# The Temporal Relationship Between Medicaid Payment Acceptance and the Implementation of Medication-Assisted Drug Treatment

Erick G Guerrero[1], Bryan R Garner[2], Benjamin Cook[3], Yinfei Kong[4] and William A Vega[1]

[1]Suzanne Dworak-Peck School of Social Work and Marshall School of Business, University of Southern California, Los Angeles, CA, USA. [2]RTI International, Durham, NC, USA. [3]Department of Psychiatry, Harvard Medical School, Boston, MA, USA. [4]Mihaylo College of Business and Economics, California State University, Fullerton, Fullerton, CA, USA.

**ABSTRACT**

**OBJECTIVE:** To examine the temporal relationship of Medicaid funding on the implementation of evidence-based practices (EBPs) in outpatient substance use disorder (SUD) treatment.

**METHODS:** We examined data from 61 publicly funded SUD treatment programs in 2011 and 2013 using crossed-lagged regressions. We tested the impact of Medicaid payment acceptance on 2 measures of EBP implementation—contingency management treatment (CMT) and medication-assisted treatment (MAT).

**RESULTS:** Medicaid payment acceptance at wave 1 was not associated with implementation of CMT at wave 2 (standardized estimate = 0.170, SE = 0.208, $P > .05$). However, Medicaid payment acceptance at wave 1 was associated with implementation of MAT at wave 2 (standardized estimate = 0.880, SE = 0.047, $P < .001$).

**CONCLUSIONS:** Medicaid payment acceptance has a temporal relationship with the implementation of MAT in SUD treatment programs serving one of the largest racial/ethnic minority communities in the United States.

**KEYWORDS:** Evidence-based practices, medication-assisted treatment, contingency management, racial and ethnic groups

Delivering evidence-based practices (EBPs), such as medication-assisted treatment (MAT) and contingency management treatment (CMT), to effectively address substance use disorder (SUD) is a priority in this field. The use of medications, such as buprenorphine for opioid dependence or naltrexone for alcohol or opioid dependence in conjunction with psychosocial interventions, is considered effective treatments for SUDs.[1] CMT, which consists of reinforcing positive behaviors, is one of the most effective psychosocial approaches to reducing substance use.[2] Despite this evidence, these EBPs are not widely implemented in SUD.[3,4]

Nationally, less than 35% of treatment programs offer MAT and 42% offered CMT.[4] In large treatment systems in metropolitan regions of the country, such as Los Angeles, less than 25% of programs report offering MAT and 35% offered CMT in 2011.[3] In particular, delivering MAT is surprisingly low, even after hospitalization for opioid-related issues.[5]

A common problem to implementing new treatment practices in SUD treatment is limited program capacity.[6] This study examines one possible influence—Medicaid payment acceptance—on program capacity. We define capacity as the degree of leadership, readiness for change, and public funding a program develops to implement new practices. This study builds from developing research showing that directorial leadership, professional accreditation, and Medicaid payment acceptance are associated with implementation of CMT and that Medicaid payment acceptance is associated with MAT in predominantly racial or ethnic minority communities of Los Angeles County.[3,4] As Medicaid certification has become a key system component to deliver MAT, it is critical to explore its role of Medicaid as a unique payment and regulatory mechanism for supporting the implementation of MAT in outpatient SUD treatment.[7] Unlike prior research, limited to cross-sectional data, this research explores changes in this relationship over a 2-year period.

