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Medicare hospital outcome measures and unrelated socioeconomic and clinical factors

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Abstract

Prior studies generally find non-existing or weakly negative (heart failure) associations between risk adjusted readmission and mortality rates at the hospital level. We examined all Hospital Referral Regions (HRR), and found persisting modest positive associations for actue myocardial infarction and stronger negative associations for heart failure at the HRR level. Subgroup analyses suggest differences in local characteristics of beneficiaries are associated with differences in RSRR and RSMR. It is clear that community infrastructure – the psychosocial context in which a discharged patient operates – should be an important predictor of post-discharge events. Yet such community differences are not currently well-addressed in CMS' hospital readmission and mortality models. Given the importance, use for accountability, and basis for substantial financial penalties of 30 day risk standardized outcome measures, it is vital that CMS hospital performance measures continue to be scrutinized.

Introduction

Concern remains that existing Centers for Medicare & Medicaid Services (CMS) hospital outcome measures may not adequately represent the quality of care provided by hospitals.[1]

Interventions that improve 30-day, all-cause, risk-standardized mortality rates (RSMRs) may worsen the readmission rates (RSRRs) due to a competing risk effect,[1] while hospital outcome measures may also simply reflect unmeasured socioeconomic and clinical factors unrelated to hospital care.[2]

To understand these two concerns better, we examined the relationship between RSRRs and RSMRs at the level of hospital referral regions (HRR), 306 distinct, large geographical areas which delineate healthcare markets.

Methods

We obtained Public Use Files on HRRs for 2008 – 2011 from CMS,[3] previously used by the Institute of Medicine to understand geographic variations.

Our data for each of the four years comprised all Medicare Fee For Service (FFS) beneficiaries continuously enrolled in both Parts A and B in that year and included CMS' calculated RSRR and RSMR for acute myocardial infarction (AMI) and heart failure (HF).

We also used CMS's 2011 data on HRR demographic characteristics. This included the number of beneficiaries in each HRR, average age, proportion of male residents, African-American residents, Hispanic residents and Medicaid (dual) eligible. We

examined the linear correlation between RSRRs and RSMRs, overall and stratified by HRR demographic characteristics, and analyzed non-linear relationships using polynomial smoothers.

Results

Our results were similar for all 4 years. By 2011, median RSRR was 18.7% for AMI, and 24.3% for HF; median RSMR were 14.8% and 11.6% respectively. Pearson correlation between RSRR and RSMR was +0.22 for AMI and -0.24 for HF by 2011; non-linear associations reflected this (**FIGURE 1**).

In subgroups, for AMI the relationship was more positive in smaller HRRs and HRRs with more males, fewer African-American, Hispanic residents or dual eligible residents. In HF, the relationship was more negative in larger HRRs and HRRs with older beneficiaries, more African-American and Hispanic residents and fewer males **(FIGURE 2**).

Discussion

Despite prior studies' results of generally non-existing or weakly negative (HF) associations between RSRR and RSMR at the hospital level,[4] we find persisting modest positive associations for AMI and stronger negative associations for HF at the HRR level.

The HF findings are consistent with long-standing concerns that increased readmissions and resource use may actually be a sign of better care in HF;[5] conversely that perverse

incentives may reduce the likelihood that deteriorating HF patients are readmitted within 30 days of discharge.[6] The AMI findings are consistent with local hospital quality initiatives yielding favorable effects on both outcome measures.

Our subgroup analyses suggest differences in local characteristics of beneficiaries are associated with differences in RSRR and RSMR. It is clear that community infrastructure – the psychosocial context in which a discharged patient operates – should be an important predictor of post-discharge events.

Socio-economic status, social network support, availability of own or community transport, access to healthful nutrition, exercise and support services, and timely access to primary and specialist follow-up care are all likely to drive adherence to medications and compliance to self-care regimes.

Yet such community differences are not currently well-addressed in CMS' hospital readmission and mortality models. Given the importance, use for accountability, and basis for substantial financial penalties of 30 day risk standardized outcome measures, it is vital that CMS hospital performance measures continue to be scrutinized.

