Evaluating the Impact of Florida Medicaid Reform on Recipients of Mental Health Services
Subproject 2: The Effect of Medicaid Reform on Baker Act and Criminal Justice Encounters

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Evaluating the Impact of Florida Medicaid Reform on Recipients of Mental Health Services

Subproject 2: The Effect of Medicaid Reform on Baker Act and Criminal Justice Encounters

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Note: This report refers to a 12 month time period before demonstration implementation and an 18 month follow-up period after implementation (from 2005 – 2008). The exact dates that distinguish the pre- and post-demonstration periods varied slightly across areas and managed care plans. The report was initially submitted to the Agency for Health Care Administration in October 2010 and officially released in September 2012.

EXECUTIVE SUMMARY

Medicaid Reform required all health care services, including mental health, physical health, and prescription drugs, to be provided through Health Maintenance Organizations (HMOs) or Provider Service Networks (PSNs). This report is one of three studies conducted to evaluate the impact of Medicaid Reform on recipients of mental health services in Broward, Duval, Baker, Clay, and Nassau counties.

This report examined the impact of Medicaid Reform on two outcome indicators among children diagnosed with serious emotional disturbances (SED) and adults diagnosed with severe mental illness (SMI). Primary questions addressed included (1) What were the rates of Baker Act examinations among adults diagnosed with SMI and children diagnosed with SED in Broward, Duval, Baker, Clay, and Nassau counties pre- and post-implementation of Medicaid Reform? (2) What were the rates of arrests among adults diagnosed with SMI and rates of juvenile justice encounters among youth in Broward, Duval, Baker, Clay, and Nassau counties pre- and post-implementation of Medicaid Reform? and (3) How did the rates of Baker Act examinations, arrests, and juvenile justice encounters in the Reform counties compare to the rates observed in other Florida counties where Medicaid managed mental health care has been implemented?

Graphical and descriptive analysis suggests that adults with SMI and youth with SED in Medicaid Reform fared as well after the implementation of managed care as before. The implementation of Reform was not associated with significant changes in Baker Act evaluations, arrests, or juvenile justice encounters. However, adults in Reform did not fare as well as adults residing in different parts of the state who were enrolled in the Prepaid Mental Health Plan (PMHP) program. There was a significant reduction in Baker Act evaluations and arrests with the implementation of the PMHP program that was not observed with Medicaid Reform. The implementation of Reform did not have different effects for children than the implementation of the PMHP program that were statistically significant.

Individuals with serious mental illness may face considerable challenges with the introduction of managed care. Indeed, Baker Act evaluations, arrests, and juvenile justice contacts all increased in the first six months following Reform. However, the increases tended to be small (e.g., arrest rates increased from 1.63 to 1.66 per 100 months) and rates fell to their pre-implementation levels by the second six month period after implementation. Some differences were evident when distinguishing between Reform HMOs and PSNs. These included an
increase in Baker Act evaluations among adults in PSNs and youth in HMOs in the first six months after Reform. In both cases, rates returned to their pre-implementation levels in the following periods. Arrest rates among adults in PSNs also increased in the first six months after Reform, and while they declined in the following periods, rates did not return to pre-implementation levels. Finally, youth in Reform HMOs experienced an increase in juvenile justice contacts with Reform. However, rates fell over the following periods.

INTRODUCTION

Medicaid Reform required all health care services, including mental health, physical health, and prescription drugs, to be provided through Health Maintenance Organizations (HMOs) or Provider Service Networks (PSNs). Medicaid Reform has been implemented in five Florida counties including Broward, Duval, Baker, Clay, and Nassau.

This report is one of three studies, each identified as objectives, conducted to evaluate the impact of Medicaid Reform on recipients of mental health services in Broward, Duval, Baker, Clay, and Nassau counties. Each objective is provided in a separate report. The studies

1. Assessed enrollee experiences with various aspects of mental health and substance abuse treatment and counseling services,
2. Examined rates of Baker Act evaluations and arrests among adults diagnosed with severe mental illnesses (SMI) and children diagnosed with serious emotional disturbances (SED), and
3. Assessed the impact of Florida’s Medicaid Reform on pharmacotherapy provided to Medicaid enrollees with severe mental illness.

