Impact of Mental Health Parity and Addiction Equity Act on Costs and Utilization in Alabama's Children's Health Insurance Program

Bisakha P. Sen, PhD; Justin Blackburn, PhD; Michael A. Morrisey, PhD; Meredith L. Kilgore, PhD; Nir Menachemi, PhD; Cathy Caldwell, MPH; David J. Becker, PhD

From the Department of Health Care Organization & Policy (B Sen, M Kilgore, and D Becker), University of Alabama at Birmingham School of Public Health; Department of Health Policy & Management (MA Morrisey), Texas A&M University School of Public Health, College Station; Department of Health Policy & Management (J Blackburn and N Menachemi), Indiana University Fairbanks School of Public Health, Indianapolis; and Alabama Department of Public Health (C Caldwell), Children's Health Insurance Program, Montgomery
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Address correspondence to Bisakha Sen, PhD, Department of Health Care Organization & Policy, University of Alabama at Birmingham School of Public Health, Ryals Public Health Building, 320, 1665 University Blvd, Birmingham, AL 35294 (e-mail: bsen@uab.edu).
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Abstract

Objective: The Mental Health Parity and Addiction Equity Act (MHPAEA) of 2008 mandates equivalent insurance coverage for mental health (MH) and substance use disorders (SUD) to other medical and surgical services covered by group insurance plans, Medicaid, and Children's Health Insurance Programs (CHIP). We explored the impact of MHPAEA on enrollees in ALL Kids, the Alabama CHIP.

Methods: We use ALL Kids claims data for October 2008 to December 2014. October 2008 through September 2009 marks the period before MHPAEA implementation. We evaluated changes in MH/SUD-related utilization and program costs and changes in racial/ethnic disparities in the use of MH/SUD services for ALL Kids enrollees using 2-part models. This allowed analyses of changes from no use to any use, as well as in intensity of use.

Results: No significant effect was found on overall MH service-use. There were statistically significant increases in inpatient visits and length of stay and some increase in overall MH costs. These increases may not be clinically important and were concentrated in 2009 to 2011. Disparities in utilization between African-American and non-Hispanic white enrollees were somewhat exacerbated, whereas disparities between other minorities and non-Hispanic whites were reduced.

Conclusions: Findings indicate that MHPAEA led to a 14.3% increase in inpatient visits, a 12.5% increase in length of inpatient stay, and a 7.8% increase in MH costs. The increases appear limited to 2009 to 2011, suggesting existing pent-up "needs" among enrollees for added MH/SUD services that resulted in a temporary spike in service use and cost immediately after MHPAEA, which subsequently subsided.

Keywords: children; mental health; Mental Health Parity and Addiction Equity Act; public insurance

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What's New

This is the first study to analyze the impact of MHPAEA on utilization and costs, and racial disparities therein, in a Children's Health Insurance Program (CHIP), and can provide insights into potential impacts on other stand-alone CHIP programs.

The enactment of the Mental Health Parity and Addiction Equity Act (MHPAEA) in 2008 has been described as the culmination of a decades-long effort to improve insurance coverage for mental health and addiction treatment in the United States. MHPAEA is a federal law that mandates equivalent insurance coverage for mental health (MH) and substance use disorders (SUD) to other medical and surgical services covered by group insurance plans, Medicaid, and Children's Health Insurance Programs (CHIP). Specifically, the Children's Health Insurance Program Reauthorization Act of 2009, under Title V ("Improving Access to Benefits") section 502 called for "parity of mental health services in CHIP plans with all covered medical and surgical benefits."[1] The Affordable Care Act later extended its provisions to individual health insurance plans offered through the marketplaces.[2]

Historically, health insurance plans typically have provided more limited coverage of MH services relative to other conditions. Before MHPAEA, many states had passed some form of parity legislation. These state policies varied substantially in terms of the eligible population, benefits covered, and diagnoses included. For example, some states (eg, Arizona, Indiana, and South

Carolina) required equal annual and lifetime caps for MH illnesses and physical ailments, whereas other states (eg, South Dakota) also required that firms provide the same deductibles, coinsurance, and number of outpatient visits as for physical illnesses. State laws also differed in the conditions covered, with some (eg, Delaware, Colorado, Maine, and Texas) applying only to a subset of severe or ''biologically based'' disorders,[3] whereas other states (eg, Vermont) required that coverage be provided for any mental illness listed in the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition*.

