

UCSF

UC San Francisco Previously Published Works

Title

The Impact of Medicaid Enrollment on Veterans Health Administration Enrollees' Behavioral Health Services Use.

Permalink

<https://escholarship.org/uc/item/0gv8q5d5>

Journal

Health services research, 53 Suppl 3(Suppl Suppl 3)

ISSN

0017-9124

Authors

Vanneman, Megan E
Phibbs, Ciaran S
Dally, Sharon K
[et al.](#)

Publication Date

2018-12-01

DOI

10.1111/1475-6773.13062




Peer reviewed

© Health Research and Educational Trust

DOI: 10.1111/1475-6773.13062

SPECIAL ISSUE: LINKING VA AND NON-VA DATA TO ADDRESS US VETERAN HEALTH SERVICES ISSUES

The Impact of Medicaid Enrollment on Veterans Health Administration Enrollees' Behavioral Health Services Use

Megan E. Vanneman , Ciaran S. Phibbs, Sharon K. Dally, Amal N. Trivedi , and Jean Yoon 

Objective. To examine Veterans Health Administration (VA) enrollees' use of VA services for treatment of behavioral health conditions (BHCs) after gaining Medicaid, and if VA reliance varies by complexity of BHCs.

Data Sources/Study Setting. VA and Medicaid Analytic eXtract utilization data from 31 states, 2006-2010.

Study Design. A retrospective, longitudinal study of Veterans enrolled in VA care in the year before and year after enrollment in Medicaid among 7,249 nonelderly Veterans with serious mental illness (SMI), substance use disorder (SUD), posttraumatic stress disorder (PTSD), depression, or other BHCs.

Data Collection/Extraction Methods. Utilization and VA reliance (proportion of care received at VA) for BH outpatient and inpatient services in unadjusted and adjusted analyses.

Principal Findings. In adjusted analyses, we found that overall Veterans did not significantly change their use of VA outpatient BH services after Medicaid enrollment. In beta-binomial models predicting VA BH outpatient reliance, veterans with SMI (IRR = 1.38, $p < .05$), PTSD (IRR = 1.62, $p < .01$), and depression (IRR = 1.36, $p < .05$) had higher reliance than veterans with other BHCs after Medicaid enrollment.

Conclusions. While veterans did not change the amount of VA outpatient BH services they used after enrolling in Medicaid, the proportion of care they received through VA or Medicaid varied by BHC.

Key Words. Veterans, Medicaid, behavioral health

The Affordable Care Act (ACA) allowed states to expand Medicaid to previously ineligible low-income adults, including many veterans (2010). When Veterans Health Administration (VA) enrollees enroll in Medicaid, they have access to two different healthcare systems. It is estimated that about 875,000 nonelderly veterans had Medicaid in 2015, 41 percent of whom also had

military or VA coverage (The Henry J. Kaiser Family Foundation 2017). In comparison with other veterans, these dual enrollees have more disabilities and are lower income (Dworsky, Farmer, and Shen 2017). Therefore, they are unlikely to face a co-pay in either healthcare system. However, the Medicaid program may improve access to care for eligible veterans facing access barriers to VA care, such as long travel distance to VA providers (Dworsky, Farmer, and Shen 2017), but this may be tempered for behavioral health services as psychiatrists have a relatively low acceptance rate in the Medicaid program when compared to other specialists (43 percent vs. 73 percent) (Bishop et al. 2014).

Despite the growth of VA-Medicaid dual users, there is limited literature on this dual use. One study simulated the effect of the Medicaid expansion on VA enrollment, inpatient days, and outpatient visits for veterans under 65 years old (Frakt, Hanchate, and Pizer 2015). The authors projected overall declines in VA enrollment (−9 percent), inpatient days (−12 percent), and outpatient visits (−6 percent) in Medicaid expansion states. For a VA enrollee population under age 65, another study using preexpansion data found an increase in VA outpatient visits and small decreases in VA emergency department and inpatient visits the year following enrollment in Medicaid (Yoon et al. 2017). The study also reported that VA outpatient and inpatient reliance (proportion of care received at VA) was higher for Veterans with behavioral health conditions (BHCs) than Veterans without BHCs. However, it is not known whether reliance varies by type of behavioral health diagnosis (i.e., serious mental illness (SMI), substance use disorder (SUD), posttraumatic stress disorder (PTSD), depression, or other).

Address for correspondence to Megan E. Vanneman, Ph.D., M.P.H., Informatics, Decision-Enhancement and Analytic Sciences Center, VA Salt Lake City Health Care System, Salt Lake City, UT; Department of Internal Medicine, Division of Epidemiology, University of Utah School of Medicine, Salt Lake City, UT; Department of Population Health Sciences, Division of Health System Innovation and Research, University of Utah School of Medicine, Salt Lake City, UT; and also University of Utah Health, Williams Building, 295 Chipeta Way, Salt Lake City, UT 84108; e-mail: megan.vanneman@va.gov. Ciaran S. Phibbs, Ph.D., Sharon K. Dally, M.S., and Jean Yoon, Ph.D., M.H.S., are with the Health Economics Resource Center, VA Palo Alto Health Care System, Menlo Park, CA. Ciaran S. Phibbs, Ph.D., is with the Center for Innovation to Implementation, VA Palo Alto Health Care System, Menlo Park, CA. Ciaran S. Phibbs, Ph.D., is with the Department of Pediatrics, Stanford University School of Medicine, Stanford, CA. Amal N. Trivedi, M.P.H., is with the Providence VA Medical Center, Providence, RI. Amal N. Trivedi, M.P.H., is with the Brown University School of Public Health, Providence, RI. Jean Yoon, Ph.D., M.H.S., is with the Department of General Internal Medicine, UCSF School of Medicine, San Francisco, CA.

Furthermore, existing literature on the impact of Medicaid access on veterans' health care has not focused on behavioral health. Both the VA and Medicaid have served as critical providers and payers of institutions supporting treatment for individuals with BHCs, including mental health and substance use disorders (Shirk 2008; Watkins et al. 2011). With policy debates on the future of VA and Medicaid underway, it is important to understand the role of both systems in providing care to veterans.