This report examines the second objective, and was prepared by the Louis de la Parte Florida Mental Health Institute at the University of South Florida under subcontract to the Department of Health Services Research, Management and Policy at the University of Florida.

Throughout this report, the implementation of Medicaid Reform is compared to the implementation of the Prepaid Mental Health Plan (PMHP) program. In March 1996, the Florida Agency for Health Care Administration (AHCA) implemented a PMHP demonstration in AHCA Area 6 (the Tampa Bay region), under the authority of a 1915b waiver from the Federal Health Care Financing Administration. A PMHP providing specialty behavioral health managed care was established to provide or arrange for all mental health services for its plan participants. In 2001, the PMHP demonstration was expanded to AHCA Area 1 (the Panhandle area), and during 2006–07 was implemented statewide, with the exception of the Medicaid Reform demonstration counties.

While both Reform plans and PMHPs are responsible for many aspects of behavioral health services, there are differences in the capitated behavioral health services for Reform and PMHP plans. For example, Reform plans are responsible for prescription drugs, while prescription
medications are not included in the PMHP capitation. The PMHP program was selected as the comparison instead of a sample receiving services through the Medicaid fee-for-service program because, with the exception of the Reform counties, the PMHP program has been implemented statewide, and in the absence of Reform, individuals in Reform counties would have likely been transitioned to the PMHP program.

**BACKGROUND**

In July 2006, Medicaid Reform was implemented in two counties in Florida, Broward and Duval. Subsequently, in July 2007, the demonstration was implemented in three additional counties, Baker, Clay, and Nassau. There are two types of managed care plans, Health Maintenance Organizations (HMOs) and Provider Service Networks (PSNs), in the Medicaid Reform program, with both utilizing provider networks to serve Medicaid recipients. While Medicaid Reform managed care plans are responsible for physical and mental health care, the focus of this report is on outcomes for individuals with mental illness. This project examined whether implementation of Medicaid Reform in Florida had an effect on Baker Act initiations or criminal justice encounters. The focus was on children with SED and adults with SMI. These groups are perhaps at greater risk for adverse outcomes and may benefit most from coordination of care.

Many studies have examined how the implementation of managed behavioral health care affects care and outcomes (Cuellar, Libby, & Snowden, 2001; Scott, Snowden, & Libby, 2002; Fisher, Normand, Dickey, Packer, Grudzinskas, & Azeni, 2004; Claassen, Kashner, Gilfillan, Larkin, & Rush, 2005). There is frequent concern expressed that managed care reduces access to care, which could lead to increased arrest rates among individuals with mental illness (Thomas, Gourley, & Mele, 2004). However, studies have found that the introduction of managed care had little or no effect on arrest rates for youth (Scott, Snowden, and Libby, 2002) or adults (Fisher, Normand, Dickey, Packer, Grudzinskas, & Azeni, 2004; Norton, Yoon, Domino, & Morrissey, 2006). The relationship between managed care and involuntary examinations has received less attention. Fisher, Barreira, Lincoln, Simon, White, Roy-Bujnowski, & Suddes (2001) found that length of involuntary hospitalization is related to insurance coverage. Uninsured patients had the shortest stays, while patients with Medicare coverage had the longest. However, whether insurance was provided through a managed care entity was not significantly related to length-of-stay. Segal, Akutsu, & Watson (1998) found that having insurance coverage increased the likelihood of repeat involuntary hospitalization, but the authors did not distinguish between fee-for-service and managed care.
RESEARCH QUESTIONS

The goal of this project was to examine the impact of Medicaid Reform on two outcome indicators among children diagnosed with SED and adults diagnosed with SMI. Primary questions addressed included (1) What were the rates of Baker Act evaluations among adults diagnosed with SMI and children diagnosed with SED in Broward, Duval, Baker, Clay, and Nassau counties pre- and post-implementation of Medicaid Reform? (2) What were the rates of arrests among adults diagnosed with SMI and rates of juvenile justice encounters among youth in Broward, Duval, Baker, Clay, and Nassau counties pre- and post-implementation of Medicaid Reform? and (3) How did the rates of Baker Act evaluations, arrests, and juvenile justice encounters in Reform counties compare to the rates observed in other Florida counties where Medicaid managed mental health care has been implemented?

