Early Impact of the Affordable Care Act Coverage Expansion on Safety-Net Hospital Inpatient Payer Mix and Market Shares

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Objective. To examine the impact of the Affordable Care Act's coverage expansion on safety-net hospitals (SNHs).

Study Setting. Nine Medicaid expansion states.

Study Design. Differences-in-differences (DID) models compare payer-specific pre-post changes in inpatient stays of adults aged 19–64 years at SNHs and non-SNHs.

Data Collection Methods. 2013–2014 Healthcare Cost and Utilization Project State Inpatient Databases.

Principal Findings. On average per quarter postexpansion, SNHs and non-SNHs experienced similar relative decreases in uninsured stays (DID = −2.2 percent, $p = .916$). Non-SNHs experienced a greater percentage increase in Medicaid stays than did SNHs (DID = 13.8 percent, $p = .041$). For SNHs, the average decrease in uninsured stays (−146) was similar to the increase in Medicaid stays (153); privately insured stays were stable. For non-SNHs, the decrease in uninsured (−63) plus privately insured (−33) stays was similar to the increase in Medicaid stays (105). SNHs and non-SNHs experienced a similar absolute increase in Medicaid, uninsured, and privately insured stays combined (DID = −16, $p = .162$).

Conclusions. Postexpansion, non-SNHs experienced a greater percentage increase in Medicaid stays than did SNHs, which may reflect patients choosing non-SNHs over SNHs or a crowd-out of private insurance. More research is needed to understand these trends.

Key Words. Community hospitals, safety-net hospitals, medically uninsured, state health policies, Medicaid expansion, utilization

The Affordable Care Act (ACA) instituted broad changes that may influence demand for services provided at safety-net hospitals (SNHs), including an extensive coverage expansion encouraging previously uninsured individuals

to enroll in state Medicaid programs or private plans offered via insurance exchange marketplaces. Beginning January 1, 2014, some states elected to expand Medicaid eligibility to include all individuals younger than 65 years with incomes up to 138 percent of the federal poverty level. As of November 2017, 33 states, including the District of Columbia, expanded Medicaid (Kaiser Family Foundation 2017a), and as of April of that year, monthly average enrollment in Medicaid and the Children's Health Insurance Program totaled 74.5 million individuals, compared with 56.8 million on average before the expansion (Kaiser Family Foundation 2017b). As of March 2016, marketplace enrollment totaled 11 million individuals (Kaiser Family Foundation 2016).

Expanding Medicaid eligibility has shifted the payer distribution at hospitals (Nikpay, Buchmueller, and Levy 2015), as some previously uninsured and privately insured individuals now have Medicaid. However, it is unclear whether SNHs and non-SNHs experienced similar changes in payer mix and whether SNHs' and non-SNHs' market shares shifted. Changes in hospital payer mix, along with ongoing challenges that hospitals face under health care reform, could affect SNH financing and ability to care for poor and underserved populations.

These challenges include expected reductions to Centers for Medicare & Medicaid Services (CMS) Disproportionate Share Hospital (DSH) payments (Kaiser Commission on Medicaid and the Uninsured 2013; Neuhausen et al. 2014). Value-based purchasing programs and electronic medical record meaningful-use criteria have also intensified financial stress (Gilman et al. 2014). In addition, the Medicaid expansion has led to some crowd-out of private insurance by Medicaid (Sommers, Kenney, and Epstein 2014; Carman, Eibner, and Paddock 2015). A shift from privately insured patients to those whose care is reimbursed at a lower rate also may affect the financial condition of hospitals. Finally, some patients who remained on private insurance have shifted to high-deductible health plans (American Hospital Association 2014). With increased patient cost sharing, hospitals may encounter more bad debts.

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Together, these factors could significantly affect financing and delivery of care at SNHs.

Changes in utilization and payer distribution at SNHs and non-SNHs should be monitored, giving the ongoing challenges that hospitals face under health care reform. The purpose of this study was to examine payer-specific utilization of inpatient care at SNHs shortly after Medicaid and private insurance marketplace expansions. Among states that implemented Medicaid expansions in 2014, we compared changes in hospital inpatient stays by payer at SNHs and at local non-SNHs.

