Original Investigation

State Parity Laws and Access to Treatment for Substance Use Disorder in the United States: Implications for Federal Parity Legislation

Hefei Wen, BA; Janet R. Cummings, PhD; Jason M. Hockenberry, PhD; Laura M. Gaydos, PhD; Benjamin G. Druss, MD, MPH

**IMPACTANCE** The passage of the 2008 Mental Health Parity and Addiction Equity Act and the 2010 Affordable Care Act incorporated parity for substance use disorder (SUD) treatment into federal legislation. However, prior research provides us with scant evidence as to whether federal parity legislation will hold the potential for improving access to SUD treatment.

**OBJECTIVE** To examine the effect of state-level SUD parity laws on state-aggregate SUD treatment rates and to shed light on the impact of the recent federal SUD parity legislation.

**DESIGN, SETTING, AND PARTICIPANTS** We conducted a quasi-experimental study using a 2-way (state and year) fixed-effect method. We included all known specialty SUD treatment facilities in the United States and examined treatment rates from October 1, 2000, through March 31, 2008. Our main source of data was the National Survey of Substance Abuse Treatment Services, which provides facility-level information on specialty SUD treatment.

**INTERVENTIONS** State-level SUD parity laws during the study period.

**MAIN OUTCOMES AND MEASURES** State-aggregate SUD treatment rates in (1) all specialty SUD treatment facilities and (2) specialty SUD treatment facilities accepting private insurance.

**RESULTS** The implementation of any SUD parity law increased the treatment rate by 9% ($P < .001$) in all specialty SUD treatment facilities and by 15% ($P = .02$) in facilities accepting private insurance. Full parity and parity only if SUD coverage is offered increased the SUD treatment rate by 13% ($P = .02$) and 8% ($P = .04$), respectively, in all facilities and by 21% ($P = .03$) and 10% ($P = .04$), respectively, in facilities accepting private insurance.

**CONCLUSIONS AND RELEVANCE** We found a positive effect of the implementation of state SUD parity legislation on access to specialty SUD treatment. Furthermore, the positive association is more pronounced in states with more comprehensive parity laws. Our findings suggest that federal parity legislation holds the potential to improve access to SUD treatment.

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**Author Affiliations:** Department of Health Policy and Management, Rollins School of Public Health, Emory University, Atlanta, Georgia (Wen, Cummings, Hockenberry, Gaydos, Druss), currently with Center for Comprehensive Access and Delivery Research and Evaluation Center, Iowa City Veterans Affairs Health Care System, Iowa City, Iowa (Hockenberry).

**Corresponding Author:** Hefei Wen, BA, Department of Health Policy and Management, Rollins School of Public Health, Emory University, 1518 Clifton Rd NE, Room 623, Atlanta, GA 30322 (hwen2@emory.edu).
An estimated 23 million Americans had a substance use disorder (SUD) in 2010, including abuse of or dependence on alcohol and/or illicit drugs. A growing body of literature has demonstrated the efficacy and cost-effectiveness of treatment for SUD. Specialty SUD treatment services such as outpatient psychosocial therapy and opioid maintenance therapy have proved to be effective in improving health, reducing patient psychosocial therapy and opioid maintenance therapy, and producing a wide range of social benefits.

Nonetheless, only 17% of those individuals who needed SUD treatment received any treatment for their condition, and only 11% (2.6 million) received treatment in a specialty setting. Financial barriers in general and limited insurance coverage for SUD in particular pose a major barrier to access to specialty SUD treatment among those individuals receiving a need for treatment. Ever since the inception of third-party payment for SUD treatment, coverage for SUD treatment has been more restrictive than that for medical/surgical treatment in terms of cost sharing and treatment limitations.

To address these discriminatory restrictions, more than one-half of the states in the United States have enacted SUD parity laws during the past 2 decades requiring employment-related group health plans to provide coverage for SUD treatment equal to that for comparable medical/surgical treatment.