Alabama, which is the focus of this paper, became a "mandated offering state" in 2000. Mandated offering states required group plans to offer optional coverage of mental illness, severe mental illness, SUD, or some combination thereof. If the option of coverage is accepted, then it usually comes with an added premium. Alabama required that if the option(s) were selected, the copayments/coinsurance for MH services had to be the same as those for physical health services.[4,5] However, there could still be quantitative constraints on MH services compared with other health services, and as we will describe later, Alabama's CHIP program had several such constraints in place.

The key provision of MHPAEA is that the financial requirements (eg, deductibles and copayments, or other forms of cost-sharing) and treatment limitations (eg, number of outpatient visits or inpatient days of coverage) that apply to MH/SUD services must be no more restrictive than those that apply to medical/surgical services covered by the plan. In addition, if an insurance plan provides out-of-network medical/surgical benefits, then it must also provide out-of-network MH/SUD benefits. Finally, standards for medical necessity determinations and reasons for any denial of benefits relating to MH/SUD benefits must be disclosed on request. The provisions became effective for plan years beginning after October 3, 2009.

Insurers frequently have voiced concerns that the provision of intensive, or long-term, care for MH conditions would drive up health care costs and premiums. Some studies find that patients with MH disorders use health services at greater rates compared with otherwise-similar individuals.[6] Evidence from the RAND Health Insurance Experiment suggests that the demand for MH services is more price-elastic than other health services and may thus increase disproportionately with lower cost-sharing.[7,8] Finally, there is concern about adverse selection, where high cost enrollees with a history of MH use are more likely to enroll when health plans provide more generous coverage.[6,9]

Studies on state MH parity laws have found mixed evidence as to whether these laws changed access, utilization, and costs for private group health insurance plans.[10-14] Relatively few studies have focused on the potential impact of parity laws on child enrollees.[3] We are not aware of any studies that have focused on the impact of MHPAEA on public insurance programs for children.

In this study, we explored the early impact of MHPAEA on enrollees of ALL Kids, the Alabama Children's Health Insurance Program. Of interest is whether there were changes in MH- and SUD-related utilization and program costs, particularly on inpatient visits and length of stay. We also explored whether the passage of MHPAEA may have changed racial and ethnic disparities in the use of MH/SUD services for ALL Kids enrollees. These results can provide insights into potential effects on other stand-alone CHIP programs, several of which are in southern states as well.

METHODS

Historically, ALL Kids coverage was available to Alabama residents younger than 19 years of age with family incomes between 100% and 200% of the federal poverty level (FPL). Beginning in October 2009, program eligibility was expanded to 300% of the FPL. Enrollees faced annual premiums and copayments that vary across the income groups defined by family income and Native American status. The program is administered by the Alabama Department of Public Health, which contracts with Blue Cross and Blue Shield of Alabama for claims processing and management. Children enrolled in ALL Kids benefit from full medical, pharmaceutical, and dental coverage from the Blue Cross and Blue Shield of Alabama −preferred provider network. Enrollees pay an annual premium and experience cost sharing in the form of copayments for selected services. Children in families with incomes between 100% and 150% of the FPL (termed the "low-fee group") face lower levels of cost sharing, whereas children in families with incomes between 150% and 200% of the FPL (termed the "fee group") face greater levels of cost sharing. Children in the 200% and 300% of the FPL following the expansion in 2009 (termed the "expansion group") have the same cost sharing as the fee group. The fourth group, comprising primarily Native American children ("no fee"), is federally exempted from all cost sharing. There are no upfront annual deductibles in the ALL Kids program, and out-of-pocket costs per plan year may not exceed 5% of the family income.[15]

We used claims data from Fall 2008 through 2014 to analyze the potential impact of MHPAEA. The start date is driven by the fact that before Fall 2008, MH services in the program were provided through an MH carve-out, and we do not have access to their claims data. Thus, the period from Fall 2008 through Summer 2009 is the period before MHPAEA implementation, whereas Fall 2009 and later marks the period when MHPAEA is in effect. During the pre-MHPAEA period, ALL Kids had in place various limits on MH/SUD services, such as a limit of 30 days per member per year for MH inpatient days; a limit of 3 days per member per year for SUD inpatient days; and 20 outpatient MH visits and 90 outpatient SUD visits per member per year.