Some prior research has suggested that public funding plays an important role in developing program capacity to deliver MAT in SUD treatment. For instance, Medicaid covers methadone treatment and decreases financial uncertainty through increasing revenue for programs to deliver EBPs, such as CMT.[6–8] Establishing temporal relationship between Medicaid payment acceptance and changes in MAT and CMT delivery is critical for informing the roll out of the Medi-Cal Organized

Delivery System Waiver in Los Angeles County,[9] which seeks to support the delivery of evidence-based care services and improve treatment outcomes.[10]

We rely on a resource-dependent theoretical framework to explain the role of Medicaid on the implementation of EBPs. Resource dependence theory posits that organizations' high dependence on necessary resources determines their selection of core services,[11] and SUD treatment programs rely heavily on their regulatory and funding environment for financial and service delivery resources.[7,8] Many SUD treatment programs face pressure from Medicaid to deliver government-endorsed medications (eg, buprenorphine).[8] By accepting Medicaid payments and other sources of revenue, SUD treatment programs may enhance their financial stability as well as their capacity to deliver EBPs (eg, MAT). Specifically, the process of certifying programs, which entails ensuring that they have the service delivery and billing capacity to receive Medicaid payments, may build capacity to deliver CMT and MAT. Hence, those programs that report completing this process and accepting Medicaid payments in 1 year could be more likely to deliver CMT and MAT in a subsequent year. Consistent with this resource-dependent framework,[11] we hypothesized there would be a positive time-lagged effect of Medicaid payment acceptance on CMT implementation (Hypothesis 1), as well as a positive time-lagged effect of Medicaid payment acceptance on MAT implementation (Hypothesis 2).

## Methods

### Sampling frame and data collection

The sampling frame we used in this study has been described in detail previously.[12] The sampling frame for program data included 122 programs from wave 1 (2011) and 112 programs from wave 2 (2013). These are programs funded by the Department of Public Health in Los Angeles County, California. For this study, the data were limited to the 61 programs for which data were available in both waves. More than 30% of programs either closed or change scope of services during this period. These programs featured primarily female counselors (68% in wave 1 and 69% in wave 2) whose average age was 47 in both waves. Respondents were predominantly counselors and managers of Latino (40% wave 1, 46% wave 2) or African American (21% wave 1, 24% wave 2) background. There were no differences between programs we included and excluded for analysis when considering key outcome and predicting variables ($P > .05$), making our analytical sample a representative sample of outpatient treatment programs located in racial/ethnic minority communities of Los Angeles County.

### Measures

*Dependent variables.* Program staff noted the frequency of CMT or MAT implementation on a 5-point scale (1 = *never* to 5 = *always*). Given the skewed distribution of results on these 2 variables, we dichotomized them to indicate programs reporting high implementation (ie, 1 = ratings of 4 [*often*] or 5 [*always*]). High implementation of CMT decreased from 43% in 2011 to 15% in 2013 ($P < 0.05$), while high implementation of MAT decreased from 16% in 2011 to 6% in 2013.[12]

*Independent variables.* The independent variable of interest is Medicaid payment acceptance. We measured acceptance of Medi-Cal payments with a binary (yes/no) indicator, asking supervisors whether the program accepted Medi-Cal payments in the current fiscal year. Of the 61 programs in our analytical sample, 48 (79%) accepted Medicaid payments in wave 1 and 40 (66%) accepted them in wave 2.

We also accounted for independent variables representing organizational capacity and associated with implementation of new practices in treatment programs. Capacity variables included measures such as organizational readiness for change (ORC) and directorial leadership. We included 5 indicators of resources (to what extent staff have adequate offices, staffing, training, equipment, and Internet access; Cronbach's α of .86) of the full measure of ORC.[13,14] Preliminary analysis justified only using the submeasure of resources from the full 5-submeasure scale representing ORC. Supervisors rated how much they perceived their programs reflected each of these items, using a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). We added and averaged items from the subscale of resources to create a score. We multiplied this average score by 10 to produce a scale in the range of 10 to 50. Higher scores indicated staff perceptions of increased program resources for change. The mean score in wave 1 is 38.3 with a standard deviation of 4.8, while wave 2 is 37.5 with a standard deviation of 4.3.

