Health Care Reform, Length of Stay, and Readmissions for Child Mental Health Hospitalizations

Sarah K. Connell, MD, MSPH,a,b Lori E. Rutman, MD, MPH,a,c Kathryn B. Whitlock, MS,l Miriam J. Haviland, PhD,a Shannon Simmons, MD, MPH,a,b Kelly Schloredt, PhD, ABPP,d Jessica Ramos, BS,l Kathy Brewer, MSc, LMHC,d Marie Augustine, MSc,d K. Casey Lion, MD, MPHa,b

ABSTRACT

BACKGROUND: Health care reform may impact inpatient mental health services by increasing access and changing insurer incentives. We examined whether implementation of the 2014 Affordable Care Act (ACA) was associated with changes in psychiatric length of stay (LOS) and 30-day readmissions for pediatric patients.

METHODS: We conducted an interrupted time-series analysis to evaluate LOS and 30-day readmissions during the 30 months before and 24 months after ACA implementation, with a 6-month wash-out period, on patients aged 4 to 17 years who were discharged from the psychiatry unit of a children’s hospital. Differences by payer (Medicaid versus non-Medicaid) were examined in moderated interrupted time series. Logistic regression was used to examine the association between psychiatric LOS and 30-day readmissions.

RESULTS: There were 1874 encounters in the pre-ACA period and 2186 encounters in the post-ACA period. Compared with pre-ACA implementation, post-ACA implementation was associated with LOS that was significantly decreasing over time (pre-ACA versus post-ACA slope difference: −0.10 days per encounter per month [95% confidence interval (CI) −0.17 to −0.02]; P = .01), especially for Medicaid-insured patients (pre-ACA versus post-ACA slope difference: −0.14 days per encounter per month [95% CI −0.26 to −0.01]; P = .03). The overall proportion of 30-day readmissions increased significantly (pre-ACA 6%, post-ACA 10%; P < .05 for the difference). We found no association between LOS and 30-day readmissions.

CONCLUSIONS: ACA implementation was associated with a decline in psychiatric inpatient LOS over time, especially for those on Medicaid, and an increase in 30-day readmissions. LOS was not associated with 30-day inpatient readmissions. Further investigation to understand the drivers of these patterns is warranted.
The prevalence of mental health conditions is rising among children and adolescents.12 These conditions are frequent and expensive reasons for youth hospitalization.3 Inpatient treatment of mental health conditions in children and adolescents is associated with considerable health gain.4 However, average length of stay (LOS) for inpatient mental health conditions has been decreasing for decades. The Affordable Care Act (ACA) Medicaid expansion has been associated with increased receipt of general pediatric care,5 but its impact on mental health services is less well characterized.6 In 2014, Medicaid expansion, the marketplace exchange, and mandated essential minimal coverage, which included mental and behavioral health, all aimed to increase access; however, these changes may also have motivated insurers to find other ways to reduce costs, such as by limiting inpatient psychiatric LOS.6,7

Patients with short LOS are likely to be at risk of subsequent negative outcomes after discharge.8 One negative outcome is readmission because it may reflect the inadequacy of the care that the patient received during the index admission. Post-ACA, hospitals are experiencing increased pressure to understand why readmissions occur. Studies of patients with mental health conditions have demonstrated conflicting associations between LOS and readmissions; in no previous study has this relationship as it relates to the rollout of the 2014 ACA provisions been examined.8–13

Our primary objectives were to evaluate changes over time, before and after ACA implementation, in LOS and 30-day readmissions for psychiatric patients admitted for mental health conditions, overall and by insurance type. Given concerns that decreasing LOS could result in increased readmissions, which have implications for care efficiency and quality measurement,14 we also explored the relationship between psychiatric LOS and 30-day emergency department (ED) return visits and inpatient readmissions.

Specifically, our secondary objective was to determine if LOS was associated with 30-day ED return visits or inpatient readmissions and to evaluate if these associations were modified by disease severity, diagnosis, insurance type, or time period. Our study was conducted at a single institution given its potential to provide further examination of the contextual (local) factors in a subsequent study.