METHODOLOGY

DATA

This research included Medicaid enrollees from several AHCA areas. Much of Area 4 (Duval, Baker, Clay, and Nassau counties) and all of Area 10 (Broward County) are part of Medicaid Reform. Areas 5, 7, and 11 were used as the comparison areas. These areas were selected because PMHPs were implemented in these areas between 2005 and 2006, which was approximately the same time Medicaid Reform was implemented, and they include metropolitan areas comparable to Jacksonville and Ft. Lauderdale. The PMHP program was selected as the comparison instead of a sample receiving services through the fee-for-service program for two reasons. First, with the exception of the Reform counties, the PMHP program had been implemented statewide by the 2006 – 2007 fiscal year. Second, in the absence of Reform, individuals in the Reform counties would have likely been transitioned to the PMHP program.

It should be noted that capitated behavioral health services differ for Reform and PMHP plans. For example, Reform plans are responsible for prescription drugs, while prescription medications are not included in the PMHP capitation. Such differences could be important to the outcomes assessed in this paper if Medicaid recipients in the Reform and PMHP programs had significantly different utilization of behavioral health medications. However, another sub-study in this report did not find such differences, thus the difference in capitation coverage is unlikely to have an important effect on outcomes in this study.

The project used data from five sources, including Medicaid, Florida Department of Children and Families’ Integrated Data System (IDS), Baker Act database, Florida Department of Law Enforcement, and Florida Department of Juvenile Justice as described below.
MEDICAID

Medicaid data included eligibility files for all enrollees and institutional and service claims for individuals enrolled in the fee-for-service system. Also included were managed care encounter data from managed care plans that served Medicaid enrollees prior to the implementation of Reform. The combination of claims and encounter data provided detailed information on the characteristics of enrollees. It is worth noting that HMO encounter data prior to Reform were available, but Reform encounters were not available for this study. Consequently, changes in service penetration and use were not examined.

INTEGRATED DATA SYSTEM (IDS)

IDS is a data system maintained by the Offices of Mental Health and Substance Abuse of the Florida Department of Children and Families (DCF). IDS is a statewide database containing information on mental health and substance abuse services paid for by DCF. The system provides additional information on a variety of descriptive variables including the demographic and diagnostic characteristics of service recipients. The IDS system also includes data on patients who received services in Florida’s State Mental Hospital system.

BAKER ACT

Under the provisions of Chapter 394, Part 1, Florida Statute (FS), an individual who appears to be mentally ill and dangerous to themselves or others can be picked up by law enforcement and delivered to a mental health receiving facility for evaluation. The action can be initiated by a mental health professional, a court, or a law enforcement officer. A receiving facility has up to 72 hours to evaluate and, if appropriate, provide treatment to the individual. During the 72-hour period, the receiving facility must petition a court for an involuntary hospitalization order, discharge the individual, or convert the individual to voluntary status. When an individual is delivered to a receiving facility, a form is completed and sent to the Florida Mental Health Institute. The data on these forms are entered into a Baker Act database and are accessible to mental health researchers.

The Baker Act database is statewide in scope and contains information on all emergency psychiatric evaluations provided under Ch. 394, Part 1, FS. It includes individual level demographic data as well as details regarding when evaluations were initiated, by what kind of professional, at what location, and for what reasons. Both children and adults experience involuntary examinations with individuals under the age of 18 representing 17% of all examinations.
FLORIDA DEPARTMENT OF LAW ENFORCEMENT (FDLE)

The FDLE database is a statewide data system that contains individual level information on the demographic characteristics and arrest records of adults who have been arrested and/or incarcerated by local or state police within the state of Florida. Information is provided on the type of offense. These data are reported on an ongoing basis by the various law enforcement entities.

FLORIDA DEPARTMENT OF JUVENILE JUSTICE (DJJ)

The DJJ database is a system that contains demographic, diagnostic, and criminal justice information about youths (under age 18) in the state of Florida who have been referred to the Department for the commission of a criminal offense. The data include demographic and social histories as well as types of offense, levels of commitment, and admission and discharge dates.

ANALYSIS

IDENTIFICATION OF INDIVIDUALS WITH SED AND SMI

The first step in the analysis was to identify individuals with SED or SMI who resided in the Reform or comparison areas. Individuals were identified through IDS data and Medicaid claims and encounter data prior to implementation of managed care. The precise methods for identification of individuals are described in Appendix A. These definitions have been used by FMHI as part of the annual evaluation of the PMHPs. Identification of individuals with SED or SMI were made using pre-implementation claims and encounter data for both the Reform and comparison counties.

