**eFigure 1 – Study Flow Diagram**

287 general acute care hospitals with 2008-2011 CMS Hospital Compare data

298 general acute care hospitals with 2008 OSHPD hospital financial data

6 hospitals excluded for having

less than or more than 1 year

of audited financial data

2 hospitals excluded for

missing 2008 OSHPD data

13 hospitals excluded

5 hospitals closed between

2008 and 2011

8 hospitals missing CMS

Hospital Compare data

285 general acute care hospitals with 2008 OSHPD and 2008-2011 Hospital Compare data

279 general acute care hospitals included in study

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **eTable 1 – Relationship between Operating Margin and 30-Day Mortality and Readmission Ratesa** | | | | |
|  | **N** | **Median % (IQR)** | **Adjusted % Change (95% CI) per 10% increase**  **in operating marginb** | |
|  |  |  | **Overall** | **Extreme outliers excludedc** |
| Myocardial infarction |  |  |  |  |
| Mortality rate | 211 | 15.2 (14.2-16.2) | **0.20 (0.06 to 0.35)d** | **0.21 (0.01 to 0.41)d** |
| Readmission rate | 184 | 19.4 (18.5-20.2) | **Non-linear e** | -0.13 (-0.37 to 0.11) |
| Congestive heart failure |  |  |  |  |
| Mortality rate | 259 | 11.1 (10.1-12.1) | **0.26 (0.07 to 0.45)d** | **0.29 (0.04 to 0.54)d** |
| Readmission rate | 264 | 24.5 (23.5-25.6) | -0.06 (-0.23 to 0.12) | -0.04 (-0.25 to 0.17) |
| Pneumonia |  |  |  |  |
| Mortality rate | 268 | 11.6 (10.4-13.2) | -0.03 (-0.22 to 0.16) | -0.13 (-0.37 to 0.10) |
| Readmission rate | 268 | 18.2 (17.3-19.1) | -0.12 (-0.24 to 0.004) | -0.08 (-0.28 to 0.11) |
| Abbreviations: IQR, interquartile range; CI, confidence interval  a 30-day outcomes are risk-standardized for age, sex, comorbidity count, and indicators of patient frailty.[3](#_ENREF_1)  b Each outcome was modeled separately, and adjusted for teaching status, metropolitan status (urban vs. rural), bed size, safety net hospital status, hospital ownership type, Medicare caseload, and volume of cases reported for the respective outcome, accounting for clustering of hospitals by owner.  c 5 hospitals were identified as extreme outliers with respect to operating margin (all 5 were ‘underperformers’ with operating margin <-38.6%)  d p<0.05 for the Wald statistic, indicating a statistically significant relationship.  e The relationship between operating margin and readmission rate for myocardial infarction was non-linear and statistically significant. Net revenue from operations was modeled as a cubic spline function. See eFigure 1. The overall adjusted F-statistic was 4.4 (p=0.003). | | | | |

**eFigure 2 – Relationship Between Operating Margin and 30 Day-Readmission and Mortality a**

1. **Acute myocardial infarction**

Overall

Excluding outliers b



Mortality

Readmission

B. **Congestive heart failure**

Excluding outliers b

Overall



Readmission

Mortality

C. **Pneumonia**

Excluding outliers b

Overall



Mortality

Readmission

Open circles represent individual hospitals. The bold dashed line and the bold solid line are the unadjusted and adjusted cubic spline curves respectively, representing the non-linear relationship between operating margin and each outcome. The shaded grey area represents the 95% confidence interval for the adjusted cubic spline curve. Thin vertical dashed lines represent median values for operating margin (%).

a Multivariate models were adjusted for teaching status, metropolitan status (urban vs. rural), bed size, safety net hospital status, hospital ownership, Medicare caseload, and volume of cases reported for the respective outcome, accounting for clustering of hospitals by owner.

b 5 hospitals were identified as extreme outliers with respect to operating margin (all 5 were ‘underperformers’ with operating margin <-38.6%).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **eTable 2 – Relationship between Total Margin and 30-Day Mortality and Readmission Ratesa** | | | | |
|  | **N** | **Median % (IQR)** | **Adjusted % Change (95% CI) per 10% increase**  **in total marginb** | |
|  |  |  | **Overall** | **Outliers excludedc** |
| Myocardial infarction |  |  |  |  |
| Mortality rate | 211 | 15.2 (14.2-16.2) | 0.06 (-0.23 to 0.36) | 0.18 (-0.09 to 0.45) |
| Readmission rate | 184 | 19.4 (18.5-20.2) | -0.09 (-0.34 to 0.16) | -0.18 (-0.41 to 0.06) |
| Congestive heart failure |  |  |  |  |
| Mortality rate | 259 | 11.1 (10.1-12.1) | **Non-linear d** | **0.32 (0.03 to 0.62)e** |
| Readmission rate | 264 | 24.5 (23.5-25.6) | -0.01 (-0.17 to 0.16) | -0.10 (-0.35 to 0.15) |
| Pneumonia |  |  |  |  |
| Mortality rate | 268 | 11.6 (10.4-13.2) | -0.11 (-0.28 to 0.06) | -0.04 (-0.33 to 0.26) |
| Readmission rate | 268 | 18.2 (17.3-19.1) | -0.04 (-0.18 to 0.11) | 0.02 (-0.18 to 0.21) |
| Abbreviations: IQR, interquartile range; CI, confidence interval  a 30-day outcomes are risk-standardized for age, sex, comorbidity count, and indicators of patient frailty.[3](#_ENREF_1)  b Each outcome was modeled separately, and adjusted for teaching status, metropolitan status (urban vs. rural), bed size, safety net hospital status, hospital ownership type, Medicare caseload, and volume of cases reported for the respective outcome, accounting for clustering of hospitals by owner.  c 3 hospitals were identified as extreme outliers with respect to total margin (all 3 were ‘underperformers’ with total margin < -31.2%)  d The relationship between total margin and heart failure mortality rate was non-linear and statistically significant. Net revenue from operations was modeled as a cubic spline function. See eFigure 2. The overall adjusted F-statistic was 2.9 (p=0.03).  e p<0.05 for the Wald statistic, indicating a statistically significant relationship. | | | | |

**eFigure 3 – Relationship Between Total Margin and 30 Day-Readmission and Mortality a**

1. **Acute myocardial infarction**

Excluding outliers b

Overall



Mortality

Readmission

**B. Congestive heart failure**

Excluding outliers b

Overall



Mortality

Readmission

**C. Pneumonia**

Excluding outliers b

Overall



Mortality

Readmission

Open circles represent individual hospitals. The bold dashed line and the bold solid line are the unadjusted and adjusted cubic spline curves respectively, representing the non-linear relationship between total margin and each outcome. The shaded grey area represents the 95% confidence interval for the adjusted cubic spline curve. Thin vertical dashed lines represent median values for total margin (%).

a Multivariate models were adjusted for teaching status, metropolitan status (urban vs. rural), bed size, safety net hospital status, hospital ownership, Medicare caseload, and volume of cases reported for the respective outcome, accounting for clustering of hospitals by owner.

b 3 hospitals were identified as extreme outliers with respect to operating margin (all 3 were ‘underperformers’ with total margin <-31.2%).