

► Performance on the elective primary total hip arthroplasty and/or total knee arthroplasty complication measure: **Hospitals with the highest proportions of vulnerable populations based on sociodemographic characteristics.**

The Centers for Medicare & Medicaid Services (CMS) periodically investigates select hospital practices that may impact a hospital's performance on the following complication measure: hospital-level risk-standardized complication rate (RSCR) following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA) [1]. The THA/TKA complication measure includes Medicare fee-for-service (FFS) beneficiaries aged 65 or older [2]. The THA/TKA complication measure assesses the occurrence of significant medical and/or surgical complications within 7 to 90 days, depending on the complication, following hospitalization for elective primary THA/TKA. Medical and surgical complications include: acute myocardial infarction (AMI), pneumonia, or sepsis/septicemia during hospitalization or within 7 days of admission; surgical site bleeding, pulmonary embolism or death during hospitalization or within 30 days of admission; or mechanical complications, periprosthetic joint infection, or wound infection during hospitalization or within 90 days of admission [2]. The THA/TKA complication measure has been publicly reported on [Hospital Compare](#) since 2013, and in Fiscal Year 2019, it will be included in the Hospital Value-Based Purchasing (HVBP) program [3].

There has been much discussion about the potential impact of patient sociodemographic status (SDS) on hospital outcome measures, including measures of complication [3, 4]. We examined THA/TKA RSCRs among hospitals identified as caring for a large proportion of vulnerable patients, as characterized by seven different SDS definitions, for hospitals with at least 25 eligible admissions. The hospitals included in this analysis are the 10% of hospitals with highest proportions of vulnerable patients as characterized by the different SDS definitions (Table 1). We compared the distribution of THA/TKA RSCRs among the hospitals identified by the various SDS definitions and also examined the number of hospitals identified as caring for high proportion of vulnerable populations by the various definitions. Variation in RSCRs reflects differences in performance among hospitals; lower RSCRs suggest better quality, and higher RSCRs suggest worse quality. To ensure accurate assessment of each hospital, the THA/TKA complication measure uses a statistical model to adjust for key differences in patient risk factors that are clinically relevant and that have a strong relationship with the complication outcome [2].

Among the subgroup of hospitals identified as serving vulnerable populations as characterized by the seven SDS definitions, only 45% of hospitals were identified by more than one definition of SDS.

Out of the 1,086 hospitals that met the criteria for serving a large proportion of vulnerable patients as characterized by at least one definition of SDS, less than half (489 hospitals; 45% of hospitals) met criteria characterized by multiple definitions of SDS. There were no hospitals that met criteria characterized by all seven definitions of SDS. However, five hospitals (< 1% of 2,810 total hospitals) met the criteria for six of the definitions, 36 hospitals (1% of total hospitals) were identified by five of the definitions, 61 hospitals (2% of total hospitals) were identified by four of the definitions, and 131 hospitals (5% of total hospitals) were identified by three of the definitions.

The median THA/TKA RSCR for all hospitals was 3.1% and median THA/TKA RSCRs for hospitals identified as serving high proportions of vulnerable populations were within 0.2 percentage points of the overall median. We observed overlapping ranges in performance for hospitals meeting criteria based on all seven SDS definitions (Figure 1). The interquartile range of THA/TKA RSCRs overall was 2.8% to 3.5% and for hospitals identified as serving high proportions of vulnerable populations the interquartile range was 2.8% to 3.6% (Table 2).

