

## HOSPITAL CHARACTERISTICS

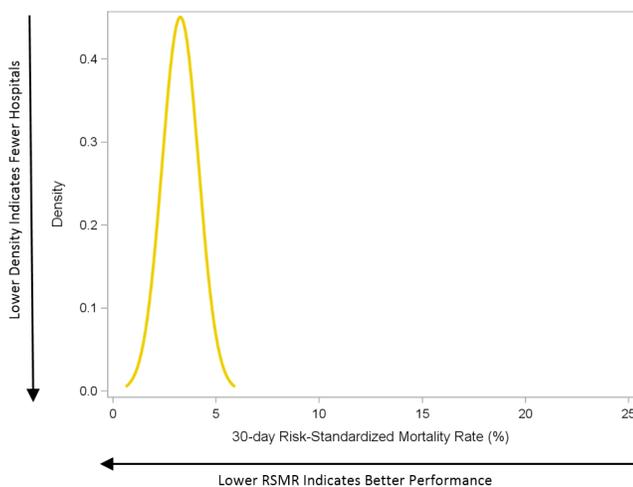
► Variation in 30-day mortality rates across hospitals following isolated coronary artery bypass graft surgery and complication rates following admission for elective primary total hip arthroplasty and/or total knee arthroplasty.

The Centers for Medicare & Medicaid Services (CMS) evaluates the distribution of measure results in order to monitor patterns, changes, and potential unintended consequences in the measure results. This information allows CMS to better understand the current state of care within U.S. hospitals. The isolated coronary artery bypass graft (CABG) mortality measure assesses mortality for any reason within 30 days of the procedure date for isolated CABG, regardless of whether the patient dies while still in the hospital or after being discharged from the hospital [1]. “Isolated” CABG procedures are those performed without concomitant high-risk cardiac and non-cardiac procedures, such as valve replacement. The elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA) 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 THA/TKA [2]. Medical and surgical complications include:

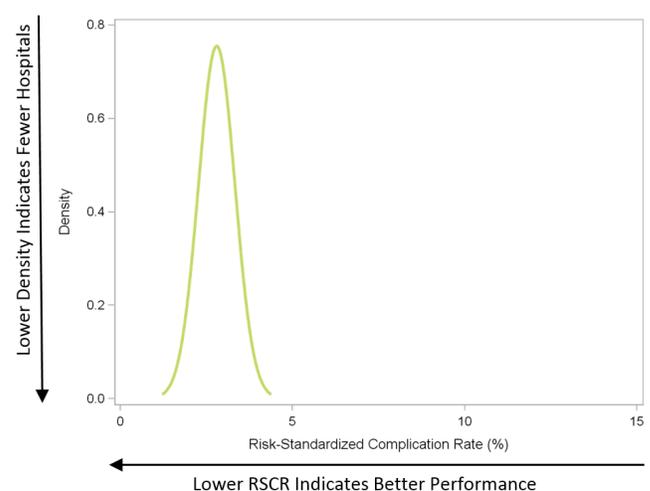
- Acute myocardial infarction (AMI), pneumonia, or sepsis/septicemia during the index admission or within 7 days from the date of admission;
- Surgical site bleeding, pulmonary embolism or death during the index admission or within the 30 days from the date of the index admission; or
- Mechanical complications, periprosthetic joint infection, or wound infection during the index admission or within 90 days from the date of the index admission [2].

The CABG mortality and THA/TKA complication measures include admissions for Medicare fee-for-service (FFS) beneficiaries aged 65 or older. 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 [3]. Publicly reported measure results are updated annually on the [Hospital Compare](#) website. The THA/TKA complication measure and CABG mortality measure will be included in the Hospital Value-Based Purchasing (HVBP) Program beginning in 2019 and 2022, respectively [4, 5].

**FIGURE 1.** Distribution of hospital RSMRs (%) for CABG, July 2013-June 2016.



**FIGURE 2.** Distribution of hospital RSCRs (%) for THA/TKA, April 2013-March 2016.



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 2013 – June 2016 reporting period and hospital THA/TKA RSCRs for each year of the April 2013 – March 2016 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 [1, 2].

Prepared for CMS by Yale New Haven Health Services Corporation - Center for Outcomes Research and Evaluation (YNHHC/CORE) September 2017

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**TABLE 1. Distribution of hospital RSMRs (%) for CABG, July 2013-June 2016.**

**TABLE 2. Distribution of hospital RSCRs (%) for THA/TKA, April 2013-March 2016.**

Distribution of CABG RSMRs (%) Number of hospitals 1,039	
Maximum	7.4
90%	4.5
75%	3.8
Median (50%)	3.1
25%	2.6
10%	2.3
Minimum	1.3

Distribution of THA/TKA RSCRs (%) Number of hospitals 2,803	
Maximum	5.6
90%	3.5
75%	3.1
Median (50%)	2.7
25%	2.5
10%	2.2
Minimum	1.4

Hospital RSMRs for CABG and RSCRs for THA/TKA were normally distributed and centered at 3.1% and 2.7%, respectively (Figure 1 and Table 1; Figure 2 and Table 2). Additionally, hospitals were distributed over an interquartile range (IQR) of 1.2 and 0.6 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 1.2 and 0.6 percentage points of the median hospital RSMR and RSCR. The range in RSMRs and RSCRs across all hospitals was 6.1 and 4.2 percentage points, respectively. This demonstrates that there are continued opportunities for improvement in both measures.

1. Jaymie Simoes, Jacqueline N. Grady, Jo DeBuhr, et al. 2017 Procedure-Specific Measure Updates and Specifications Report Hospital-Level 30-Day Risk-Standardized Mortality Measure: Isolated Coronary Artery Bypass Graft (CABG) Surgery – Version 4.0. <https://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier4&cid=1163010421830>. Available as of April 4, 2017.
2. Jaymie Simoes, Jacqueline N. Grady, Jo DeBuhr, et al. 2017 Procedure-Specific Measure Updates and Specifications Report Hospital-Level Risk-Standardized Complication Measure: Elective Primary Total Hip Arthroplasty (THA) and/or Total Knee Arthroplasty (TKA) – Version 6.0. <https://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier4&cid=122872782693>. Available as of April 4, 2017.
3. Hospital Inpatient Quality Reporting (IQR) Program Overview. QualityNet website. <https://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier2&cid=1138115987129>. Accessed March 1, 2017.
4. Hospital Value-Based Purchasing Overview. QualityNet website. <https://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier2&cid=122872039937>. Accessed March 1, 2017.
5. Centers for Medicare and Medicaid Services. Hospital Inpatient Prospective Payment Systems for Acute Care Hospitals, Final Rule Fiscal Year 2017. 81 FR 56761. Federal Register website. <https://www.federalregister.gov/d/2016-18476>. Published August 22, 2016. Effective October 1, 2016. Accessed March 1, 2017.

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