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RESEARCH ARTICLE

The Mental Health Parity and Addiction Equity Act Evaluation Study: Impact on Mental Health Financial Requirements among Commercial “Carve-In” Plans

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Objective. Did mental health cost-sharing decrease following implementation of the Mental Health Parity and Addiction Equity Act (MHPAEA)?

Data Source. Specialty mental health copayments, coinsurance, and deductibles, 2008–2013, were obtained from benefits databases for “carve-in” plans from a national commercial managed behavioral health organization.

Study Design. Bivariate and regression-adjusted analyses compare the probability of use and (conditional) level of cost-sharing pre- and postparity. An interaction term is added to compare differential levels of pre- and postparity cost-sharing changes for plans that were and were not already at parity pre-MHPAEA.

Findings. Controlling for employer/plan characteristics, MHPAEA is associated with higher intermediate care copayments (\$15.9) but lower outpatient (\$2.6) copayments among in-network-only plans. Among plans with in- and out-of-network benefits, MHPAEA is associated with lower inpatient (\$23.2) and outpatient (\$2.5) copayments, but increases in inpatient and intermediate in-network and out-of-network coinsurance (about 1 percentage point). Among the few plans not at parity pre-MHPAEA, changes in use and level of cost-sharing associated with MHPAEA were more dramatic.

Conclusion. Mixed evidence that MHPAEA led to more generous mental health benefits may stem from the finding that many plans were already at parity pre-MHPAEA. Future policy focus in mental health may shift to slowing growth in cost-sharing for all health services.

Key Words. Mental health, commercial insurance, parity

Historical inequities in generosity between medical and behavioral health (BH) insurance coverage are well documented (Hodgkin et al. 2003; Zuvekas and Meyerhoefer 2006). In 2008, the 110th Congress passed the Paul

Wellstone and Pete Domenici Mental Health Parity and Addiction Equity Act (MHPAEA). A landmark piece of legislation, MHPAEA required commercial large-group insurance plans covering mental health (MH) and/or substance use disorder (SUD) to do so on the same terms as medical/surgical coverage. Specifically, with its Interim Final Rule, effective for plans renewing on or after July 1, 2010, and subsequent Final Rule, the law applied its parity mandate not only to financial requirements (e.g., copayments, coinsurance, deductibles, and out-of-pocket maxima) and quantitative treatment limits (QTLs, e.g., number of inpatient days or outpatient visits covered by the plan) but also nonquantitative treatment limits (NQTLs, e.g., utilization review, etc.). For plans with out-of-network coverage, MHPAEA applies to these benefits as well as in-network benefits.

Champions of the law sought to improve equity in access to BH care. However, to date, published studies find scant evidence that the law led to substantially higher levels of behavioral health utilization or expenditures (Busch et al. 2014; McGinty et al. 2015; Harwood et al. 2016). These findings could be explained if MHPAEA did not reduce cost-sharing. Alternatively, if MHPAEA did reduce cost-sharing, that might support arguments that other factors (e.g., stigma, provider supply, etc.) influence utilization as much or more than cost-sharing. Thus, understanding how MHPAEA affected cost-sharing can help interpret these and future MHPAEA evaluations.

Prior to passage of MHPAEA, other efforts to achieve BH coverage parity were legislated. Forty-five states had parity laws, although these laws varied in which behavioral health conditions, benefits, and employer groups were included in the mandates (Shern 2009). Furthermore, due to the Employee Retirement Income Security Act of 1974, which exempts self-insured firms from state insurance mandates, only one-fifth of U.S. employees with

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employer-sponsored health insurance were subject to strong state parity laws (Buchmueller et al. 2007). To improve parity on a national level, the federal Mental Health Parity Act was passed in 1996, requiring parity for annual and lifetime dollar limits. Although this law likely improved dollar limit parity, unintended consequences included more stringent use of financial requirements and QTLs (U.S. Government Accountability Office 2000). In 2001 the 8.7 million beneficiaries of the Federal Employee Health Benefits Program were guaranteed parity in financial requirements and QTLs. However, exclusion of NQTLs from the law led to increased use of direct care management, offsetting potential access gains due to reduced cost-sharing (Goldman et al. 2006; Ridgely et al. 2006).

Compared to these prior parity laws, MHPAEA mandated more comprehensive parity provisions, which applied nationally to both fully insured and self-insured plans offering BH coverage (although BH coverage is not mandated). Its provisions were restricted to employers with more than 50 employees renewing plans on or after January 1, 2010.¹ Due to its applicability to self-insured plans and its closure of the QTL and NQTL loopholes (thereby preventing plans from limiting utilization through these mechanisms once cost-sharing is reduced), MHPAEA is the strongest parity law to date. The Affordable Care Act's provision including BH as an essential health benefit adds consumers on the individual health insurance market as well as Medicaid managed care organization, Medicaid alternative benefit plan, and Children's Health Insurance Program enrollees to the populations whose BH benefits are subject to MHPAEA (Beronio, Glied, and Frank 2014; Centers for Medicare and Medicaid Services 2016). This broader reach of MHPAEA underscores the salience of understanding the effects of the law on benefits.

Despite the key role of financial requirements in access to behavioral health care, to date, only one peer-reviewed study has examined the impact of MHPAEA on cost-sharing. Horgan and colleagues compared self-reported 2009 and 2010 data from a nationally representative sample of 939 health plans to determine the early effects of MHPAEA on cost-sharing, QTLs, and NQTLs. In unadjusted analyses, they found that both BH and medical in-network outpatient copayments were significantly higher in 2010 compared to 2009, but other changes in cost-sharing following parity implementation (e.g., BH coinsurance) were insignificant (Horgan et al. 2016). The present study complements earlier work by examining MHPAEA's effects after the transition period, when the Interim Final Rule was in place

and legal compliance was required. Our study also draws benefit design information from databases used for claims processing, not survey data.

This study uses data from 2008 to 2013 to investigate changes in copayments, coinsurance, and deductibles for specialty MH services before and after MHPAEA implementation, among “carve-in” plans, which provide both medical and specialty BH coverage (rather than BH coverage only, as “carve-out” BH plans do). Benefit design data were provided through Optum (hereafter referred to as “Optum”), a fully owned subsidiary of UnitedHealth Group, one of the largest national managed behavioral health organizations (MBHO) during our study period. The study describes MHPAEA’s impact on cost-sharing, through the following questions: Comparing all study plans pre- to postparity: (i) Did fewer plans use copayments and coinsurance? (ii) Did the levels of cost-sharing decrease among plans that did use copayments and coinsurance? (iii) Did more plans combine BH and medical deductibles?² To assist interpretation of findings from the first three questions, we also asked, for the subset of plans that existed before and after parity: (iv) How many plans were *not* already at parity with respect to copayment and coinsurance levels pre-MHPAEA, (v) Did fewer of these plans use cost-sharing in the post-parity period, and (vi) Were postparity decreases in copayment and coinsurance levels larger among the plans not already at parity in the preparity period compared to plans that were already at parity?