More recently, the passage of the 2008 Mental Health Parity and Addiction Equity Act (MHPAEA) incorporated SUD parity into federal legislation for the first time. However, the MHPAEA mandates parity only for employment-related and self-funded group health plans and only for existing SUD coverage offered by those plans (ie, parity-if-offered). Subsequently, provisions of the 2010 Affordable Care Act (ACA) extended SUD parity to Medicaid-managed care plans, Medicaid benchmark and benchmark-equivalent plans, and state health insurance exchange plans. Furthermore, the ACA requires that coverage for SUD treatment, as an essential health benefit, must be offered and must be offered on par with that for comparable medical/surgical treatment (ie, full parity).

Nonetheless, prior research provides us with scant evidence about the likely effect of federal parity legislation on access to SUD treatment. Two studies examined SUD parity laws in the private insurance market of a particular state (ie, Vermont and Oregon), and a third study evaluated SUD parity implementation in the Federal Employees Health Benefits program; none of these studies found a significant improvement in access to SUD treatment attributable to the implementation of SUD parity. However, findings from these studies may have limited generalizability to the anticipated effect of the recent federal SUD parity legislation. First, the study examining Vermont’s 1998 parity law did not include a comparison group to control for the downward secular trend in access to SUD treatment nationwide. In addition, the study examining Oregon’s 2007 parity law captured only a policy change from partial parity (implemented in 2000) to full parity, which might be confounded by Oregon’s simultaneous reform of methamphetamine regulation (effective in July 2006) that dramatically curbed the underlying prevalence rate. Finally, the study evaluating parity of the Federal Employees Health Benefits focused on a study population with a unique risk profile (eg, less likely to use and abuse or to depend on substance) and financial capacity (eg, less likely to have financial barriers to treatment) that may limit the generalizability of the results to broader populations with private insurance.

The present study advances the existing literature by analyzing all state-level SUD parity laws in the private insurance market implemented from October 1, 2000, through March 31, 2008, and applying a rigorous quasi-experimental design to the variations among those state parity laws in the timing of the implementation and the comprehensiveness of the mandate. We hypothesized that (1) the implementation of SUD parity legislation increased the SUD treatment rate at the state level; (2) the increase in the treatment rate was more pronounced in states with more comprehensive SUD parity laws; and (3) the increase in the SUD treatment rate associated with the implementation of SUD parity laws was concentrated in facilities accepting private insurance.

**Methods**

**Data Sources**

The main source of our data is the National Survey of Substance Abuse Treatment Services (N-SSATS), which provides facility-level information on specialty SUD treatment from 2000 through 2008. (In 2002, the reference date for the annual survey was changed from September to March to enhance the response rate, leaving a gap period from September 2000 to March 2001 with no data collected.) The N-SSATS facility data cover all known specialty SUD treatment facilities, allowing for a nearly complete enumeration of specialty SUD treatment services in the United States. A specialty SUD treatment facility, according to N-SSATS, is defined as a hospital, a residential SUD facility, an outpatient SUD treatment facility, a mental health facility with an SUD treatment program, or other facility with an SUD treatment program providing the following treatment services: (1) outpatient, inpatient, or residential/rehabilitation SUD treatment; (2) detoxification treatment; (3) opioid treatment programs such as maintenance therapy with methadone and levo-alpha-acetylmethadol; and (4) halfway-house services that include SUD treatment. Throughout the study period, response rates ranged from 92% to 95%. We merged the N-SSATS data with select state-level measures from nationally representative data sets to provide supplementary information on important state socioeconomic characteristics and policy environment (discussed below). The Emory University Institutional Review Board determined that this study did not require institutional review board oversight because all data were collected from publically available sources and de-identified, and the authors did not have access to any protected health information.

**Analytic Sample**

We combined the N-SSATS data sets from 2000 to 2008 and converted the facility-level data to the state level to create an analytic panel of 392 state-year observations across the 49
states and 8 years. Virginia was excluded from the analysis because it was the only state that moved away from parity when full parity was repealed and regressed to partial parity in 2004.

Measurement of Variables

Dependent Variable

All surveyed facilities were requested to report the total SUD treatment counts in the most recent 12 months before the survey. The N-SSATS method specified that the treatment count should only include the initial entry of a client into treatment; subsequent visits to the same service or transfer to a different service within a single continuous course of treatment were excluded. The missing-item rate for treatment count was approximately 7% during the study period.