To be included in these analyses, Medicaid recipients must have been enrolled in the Reform initiative or were residing in Areas 5, 7, or 11 and enrolled in a PMHP. A 12 month time period before managed care implementation and an 18 month follow-up period after implementation were compared for individuals in Reform and PMHP counties. The exact dates that distinguish the pre- and post-Reform periods varied across AHCA areas and plans depending on the date of Reform implementation. The first Reform enrollments in Broward and Duval counties were in September 2006, while enrollment began in July 2007 in Baker, Clay, and Nassau counties. However, not all Reform plans were approved by AHCA at the beginning of the implementation period and for enrollees in a given plan, the date of approval was used as the implementation date. PMHPs were implemented in AHCA Areas 5 and 7 in August 2005 and in Area 11 in August 2006. For example, for an individual enrolled in a Reform plan on September 1, 2006, it was determined whether the individual was Medicaid eligible from March 2006 through August 2006 and/or September 2006 through February 2007. Only individuals with at least six months
of continuous eligibility before and/or after managed behavioral health care were included in the sample.

**BAKER ACT**

The first outcome considered was Baker Act evaluations. Baker Act evaluations were reviewed for the sample for one year before managed care implementation and for 18 months after managed care implementation. We compared per-member per-eligible month Baker Act rates before and after managed behavioral health care implementation in the Reform and PMHP counties. Baker Act rates are presented in figures for Reform and PMHP areas for each of the five time periods in order to assess time trends. These rates are not adjusted based on differences in enrollee characteristics across plans or time. As such, no statistical tests were performed on the “raw” rates to assess whether any differences are statistically significant.

While Baker Act rates provide important information, the number of Baker Act evaluations varies across individuals in part based on their demographic characteristics. Such demographic characteristics can vary across counties and also vary for individuals who are enrolled in HMOs and PSNs. Thus, we also used regression analysis to case-mix adjust for differences in demographic characteristics, and to assess whether any differences between Reform and PMHP areas are statistically significant.

The dependent variable denoted the number of Baker Act evaluations per eligible month for the individual in one of five time periods (7 – 12 months before implementation, 0 – 6 months before implementation, 0 – 6 months after implementation, 7 – 12 months after implementation, and 13 – 18 months after implementation). The 18 month follow-up period should allow sufficient time for outcome changes to be observed. An overview of the regression model is provided below with a more complete discussion of the model provided in Appendix B.

Baker Act evaluations were compared between Reform areas and PMHP areas. More explicitly, Baker Act rates were compared before and after managed care implementation. The primary question is whether the outcome changed to a greater or lesser degree in the Reform areas than the comparison PMHP areas.

The second comparison distinguished between individuals in Reform counties who were enrolled in HMOs and PSNs. In this case, the primary question is whether the outcome changed to a greater or lesser degree in the Reform HMOs than the comparison PMHP areas, or in Reform PSNs than PMHP areas. Comparisons can also be made between Reform HMOs and PSNs.

While there are a number of additional comparisons that could be made (e.g., between Reform areas, between PSNs and HMOs, or between specific plans), the analysis was limited by sample
size considerations. To ensure the anonymity of enrollees, no comparisons were made when there were fewer than 30 people in a cell.

**ARRESTS**

The second outcome examined was arrests as reported in the FDLE database. Per-member per-eligible month arrest rates were compared before and after managed behavioral health care implementation. We also estimated regression models similar to those discussed above. In this case, the dependent variable denoted the number of arrests per eligible month experienced by the individual during the time period. Reform plans were compared to PMHPs, and in addition, we also distinguished between individuals in Reform counties who were enrolled in HMOs and PSNs.