The leadership scale measured 2 leadership styles associated with the implementation of new practices.[13,14] Transformational leadership represents leaders' promotion of employees' professional development (7 items total), whereas transactional leadership relates to leaders' promotion of job expectations using reward and incentives (2 items; Cronbach's α = .96). Supervisors and staff rated how much they agreed their director's leadership supported transformational and transactional leadership, using a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*). Treatment staff's higher scores represent higher level of directorial leadership (Cronbach's α = .92). The mean score in wave 1 is 39.1 with a standard deviation of 6.8 and that in wave 2 is 39.3 with a standard deviation of 4.6.

Finally, we controlled for regulation because it also plays an important role in the implementation of new practices. We measured accreditation by The Joint Commission (TJC) with dichotomous scales. Of the 61 programs in our sample, 11 (18%) had TJC accreditation in wave 1 and 15 (25%) had it in wave 2.

### Analytic strategy

We tested hypotheses using cross-lagged logistic regressions, a well-documented technique for predictive estimations that are

**Table 1.** Factors included in models.

|  | WAVE 1 | WAVE 2 |
| --- | --- | --- |
| Medication-assisted treatment (MAT) | 12 (19.7%) | 5 (8.2%) |
| Contingency management treatment (CMT)* | 28 (45.9%) | 16 (26.2%) |
| Medicaid | 48 (78.7%) | 40 (65.6%) |
| The joint commission (TJC) | 11 (18.0%) | 15 (24.6%) |
| Organizational readiness for change (Resources) | 38.3 (4.8) | 37.5 (4.3) |
| Leadership | 39.1 (6.8) | 39.3 (4.6) |

*$P$ value $< .05$.

more reliable than those of ordinary linear regression.[15] We estimated a baseline model with only autoregressive effects for each measure. The second model estimated the autoregressive effects and cross-lagged paths with measure 1 (eg, Medicaid payment acceptance) predicting measure 2 (eg, MAT) at the subsequent time point. The third model estimated the autoregressive effects and cross-lagged paths with measure 2 (eg, MAT) predicting measure 1 (eg, Medicaid payment acceptance) at the subsequent time point. Finally, the fourth model (ie, the fully cross-lagged model) estimated the autoregressive effects and cross-lagged paths between the 2 measures. We handled missing data, which were limited to less than 4% in most variables, with multiple imputation. We conducted analyses using Mplus, version 7. Our study had statistical power to detect a small to medium effects.

## Results

The program capacity factors included (Medicaid payment acceptance, organization readiness for change resources, TJC, or directorial leadership) did not change significantly over time. But high implementation of CMT decreased from 46% in wave 1 to 26% in wave 2 ($P<.05$; see Table 1).

Our results did not support Hypothesis 1 (see Table 2). That is, Medicaid payment acceptance at wave 1 did not predict high implementation of CMT at wave 2 (standardized estimate = 0.170, SE = 0.208, $P>.05$).

We did find support for Hypothesis 2 (see Table 2). Medicaid payment acceptance at wave 1 predicted high implementation of MAT at wave 2 (standardized estimate = 0.880, SE = 0.047, $P>.001$).

Other important findings include the relationship between leadership at wave 1 and Medicaid payment acceptance at wave 2 (standardized estimate = 0.420, SE = 0.160, $P>.01$). We reviewed the number of quadrature points to check the adequacy of our logistic regression models.

## Discussion

This study focused on understanding the temporal relationship between SUD treatment organizations' acceptance of Medicaid payment and their implementation of 2 EBPs (ie, MAT and CMT), accounting for other program capacity factors. To our knowledge, this is the first study that has examined and supported a positive temporal relationship between Medicaid payment acceptance and subsequent implementation of MAT. The current finding is significant given it provides evidence supporting the role of Medicaid program certification, which allows programs to accept payments in MAT implementation, a practice that has received increasing evidentiary support.[16]

We observed a significant decrease in programs fully implementing CMT, while full implementation of MAT was not statistically significant. This decrease in high implementation of CMT may be associated with limited financial and policy supports for programs to invest in the consistent delivery of CMT. Most programs may not implement CMT with high degrees of fidelity. The non-significant changes in Medicaid payment acceptance may be due to a new re-licensing process that all programs needed to complete. But we accounted for important program resources in our study (ie, public funding, licensing, professional accreditation, and staff with graduate degrees) that have been associated with implementation of MAT and CMT in other studies.[3,4] Nonetheless, the temporal relationship identified in our study between Medicaid and MAT was robust.