Conceptual Framework

Changes in Medicaid inpatient stays within a hospital come from two pools: (1) previously uninsured and privately insured patients who used hospital services before and choose the same hospital after enrolling in Medicaid and (2) patients newly covered by Medicaid who sought hospital care before but switched hospitals and those new to the inpatient market. Regarding the first pool of patients, SNHs historically have treated more uninsured patients than non-SNHs (America's Essential Hospitals 2014). Presumably, compared with non-SNHs following Medicaid expansion, SNHs will have more patients whose insurance status shifted from uninsured to Medicaid. SNHs are more likely than non-SNHs to serve patients from low-income neighborhoods (Sutton et al. 2016), some of whom have private insurance and now qualify for Medicaid under the expanded income limits. Thus, compared with non-SNHs, SNHs also may see more patients whose coverage has shifted from private insurance to Medicaid.

Hospitals also may experience new utilization by patients who switch hospitals and by those who enter the market. Gaining insurance coverage generally expands demand for services (Anderson, Dobkin, and Gross 2012), although many Medicaid managed care plans have a limited network of providers (Mershon 2016). Transitioning from a high-deductible private plan to Medicaid, which covers all costs, may have the same effect. If non-SNH location and quality are more attractive, previously uninsured and some previously privately insured patients who gained Medicaid coverage may choose non-SNHs postexpansion. A shift from SNHs to non-SNHs was observed following past insurance coverage expansions (Gaskin, Hadley, and Freeman 2001; Lasser et al. 2016). As a result, SNHs may see a reduction in uninsured and privately insured inpatient stays, but no corresponding increase in Medicaid stays. In contrast, non-SNHs may enjoy a net gain in total Medicaid,

uninsured, and privately insured stays combined, coming from previous SNH customers and those who are new to hospitals.

Although SNHs will likely welcome newly covered Medicaid patients, it is less clear that non-SNHs will embrace them because of low Medicaid reimbursement rates, which typically fall below treatment costs (Callison and Nguyen 2018). On the other hand, several factors may prompt non-SNHs to attract Medicaid patients. First, the majority of hospital costs are fixed and do not vary by patient volume (Rauh et al. 2011). Medicaid payments are below average total costs but generally cover more than half of the marginal costs of care (Cunningham et al. 2016). Thus, Medicaid payments should cover the marginal costs of care associated with absorbing more Medicaid patients and contribute to fixed costs. Medicaid admissions can increase hospital profitability after considering both base and supplemental CMS payments (Stensland, Gaumer, and Miller 2016), although the extent to which hospitals benefit financially from the Medicaid expansion likely varies across hospitals and according to state decisions related to Medicaid reimbursement rates and cuts to supplemental payments (Cunningham et al. 2016).

Second, the fact that greatest growth in managed care organizations (MCOs) has occurred in Medicaid expansion states suggests that the majority of new enrollees are covered under Medicaid MCOs, which are contractually obligated to establish a network of providers for Medicaid patients (Paradise 2017). It is unclear how Medicaid MCOs, which may have narrow provider networks (Mershon 2016), are distributed across SNHs and non-SNHs. Historically, growth in Medicaid managed care has resulted in fewer patients being treated at SNHs (Siegel 1996; Gaskin 1999) and greater competition for low-risk Medicaid patients with fewer medical concerns (Gaskin, Hadley, and Freeman 2001).

Finally, recent trends among privately insured patients may affect hospital decisions related to Medicaid patients. Coinsurance and deductibles have increased among patients with employer-sponsored coverage and those insured through health insurance marketplaces (Kaiser Family Foundation 2008, 2013a; Armour 2013; American Hospital Association 2014; Office of the Assistant Secretary for Planning and Evaluation 2014), which may increase the rate at which hospitals encounter bad debt. Because patients are increasingly sensitive to higher out-of-pocket costs, inpatient stays, particularly for discretionary procedures, may decrease (Felland et al. 2010). Patients also may seek care in hospitals with lower prices or in lower-cost settings (Mehrotra and Lave 2012; American Hospital Association 2014). As the demand for services by privately insured patients decreases and bad debt among those

who do seek services increases, strategic decisions that non-SNHs make with respect to payer mix may change.

Specific Aims

We compared changes in inpatient stays from 2013 through 2014 among adults aged 19–64 years at SNHs with local non-SNH competitors in states that implemented the Medicaid expansion in January 2014. We focused on three specific aims and hypotheses.

Specific Aim 1. We aimed to compare the average effect of the insurance coverage expansions on Medicaid, uninsured, and privately insured inpatient volume in SNHs and non-SNHs. Because the baseline number of stays by payer differed between SNHs and non-SNHs, we examined the pre- and post-ACA percentage changes in the number of inpatient stays at SNHs and non-SNHs.