STUDY DATA AND METHODS

This study uses 2008–2013 administrative data drawn from proprietary databases used by UnitedHealthcare (UHC), Optum’s sister company under UnitedHealth Group. The behavioral health division of Optum manages the behavioral benefit for UHC as well as provides care management services to its members enrolled in “carve-in” plans. These databases are used to adjudicate claims and calculate patient out-of-pocket costs. The data include information about specialty MH and medical financial requirements (copayments, coinsurance, and deductibles), enrollees, employer characteristics (e.g., size, industry, region), and plan type. Specialty MH includes services provided by behavioral health specialists (e.g., psychiatrists, social workers, etc.). It does not include MH provided in primary care offices, or general medical care. The unit of analysis is the plan-year.

Our initial sample of 661 employers, 7,930 plans, and 27,568 plan-years included all “carve-in” plans offered by Optum employers at least 1 year

pre- and 1 year postparity (based on 2008–2012), or during 2009. The main study sample (Appendix SA2), hereafter called the “full sample,” includes self-insured plans of large employers in the 50 US states, which are subject to parity and renewed on the calendar year, resulting in 385 employers, 3,822 plans, and 12,163 plan-years. These plans represent approximately 23 million enrollee-years. For two reasons, the sample excludes fully insured plans.³ First, these are rare in our study sample. Second, fully insured plans are subject to state parity laws so might respond differently to MHPAEA. Analyses are stratified by network status, that is, whether plans cover only in-network care (INN-only plans) or both in- and out-of-network care (INN/OON plans). A subset of the full sample, referred to hereafter as the “pre/post sample,” contains 6,595 plan-year observations corresponding to 1,311 plans that existed in any pre-parity year (2008–2009) and any postparity year (2011–2013).

Outcome measures include in-network copayments (per visit, or per-admission for inpatient care) and in-network and out-of-network patient coinsurance rate. Out-of-network copayments are rare among plans in our data, and thus not examined in this analysis. Copayments are adjusted to 2013 dollars using the Consumer Price Index value for “inpatient hospital services” and “other medical professionals.” Additional outcome variables indicate whether plans combine BH and medical deductibles, with separate variables for in-network and out-of-network care. Since Optum reported that, preparity, BH and medical out-of-pocket maxima were combined, we did not request these data.

Outcomes are reported separately by service type: inpatient, intermediate, and outpatient office-based professional care. The “intermediate” category includes a variety of settings—some unique to BH treatment—such as partial hospitalization, day treatment, sober living, and transitional living arrangement. Benefits for professional charges in outpatient hospital clinics and intermediate settings are not reported because they had nearly identical results to office-based professional care.

About 5 percent of study plan-years “tier” benefits, requiring different payment levels depending on previous use (e.g., \$25 copayment for initial 5 visits, \$30 copayment thereafter). When a plan tiers benefits for a particular cost-sharing feature in a particular year, we exclude that plan-year observation from relevant analyses (Appendix SA3 reports the percent of plan-years excluded). Plans that do not cover a particular service (e.g., intermediate care) in a year are also excluded from relevant analyses (Appendix SA4 reports the percent of plan-years excluded). A small number of plan-years ($n = 122$)

charge inpatient copayments per diem (rather than per admission) and are thus excluded from inpatient copayment analyses.

The main predictors indicate if the plan-year observation is drawn from the transition period (2010) or the postparity period (2011–2013) versus the preparity period (2008–2009). Covariates indicate employer group size (51–1,000, 1,001–5,000, 5,001–40,000, 40,001, and up); employer group industry, based on two-digit North American Industry Classification System codes; Census region; and whether the plan type is “more managed” (e.g., HMO) versus “less managed” (e.g., PPO). Additional variables, used for stratification in some of the analyses, indicate whether a cost-sharing feature was already at parity for the plan pre-MHPAEA. We define not being at parity pre-MHPAEA as having a MH cost-sharing feature that is less generous than the corresponding medical cost-sharing feature (e.g., MH inpatient copayment is higher than medical inpatient copayment) in 2008 or 2009.

Initial descriptive data report the employer size, industry, census region, and plan type for the full sample. Descriptive (bivariate) analyses report, by parity period, the proportion of INN-only and INN/OON plans in the full sample that use each cost-sharing feature, and among the subset of plans that use each feature, the mean and standard deviation. Statistical significance of differences across time periods is established using chi-squared and Kruskal–Wallis tests at a 95 percent confidence level.

A two-part model on the full sample determines average changes in copayment and coinsurance associated with the transition and postparity periods, controlling for covariates, and stratifying by INN-only versus INN/OON (Duan et al. 1984). Logistic regressions estimate the probability that plans use a particular cost-sharing feature. Among plans requiring a particular cost-sharing feature, gamma regressions estimate the level of cost-sharing. Gamma models were used to account for the skewed conditional distributions of the cost-sharing variables. Finally, the estimates from both parts of the model are used to determine the average regression-adjusted change in the level of each cost-sharing feature among all plans (e.g., among both plans requiring copayments and plans with zero copayments).

Multivariate analyses are repeated among the pre/postsample to confirm that the results from the full sample are reflective of changes made to plans existing both before and after parity implementation. Also in the pre/postsample, we examine categorical variables stating whether, for inpatient care or office-based professional care, the plan required copayments and

coinsurance, only copayments, only coinsurance, or neither, comparing pre- to postparity use of cost-sharing features.

Finally, we use the pre/postsample to report the proportion of plan-years for plans that were already at parity pre-MHPAEA, for each cost-sharing feature. This sample is used because both pre- and post-MHPAEA cost-sharing can be assessed among these plans. We run gamma regressions on cost-sharing level among plans requiring cost-sharing, where the main predictors are interactions of the indicator for being at parity pre-MHPAEA and the indicators for parity period. The interaction term estimates the modifying effect of not being at parity pre-MHPAEA on changes in copayment and coinsurance use and levels post-MHPAEA.