The treatment counts in all specialty facilities were aggregated to each state s in each year t to determine the state-aggregate annual number of SUD treatment entries. We also aggregated the treatment counts only for facilities that accept private insurance. Both measures of the state-aggregate annual treatment entries were then weighted by the state population size to generate the 2 dependent variables assessing the following: (1) the treatment rate among all facilities (treatment rate, ) as the number of SUD treatment entries into all specialty SUD treatment facilities per 100 state residents in each state s for each year t; and (2) the treatment rate for facilities accepting private insurance (treatment rate-Pt, ) as the number of SUD treatment entries into specialty SUD treatment facilities that accept private insurance per 100 state residents in each state s for each year t.

Primary Independent Variables

In a broad sense, SUD parity refers to a policy mandating insurance coverage for SUD treatment to be “no more restrictive” than coverage for comparable medical/surgical treatment, with respect to cost sharing (eg, deductibles, copayments, coinsurance, and out-of-pocket expenses), treatment limitations (eg, annual or lifetime limits on number of visits or hospital days), or both. The first independent variable of interest is a dichotomous indicator for the implementation of any parity law in a given state s during a given year t (parity, ). The implementation indicator was assigned a value of 1 for each full year subsequent to the time when a state first implemented its SUD parity law and a value of 0 for the preimplementation periods and for states without any SUD parity law.

We also created a categorical measure to distinguish among the following different levels of comprehensiveness in the implementation of parity:

1. Full parity, requires SUD coverage to be offered and offered on par with the comparable medical/surgical coverage in all aspects of cost sharing and treatment limitations;
2. Partial parity, though requiring that SUD coverage be offered, allows for discrepancies between SUD coverage and comparable medical/surgical coverage in some aspects of cost sharing and treatment limitation;
3. Parity-if-offered, does not require SUD coverage to be offered, but if offered, it should be on par with the comparable medical/surgical coverage in all aspects of cost sharing and treatment limitations.

To assess the implementation and the comprehensiveness of the state SUD parity laws, we reviewed the relevant information provided by the Substance Abuse and Mental Health Services Administration, the National Conference of State Legislatures, and other advocacy organizations. We also referred to the original state statutes to detect the subtlety in statutory language and to reconcile the inconsistencies among various sources. Table 1 presents detailed information on state SUD parity laws during the study period.

Covariates

To account for the state-year heterogeneity, we included key time-varying sociodemographic characteristics and policy environment factors that have been extensively documented to influence access to SUD treatment. Our covariates constituted the percentage of state population who are (1) black or African American, (2) Hispanic or Latino, (3) living in poverty (≤100% at or below the federal poverty line), (4) classified with SUD (ie, meets the DSM-IV diagnostic criteria for alcohol abuse/dependence and/or illicit drug abuse/
dependence, and (5) eligible for Medicaid. We also included the per capita amount of the Substance Abuse Prevention and Treatment Block Grant (SAPTBG) allocated to the state as a proxy for system capacity.31 The SAPTBG represents a significant federal contribution to the state budgets for substance abuse prevention and treatment systems and accounts for approximately 40% of public funds expended by states for SUD treatment. In 2001, 16 states reported that more than half of their total funding for SUD treatment programs came from the SAPTBG.

In addition to the sociodemographic and policy covariates, we adjusted for the target population and exemption conditions that are commonly included in state SUD parity legislation. Most parity laws apply only to employment-related group health plans, leaving the individual (non–employment-based) health insurance market unregulated. Moreover, the federal preemption by the Employee Retirement Income Security Act of 197432 does not allow state legislatures to impose health insurance regulations on self-insured business (usually large employers). Some states also exempt employers with fewer than 50 or fewer than 20 employees, further limiting the reach of SUD parity.33 When we considered the availability of the consistent data across the study states and years, we controlled for the percentage of the state population (1) covered by employer-sponsored health insurance, (2) covered by individually purchased health insurance, (3) with large employers (ie, >500 employees), and (4) with small employers (ie, <20 employees).