We employed pooled enrollee-quarter level data for our empirical analyses. We identified MH/SUD claims and

associated costs using *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*, codes listed in the Appendix. All costs were adjusted to 2014 dollars using the Consumer Price Index for all items (1982−1984 = 100) from the Bureau of Labor Statistics. MH/SUD services are categorized as being obtained in an outpatient/physician's office setting, an inpatient setting, an ED setting, or "other" setting. In addition, for inpatient admissions, we also calculated the length of stay. The length of stay was assigned to the quarter when the inpatient admission initially occurred, even if the hospitalization extended to the next quarter.

We used 2-part models to estimate the association MHPAEA and our outcomes of interest. Two-part models are appropriate for outcomes (eg, number of MH/SUD visits) with a large proportion of zeroes for the sample. The first part of the model estimated how covariates of interest are associated with the likelihood of the outcome being non-zero versus zero. The second part of the model estimated how covariates of interest are associated with the level of outcome conditional on it occurring. Our main covariate of interest was a binary indicator for MHPAEA being in effect (post-MHPAE) versus not (pre-MHPAE). To account for the possibility that the effect of MHPAEA law may be different in the immediate aftermath of passage versus after it has been in place for some years, we also separately categorized the "post-MHPAEA" period into an "early period" (2009−2011) and "later period" (after 2011). We additionally included a continuous "time" indicator to measure trends in MH/SUD service utilization and dummy indicators for each quarter to account for seasonal fluctuations in utilization. The models also included a binary indicator for January 2014 onwards, since that marks the period all provisions of The Affordable Care Act went into effect, including the transition of children aged 6−19 years with incomes less than 133% FPL from CHIP to Medicaid. All models also controlled for sociodemographic and economic characteristics, including age, sex, race-ethnicity (non-Hispanic white, African-American, other), eligibility/FPL category, and urban/rural residency status. Because previous research suggests that poor MH is associated with chronic health conditions like asthma, we also included whether the enrollee had any chronic health conditions.

Since MHPAEA applied to all CHIP enrollees, we did not have a control group per se for our empirical analyses. However, we employed a falsification test by testing the association between passage of MHPAEA and total cost for non-MH/SUD health services.

To further ensure that any changes associated with MHPAEA were not just an artifact of the 200% to 300% FPL expansion group joining the pool, we also re-estimated all models after excluding that group altogether from the sample. All results are presented as "marginal effects" (MEs), which represent the absolute risk difference between a group and the reference category.

To explore whether passage of MHPAEA changed health disparities, we also estimated models in which the binary MHPAEA indicator was interacted with race-ethnicity. Due to the challenges of computing and interpreting MEs for interaction terms in nonlinear 2-part models, we present these results in a linear, quasi-difference-in-difference framework. The statistical software STATA (v. 14; StataCorp LLC, College Station, Tex) was used for all empirical estimations. This project was approved by the Institutional Review Board of the University of Alabama at Birmingham.

RESULTS

Figure 1 shows the mean visits in each category per 1000 enrollee, by quarter, over the entire study period.