Hypothesis 1: SNHs serve more low-income patients who previously were uninsured or had private insurance and now may qualify for Medicaid. Conversely, non-SNHs may serve more high-income uninsured patients who do not qualify for the Medicaid expansion and remain either uninsured or purchase subsidized private plans post-ACA. Thus, we hypothesized that SNHs may experience higher percentage decreases in uninsured and privately insured stays and higher percentage increases in Medicaid stays, compared with non-SNHs.

Specific Aim 2. We aimed to understand the extent to which decreases in the number of uninsured and privately insured inpatient stays were offset by increases in Medicaid inpatient stays at SNHs, as compared with non-SNHs. Increases in Medicaid stays that more than offset decreases in uninsured and privately insured stays, either at SNHs or non-SNHs, may suggest new utilization by patients who switched hospitals or by those who are new to the market, as well as an increase in the demand for services by existing patients who previously had private insurance but now have Medicaid and thus lower out-of-pocket costs. Conversely, a net loss may suggest movement of patients from one hospital to another or decreased utilization, such as that associated with greater patient cost sharing. If the increase in Medicaid stays is offset by the decrease in uninsured and privately insured stays, that may suggest a shift in insurance status among existing patients who have remained as customers of

the same hospitals. However, each scenario could mask competing trends.

Hypothesis 2: Individuals who previously had no insurance or had private insurance with high deductibles who now have Medicaid may be poor and more likely to reside closer to SNHs than to non-SNHs; as a result of their new coverage, they may increase their demand for services at SNHs. Thus, we hypothesized that increases in Medicaid stays will offset decreases in uninsured and privately insured stays to a greater extent at SNHs than at non-SNHs.

Specific Aim 3. As payer distribution changes at hospitals, so may hospitals' share of Medicaid, uninsured, and privately insured patients in the market. Our final aim was to examine changes in SNHs' and non-SNHs' market share of inpatient stays by payer.

Hypothesis 3: Consistent with hypotheses 1 and 2, we hypothesized that market share of Medicaid stays will increase more for SNHs and that privately insured stays will increase more for non-SNHs.

METHODS

Data Sources

We used data from the 2012–2014 Healthcare Cost and Utilization Project State Inpatient Databases (SID). The SID comprise all-payer, encounter-level data for all inpatient discharges from nearly all hospitals in a given state. We used 2012 data to identify eligible SNHs and non-SNHs and used the 2013–2014 data to measure preexpansion (2013) and postexpansion (2014) outcomes. We drew information on hospital characteristics from the American Hospital Association Annual Hospital Survey.

Study Sample

We selected nine Medicaid expansion states for which quarterly data were available for 2014 (Arizona, California, Colorado, Iowa, Kentucky, Michigan, Minnesota, New Jersey, and New York). We included nonrehabilitation, general, acute-care community (i.e., nonfederal) hospitals that contributed data each year from 2012 through 2014. We excluded hospitals with <25 beds, hospitals in rural areas, and hospitals with no competitors.

We defined competitors as nonrural hospitals with ≥ 25 beds within a 15-mile radius. As was done in previous studies (Garnick et al. 1987; Robinson and Luft 1987; Gresenz, Rogowski, and Escarce 2004; Wong, Zhan, and Mutter 2005), we used a 15-mile radius to define a hospital's local market because patients tend not to travel far for hospital services (Tay 2003). We excluded hospitals with no competitors in their market because changes in market share are not relevant for monopolists. We also excluded non-SNHs with no SNHs in their market because non-SNHs located far from a SNH and those located near SNHs are likely to have different characteristics. This type of close rival analysis is similar to other studies (Lindrooth, Lo Sasso, and Bazzoli 2003; Dafny 2005; Wu 2008) that found proximity to be an important determinant of hospital decisions. Therefore, a non-SNH located near an SNH is a potential competitor, regardless of the types of services they provide or the types of patients they serve. In addition, SNHs and non-SNHs often operate in different markets—in terms of the types of payer populations they serve, the services they provide, and geographic location. Therefore, narrowing the study sample to nearby hospitals increases the comparability of each SNH with its non-SNH peers.