Generalized estimating equations control for nonindependence of plan-year observations within employer (Ziegler, Kastner, and Blettner 1998). All data analyses were performed in *StataIC version 12* (StataCorp, College Station, TX, USA).

RESULTS

The study sample contains 385 employers, 3,609 INN-only plan-years, and 8,554 INN/OON plan-years (data not in table). The sample represents employers diverse in size, industry, and region, as well as both more managed and less managed plans (Table 1).

Cost-Sharing Requirements

The proportions of INN-only and INN/OON plan-years that require each cost-sharing feature, by parity period, appear in Columns 2–4 of Table 2. For both INN-only and INN/OON plan-years, a significantly lower proportion require copayments for office-based professional services postparity compared to preparity, and for INN/OON plan-years, the proportion requiring inpatient copayments significantly decreases as well. On the other hand, for INN/OON plan-years, a significantly higher proportion required in-network coinsurance for intermediate care, and office-based professional services, postparity compared to preparity. The proportion of plan-years that used out-of-network coinsurance was very high for all three service types preparity and remained high postparity (over 99 percent).

Table 1: Descriptive Statistics on Employer and Plan Characteristics of "Carve-In"* Plans, at Employer Level and Plan Levels

<i>Employer Characteristics</i>	<i>Employers (n = 385), n (%)</i>
Average number of enrolled employees	
51–4,999 employees	237 (61.6)
5,000–10,000 employees	70 (18.2)
10,001–40,000 employees	68 (17.7)
40,001 employees or more	10 (2.6)
Employer industry	
Agriculture, forestry, fishing, and hunting	1 (0.3)
Mining	14 (3.6)
Utilities	17 (4.4)
Construction	9 (2.3)
Manufacturing	112 (29.1)
Wholesale trade	14 (3.6)
Retail trade	19 (4.9)
Transportation and warehousing	16 (4.2)
Information	33 (8.6)
Finance and insurance	50 (13.0)
Professional, scientific, and technical services	35 (9.1)
Management of companies and enterprises	2 (0.5)
Educational services	7 (1.8)
Health care and social assistance	21 (5.5)
Arts, entertainment, and recreation	8 (2.1)
Accommodation and food service	8 (2.1)
Other services (except public administration)	14 (3.6)
Public administration	5 (1.3)
Census division	
New England	21 (5.5)
Middle Atlantic	68 (17.7)
East North Central	58 (15.1)
West North Central	31 (8.1)
South Atlantic	53 (13.8)
East South Central	9 (2.3)
West South Central	76 (19.7)
Mountain	15 (3.9)
Pacific	54 (14.0)
Plan characteristics	<i>Plans (n = 3,822), n (%)</i>
More managed (e.g., HMO) versus less managed (e.g., PPO)	2,681 (70.2)

Notes. *"Carve-in" plans administer behavioral health benefits along with medical benefits. This contrasts with "carve-out" plans, which only administer behavioral health and contract with a medical vendor for medical benefits.

Cost-Sharing Mean Level among Plan-Years That Required Cost-Sharing

Columns 5–7 of Table 2 report the mean and standard deviation of each cost-sharing feature, among plan-years that require that feature, by parity period.

Table 2: Percent of Plan-Years[†] Requiring Copayments and Patient Coinsurance, and Mean and Standard Deviation among Subset of Plans Requiring Copayment and Patient Coinsurance, by Parity Period[‡] and Network Status

	% Requiring Cost-Sharing Feature			Mean (Standard Deviation) among Plans Requiring Cost-Sharing Feature		
	Pre	Transition	Post	Pre	Transition	Post
<i>In-network only plans (n = 3,609)</i>						
Copayment (in-network)				\$	\$	\$
Inpatient	22.0	19.7	18.8	303 (132)	332 (147)	331 (145)
Intermediate [§]	18.8	18.2	21.0	243 (115)	275 (149)	293 (149)
Office-based professional	39.1	33.8	32.05*	29 (12)	27 (10)	24 (8)*
Patient coinsurance (in-network)				%	%	%
Inpatient	78.7	79.6	81.8	17 (6)	17 (7)	18 (5)*
Intermediate [§]	77.8	78.2	81.1	18 (9)	18 (9)	18 (6)*
Office-based professional	57.1	59.0	61.0	22 (13)	20 (10)	19 (6)
<i>In- and out-of-network plans (8,554)</i>						
Copayment (in-network)				\$	\$	\$
Inpatient	17.2	14.2	11.7*	315 (158)	289 (154)	282 (119)*
Intermediate [§]	13.9	14.2	13.5	254 (139)	237 (146)	250 (122)
Office-based professional	36.6	27.0	31.5*	28 (10)	29 (11)	26 (9)*
Patient coinsurance (in-network)				%	%	%
Inpatient	88.6	90.2	93.3	17 (7)	17 (6)	17 (6)*
Intermediate [§]	85.0	88.9	92.3*	17 (7)	17 (7)	17 (5)*
Office-based professional	54.0	50.2	56.1*	19 (11)	17 (7)	18 (5)*
Patient coinsurance (out-of-network)				%	%	%
Inpatient	99.3	99.4	99.5	36 (9)	37 (9)	38 (8)*
Intermediate [§]	99.3	99.4	99.5	36 (9)	37 (9)	38 (8)*
Office-based professional	99.3	99.4	99.6	37 (9)	37 (9)	38 (8)*

* $p < .05$.

[†]The unit of observation is the plan-year, so one plan may count up to twice in the preperiod, once in the transition period, and three times in the postperiod. Analysis excludes plan-years with one cost-sharing level for some visits and another cost-sharing level for other visits for a particular cost-sharing feature, as well as plan-years that do not cover a particular service and plan-years with missing data for a particular cost-sharing feature.

[‡]Preparity (2008–2009), transition (2010), postparity (2011–2013).

[§]Intermediate care includes partial hospitalization, day treatment, sober living, and transitional living arrangements.

Looking first at cost-sharing for inpatient services, among INN/OON plan-years using inpatient copayments, the average inflation-adjusted copayment amounts are significantly lower postparity (\$282) compared to preparity (\$315), although significant changes are not seen in inpatient copayments among INN-only plan-years. Among both INN-only and INN/OON plan-years requiring coinsurance for in-network inpatient services, average inpatient coinsurance increases about 1 percentage point postparity, compared to

preparity, a small but statistically significant increase. A comparable increase in out-of-network inpatient coinsurance occurs among INN/OON plan-years requiring that cost-sharing feature.