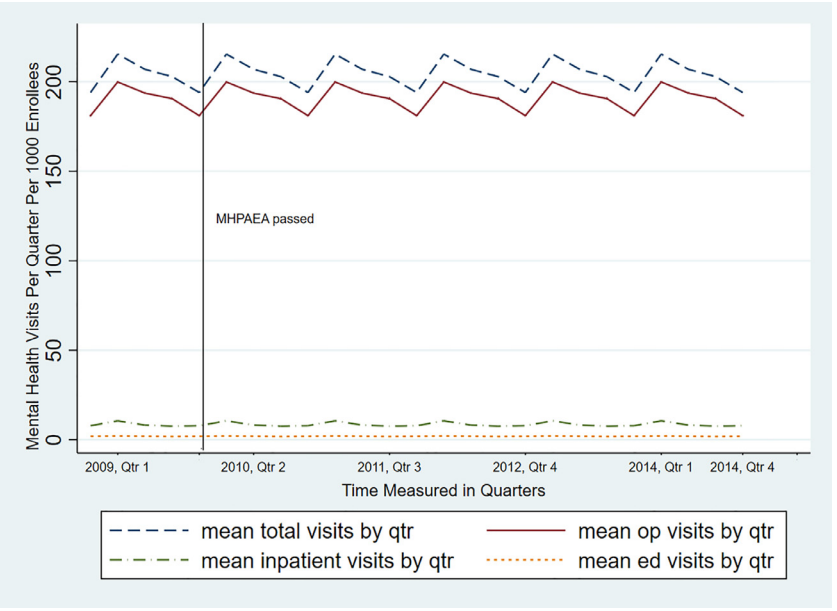

Figure 1. *Mean mental health/substance use disorder visits in different categories per 1000 enrollees, by quarter. MHPAEA indicates Mental Health Parity and Addiction Equity Act.*

Outpatient MH/SUD visits accounted for the overwhelming majority of overall MH/SUD visits. Moreover, the figure shows a distinct seasonal pattern in MH/SUD visits, although there does not appear to be any clear indication of a trend otherwise. Notably, ED visits for MH/SUD that did not lead to inpatient admissions appear to be very low in number. On the basis of this information, we focused on presenting results from overall visits, outpatient/ambulatory and inpatient visits, as well as inpatient length of stay and total program costs for MH/SUD.

Table 1 presents descriptive statistics for the periods before and after passage of MHPAEA. In both periods, descriptive statistics are presented for the full sample of enrollees, and for the subsample that had a non-zero amount of MH/SUD spending for our study period, that is, they incurred MH/SUD expenditures at least once in this period. From the descriptive statistics, there was a slight increase in all categories of MH visits—with the exception of ED visits, as well as a small increase in average enrollee costs per quarter, from the pre to post-MHPAEA period. Further analyses, not shown in tables, revealed that the 95th percentile of costs increased from $446.93 in the pre MHPAEA period to $482.22 in the post-MHPAEA period.

Results for 2-part models with and without the expansion group are in Table 2. There was a slight increase in "any use" of MH services following the passage of the MHPAEA act, of approximately 0.2% (ME: 0.002, t-stat: 4.21) and a similar increase in "any use" of outpatient visits (ME: 0.002, t-stat: 4.23). However, intensity of use shows a negative, albeit insignificant, change. The overall effect on total MH services and outpatient visits was not significant (ME: 0.004, t-stat: 1.22; ME: 0.001, t-stat: 0.36). We observed no change in the likelihood of "any" inpatient visits. However, conditional upon visits, there was an increase in number of visits, and the overall effect on inpatient visits was positive (ME: 0.001, t-stat: 3.65). Correspondingly, there was no change in the likelihood of going from no to any length of stay, which is essentially the same as going from "no inpatient visit" to "any visit." However, conditional upon a non-zero length of stay, there was an increase, and the overall effect on inpatient length of stay was positive (ME: 0.001, t-stat: 2.68). There was also an increase in the likelihood of any MH/SUD program costs and a positive but insignificant effect on level of costs conditional upon non-zero costs. The overall effect on costs was positive (ME: 1.80, t-stat: 2.63). The increases in MH/SUD inpatient service utilization appeared more concentrated in the "early" period of 2009 to 2011, following the passage of the MHPAEA. For example, both the number of inpatient admissions and the length of stay showed a significant increase in the early post-MHPAEA period (ME: 0.001, t-stat 2.62 and ME: 0.0008, t-stat: 2.08) but not in the later post-MHPAEA period (ME: 0.00006, t-stat: 0.10 and ME: 0.0003, t-stat: 0.35). However, the change in the likelihood of using any MH/SUD service remained significant in both early and later periods.

The results remained very similar when the expansion group was excluded, suggesting that this group, which was added to the enrollee pool at the same time as MHPAEA, was not driving the results. Finally, the falsification tests found no evidence of a significant positive association between MHPAEA and non-MH/SUD health costs. In fact, the associations appeared negative in many cases.