### METHODS

#### Data and Sample

We conducted a retrospective study of patients discharged from the inpatient psychiatric unit at a tertiary care, university-affiliated, 403-bed children’s hospital with a dedicated pediatric ED in the northwestern United States. As of 2019, there were 41 psychiatric unit beds available.

#### TABLE 1 Descriptive Statistics by Encounter (N = 4398)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-ACA (30 mo), n = 1874</th>
<th>Implementation (6 mo), n = 338</th>
<th>Post-ACA (24 mo), n = 2188</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at first discharge, median (IQR), y</td>
<td>15.0 (12.0–18.0)</td>
<td>14.0 (13.0–16.0)</td>
<td>15.0 (13.0–16.0)</td>
<td>.002*</td>
</tr>
<tr>
<td>Female sex, n (%)</td>
<td>964 (51.4)</td>
<td>187 (55.3)</td>
<td>1194 (54.6)</td>
<td>.1</td>
</tr>
<tr>
<td>Race and/or ethnicity, n (%)6</td>
<td>White</td>
<td>1193 (63.7)</td>
<td>190 (56.2)</td>
<td>1316 (60.2)</td>
</tr>
<tr>
<td></td>
<td>African American</td>
<td>125 (6.7)</td>
<td>31 (9.2)</td>
<td>171 (7.8)</td>
</tr>
<tr>
<td></td>
<td>Hispanic</td>
<td>178 (9.5)</td>
<td>33 (9.8)</td>
<td>253 (11.6)</td>
</tr>
<tr>
<td></td>
<td>Asian American</td>
<td>82 (4.4)</td>
<td>14 (4.1)</td>
<td>75 (3.4)</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>296 (15.8)</td>
<td>70 (20.7)</td>
<td>371 (17.0)</td>
</tr>
<tr>
<td>Language, n (%)</td>
<td>English</td>
<td>1792 (95.6)</td>
<td>320 (94.7)</td>
<td>2094 (95.8)</td>
</tr>
<tr>
<td></td>
<td>Spanish</td>
<td>34 (1.8)</td>
<td>6 (1.8)</td>
<td>49 (2.2)</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>48 (2.6)</td>
<td>12 (3.6)</td>
<td>43 (2.0)</td>
</tr>
<tr>
<td>Payer, n (%)</td>
<td>Medicaid</td>
<td>625 (33.3)</td>
<td>139 (41.1)</td>
<td>932 (42.6)</td>
</tr>
<tr>
<td></td>
<td>Private, contracted</td>
<td>899 (48.0)</td>
<td>141 (41.7)</td>
<td>946 (43.3)</td>
</tr>
<tr>
<td></td>
<td>Private, not contracted</td>
<td>215 (11.5)</td>
<td>46 (13.6)</td>
<td>214 (9.8)</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>135 (7.2)</td>
<td>12 (3.6)</td>
<td>94 (4.3)</td>
</tr>
<tr>
<td>Primary diagnosis, n (%)</td>
<td>Depressive disorder</td>
<td>814 (43.4)</td>
<td>168 (48.7)</td>
<td>1059 (48.4)</td>
</tr>
<tr>
<td></td>
<td>Disruptive disorder</td>
<td>539 (28.8)</td>
<td>78 (23.1)</td>
<td>533 (24.4)</td>
</tr>
<tr>
<td></td>
<td>Other psychiatric diagnoses</td>
<td>521 (27.8)</td>
<td>92 (27.2)</td>
<td>594 (27.2)</td>
</tr>
<tr>
<td>Complexity, n (%)</td>
<td>Medical comorbidity6</td>
<td>937 (50.0)</td>
<td>176 (52.1)</td>
<td>1004 (45.9)</td>
</tr>
<tr>
<td></td>
<td>Discharged on antipsychotic6</td>
<td>482 (25.7)</td>
<td>77 (22.8)</td>
<td>639 (29.2)</td>
</tr>
<tr>
<td>Developmental diagnosis, n (%)</td>
<td>Autism</td>
<td>147 (7.8)</td>
<td>48 (14.2)</td>
<td>296 (13.5)</td>
</tr>
<tr>
<td></td>
<td>Developmental delay</td>
<td>224 (12.0)</td>
<td>54 (16.0)</td>
<td>354 (16.2)</td>
</tr>
<tr>
<td></td>
<td>Intellectual disability</td>
<td>53 (2.8)</td>
<td>27 (8.0)</td>
<td>101 (4.6)</td>
</tr>
<tr>
<td></td>
<td>Eating disorder</td>
<td>38 (2.0)</td>
<td>8 (2.4)</td>
<td>29 (1.3)</td>
</tr>
</tbody>
</table>

IQR, interquartile range; —, not applicable.