**JUVENILE JUSTICE**

The third outcome was juvenile justice encounters among children and youth. Once again, per-member per-eligible month juvenile justice rates were compared before and after managed behavioral health care implementation. Regression models were also estimated with the dependent variable denoting the individual had a juvenile justice encounter during the time period. Once again, the analysis compared outcomes for enrollees in Reform plans and PMHPs, and also distinguished between individuals in Reform counties who were enrolled in HMOs and PSNs.
RESULTS

SAMPLE DEMOGRAPHICS

Medicaid data and IDS data were used to identify youth with SED and adults with SMI. A total of 50,104 individuals were identified. Table 1 contains frequencies of individuals by age group (SED versus SMI), gender, and racial group (White, Black, and Other) in the Reform areas and the comparison non-Reform areas. This table is provided to determine whether the demographic characteristics were similar in the Reform and PMHP areas.

There were 35,155 observations in the PMHP areas and 14,949 in the Reform areas. The sample in the Reform areas was slightly younger than in the PMHP areas with 76% of those in the Reform area under the age of 21 compared to 67% of the PMHP sample.

Among youth with severe emotional disturbance, the gender distribution was very similar in the PMHP and Reform areas with both areas having 63% boys. The racial distribution was quite different with 40% of the PMHP areas being Hispanic compared to 10% of the Reform areas. The Reform areas had a much higher proportion of Blacks (40%) compared to the PMHP areas (17%).

Among adults, the gender distributions were similar in both areas with men comprising 31% of the PMHP sample and 28% of the Reform sample. The adult samples had a much greater proportion of women compared to the youth samples. The racial distributions in the adult samples were similar to the youth samples. The PMHP areas had a much greater proportion of Hispanics (54%) compared to the Reform areas (9%), while the Reform areas had greater proportions of Blacks (32%) and Whites (49%).
Table 1: Demographic Characteristics in PMHP and Reform Areas

<table>
<thead>
<tr>
<th></th>
<th>PMHP</th>
<th>Reform</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Obs</td>
<td>%</td>
</tr>
<tr>
<td>Ages 1-12</td>
<td>15,098</td>
<td>42.9%</td>
</tr>
<tr>
<td>Ages 13-20</td>
<td>8,329</td>
<td>23.7%</td>
</tr>
<tr>
<td>Ages 21-54</td>
<td>8,921</td>
<td>25.4%</td>
</tr>
<tr>
<td>Ages 55-64</td>
<td>2,807</td>
<td>8.0%</td>
</tr>
<tr>
<td>Total</td>
<td>35,155</td>
<td>100.0%</td>
</tr>
<tr>
<td>SED Children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>14,888</td>
<td>63.6%</td>
</tr>
<tr>
<td>Female</td>
<td>8,539</td>
<td>36.4%</td>
</tr>
<tr>
<td>Total</td>
<td>23,427</td>
<td>100.0%</td>
</tr>
<tr>
<td>Black</td>
<td>4,016</td>
<td>17.1%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>9,459</td>
<td>40.4%</td>
</tr>
<tr>
<td>Other</td>
<td>4,991</td>
<td>21.3%</td>
</tr>
<tr>
<td>White</td>
<td>4,961</td>
<td>21.2%</td>
</tr>
<tr>
<td>Total</td>
<td>23,427</td>
<td>100.0%</td>
</tr>
<tr>
<td>SMI Adults</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>3,618</td>
<td>30.8%</td>
</tr>
<tr>
<td>Female</td>
<td>8,110</td>
<td>69.2%</td>
</tr>
<tr>
<td>Total</td>
<td>11,728</td>
<td>100.0%</td>
</tr>
<tr>
<td>Black</td>
<td>1,512</td>
<td>12.9%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>6,320</td>
<td>53.9%</td>
</tr>
<tr>
<td>Other</td>
<td>987</td>
<td>8.4%</td>
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<tr>
<td>White</td>
<td>2,909</td>
<td>24.8%</td>
</tr>
<tr>
<td>Total</td>
<td>11,728</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
BAKER ACT EVALUATIONS

Baker Act evaluations were reviewed separately for adults and children. Figures 1 and 2 graphically present Baker Act rates for adults. The rates are computed per 100 eligible months and are not case-mix adjusted.

The results in Figure 1 indicate that Baker Act rates were trending upward in the Reform areas prior to the implementation of Medicaid Reform with Baker Act rates increasing from 2.03 per 100 eligible months to 2.48. This upward trend continued in the first six months after implementation with rates increasing to 2.93, before declining to 2.50 and 2.71 in the following two periods. In the PMHP areas, there was also an upward trend in the year preceding managed care with Baker Act rates increasing from 2.38 to 2.65, but Baker Act rates declined in each of the three periods after the PMHP program was implemented (1.83, 1.50, and 1.33, respectively).