SNH Definition

We used 2012 data to determine safety-net status using a definition consistent with the Institute of Medicine and a prior study (Reiter, Jiang, and Wang 2014). We assigned a payer to each record, using a hierarchy based on expected primary, secondary, and tertiary payers: If Medicare was listed on any payer, the stay was assigned to Medicare, followed by Medicaid, and private insurance; then we considered the stay uninsured if the primary expected payer was self-pay or no charge; we grouped all other stays as “other” payers. We recategorized certain codes from the other payer category, such as indigent care programs and the Indian Health Service, as uninsured (Barrett et al. 2014a,b). Next, we sorted all nonrehabilitation, general, acute-care community hospitals by the percentage of Medicaid and uninsured stays among patients of all ages, with SNHs representing those within each state's top quartile.

Outcome Variables

We examined the number of inpatient stays using 2013–2014 discharge data for adults aged 19–64 years by expected payer (Medicaid, private, and

uninsured). We did not examine Medicare and other payers because Medicare and smaller payers are less likely to be affected by the Medicaid expansion and health insurance marketplaces and because several major Medicare policy changes in 2014 would affect the outcomes.

To measure market share, we defined hospital markets using a fixed-radius approach consistent with our definition of SNHs and their local non-SNH competitors. We calculated each hospital's market share as the percentage of inpatient stays for that hospital (numerator) out of all inpatient stays in its market, defined as stays at hospitals within a 15-mile radius (denominator). Hospitals within the 15-mile radius included all nonrehabilitation, general, acute-care community hospitals, before omitting ineligible hospitals from the final sample. Thus, small hospitals (<25 beds) were included in the market share calculations but were excluded from the final cohort.

Statistical Method

We used a differences-in-differences (DID) model to compare pre- and post-ACA change in the dependent variables between SNH and non-SNHs:

$$Y_{it} = \beta_1 \text{SNH}_i + \beta_2 \text{Post}_t + \beta_3 \text{SNH}_i * \text{Post}_t + \text{Hospital FE}_i \\ + \text{Quarter FE}_t + \text{SNH}_i * \text{State}_s * \text{Time}_t + \varepsilon_{it}$$

Because both SNHs and non-SNHs were exposed to insurance coverage expansions, our approach differs from a traditional DID approach that compares pre- and postchanges between one group exposed to an intervention and a control group. Nevertheless, the main effect of interest is estimated by the interaction term of two indicator variables (SNH status and postexpansion period) and can be interpreted the same way as in a traditional DID model. β_3 indicates change in pre- and postexpansion volume and market share at SNHs in the dependent variable relative to those at their non-SNH peers. Hospital fixed effects (Hospital FE_i) control for time-invariant observed and unobserved differences between hospitals. Because the value of SNH_i is fixed over time, it is perfectly collinear with hospital fixed effects (FEs) and thus drops out of the estimation model. This does not affect our estimation, because the differences between SNHs and non-SNHs are absorbed into hospital FEs. Quarter FEs (Quarter FE_t) control for period-specific shocks that affect all hospitals equally in each quarter of 2013 and 2014. Finally, the $\text{SNH}_i * \text{State}_s * \text{Time}_t$ terms accommodate linear pre-ACA trends that may differ across SNH status within states. By including hospital and time FEs, the model effectively removes time-constant between-hospital variations in

outcomes and uses hospital-specific changes per quarter over time (within-hospital variation) to model an average impact differential between SNHs and non-SNHs following the ACA coverage expansions. We present models with and without a log transformation of the outcomes, which respectively estimate the average pre-post *percentage changes* and *absolute differences* in the outcomes between SNHs and non-SNHs.

RESULTS

Sample Characteristics

We identified 1,311 nonrehabilitation, general, acute-care community hospitals in the nine Medicaid expansion states in 2012. We excluded 304 hospitals that had <25 beds or were in rural areas, 368 hospitals with no competitors, and 83 hospitals with no stays in 2013 or 2014. The final study sample included 189 SNHs and 367 non-SNHs. There were fewer differences between SNHs and non-SNHs after exclusion criteria were applied (Table 1).

Descriptive Trends

Figure 1 and Table 2 present trends in the volume and market share of inpatient stays among adults aged 19–64 years from 2013 to 2014. We used average quarterly changes from the preperiod (2013) to extrapolate projected trends in the postperiod and compared these with observed trends. Figure 1a presents the average number of inpatient stays by payer through Q4 2014 for SNHs and non-SNHs and highlights two important developments. First, there appeared to be no major changes prior to the Medicaid expansion. Second, trends began to diverge after Q4 2013. In 2014 for both SNHs and non-SNHs, the number of stays began to grow for Medicaid but decline for uninsured patients much more than was projected, whereas privately insured stays generally were below the hypothetical projected trend.