Program directors' leadership had a temporal relationship with Medicaid payment acceptance in wave 2. This suggests that directors' support of their staff also may be indicative of their programs' preparedness to receive Medicaid payments. The current finding is timely given the increasing need to identify how program directors can promote the implementation of MAT to address the nation's current opioid crisis.[16]

Although significant, the study has some limitations. Cross-lagged analyses improved our ability to examine temporal relationships, but strength of inferences that may be drawn from them is not as great as those that may be made with experimental designs. Also, our analytical models may include predictive factors that may be endogenous, such as Medicaid payment

**Table 2.** Cross-lagged relationships between Medicaid at wave 1 (2011) and MAT and CMT at wave 2 (2013).

|  | $MAT_{W2}$ | | $MEDICAID_{W2}$ | |
|---|---|---|---|---|
|  | STANDARDIZED ESTIMATE | SE | STANDARDIZED ESTIMATE | SE |
| $MAT_{w1}$ | 0.104 | 0.115 | 0.040 | 0.151 |
| $Medicaid_{w1}$ | 0.880** | 0.047 | 0.216 | 0.133 |
| $TJC_{w1}$ | −0.038 | 0.151 | 0.210 | 0.181 |
| $ORC\ Resources_{w1}$ | −0.011 | 0.145 | −0.126 | 0.177 |
| $Leadership_{w1}$ | 0.003 | 0.139 | 0.420* | 0.160 |
|  | $CMT_{W2}$ | | $MEDICAID_{W2}$ | |
|  | STANDARDIZED ESTIMATE | SE | STANDARDIZED ESTIMATE | SE |
| $CMT_{w1}$ | 0.070 | 0.175 | −0.113 | 0.152 |
| $Medicaid_{w1}$ | 0.170 | 0.208 | 0.223 | 0.125 |
| $TJC_{w1}$ | −0.141 | 0.166 | 0.220 | 0.185 |
| $ORC\ Resources_{w1}$ | −0.011 | 0.218 | −0.087 | 0.171 |
| $Leadership_{w1}$ | −0.093 | 0.209 | 0.412* | 0.158 |

Abbreviations: CMT, contingency management treatment; MAT, medication-assisted treatment; ORC, organizational readiness for change; TJC, The Joint Commission; W1, Wave 1; W2, Wave 2.
Bolded line in figure is the only statistically significant relationship found.
*$P < .01$, **$P < .001$.

acceptance. But, this risk for endogeneity does not significantly impact modeling of our outcomes of interest (MAT and CMT). Another limitation was that only 2 years of data (2011 and 2013) were available, which may be insufficient for examining the full effect of Medicaid expansion on high implementation of CMT. But with these 2 time points, we observed a robust relationship more so than studies that rely on cross-sectional data. Finally, our data are limited to a single county and thus the extent to which they generalize to other counties is not known. Nonetheless, the current data are from the largest county in the United States impacting more than 10 million people and data from nationally representative samples show similar rates of implementation across the country.[3,4]

Findings have significant implications for the current health care policy in the United States that seeks to increase access to MAT during the opioid epidemic. As states which originally opposed expanding Medicaid are now taking steps to increase public insurance coverage, findings from this study highlight the importance of providers' acceptance of Medicaid to deliver MAT, a service need particularly critical for treating opioid use disorders.

