

# Impacts of a Medicaid Wraparound Model Demonstration Program on Youth Specialty Mental Health Services Use

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## Abstract

*Effective coordination of mental health care is critical in Medicaid wraparound model programs for youth. This study examined participation over time in mental health services for youth diverted or transitioned from residential care to a Medicaid wraparound demonstration program. Youth in wraparound had more sustained use of mental health outpatient clinic services than did propensity score matched youth who were not in wraparound. However, the rate of outpatient clinic follow-up after inpatient discharge was no greater in wraparound. Routine assessment of wraparound programs' impacts on receipt of mental health care may inform the development of Medicaid wraparound program performance standards.*

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## Introduction

The wraparound model, which provides intensive team-based case management services and other supports to youth with severe emotional and behavioral problems, was developed in part to provide a community-based alternative to residential care.<sup>1-5</sup> Some states are exploring adding wraparound services to their state Medicaid plan.<sup>6,7</sup> A critical issue for states to consider in this process is how best to integrate wraparound within their public behavioral health systems of care for Medicaid enrolled youth. However, little information is available in relation to how wraparound programs may affect their clients' receipt of other specialty mental health services within an integrated behavioral health system of care financed by Medicaid.

Before 1980, residential care was a public mental health system's most restrictive placement option for youth with severe emotional and behavioral problems. The wraparound model was developed in the 1980s, partly in response to awareness that residential care does not achieve positive long-term outcomes for youth and that many at-risk youth can remain in their communities if they receive adequate supports.<sup>8-12</sup> Many new wraparound programs were established during the late 1980s and 1990s, and by the late 2000s, most states had at least one program.<sup>6</sup> However, the potential need for these programs continued to exceed their availability largely due to the difficulty of obtaining financing for wraparound services.<sup>7</sup>

Although states have historically not been permitted to finance wraparound services using Medicaid, changes introduced by the 2010 Affordable Care Act enable this option.<sup>13</sup> Among the changes, the Affordable Care Act eliminated the requirement under section 1915(i) of the Social Security Act that states demonstrate to the federal government that wraparound and other home- and community-based services are "budget neutral" to Medicaid and that access to wraparound is limited to persons with an "institutional level of need".<sup>14</sup> The removal of these requirements effectively makes it more attractive for states to include wraparound in their state Medicaid plan. Prior to these reforms, states were able to offer Medicaid-financed wraparound services only after applying for a Medicaid program waiver, a process that is administratively burdensome and that effectively restricts wraparound program eligibility to youth who would otherwise have been institutionalized. Under these requirements, wraparound could be offered only to a limited number of youth who already met relatively strict criteria for institutional placement (e.g., multiple prior psychiatric hospitalizations) or who had already been placed in an institution. By contrast, under the revised rules, essentially any youth who meets recognized clinical criteria for receipt of wraparound services may qualify for enrollment in a Medicaid-financed wraparound program. This implies that states now have greater authority to include a greater number of at-risk youth in wraparound services than they did previously and may utilize wraparound programs for the purpose of preventing youth from reaching the point of needing institutional placement in the first place.

The prospect of Medicaid wraparound programs suggests that states should foster coordination of wraparound services with other Medicaid financed behavioral health services in a community-based behavioral health system of care.<sup>15,16</sup> Youth who enroll in wraparound typically have an ongoing need for outpatient mental health services, such as psychotherapy and psychotropic medication management, and are prone to acute psychiatric symptoms and to engaging in behaviors that can result in inpatient hospital admission or referral to residential care. As the provider chiefly responsible for maintaining youth in community settings, Medicaid wraparound programs should coordinate clients' receipt of clinically indicated behavioral health care services and should intervene to prevent avoidable inpatient and residential care admissions. However, wraparound clients' use of specialty mental health care services is not routinely assessed by state behavioral health administrations and Medicaid. Consequently, information about wraparound programs' performance in coordinating mental health care may be useful for informing states' implementation and oversight of these programs.

Rigorous research-based examinations of wraparound programs' impacts on youth's use of mental health services have not been completed. A literature search identified only two relevant studies, neither of which directly addresses the impacts of wraparound on receipt of outpatient and inpatient specialty mental health services when compared with usual outpatient care. A randomized trial by Bruns and colleagues compared receipt of all home-and-community-based services for youth receiving wraparound versus youth receiving non-wraparound-intensive mental health case management.<sup>17</sup> Group differences were not statistically significant. In an observational study of non-wraparound case management services, Bender, Kapp, and Hall found that receipt of more case management hours was associated with attending more individual therapy sessions and a greater likelihood of attending group therapy.<sup>18</sup> However, that study lacked a comparison group and consequently did not address the potential simultaneity between case management hours and therapy utilization.