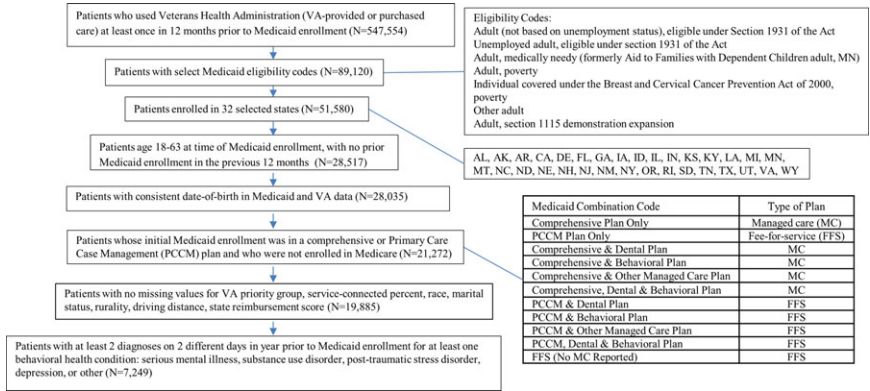
This study therefore examined VA enrollees' behavioral health use following enrollment in Medicaid. We hypothesized that VA enrollees would utilize Medicaid for some behavioral health services after gaining Medicaid coverage, but that VA use would remain high. This hypothesis is consistent with previous findings on dual VA-Medicare enrollees, which found high reliance on VA behavioral health services (Liu et al. 2010) as well as a positive association between having a BHC and VA reliance (Petersen et al. 2010). We also hypothesized that VA reliance would vary based on BHC, specifically that individuals with combat-related BHCs—such as PTSD—would have higher reliance on VA after enrolling in Medicaid than individuals with less severe conditions, such as depression. This is the first study to examine differences by BHC categories (SMI, SUD, PTSD, depression, and other), and the hypothesis is motivated by previous work showing greater military and combat-related cultural competency among VA versus civilian providers (Tanielian et al. 2014) and VA leadership in developing specialized behavioral health treatment (e.g., for PTSD, depression, military sexual trauma, and suicide prevention) (U.S. Department of Veterans Affairs 2012; Finley et al. 2017; Lemle 2018).

METHODS

Study Design

We conducted a retrospective, longitudinal study of the use of face-to-face outpatient and inpatient behavioral health services in the year before and year after enrollment in Medicaid among 7,249 nonelderly veterans with BHCs (Figure 1). We excluded veterans without VA utilization, veterans with Medicare coverage, and veterans enrolled in Medicaid through disability eligibility. Veterans had to have been enrolled in the VA for 12 months prior to enrolling in Medicaid for at least 1 month in calendar year (CY) 2006 to 2010. Veterans were included from 31 states (see Figure 1).

Figure 1: Sample Derivation [Color figure can be viewed at wileyonlineli-
brary.com]



We categorized patients into mutually exclusive categories based on a hierarchical ordering of behavioral health severity (Hunter et al. 2015): SMI ($n = 975$); SUD ($n = 2,478$); PTSD ($n = 1,044$); depression ($n = 1,799$); and other BHCs ($n = 953$). SMI included schizophrenia, manic depression, and other psychosis. SUD included alcohol and any other drug dependence/abuse. Other BHCs included other nonpsychotic disorders, borderline personality disorder, antisocial personality disorder, and other personality disorders.

We measured these patients’ behavioral health utilization in VA for the 12 months before and 12 months after enrolling in Medicaid, and their Medicaid utilization for the 12 months after enrolling in Medicaid. Our main outcome variables were number of VA outpatient and number of VA inpatient behavioral health services in the year before and year after enrolling in Medicaid. Our secondary outcome variables were VA reliance (proportion of care received at VA) for behavioral health outpatient visits and VA reliance for behavioral health inpatient stays in the year after enrolling in Medicaid. This study was approved by the Stanford University Institutional Review Board (IRB) and the University of Utah IRB.

Data Linkage, Sources, and Challenges

VA-Medicaid data linkage is performed centrally by the VA Information Resource Center (VIREC). Veterans’ data are linked through scrambled social security number. Specifically for our study, VIREC provided linked Medicaid Analytic Extract (MAX) and VA enrollee files for CY2006-2010

(U.S. Department of Veterans Affairs 2016). We used the VA Assistant Deputy Under Secretary for Health (ADUSH) Enrollment file and VA utilization from VA Medical SAS files from fiscal years (FY) 2005–2011 to limit our cohort to users of VA health care (U.S. Department of Veterans Affairs 2015). Utilization for care provided by non-VA providers and paid for by VA came from VA Purchased Care files. Purchased care was included as VA care.

There are certain Medicaid data challenges that are important to highlight. First, there is a long time lag in receiving Medicaid data; hence, our analyses were of pre-ACA data. Currently, Medicaid data are available through 2013. Second, there was limited information on enrollees utilization in Medicaid managed care plans, which meant that we limited our study to states with fee-for-service (FFS) only or with high quality managed care data. Third, there was limited information on providers. Fields for national provider identifier and provider taxonomy code were not consistently populated in our data, which led us to devise a system for classifying providers based on the service-type codes most frequently used by each provider and billing provider information. Fourth, there were differences in service-type coding systems by state. Some states have their own service-type coding systems rather than the standard Current Procedural Terminology (CPT), Healthcare Common Procedure Coding System (HCPCS), or International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) coding systems, and we obtained documentation on these state-specific coding systems when possible. Fifth, there were undocumented differences in state data systems (e.g., methods of coding missing data), which necessitated extensive data cleaning procedures, including identification of the particular values denoting missing data used by each state for each variable. Sixth, there were occasionally discrepancies between VA and Medicaid demographic data (i.e., date of birth, gender, place of residence). We dropped patients with discrepancies in date of birth. In most cases of discrepant age, gender, and zip code, we relied on the Medicaid values.

Behavioral Health Utilization Measures

VA behavioral health utilization for each patient was estimated in the year before and year after enrolling in Medicaid, and Medicaid behavioral health utilization was estimated for the year after enrolling in Medicaid. Medicaid behavioral health outpatient utilization included care received at a clinic, physician's office, or hospital outpatient department,

and excluded care categorized as laboratory, diagnostic, pharmacy, long-term care, and home care services. Each Medicaid behavioral health outpatient visit had a unique combination of patient, service day, and servicing provider. For VA services, exclusion criteria similar to the Medicaid data applied. Each VA behavioral health outpatient visit had a unique combination of patient, service day, and clinic location. Each behavioral health inpatient stay included a unique combination of patient, admission day, and servicing provider for Medicaid and patient, discharge day, and VA facility for VA. For outpatient care, visits were classified as behavioral health if either the service code or the provider type was classified as behavioral health. Service-type code classification varied by the type of code. CPT/HCPCS codes were mapped to Berenson-Eggers Type of Service (BETOS) code or to Agency for Healthcare Research and Quality (AHRQ) Healthcare Cost and Utilization Project (HCUP) clinical classification categories. ICD-9-CM diagnosis codes or state-specific service-type codes were categorized based on review of specific codes. For both Medicaid and VA, emergency department visits were counted as a separate category and are reported on in a previous study (Yoon et al. 2017). Inpatient care was categorized as behavioral health based on the principal diagnosis using a mapping developed by the VA Women's Health Evaluation Initiative (Frayne et al. 2014), which is an extension of the AHRQ Clinical Classifications Software (CCS) for ICD-9-CM.