Table 2 also identifies small changes in cost-sharing for intermediate care, among plan-years requiring cost-sharing for these services. A small but significant increase in average in-network coinsurance is observed among INN/OON plan-years (16.8 percent preparity vs. 17.4 percent postparity), while small but significant decreases in in-network coinsurance are observed among INN-only plan-years (18.2 percent preparity vs. 17.6 percent postparity). On average, INN/OON plan-years require higher out-of-network intermediate care coinsurance postparity (38 percent) than preparity (36 percent).

In general, Table 2 finds reductions in office-based professional cost-sharing among plan-years requiring it. Specifically, average office-based professional copayments decrease after parity for both INN-only (\$29 preparity, \$24 postparity) and INN/OON plan-years (\$28 preparity, \$26 postparity). Among both INN-only and INN/OON plan-years, the average postparity in-network coinsurance levels for office-based professional services decrease between 2 and 3 percentage points from the preparity levels, although only the decreases among INN/OON plan-years are statistically significant. Compared to preparity, among INN/OON plan-years requiring out-of-network coinsurance for office-based professional services, the average levels increase 1 percentage point postparity, a small but statistically significant increase.

In results not shown in tables, the proportion of plan-years requiring a BH deductible separate from the medical deductible is very low, both pre- and postparity. This is true for inpatient, intermediate, and office-based professional services (e.g., preparity, 0.7 percent of INN/OON plan-years have a BH intermediate care deductible that accumulates separately from the medical deductible; postparity, 0.6 percent do).

Regression Analyses: In-Network-Only Plan-Years

The regression-adjusted changes in use and level of cost-sharing features can be seen for INN-only plan-years in Table 3. Parity is not associated with significant changes in inpatient cost-sharing among INN-only plan-years. Parity is associated with a \$37.35 increase, on average, in intermediate care copayments, among the subset of INN-only plan-years requiring this cost-sharing feature. This translates into postparity intermediate care copayments that are, on average, \$15.92 higher than preparity, among all INN-only plan-years. Similarly,

Table 3: For In-Network-Only Plan-Years ($n = 3,609$)[†], Regression-Adjusted Changes Associated with Parity[‡] in Probability of Use and Level of Cost-Sharing Feature among Plans That Use Them and among All Plans

	Change in the Probability of Using Cost-Sharing Feature [§]		Change in Level of Benefit Design Feature, among Plans Requiring Cost-Sharing Feature [§]		Change in Level of Benefit Design Feature, among All Plans [§]	
	Transition	Post	Transition	Post	Transition	Post
	Copayment (in-network)			\$	\$	\$
Inpatient	-0.01	-0.02	18.66	-3.94	1.06	-5.24
Intermediate [¶]	0.00	0.03	29.09	37.35*	5.83	15.92*
Office-based professional	-0.03	-0.05	-1.24	-3.88*	-1.33	-2.58*
Patient coinsurance (in-network)			%	%	%	%
Inpatient	-0.01	0.00	-0.10	0.38	-0.16	0.37
Intermediate [¶]	-0.01	0.00	-0.41	-0.30	-0.52	-0.17
Office-based professional	-0.01	0.00	-2.18*	-2.31	-1.41*	-1.28

* $p < .05$.

[†]The unit of observation is the plan-year, so one plan may count up to twice in the preperiod, once in the transition period, and three times in the postperiod. Analysis excludes plan-years with one cost-sharing level for some visits and another cost-sharing level for other visits for a particular cost-sharing feature, as well as plan-years that do not cover a particular service and plan-years with missing data for a particular cost-sharing feature.

[‡]Preparity (2008–2009) (reference), transition (2010), postparity (2011–2013).

[§]Change in probability of using cost-sharing feature determined using logistic regression. Change in level of cost-sharing determined using a generalized linear model regression with a gamma distribution and a log link function. All regressions control for employer size, employer's region, employer's industry, and plan type. Standard errors are adjusted for intraclass correlation at the employer group level.

[¶]Intermediate care includes partial hospitalization, day treatment, sober living, and transitional living arrangements.

parity is associated with small decreases in average copayments for office-based professional services (\$3.88) among INN-only plan-years requiring these cost-sharing features. In the full sample of INN-only plan-years, the magnitude of this association is smaller but still significant (\$2.58). Significant reductions in office-based professional coinsurance level were not observed among plans requiring this cost-sharing feature or in the full sample of INN-only plan-years postparity.

Regression Analysis: In- and Out-of-Network Plan-Years

Table 4 displays regression-adjusted results for INN/OON plan-years. Among this group, the probability of plan-years requiring an inpatient

Table 4: For In- and Out-of-Network Plan-Years ($n = 8,554$)[†], the Changes Associated with Parity[‡] in Use and Level of Cost-Sharing Feature among Plans That Use Them and among All Plans

	<i>Change in the Probability of Using Cost-Sharing Feature[§]</i>		<i>Change in Level of Benefit Design Feature, among Plans Requiring Cost-Sharing Feature[§]</i>		<i>Change in Level of Benefit Design Feature, among All Plans[§]</i>	
	<i>Transition</i>	<i>Post</i>	<i>Transition</i>	<i>Post</i>	<i>Transition</i>	<i>Post</i>
Copayment (in-network)			\$	\$	\$	\$
Inpatient	-0.03	-0.06*	-30.58*	-43.93*	-13.93*	-23.20*
Intermediate [¶]	0.00	-0.01	-14.72	-5.49	-1.61	-2.64
Office-based professional	-0.11*	-0.06	0.74	-2.82*	-2.97*	-2.50*
Patient coinsurance (in-network)			%	%	%	%
Inpatient	0.02	0.04*	0.38	0.75*	0.60	1.32*
Intermediate [¶]	0.03*	0.06*	0.28	0.51	0.82*	1.40*
Office-based professional	-0.02	0.02	-1.83*	-1.68*	-1.32*	-0.49
Patient coinsurance (out-of-network)			%	%	%	%
Inpatient	0.00	0.01	0.67	1.03*	0.78	1.23*
Intermediate [¶]	0.00	0.01	0.94*	1.28*	1.05*	1.48*
Office-based professional	0.01	0.01	0.11	0.71	0.29	0.94*

* $p < .05$.

[†]The unit of observation is the plan-year, so one plan may count up to twice in the preperiod, once in the transition period, and three times in the postperiod. Analysis excludes plan-years with one cost-sharing level for some visits and another cost-sharing level for other visits for a particular cost-sharing feature, as well as plan-years that do not cover a particular service and plan-years with missing data for a particular cost-sharing feature.