This study examines how a Medicaid wraparound demonstration program in Maryland affected the course of youths' participation in mental health inpatient, outpatient, emergency department, and residential care services, as well as outpatient follow-up following a mental health inpatient stay. All youth who enrolled in Maryland's wraparound demonstration program was either being diverted or transitioned from out-of-home residential care. All who enrolled received intensive care coordination in the community using the wraparound model.<sup>1-3,5</sup> It was hypothesized that youth who received wraparound services would have greater sustained participation in outpatient specialty mental health clinic services, as compared with similar youth who did not enter wraparound services but were receiving outpatient specialty mental health services at the start of the study period.

It was also hypothesized that youth receiving wraparound would be more likely than youth in usual outpatient care to complete a follow-up outpatient mental health clinic visit within 30 days following discharge from mental health inpatient care. Completion of a timely follow-up outpatient clinic visit after a mental health inpatient stay is an indicator of wraparound program performance. Such follow-ups are used to evaluate ongoing mental health treatment needs, manage medications, and coordinate other related services and supports. As such, timely outpatient follow-up is considered instrumental for effective management of a chronic mental health condition, and wraparound programs are intended to manage receipt of any and all services that may sustain a youth's tenure in the community.<sup>19</sup>

## Methods

### Data and sample

From October 2009 to October 2012, 273 youth were enrolled in Maryland's Wraparound Demonstration Waiver program, according to program enrollment records. Maryland's Waiver Program was authorized by the Centers for Medicare and Medicaid services under a Medicaid 1915c Home-and-Community-Based Services Waiver. In the program, private care management entities provided high-intensity care management utilizing the wraparound model to youth with severe emotional and behavioral problems. All wraparound providers were required to demonstrate to the state Mental Hygiene Administration that they met fidelity standards for delivery of model wraparound services, as measured by the Wraparound Fidelity Index Version 4.0.<sup>20</sup> State evaluators measured fidelity on an ongoing basis through interviews with wraparound team members, caregivers, and youth. During the final reporting period, the average wraparound fidelity scores were 76 from caregiver reports and 78 from youth and team member reports. The fidelity scores suggest that the wraparound model was implemented with adequate fidelity. In addition to care management services, wraparound clients could access up to seven specific home and community-based services and supports: caregiver peer-to-peer

support, family and youth training, in-home respite, out-of-home respite, crisis and stabilization services, youth peer-to-peer support, and expressive and experiential therapies. Although wraparound services did not include other specialty mental health services, such as psychotherapy, psychotropic medications, or inpatient care, all youth in wraparound were enrolled in Maryland Medicaid and consequently were eligible to receive specialty mental health services at no cost to themselves or their families.

All 273 youth in wraparound met the following program eligibility criteria: aged 5 to 21 at time of enrollment, not receiving services through another Medicaid home-and-community-based services waiver, and living in a jurisdiction where Maryland Waiver services were available (Baltimore City Region, southeast Maryland/Washington DC, and northwest Maryland). In addition, a psychiatrist had to certify that the youth has a residential treatment level-of-need for care and that wraparound supports would enable the youth to live in the community. Once enrolled, youth were eligible to receive wraparound services for up to 24 months.

Of the 273 youth in wraparound, 233 could be matched to their public mental health claims data, the source of information on receipt of specialty mental health care. The 40 youth not found in public mental health claims database were excluded from the study sample. Of these 40 youth, 18 remained in Department of Juvenile Services custody or in residential treatment, 11 had reached the lifetime maximum age for public mental health system enrollment, six were in families who withdrew their authorization for services, four were considered successful discharges from residential care, and one moved out of state. Two of the remaining 233 youth had no claims-based mental health disorder diagnosis and consequently were also excluded, leaving a final sample of 231 youth in wraparound.