When veterans were enrolled in both VA and Medicaid, VA behavioral health reliance was calculated as: $VA \text{ behavioral health reliance} = VA \text{ behavioral health utilization} / (VA \text{ behavioral health utilization} + Medicaid \text{ behavioral health utilization})$. VA reliance was calculated for outpatient behavioral health visits and inpatient behavioral health stays separately. Reliance was only calculated for patients who had behavioral health outpatient visits or stays in the post-Medicaid enrollment period.

Other Measures

While the association between demographic and health variables with VA behavioral health utilization and reliance have not been previously studied for dual VA-Medicaid enrollees, we accounted for control variables used in dual VA-Medicare regressions (Petersen et al. 2010; Liu et al. 2011) and additional factors hypothesized to be related to VA and Medicaid demand for services (Yoon et al. 2017). Measures on age, sex, race/ethnicity, state of Medicaid enrollment, FFS or managed care Medicaid plan status, Medicaid

eligibility, and months enrolled in Medicaid category were constructed from Medicaid data. Measures on marital status, driving distance to nearest VA primary/secondary care site, VA priority group (see Appendix SA2 for definition), and Charlson Comorbidity Index (CCI) were constructed from VA data. We also included two county-level variables from the Health Resources & Services Administration's Area Health Resource File—mental health professional shortage area (MHPSA) to account for access to nonfederal behavioral health providers and unemployment rate to account for economic conditions.

We also included measures of Medicaid generosity of eligibility (“eligibility score”), quality of care measures (“quality score”), and reimbursement generosity (“reimbursement score”) (Arellano and Wolfe 2007; Sommers et al. 2012). These state Medicaid program scores were developed by experts based on 55 indicators for the presence of Medicaid program factors for these categories: eligibility (based on indicators for financial and categorical requirements), reimbursement (based on payments per enrollee and demographic group, physician fees, and Medicaid fees compared to Medicare fees), and quality (based on indicators for structure, process, and outcomes). States could not receive points for any of these measures for just meeting federal requirements, but could have points deducted for not meeting measurements or norms.

Analysis

We calculated standardized differences between each BHC group and the other BHC category. Standardized differences are the difference in means or proportions divided by the standard error, and a value above 0.20 indicates an important difference between groups (Yang and Dalton 2012). We calculated the mean number of VA behavioral health outpatient visits and inpatient stays in the year before and year after Medicaid enrollment and annualized Medicaid behavioral health outpatient visits and inpatient stays in the year following Medicaid enrollment. We used *t*-tests for each BHC group to compare VA behavioral health utilization before and after Medicaid enrollment. We calculated reliance for the months of dual enrollment and used analysis of variance (ANOVA) to study differences between BHC groups. Standardized differences, *t*-tests, and ANOVAs were conducted using SAS9.2 (SAS Institute, Cary, NC, USA).

We fit statistical models using *STATA* 14.0 (StataCorp, College Station, TX, USA). In order to understand whether VA utilization changed after enrollment in Medicaid, we used multivariable generalized

estimating equations (GEE) using a gamma distribution and a log link function, conditional on positive VA behavioral health utilization. This count model for VA outpatient visits has two observations per veteran (one for the “pre” baseline year, and one for the “post” year following Medicaid enrollment), and a postindicator as the explanatory variable of interest, indicating how VA visits changed after Medicaid expansion. Thus, the GEE models include data for veterans with behavioral health utilization in both the pre- and postyears. We also ran beta-binomial models predicting VA reliance, since the majority of veterans were either entirely reliant on VA or entirely reliant on Medicaid for behavioral health care (Liu et al. 2011, 2013). Since reliance is a measure of dual system use, these models include data for veterans with behavioral health utilization in the postyear only, when VA enrollees were also enrolled in Medicaid. All regression models were adjusted with the aforementioned veteran and Medicaid program characteristics, and also included fixed effects for Medicaid enrollment year to account for differences in economic conditions.

RESULTS

Descriptive Behavioral Health Cohort Characteristics

Our cohort consisted of 7,249 nonelderly veterans with BHCs who used VA for one year prior to enrolling in Medicaid for at least 1 month in the subsequent year (Table 1). There were some notable differences in patient characteristics by behavioral health group.

Unadjusted VA and Medicaid Behavioral Health Utilization

In the year before enrolling in Medicaid, veterans with BHCs had high levels of behavioral health outpatient utilization (Figure 2a). In the baseline year, on average, veterans in the SUD group had the largest mean number of VA behavioral health visits (27.86; SD = 40.68) and veterans in the other BHC group had the fewest (3.25; SD = 4.42) ($p < .0001$). After gaining Medicaid coverage, mean VA behavioral health outpatient visits increased a statistically significant amount for the PTSD (19 percent; $p < .01$), depression (34 percent; $p < .0001$), and other BHC (57 percent; $p < .0001$) groups, and decreased nonsignificantly for the SMI (−5 percent; $p = .33$) and SUD (−2 percent; $p = .49$) groups. Total (VA + Medicaid) mean behavioral health outpatient visits increased for all BHC groups and was statistically significant except in the

Table 1: Patient and State Medicaid Program Characteristics for Veterans with Behavioral Health Conditions