Figure 1b presents trends in average market share of Medicaid and uninsured inpatient stays across hospitals. In 2013, Medicaid and uninsured shares declined for SNHs and grew for non-SNHs, whereas market share of privately insured stays declined for non-SNHs and grew for SNHs. In 2014, these trends continued. Hospitals' market share of Medicaid stays continued to decline for SNHs and increase for non-SNHs, as projected. Trends in shares of uninsured and privately insured stays were slightly below the projected trend for SNHs and above the projected trend for non-SNHs.

Table 1: Institutional and Market Characteristics of SNHs and Non-SNHs in Nine States Implementing the Medicaid Expansion in 2014

<i>Characteristic</i>	<i>Total Community Nonrehabilitation, General Acute-Care Hospitals</i>			<i>Included in Study*</i>		
	<i>SNHs (N = 332)</i>	<i>Non-SNHs (N = 979)</i>	<i>p</i>	<i>SNHs (N = 189)</i>	<i>Non-SNHs (N = 367)</i>	<i>p</i>
Teaching status, %						
Major teaching hospital	13.9	7.1	<.001	19.0	13.6	.013
Other teaching hospital	59.7	76.8		45.0	58.0	
Nonteaching hospital	26.4	16.2		36.0	28.3	
Bed size, %						
<100	33.0	42.9	.001	11.6	10.4	.575
100–299	35.2	35.4		43.4	49.6	
300–499	20.3	14.1		28.6	24.8	
500+	11.5	7.6		16.4	15.3	
System affiliation, %	60.6	61.7	.729	58.2	74.3	<.001
Ownership, %						
Public	21.5	17.8	.004	25.4	4.6	<.001
Private, nonprofit	65.5	74.1		57.1	82.8	
For profit	13.0	8.1		17.5	12.6	
Hospital region, %						
Northeast	23.2	23.1	.999	31.2	27.0	.392
Midwest	29.8	29.7		17.5	15.3	
South	11.1	10.9		5.3	4.1	
West	35.8	36.3		46.0	53.7	
Location, %						
Large metropolitan	48.8	42.3	.035	68.3	73.8	.010
Small/medium metropolitan	20.0	23.2		23.8	23.7	
Micropolitan	14.8	12.3		7.9	2.5	
Rural	16.4	22.1		N/A*	N/A*	
In early Medicaid expansion state, %	48.8	49.0	.941	51.9	60.8	.044
Total competing hospitals, mean <i>N</i> *	12.0	6.7	<.001	19.4	14.6	.003
Competing SNHs, mean <i>N</i> *	5.1	2.3	<.001	8.5	5.6	.001
Competing non-SNHs, mean <i>N</i> *	6.6	4.4	<.001	10.9	9.1	.018

Notes. Data on all nonrehabilitation, general, acute-care community hospitals, and the subset of eligible hospitals included in this study came from the 2013–2014 Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) for nine states: AZ, CA, CO, IA, KY, MI, MN, NJ, and NY.

*Hospitals included in the study were those in nonrural areas with 25+ beds and competitors (defined as nonrural hospitals with 25+ beds within a 15-mile radius); non-SNHs were counted as having no competitors and excluded if no SNHs were located within 15 miles.

N/A, not applicable; SNH, safety-net hospital.

Table 2 presents payer-specific changes in the number of inpatient stays and market share in the pre- and post-ACA periods by SNH status. This information is based on the same data displayed in Figures 1a,b. There are several additional observations of note. First, there was a significant scale difference between SNHs and their local non-SNH peers in volume by payer. On average, SNHs had 1,167 Medicaid and uninsured stays combined in the preperiod, whereas non-SNHs had less than half that volume (522). In contrast, private volume at SNHs was less than half of that at non-SNHs (409 and 908, respectively).

Also, the number of uninsured stays declined by about half for both SNHs and non-SNHs. However, the decline was faster among SNHs (55.1 percent decrease) than among their local non-SNH peers (46.7 percent decrease), substantially reducing the difference in uninsured stays between the two hospital types by the end of 2014. In addition, the relative change in Medicaid stays was smaller for SNHs (17.0 percent) than for non-SNHs (27.1 percent). All these changes were statistically significant ($p < .001$). Privately insured stays remained stable for SNHs and decreased for non-SNHs (by 3.6 percent, $p < .001$), but they were slightly below the projected trend for both SNHs and non-SNHs (expected increase of 1.7 percent for SNHs and expected decrease of 1.1 percent for non-SNHs).