A comparison group was drawn from the population of youth enrolled in Maryland's public mental health system who were participating in outpatient mental health care at the start of the study period. This comparison group was chosen to represent the usual trajectory of service utilization for youth living in the community. The trajectories of mental health services use over time among outpatient participants provides an informative baseline against which to compare the performance of the wraparound programs in engaging and coordinating mental health care for their clients. However, there may be important differences between wraparound clients and this comparison group that are related to wraparound clients' use of mental health services. Consequently, any inferences drawn from the contrast between wraparound clients and youth in the comparison group should be contextualized by noting potentially important residual differences between these two groups.

The comparison group was selected in three steps. First, all ( $N = 175,437$ ) public mental health-enrolled youth aged 6 to 18 years that had at least one outpatient mental health encounter with a valid mental health diagnosis between 2009 and 2012 were identified. However, initial comparisons showed that wraparound clients sharply differed from other youth in the public mental health system on age and diagnosis, with wraparound clients being, on average, older and more likely to have diagnoses of ADHD, bipolar disorder, or on the schizophrenia spectrum. The larger public mental health population also had a different distribution across calendar years. Consequently, in the second step, nine potential comparison youth for every youth in wraparound were selected from the larger pool. The nine had to be in the same age group (6 to 10, 11 to 16, 17 to 19) and diagnosis category—schizophrenia spectrum and bipolar disorders, mood and anxiety disorders, ADHD, and other disorders—as the wraparound client, and had to have had at least one outpatient mental health clinic visit during the calendar year of enrollment in wraparound. The reason for selecting nine comparison youth for each wraparound client was because this was the maximum number of comparison youth available in every combination of age group, diagnosis category, and year. This step resulted in a group of  $N = 2079$  youth, from which a final comparison group was constructed selected using additional measures and propensity score matching (described below).

## Measures of services utilization

Information on psychiatric outpatient clinic, inpatient, emergency department, and residential care services from 2007 to 2014, as well as treatment-based diagnoses, age, gender, race, and zip code of residence, were obtained from the Maryland Public Mental Health System administrative database. The database includes all paid claims for Medicaid and state-financed specialty mental health services. Six dependent variable measures were constructed for mental health services utilization during four consecutive 90-day periods following a study index date for each youth: (1) any psychiatric inpatient admission, (2) number of psychiatric inpatient bed days, (3) any outpatient clinic visits, (4) number of outpatient mental health clinic visits, (5) any psychiatric emergency department visits, and (6) number of psychiatric emergency department visits. For youth who entered wraparound, the study index date was assigned as the date of enrollment. For the comparison group, the study index date was a randomly chosen date within the 90-day period following a randomly chosen outpatient mental health visit during the selected calendar year. Analogous measures of service use were also defined for the 90-day period that immediately preceded the study index date (i.e., for the pre-index period). In addition to these measures, a binary indicator of having an outpatient mental health clinic visit within 30 days following discharge from a mental health inpatient hospitalization was constructed for those individuals who had a mental health inpatient stay during the post-index study period.

Complete data on residential treatment use were available only for youth in wraparound. Although residential care stays in privately owned facilities were included in the Maryland Public Mental Health System database, residential care stays in state owned facilities are financed separately and consequently were not included. As a result, data for wraparound clients' stays in the state owned facilities were obtained from a separate state database. For youth in the comparison group, data on stays in state-owned residential treatment facilities were unavailable as a result of administrative restrictions.

## Propensity score matching

One-to-one propensity score matching without replacement was used to match each wraparound client with a youth from the comparison group.<sup>21</sup> The propensity score estimation model included gender, age, race (white non-Hispanic, black non-Hispanic, Hispanic/other), diagnosis category, metropolitan area (Baltimore, Washington DC, or other), and binary indicators for whether a youth had received any mental health outpatient clinic services and any mental health inpatient admissions during the pre-index period. Diagnosis categories were defined based on prevalence and based on prior research evidence of association with service use intensity.<sup>22-24</sup> After propensity score matching, the sample contained  $n=231$  wraparound clients and  $n=231$  propensity score matched youth from the comparison group. Chi-square test statistics with  $p<0.10$  were used to assess whether propensity score matching balanced the study groups on observed characteristics. As is the convention in many propensity score matching studies,  $p<0.10$  was selected as the criterion level for balancing covariates.<sup>25</sup> This criterion served as the minimum acceptable  $p$  value in tests of covariate mean differences between the two study groups. The covariates in this study were balanced to the degree that the covariate means did not differ by study group at significance levels less than 0.10. Although a higher  $p$  value standard might have resulted in greater overall covariate balance between study groups, it is often not possible to achieve balance for all covariates at criterion levels greater than  $p<0.10$ , especially when the group of interest is small in number.