Characteristic	Behavioral Health Condition Group ^{*,†,‡}				
	SMI (n = 975)	SUD (n = 2,478)	PTSD (n = 1,044)	Depression (n = 1,799)	Other (n = 953)
Patient characteristics					
Age, years	43.4 (10.3)	47.2 (8.7)	38.6 (11.8)	42.2 (10.9)	42.8 (11.1)
Standardized difference	0.06	0.41	-0.38	-0.04	N/A
Sex, %					
Female	23	7	34	35	25
Male	77	93	66	65	75
Standardized difference	0.04	0.49	-0.20	-0.23	N/A
Race/ethnicity, %					
Black	34	45	27	25	29
Hispanic	8	9	12	9	9
Other	2	2	3	2	3
White	57	45	58	64	59
Standardized difference	0.15	0.34	0.11	0.10	N/A
Marital status, %					
Married	25	19	45	39	43
Separated/ divorced/widowed	34	37	25	32	30
Single	40	44	30	29	28
Standardized difference	0.38	0.54	0.11	0.08	N/A
Rurality, %					
Highly rural	1	1	1	1	1
Rural	28	21	39	37	33
Urban	71	78	60	62	66
Standardized difference	0.11	0.28	0.13	0.10	N/A
Driving distance VA primary care, miles [§]					
Driving distance VA primary care, miles [§]	11.2 (12.9)	8.8 (11.2)	14.5 (14.8)	14.4 (13.8)	13.5 (13.5)
Standardized difference	-0.23	-0.49	0.04	0.07	N/A
Driving distance VA secondary care, miles [¶]					
Driving distance VA secondary care, miles [¶]	34.8 (38.5)	25.9 (34.3)	50.7 (48.0)	46.4 (43.5)	41.0 (42.3)
Standardized difference	-0.21	-0.52	0.20	0.15	N/A
VA priority group, %					
One	14	4	24	12	8
Two	8	5	16	12	10
Three	14	11	16	18	19
Four-six	57	71	38	49	54
Seven-eight	7	10	5	9	10
Standardized difference	0.28	0.39	0.56	0.18	N/A

continued

Table 1. *Continued*

<i>Characteristic</i>	<i>Behavioral Health Condition Group^{*,†,‡}</i>				
	<i>SMI</i> (<i>n</i> = 975)	<i>SUD</i> (<i>n</i> = 2,478)	<i>PTSD</i> (<i>n</i> = 1,044)	<i>Depression</i> (<i>n</i> = 1,799)	<i>Other</i> (<i>n</i> = 953)
Charlson Comorbidity Index	0.5 (0.7)	0.6 (0.8)	0.3 (0.6)	0.4 (0.7)	0.4 (0.7)
Standardized difference	0.06	0.19	0.12	0.04	N/A
Medicaid eligibility, %					
Eligible under section 1931	17	11	21	21	21
Unemployed adult	2	2	4	4	5
Medically Needy	10	6	17	15	16
Poverty	5	1	10	9	6
Other	8	5	12	10	9
Section 1115 Demo	58	75	36	42	43
Expansion Standardized difference	0.35	0.71	0.22	0.13	N/A
Months enrolled in Medicaid	9.0 (3.7)	9.5 (3.4)	8.6 (3.9)	8.9 (3.8)	9.1 (3.7)
Standardized difference	-0.02	0.11	-0.13	-0.04	N/A
Insurance coverage, %					
Private or other public	7	5	13	9	9
Other	4	3	1	3	2
None reported	89	92	86	89	89
Standardized difference	0.11	0.15	0.13	0.03	N/A
Medicaid plan, %					
FFS	89	89	88	87	88
MC	11	11	12	13	13
Standardized difference	0.05	0.03	0.02	-0.03	N/A
Mental health professional shortage area (MHPSA), %					
Not MHPSA	15	14	16	15	15
Partial MHPSA	45	52	40	46	41
Full MHPSA	39	34	44	39	44
Missing	0.3	0.2	0.1	0.1	0
Standardized difference	-0.02	-0.15	-0.07	-0.03	N/A
Unemployment rate	8.3 (2.9)	6.0 (2.8)	8.5 (2.8)	8.3 (3.0)	8.3 (2.9)
Standardized difference	0.10	0.22	0.04	0.10	N/A

continued

Table 1. *Continued*

Characteristic	Behavioral Health Condition Group ^{*†‡§¶}				
	SMI (n = 975)	SUD (n = 2,478)	PTSD (n = 1,044)	Depression (n = 1,799)	Other (n = 953)
State Medicaid program scores					
Eligibility (91–297)	218.1 (55.8)	228.6 (52.0)	197.6 (55.4)	196.6 (56.9)	198.6 (57.2)
Standardized difference	0.37	0.61	−0.02	−0.03	N/A
Quality of care (−4 to 109)	73.7 (19.5)	75.0 (16.5)	72.6 (23.1)	72.0 (22.3)	74.4 (22.7)
Standardized difference	−0.02	0.04	−0.08	−0.12	N/A
Reimbursement (12 to 250)	75.3 (39.0)	71.8 (43.8)	86.8 (40.4)	85.3 (39.2)	81.8 (38.7)
Standardized difference	−0.21	−0.41	0.13	0.12	N/A

*Other included other nonpsychotic disorders, borderline personality disorder, antisocial personality disorder, and other personality disorder; PTSD, posttraumatic stress disorder; SMI, serious mental illness; SUD, substance use disorder.

†Data are presented as mean (standard deviation) values unless otherwise indicated.

‡Standardized differences are presented below the means (SD) or %. Standardized differences are the difference in means or proportions divided by the standard error. Standardized differences compare each behavioral health group to the “other” group. Imbalance was defined as an absolute value greater than 0.20 (small effect size) and is presented in bold text above.

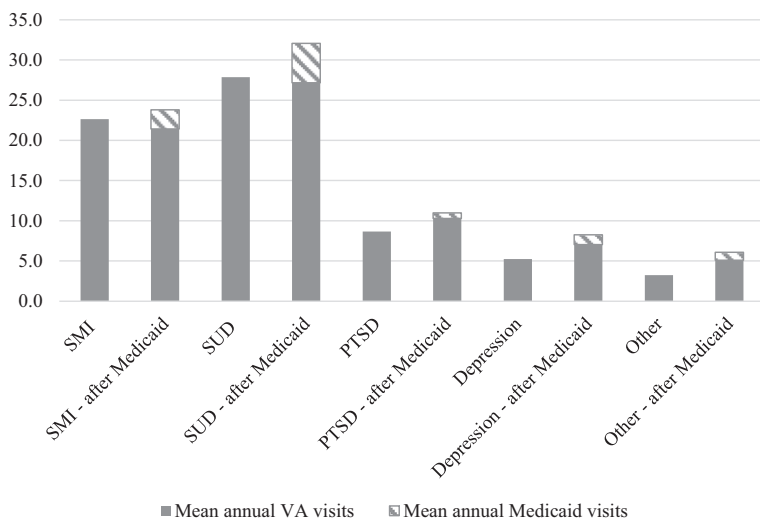
§Used in outpatient reliance regression.

