acute Myocardial Infarction (AMI) Mortality Rate	1799	3	14	50	160	521
IQI #16 Congestive Heart Failure (CHF) Mortality Rate	1947	14	63	158	318	704
IQI #17 Acute Stroke Mortality Rate	1882	5	26	71	163	394
IQI #18 Gastrointestinal Hemorrhage Mortality Rate	1877	7	36	93	178	337
IQI #19 Hip Fracture Mortality Rate	1606	7	31	60	100	189
IQI #20 Pneumonia Mortality Rate	1990	21	87	169	282	513
IQI #30 Percutaneous Transluminal Coronary Angioplasty (PTCA) Rate	732	25	148	320	529	1285
IQI #32 Acute Myocardial Infarction (AMI) without Transfer Cases	1775	3	15	49	140	386

Note: Data Source: 2008 State Inpatient Databases (SID) using Version 4.3 of the AHRQ QI Software. Highlighted cells are where the standard error on the approximation error is more than 0.5% of the overall expected rate.

Table 3b. Patient Safety Indicator (PSI) Average Denominator by Hospital Denominator Size

		Average Hospital Denominator by Hospital Denominator Size Quintile				
AHRQ QI	Number of Hospitals	Q1 (Smallest	Q2	Q3	Q4	Q5 (Largest)
PSI #02 Death in Low-Mortality Diagnosis Related Groups (DRGs)	1969	33	288	970	2458	5819
PSI #03 Pressure Ulcer Rate	2053	39	291	1101	2518	5753
PSI #04 Death among Surgical Inpatients with Serious Treatable Complications	1710	3	15	41	94	265
PSI #06 Iatrogenic Pneumothorax Rate	2092	103	499	1533	3366	7293
PSI #07 Central Venous Catheter—Related Blood Stream Infection	2094	91	477	1472	3227	7020
PSI #08 Postoperative Hip Fracture Rate	1928	20	164	579	1489	4309
PSI #09 Postoperative Hemorrhage or Hematoma Rate	1938	26	266	956	2384	6533
PSI #10 Postoperative Physiologic and Metabolic Derangement Rate	1845	14	140	494	1293	3829
PSI #11 Postoperative Respiratory Failure Rate	1836	13	133	435	1071	3008
PSI #12 Postoperative Pulmonary Embolism or Deep Vein Thrombosis Rate	1938	27	268	959	2384	6528
PSI #13 Postoperative Sepsis Rate	1759	5	35	103	260	820
PSI #14 Postoperative Wound Dehiscence Rate	1822	11	78	206	419	1065
PSI #15 Accidental Puncture or Laceration Rate	2092	105	511	1580	3478	7652

Note: Data Source: 2008 State Inpatient Databases (SID) using Version 4.3 of the AHRQ QI Software. Highlighted cells are where the standard error on the approximation error is more than 0.5% of the overall expected rate.

Table 3c. Pediatric Quality Indicator (PDI) Average Denominator by Hospital Denominator Size

		Average Hospital Denominator by Hospital Denominator Size Quintile				
AHRQ QI	Number of Hospitals	Q1 (Smallest	Q2	Q3	Q4	Q5 (Largest)
PDI #01 Accidental Puncture or Laceration Rate	1919	6	58	242	683	3104
PDI #02 Pressure Ulcer Rate	1488	1	4	11	35	479
PDI #05 Iatrogenic PneumothoraxRate	1918	6	56	225	615	2793
PDI #06 Pediatric Heart Surgery Mortality Rate	147	1	3	12	78	261
PDI #08 Postoperative Hemorrhage or Hematoma Rate	1274	1	3	6	14	267
PDI #09 Postoperative Respiratory Failure Rate	1259	1	3	6	13	203
PDI #10 Postoperative Sepsis Rate	1050	1	2	4	11	214
PDI #11 Postoperative Wound Dehiscence Rate	1272	1	3	6	14	122
PDI #12 Central Venous Catheter Related Blood Stream Infection Rate	1887	5	42	182	540	2471
NQI #01 Neonatal Iatrogenic Pneumothorax Rate	1287	4	15	40	104	322
NQI #02 Neonatal Mortality Rate	1368	83	366	819	1712	3879
NQI #03 Neonatal Blood Stream Infection Rate	1137	1	4	10	42	189

Note: Data Source: 2008 State Inpatient Databases (SID) using Version 4.3 of the AHRQ QI Software. Highlighted cells are where the standard error on the approximation error is more than 0.5% of the overall expected rate.