Statistical Analysis

We analyzed the effect of state SUD parity laws on state-aggregate SUD treatment rates, using 2-way (state and year) fixed-effect modeling to account for unobserved or unmeasured factors in the treatment rates that are systematically correlated with the parity laws. The 2-way fixed-effect approach can be viewed as an extension of the difference-in-difference framework to fit multiple-unit and multiple-time models that go beyond the traditional 2 groups (intervention vs comparison) and 2 periods (before and after).34 By distinguishing the real impact of parity legislation from the confounding factors of the state heterogeneity35 and the national secular trend, we are able to obtain unbiased estimates of the effect of state SUD parity laws.

We estimated 4 models. Model 1 estimated the SUD treatment rate among all specialty SUD treatment facilities at state s in year t (treatment rate), as a function of the dichotomous indicator of SUD parity implementation (parity), the state fixed effect (s), the year fixed effect (t), and the state sociodemographic and policy covariates (covariate vector), and an idiosyncratic error term (εst). Model 2 replaced the dichotomous indicator of any SUD parity implementation (parity) with the categorical variable of the comprehensiveness in parity mandate (full parity, partial parity, and parity-if-offered). The dependent variable of both models, the SUD treatment rate among all specialty SUD treatment facilities (treatment rate), was measured based on the entire population instead of those targeted by state parity. The estimated effect of parity legislation, in this sense, would be diluted over a mixture of target (ie, those groups with private insurance plans affected by parity) and nontarget groups (ie, those groups with no insurance, with public insurance, or with private insurance plans not affected by parity). To refine our crude estimates, we also limited the treatment rate measure to facilities accepting private insurance (treatment rate-PI) and reestimated the 2 models described above.

All estimated standard errors were clustered at the state level to correct for the serial correlation that otherwise leads to false rejections of the null hypothesis.36 Analysis was performed using commercially available statistical software (STATA, version 12.0; StataCorp).

Results

The Figure shows an upward trend in the SUD treatment rate in parallel with the implementation of SUD parity legislation. Among the 10 states that first implemented SUD parity or extended their parity laws to a higher level of comprehensiveness from 2000 through 2008, the mean SUD treatment rate rose from 1.38 percentage points (per 100 population) during the year immediately before the parity implementation to 1.53 percentage points in the year immediately after implementation. The preparity and postparity change in the SUD treatment rate was equivalent to an 11% increase ([1.53 - 1.38] ÷ [1.53 + 1.38] ÷ 2)]. Among states that did not change their SUD parity status, the mean SUD treatment rate fell from 1.44 to 1.38 percentage points during the same period, which corresponds to a decrease of 4% ([1.38 - 1.44] ÷ [(1.38 + 1.44) ÷ 2]). This observational trend comparison demonstrated a positive association between SUD parity and treatment rate.

Table 2 summarizes the descriptive statistics for the following 3 groups of states: (1) the 10 parity states that first implemented parity laws or extended their laws from 2000 through 2008; (2) the 23 states that do not have SUD parity; and (3) the other 16 states that first implemented parity laws before 2000 and did not change their laws during the study period. We combined groups 2 and 3 as the control group representing the states without changes in parity laws during the study period. The 2-sample t tests of mean differences between the 10 parity states with changes in their parity laws and the remaining states without changes indicated that the parity states had a significantly higher rate of SUD treatment in all specialty SUD treatment facilities (P = .03) and in facilities accepting private insurance (P < .001).

Table 3 reports the regression results for the estimated effect of SUD parity implementation on the SUD treatment rate. The implementation of any SUD parity law significantly increased the treatment rate in all specialty SUD treatment facilities (model 1.1, marginal effect [ME] = 0.13 percentage points [95% CI, 0.04-0.23]) and in facilities accepting private insurance (model 2.1, 0.16 [0.03-0.30]). To place the magnitude of effect into context, we translate the estimated ME (ie, change in percentage points per 100 state residents) into the percentage of change in the SUD treatment rate. Given that the mean SUD treatment rate was 1.40 percentage points in all specialty SUD treatment facilities and 1.10 percentage points in fa-
Discussion

Our findings indicate that the implementation of state SUD parity legislation results in a significant improvement in access to specialty SUD treatment. The implementation of any SUD parity law increased the treatment rate by 9% in all specialty SUD treatment facilities and by 15% in facilities accepting private insurance. Our study contributes to the existing literature by using state-level panel data on a nearly complete enumeration of all treatment counts in specialty SUD treatment facilities, harnessing all legislative changes in state-level SUD parity laws during the study period, and tailoring a rigorous quasi-experimental design to this series of state experiments.