* Kruskal-Wallis rank sum test (all other P values were calculated by using Pearson’s χ² test).

6 Mutually exclusive categories in which individuals reporting Hispanic ethnicity are classified as Hispanic and those reporting non-Hispanic ethnicity are classified by reported race.

6 Medical comorbidity includes any nonpsychiatric diagnosis coded during the encounter.

6 We used discharged on antipsychotics (not as needed) as a proxy for severity.
Children aged 4 to 17 years, cared for by the psychiatry service, and discharged from the psychiatric unit from October 1, 2011, to September 30, 2016, were eligible for study inclusion. The age range reflects our institution’s admission criteria and our understanding that both diagnostic criteria and therapies may differ for those <4 years of age.

We included patients admitted to other units during their hospital stay if they were discharged from the psychiatric unit. We excluded patients who spent <24 hours on the psychiatric unit because such short admissions were unlikely to have the same therapeutic significance. The hospital institutional review board approved this study.

Exposures and Outcomes

For our primary analysis, our exposure of interest was time with respect to the national-level health care reform associated with the ACA, which was implemented in 2014. We considered the months before the closure of the Marketplace Exchange (October 2011 to March 2014) as the pre-reform period and the months from October 2014 to September 2016 as the postreform period. We excluded the implementation period (April 2014 to September 2014) from the analysis.

For our primary analyses, our outcomes were LOS for mental health conditions (this included time spent outside the psychiatry unit for some patients) and 30-day inpatient readmissions. For descriptive purposes, we also report LOS in census days (number of days that the patient was present at midnight) grouped in 3-day blocks on the basis of Medicaid’s authorization approach.

For our secondary analysis, our exposure of interest was LOS for mental health conditions and our outcomes of interest were 30-day ED return visits and inpatient readmissions. We evaluated associations between LOS and these outcomes among our full cohort but also looked specifically for moderation by time period as it related to ACA implementation.

### TABLE 2

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Pre-ACA (30 mo), n = 1874</th>
<th>Implementation (6 mo), n = 338</th>
<th>Post-ACA (24 mo), n = 2186</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOS, mean (SD), d</td>
<td>8.9 (7.2)</td>
<td>10.3 (10.2)</td>
<td>8.0 (8.4)</td>
<td>.0003</td>
</tr>
<tr>
<td>LOS in census days, n (%)</td>
<td></td>
<td></td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>1–3</td>
<td>136 (7.3)</td>
<td>22 (6.5)</td>
<td>239 (10.9)</td>
<td>—</td>
</tr>
<tr>
<td>4–6</td>
<td>427 (22.8)</td>
<td>73 (21.6)</td>
<td>962 (44.0)</td>
<td>—</td>
</tr>
<tr>
<td>7–9</td>
<td>860 (45.9)</td>
<td>138 (40.8)</td>
<td>595 (27.2)</td>
<td>—</td>
</tr>
<tr>
<td>10+</td>
<td>451 (24.1)</td>
<td>105 (31.1)</td>
<td>390 (17.8)</td>
<td>—</td>
</tr>
<tr>
<td>Readmissions, n (%)</td>
<td></td>
<td></td>
<td></td>
<td>—</td>
</tr>
<tr>
<td>30-d ED</td>
<td>103 (5.5)</td>
<td>44 (13.0)</td>
<td>279 (12.8)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>30-d Inpatient</td>
<td>100 (5.3)</td>
<td>31 (9.2)</td>
<td>211 (9.7)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

—, not applicable.