[‡]Preparity (2008–2009) (reference), transition (2010), postparity (2011–2013).

[§]Change in probability of using cost-sharing feature determined using logistic regression. Change in level of cost-sharing determined using a generalized linear model regression with a gamma distribution and a log link function. All regressions control for employer size, employer's region, employer's industry, and plan type. Standard errors are adjusted for intraclass correlation at the employer group level.

[¶]Intermediate care includes partial hospitalization, day treatment, sober living, and transitional living arrangements.

copayment is 6 percentage points lower postparity than preparity, and among plan-years requiring inpatient copayments, copayment levels are, on average, \$43.93 lower postparity than preparity. Together, these effects result in inpatient copayments being \$23.20 lower, on average, postparity than preparity among all INN/OON plan-years. However, parity is also associated with a 4 percentage point increase in the probability that plan-years require in-network coinsurance for inpatient services. Further, among plan-years that do require inpatient in-network coinsurance, the coinsurance level increases 0.75 percentage points, on average, postparity. Combining these two effects, inpatient

in-network coinsurance is 1.32 percentage points higher postparity than preparity when averaged across all INN/OON plan-years. The average inpatient out-of-network coinsurance also increases postparity (1.03 percentage points), for INN/OON plan-years requiring it, as well as among the full sample of INN/OON plan-years (1.23 percentage points).

Parity is associated with significant but modest increases in cost-sharing for intermediate care among INN/OON plan-years (Table 4). Postparity, the probability that plan-years require in-network coinsurance for intermediate care increases 6 percentage points, driving a 1.40 percentage point increase, on average, in intermediate in-network coinsurance levels averaged across all INN/OON plan-years. Also postparity, among INN/OON plan-years requiring out-of-network coinsurance for intermediate care, the average level of this cost-sharing feature increases 1.28 percentage points from the preparity level, and among all INN/OON plan-years, the average level increases 1.48 percentage points.

The regression-adjusted results also suggest cost-sharing decreases for office-based professional services postparity (Table 4) among INN/OON plan-years. Postparity, copayment levels are, on average, \$2.82 lower than preparity, among INN/OON plan-years requiring this cost-sharing feature. Among all INN/OON plan-years, postparity office-based professional copayments are, on average, \$2.50 lower than preparity. Parity is also associated with a 1.7 percentage point decrease in in-network coinsurance for office-based professional services, among the subset of plan-years requiring it but not among the full sample of INN/OON plan-years. Postparity, out-of-network coinsurance for office-based services increased by nearly a percentage point among all INN/OON plan-years, compared to preparity.

In results not shown in the tables, the estimates were nearly identical when analyses were repeated among the restricted pre/postsample. Although most plans in the pre/postsample ($n = 1,311$ plans) used the same cost-sharing features pre- and postparity, a small number of plans⁴ (Inpatient: 12 plans, Office-based professional: 105 plans) switched from using copayments but not in-network coinsurance to using in-network coinsurance but not copayments or vice versa. Small numbers of plans also switched from requiring both copayments and in-network coinsurance preparity to requiring only copayments or only in-network coinsurance post-MHPAEA (Inpatient: 58 plans, Office-based professional: 16 plans), and similarly small numbers of plans switched from requiring only copayments or only in-network coinsurance to

requiring both cost-sharing features (Inpatient: 52 plans, Office-based professional: 28 plans).

Analysis of Plans Not at Parity Pre-MHPAEA

Based on the pre/postsample, Column 2 of Table 5 shows the percent of INN-only and INN/OON plan-years for which the plan was not already at parity pre-MHPAEA, for each cost-sharing feature. A minority of preparity plan-years (2–25 percent) were not already at parity before MHPAEA was implemented. By definition, all of these plans required higher cost-sharing for MH than medical care Pre-MHPAEA, and thus 100 percent of the plans required cost-sharing for each service.⁵ Data not in Table 5 indicate that, post-MHPAEA, the proportions of INN/OON plan-years requiring cost-sharing decreased significantly for copayments, to 29 percent for inpatient, 37 percent for intermediate, and 69 percent for office-based professional care. Similar decreases were observed among INN-only plan-years, for all cost-sharing features except outpatient professional in-network coinsurance. Out-of-network coinsurance continued to be used among 100 percent of INN/OON plans for all service types post-parity.

Table 5 shows results from the conditional regressions (run among pre-post sample plans requiring each cost-sharing feature) interacting parity period indicators with indicators for whether the plan was already at parity pre-MHPAEA, to examine whether the estimated MHPAEA effects are larger among plans not already at parity pre-MHPAEA. For plans not at parity pre-MHPAEA, office-based professional copayments decreased significantly (INN-only: \$9; INN/OON: \$6) postparity as did intermediate in-network coinsurance (INN/OON: 12 percentage points), office-based professional in-network coinsurance (INN-only: 19 percentage points; INN/OON: 32 percentage points), and all out-of-network coinsurance (14–15 percentage points). For plans at parity pre-MHAEA, few of the postparity changes in cost-sharing were significant, and, with the exception of inpatient and intermediate copayments which decreased \$56 and \$26, respectively, among INN/OON plans, significant results reveal minute increases in cost-sharing. For INN-only and INN/OON plans, the modifying effect of being a plan not at parity pre-MHPAEA, versus a plan already at parity pre-MHPAEA, is significant for office-based professional copayments and in-network coinsurance, intermediate in-network coinsurance (INN/OON plans only), and out-of-network coinsurance for all three service types.

