

MEMORANDUM

To: Helen Burstin, National Quality Forum

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Through: Lein Han, CMS

Subject: Additional studies related to socioeconomic status for Measure 1789, Hospital-wide all-cause unplanned readmission measure (HWR)

Date: April 2, 2012

Pursuant to a request from Helen Burstin at the National Quality Forum, the HWR development team has conducted additional analyses of the impact of socioeconomic status (SES) on hospital risk-standardized readmission rates.

This memorandum includes:

- An executive summary of the findings
- Definitions of socioeconomic status used in these analyses
- Analyses of risk-standardized readmission rates for hospitals with many low SES patients compared to others
- An analysis of risk-standardized readmission rates for hospitals with many low SES patients compared to others, excluding Medicaid patients

Socioeconomic Status Analyses for Hospital-wide Readmission Measure

EXECUTIVE SUMMARY

- Concern has been raised that hospitals serving vulnerable patient populations may be disproportionately and unfairly identified as poor performers by the hospital-wide readmission measure (HWR), if readmissions for these patients are largely beyond the control of the hospital or community.
- We examined the performance of hospitals based on proportion of low SES patients they serve, using four different measures of SES.
 - Hospitals with high proportion of low SES patients (low SES hospitals) have slightly higher risk-standardized readmission rates (RSRR) than other hospitals using a variety of definitions
 - The largest differences are found between hospitals with >30% Medicaid patients compared to hospitals with <10% Medicaid patients
 - Comparing these two extremes, the absolute difference in median RSRRs is 0.4% and the absolute difference in mean RSRR is 0.7%
 - For all other definitions of low SES hospitals, the absolute difference between group medians and means is **less than 0.3%**
- We also examined how hospitals with >30% Medicaid patients perform in caring for their patients who are **not** low SES to determine whether differences in performance persist even when low SES patients are removed from the measure.
 - Low SES hospitals have slightly higher RSRRs than other hospitals **even for patients without low SES**. That is, differences remain even when patients with low SES, as defined by Medicaid eligibility, are removed from the measure.
- The difference in RSRRs between low SES hospitals and others thus is not explained by their disproportionate share of low SES patients, but is likely attributable in part to other factors, including hospital quality.

BACKGROUND

Concern has been raised that hospitals serving vulnerable patient populations may be disproportionately and unfairly characterized as poor performing hospitals by the hospital-wide readmission measure (HWR), if readmissions for these patients are largely beyond the control of the hospital or community.

This document provides additional analyses of the relationship between socioeconomic status (SES) and hospital performance.

Throughout the document, we refer to hospitals serving large numbers of vulnerable patients as “low SES hospitals.”

Hospital-level SES definition

In order to examine the effect of low SES on hospital performance, we need to define low SES hospitals. There is no single accepted definition of this type of hospital. Consequently we have examined four alternate definitions in these analyses:

Proportion of Medicaid patients

We define a low SES hospital as one whose patient population is at least 30% Medicaid-insured according to the 2008 American Hospital Association survey. We compare these hospitals to three other groups: <10% Medicaid, 10 to <20% Medicaid and 20 to <30% Medicaid. Altogether, 331 hospitals (7.3%) have more than 30% Medicaid patients.

Safety net status

We define a safety net hospital as a public hospital, or as a private hospital with a Medicaid caseload greater than one standard deviation above its state's mean hospital Medicaid caseload. Altogether 1,412 hospitals (31.1%) are classified as safety net.

Disproportionate-share

The Medicare Disproportionate Share (DSH) payment adjustment is intended to compensate hospitals for the higher operating costs they incur in treating a large share of low-income patients. Hospitals whose DSH patient percentage exceeds 15 percent are eligible for a DSH payment adjustment based on a statutory formula.

For this analysis we define a DSH hospital as any hospital with a DSH patient percentage greater than 15 percent. Altogether 2,691 (57.3%) of hospitals are categorized as DSH hospitals.

Public hospital

We define a public hospital as one that reports public ownership in the American Hospital Association survey from 2008. Altogether 1,084 (23.9%) of hospitals are classified as public hospitals.

Summary: We define low SES hospitals four different ways in these analyses.

PERFORMANCE OF LOW SES HOSPITALS

Using each of the four definitions above, we examined the performance of low SES hospitals compared to others, comparing the mean, median, and range of risk standardized readmission rates (RSRRs) between low SES and other hospitals.