¶Used in inpatient reliance regression.

case of SMI (SMI 5 percent, $p = .36$; SUD 15 percent, $p < .0001$; PTSD 27 percent, $p < .0001$; depression 3 percent, $p < .0001$; other 87 percent, $p < .0001$).

Inpatient utilization patterns broadly mirrored those of outpatient utilization with respect to BHC groups (Figure 2b). On average, veterans in the SUD group had the largest number of VA behavioral health stays (0.90; SD=1.57) and veterans in the other BHC group had the fewest (0.02; SD=0.18) in the baseline year. After gaining Medicaid coverage, mean VA behavioral health inpatient stays increased a statistically significant amount for the PTSD (197 percent; $p < .0001$), depression (81 percent; $p < .0001$), and other BHC (135 percent; $p < .05$) groups and decreased a statistically significant amount for the SMI (−28 percent; $p < .0001$) and SUD (−37 percent; $p < .0001$) groups. Total mean behavioral health inpatient stays increased for the PTSD (126 percent; $p < .001$), depression (171 percent; $p < .0001$), and other BHC (357 percent; $p < .001$) groups and decreased for the SMI (−18 percent; $p < .05$) and SUD (−16 percent; $p < .001$) groups.

Figure 2: (a) Annualized Unadjusted Outpatient Behavioral Health Visits Before and After Enrolling in Medicaid ($n = 7,249$), 2006–09* (b) Annualized Unadjusted Inpatient Behavioral Health Visits Before and After Enrolling in Medicaid ($n = 7,249$), 2006–09*



Notes. *Other included other nonpsychotic disorders, borderline personality disorder, antisocial personality disorder, and other personality disorder; PTSD, posttraumatic stress disorder; SMI, serious mental illness; SUD, substance use disorder.

Adjusted VA Behavioral Health Utilization after Medicaid Enrollment

We predicted VA outpatient behavioral health visits using GEE (Table 2). Our key independent variable of interest, year after Medicaid, indicates whether the number of VA outpatient behavioral health visits changed after enrolling in Medicaid. We found that there was not a statistically significant difference in the number of VA outpatient behavioral health visits used in the year following Medicaid enrollment compared to the baseline year. Veterans in the SMI, SUD, PTSD, and depression groups used more VA outpatient behavioral health visits than veterans in the other BHC group (all $p < .01$). Other factors significantly associated with more VA outpatient behavioral health visits included: age; VA priority groups one, two, and four-six (with seven-eight as the reference group); being black (vs. white); being enrolled in a managed care (vs. FFS) Medicaid plan; having a higher CCI; qualifying for Medicaid through Section 1,931, unemployed adult, medically needy,

poverty/pregnant women, or other Medicaid eligibility status (compared to 1,115 demonstration waiver status); living in a county with a higher unemployment rate; having a longer drive distance to VA primary care; and being in a state with a higher Medicaid reimbursement rate.

Table 2: VA Behavioral Health Care Utilization Regression Results

	<i>VA Outpatient Visits Mean Difference (Standard Error) N = 6,458</i>	<i>VA Inpatient Stays Mean Difference (Standard Error) N = 1,442</i>
Year after Medicaid	1.02 (0.02)	0.43** (0.02)
Patient characteristics		
Behavioral health condition group (ref=Other)		
SMI	3.47** (0.22)	3.25** (0.22)
SUD	4.10** (0.23)	2.45** (0.73)
PTSD	2.11** (0.13)	1.85 (0.62)
Depression	1.40** (0.08)	1.95* (0.63)
Months enrolled in Medicaid	0.99 (0.004)	0.96** (0.01)
Age, years	1.00** (0.002)	1.00 (0.004)
Male (ref=female)	1.00 (0.05)	1.17 (0.15)
VA priority group (ref=7–8)		
One	1.22** (0.09)	1.13 (0.20)
Two	1.23** (0.09)	1.25 (0.24)
Three	1.10 (0.08)	1.05 (0.16)
Four–six	1.18** (0.07)	1.12 (0.14)
Marital status (ref=married)		
Separated/divorced/widowed	1.08 (0.05)	1.00 (0.10)
Single, never married	1.08 (0.05)	1.01 (0.10)
Race/ethnicity (ref=White)		
Black	1.20** (0.04)	0.88 (0.06)
Hispanic	0.98 (0.05)	0.78* (0.10)
Other	1.04 (0.11)	0.65 (0.17)
Managed care	0.87* (0.05)	0.91 (0.11)
Charlson Comorbidity Index	1.09** (0.03)	1.08 (0.05)
Medicaid eligibility (ref=1115 demonstration waiver)		
Section 1931	0.76** (0.04)	0.77 (0.10)
Unemployed adult	0.67** (0.07)	0.52 (0.17)
Medically needy	0.62** (0.04)	0.62** (0.10)
Poverty/pregnant women	0.56** (0.05)	0.41** (0.13)
Other Medicaid eligibility	0.69** (0.05)	–
Mental health professional shortage area		
Partial	0.92 (0.04)	1.19 (0.11)
Whole	0.91 (0.04)	1.25* (0.13)
Unemployment rate	0.97** (0.007)	1.00 (0.02)
Drive distance to VA primary/secondary care	0.99** (0.001)	1.00* (0.001)

continued

Table 2. *Continued*

	<i>VA Outpatient Visits</i> <i>Mean Difference</i> <i>(Standard Error)</i> <i>N = 6,458</i>	<i>VA Inpatient Stays</i> <i>Mean Difference</i> <i>(Standard Error)</i> <i>N = 1,442</i>
State Medicaid program scores		
Reimbursement	0.80** (0.03)	0.74** (0.08)
Quality	1.01 (0.03)	1.12 (0.08)
Eligibility	1.01 (0.04)	0.81* (0.09)

Notes. The outpatient utilization regression was conducted including patients who had at least one VA behavioral health outpatient visit in the baseline year and adjusted for year fixed effects and all factors in the table, including drive distance to VA primary care from a GEE model. The inpatient utilization regression was conducted including patients who had at least one VA behavioral health inpatient stay in the baseline year and adjusted for year fixed effects and all factors in the table—including drive distance to VA secondary care—except for other Medicaid eligibility due to collinearity. Both models adjusted for the factors in the table as well as year fixed effects.