Table 5: Among Plans Existing Pre- and Postparity,[†] Percent of Preparity Plan-Years Not Already at Parity Pre-MHPAEA,[‡] and among Those Requiring Each Cost-Sharing Feature, Regression-Adjusted[§] Modifying Effect of Not Being at Parity Pre-MHPAEA on Level of Cost-Sharing Features Associated with MHPAEA Implementation

	Plans NOT Already at Parity Pre-MHPAEA		Plans Already at Parity Pre-MHPAEA		Modifying Effect of Not Being at Parity Pre-MHPAEA [§]
	Predicted Level of Cost-Sharing Feature for Plan-Years Requiring It		Predicted Level of Cost-Sharing Feature for Plan-Years Requiring It		
	Post	Pre	Post	Pre	
% of Preparity Plan-Years NOT at Parity Pre-MHPAEA					
	Difference (Post-Pre)		Difference (Post-Pre)		Difference (Post-Pre)
	\$ (SE)	\$ (SE)	\$ (SE)	\$ (SE)	\$ (SE)
	264.2 (31)	283.6 (28)	303.7 (14)	311.5 (19)	-11.5 (21)
	188.9 (31)	216.6 (46)	270.4 (13)	245.5 (18)	-52.6 (49)
	25.7 (1)	34.2 (2)	23.2 (1)	20.3 (1)	-11.4 (2)*
	Percentage points (SE)		Percentage points (SE)		Percentage points (SE)
	17.8 (1)	19.3 (3)	17.4 (0.4)	17.4 (0.3)	-1.5 (3)
	19.4 (2)	28.0 (5)	17.4 (0.4)	17.7 (0.4)	-8.3 (5)
	21.9 (2)	41.2 (6)	18.7 (0.4)	18.3 (0.4)	-19.6 (6)*
In-network only plan-years (n = 2,016)					
Copayment (in-network)					
Inpatient	2%				
Intermediate**	3%				
Office-based professional	25%				
Patient coinsurance (in-network)					
Inpatient	3%				
Intermediate**	4%				
Office-based professional	10%				

Continued

Table 5 Continued

	Plans NOT Already at Parity Pre-MHPAEA				Plans Already at Parity Pre-MHPAEA				Modifying Effect of Not Being at Parity Pre-MHPAEA ^a
	Predicted Level of Cost-Sharing Feature for Plan-Years Requiring It		Difference (Post-Pre)	\$ (SE)	Predicted Level of Cost-Sharing Feature for Plan-Years Requiring It		Difference (Post-Pre)	\$ (SE)	
	Post	Pre			Post	Pre			
% of Preparity Plan-Years NOT at Parity Pre-MHPAEA									
<i>In- and out-of-network plan-years (n = 4,579)</i>									
Copayment (in-network)									
Inpatient	2%	\$ (SE) 226.4 (20)	300.3 (43)	-\$ (SE) 73.9 (41)	\$ (SE) 266.1 (9)	322.4 (12)	-\$ (SE) 56.3 (12)*	\$ (SE) -17.6 (43)	
Intermediate**	2%	159.1 (20)	167.6 (37)	-8.5 (26)	236.8 (9)	262.8 (11)	-26.1 (13)*	17.6 (30)	
Office-based professional	22%	27.5 (1)	33.0 (1)	-5.5 (1)*	24.2 (1)	22.8 (1)	1.4 (1)	-7.0 (1)*	
Patient coinsurance (in-network)		% (SE)	% (SE)	Percentage points (SE)	% (SE)	% (SE)	Percentage points (SE)	Percentage points (SE)	
Inpatient	3%	18.5 (3)	23.1 (3)	-4.6 (3)	17.1 (0.3)	16.7 (0.3)	0.4 (0.2)*	-5 (3)	
Intermediate**	3%	18.1 (2)	29.7 (5)	-11.6 (5)*	17.1 (0.3)	16.8 (0.3)	0.4 (0.2)*	-11.9 (5)*	
Office-based professional	6%	17.5 (2)	49.0 (5)	-31.5 (6)*	17.1 (0.4)	17.0 (0.4)	0.1 (0.3)	-31.6 (6)*	

Continued

Table 5 Continued

	Plans NOT Already at Parity Pre-MHPAEA				Plans Already at Parity Pre-MHPAEA			
	Predicted Level of Cost-Sharing Feature for Plan-Years Requiring It		Difference (Post-Pre)		Predicted Level of Cost-Sharing Feature for Plan-Years Requiring It		Difference (Post-Pre)	
	Post	Pre	% (SE)	Percentage points (SE)	Post	Pre	% (SE)	Percentage points (SE)
% of Parity Plan-Years NOT at Parity Pre-MHPAEA								
Patient coinsurance (out-of-network)								
Inpatient	3%		36.4 (2)	50.0 (2)	37.2 (0.5)	36.5 (0.5)	37.2 (0.5)	0.7 (0.3)*
Intermediate**	2%		35.3 (2)	49.5 (3)	37.2 (0.5)	36.3 (0.5)	37.2 (0.5)	0.9 (0.3)*
Office-based professional	4%		34.9 (2)	49.1 (1)	37.1 (0.5)	36.5 (0.5)	37.1 (0.5)	0.6 (0.3)*

* $p < .001$.

[†]This analysis uses the pre/post sample ($n = 6,888$ plan-years), which includes plans with plan-year observations in 2008 and/or 2009 and at least one year 2011–2013.

[‡]Indicators of being at parity pre-MHPAEA can vary by cost-sharing feature. If a plan has one pre-MHPAEA observation (i.e., in either 2008 or 2009) with a behavioral health cost-sharing feature that is as generous, or more generous, than the corresponding medical cost-sharing feature, the plan is classified as at parity pre-MHPAEA for that cost-sharing feature. All plan-years associated with this plan are also classified as at parity pre-MHPAEA.

[§]Change in level of cost-sharing determined using a generalized linear model regression with a gamma distribution and a log link function. All regressions control for employer size, employer's region, employer's industry, and plan type. Standard errors are adjusted for intraclass correlation at the employer group level.

[¶]Calculated using *STATA* postestimation commands, the modifying effect of not being at parity pre-MHPAEA subtracts the (post-pre) difference for plans that were already at parity pre-MHPAEA from the (post-pre) difference for plans that were not already at parity pre-MHPAEA. The unit for both differences and the modifying effect are dollars for copayments, and percentage points for coinsurance.

^{**}Intermediate care includes partial hospitalization, day treatment, intensive outpatient treatment, sober living, and transitional living arrangements.

DISCUSSION

MHPAEA introduced the most far-reaching and comprehensive parity law to date. This analysis investigates whether MHPAEA lowered MH cost-sharing for enrollees of behavioral health care “carve-in” plans and discovers a nuanced story. Among the full sample, regression analyses found MHPAEA did not lead to broad reductions in enrollee copayments or coinsurance for MH services. Although parity was generally associated with modest decreases in cost-sharing for office-based professional services for INN-only and INN/OON plans, and in inpatient copayments for INN/OON plans, for INN/OON plans, parity was also associated with increases in inpatient and intermediate in-network coinsurance and in inpatient, intermediate, and office-based professional out-of-network coinsurance. Also in the full sample, parity was not associated with a significant change in how BH deductibles were accrued; the vast majority of plans combined BH with medical deductibles both before and after parity. However, among the small number of plans not already at parity pre-MHPAEA, both use and level of many cost-sharing features decreased substantially following MHPAEA implementation.