## Conclusions
In sum, this study provides empirical evidence suggesting that Medicaid payment acceptance may indeed lead to increases in SUD treatment programs' implementation of MAT. As large treatment systems across the United States are considering or already implementing Medicaid-funded MAT approaches,[9] developing director's leadership could help programs become Medicaid certified. The Medicaid-funded delivery system may increase access to MAT, particularly in racial/ethnic minority communities impacted by use of heroin and other opioids.

## Author Contributions
EGG and BRG were the study principal investigator and developed the theoretical background and conceptualization of the study. BC, YK and WAV contributed to the study design, writing, data analysis, and editing. All authors reviewed and approved the final draft.

## REFERENCES
1. Comer SD, Walker EA, Collins ED. Buprenorphine/naloxone reduces the reinforcing and subjective effects of heroin in heroin-dependent volunteers. *Psychopharmacology*. 2005;181:664–675. doi:10.1007/s00213-005-0023-6.
2. Prendergast M, Podus D, Finney J, Greenwell L, Roll J. Contingency management for treatment of substance use disorders: a meta-analysis. *Addiction*. 2006;101:1546–1560. doi:10.1111/j.1360-0443.2006.01581.x.
3. Guerrero EG, He A, Kim A, Aarons GA. Organizational implementation of evidence-based substance abuse treatment in racial and ethnic minority communities. *Adm Policy Ment Health*. 2014;41:737–749. doi:10.1007/s10488-013-0515-3.
4. Roman PM, Abraham AJ, Knudsen HK. Using medication-assisted treatment for substance use disorders: evidence of barriers and facilitators of implementation. *Addict Behav*. 2011;36:584–589.

5. Naeger S, Ali MM, Mutter R, Mark T, Hughey L. Post-discharge prescription fills following an opioid hospitalization. *Psychiatr Serv*. 2016;67:1264–1267.

6. Guerrero EG, Aarons GA, Grella CE, Garner BR, Cook B, Vega WA. Program capacity to eliminate outcome disparities in addiction health services. *Adm Policy Ment Health*. 2014;43:23–35. doi:10.1007/s10488-014-0617-6.

7. Rawson R, McLellan T. Health reform and treatment changes in organization, financing, and standards of care. Paper presented at: Los Angeles County Public Health Department; 8–9 December 2010; Los Angeles, CA.

8. McKenna RM. Treatment use, sources of payment, and financial barriers to treatment among individuals with opioid use disorder following the national implementation of the ACA. *Drug Alcohol Depend*. 2017;179:87–92.

9. Los Angeles County Department of Public Health. System transformation to advance recovery and treatment. http://publichealth.lacounty.gov/sapc/Health-Care/HealthCareReform.htm. Accessed January 20, 2018.

10. California Department of Health Care Services. Section 1115 Medicaid waiver resources. http://www.dhcs.ca.gov/provgovpart/pages/waiverrenewal.aspx. Updated 2017. Accessed January 20, 2018.

11. Pfeffer J, Salancik GR. *The External Control of Organizations*. New York, NY: Harper & Row; 1978.

12. Guerrero EG, Garner B, Cook B, Kong Y. Does the implementation of evidence based and culturally competent practices reduce disparities in addiction treatment outcomes? *Addict Behav*. 2017;73:119–123. doi:10.1016/j.addbeh.2017.05.006.

13. Lehman WE, Greener JM, Simpson DD. Assessing organizational readiness for change. *J Subst Abuse Treat*. 2002;22:197–209.

14. Edwards JR, Knight DK, Broome KM, Flynn PM. The development and validation of a transformational leadership survey for substance use treatment programs. *Subst Use Misuse*. 2010;45:1279–1302. doi:10.3109/10826081003682834.

15. Kenny DA. Cross-lagged panel correlation: a test for spuriousness. *Psychol Bull*. 1975;82:887–903. doi:10.1037/0033-2909.82.6.887.

16. Volkow ND, Frieden TR, Hyde PS, Cha SS. Medication-assisted therapies—tackling the opioid-overdose epidemic. *N Engl J Med*. 2014;370:2063–2066.