

### Hospital Characteristics Associated With Penalties in the Centers for Medicare & Medicaid Services Hospital-Acquired Condition Reduction (HAC) Program

#### Take Away Points

- HAC penalization measures seem to have measurement and validity problems and may not reflect poor quality—hospitals characterized by large sizes, complex case mixes, high volume admissions and accreditations are associated with high quality summary scores and higher likelihood of HAC penalizations.
- Data analyses also suggest surveillance bias, where hospitals with adequate systems (e.g., standardized procedures and data infrastructures) to identify and report adverse outcomes are incorrectly tagged as poor performing and unfairly penalized; i.e., if you don't look, you don't find and you look good.
- The HAC penalization measures do not incorporate comprehensive risk adjustment indices that take into account patient-level comorbidities, operative complexity, and important clinical and organization variables.

#### The Issue

The HAC program may be unfairly penalizing hospitals because of measurement issues associated with its component metrics. Potential measurement problems include data abstraction and ascertainment bias (e.g., HAC rates may vary by clinical practice and local data collection procedures); inadequacies in risk-adjustments for differences in case mix, patient comorbidities and sociodemographic characteristics; and hospital-hospital variations in interpretations of the coding rules. Moreover, inconsistencies in the calculation of HAC scores seem to favor hospitals without complete information on the composites of the two domains of HAC.

#### Source

Rajaram R, Chung JW, Kinnier CV, Barnard C, Mohanty S, Pavey ES, McHugh MC, Bilimoria KY (2015). *Journal of the American Medical Association*, 314 (4), 375-383.

#### Study Methods and Design

The study aims to compare the characteristics of hospitals penalized in the HAC (Hospital-Acquired Condition) Reduction Program with those not penalized and determine the association between a composite measure of hospital quality and penalization in the HAC program. The researchers conducted a retrospective quantitative analysis of data from 3284 hospitals that participated in the HAC Reduction Program. 721 (22.0%) of the hospitals were penalized while 2563 (78%) were not penalized.

- **Data Sources:** CMS Hospital Compare website for data on HAC scores, participation systematic clinical surgery registry, etc.; the 2015 American Hospital Association Annual Survey for data on hospital characteristics; and the CMS Impact File for resident-to-bed ratio, case mix index, etc.
- **Analytical Strategies:**  $\chi^2$  tests to examine bivariate relationships between HAC penalization and hospital characteristics; multivariable logistic regression models to identify hospital characteristics associated with HAC penalization; Cuzick extension of the Wilcoxon rank-sum test to assess mean process-of-care and outcome measure performance rates across hospital

quality summary score categories; and Cochran-Armitage test to examine the association between HAC penalization and hospital quality summary scores.

- **Variables Examined:** Hospital bed size, total hospital admissions (categorized into quartiles), Joint Commission accreditation, Commission on Cancer accreditation, membership in the Council of Teaching Hospitals, resident-to-bed ratios, case mix index, safety-net hospital status, provision of transplant services, level I trauma center status, inpatient surgeries per bed, nurse-to-bed ratio, and participation in a clinical surgical registry.

### Key Findings and Limitations

- Bivariate analyses revealed that HAC penalization was more frequent for hospitals with higher number of beds, large hospital admission volume, Joint Commission accreditation, level I trauma center, higher nurse-to-bed ratio, participation in clinical surgical registry, higher CMI, and safety-net hospital status.
  - There was a stepwise increase in penalization rates as the level of teaching hospital intensity increased (i.e., from non-teaching to very major teaching).
- HAC penalization was more common for hospitals with complete HAC data (i.e., with both Domains 1 and 2). Majority (89.4%) of the hospitals with only Domain 2 were small hospitals with less than 100 beds and less likely to be penalized; hospitals with Domain 2 were more likely to be penalized.
- The odds of HAC penalization was higher for hospitals accredited by the Joint Commission, major or very major teaching hospital, safety-net hospitals, level I trauma centers, participants in clinical surgical registries, and hospitals within the highest CMI quartile (hospitals in the highest CMI quartile have almost double fold odds of penalization than hospitals in the bottom CMI quartile).
- Hospitals with a higher quality summary score performed significantly better on all measures than those with a lower hospital quality summary score, with the exception of discontinuing postoperative antibiotics within 24 hours of surgery, but were more frequently penalized in the HAC Reduction Program than lower quality hospitals.
- Hospitals with higher quality scores, though less likely to be in the bottom quartile on the CLABSI component than those with lower quality summary scores, were more likely to be in the bottom quartile on both the PSI-90 and CAUTI components than those with lower scores.

*“Our study can be interpreted in two ways. First, traditional quality metrics (e.g., accreditations, process measures, mortality) may be flawed and thus conflict with hospital HAC measure performance. Alternatively, the HAC Reduction Program may not accurately measure hospital quality.”*

These findings should be interpreted with caution due to study limitations. For example, the results are only relevant for the FY2015 HAC Reduction Program. Also, the authors varied the metrics included in this quality score—although this did not substantively change the results, the composite measure does not include other metrics of hospital quality (e.g., availability of electronic health records, etc.).

### Final Thoughts

HAC penalization measures are based on limited assessments and may not truly reflect poor quality hospitals; therefore the HAC penalization method should be reevaluated to ensure it achieves its intended goals.