Finally, we comment on absolute changes in Medicaid stays relative to the other payers. For SNHs, the average quarterly decrease in uninsured stays (−146; $p < .001$) was offset by a similar increase in Medicaid stays (153; $p < .001$), with no change in privately insured stays. In contrast, for non-SNHs the decrease in uninsured stays (−63; $p < .001$) was more than offset by an increase in 105 Medicaid discharges ($p < .001$). However, the decrease in uninsured (−63) and privately insured (−33) stays combined for non-SNHs (−96) was offset by a similar increase in Medicaid stays (105). For SNHs, the observed net change in the total number of Medicaid, uninsured, and privately insured stays combined (7) was slightly fewer than the projected net change (12), but the observed and projected net changes were equal for non-SNHs (8).

Regression Results

Table 3 presents the DID regression results, which account for the hospital fixed effects and accommodate secular pre-ACA trends within SNH status and states. With respect to the average effect of the insurance coverage

expansions, the pre- and post percentage increase in Medicaid stays was greater for non-SNHs than for SNHs (13.8 percent; $p = .041$). Although the percentage decrease in uninsured stays was slightly greater for SNHs than for non-SNHs in the descriptive results, the model suggests that SNHs and non-SNHs had similar percentage decreases in uninsured stays (−2.2 percent; $p = .916$). The negative DID estimate for privately insured stays suggests that SNHs were further below trend than non-SNHs (−5.5 percent; $p = .069$).

With respect to absolute changes, on average SNHs gained 52 ($p = .015$) more Medicaid inpatient stays than non-SNHs per quarter in the postperiod and SNHs lost more uninsured stays than non-SNHs (−74; $p = .001$). Absolute changes in privately insured stays were similar across the hospital types (8; $p = .251$). Considering Medicaid, uninsured, and privately insured stays combined, non-SNHs gained 16 more stays than SNHs per quarter in the postperiod ($p = .162$).

The negative DID estimates across the board indicate that overall market shares of Medicaid, uninsured, and privately insured stays shifted toward non-SNHs. Because of the scale differences between SNHs and non-SNHs in market share during the preperiod, we comment on pre- and post percent changes, although none of these DID estimates reached statistical significance at $p < .05$. The difference between the SNH decrease and non-SNH increase in Medicaid and uninsured market shares amounted to −6.8 percent ($p = .073$) per quarter for Medicaid stays and −6.7 percent ($p = .632$) per quarter for uninsured stays. Pre-ACA, SNHs were gaining and non-SNHs were losing privately insured market share. This trend slowed after the ACA, as reflected in the negative DID estimate comparing pre- and post percent changes in market share of privately insured stays between SNHs and non-SNHs (−3.6 percent; $p = .123$).

Figure 1: (a) Changes in Inpatient Volume among Adults Aged 19–64 Years for SNHs and Non-SNHs, 2013–2014. (b) Changes in Market Share of Inpatient Stays among Adults Aged 19–64 Years for SNHs and Non-SNHs by Payer, 2013–2014. [Color figure can be viewed at wileyonlinelibrary.com]

Notes. Data came from the 2013–2014 Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) for nine states: AZ, CA, CO, IA, KY, MI, MN, NJ, and NY. Dashed line signifies the projected trend extrapolated from average quarterly percent changes during the preperiod. Q1-13, first quarter, 2013; Q2-13, second quarter, 2013; Q3-13, third quarter, 2013; Q4-13, fourth quarter, 2013; Q1-14, first quarter, 2014; Q2-14, second quarter, 2014; Q3-14, third quarter, 2014; Q4-14, fourth quarter, 2014; SNH, safety-net hospital.

Figure 1: Continued

Table 2: Changes in Quarterly Inpatient Volume and Market Share of Inpatient Stays among Adults 19–64 Years for SNHs and Non-SNHs Pre- and Postexpansion

