Variation in 30-day mortality rates across hospitals following isolated coronary artery bypass graft surgery and complication rates following admission for elective primary total hip arthroplasty and/or total knee arthroplasty.

The Centers for Medicare & Medicaid Services (CMS) periodically provides a comprehensive overview of national performance on measures of mortality and complications following specific inpatient surgical procedures for Medicare fee-for service (FFS) beneficiaries aged 65 or older [1]. The procedure-specific mortality measure assesses mortality for any reason within 30 days of the procedure date for isolated coronary artery bypass graft (CABG) surgery, regardless of whether the patient dies while still in the hospital or after discharge from the hospital [2]. "Isolated" CABG procedures are those performed without concomitant high-risk cardiac and non-cardiac procedures, such as valve replacement [2]. The procedure-specific complication measure assesses the occurrence of significant medical and/or surgical complications within 7 to 90 days, depending on the complication, from the date of admission for elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA) [3]. Medical and surgical complications include: acute myocardial infarction (AMI), pneumonia, or sepsis/septicemia during the index admission or within 7 days from the date of admission; surgical site bleeding, pulmonary embolism or death during the index admission or within the 30 days from the date of the index admission; or mechanical complications, periprosthetic joint infection, or wound infection during the index admission or within 90 days from the date of the index admission [3]. CMS began publicly reporting risk-standardized complication rates (RSCRs) following elective primary THA/TKA in 2013, and risk-standardized mortality rates (RSMRs) following isolated CABG surgery in 2015 [4]. Publicly reported measure results are updated annually on the *Hospital Compare* website. In Fiscal Year 2019, the THA/TKA complication measure will be included in the Hospital Value-Based Purchasing (HVBP) Program [5, 6].

FIGURE 1. *Distribution of hospital RSMRs (%) for CABG, July 2012-June 2015.*

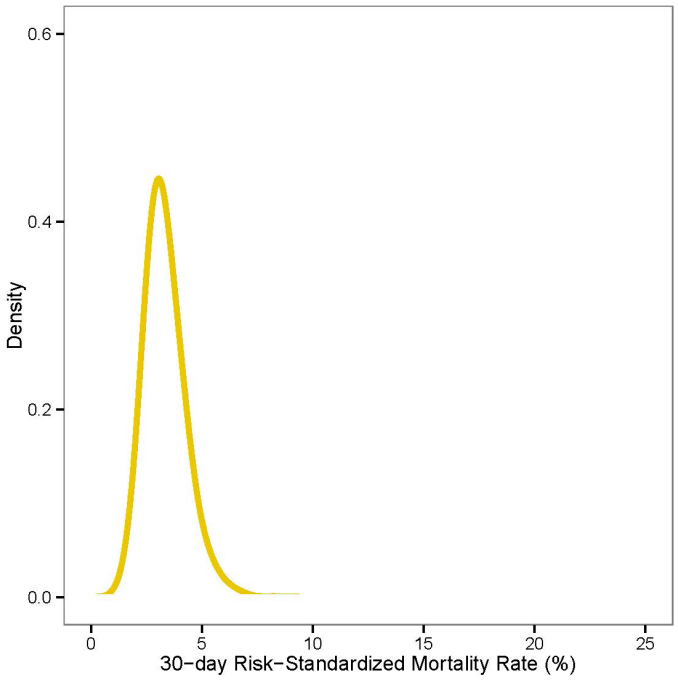
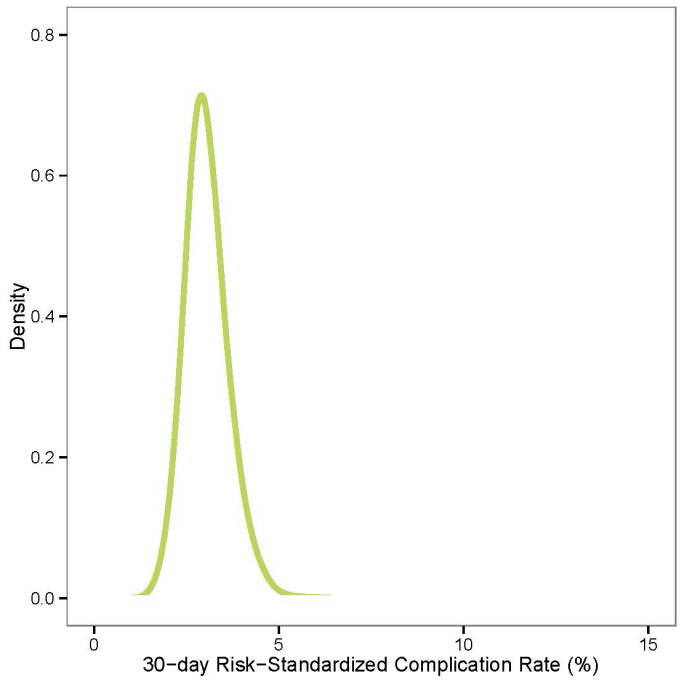


FIGURE 2. *Distribution of hospital RSCRs (%) for THA/TKA, April 2012-March 2015.*



Variation in procedure-specific RSMRs and RSCRs reflects differences in performance among hospitals; wider distributions suggest more variation in quality, and narrower distributions suggest less variation in quality. To determine the extent of variation present in these measures, we examined hospital CABG RSMRs for each year in the July 2012 – June 2015 reporting period and hospital THA/TKA RSCRs for each year of the April 2012 – March 2015 reporting period. We included hospitals with 25 or more qualifying cases. To ensure accurate assessment of each hospital, the measures use a statistical model to adjust for key differences in patient risk factors that are clinically relevant and that have strong relationships with the outcome [2, 3].

TABLE 1. *Distribution of hospital RSMRs (%) for CABG, July 2012-June 2015.*

	Distribution of CABG RSMRs (%)
Maximum	8.3
90%	4.4
75%	3.8
Median (50%)	3.2
25%	2.7
10%	2.4
Minimum	1.4

TABLE 2. *Distribution of hospital RSCRs (%) for THA/TKA, April 2012-March 2015.*

	Distribution of THA/TKA RSCRs (%)
Maximum	6.0
90%	3.8
75%	3.4
Median (50%)	3.0
25%	2.7
10%	2.4
Minimum	1.5

Hospital RSMRs for CABG and RSCRs for THA/TKA were normally distributed and centered at 3.2% and 3.0%, respectively (Figure 1 and Table 1; Figure 2 and Table 2). Additionally, hospitals were distributed over an interquartile range (IQR) of 1.1 and 0.7 percentage points, respectively (Table 1 and Table 2).

For the CABG and THA/TKA procedure-specific mortality and complication measures, half of the hospitals had RSMRs and RSCRs within 1.1 and 0.7 percentage points of the median hospital RSMR and RSCR. The range in RSMRs and RSCRs across all hospitals was 6.9 and 4.5 percentage points, respectively. This demonstrates that there are continued opportunities for improvement in both measures.

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