Indeed, the increasing financial impact of CMS penalties on hospitals, and the possibility that these outcome measures may not accurately reflect hospital performance, suggests that further investigation of new and alternative operationalization of hospital quality outcomes may be merited.[1]

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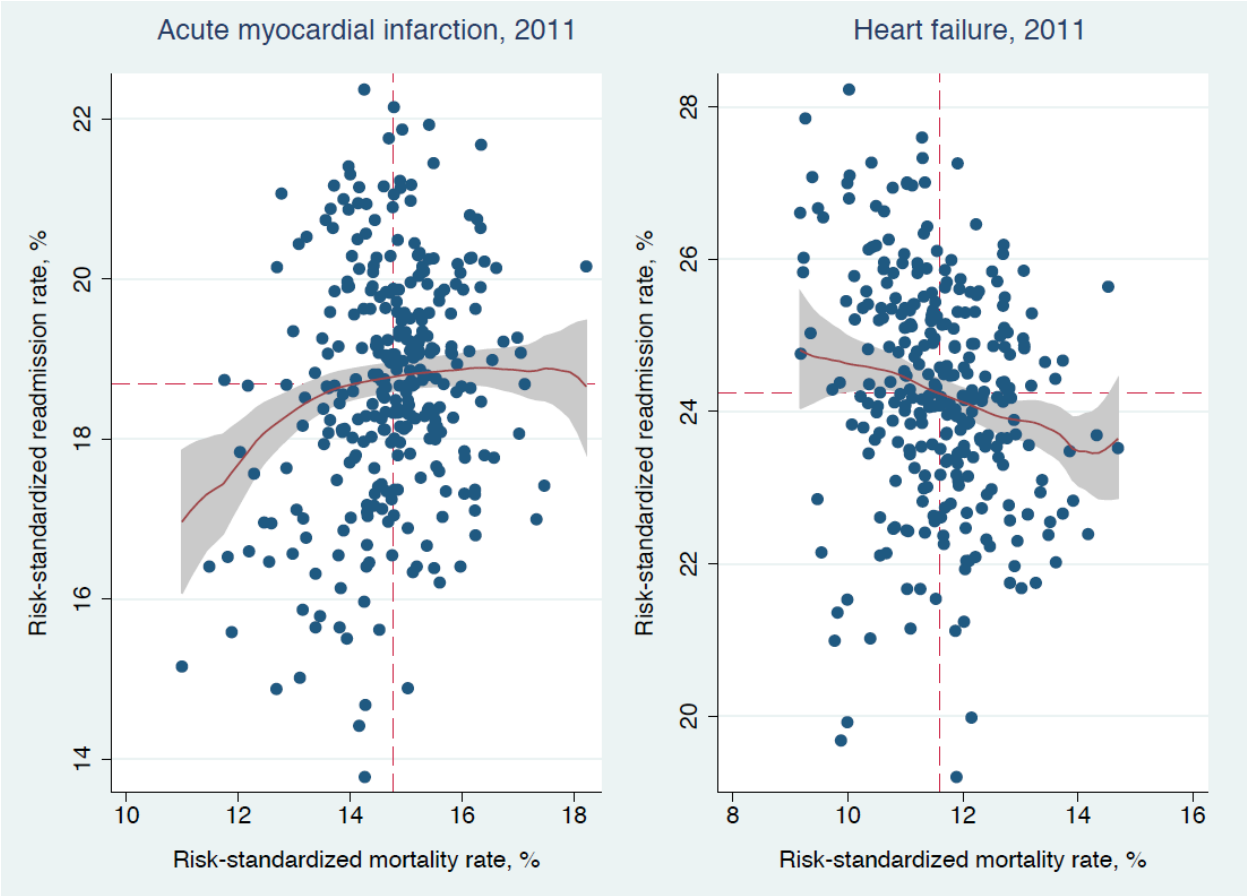
Figure 1. Relationships between hospital referral region 30-day, risk-standardized, all-cause readmission (RSRR) and mortality (RSMR) rates, 2011.



Note: Each marker represents one of 306 HRR. Local polynomial smoothed trendlines with 95% confidence limits shown. Dashed vertical and horizontal lines represent median RSMR and RSRR values in the 306 HRRs, respectively.

Figure 2. Subgroup analyses by demographic characteristics of HRR for relationships between RSRR and RSMR, 2011