** $p < .01$, * $p < .05$.

We also predicted VA inpatient behavioral health stays using GEE (Table 2). The number of VA inpatient behavioral health stays increased after enrolling in Medicaid ($p < .01$). Veterans in the SMI, SUD, and depression group, but not the PTSD group, used significantly more VA inpatient behavioral health stays than veterans in the other BHC group. Other factors significantly associated with more VA inpatient behavioral health stays included: months enrolled in Medicaid; being Hispanic (vs. white); qualifying for Medicaid through medically needy or poverty/pregnant status (compared to 1,115 demonstration waiver status); living in a whole-county MHPSA; having a longer drive distance to VA secondary care; and being in a state with a higher Medicaid reimbursement rate or more generous eligibility criteria.

Unadjusted VA Behavioral Health Reliance after Medicaid Enrollment

Although VA reliance on behavioral health outpatient care was high for all BHC groups, it varied by group (Table 3). VA outpatient reliance for behavioral health care was lowest for veterans in the SUD group (86 percent) and highest for veterans in the PTSD group (95 percent) ($p < .0001$).

VA behavioral health inpatient reliance was lower than VA behavioral health outpatient reliance for all BHC groups (Table 3). VA behavioral health inpatient reliance ranged from 58 percent for other BHC to 81 percent for PTSD; differences between BHC groups were not statistically significant ($p = .06$).

Table 3: Unadjusted Mean VA Reliance by Behavioral Health Condition*

	SMI (N = 975)		SUD (N = 2,478)		PTSD (N = 1,044)		Depression (N = 1,799)		Other (N = 953)		ANOVA Stats p-Value		
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean		SD	SD
Outpatient behavioral health visits	800	0.91	1,910	0.86	773	0.95	1,138	0.93	489	0.90	0.27	0.23	<.0001
Inpatient behavioral health stays	209	0.73	548	0.75	65	0.81	97	0.73	42	0.58	0.49	0.42	.06

*Other included other nonpsychotic disorders, borderline personality disorder, antisocial personality disorder, and other personality disorder; PTSD, posttraumatic stress disorder; SMI, serious mental illness; SUD, substance use disorder.

Adjusted VA Behavioral Health Reliance after Medicaid Enrollment

In an adjusted beta-binomial model, several patient and state factors predicted VA behavioral health outpatient reliance (Appendix SA2: Table S1). Incidence rate ratios (IRRs) represent the difference in the proportion of total visits and stays that occurred in the VA (VA reliance) associated with each unit change for a continuous variable or category for a dummy variable. With respect to our key independent variables of BHC groups, veterans in the SMI (IRR = 1.38, $p < .05$), PTSD (IRR = 1.63, $p < .01$), and depression (IRR = 1.36, $p < .05$) groups had statistically significantly higher VA behavioral health outpatient reliance than veterans with other BHCs in the year following Medicaid enrollment. Each additional month enrolled in Medicaid was significantly associated with a 9 percent lower proportion of behavioral health outpatient visits occurring in VA ($p < .01$). Other factors associated with higher VA outpatient behavioral health reliance included: compared to being in a lower priority level (7–8), being in higher VA priority levels 1, 2, and 3; being black (vs. white); and having a higher CCI score. Factors associated with lower VA inpatient behavioral health reliance included: being in the Medicaid section 1,931 versus state 1115 demonstration waiver enrollment category; and living in states with generous Medicaid eligibility.

Patient and state factors associated with VA behavioral health inpatient reliance largely differed from the factors associated with VA behavioral health outpatient reliance (Appendix SA2: Table S2). The only two overlapping factors were PTSD group and CCI. As was the case for VA behavioral health outpatient reliance, being in the PTSD (IRR = 3.69, $p < .01$) versus the other BHC group and having a higher CCI score (IRR = 1.29, $p < .05$) was associated with higher VA behavioral health inpatient reliance. Unlike for VA behavioral health outpatient care, being in the SUD (IRR = 2.18) versus other BHC group was also associated with higher VA reliance ($p < .05$). Factors associated with lower VA inpatient behavioral health reliance included: being in the Medicaid medically needy versus state 1115 demonstration waiver eligibility category ($p < .01$); living in states with better Medicaid quality; and longer driving distance to VA secondary care.

Since all veterans were not enrolled in Medicaid for a full 12 months in the post-Medicaid year, we ran a sensitivity analysis to compare the reliance results above with those for the subset of veterans with 12 months of dual enrollment. While not all the same variables are statistically significant when comparing the 1–12 and the 12-month models (perhaps due to sample size

differences), the point estimates are of similar magnitude. The sensitivity analysis regression results appear in Appendix SA2 (Tables S1 and S2).

DISCUSSION

While veterans with BHCs did not significantly alter their utilization of VA outpatient behavioral health visits after enrolling in Medicaid, they did start to use Medicaid outpatient behavioral health services, thus increasing total outpatient behavioral health utilization. In contrast, veterans with BHCs significantly increased their VA inpatient behavioral health stays after enrolling in Medicaid.

Furthermore, after enrolling in Medicaid, veterans received the majority of their behavioral health care in VA. After gaining Medicaid coverage, there were statistically significant differences in VA reliance by BHC. Veterans in all BHC groups used the Medicaid system for some behavioral health care once enrolled in the program. Future work should examine veterans' preferences and care coordination in these two systems by BHC.

Our results contribute new information on dual system use for veterans with BHCs. While previous studies have examined dual VA-Medicare behavioral health utilization (Liu et al. 2010; Petersen et al. 2010), this is the first study on VA-Medicaid dual behavioral health use, and the first to examine differences by BHC categories (SMI, SUD, PTSD, depression, and other).

The linkage of VA and Medicaid data is critically important for research, clinical, and policy communities. In the current study, Veterans decreased their VA behavioral health outpatient care by 9 percent for each additional month of Medicaid coverage, which is larger than the effect (5 percent) previously reported for all VA outpatient care (Yoon et al. 2017), so patients may have been more likely to utilize Medicaid for VA care for behavioral health services than other care. This suggests that both VA and Medicaid provided important behavioral health resources for veterans and that clinicians should be aware of care provided, such as drugs prescribed, in both systems in order to better coordinate care. Additionally, while many studies only include data from one healthcare system, our study highlights how critical it is to incorporate multisystem data in order to have accurate study findings.