As shown in Table 1, prior to propensity score matching, the comparison group had greater percentages of females (47 versus 40%,  $\chi^2=4.0$ ,  $p=0.047$ ), white non-Hispanics (67 versus 42%,  $\chi^2=58.3$ ,  $p<0.001$ ), individuals from the Baltimore metropolitan area (68 versus 59%,  $\chi^2=7.9$ ,  $p=0.005$ ) and from non-metropolitan areas of Maryland (28 versus 21%,  $\chi^2=4.9$ ,  $p=0.027$ ), and

**Table 1**  
 Characteristics of wraparound clients and youth in the comparison group before and after propensity score matching

Youth characteristics	Before propensity score matching				After propensity score matching				
	Wraparound (n = 231)		Comparison (n = 2079)		Wraparound (n = 231)		Comparison (n = 231)		
	n or mn ± SD	%	n	%	n	%	n	%	
Gender									
Female	92	39.8	971	46.7	92	39.8	90	39.0	<.1 0.849
Male	139	60.2	1108	53.3	139	60.2	141	61.0	
Age (years)	13.6 ± .2		14.0 ± .1		13.6 ± .2		13.4 ± .2		0.4 0.509
Race-ethnicity									
White non-Hispanic	96	41.6	1391	66.9	96	41.6	88	38.1	0.6 0.447
Black non-Hispanic	120	52.0	652	31.4	120	52.0	131	56.7	1.1 0.304
Hispanic/other/unknown	15	6.5	36	1.7	15	6.5	12	5.2	0.4 0.551
Metropolitan statistical area									
Washington, DC	46	19.9	82	4.0	46	19.9	31	13.4	3.5 0.060
Baltimore	136	58.9	1414	68.1	136	58.9	157	68.0	4.1 0.042
Other	49	21.2	579	27.9	49	21.2	43	18.6	0.5 0.484
Mental health diagnosis									
Psychotic disorders	58	25.1	522	25.1	58	25.1	62	26.8	0.2 0.671
Mood and anxiety disorders	94	40.7	846	40.7	94	40.7	97	42.0	0.1 0.777
Attention deficit hyperactivity disorder	58	25.1	522	25.1	58	25.1	58	25.1	<0.1 0.999
Other mental health diagnosis	21	9.1	189	9.1	21	9.1	14	6.1	1.5 0.217
Any inpatient mental health admission, prior 90 days	22	9.5	139	6.7	22	9.5	29	12.6	1.1 0.298
Any outpatient mental health visits, prior 90 days	120	52.0	1775	85.4	120	52.0	124	53.7	0.1 0.709

individuals who had used outpatient mental health services in the prior 90 days (85 versus 52%,  $\chi^2 = 157.7, p < 0.001$ ). The comparison group also had lower percentages of Black non-Hispanics (31 versus 52%,  $\chi^2 = 39.6, p < 0.001$ ) and individuals from the Washington DC metropolitan area (4 versus 20%,  $\chi^2 = 101.3, p < 0.001$ ) and was also older than wraparound clients on average (mean age = 14.0 years versus mean age = 13.6 years,  $\chi^2 = 6.32, p < 0.10$ ). After propensity score matching eliminated, these mean group differences were not statistically significant at  $p < 0.10$ .

