

► Performance on the stroke mortality 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 mortality measure: hospital-level 30-day risk-standardized mortality rate (RSMR) following acute ischemic stroke [1]. The stroke mortality measure includes Medicare fee-for-service (FFS) beneficiaries aged 65 or older [2]. The stroke mortality measure assesses the occurrence of death for any cause within 30 days after hospital admission for acute ischemic stroke [2]. The stroke mortality measure has been publicly reported on [Hospital Compare](#) since 2014 [3].

There has been much discussion about the potential impact of patient sociodemographic status (SDS) on hospital outcome measures, including measures of mortality [3, 4]. We examined stroke RSMRs 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 stroke RSMRs 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 RSMRs reflects differences in performance among hospitals; lower RSMRs suggest better quality, and higher RSMRs suggest worse quality. To ensure accurate assessment of each hospital, the stroke mortality 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 mortality outcome [2].

Among the subgroup of hospitals identified as serving vulnerable populations as characterized by the seven SDS definitions, only 47% of hospitals were identified by more than one definition of SDS.

Out of the 1,046 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 (495 hospitals; 47% 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, seven hospitals (< 1% of 2,803 total hospitals) met the criteria for six of the definitions, 29 hospitals (1% of total hospitals) were identified by five of the definitions, 76 hospitals (3% of total hospitals) were identified by four of the definitions, and 146 hospitals (5% of total hospitals) were identified by three of the definitions.

The median stroke RSMR for all hospitals was 14.7% and median stroke RSMRs for hospitals identified as serving high proportions of vulnerable populations were within 0.4 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 stroke RSMRs overall was 13.7% to 15.8% and for hospitals identified as serving high proportions of vulnerable populations the interquartile range was 13.3% to 15.9% (Table 2).