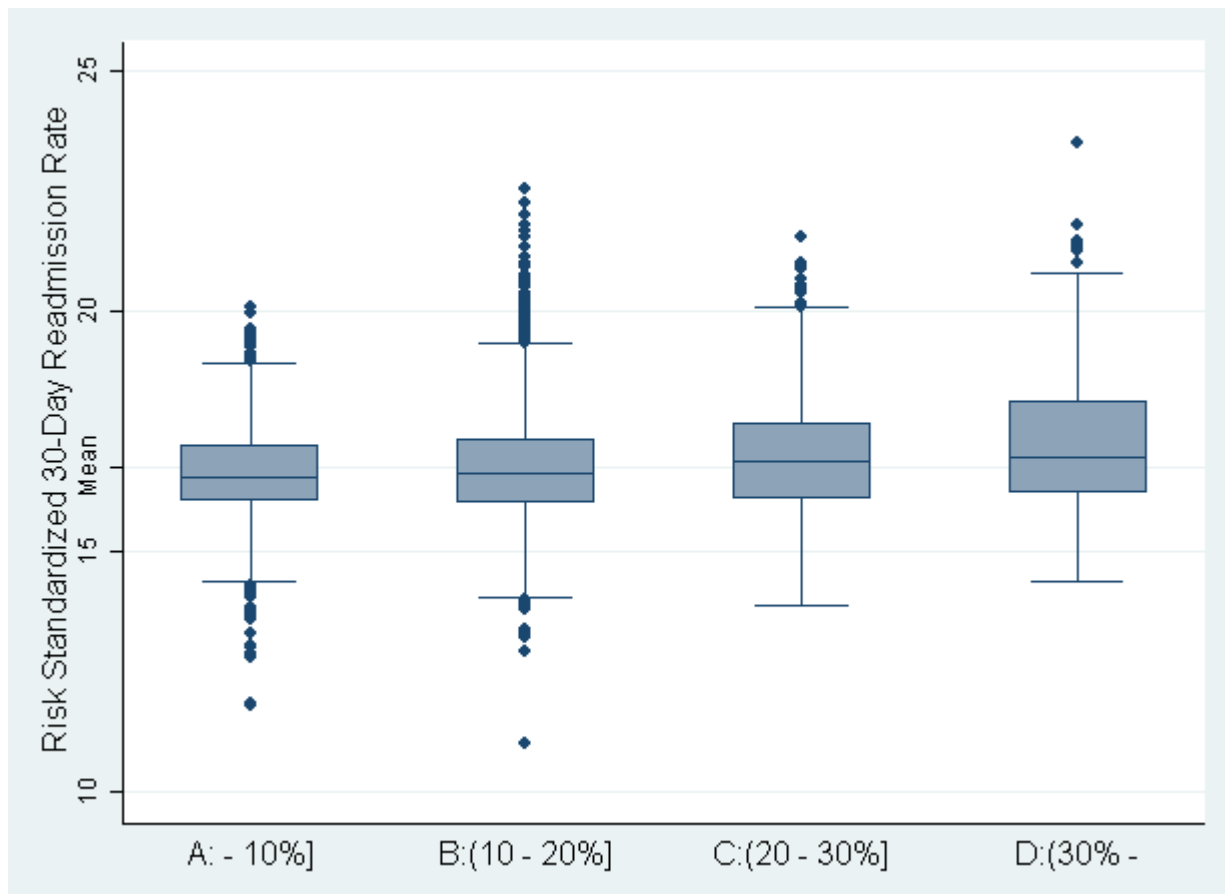
Proportion of Medicaid patients

Table 1: Mean, median and range of RSRR, by proportion of Medicaid patients

Proportion of Medicaid patients	Hospitals	Risk-standardized readmission rate (RSRR)					
		Mean (SD)	Minimum	Lower Quartile	Median	Upper Quartile	Maximum
<10%	1,199	16.61 (1.03)	11.78	16.04	16.56	17.20	20.07
10 to <20%	2,132	16.75 (1.19)	11.01	16.02	16.63	17.35	22.55
20-<30%	881	16.94 (1.28)	13.88	16.07	16.88	17.67	21.56
30%+	331	17.27 (1.48)	14.39	16.22	16.96	18.11	23.50

- Hospitals with 30% or more Medicaid admissions had median RSRR of 16.96 compared with a median RSRR of 16.56 for hospitals with fewer than 10% Medicaid admissions.

Figure 1: Box-and-whisker plot of RSRR, by proportion of Medicaid patients



- A box-and-whisker plot graphically displays the distribution of a variable. The line in the shaded box represents the median value. The shaded box, bounded by the upper (75th) and lower (25th) quartiles, represents the interquartile range (IQR). Fifty percent of hospitals fall within this box. The lines, or "whiskers," extending from either end of the box are equal to 1.5 times the IQR (the 75th percentile minus the 25th percentile). All data points beyond the whiskers are considered outliers. These outliers are represented by individual dots.
- Here we see that the majority of hospitals, regardless of Medicaid proportion, fall into the same range of performance. There are no low readmission outliers in the low SES hospital group.

