

► Performance on the pneumonia 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 pneumonia [1]. The pneumonia mortality measure includes Medicare fee-for-service (FFS) and Veterans Health Administration (VA) beneficiaries aged 65 or older [2]. The pneumonia mortality measure assesses the occurrence of death for any cause within 30 days after hospital admission for pneumonia [2]. The pneumonia mortality measure has been publicly reported on [Hospital Compare](#) since 2008 and has been included in the Hospital Value-Based Purchasing (HVBP) Program since 2013 [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 pneumonia 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 pneumonia 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 pneumonia 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]. Please note that VA hospitals are not included in this analysis.

Among the subgroup of hospitals identified as serving vulnerable populations as characterized by the seven SDS definitions, only 48% of hospitals were identified by more than one definition of SDS.

Out of the 1,615 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 (786 hospitals; 48% 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, four hospitals (< 1% of 4,371 total hospitals) met the criteria for six of the definitions, 33 hospitals (1% of total hospitals) were identified by five of the definitions, 120 hospitals (3% of total hospitals) were identified by four of the definitions, and 220 hospitals (5% of total hospitals) were identified by three of the definitions.

The median pneumonia RSMR for all hospitals was 11.5% and median pneumonia 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 pneumonia RSMRs overall was 10.5% to 12.6% and for hospitals identified as serving high proportions of vulnerable populations the interquartile range was 10.3% to 13.2% (Table 2).

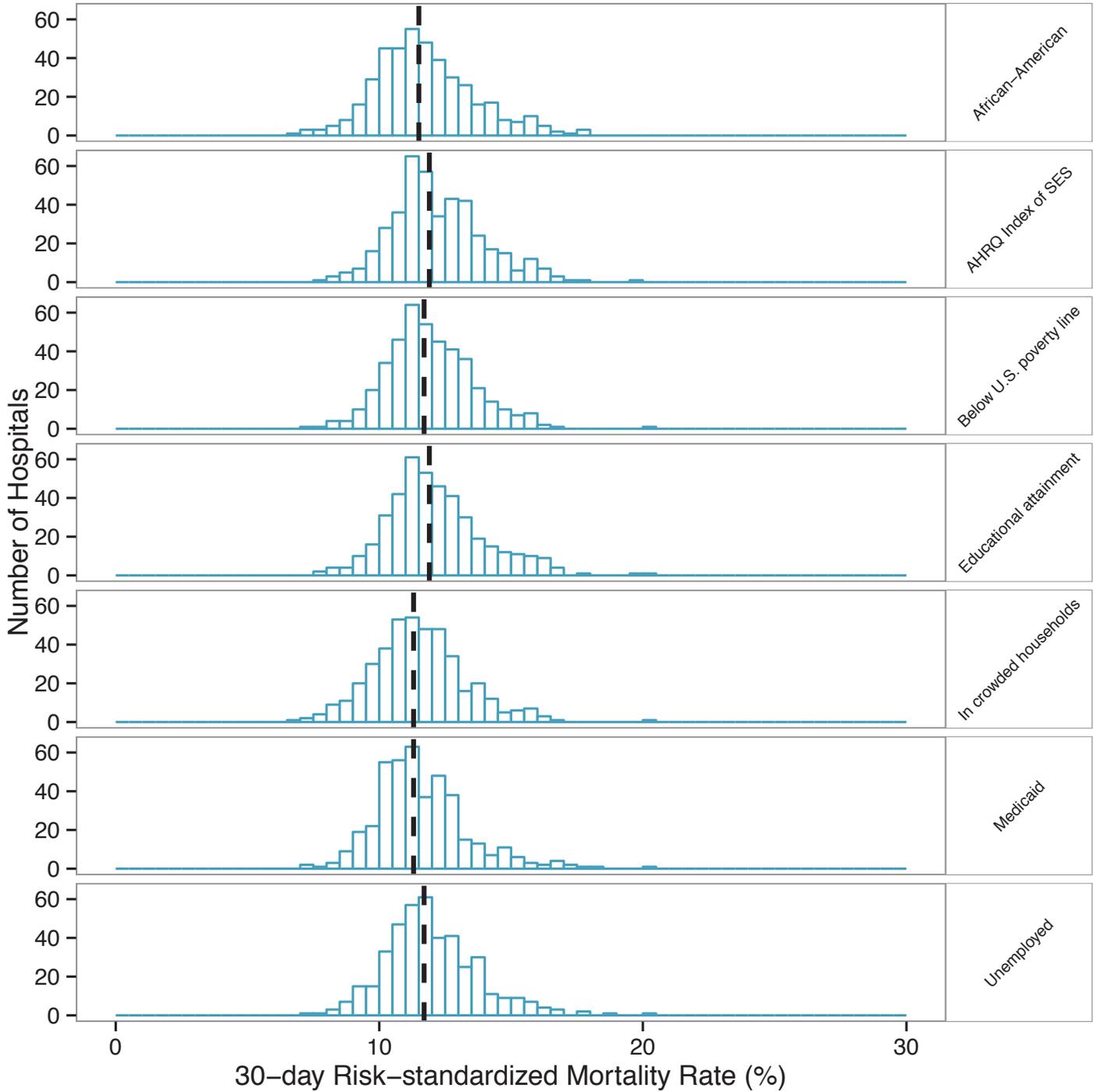
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TABLE I Definitions and data sources for the following sociodemographic characteristics: living below the U.S. poverty line; an educational attainment below high school; unemployed; living in crowded households; African-American; receiving Medicaid; 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 67.2% 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 86.3% 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 71.1% 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 74.1% 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 22.1% of Medicare FFS patients identified as African-American	Medicare Part A Inpatient Claims 2013
Medicaid	Patients that have Medicaid coverage	Hospitals with more than 28.9% 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 92.1% 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 pneumonia 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 pneumonia 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.

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

	All hospitals; n=4,371	Below U.S. poverty line; n=424	Educational attainment below high school; n=423	Unemployed; n=423	In crowded households; n=423	African- American; n=422	Medicaid; n=419	Low AHRQ Index of SES score; n=424
Maximum	20.3	20.3	20.3	20.3	20.3	17.9	20.3	19.8
75%	12.6	12.9	13.0	12.9	12.4	12.8	12.4	13.2
Median (50%)	11.5	11.7	11.9	11.7	11.3	11.5	11.3	11.9
25%	10.5	10.8	10.9	10.8	10.3	10.4	10.4	11.0
Minimum	6.9	7.2	7.5	7.3	6.9	6.9	7.2	7.9

The median pneumonia RSMR for all hospitals was 11.5% and median pneumonia 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 pneumonia RSMRs overall was 10.5% to 12.6% and for hospitals identified as serving high proportions of vulnerable populations the interquartile range was 10.3% to 13.2%.

1. Medicare Hospital Quality Chartbook 2014: Performance Report on Outcome Measures. Prepared by Yale New Haven Health Services Corporation Center for Outcomes Research and Evaluation for the Centers for Medicare and Medicaid Services 2014; <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/Downloads/Medicare-Hospital-Quality-Chartbook-2014.pdf>. Accessed 16 June 2015.

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3. “Hospital Inpatient Prospective Payment Systems for Acute Care Hospitals, Final Rule.” Federal Register / 22 August 2014; <http://federalregister.gov/a/2014-18545>. Accessed 16 June 2015.

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. Accessed 9 July 2015.

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