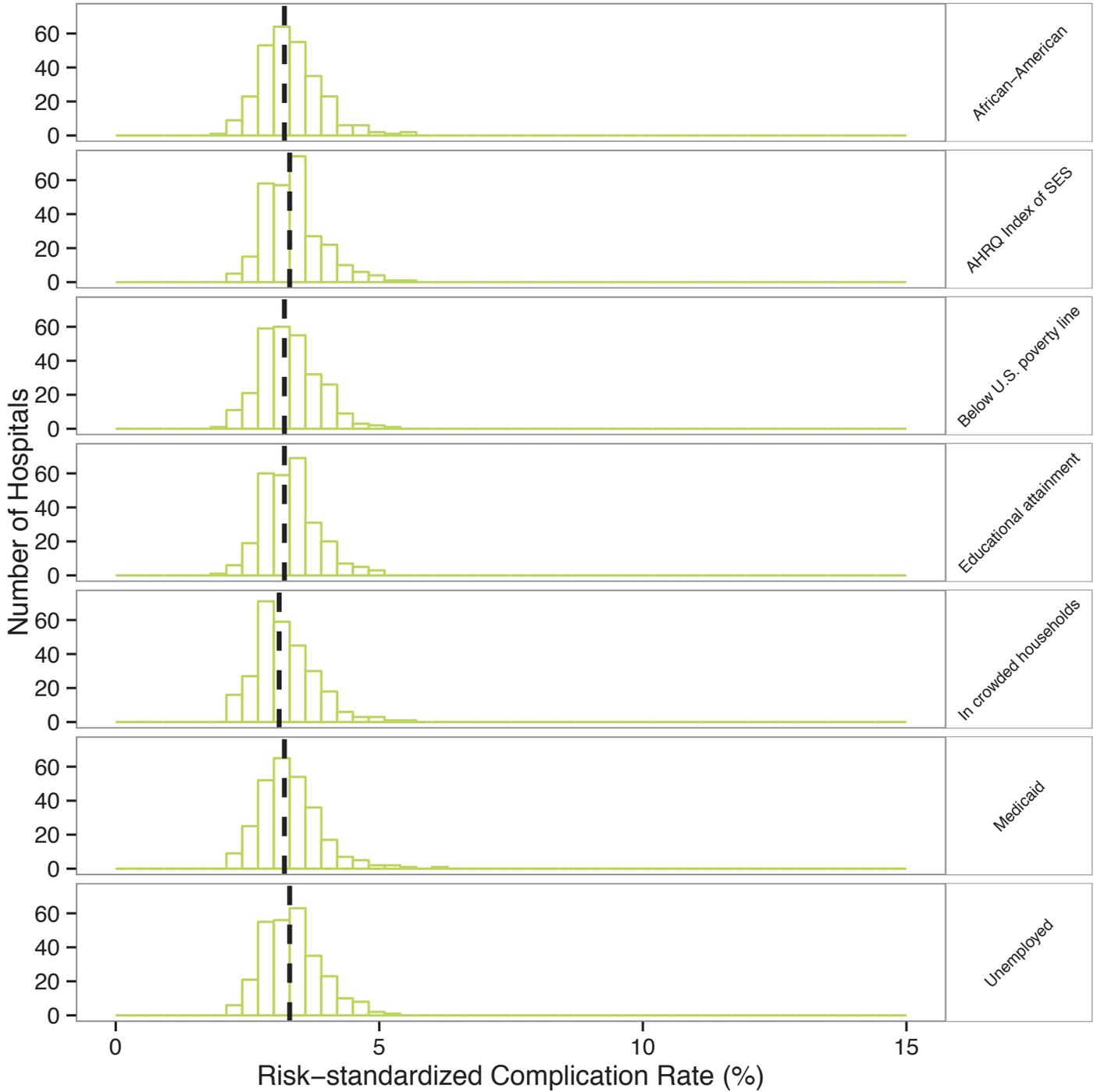
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TABLE I Definitions and data sources for the following sociodemographic characteristics: living below the U.S. poverty line; an educational attainment below high school; unemployed; living in crowded households; African-American; receiving Medicaid; and residing in a zip-code with a low AHRQ Index of SES score.