*Census days counts the number of days that the patient was present at midnight as an inpatient.*

A

![Pre-ACA](https://example.com/preaca.png)  
**Pre-ACA**

- Intercept: 9.8 (95% CI 8.9 to 10.6)
- Slope: 0.05 (95% CI 0.006 to 0.10)

B

![Post-ACA](https://example.com/postaca.png)  
**Post-ACA**

- Intercept: 8.6 (95% CI 7.8 to 9.4)
- Slope: −0.05 (95% CI −0.10 to 0.01)

**FIGURE 1** ITS analysis results for LOS in days, before and after full implementation of the 2014 ACA. The 6-month wash-out period is denoted by the dashed center lines. A, Mean LOS in days. B, Mean LOS in days stratified by insurance status. All estimates are followed by 95% CIs. Intercept refers to the y-intercept for each time period-specific regression line. Slope refers to the slope for each time period-specific regression line, which indicates the change in outcome by month over the study. The difference between pre- and post-ACA period intercepts is the calculated difference in time period-specific intercepts, indicating the mean value for the outcome at the beginning of each time period. When no significant slope exists during the time period, the intercept equals the mean value for the time period. The P value indicates whether the 2 intercepts are statistically different from one another. Rounding to significant digits in the figures may have resulted in slight calculation differences. The difference between pre- and post-ACA slopes is the calculated difference in time period-specific slopes, indicating the change from the established trajectory during the pre-ACA period to the observed trajectory during the post-ACA period. The P value represents whether the 2 slopes are statistically different from one another. Rounding to significant digits in the figures may have resulted in slight calculation differences.
Patient and Clinical Characteristics
We obtained patient characteristics (age, sex, race and/or ethnicity, insurance type, and language) from hospital administrative data. Patients were classified as covered by Medicaid, private insurance that contracted with the hospital, private insurance that did not contract with the hospital, or other types of insurance, such as military. Patients who self-paid for care were considered to have “other” insurance. No major payer contract changes occurred during the study period, although a few patients switched from noncontracted to contracted insurance types; given their small representation, we kept them listed as contracted.

Clinical characteristics of interest included primary diagnosis, disease severity, and medical comorbidity. We used International Classification of Diseases (ICD) codes to group patients into categories based on a primary diagnosis of a depressive disorder, disruptive disorder, or other psychiatric disorder given that our institution historically has had clinical pathways for treating depressive and disruptive behavioral disorders, which might affect LOS or readmissions. Our other diagnosis category included those diagnosed with bipolar disorder; schizophrenia, psychotic disorders, anxiety, and eating disorders, among others (Supplemental Table 3). We also noted diagnostic codes for developmental disorders (eg, autism, intellectual disability) during the initial encounter because they could potentially affect LOS and inpatient readmissions. Having a primary diagnosis of an eating disorder was noted for descriptive purposes. We identified patients who were prescribed a scheduled antipsychotic at discharge as a proxy for severity (Supplemental Table 4). Medical comorbidity included any nonpsychiatric diagnosis coded during the encounter.

Statistical Analysis
Patient and clinical characteristics for encounters before and after ACA implementation were summarized via frequencies and percentages and means and SD as appropriate.

Because an interrupted time-series (ITS) analysis strongly lends itself to evaluating natural experiments, such as policy change,16,17 we conducted an ITS analysis on the full population of patients who were admitted. Specifically, we evaluated the association of time, based on month of discharge relative to implementation of the ACA, with mean LOS for mental health conditions and 30-day inpatient readmission proportions. We fit linear regression models with interaction terms for month of discharge and time period (pre- and post-ACA) to compare trends in each outcome between the 2 time periods. We compared the pre- and post-ACA period slopes and intercepts using t tests. Because we hypothesized that health care reform most likely affected patients insured by Medicaid, we repeated the ITS analysis, stratifying by insurance type (Medicaid versus non-Medicaid). LOS was found to have a close-to-normal distribution in this population. We also performed our ITS analyses using log transformation and truncation to improve normality and found no substantial difference.

To address our secondary objective, we used logistic regression to evaluate the association of LOS for mental health conditions with 30-day ED return visits and inpatient readmissions. We controlled for age at discharge, race and/or ethnicity, the presence of intellectual disability, and

![Graph showing mean LOS by insurance type](https://via.placeholder.com/150)

**FIGURE 1** Continued.
specific developmental disorders. To evaluate whether insurance type (Medicaid versus non-Medicaid), disease severity (discharged on antipsychotics versus not), diagnosis (depressive disorder versus disruptive disorder versus neither) or time period (preimplementation, implementation, and postimplementation) modified the observed associations between LOS and ED return visits and readmissions, we added interaction terms in subsequent models. We included all ED return visits and hospital readmissions given that poor mental health affects physical health. We chose to use antipsychotics alone as a proxy for severity to increase specificity, forgoing some potential sensitivity that might have been captured with using antidepressants as well.