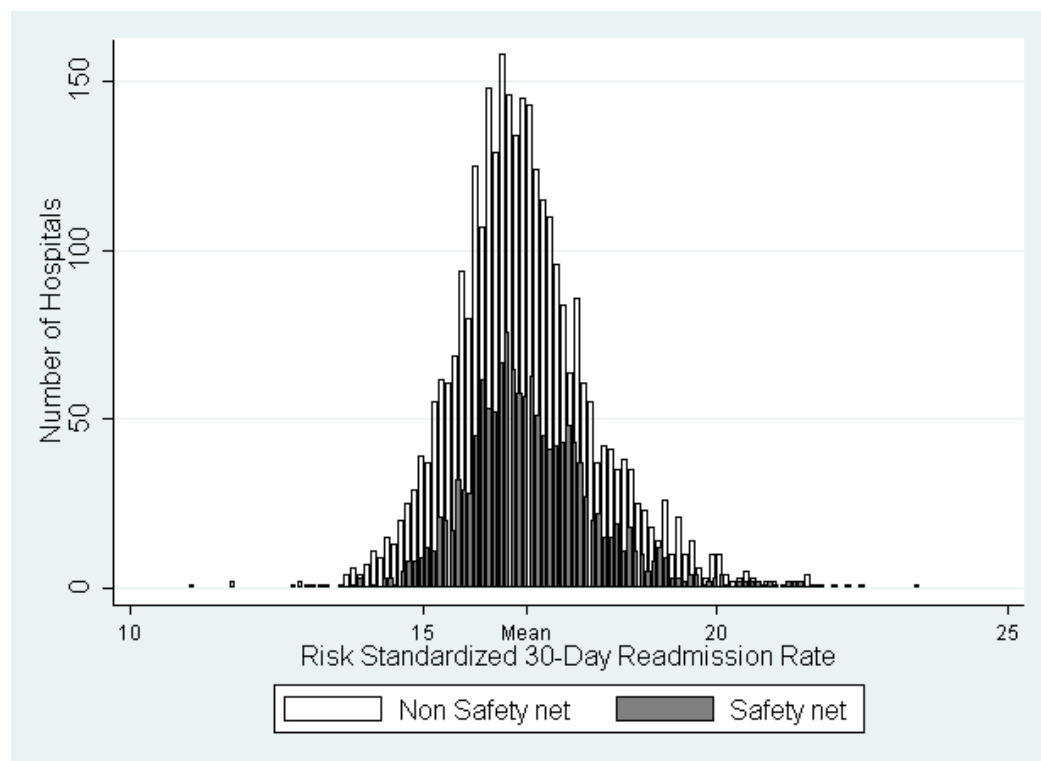
Safety net hospitals

Table 2: Mean, median and range of RSRR, by safety net status

Safety net hospital	Hospitals	Risk-standardized readmission rate (RSRR)					
		Mean (SD)	Minimum	Lower Quartile	Median	Upper Quartile	Maximum
No	3,131	16.74 (1.22)	11.01	15.98	16.63	17.38	22.55
Yes	1,412	16.89 (1.16)	13.06	16.16	16.75	17.49	23.50

- Safety net hospitals had a median RSRR of 16.75 compared to 16.63 for non-safety net hospitals.

Figure 2: Histogram of RSRR, by safety net status



- This figure illustrates the distribution of performance for safety net and non-safety net hospitals. If safety net hospitals had consistently worse performance than non-safety net hospitals, we would expect the safety net histogram to be shifted to the right. However, we see that the two histograms essentially overlap.