Results presented in Table 3 indicate that, pre-MHPAEA, African-Americans and "other race-ethnicities" used significantly lower levels of MH/SUD services than non-Hispanic whites. Post-MHPAEA, there is actually a modest widening in the disparities in use of MH/SUD services between African-American and non-Hispanic white enrollees, based on coefficient estimates of "Post-MHPAEA*African-American" for all visits (β: −0.02, t-stat: −3.53) and outpatient visits (β: −0.01, t-stat: −3.11). The interaction had a negative, although insignificant, coefficient estimate for cost. In contrast, enrollees of other race ethnicities experienced a significant increase in inpatient length of stay (β: 0.005, t-stat: 2.08), outpatient visits (β: 0.02, t-stat: 2.87), and total MH costs (β: 6.27, t-stat: 2.61) relative to non-Hispanic white patients. In no cases were the baseline disparities completely eliminated, but they were substantially reduced. For example, the disparity in total MH costs shrank on average by $6.27, which, based on the average baseline gap of $15.63, is a 40% decline.

DISCUSSION

This study adds to the literature on the MHPAEA by being the first study to examine health service utilization, costs, and racial disparities therein among children in a public health insurance program. We focused on the standalone CHIP program in Alabama and suggest that the results have relevance for the 13 other states with standalone CHIP programs[16] and comparable eligibility criteria,[17] including other southern states of Georgia, Mississippi, and Texas.

Previous studies of the effects of state MH parity laws, or parity laws in the Federal Employees Health Benefits (FEHB) program, have shown mixed results. For example, a comparison of 7 FEHB plans found an increase in service use in 1 plan, a decrease in a second plan, and no significant changes in the remainder.[18] Separate analyses focusing on child enrollees in these FEHB plans found evidence of increased use of services in just 1 plan. Furthermore, there was evidence of declines in out-of-pocket spending on MH/SUD services in 3 of the FEHB plans, which is consistent with findings of lower out-of-pocket spending and lower probability of financial hardship for families with children with MH needs in parity states compared with other states.[19]

In ALL Kids, the impact of MHPAEA was largely through removal of quantitative constraints on MH service use, such as number of inpatient days and outpatient visits. Our findings are consistent with these changes. Particularly, we saw increases both in inpatient admissions

Table 1. Summary Statistics, Pooled Enrollee-Quarter, Pre-MHPAEA (Parity = 0), and Post-MHPAEA (Parity = 1)

	Pre-MHPAE (N = 304,036)		Post-MHPAE (N = 1,731,783)		Pre-MHPAE, any use (N = 57,240)		Post-MHPAE, any use (N = 363,880)	
Variable	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Total MH visits, all	0.178	(1.518)	0.209	(1.588)	0.946	(3.394)	0.995	(3.351)
Total MH visits, outpatient	0.167	(1.456)	0.195	(1.485)	0.890	(3.259)	0.928	(3.133)
Total MH visits, inpatient	0.007	(0.264)	0.009	(0.346)	0.035	(0.609)	0.042	(0.754)
Inpatient length of stay	0.008	(0.302)	0.009	(0.347)	0.043	(0.696)	0.043	(0.756)
Total MH visits, ED	0.002	(0.060)	0.002	(0.068)	0.009	(0.138)	0.009	(0.149)
Inflation-adjusted MH costs	23.666	(299.445)	26.490	(346.167)	125.706	(680.775)	126.071	(746.828)
Member age	10.494	(4.780)	10.415	(4.948)	10.463	(4.210)	11.066	(4.582)
Female	0.495		0.496	(0.500)	0.431		0.429	(0.495)
Race								
African-American	0.346		0.307		0.238		0.228	
Other	0.084		0.135		0.059		0.090	
Has chronic condition	0.267		0.241		0.397		0.355	
Rural/urban category								
Urban	0.650		0.667		0.670		0.692	
FPL								
100%–150%	0.617		0.462		0.604		0.452	
150%–200%	0.375		0.348		0.387		0.353	
Exempt	0.008		0.008		0.009		0.009	
Expansion	–		0.182		–		0.185	

MHPAEA indicates Mental Health Parity and Addiction Equity Act; SD, standard deviation; MH, mental health; ED, emergency department; and FPL, federal poverty level.
Means and SDs are presented for continuous variables and proportions for discrete variables.