All tests were 2 sided, and \( P < .05 \) was considered statistically significant. All statistical analyses were performed in SAS version 9.4 (SAS Institute, Inc, Cary, NC) and R version 11.

RESULTS

During our study period, there were 4460 encounters from which patients were discharged from the inpatient psychiatric unit. We excluded 62 of these admissions because the LOS was \(<24\) hours. Ninety-nine percent of all minutes during the encounters were spent in the psychiatric unit. The mean age at first discharge was similar between patients in the pre- and post-ACA periods, as was the distribution of sex (Table 1). A smaller proportion of patients in the pre-ACA period were Hispanic, non-Hispanic African American, or other races and/or ethnicities. Medicaid covered 33.3% of encounters during the pre-ACA period, compared with 42.6% during the post-ACA period. More admissions to the psychiatric unit in the post-ACA period were for depressive disorders (48.4% vs 43.4%). Additionally, in the post-ACA period, we observed more encounters with a diagnosed developmental delay (specifically autism) and/or intellectual disability and with discharge on antipsychotic medications. We observed similar proportions of encounters with a primary diagnosis of an eating disorder in the pre- and post-ACA periods. The overall mean LOS for mental health conditions decreased from 8.9 days (SD 7.2) to 8.0 days (SD 8.4) pre- to post-ACA. Comparing LOS in census days, there was a striking shift in LOS distribution post-ACA, favoring shorter LOS for a larger proportion of patients (Table 2). Post–ACA implementation, we observed an increase in 30-day ED return visits and inpatient readmissions, from 5.5% to 12.8% and 5.3% to 9.7%, respectively (Table 2). In the ITS analysis, we found that the mean psychiatric LOS during the pre-ACA period was rising at a rate of 0.05 days per encounter per month (95% confidence interval [CI] 0.006 to 0.10; Fig 1A). In the post-ACA period, the mean LOS was decreasing by 0.05 days per encounter per month (95% CI –0.10 to 0.01). The difference in the rate of change in LOS between the pre- and post-ACA periods was statistically significant (\( P \) for interaction = .01). We observed a larger difference in the rate of LOS change over time among patients insured by Medicaid (pre- to post-ACA slope difference: –0.14; 95% CI –0.26 to –0.01) than among patients...
not insured by Medicaid (pre- to post-ACA slope difference: −0.06; 95% CI −0.14 to 0.03).

We also observed a significant increase in the mean proportion of 30-day inpatient readmissions after implementation of the ACA (pre-ACA intercept: 6% [95% CI 3% to 7%]; post-ACA intercept: 10% [95% CI 7% to 12%]; Fig 2A). We did not observe an overall trend over time in 30-day readmissions, either before or after ACA implementation. When we stratified by insurance type, for those on Medicaid, we observed a probable change in the slope direction (increasing pre-ACA to decreasing post-ACA) and a net decrease in the change in readmissions over time that did not reach statistical significance (pre-ACA versus post-ACA slope difference: −0.4%; 95% CI −0.8% to 0.03%). For those not on Medicaid, we saw the inverse, with a probable change in slope direction (decreasing pre-ACA to increasing post-ACA) and a net increase in the change in readmissions over time that did not reach statistical significance (pre-ACA versus post-ACA slope difference: 0.2%; 95% CI −0.01% to 0.50%).

We did not find an association between LOS and inpatient readmissions (adjusted odds ratio 1.00; 95% CI 0.99 to 1.01) after adjusting for age, race and/or ethnicity, developmental delay, intellectual disability, diagnosis, insurance type, and disease severity. We also did not find significant effect measure modification (EMM) by diagnosis, insurance type, disease severity, or time period (Supplemental Table 5). We did observe an association between LOS and 30-day ED return visits (adjusted odds ratio 0.98; 95% CI 0.96 to 0.99) and EMM by diagnosis (disruptive disorder), insurance type (Medicaid), and severity (nonsevere), but not by time period (Supplemental Table 5).