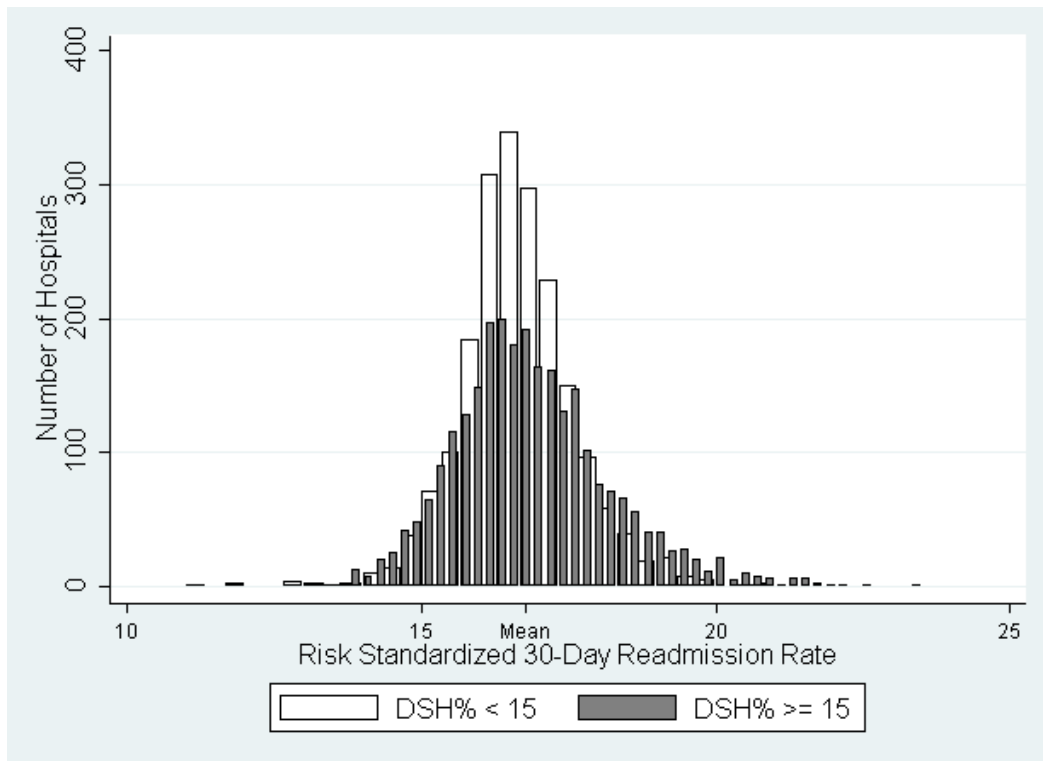
Disproportionate share hospitals

Table 3: Mean, median and range of RSRR, by DSH status

DSH	Hospitals	Risk-standardized readmission rate (RSRR)					
		Mean (SD)	Minimum	Lower Quartile	Median	Upper Quartile	Maximum
No	2,005	16.64 (0.97)	11.01	16.08	16.59	17.16	20.99
Yes	2,691	16.90 (1.33)	13.19	16.02	16.76	17.64	23.50

- DSH hospitals had a median RSRR of 16.76 compared to 16.59 for non-DSH hospitals.

Figure 3: Histogram of RSRR, by DSH status



- This figure illustrates the distribution of performance between DSH and non-DSH hospitals. As for the safety net hospitals, we see that the two histograms essentially overlap with slight increase in high outliers in the DSH group.