Finally, these behavioral health findings have policy implications for VA that would not be apparent without linkage of VA and Medicaid data. First and foremost, in post-ACA analyses, the VA should not expect to experience changing demand for VA outpatient behavioral health services by younger

veterans who enroll in Medicaid. However, VA should anticipate that some veterans will use Medicaid for behavioral health services and will thus experience heightened care coordination challenges. Additionally, total federal and state dollars spent on behavioral health services are expected to have increased due to increased total utilization of behavioral health services. This finding aligns with previous literature on behavioral health, albeit on nonveteran populations (Han et al. 2015; Wen, Druss, and Cummings 2015; Ali et al. 2016; Burns et al. 2016).

Limitations

Our study faced the same limitations as the parent study (Yoon et al. 2017). First, other insurance coverage is not always accurately measured in the VA. Thus, some patients may have had private health insurance prior to enrolling in Medicaid that we did not account for. Second, this study does not include data on why veterans chose to enroll in Medicaid, which could help to explain differences in utilization and reliance. Third, this study did not include VA enrollees who did not use VA care or those who were eligible for VA but did not enroll, so results may not generalize beyond VA enrollees who use VA care. Fourth, the study focuses on utilization in the 12 months after Medicaid enrollment and may not provide a complete picture of veterans' demand for behavioral health services.

There are a few limitations unique to the current study. While we improved upon the parent study by controlling for secular trends (year), economic conditions (unemployment rate) and access to nonfederal clinicians (MHPSA), we were not able to control for VA facility factors influencing veterans' ability to obtain VA care (e.g., wait time, capacity), disease severity, duplication of services (Maciejewski et al. 2013), or substitution effects (Nelson et al. 2018) that could help to explain our results. Additionally, it should be noted that we focused on behavioral health services provided by behavioral health specialists, rather than behavioral health care provided by any provider (e.g., primary care). During the course of this study, efforts were made to integrate primary and behavioral health care in both VA (State Health Access Data Assistance Center (SHADAC) for Medicaid and CHIP Payment Access Commission (MACPAC) (2015). However, since integration had barely begun during the course of our study, this is a minor limitation.

Finally, a general limitation related to policy implications is that the data for this study preceded the ACA and the Veterans Choice Act (2014), which

increased veterans' access to community providers paid for by VA. Thus, while this study simulates the effect of gaining Medicaid coverage for VA enrollees prior to the ACA and Choice Act, it may not entirely predict effects on utilization given the presence of the Medicaid expansion and Choice Act. However, for the time being, these estimates are the best that could be achieved given the redaction of Medicaid claims with evidence of SUD (Frakt, Hanchate, and Pizer 2015) and a lag in accessing Medicaid data. For a period of time, due to the Confidentiality of Alcohol and Drug Abuse Patient Records regulations, 42 CFR Part 2, Medicaid claims were removed if they included a diagnosis-related group (DRG), diagnosis, or service-type code related to substance abuse. Specifically, substance-abuse-related claims were redacted from Medicaid data starting in 2010. This redaction rule was reversed on January 18, 2017.

CONCLUSION

Through linking VA and Medicaid data, we were able to understand changes in nonelderly veterans' behavioral health services use following Medicaid enrollment. While VA outpatient behavioral health utilization did not change and reliance on VA for behavioral outpatient care remained high after enrolling in Medicaid, Veterans used some Medicaid behavioral health outpatient services once enrolled in the program. Patients with PTSD had the highest reliance on VA care, highlighting the important role of VA providers on treating service-connected disabilities. Veterans using the most Medicaid behavioral health outpatient care were in the SMI and SUD BHC groups. After gaining Medicaid coverage, reliance on VA for behavioral health inpatient care was lower than for behavioral health outpatient care across all BHC groups. Increased total behavioral health utilization could represent pent-up demand for services, dual use of healthcare systems, or worsening disease severity.

ACKNOWLEDGMENTS

Joint Acknowledgment/Disclosure Statement: This work was supported by Merit Review Award # IIR 13-313 from the U.S. Department of Veterans Affairs, Health Services Research and Development Service. Dr. Vanneman would like to acknowledge research support from the VA Office of Academic

Affiliations as well as the University of Utah Health Enhancing Development-Generating Excellence (EDGE) Scholar and Vice President's Clinical and Translational Scholars (VPCAT) programs.

Support for VA/CMS data provided by the Department of Veterans Affairs, VA Health Services Research and Development Service, VA Information Resource Center (Project Numbers SDR.02-237 and 98-004).

Disclosures: None.

Disclaimer: The contents do not represent the views of the U.S. Department of Veterans Affairs or the United States Government.

REFERENCES

2010. "Patient Protection and Affordable Care Act."
2014. "Veterans Access, Choice and Accountability Act."
- Ali, M. M., J. Teich, A. Woodward, and B. Han. 2016. "The Implications of the Affordable Care Act for Behavioral Health Services Utilization." *Administration and Policy In Mental Health* 43 (1): 11–22.
- Arellano, A., and S. Wolfe. 2007. *Unsettling Scores: A Ranking of State Medicaid Programs*. Washington, DC: Public Citizen.
- Bishop, T. F., M. J. Press, S. Keyhani, and H. A. Pincus. 2014. "Acceptance of Insurance by Psychiatrists and the Implications for Access to Mental Health Care." *JAMA Psychiatry* 71 (2): 176–81.
- Burns, M. E., H. A. Huskamp, J. C. Smith, J. M. Madden, and S. B. Soumerai. 2016. "The Effects of the Transition From Medicaid to Medicare on Health Care Use for Adults with Mental Illness." *Medical Care* 54 (9): 868–77.
- Dworsky, M., C. M. Farmer, and M. Shen. 2017. *Veterans' Health Insurance Coverage Under the Affordable Care Act and Implications of Repeal for the Department of Veterans Affairs*. Santa Monica, CA: RAND Corporation.
- Finley, E. P., P. H. Noel, S. Lee, E. Haro, H. Garcia, C. Rosen, N. Bernardy, M. J. Pugh, and J. A. Pugh. 2017. "Psychotherapy Practices for Veterans with PTSD among Community-Based Providers in Texas." *Psychological Services* [epub ahead of print]. <https://doi.org/10.1037/ser0000143>
- Frakt, A. B., A. Hanchate, and S. D. Pizer. 2015. "The Effect of Medicaid Expansions on Demand for Care From the Veterans Health Administration." *Healthcare* 3 (3): 123–8.
- Frayne, S. M., C. S. Phibbs, F. Saechao, N. C. Maisel, S. A. Friedman, A. Finlay, E. Berg, V. Balasubramanian, S. K. Dally, L. Ananth, Y. Romodan, J. Lee, S. Iqbal, P. M. Hayes, L. Zephyrin, A. Whitehead, A. Torgal, J. G. Katon, and S. Haskell. 2014. *Sourcebook: Women Veterans in the Veterans Health Administration. Volume 3. Sociodemographics, Utilization, Costs of Care, and Health Profile*. Washington, DC: Women's Health Evaluation Initiative, Women's Health Services, Veterans Health Administration, Department of Veterans Affairs.