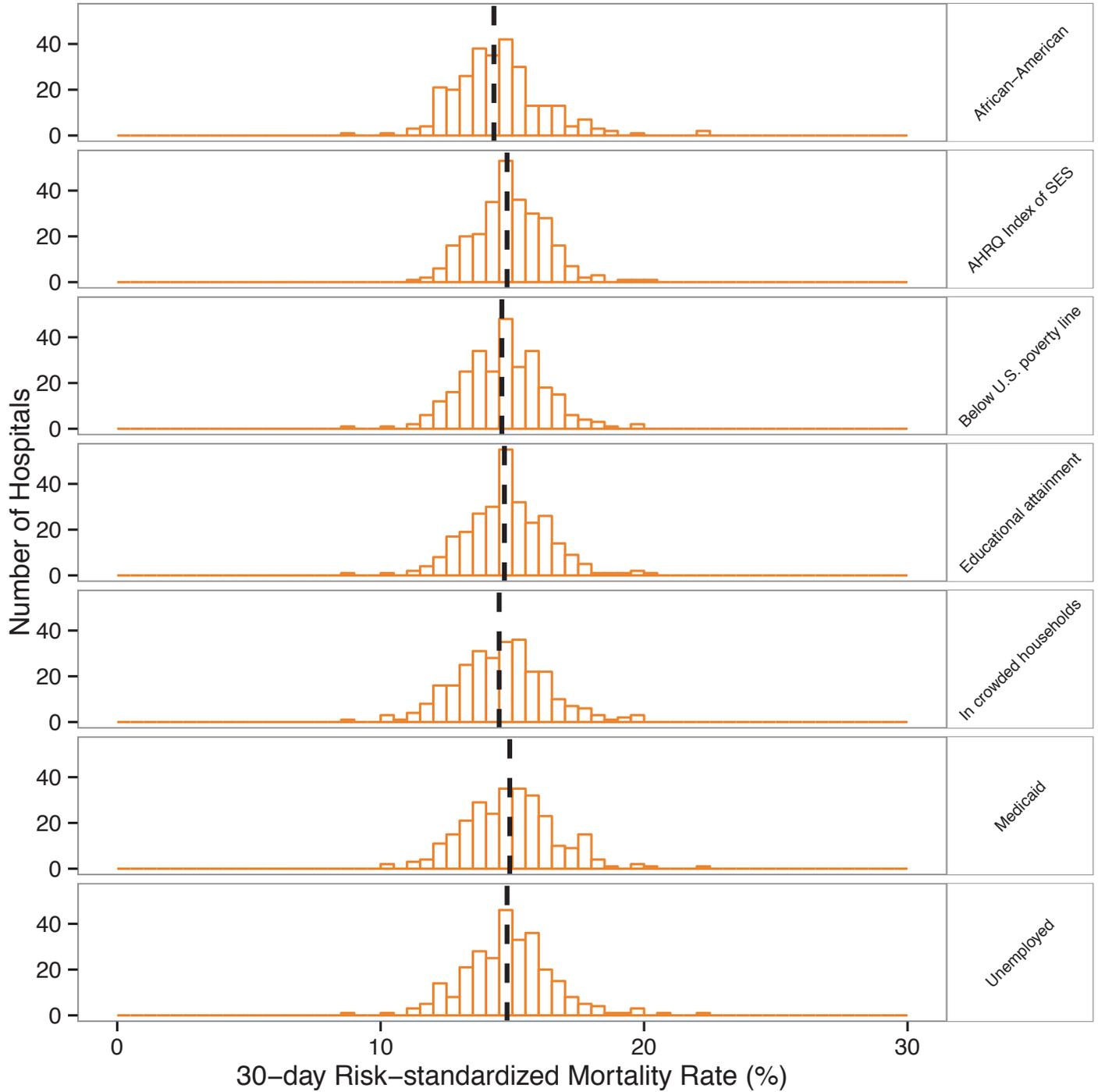
## SOCIODEMOGRAPHIC STATUS

**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 59.5% 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 $\geq 25$ years have less than a 12th-grade education	Hospitals with more than 74.9% 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 67.8% 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 70.7% 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 23.3% of Medicare FFS patients identified as African-American	Medicare Part A Inpatient Claims 2013
Medicaid	Patients that have Medicaid coverage	Hospitals with more than 30.5% 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 82.6% of FFS patients that meet the vulnerable patient definition	AHRQ SES index [6] ACS 2008 – 2012 5 year estimate Medicare Part A Inpatient Claims 2012

SOCIODEMOGRAPHIC STATUS

**FIGURE I** Distributions and medians of stroke RSMRs (%) 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, July 2011-June 2014.



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**TABLE 2** Distributions of stroke RSMRs (%) 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, July 2011-June 2014.

**Stroke RSMRs (%) for hospitals with the highest proportions of patients:**

	All hospitals; n=2,803	Below U.S. poverty line; n=280	Educational attainment below high school; n=279	Unemployed; n=280	In crowded households; n=280	African- American; n=279	Medicaid; n=277	Low AHRQ Index of SES score; n=279
Maximum	22.3	19.8	20.4	22.2	19.8	22.2	22.2	20.4
75%	15.8	15.6	15.6	15.8	15.6	15.2	15.9	15.7
Median (50%)	14.7	14.6	14.7	14.8	14.5	14.3	14.9	14.8
25%	13.7	13.5	13.7	13.8	13.3	13.3	13.7	14.0
Minimum	8.7	8.7	8.7	8.7	8.7	8.7	10.1	11.4

The median stroke RSMR for all hospitals was 14.7% and median stroke RSMRs for hospitals identified as serving high proportions of vulnerable populations were within 0.4 percentage points of the overall median. Similarly, the interquartile range of stroke RSMRs overall was 13.7% to 15.8% and for hospitals identified as serving high proportions of vulnerable populations the interquartile range was 13.3% to 15.9%.

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4. National Quality Forum. Risk Adjustment for Socioeconomic Status or Other Sociodemographic Factors, Technical Report, August 15, 2014; [http://www.qualityforum.org/Publications/2014/08/Risk\\_Adjustment\\_for\\_Socioeconomic\\_Status\\_or\\_Other\\_Sociodemographic\\_Factors.aspx](http://www.qualityforum.org/Publications/2014/08/Risk_Adjustment_for_Socioeconomic_Status_or_Other_Sociodemographic_Factors.aspx). Accessed 9 July 2015.

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