Table 2. Estimated Effect of Passage of MHPAE on MH Service Use and Costs From 2-Part Models

	Part 1: Logit Results (t-stat)	Marginal Effect	Part 2: GLM Result (t-stat)	Combined Marginal Effect	Part 1: Logit Results (t-stat)	Marginal Effect	Part 2: GLM Result (t-stat)	Combined Marginal Effect
	Full Sample				Without Expansion Group			
Total MH visits, all								
Post-MHPAEA	0.05** (4.21)	0.002	−0.02 (−1.24)	0.004 (1.22)	0.06** (5.07)	0.003	−0.02 (−0.99)	0.007 (1.90)
Total MH visits, Inpatient								
Post-MHPAEA	0.07 (0.82)	0.00003	0.33** (5.56)	0.001** (3.65)	0.06 (0.72)	0.00003	0.30** (4.56)	0.002** (3.31)
Inpatient length of stay								
Post-MHPAEA	0.07 (0.82)	0.00003	0.21** (3.48)	0.001** (2.68)	0.06 (0.72)	0.00003	0.20** (3.28)	0.001** (2.49)
Outpatient MH visits								
Post-MHPAEA	0.05** (4.23)	0.002	−0.04 (−1.89)	0.001 (0.36)	0.06** (5.10)	0.003	−0.03 (−1.89)	0.004 (1.18)
Inflation adjusted MH costs								
Post-MHPAEA	0.05** (4.20)	0.002	0.04 (1.31)	1.80** (2.63)	0.06** (5.06)	0.003	0.05 (1.39)	2.12** (3.01)
Non-MH health costs								
Post-MHPAEA	−0.02 (−1.60)	−0.005	−0.016 (−1.30)	−5.66 (−1.33)	0.006 (1.06)	0.001	−0.02 (−1.62)	−6.24 (−1.44)
	Models Separating Effects of Post-MHPAEA Into “Early” and “Later” Periods							
Total MH visits, all								
Post-MHPAEA (early period)	0.06** (4.43)	0.003	−0.03 (−1.49)	0.004 (1.15)	0.07** (4.95)	0.003	−0.02 (−1.19)	0.007 (1.75)
Post-MHPAEA (later period)	0.08** (3.48)	0.004	−0.05 (−1.31)	0.005 (0.73)	0.09** (3.42)	0.004	−0.04 (−0.99)	0.008 (0.02)
Total MH visits, Inpatient								
Post-MHPAEA (early period)	0.03 (0.28)	0.00001	0.25** (3.40)	0.001** (2.62)	0.05 (0.47)	0.00002	0.22** (2.84)	0.001** (2.43)
Post-MHPAEA (later period)	−0.06 (−0.36)	−0.00002	0.08 (0.62)	0.00006 (0.10)	0.01 (0.07)	0.00006	0.04 (0.80)	0.0002 (0.23)
Inpatient length of stay								
Post-MHPAEA (early period)	0.03 (0.28)	0.00001	0.19** (2.68)	0.0008** (2.08)	0.05 (0.47)	0.00002	0.18** (2.50)	0.001** (2.07)
Post-MHPAEA (later period)	−0.06 (−0.36)	−0.00002	0.13 (1.08)	0.0003 (0.35)	0.01 (0.07)	0.00006	0.12 (0.93)	0.0006 (0.61)
Outpatient MH visits								
Post-MHPAEA (early period)	0.05** (3.47)	0.002	−0.02 (−0.65)	0.005 (1.36)	0.04** (2.59)	0.002	−0.03 (−1.32)	0.001 (0.30)
Post-MHPAEA (later period)	0.05** (2.48)	0.002	0.01 (0.24)	0.009 (1.56)	0.03 (1.30)	0.001	−0.02 (−0.44)	0.002 (0.34)
Inflation adjusted MH costs								
Post-MHPAEA (early period)	0.06** (4.43)	0.003	0.014 (0.38)	1.42* (1.90)	0.07** (4.94)	0.003	0.019 (0.51)	1.72** (2.25)
Post-MHPAEA (later period)	0.08** (3.48)	0.004	−0.046 (−0.71)	0.61 (0.46)	0.09** (3.41)	0.004	−0.038 (−0.55)	0.88 (0.62)
Non-MH health costs								
Post-MHPAEA (early period)	−0.04** (−2.15)	−0.009	0.01 (0.80)	−0.65 (−0.13)	−0.04** (−2.91)	−0.01	−0.0006 (−0.40)	−0.59 (−0.98)
Post-MHPAEA (later period)	−0.02 (−0.79)	−0.004	0.01 (0.50)	0.23 (0.29)	−0.03 (−1.70)	−0.006	−0.004 (−0.60)	−0.99 (−0.80)

MHPAEA indicates Mental Health Parity and Addiction Equity Act; MH, mental health; and GLM, generalized linear model.