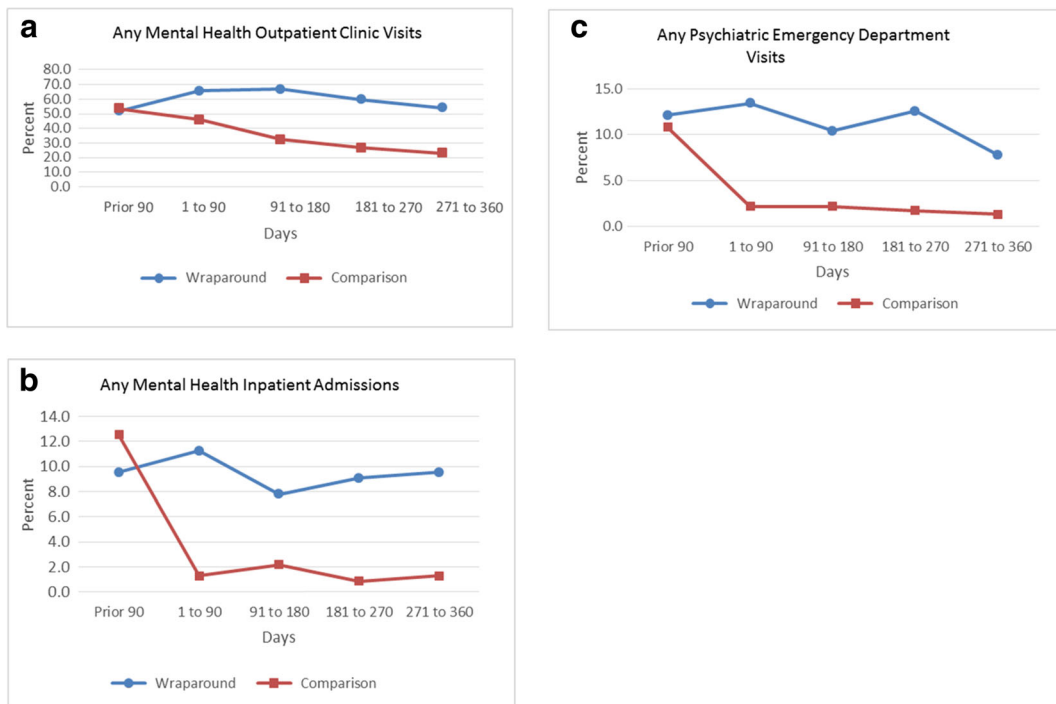
## Analyses

Using the propensity score matched sample, probit regression was used to estimate models for binary-valued dependent variables indicating any service use in a category during each 90-day period (i.e., models for dependent variables 1, 3, and 5), and negative binomial regression was used to estimate models for service counts among youth who had any use of a service within a 90-day period (i.e., models for dependent variables 2, 4, and 6). To explore specification of the covariates in the regression models, mean values of the six dependent variables were plotted for the pre-index and four post-index periods using the propensity score matched sample (Figs. 1 and 2).

The means for any service use by category (Fig. 1a–c) suggested that the two study groups had similar means during the pre-index period. By contrast, the means for numbers of admissions or visits (Fig. 2a–c) suggested that the pre-index means for mental health inpatient days and outpatient clinic visits might differ by study group. Consequently, regressions for number of inpatient days and for number of outpatient clinic visits were adjusted for their corresponding pre-index values. All regressions were also adjusted for the same set of covariates used in the

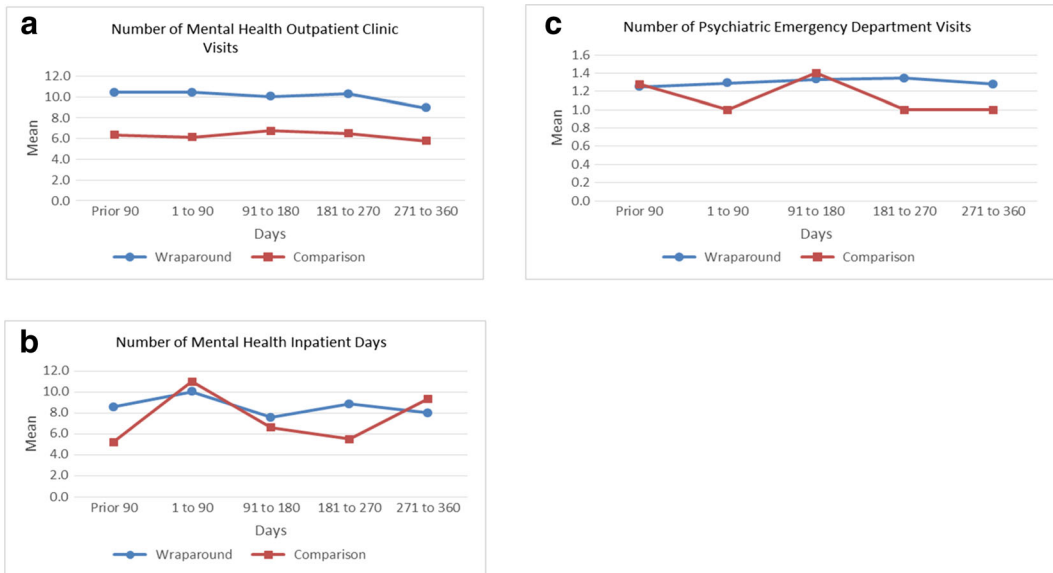
**Figure 1**

Proportion with any service use in category (propensity score matched sample)



**Figure 2**

Service counts among youth with any service use in category (propensity score matched sample)



propensity score matching model and were estimated using random effects to account for multiple observations per youth. Regressions were not adjusted for time-by-group interactions, because visual evidence in Figures 1 and 2 suggested no time-by-group interaction effects.