The parity law was designed to equalize the relative generosity of BH and medical benefits rather than achieve a given level of cost-sharing. Because of this, MHPAEA may have increased generosity of specialty MH cost-sharing relative to medical benefits rather than compared to preparity MH cost-sharing levels. For the large number of plans in the full sample that were already at parity pre-MHPAEA, changes in MH cost-sharing was likely driven by medical cost-sharing trends rather than the MHPAEA mandate. Indeed, in previous analyses, we noted that among pre/postplans, higher proportions increased medical cost-sharing features than decreased them, and the increases tended to be higher in magnitude than the decreases (although the vast majority of plans held cost-sharing levels constant). In this context, our finding of only modest decreases and some increases in cost-sharing following parity implementation is less surprising.

While the full sample provides a useful wide-lens view of cost-sharing before and after MHPAEA implementation, understanding the impact of MHPAEA on the small subset of plans that were not already at parity is also important. This study observes substantial reductions in copayments and coinsurances which may reasonably represent reductions in financial barriers to care.

This study strongly suggests that many large, self-insured plans had equally generous BH and medical cost-sharing even before MHPAEA. Insurers may have been reducing differences between BH and medical health

benefits over time, so that some plans were already at parity even before MHPAEA's 2008 passage. Compared to "carve-out" plans (which only administer behavioral health benefits), "carve-in" plans may have been more easily able to achieve parity, since they can access data about both sets of benefits without having to request information from outside medical vendors.

Even modest decreases in cost-sharing for visits to specialty providers for psychotherapy and psychotropic medication management may help make these services more accessible to cost-sensitive enrollees. A large body of literature supports the claim that individuals tend to be more sensitive to price in seeking MH care compared to medical care (Manning et al. 1986; Meyerhoefer and Zuvekas 2006). In addition, as outpatient specialty visits are among the most common psychiatric services sought by enrollees in the sample plans, these reductions may be particularly valued, to the extent that enrollees are aware of them. In contrast, small increases in coinsurance for inpatient care may introduce new cost barriers to patients in need of costly treatment, although the increases in inpatient coinsurance rates could have been partially offset by the decline in inpatient copayments.

Our findings should be considered in light of some limitations. Our analyses do not use a control group. Control group candidates such as small employers (who were exempt from MHPAEA during the study period) and fully insured plans in states with prior parity laws (for which parity may have already been required for these cost-sharing features prior to MHPAEA) were considered, but they were ultimately deemed too dissimilar to provide valid comparisons and/or too small in number to provide meaningful controls. Also, findings based on the pre/postsample are limited by the generalizability of that sample to the full sample, although supplemental analyses find comparable proportions of plans not at parity pre-MHPAEA in both samples. Finally, MHPAEA may have led to substantial changes in other areas of benefit design, including elimination of limits on the number of visits or days of inpatient care covered by the plan and the reduced use of prior authorization and expanded provider networks (Goplerud 2013; Horgan et al. 2016). If so, overall cost-sharing may still have declined, despite the relatively modest impact on financial requirements per se. Ongoing work by our team is using administrative databases delivered by Optum to examine MHPAEA's overall effect on cost-sharing as well as on utilization and expenditures.

Our conclusions regarding changes between the preparity (2008 and 2009) and transition (2010) periods differ somewhat with those of the earlier Horgan et al. (2016) study, which focused on changes during this time period among 939 health plans, including both "carve-in" and "carve-out" models.

Our regression-adjusted analysis of administrative data for 3,822 “carve-in” plans found that between the preparity and transition periods, office-based professional copayments increased (among plans that required them), although in our study, these associations are not statistically significant. Our findings further deviate from Horgan et al. in that we do detect significant decreases in coinsurance levels between the preparity and transition period. It is important to note that, in our data, the magnitude and significance of the estimated parity effects depended on whether the preparity period was being compared with the transition period or the postparity period. These discrepancies suggest the desirability of using longer follow-up periods when measuring the ultimate impact of policy changes. In addition, Horgan et al. do not separately examine MHPAEA's effects on the subset of plans not already at parity pre-MHPAEA.

CONCLUSION

This analysis extends existing knowledge of the early effects of parity on copayments, coinsurance, and deductibles to reveal longer term effects on patient cost-sharing. It is also the first peer-reviewed original research to apply administrative data from a large MBHO to investigate benefit design changes associated with MHPAEA.

This study's most consistent finding is that, overall, MHPAEA was associated with modest decreases in outpatient cost-sharing; however, the study also detects small but statistically significant increases in inpatient and intermediate coinsurance. The conclusion that MHPAEA may not have greatly reduced cost-sharing for MH services can likely be explained in two ways: (i) for many plans, cost-sharing levels were already at parity even prior to implementation, and (ii) MHPAEA may have increased relative (i.e., compared to medical benefits) rather than absolute (i.e., compared to preparity) generosity of specialty BH care coverage. With this understanding, our study suggests that the policy focus in MH (and behavioral health more broadly) may shift from attaining parity with medical benefits to slowing growth in cost-sharing for all health services without reducing access and quality.

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NOTES

1. Other exemptions include disability plans, long-term care plans, government-sponsored plans opting out, hospital or other fixed indemnity insurance, and plans showing that their costs increased by a certain amount as a result of compliance.
2. We report MH copayments and coinsurance, and an indicator of whether BH (MH and SUD) and medical deductibles accumulate together.
3. Nationally, self-insured plans cover the majority of commercially insured patients and are more common among large employers than small employers; the Employee Health Benefits Survey estimated self-insured plans covered 61 percent of commercially insured patients in 2013. It also found 93 percent of employers with 5,000 or more employees and 79 percent of employers with 1000–4,999 employees were self-insured in 2013. Only 16 percent of employers with 3–199 employees were self-insured in 2013 (Kaiser Family Foundation and Health Research and Educational Trust 2013).
4. The unit of observation is plan, rather than plan-year, because identification of the pre/postsample requires looking at observations corresponding to the same plan over time.
5. Pre-parity rates of cost-sharing use are 100 percent for all cost-sharing features because if the medical copayment was 0 then MH copayment was greater than 0, and if medical copayment was greater than 0, then the MH copayment was also greater than 0.