Figure. Trend in Substance Use Disorder (SUD) Treatment Rate by SUD Parity Status

A, Any change in parity compared with no change. B, All changes in parity ranging from none to full. State-aggregate SUD treatment rates reflect the preparity and postparity periods. We centered the year each state started to implement the law at time 0. The vertical line represents the year during which each state started to implement or extend the law, and it corresponds with the period covered in National Survey of Substance Abuse Treatment Services (N-SSATS) from April 2001 to March 2002 (N-SSATS 2002) for Delaware and Michigan, April 2002 to March 2003 (N-SSATS 2003) for Montana and Rhode Island, April 2003 to March 2004 (N-SSATS 2004) for Maine and New Hampshire; April 2004 to March 2005 (N-SSATS 2005) for Wisconsin and West Virginia; and April 2006 to March 2007 (N-SSATS 2007) for Oregon. Kentucky implemented parity during the gap year between N-SSATS 2000 and 2002, so time 0 consisted of 9 data points instead of 10. For the other states with no change in parity, the treatment rates during N-SSATS 2002, 2003, 2004, 2005, and 2007 were weighted by 2/9, 2/9, 2/9, 2/9, and 1/9, respectively, to match the proportions of the states that implemented parity in a given year. Following the same procedure, we determined times −2, −1, 1, 2, and 3 for the states with any change in parity, and then transferred states with no change in parity to the corresponding time in accord with the parity states. Only 7 states with any change in parity were included for time −2 (no data for Kentucky, Delaware, or Michigan), time 2 (no data for Oregon), and time 3 (no data for Oregon).
The ACA will extend SUD insurance coverage to approximately 30 million previously uninsured persons. 

The ACA will extend SUD insurance coverage to approximately 30 million previously uninsured persons. By expanding the scope of insurance coverage to the uninsured, the ACA will help reduce the number of people who are uninsured and thus improve access to care.

When considering the implications of our findings for the states accepting full parity, the results of our analysis of the states with the highest increases in SUD treatment rates are consistent with the findings of the states with the highest increases in SUD treatment rates. The estimated growth in SUD treatment rates in the public and private sectors will be subject to full parity. In our analysis of the states with the highest increases in SUD treatment rates, the estimated growth in SUD treatment rates will be subject to full parity.
fold, tracking the effect of both laws on SUD treatment to ensure that they are able to fulfill their promise in improving access to SUD treatment will be critical.

The conclusions of this study should be interpreted in light of the following limitations. First, we cannot identify individuals’ insurance coverage and their employment status in the facility-level N-SSATS data or find more detailed facility-level information on the percentage of treatment entries/clients who were covered by the health insurance plans subject to parity. Thus, the dependent variable, the state-aggregate SUD treatment rate, was measured based on the entire population instead of the population targeted by state parity laws. We refined our analysis by restricting the measurement of the treatment rate to facilities accepting private insurance, which yielded a larger point estimate of the parity effect. We also conducted sensitivity analyses for facilities not accepting private insurance (Supplement [eTables 1-6]) and found no difference in SUD treatment rates attributable to parity. Considered together, these additional analyses suggest that the effect of SUD parity on the treatment rate is primarily driven by the increased treatment rate among the target population.

Second, N-SSATS did not ask facilities to report treatment counts for alcohol and illicit drug use separately; thus, we were only able to assess the effect of parity on combined SUD treatment rates, despite their distinct legal status, patterns of treatment, and consequently individuals’ policy sensitivity and price elasticity. Third, as with any observational study, we cannot definitively establish causality between the implementation of SUD parity laws and access to SUD treatment. However, the rigorous methods and robust results strongly suggest that parity improved access.