- Han, B., J. Gfroerer, S. J. Kuramoto, M. Ali, A. M. Woodward, and J. Teich. 2015. "Medicaid Expansion Under the Affordable Care Act: Potential Changes in Receipt of Mental Health Treatment among Low-Income Nonelderly Adults with Serious Mental Illness." *American Journal of Public Health* 105 (10): 1982–9.
- Hunter, G., J. Yoon, D. M. Blonigen, S. M. Asch, and D. M. Zulman. 2015. "Health Care Utilization Patterns among High-Cost VA Patients with Mental Health Conditions." *Psychiatric Services (Washington, D. C.)* 66 (9): 952–8.
- Lemle, R. B. 2018. "Choice Program Expansion Jeopardizes High-Quality VHA Mental Health Services." *Federal Practitioner* 35: 18–24.
- Liu, C. F., M. Chapko, C. L. Bryson, J. F. Burgess Jr, J. C. Fortney, M. Perkins, N. D. Sharp, and M. L. Maciejewski. 2010. "Use of Outpatient Care in Veterans Health Administration and Medicare among Veterans Receiving Primary Care in Community-Based and Hospital Outpatient Clinics." *Health Services Research* 45 (5 Pt 1): 1268–86.
- Liu, C. F., W. G. Manning, J. F. Burgess Jr, P. L. Hebert, C. L. Bryson, J. Fortney, M. Perkins, N. D. Sharp, and M. L. Maciejewski. 2011. "Reliance on Veterans Affairs Outpatient Care by Medicare-Eligible Veterans." *Medical Care* 49 (10): 911–7.
- Liu, C. F., J. F. Burgess Jr, W. G. Manning, and M. L. Maciejewski. 2013. "Beta-Binomial Regression and Bimodal Utilization." *Health Services Research* 48 (5): 1769–78.
- Maciejewski, M. L., V. Wang, J. F. Burgess Jr, C. L. Bryson, M. Perkins, and C. F. Liu. 2013. "The Continuity and Quality of Primary Care." *Medical Care Research and Review: MCCR* 70 (5): 497–513.
- Nelson, R. E., B. Hicken, M. Vanneman, C. F. Liu, and R. Rupper. 2018. "The Impact of a Change in the Price of VA Health Care on Utilization of VA and Medicare Services." *Medical Care* 56 (7): 569–76.
- Petersen, L. A., M. M. Byrne, C. N. Daw, J. Hasche, B. Reis, and K. Pietz. 2010. "Relationship between Clinical Conditions and Use of Veterans Affairs Health Care among Medicare-Enrolled Veterans." *Health Services Research* 45 (3): 762–91.
- Shirk, C. 2008. *Medicaid and Mental Health Services*. Washington, DC: National Health Policy Forum.
- Sommers, B. D., M. R. Tomasi, K. Swartz, and A. M. Epstein. 2012. "Reasons for the Wide Variation in Medicaid Participation Rates among States Hold Lessons for Coverage Expansion in 2014." *Health Affairs (Millwood)* 31 (5): 909–19.
- State Health Access Data Assistance Center (SHADAC) for Medicaid and CHIP Payment Access Commission (MACPAC). 2015. *Catalog of Medicaid Initiatives Focusing on Integrating Behavioral and Physical Health Care: Final Report*. Washington, DC: School of Public Health, University of Minnesota.
- Tanielian, T., C. Farris, C. Epley, C. M. Farmer, E. Robinson, C. C. Engel, M. W. Robbins, and L. H. Jaycox. 2014. *Ready to Serve: Community-Based Provider Capacity to Deliver Culturally Competent, Quality Mental Health Care to Veterans and Their Families*. Santa Monica, CA: RAND Corporation.
- The Henry J. Kaiser Family Foundation. 2017. *Medicaid's Role in Covering Veterans*. Menlo Park, CA: The Henry J. Kaiser Family Foundation.

- U.S. Department of Veterans Affairs. 2012. *Guide to VA Mental Health Services for Veterans & Families*. Washington, DC: U.S. Department of Veterans Affairs.
- U.S. Department of Veterans Affairs. 2015. "System of Records Notice 97VA10P1: Consolidated Data Information System-VA. 76 FR 25409."
- U.S. Department of Veterans Affairs. 2016. "VHA Directive 1153: Access to Centers for Medicare and Medicaid Services (CMS) and United States Renal Data System (USRDS) Data for Veterans Health Administration (VHA) users within the Department of Veterans Affairs (VA) Information Technology (IT) Systems."
- Watkins, K. E., H. A. Pincus, B. Smith, S. M. Paddock, T. E. Mannle, A. Woodroffe, J. Solomon, M. E. Sorbero, C. M. Farmer, K. A. Hepner, D. M. Adamson, L. Forrest, and C. Call. 2011. *Veterans Health Administration Mental Health Evaluation: Capstone Report*. Santa Monica, CA: RAND Corporation.
- Wen, H., B. G. Druss, and J. R. Cummings. 2015. "Effect of Medicaid Expansions on Health Insurance Coverage and Access to Care among Low-Income Adults with Behavioral Health Conditions." *Health Services Research* 50 (6): 1787–809.
- Yang, D., and J. E. Dalton. 2012. "A Unified Approach to Measuring the Effect Size between two Groups Using SAS." *SAS Global Forum* 1–6.
- Yoon, J., M. E. Vanneman, S. K. Dally, A. N. Trivedi, and C. S. Phibbs. 2017. "Use of Veterans Affairs and Medicaid Services for Dually Enrolled Veterans." *Health Services Research* 53 (3): 1539–61.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix SA1: Author Matrix.

Appendix SA2: Table S1. VA Outpatient Behavioral Health Care Reliance Regression Results.

Table S2: VA Inpatient Behavioral Health Care Reliance Regression Results.