REFERENCES

- Beronio, K., S. Glied, and R. Frank. 2014. "How the Affordable Care Act and Mental Health Parity and Addiction Equity Act Greatly Expand Coverage of Behavioral Health Care." *The Journal of Behavioral Health Services & Research* 41 (4): 410–28. doi:10.1007/s11414-014-9412-0.
- Buchmueller, T. C., P. F. Cooper, M. Jacobson, and S. H. Zuvekas. 2007. "Parity for Whom? Exemptions and the Extent of State Mental Health Parity

- Legislation." *Health Affairs (Project Hope)* 26 (4): w483–7. doi:10.1377/hlthaff.26.4.w483.
- Busch, S. H., A. J. Epstein, M. O. Harhay, D. A. Fiellin, H. Un, D. Leader, and C. L. Barry. 2014. "The Effects of Federal Parity on Substance Use Disorder Treatment Running Title: Federal Parity." *The American Journal of Managed Care* 20 (1): 76–82.
- Centers for Medicare and Medicaid Services. 2016. "Medicaid and Children's Health Insurance Programs; Mental Health Parity and Addiction Equity Act of 2008; the Application of Mental Health Parity Requirements to Coverage Offered by Medicaid Managed Care Organizations, the Children's Health Insurance Program (CHIP), and Alternative Benefit Plans." Federal Register [accessed July 1, 2016]. Available at <https://www.federalregister.gov/articles/2016/03/30/2016-06876/medicaid-and-childrens-health-insurance-programs-mental-health-parity-and-addiction-equity-act-of>
- Duan, N., W. G. Manning, C. N. Morris, and J. P. Newhouse. 1984. "Choosing between the Sample-Selection Model and the Multi-Part Model." *Journal of Business & Economic Statistics* 2 (3): 283. doi:10.2307/1391711.
- Goldman, H., R. G. Frank, M. Audrey Burnam, H. A. Huskamp, M. Susan Ridgely, S.-L. T. Normand, A. S. Young, C. L. Barry, V. Azzone, A. B. Busch, S. T. Azrin, G. Moran, C. Lichtenstein, and M. Blasinsky. 2006. "Behavioral Health Insurance Parity for Federal Employees." *The New England Journal of Medicine* 354 (13): 1378–86. doi:10.1056/NEJMsa053737.
- Goplerud, E. 2013. "United States Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation, 2013. Consistency of Large Employer and Group Health Plan Benefits with Requirements of the Paul Wellstone and Pete Domenici Mental Health Parity and Addiction Equity Act of 2008." Washington, DC: US Department of Health and Human Services Assistant Secretary for Planning and Evaluation Office of Disability, Aging and Long-Term Care Policy. Available at https://www.dol.gov/ebsa/pdf/hhswellstone_domenicimhpaealargeemployerandghpbconsistency.pdf
- Harwood, J., F. Azocar, S. Friedman, M. Ong, A. Thalmayer, C.-H. Tseng, K. Wells, X. Haiyong, and S. Ettner. 2016. "The Mental Health Parity and Addiction Equity Act Evaluation Study: Impact on Specialty Behavioral Healthcare Utilization and Spending Among Carve-In Enrollees." *Medical Care*, Epub September 14, 2016.
- Hodgkin, D., C. M. Horgan, D. W. Garnick, and E. L. Merrick. 2003. "Cost Sharing for Substance Abuse and Mental Health Services in Managed Care Plans." *Medical Care Research and Review* 60 (1): 101–16. doi:10.1177/1077558702250248.
- Horgan, C. M., D. Hodgkin, M. T. Stewart, A. Quinn, E. L. Merrick, S. Reif, D. W. Garnick, and T. B. Creedon. 2016. "Health Plans' Early Response to Federal Parity Legislation for Mental Health and Addiction Services." *Psychiatric Services* 67(2): 162–8. doi:10.1176/appi.ps.201400575.
- Kaiser Family Foundation and Health Research and Educational Trust. 2013. "Employer Health Benefits, 2013 Annual Survey [accessed August 15, 2016]." Available at <http://kaiserfamilyfoundation.files.wordpress.com/2013/08/8465-employer-health-benefits-20131.pdf>

- Manning Jr, W. G., K. B. Wells, N. Duan, J. P. Newhouse, and J. E. Ware Jr. 1986. "How Cost Sharing Affects the Use of Ambulatory Mental Health Services." *JAMA* 256 (14): 1930–4. doi:10.1001/jama.1986.03380140100030.
- McGinty, E. E., S. H. Busch, E. A. Stuart, H. A. Huskamp, T. B. Gibson, H. H. Goldman, and C. L. Barry. 2015. "Federal Parity Law Associated with Increased Probability of Using out-of-Network Substance Use Disorder Treatment Services." *Health Affairs (Project Hope)* 34 (8): 1331–9. doi:10.1377/hlthaff.2014.1384.
- Meyerhoefer, C. D., and S. H. Zuvekas. 2006. "New Estimates of the Demand for Physical and Mental Health Treatment." SSRN Scholarly Paper ID 921604. Rochester, NY: Social Science Research Network. Available at <http://papers.ssrn.com/abstract=921604>
- Ridgely, M. S., M. A. Burnam, C. L. Barry, H. H. Goldman, and K. D. Hennessy. 2006. "Health Plans Respond to Parity: Managing Behavioral Health Care in the Federal Employees Health Benefits Program." *The Milbank Quarterly* 84 (1): 201–18. doi:10.1111/j.1468-0009.2006.00443.x.
- Shern, D. 2009. "Parity Pays Dividends. Increased Costs in Behavioral-Health Benefits Offset by Other Savings." *Modern Healthcare* 39 (2): 24.
- U.S. Government Accountability Office. 2000. "Mental Health Parity Act: Despite New Federal Standards, Mental Health Benefits Remain Limited HEHS-00-95" [accessed August 15, 2016]. Available at <http://www.gao.gov/products/GAO/HEHS-00-95>
- Ziegler, A., C. Kastner, and M. Blettner. 1998. "The Generalised Estimating Equations: An Annotated Bibliography." *Biometrical Journal* 40 (2): 115–39. doi:10.1002/(SICI)1521-4036(199806)40:2<115:AID-BIMJ115>3.0.CO;2-6.
- Zuvekas, S. H., and C. D. Meyerhoefer. 2006. "Coverage for Mental Health Treatment: Do the Gaps Still Persist?" *The Journal of Mental Health Policy and Economics* 9 (3): 155–63.

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

- Appendix SA1: Author Matrix.
- Appendix SA2: Sample Size Flow Chart.
- Appendix SA3: Proportion of Plan-Years with Tiered Benefits.
- Appendix SA4: Proportion of Plan-Years That Do Not Cover Services.