**DISCUSSION**

Our ITS analysis supported our hypotheses that ACA implementation was associated with decreased psychiatric LOS, overall and by insurance type. Although the mean LOS during the pre-ACA period was increasing, ACA implementation was associated with a halt to the rate increase. This functional decrease in overall LOS amounts to a difference of 2.4 days per encounter over the course of the 24-month post-ACA period, compared with what we would have expected given the pre-ACA trajectory. Given the increasing severity of pediatric mental illness and studies suggesting worse outcomes with shorter LOS, it seems likely that this reduced time of active treatment planning and therapeutic intervention would have negative sequelae. Medicaid-insured patients were observed to have a steady decrease in their LOS post-ACA. Patients not insured by Medicaid had a significantly shorter mean LOS post-ACA implementation but no trend over time. These patterns may reflect differences in the speed with which insurers changed their policies or practice to respond to changes in health care policy.

Although few have reported on changes in LOS for pediatric mental health conditions subsequent to the ACA, it has been observed that psychiatric LOS has decreased over time despite increased rates of serious illness and self-harm. Given that illness severity does not seem to drive LOS and that others have found that having a managed care payer was a predictor of shorter LOS, it seems plausible that administrative and insurance factors have always had a disproportionately large influence on LOS for mental health indications. Importantly, there are no recent

---

**FIGURE 2**

Continued.
studies in which authors look at the association between psychiatric LOS and aftercare, so it is possible that an increase in available aftercare was responsible for the shortened inpatient stay. A more complete understanding of the reasons for and implications of this reduced LOS will require additional research, including qualitative studies of family experience.

In 1 previous study, adolescents admitted after Medicaid-managed care reforms were more likely to experience readmissions; the highest risk was in the first 15 to 30 days postdischarge, suggesting that the quality of care may be adversely affected by managed care reforms. Yet, when we stratified by Medicaid versus non-Medicaid, we saw no significant differences in monthly trends for readmissions. We did observe a nonsignificant increase in the average proportion of patients readmitted for those not on Medicaid and a nonsignificant decrease in the average proportion of patients readmitted for those on Medicaid. For those on Medicaid, the observed trajectory, if real, could potentially reflect increased insurance denials, a change in the covered population’s illness severity, or better outpatient care. Studies in which authors have examined the association between access to care and pediatric mental health readmissions have produced mixed results: some authors report that aftercare increases the likelihood of readmission, and others report that it decreases reuse. Furthermore, recent studies of health care reform have revealed varying effects on mental health hospitalizations for young adults, but the authors of these studies did not look specifically at readmissions or aftercare.

Previous literature suggests that administratively limiting LOS among patients admitted for mental health conditions may have negative consequences, such as increasing hospital readmission rates. In theory, patients who stay longer are more likely to be stable at the time of discharge, be better engaged, and follow-up with recommended care. We did not, however, find a significant association between LOS and inpatient readmissions or EMM by time period despite observing an increase in readmissions and decreasing LOS in the post-ACA period. One reason that psychiatric LOS may not always be associated with readmission is that patients who stay longer could potentially be sicker or lack social supports. In our analysis, we adjusted for illness severity using antipsychotic medication at discharge as a proxy for disease severity and did not find that this made a difference. This suggests that varying rates of readmission to youth psychiatric services continue to be due to organizational-level factors associated with quality of care influencing treatment outcomes.

We did observe an association between LOS and 30-day ED return visits and EMM by diagnosis (disruptive disorder), insurance type (Medicaid), and severity (nonsevere), but not by time period. However, given the small magnitude of the odds ratio (a 2% decrease for each additional day of inpatient stay) and no modification by time period, we are cautious about overinterpreting this result.

