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Medicaid beneficiaries undergoing complex surgery at quality care centers: insights into the Affordable Care Act

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Abstract

BACKGROUND: Medicaid beneficiaries do not have equal access to high-volume centers for complex surgical procedures. We hypothesize there is a large Medicaid Gap between those receiving emergency general vs complex surgery at the same hospital.

METHODS: Using the Nationwide Inpatient Sample, 1998 to 2010, we identified high-volume pancreatectomy hospitals. We then compared the percentage of Medicaid patients receiving appendectomies vs pancreatectomies at these hospitals. Hospital characteristics associated with increased Medicaid Gap were evaluated using generalized estimating equation models.

RESULTS: A total of 602 hospital-years of data from 289 high-volume pancreatectomy hospitals were included. Median percentages of Medicaid appendectomies and pancreatectomies were 12.1% (interquartile range: 5.8% to 19.8%) and 6.7% (interquartile range: 0% to 15.4%), respectively. Hospitals that performed greater than or equal to 40 pancreatic resections per year had higher odds of having significant Medicaid Gap (odds ratio 2.3, 95% confidence interval 1.1 to 5.0).

CONCLUSIONS: Gaps exist between the percentages of Medicaid patients receiving emergency general surgery vs more complex surgical care at the same hospital and may be exaggerated in hospitals with very high volume of complex elective surgeries.

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Expansion of Medicaid eligibility is one of the keystones of the Patient Protection and Affordable Care Act.[1] Medicaid expansion is designed to improve access to high-quality healthcare for the poorest of Americans, and

is estimated to bring over 16 million new enrollees to Medicaid.[2] Increasing Medicaid coverage, however, may not increase access to high quality health care. The mechanisms for decreased access to high quality health care among Medicaid enrollees are not completely characterized.

Questions of Medicaid access and patterns of care are particularly important to the surgical field. Although 81% of general surgeons are willing to accept new Medicaid

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patients, in some surgical specialties only 50% are willing to accept new Medicaid patients.[3] Across a number of surgical interventions, and in particular those complex interventions requiring specialized care, having Medicaid is associated with worse outcomes.[4–12] At least some of these differences in outcome have been attributed to decreased access to high-volume centers.[13–17] There is an assumption that access to emergency surgery is not an issue and that it is selective access to high volume, high-quality centers for elective, specialized services which drives this outcome disparity.

The differences between Medicaid access to emergency surgery and specialized surgery are further highlighted when looking at the geographic distributions of Medicaid enrollees and specialized surgical care. Most Medicaid enrollees tend to be in urban centers,[18] where also most of the highly specialized, high-volume hospitals tend to be.[19] It has been demonstrated that a disproportionately low number of Medicaid enrollees receive complex procedures at high-volume centers when compared with the number of Medicaid enrollees in the catchment area for these hospitals.[20–22] This would imply that there is selective access to specialized services within these hospitals.

To explore selective access within high-volume hospitals, we used the nationally representative data available in the Nationwide Inpatient Sample (NIS). We developed a metric called Medicaid Gap that directly compares the percentage of Medicaid primary patients in different surgical populations within high-volume hospitals. We chose pancreatic resections for our index complex surgical procedure. We chose appendectomies for our index emergency surgical procedure. A larger Medicaid Gap implies more selective access for Medicaid patients within each hospital. We explored the distribution of Medicaid Gap at high-volume hospitals across the country and identified those hospital characteristics associated with a large Medicaid Gap. Ultimately, we hope to provide another means to quantify and track selective access for Medicaid patients. To increase access to high quality care for even the most vulnerable Americans, metrics for equity and quality will have to be developed and rewarded.

Methods

We used the 1998 to 2010 NIS, part of the Healthcare Cost and Utilization Project from Agency for Healthcare Research and Quality. NIS is composed of all discharge records from a representative yearly 20% sample of all United States community hospitals.[23] NIS is the largest all-payer database that is publicly available in the United States. It includes a representative sample of short term, general, and specialty hospitals and is stratified and weighted with regard to hospital ownership, bed size, teaching status, urban and/or rural location, and the US region. We obtained information on inpatient procedure, patient primary insurance and hospital characteristics from NIS.

One hospital may be included in the 1998 to 2010 cycles of NIS for multiple years. In such scenarios, each year's data from the same hospital was treated as separate but correlated data points.

Discharge records of pancreatic resection and appendectomy were identified using International Classification of Diseases-9 procedure codes (pancreatic resection: 52.51 to 52.57, 52.6, 52.7; appendectomy: 47.0 to 47.19). A hospital was defined as a high-volume hospital if it performed over 10 pancreatic resections in a given year. Very high pancreatic volume was defined as a hospital performing over 40 pancreatic resections within that year.

Three populations were defined at each high-volume pancreatic center: those patients receiving pancreatic resections, those patients receiving appendectomies, and the general hospital population. All the three populations were limited to patients under 65 years old to decrease confounding from Medicare coverage. The percentage of patients with Medicaid as their primary insurance was calculated for each population.

Medicaid Gap was then defined as the percentage of Medicaid primary patients in the appendectomy population minus the percentage of Medicaid primary patients in the pancreatic resection population for each high-volume hospital. As a comparison, the Medicaid Gap between the appendectomy population and the general hospital population was also calculated. High Medicaid Gap was defined as those hospitals in the top decile for Medicaid Gap.

Pancreatic resection Medicaid Gap =
% Medicaid primary appendectomies −
% Medicaid primary pancreatic resections

General population Medicaid Gap =
% Medicaid primary appendectomies −
% Medicaid primary in adult hospital population under 65

To evaluate how Medicaid Gap varied by type of hospital, we built a multivariable logistic model with high Medicaid Gap status as the outcome. Given that multiple data points from the same hospital may be correlated, we adopted the generalized estimating equation (GEE) method to estimate regression coefficients. GEE is a type of population average model commonly used to analyze correlated data with binary outcome. We chose GEE over other correlated data methods because we were interested in estimating population-average differences between hospitals of different types. GEE also has the advantage of having no underlying assumption on data distribution and being robust to model specification. Because of the lack of diversity of the high-volume pancreatic resection hospitals, our regression model included only pancreatic resection volume and geographical area as predictors.

All analyses were performed using SAS 9.4 (Cary, NC). A sensitivity analysis was performed by combining multiple years' data from the same hospital to generate only one data point per hospital.