

Evaluation of hospitals participating in the American College of Surgeons National Surgical Quality Improvement Program



Catherine R. Sheils, BA,^{a,b} Allison R. Dahlke, MPH,^a Lindsey Kreutzer, MPH,^a
Karl Y. Bilimoria, MD, MS,^{a,c} and Anthony D. Yang, MD,^{a,c} Chicago, IL, and Rochester, NY

Background. The American College of Surgeons National Surgical Quality Improvement Program is well recognized in surgical quality measurement and is used widely in research. Recent calls to make it a platform for national public reporting and pay-for-performance initiatives highlight the importance of understanding which types of hospitals elect to participate in the program. Our objective was to compare characteristics of hospitals participating in the American College of Surgeons National Surgical Quality Improvement Program to characteristics of nonparticipating US hospitals.

Methods. The 2013 American Hospital Association and Centers for Medicare & Medicaid Services Healthcare Cost Report Information System datasets were used to compare characteristics and operating margins of hospitals participating in the American College of Surgeons National Surgical Quality Improvement Program to those of nonparticipating hospitals.

Results. Of 3,872 general medical and surgical hospitals performing inpatient surgery in the United States, 475 (12.3%) participated in the American College of Surgeons National Surgical Quality Improvement Program. Participating hospitals performed 29.0% of all operations in the United States. Compared with nonparticipating hospitals, American College of Surgeons National Surgical Quality Improvement Program hospitals had a higher mean annual inpatient surgical case volume (6,426 vs 1,874; $P < .001$) and a larger mean number of hospital beds (420 vs 167; $P < .001$); participating hospitals were more often teaching hospitals (35.2% vs 4.1%; $P < .001$), had more quality-related accreditations ($P < .001$), and had higher mean operating margins ($P < .05$). States with the highest proportions of hospitals participating in the American College of Surgeons National Surgical Quality Improvement Program had established surgical quality improvement collaboratives.

Conclusion. The American College of Surgeons National Surgical Quality Improvement Program hospitals are large teaching hospitals with more quality-related accreditations and financial resources. These findings should be considered when reviewing research studies using the American College of Surgeons National Surgical Quality Improvement Program data, and the findings reinforce that efforts are needed to facilitate participation in surgical quality improvement by all hospital types. (*Surgery* 2016;160:1182-8.)

From the Surgical Outcomes and Quality Improvement Center (SOQIC), Department of Surgery,^a and Center for Healthcare Studies in the Institute for Public Health and Medicine,^c Feinberg School of Medicine, Northwestern University, Chicago, IL; University of Rochester School of Medicine,^b Rochester, NY

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Reprint requests: Anthony D. Yang, MD, Surgical Outcomes and Quality Improvement Center (SOQIC), Department of Surgery and Center for Healthcare Studies, Feinberg School of Medicine, Northwestern University, 676 St. Clair Street, Arkes Pavilion, Suite 6-650, Chicago, IL 60611. E-mail: anthony.yang@northwestern.edu.

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THE AMERICAN COLLEGE OF SURGEONS NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM (ACS NSQIP) is a national surgical quality improvement (QI) effort with a rigorous data collection platform for tracking surgical outcomes and process measures. The program initially began in the Veterans Health Administration system, but after the ACS NSQIP program opened participation to private and not-for-profit hospitals in 2001, it rapidly expanded to include nearly 500 hospitals within

its first decade.¹⁻⁴ Hospitals participating in ACS NSQIP have demonstrated reductions in morbidity and mortality^{2,5,6} and have benefited from the cost savings associated with improved quality.⁷⁻⁹ State-wide and regional ACS NSQIP collaboratives also have emerged to encourage QI efforts on a local level, many with notable success.⁹⁻¹¹

Given the widespread use of ACS NSQIP in research and QI efforts, there have been recent calls for it to become a public reporting platform nationwide and for its metrics to be used in pay-for-performance initiatives.¹² As such, it is important to understand which types of hospitals elect to participate in the program. ACS NSQIP initially was adopted disproportionately in high-volume, academic hospitals,^{11,13} but the details of how the program has expanded during the past 10 years or more have not been described fully. Participating hospitals incur an annual participation fee, and their participation is also resource intensive because the required data is abstracted by 1 or more full-time skilled nurse reviewers or health information experts.^{14,15} Others have suggested that smaller community hospitals, in particular, may lack the infrastructure and resources necessary to enroll in ACS NSQIP.¹⁶

Despite the entrenchment of ACS NSQIP as the premier surgical quality measurement program³ and the widespread use of ACS NSQIP data for research and QI, the scope and reach of the program have not been defined meaningfully during recent times. A detailed evaluation and comparison of the different characteristics of US hospitals participating in ACS NSQIP to those not participating can provide insight into the selection bias of research studies utilizing ACS NSQIP data and can indicate which types of hospitals may face barriers to participating in the program. Therefore, the objectives of this study are (1) to compare the characteristics of hospitals participating in ACS NSQIP to those of nonparticipating hospitals and (2) to estimate the proportion of operations performed in ACS NSQIP hospitals and nonparticipating hospitals in the United States.

METHODS

Data sources. US hospitals were identified as ACS NSQIP “participating hospitals” if they were enrolled in the program as of May 1, 2015. The remaining hospitals were classified as “nonparticipating hospitals.” The 2013 American Hospital Association (AHA) annual survey of hospitals (the most recent publically available AHA dataset) was

used to ascertain hospital-level characteristics. The Centers for Medicare and Medicaid Services (CMS) 2013 Healthcare Cost Report Information System reports were used to calculate hospital operating margins. The top and bottom 1% of hospital operating margins ($n = 70$) were excluded to avoid distortion by extreme values,¹⁷ but these hospitals were otherwise included in the analysis. The 2013 CMS Hospital Value-Based Purchasing scores were used as a measure of hospital quality.¹⁸ As an indicator of the patient population served by the hospitals, the highest quartile of the CMS disproportionate share hospital patient percentage was used to define safety-net hospitals.¹⁹⁻²²

Sample. Hospitals were included in the analysis if the hospital was classified by the AHA as a general medical and surgical hospital, cancer hospital, or obstetric/gynecologic hospital. Hospitals performing <100 operative cases annually (20% of participating hospitals; mean 26.4 cases) were excluded from analysis because they were extremely low-volume centers and because it was unclear whether the operative volume of these centers was sufficient for them to benefit from participating in ACS NSQIP. Because surgery centers and physician offices were not categorized as general medical/surgical, cancer, or obstetric/gynecologic hospitals in the AHA dataset, procedures conducted at these sites were not captured in our analysis of US surgical volumes (Fig 1).

Variables. Hospital characteristics included in this analysis were hospital bed size; hospital ownership/control; Council of Teaching Hospitals and Health Systems teaching status; accreditation by the Joint Commission, American College of Surgeons Commission on Cancer and/or the Accreditation Council for Graduate Medical Education; and designation as a level 1 trauma center, safety-net hospital, critical access hospital, sole community provider, and/or rural health clinic/hospital. The total number of operations conducted at each hospital, including inpatient and outpatient procedures, was also included in our analysis. Additional variables included operating margin and value-based purchasing score.

Statistical analysis. Pearson χ^2 tests and Student t tests were performed to evaluate differences between ACS NSQIP-participating hospitals and nonparticipating hospitals. All statistical analyses were performed using SAS software (version 9.4; SAS Institute, Inc, Cary, NC). As a secondary analysis of nonidentifiable and existing data, this study was determined to be nonhuman subjects research by Northwestern University’s Institutional Review Board office.

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