Marginal predicted mean values of each dependent variable were estimated from the regression findings under alternating assumptions of wraparound enrollment and non-enrollment.<sup>26</sup> The difference in these marginal means provided an estimate of the impact of wraparound services on the expected value of each dependent variable, after adjusting for covariate values. Actual sample covariate values were used in these predictions rather than sample means.<sup>26</sup>

Two additional analyses were completed to address specific questions that could not be addressed in the regression framework. First, in an analysis of those youth who had a psychiatric inpatient stay during the 360-day period after the study index date ( $n = 96$  wraparound clients and  $n = 21$  youth not in wraparound), the proportion in each study group who completed an outpatient clinic follow-up within 30 days of their inpatient discharge date was compared, using a chi-square test. Although this analysis was based on the propensity score matched sample, further covariate adjustment was not practical due to the small number of observations. Second, changes over time in the mean proportion of wraparound clients using residential treatment services were estimated and compared to pre-index levels.

## Results

In regression analyses (Table 2), the adjusted 90-day probability of having an outpatient clinic visit was 0.621 in the wraparound group and 0.316 in the comparison group ( $z = 9.6, p < 0.001$ ). Wraparound enrollment was also associated with a greater likelihood of a mental health inpatient admission (0.013 in wraparound, 0.099 in comparison;  $z = 7.2; p < 0.001$ ). Wraparound clients also had more outpatient clinic visits per 90-day period, on average, than other youth (9.2 visits versus 5.3 visits per 90 days;  $z = 5.0, p < 0.001$ ). Finally, wraparound clients had a greater probability of a



mental health emergency department visit per 90-day period than other youth (0.116 versus 0.022;  $z = 6.7, p < 0.001$ ).

Using the subsample of  $N = 117$  youth who had an inpatient stay during the post-index period, the proportion of youth who completed an outpatient clinic visit within 30 days of discharge was calculated for each study group. Among the 21 youth in the comparison group who had an inpatient stay, 13 youth (62%) completed an outpatient follow-up visit, and among the 96 wraparound clients with an inpatient stay, 59 clients (61%) completed an outpatient follow-up. The chi-square test of a mean group difference was not statistically significant ( $\chi^2 = 0.002, p = 0.970$ ).

Rates of any residential treatment program use for wraparound clients are shown in Table 3. Rates of 90-day residential treatment use were 75% lower in the first 90-day post-index period compared to pre-index period (6.9 versus 28.1%) and remained approximately 60% lower during the last three 90-day periods ( $p < 0.001$ ).

## Discussion

This is the first study to examine youth participation over time in inpatient and outpatient specialty mental health services after they enter a Medicaid wraparound program. Compared with youth in usual outpatient care at the start of the study period, youth in wraparound were twice as likely to use outpatient clinic services during the first year of wraparound and, among those who received at least some outpatient clinic care, had 74% more outpatient clinic visits per 3-month period. Youth in wraparound were also more than six times as likely as youth in usual outpatient care to be admitted for mental health inpatient care and were more than four times as likely to have any mental health emergency department use. These results suggest that wraparound providers may

**Table 2**

Regression estimates of mental health services use (propensity score matched sample,  $N = 462$ )

Service category	Coef	$z$	$p$	95% CI lower	95% CI upper	Comparison group adjusted mean (p0)	Wraparound group adjusted mean (p1)	Difference in means (p1-p0)
Outpatient clinic								
Any visits	0.98	9.6	<0.001	0.77	1.18	31.6%	62.1%	30.6%
Number of visits	0.55	5.0	<0.001	0.33	0.76	5.3	9.2	3.9
Inpatient								
Any admissions	1.02	7.2	<0.001	0.74	1.29	1.3%	9.9%	8.6%
Number of bed days	0.08	0.2	0.832	-0.62	0.77	8.2	8.8	.6
Emergency department								
Any visits	0.89	6.7	<0.001	0.63	1.15	2.2%	11.6%	9.4%
Number of visits	0.11	0.3	0.775	-0.66	0.89	1.1	1.3	0.2