This study has several limitations. Although we used antipsychotics as a proxy for illness severity, this does not fully capture the burden of severe mental health conditions, including some of those with suicidal ideation. Additionally, our ITS analysis may have been influenced by some population heterogeneity from the pre- to post-ACA period. Unfortunately, a suitable concurrent control group for this study was not available given the broad-reaching effects of the policy. We did exclude data for the 6 months from when the ACA was first implemented to allow the potential effect to operate at full speed, but this time period might have been too short. Furthermore, a denominator, such as all hospital encounters, was not practical given the changes that were occurring over the study period in total beds and available staff for both general medicine and mental health admissions. We did not have information on whether patients were readmitted to other hospitals, which may have caused us to underestimate our associations. Also, the results of this research may not be generalizable to other hospitals or different geographic areas. ACA-related effects may be expected to be more pronounced in states with lower levels of Medicaid coverage for children at baseline. Although Washington State’s Medicaid program underwent early expansion, the 2014 ACA rollout still had an impact on required mental health care coverage. We observed an increasing mean LOS over our 30-month pre-ACA period. This finding is in contrast to decades of decline in LOS for psychiatric indications nationally. Although this is also a potential threat to our study’s generalizability, it could suggest that mean LOS shortening is not linear in nature but occurs at specific moments in time; it may also reflect a brief change in trajectory given that we considered only the 30 months before ACA implementation.

CONCLUSIONS

ACA implementation was associated with a halt in rising LOS for youth admitted with mental health conditions. A subsequent decline in mental health inpatient LOS was observed post-ACA implementation, especially for those on Medicaid. Significantly increased 30-day readmissions were observed post-ACA; however, there were no time-trend differences and no differences when stratifying by insurance status. There was no association between LOS and 30-day inpatient readmissions or EMM by time period. We did observe an association of small magnitude between LOS and ED return visits. We hope that our study inspires critical ongoing evaluation of drivers for pediatric inpatient mental health readmissions that endeavor to improve the quality of pediatric mental health care.

Acknowledgments

We would like to acknowledge Rita Mangione-Smith and Michelle Garrison for their critical feedback on the study design and the analytic plan.

REFERENCES

1. The Annie E. Casey Foundation Kids Count Data Center. Children who have one or more emotional, behavioral, or developmental conditions in the United States. Available at: https://datacenterkidscount.org/data/tables/9699/children-who-have-one-or-more-emotional-behavioral-or-developmental-conditions?loc=1&loct=2#detailed/2/2


Health Care Reform, Length of Stay, and Readmissions for Child Mental Health Hospitalizations
Sarah K. Connell, Lori E. Rutman, Kathryn B. Whitlock, Miriam J. Haviland, Shannon Simmons, Kelly Schloredt, Jessica Ramos, Kathy Brewer, Marie Augustine and K. Casey Lion
Hospital Pediatrics 2020;10;238
DOI: 10.1542/hpeds.2019-0197 originally published online February 3, 2020;

Updated Information & Services
including high resolution figures, can be found at:
http://hosppeds.aappublications.org/content/10/3/238

Supplementary Material
Supplementary material can be found at:
http://hosppeds.aappublications.org/content/suppl/2020/01/30/hpeds.2019-0197.DCSupplemental

References
This article cites 26 articles, 6 of which you can access for free at:
http://hosppeds.aappublications.org/content/10/3/238#BIBL

Subspecialty Collections
This article, along with others on similar topics, appears in the following collection(s):
Hospital Medicine
http://www.hosppeds.aappublications.org/cgi/collection/hospital_medicine_sub
Psychiatry/Psychology
http://www.hosppeds.aappublications.org/cgi/collection/psychiatry_psychology_sub

Permissions & Licensing
Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
http://www.hosppeds.aappublications.org/site/misc/Permissions.xhtml

Reprints
Information about ordering reprints can be found online:
http://www.hosppeds.aappublications.org/site/misc/reprints.xhtml
Health Care Reform, Length of Stay, and Readmissions for Child Mental Health Hospitalizations

Sarah K. Connell, Lori E. Rutman, Kathryn B. Whitlock, Miriam J. Haviland, Shannon Simmons, Kelly Schloredt, Jessica Ramos, Kathy Brewer, Marie Augustine and K. Casey Lion

*Hospital Pediatrics* 2020;10;238
DOI: 10.1542/hpeds.2019-0197 originally published online February 3, 2020;

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://hosppeds.aappublications.org/content/10/3/238

Data Supplement at:
http://hosppeds.aappublications.org/content/suppl/2020/01/30/hpeds.2019-0197.DCSupplemental