Variable	Observed				Projected			
	Mean, Pre-ACA	Mean, Post-ACA	Absolute Change	% Change	p*	Mean, Post-ACA	Absolute Change	% Change
Inpatient stays, N								
SNHs								
Medicaid	902	1,055	153	17.0	<.001	883	–19	–2.1
Uninsured	265	119	–146	–55.1	<.001	290	25	9.4
Private	409	409	0	0	.892	416	7	1.7
Medicaid, uninsured, and private combined	1,576	1,583	7	0.4	.519	1,588	12	0.8
Non-SNHs								
Medicaid	387	492	105	27.1	<.001	401	14	3.6
Uninsured	135	72	–63	–46.7	<.001	140	5	3.7
Private	908	875	–33	–3.6	<.001	898	–10	–1.1
Medicaid, uninsured, and private combined	1,431	1,439	8	0.6	.269	1,439	8	0.6
Market share, %								
SNHs								
Medicaid	21.7	21.1	–0.6	–2.8	.019	21.0	–0.7	–3.2
Uninsured	19.9	18.0	–1.9	–9.5	.002	19.0	–0.9	–4.5
Private	14.2	14.3	0.1	0.7	.737	14.7	0.5	3.5
Non-SNHs								
Medicaid	10.4	10.8	0.4	3.8	.003	10.8	0.4	3.8
Uninsured	11.5	12.4	0.9	7.8	.003	11.9	0.4	3.5
Private	14.9	14.9	0.0	0.0	.519	14.6	–0.3	–2.0

Notes: Data came from the 2013–2014 Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) for nine states: AZ, CA, CO, IA, KY, MI, MN, NJ, and NY. Projected trend was extrapolated from the average quarterly change in the pre-ACA period.

ACA, Affordable Care Act; SNH, safety-net hospital.

DISCUSSION

For SNHs and non-SNHs, Medicaid expansion brings in new revenue, because hospital stays by newly covered individuals are now paid by Medicaid instead of relying on charity care or other subsidies for uncompensated care. From 2013 to 2014, the number of uninsured individuals in the population decreased by 27 percent across the nine states included in this study (Kaiser Family Foundation 2013b). We found that on average uninsured inpatient stays decreased by 55 percent for SNHs and 47 percent for non-SNHs. After accounting for hospital fixed effects and pre-ACA trends, the results of our regression models suggest that the pre- and postpercentage decrease in uninsured stays was similar across the two types of hospitals (differing by only 2.2 percent across SNH vs. non-SNH; $p = .916$).

At the same time, the pre- and postpercentage increase in Medicaid stays was 13.8 percent larger for non-SNHs than for SNHs ($p = .041$). Similarly, non-SNHs experienced a percentage increase and SNHs a percentage decrease in the market share of Medicaid stays ($p = .073$). One possible explanation for these results is that new or existing patients chose non-SNHs over SNHs. However, non-SNHs experienced a net increase of only 16 more Medicaid, uninsured, and privately insured inpatient stays combined per quarter during the postperiod than SNHs ($p = .162$), which does not support the notion that many patients have chosen non-SNHs over SNHs. Another possible explanation is that a crowd-out of private insurance contributed to faster growth in Medicaid stays at non-SNHs than SNHs. We did not track patients over time to detect individual-level changes in insurance coverage or choice of hospital. However, our analysis of absolute changes in Medicaid inpatient stays relative to other payers may shed light on these trends.

We found that there were 33 fewer privately insured stays and 63 fewer uninsured stays per quarter at non-SNHs postexpansion. If we were to assume that all 33 privately insured stays converted to Medicaid, these stays would constitute 31 percent of the additional 105 Medicaid stays at non-SNHs, which is consistent with the size of a crowd-out cited by Sommers, Kenney, and Epstein (2014), who estimate crowd-out effects on the order of 30 to 40 percent in some states. More conservatively, Carman, Eibner, and Paddock (2015) found that of an estimated 12.6 million persons who gained Medicaid coverage between 2013 and 2015, only an estimated 1.2 million—10 percent—had employer-sponsored or nongroup private insurance coverage pre-ACA.

Table 3: Regression Results Testing Differential Trends in Quarterly Inpatient Volume and Market Share between SNHs and Non-SNHs from Pre- to Postexpansion

Variable	Difference in Pre- and Postexpansion Change between SNHs and non-SNHs			
	Absolute Change	<i>p</i>	% Change	<i>p</i>
Inpatient stays, <i>N</i>				
Medicaid	52	.015	−0.138	.041
Uninsured	−74	.001	−0.022	.916
Private	8	.251	−0.055	.069
Medicaid, uninsured and private combined	−16	.162	−0.013	.264
Market shares, %				
Medicaid	−0.4	.157	−0.068	.073
Uninsured	−1.5	.020	−0.067	.632
Private	−0.6	.029	−0.036	.123

Notes. Data came from the 2013–2014 Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) for nine states: AZ, CA, CO, IA, KY, MI, MN, NJ, and NY. Percent change is on a scale of 0 to 1. Percentage points are on a scale of 0 to 100. SNH, safety-net hospital.