Sociodemographic characteristics	Definition of vulnerable patients based on sociodemographic characteristics	Identification of hospitals with the highest proportion of vulnerable patients	Source
Below U.S. poverty line	Patients from zip codes where more than 29.7% of the residents are below the United States (U.S.) poverty line	Hospitals with more than 55.4% of Medicare fee-for service (FFS) patients that meet the vulnerable patient definition	American Community Survey (ACS) 2008 – 2012 5 year estimate Medicare Part A Inpatient Claims 2012
Educational attainment below high school	Patients from zip codes where more than 18.6% of the residents aged ≥ 25 years have less than a 12th-grade education	Hospitals with more than 61.8% of Medicare FFS patients that meet the vulnerable patient definition	ACS 2008 – 2012 5 year estimate Medicare Part A Inpatient Claims 2012
Unemployed	Patients from zip codes where more than 11.5% of the residents aged 16 years or older in labor force who are unemployed and actively seeking work	Hospitals with more than 59.9% of Medicare FFS patients that meet the vulnerable patient definition	ACS 2008 – 2012 5 year estimate Medicare Part A Inpatient Claims 2012
Crowded households	Patients from zip codes where more than 3.2% of the residents live in households containing one or more person per room	Hospitals with more than 64.7% of Medicare FFS patients that meet the vulnerable patient definition	ACS 2008 – 2012 5 year estimate Medicare Part A Inpatient Claims 2012
African-American	African-American patients	Hospitals with more than 18.9% of Medicare FFS patients identified as African-American	Medicare Part A Inpatient Claims 2013
Medicaid	Patients that have Medicaid coverage	Hospitals with more than 28.8% of patients with Medicaid coverage	American Hospital Association (AHA) Survey 2013 [5]
AHRQ Index of SES scores	Patients from zip codes with an Agency for Healthcare Research & Quality (AHRQ) socioeconomic status (SES) index score below 31.8	Hospitals with more than 69.4% of Medicare FFS patients that meet the vulnerable patient definition	AHRQ SES index [6] ACS 2008 – 2012 5 year estimate Medicare Part A Inpatient Claims 2012

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FIGURE I Distributions and medians of THA/TKA RSCRs (%) for hospitals with the highest proportion of patients with one of the following sociodemographic characteristics: living below the U.S. poverty line; an educational attainment below high school; unemployed; living in crowded households; African-American; receiving Medicaid; and residing in a zip-code with a low AHRQ Index of SES score, April 2011-March 2014.



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TABLE 2 Distributions of THA/TKA RSCRs (%) for hospitals with the highest proportion of patients with one of the following sociodemographic characteristics: living below the U.S. poverty line; an educational attainment below high school; unemployed; living in crowded households; African-American; receiving Medicaid; and residing in a zip-code with a low AHRQ Index of SES score, April 2011-March 2014.

THA/TKA RSCRs (%) for hospitals with the highest proportions of patients:

	All hospitals; n=2,810	Below U.S. poverty line; n=280	Educational attainment below high school; n=280	Unemployed; n=280	In crowded households; n=280	African- American; n=280	Medicaid; n=276	Low AHRQ Index of SES score; n=280
Maximum	6.9	5.1	4.8	5.2	5.5	5.5	6.1	5.5
75%	3.5	3.6	3.5	3.6	3.5	3.6	3.6	3.6
Median (50%)	3.1	3.2	3.2	3.3	3.1	3.2	3.2	3.3
25%	2.8	2.8	2.9	2.9	2.8	2.9	2.8	2.9
Minimum	1.4	2.0	2.0	2.2	2.1	2.0	2.1	2.1

The median THA/TKA RSCR for all hospitals was 3.1% and median THA/TKA RSCRs for hospitals identified as serving high proportions of vulnerable populations were within 0.2 percentage points of the overall median. Similarly, the interquartile range of THA/TKA RSCRs overall was 2.8% to 3.5% and for hospitals identified as serving high proportions of vulnerable populations the interquartile range was 2.8% to 3.6%.

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