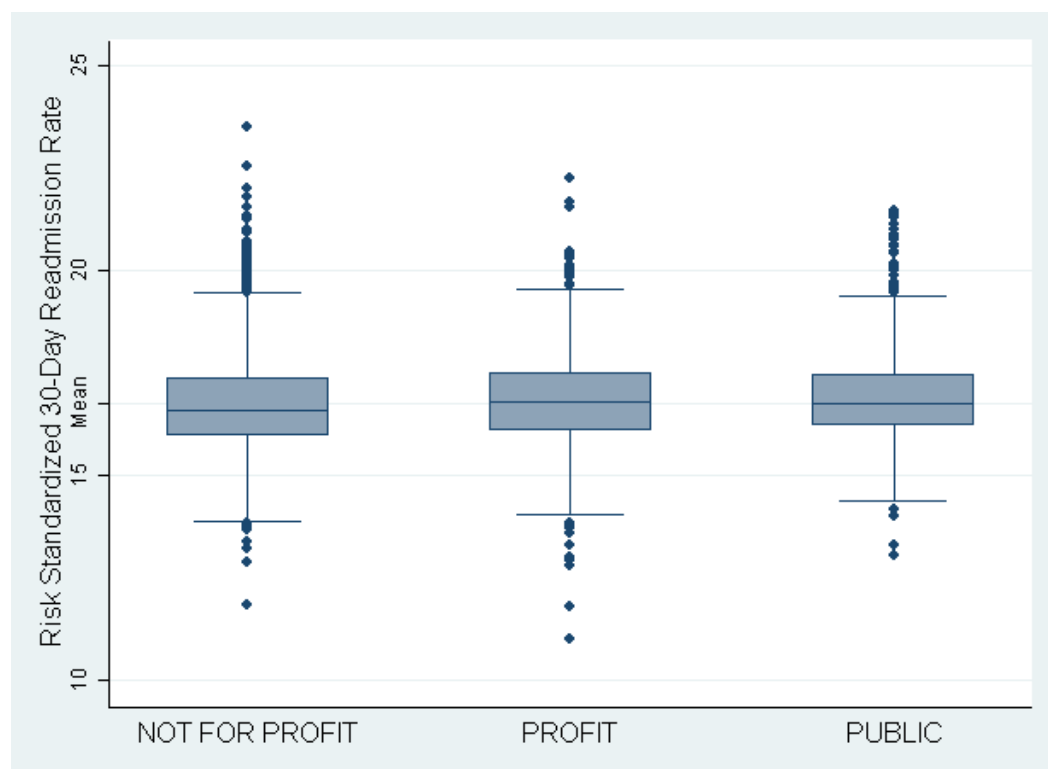
Public hospitals

Table 4: Mean, median and range of RSRR, by ownership status

Ownership	Hospitals	Risk-standardized readmission rate (RSRR)					
		Mean (SD)	Minimum	Lower Quartile	Median	Upper Quartile	Maximum
Private, for profit	762	16.85 (1.28)	11.01	16.09	16.81	17.50	22.26
Private, not for profit	2,697	16.73 (1.23)	11.81	15.96	16.59	17.36	23.50
Public	1,084	16.88 (1.08)	13.06	16.19	16.75	17.48	21.48

- Public hospitals had a median RSRR of 16.75 compared to 16.59 for private, non-profit hospitals, and 16.81 for private, for-profit hospitals.

Figure 4: Box-and-whisker plot of RSRR, by ownership status



- The performance of public hospitals overlaps almost exactly with performance of not for profit and for-profit hospitals

Overall summary:

- Low SES hospitals have slightly higher RSRRs than other hospitals using a variety of definitions, although public hospitals outperform for-profit hospitals.
- The largest differences are found between the hospitals with the largest fraction of Medicaid patients (7.3% of hospitals) and those with the smallest fraction of Medicaid patients (26.4% of hospitals).
- Comparing these extremes, the absolute difference in median RSRRs is 0.4% and the absolute difference in mean RSRRs is 0.7%.
- For all other definitions of low SES, the difference between group means and medians is less than 0.3%.
- There is substantial overlap between groups using any of the 4 definitions, as illustrated in the figures.

ASSESSING HOSPITAL PERFORMANCE WITHOUT LOW SES PATIENTS

In the previous analyses we showed very little difference in performance between low SES hospitals and others using the definition of low SES hospital as a safety net, DSH or public hospital.

Comparing the 331 hospitals with the largest fraction of low SES patients to the 1,199 hospitals with the smallest fraction of low SES patients, we saw slightly bigger differences in RSRRs, although differences were still small on an absolute basis.

To understand these differences better, we examined hospital RSRRs excluding their low SES patients. For the purposes of this analysis, we categorized patients with Medicaid coverage as low SES patients. That is, we examined how hospitals with the highest proportion of Medicaid patients performed for their patients *without* Medicaid by eliminating all patients with Medicaid coverage from the measure calculation.

- If low SES hospitals had similar performance to other hospitals once Medicaid patients were removed from the measure, we would conclude that their slightly higher overall readmission rate was attributable to their disproportionate share of Medicaid patients.
- However, if these hospitals still had worse performance than other hospitals even for patients *without* low SES, we would conclude that their overall performance was not driven by the SES of their patient population, but was likely due in part to other factors, including differences in hospital quality.

Performance of low SES hospitals *without* Medicaid patients

Table 5: Mean, median and range of RSRR, by proportion of Medicaid patients, Medicare patients only

Proportion of Medicaid patients	Hospitals	Risk-standardized readmission rate, Medicare only					
		Mean (SD)	Minimum	Lower Quartile	Median	Upper Quartile	Maximum
<10%	1,199	15.70 (0.85)	11.49	15.25	15.67	16.17	18.92
10 to <20%	2,132	15.77 (0.93)	10.48	15.23	15.69	16.23	19.84
20-<30%	881	15.88 (0.97)	13.01	15.31	15.86	16.43	19.97
30%+	331	16.09 (1.07)	13.77	15.38	15.88	16.53	20.61

- After excluding all Medicaid patients from the measure, hospitals with the highest proportion (30%+) of Medicaid patients still had higher mean, median, and range of performance when compared with hospitals with the smallest proportion of Medicaid patients.

Summary: Small differences in RSRRs persist even when Medicaid patients are excluded from the measure.