The preceding results are from 2-part models, estimated using pooled quarter-level enrollee data from 2008 to 2014. Models control for the following variables: a linear time trend, binary indicators for quarter, a binary indicator for 2014 (when all The Affordable Care Act provisions go into effect), enrollee sex, race, federal poverty level category (no fee, low fee, fee, and expansion), and binary indicators for age-category, urban residence, and any chronic conditions. Costs are adjusted to 2014 dollars using the Consumer Price Index (1982−84 = 100). N = 2,035,780 for full model, N = 1,720,815 when the expansion group is excluded. Models are estimated using STATA (v. 14) and the ‘tpm’ add-on procedure, followed by the ‘margins’ routine. Marginal effects are computed holding other values at the sample mean: **$P < .05$.

Table 3. Estimated Effect of MHPAE on Racial Disparities in Health Service Use and Costs—Linear Difference-in-Difference

	Difference-in-Difference Regressions (t-stat) Full Sample	Difference-in-Difference Regressions (t-stat) Without Expansion Group
Total MH visits, all		
African-American	−0.11* (−17.27)	−0.10* (−17.33)
Other	−0.10* (−9.67)	−0.10* (−9.84)
Post-MHPAEA*African-American	−0.02* (−3.53)	−0.03* (−4.01)
Post-MHPAEA*Other	0.02 (1.50)	0.008 (0.75)
Total MH visits, Inpatient		
African-American	−0.006* (−4.23)	−0.005* (−4.23)
Other	−0.005* (−2.04)	−0.004* (−2.07)
Post-MHPAEA*African-American	0.0003 (0.20)	0.00002 (0.01)
Post-MHPAEA*Other	0.003 (1.74)	0.002 (1.77)
Inpatient length of stay		
African-American	−0.005* (−3.67)	−0.005* (−3.73)
Other	−0.006* (−2.34)	−0.006* (−2.64)
Post-MHPAEA*African-American	0.0002 (0.21)	−0.0003 (−0.21)
Post-MHPAEA*Other	0.005* (2.08)	0.004 (1.78)
Outpatient MH visits		
African-American	−0.11* (−26.32)	−0.11* (−26.54)
Other	−0.10* (−17.86)	−0.11* (−15.84)
Post-MHPAEA*African-American	−0.01* (−3.11)	−0.01* (−3.01)
Post-MHPAEA*Other	0.02* (2.87)	0.02* (2.20)
Inflation-adjusted MH costs		
African-American	−15.05* (−11.34)	−15.03* (−11.21)
Other	−15.63* (−6.85)	−15.78* (−6.83)
Post-MHPAEA*African-American	−1.92 (−1.33)	−2.49 (−1.68)
Post-MHPAEA*Other	6.27* (2.61)	4.96* (2.02)

MHPAEA indicates Mental Health Parity and Addiction Equity Act; MH, mental health.

Models control for the following variables: a linear time trend, binary indicators for quarter, a binary indicator for 2014 (when all The Affordable Care Act provisions go into effect), enrollee sex, race, federal poverty level category (no fee, low fee, fee, and expansion), and binary indicators for age-category, urban residence, and any chronic conditions. Costs are adjusted to 2014 dollars using the Consumer Price Index (1982−84 = 100). N = 2,035,780 for full model, N = 1,720,815 when the expansion group is excluded.