<sup>a</sup>Regressions were adjusted for gender, age, race-ethnicity, metropolitan statistical area, mental health diagnosis, and inpatient admission and outpatient mental health clinic use during the prior 90 days

**Table 3**Residential treatment program use among wraparound clients ( $N=231$ )

Number of days before/after the study index date	Statistic			
	<i>n</i>	%	<i>t</i> <sup>a</sup>	<i>p</i>
Pre-90	65	28.1		
1–90	16	6.9	–6.7	<.001
91–180	26	11.3	–4.8	<.001
181–270	27	11.7	–4.7	<.001
271–360	27	11.7	–4.7	<.001

have helped sustain clients' ongoing participation in outpatient mental health services and may have been instrumental in facilitating client access to inpatient and emergency department services.

Among wraparound clients, the rate of residential care services use per quarter decreased by 75% in the first 3 months after youth entered wraparound services and for the remainder of the year remained approximately 60% lower than the pre-wraparound rate. This sustained reduction in use of residential care suggests that wraparound services helped many youth remain living in the community rather than in an institution, a key objective of Maryland's 1915c Home-and-Community-based Services Waiver program.

By contrast to the findings for overall mental health utilization, youth in wraparound were no more likely than youth in the comparison group to complete an outpatient follow-up visit within 30 days after discharge from mental health inpatient care. Approximately 60% of youth in both groups completed an outpatient follow-up visit. Similar rates of outpatient follow-up after discharge for children and youth have been reported in multiple studies.<sup>27</sup> The absence of a differential rate of outpatient follow-up in the two study groups perhaps is surprising. Care coordination is a core element of wraparound, and timely outpatient follow-up after inpatient discharge is widely considered to be a good clinical practice and a quality indicator.<sup>3,9,28</sup> On the other hand, wraparound providers were not contractually required to ensure that clients completed an outpatient follow-up visit after a hospitalization. As a result, evidence that 40% of wraparound clients did not complete a timely outpatient clinic follow-up visit after hospitalization might reflect the absence of a state standard for this dimension of wraparound care.

Given that all youth who entered wraparound were either living in or diverted from residential care, unmeasured group differences in inpatient admission risk likely contributed to the greater rate of inpatient utilization found for wraparound clients. However, wraparound services also might have contributed to wraparound clients' greater rate of inpatient utilization. The wraparound care coordinators had frequent contact with their clients and were required to monitor and document any crisis or incident involving a client. As a result, they likely were aware of emergent crises and may have been more involved than usual outpatient providers in initiating and coordinating hospital admissions. In that regard, it is worth reiterating that the wraparound programs were not financially responsible for most specialty mental health care services including inpatient. Consequently, putting wraparound programs at financial risk for inpatient care expenses might affect the rate of hospitalization among wraparound clients.

Some limitations of this study must be considered when interpreting its findings. First, the propensity score matching model was adjusted only for demographic characteristics, diagnosis category, region, and recent prior services use. More relevant predictors of risk for residential treatment admission would include measures of behavior problems, prior acts of violence, prior juvenile justice system involvement,

and measures of impaired social and academic functioning. No such measures were available in the administrative data. Other unmeasured characteristics, such as family supports, level of functioning, and mental health symptom severity, could have differed between the two study groups and could have been confounded with study outcomes. For example, wraparound clients might have had greater average propensity for aggression or violence. Unmeasured confounding of this type would have resulted in a bias toward finding larger positive effects of wraparound on mental health services use. In addition, complete data on residential treatment stays were not available for youth in the comparison group, which limited comparisons of residential use over time. However, given the highly selected nature of the wraparound group—individuals diverted or transferred from residential care—it is unlikely that any group of outpatient participants would have had a comparable history of residential care use. While a group of residential care clients could have had a comparable history of residential care use, such a comparison group would not have provided a useful comparison on trajectory of outpatient and inpatient mental health services use. Utilization among individuals in the comparison group provides a benchmark for typical patterns of inpatient and outpatient utilization against compared to patterns of utilization in the Waiver group. Propensity score matching and multivariable regression were used to adjust for observed differences between the Waiver group and the outpatient client group. Measures of past inpatient and outpatient utilization were used to adjust for prior group differences in propensity for using these mental health services. The resulting comparisons are thus a comparison between groups that may have similar propensity for inpatient and outpatient mental health services use but may have other clinical differences that are related to risk of residential admission.