Despite these limitations, our study provides useful insight into the potential effect of the implementation and the comprehensiveness of SUD parity on access to SUD treatment and, in broad terms, the potential of financial incentives and policy leverage to influence treatment-seeking behavior. We found that the implementation of state SUD parity laws significantly increased the SUD treatment rate and that the increase was more pronounced in states implementing more comprehensive laws. These findings suggest that the MHPAEA of 2008 and the ACA of 2010 hold the potential to improve access to SUD treatment.

Table 3. Regression Results for the Estimated Effect of SUD Parity Implementation and Other Covariates on the SUD Treatment Rate

<table>
<thead>
<tr>
<th>Primary independent variables</th>
<th>SUD Treatment Rate, Marginal Effect (95% CI), %</th>
<th>All Facilities</th>
<th>Facilities Accepting Private Insurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parity</td>
<td></td>
<td>Model 1.1</td>
<td>Model 1.2</td>
</tr>
<tr>
<td>Full parity</td>
<td>0.13* (0.04 to 0.23)</td>
<td></td>
<td>0.16* (0.03 to 0.30)</td>
</tr>
<tr>
<td>Partial parity</td>
<td>0.18* (0.03 to 0.33)</td>
<td>0.23* (0.03 to 0.43)</td>
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</tr>
<tr>
<td>Parity-if-offered</td>
<td>0.08 (~0.02 to 0.19)</td>
<td>0.10 (~0.02 to 0.21)</td>
<td></td>
</tr>
<tr>
<td>Covariate</td>
<td></td>
<td>Model 2.1</td>
<td>Model 2.2</td>
</tr>
<tr>
<td>African American or black</td>
<td>−0.06 (~0.16 to 0.03)</td>
<td>−0.04 (~0.15 to 0.06)</td>
<td></td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>−0.10~ (−0.18 to −0.02)</td>
<td>−0.07~ (−0.14 to −0.00)</td>
<td></td>
</tr>
<tr>
<td>Poverty</td>
<td>−0.03 (~0.08 to 0.02)</td>
<td>−0.05~ (−0.09 to −0.00)</td>
<td></td>
</tr>
<tr>
<td>SUD prevalence</td>
<td>0.02 (~0.05 to 0.08)</td>
<td>−0.01 (~0.07 to 0.05)</td>
<td></td>
</tr>
<tr>
<td>Medicaid eligible</td>
<td>0.02~ (0.00 to 0.04)</td>
<td>0.01 (~0.01 to 0.03)</td>
<td></td>
</tr>
<tr>
<td>SAPTBG funding, $ per person</td>
<td>−0.13 (~0.43 to 0.17)</td>
<td>−0.10 (~0.35 to 0.15)</td>
<td></td>
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<tr>
<td>Employer-sponsored private insurance</td>
<td>−0.01 (~0.03 to 0.01)</td>
<td>−0.00 (~0.02 to 0.01)</td>
<td></td>
</tr>
<tr>
<td>Workforce &gt;500 employees</td>
<td>0.01 (~0.01 to 0.03)</td>
<td>0.00 (~0.02 to 0.02)</td>
<td></td>
</tr>
<tr>
<td>Workforce &lt;20 employees</td>
<td>−0.01 (~0.08 to 0.07)</td>
<td>−0.01 (~0.07 to 0.08)</td>
<td></td>
</tr>
<tr>
<td>R² Value</td>
<td>0.88</td>
<td>0.89</td>
<td>0.89</td>
</tr>
</tbody>
</table>

Abbreviations: SAPTBG, Substance Abuse Prevention and Treatment Block Grant; SUD, substance use disorder.

* The 95% confidence interval is calculated based on cluster-adjusted SE (state-level clustering).

a Described in the Measurement of Variables subsection of the Methods section.

Author Contributions: Ms Wen had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Wen, Cummings, Gaydos, Druss.

Acquisition of data: Wen.

Analysis and interpretation of data: Wen, Cummings, Hockenberry, Druss.

Drafting of the manuscript: Wen.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: Wen, Hockenberry.

Obtained funding: Cummings, Druss.
Research Original Investigation

Cost-effectiveness of four treatment modalities for highly active antiretroviral therapy (HAART)


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