*$P < .05$.

and inpatient lengths of stay. Results from our 2-part models showed an average increase of 0.001 in the total number of inpatient admissions per quarter. On the basis of the Pre-MHPAEA mean of 0.007 inpatient admissions per quarter, this represents a 14.3% increase. Along parallel lines, inpatient length of stay also increased by 0.001, which represents an increase of 12.5% based on the Pre-MHPAEA mean inpatient length of stay of 0.008. This finding is consistent with previous studies that found that inpatient admissions and length of stay increased in the period following passage of MHPAEA. For example, previous work showed that, among beneficiaries covered by employer-sponsored health insurance, MH inpatient admissions increased from 2.4 per 1000 beneficiaries in 2009 to 2.7 per 1000 beneficiaries in 2011, and the average length of stay increased from 6.1 days to 6.9 days.[20] However, the authors of that report cautioned that the precise role of MHPAEA was unclear.

Overall MH costs for the program also increased on average by 1.80 inflation-adjusted dollars. On the basis of the pre-MHPAEA mean of $23.67 per enrollee, this represents an increase of 7.8%. One intriguing finding was an increase in the probability of any MH/SUD visits compared with none, not an increase in the frequency of visits conditional on having any. One explanation might be adverse selection—namely that enrollees in the post-MHPAEA period were more likely to need at least some MH/SUD services compared with their counterparts in the pre MHPAEA period. We are unable to test this rigorously, given that there is only one fiscal year in our data before the passage of MHPAEA. Moreover, in our "falsification" analyses where we used non-MH/SUD costs as the outcome, we did not find any positive associations between MHPAEA and these costs but did see some indication of a negative association. It is possible that non-MH/SUD services, such as visits with a primary care physician or behavioral counseling during well-visits, may be substitutes for MH/SUD visits. Hence, greater availability of the latter may plausibly lead to a slight decline in the former. This should be explored in further research.

Another interesting finding is that the effects of MHPAEA on inpatient admissions appear to be more concentrated in the years immediately after its passage and seem to dissipate after 2011. This suggests that there may have been pent-up "needs" among enrollees who required added MH/SUD services in an inpatient setting, resulting in a spike in such service use immediately after the MHPAEA, which subsequently subsided. Taken with the earlier findings, we conjecture that MHPAEA mostly impacted the small number of patients who were affected by the pre-MHPAEA quantitative constraints—and thus likely the sickest and most vulnerable patients benefitted. We further argue that, in context of the overall program, the increases in service use as well as costs were small and not of sufficient clinical importance to merit concern.

With regard to racial disparities in MH service utilization, we found baseline disparities that may reflect disparities in

access. We found a slight exacerbation in disparities between African-Americans and non-Hispanic whites in the post-MHPAEA period, with total and outpatient visits for African-Americans declining by a small, but statistically significant, amount. In contrast, the disparities between other race ethnicities and non-Hispanic white patients were reduced for inpatient length of stay and outpatient visits, and in case of MH/SUD spending, the gap was reduced by approximately 40% of the baseline amount.

We recognize several limitations of this work. First, MHPAEA applied to all enrollees; thus, we did not have a "control group" that allowed us to separate the effect of MHPAEA from underlying time trends in utilization, although we did include a falsification test. Another limitation is the relatively short period between the end of the MH/SUD carve-out in ALL Kids and the implementation of MHPAEA, which allowed us to examine just 4 quarters of data in the baseline period before the law is passed. This poses a barrier to assessing whether new enrollees in the post-MHPAEA period were more likely to utilize MH/SUD services in the first year of enrollment than new enrollees in the pre-MHPAEA period.

Another challenge arises from the fact we are able to assess observed change in service utilization but do not know the extent to which there are still barriers to accessing services, particularly the distance that each enrollee has to travel, or the wait times, to see a provider. For example, a previous report based on other states found that plan beneficiaries faced considerable challenges finding psychiatrists who were accepting new patients after the passage of MHPAEA.[21] There may also be heterogeneity in the change in demand for specific MH/SUD health services after MHPAEA. Caution must be exercised in generalizing these findings to all public insurance programs, especially given the variation of results of parity across FEHB plans mentioned previously. Finally, as is always the case with claims data, we can evaluate service use and costs but cannot evaluate actual improvements in health and quality of life per se, or reductions in financial stress and worries. These dimensions should be explored in future research to get a more complete picture of the impact of the MHPAEA.

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SUPPLEMENTARY DATA

Supplementary data related to this article can be found online at https://doi.org/10.1016/j.acap.2018.07.014.

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