### **Implications for Behavioral Health**

These results have several implications for state agencies that are planning, implementing, or regulating Medicaid wraparound programs. First, states should consider requiring that wraparound providers regularly report the status of client engagement with and discharge from outpatient mental health clinic services. Although wraparound clients were more likely than youth who were receiving outpatient services at the start of the study period to continue attending an outpatient clinic, approximately 40% of wraparound clients did not have any outpatient clinic visits during each 3-month period after starting wraparound. Information on the reasons for discharges from outpatient care was not available for this study, and consequently, it is unclear how many of these youth were appropriately discharged. However, it is likely that at least some of the youth who did not have any outpatient clinic visits continued to have a compelling need for regular clinical follow-up. Consequently, reports on wraparound clients' continuing participation in outpatient clinic services would inform states' calibration of a reasonable performance standard for regular outpatient follow-up in Medicaid wraparound programs.

Similarly, states should assess Medicaid wraparound programs' coordination of mental health outpatient clinic follow-up after a youth is hospitalized for a mental health reason and then is subsequently discharged. Timely outpatient clinic follow-up is considered critical for ensuring continued participation in outpatient care and for preventing unnecessary hospital readmissions.<sup>19,28</sup> Outpatient follow-up also provides an opportunity for coordination of services involving both the outpatient provider and the wraparound team. Concerns around psychotropic medication use or return to school may be discussed during such follow-ups, for example.

States should also consider stipulating guidelines and decision processes for Medicaid wraparound programs around when clients should be brought to an emergency department or referred for inpatient hospitalization. Inpatient hospitalization may often be warranted among youth who have been referred to wraparound programs, especially when youth pose a significant risk of harm to themselves or others, require care from a clinical team, or require long periods of observation.<sup>29</sup> Explicit standards for hospitalization may also clarify when youth with acute symptoms can be diverted to interventions that are less restrictive than inpatient care, such as crisis stabilization and management.<sup>30</sup> Formulations of such

guidelines could also include explicit incentives linked to wraparound program performance. Although Maryland's wraparound demonstration included access to mobile crisis response teams, incentives in the wraparound demonstration program may not have aligned well with the goal of averting unnecessary mental health hospitalizations.

In addition to specifying standards and requirements for wraparound programs, states should consider aligning financial incentives with community-based principles. For example, if wraparound providers are expected to encourage the use of alternatives to intensive services, financial incentives could be linked with improvements in the quality of outpatient mental health care received and with prompt crisis intervention. More generally, public behavioral health systems should consider how the objectives of wraparound (e.g., sustained community tenure and integration) can be promoted through the design of contractual performance incentives.

States should also rigorously examine the fiscal impacts of wraparound programs, an important issue that could not directly be examined in this study. Such assessments are needed to inform assessments of the financial savings and fiscal sustainability of wraparound programs in Medicaid. In relation to fiscal effects, the findings that youth who entered wraparound programs utilized both outpatient and inpatient mental health services at higher rates than youth in the outpatient services comparison group should not be interpreted as suggesting that Maryland's Medicaid wraparound waiver resulted in higher mental health costs or was not cost-effective compared to traditional Medicaid. These results are not surprising given both the supportive orientation of wraparound programs and the complexity of mental health needs among the youth who were referred to wraparound. All of these youth met regulatory criteria for an institutional level of care, and many had been discharged from residential care, whereas many youth in the outpatient services group may not have needed such intensive supports. Consequently, these results do not have any implications for the fiscal impacts of wraparound programs. To date, the only relevant evaluation of impacts on Medicaid expenditures found that community-based services resulted in substantially lower Medicaid costs when compared to residential placement.<sup>31</sup> However, additional studies are needed to assess broader fiscal effects of wraparound beyond the Medicaid program alone.

In summary, youth receiving high-fidelity wraparound services as part of a Medicaid 1915c waiver demonstration program were more likely to sustain their use of mental health outpatient services and had more hospital inpatient and emergency department admissions, when compared with clinically similar youth who were receiving outpatient mental health clinic services at the start of the study period. However, youth receiving wraparound were no more likely to receive a follow-up outpatient clinic visit within 30 days of discharge from mental health inpatient care. States offering wraparound in their Medicaid plans should consider using performance standards and incentives to foster greater care coordination and integration among the different services that comprise their behavioral health systems of care for youth.

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