Assuming a crowd-out rate of 10 percent and that all previously uninsured stays at non-SNHs converted to Medicaid, the additional 105 Medicaid stays at non-SNHs could be explained by a shift in coverage for 74 existing patients—63 who were previously uninsured and 11 who were privately insured (e.g., 10 percent of 105). This leaves open the possibility that of the 105 additional Medicaid stays at non-SNHs per quarter postexpansion, up to 31 may represent new stays, which could represent patients who are totally new to the health care system, patients who switched from SNHs to non-SNHs, or existing patients who increased their rate of utilization.

In addition, factors other than a crowd-out may influence the degree to which privately insured stays are below the projected trend postexpansion. Greater cost sharing may increase the rate at which patients who were privately insured both before and after the ACA avoid inpatient care (American Hospital Association 2014). Although some previously uninsured individuals now have private plans purchased through health insurance marketplaces, most selections are silver plans with high deductibles, which also may reduce the rate at which individuals seek inpatient care (American Hospital Association 2014; Office of the Assistant Secretary for Planning and Evaluation 2014). Our regression models suggest that privately insured stays at SNHs were further below trend than at non-SNHs, by 5.5 percent ($p = .069$). More research

is needed to understand how these aggregate results reflect a crowd-out of private insurance by Medicaid, a decrease in utilization associated with greater patient cost sharing, and a shift from being uninsured to privately insured—all of which may be occurring disproportionately across SNHs and non-SNHs.

Our findings have two main implications. In these nine states postexpansion, both SNHs and non-SNHs maintained a similar volume of Medicaid, uninsured, and privately insured inpatient stays combined among the adult population aged 19–64 years targeted by the coverage expansions. However, SNHs should be monitored further to establish how slower growth in Medicaid inpatient volume affects them financially. Although it may allow them to focus on attracting other higher-paying customers, we also found that privately insured stays were further below trend for SNHs than for non-SNHs. In addition, we did not account for the underlying risk or severity of the patient population. Previous research found that, with the growth of Medicaid managed care, healthier patients left SNHs to seek care at non-SNHs (Gaskin, Hadley, and Freeman 2001). Non-SNHs could be gaining healthier Medicaid patients while those who are sicker or disabled remain at SNHs.

Second, our findings among non-SNHs are consistent with a crowd-out of private insurance, which could negatively affect hospital margins. Future research is needed to understand the extent of the crowd-out in inpatient and other hospital settings, whether the crowd-out has affected SNHs and non-SNHs differently, and implications for hospital finances. A recent study estimated that hospitals receive reimbursement for privately insured patients that is 1.5 times higher than that for Medicaid patients. However, the authors concluded that a very high crowd-out (70 percent) would be required to reduce inpatient revenue (Nikpay et al. 2016).

This study has several limitations. First, we examined average trends across hospitals and could not discern movement of patients from one type of hospital to another hospital. In addition, we used expected payer at the time of discharge, which may differ from final payer. Uninsured stays may have been converted to payment later, and hospitals play important roles in enrolling patients in Medicaid and other programs. Furthermore, most new Medicaid enrollees are in managed care plans with narrow networks (Mershon 2016). However, the potential impact of narrow networks on the utilization of SNHs versus non-SNHs is unknown, because each Medicaid managed care plan's network is specific to the plan and such information is not publicly available. Finally, we used a practical approach to define SNHs that was consistent with prior literature and the Institute of Medicine, but it is unknown whether this

definition accurately reflects the role that hospitals play in their state and local market. Other SNH definitions also have limitations—uncompensated care includes Medicaid shortfalls and care provided to the uninsured but also includes bad debt from patients with private insurance; the DSH index is based on care provided to patients with Medicaid only and excludes uninsured patients.

In conclusion, the ACA has the potential to change the landscape of hospital competition. Previously, SNHs traditionally served patients with Medicaid or no insurance, non-SNHs tended to serve more patients with private insurance, and teaching hospitals typically served more complex and higher-risk patients. Although our results show only early effects for nine states from 2014, they demonstrate new and important trends. Non-SNHs experienced greater percentage increases in Medicaid stays and fared better in maintaining privately insured inpatient volume. These trends could have important implications for SNH financing. Future research is needed to monitor local market dynamics facing SNHs.

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Appendix SA1: Author Matrix.