Figure 1: Baker Act Rates for Adults with Serious Mental Illness per 100 Eligible Months—Reform Compared to PMHP
The results in Figure 2 indicate differences between Reform HMOs and PSNs. Baker Act rates in the 7 – 12 months prior to implementation were higher among people who enrolled in a PSN (2.59) compared to 1.89 among individuals who enrolled in HMOs. The rates were stable in the next six months among individuals who were to enroll in PSNs (2.55), however Baker Act rates increased among recipients who were to enroll in HMOs (to 2.91). In the six months following implementation, Baker Act rates jumped among adults in PSNs to 3.96, while declining among adults in HMOs to 1.73. Baker Act rates declined in the following six months for individuals in PSNs, returning to the pre-implementation levels at 2.68 and 2.76 in the following two periods. After the initial decline among recipients in HMOs, rates increased over the following two periods to 2.29 and 2.62. Individuals in PSNs and HMOs had Baker Act rates above the PMHP average in the second and third periods following implementation of behavioral managed care.

Figure 2: Baker Act Rates for Adults with Serious Mental Illness per 100 Eligible Months—Reform HMO and PSN Compared to PMHP

Baker Act rates among youth in the Reform areas declined slightly (1.12 to .91) in the six months preceding Reform and remained stable (.95) in the six months following Reform. Baker Act rates fell in the following six months to .69 before increasing to .82 in months 13 – 18 post-Reform.

Despite an increasing trend prior to managed care implementation, Baker Act rates among youth in PMHPs declined in the each of the three periods following implementation of the PMHP program.

Overall, there were not considerable differences in Baker Act rates among youth in Reform and PMHP plans. Overall, Baker Act rates declined among recipients in both the Reform and PMHP areas.

Figure 3: Baker Act Rates for Children and Youth with Severe Emotional Disturbance per 100 Eligible Months—Reform Compared to PMHP
Figure 4 compares Baker Act rates among youth who enrolled in Reform HMOs and PSNs. Youth who enrolled in PSNs had Baker Act rates similar to youth in PMHPs. There was relatively little difference in any of the five periods. Baker Act rates varied to a greater degree among individuals in Reform HMOs. In the 7 – 12 months prior to Reform, there were 1.46 Baker Act evaluations per 100 eligible months among recipients who enrolled in HMOs. The rate fell in the next six months to .84 Baker Act evaluations per 100 eligible months. However, in the six months following Reform, the rate increased to 1.37 Baker Act evaluations. In the 7 – 12 and 13 – 18 months after Reform, Baker Act rates for enrollees in HMOs were similar to those in PMHPs and PSNs.

**Figure 4: Baker Act Rates for Children and Youth with Severe Emotional Disturbance per 100 Eligible Months—Reform HMO and PSN Compared to PMHP**

![Graph showing Baker Act rates for children and youth with severe emotional disturbance per 100 eligible months—Reform HMO and PSN compared to PMHP.](image)

Table 2 contains the Baker Act rates as well as the coefficient p-values from the regression models outlined in the methods section. In particular, we report the p-value associated with question of whether Baker Act rates changed more in Reform counties than in PMHP areas. Typically, a p-value below .05 is considered statistically significant, indicating that the change in Baker Act rates differed in Reform and PMHP areas.

Consistent with Figure 1, Baker Act rates fell after managed care was implemented in the PMHP areas but rates did not decline in the Reform areas. The difference in the decline between the Reform and PMHP areas was statically significant (p < .001), indicating that on average Baker Act rates declined after the PMHP program was implemented relative to when Medicaid Reform was implemented.
Table 2: Baker Act Rates for Adults and Children in Reform and PMHP Areas

<table>
<thead>
<tr>
<th></th>
<th>7 – 12 months pre</th>
<th>0 – 6 months pre</th>
<th>0 – 6 months post</th>
<th>7 – 12 months post</th>
<th>13 – 18 months post</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SMI Adults</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PMHP areas</strong></td>
<td>2.03</td>
<td>2.48</td>
<td>1.83</td>
<td>1.50</td>
<td>1.33</td>
<td>—</td>
</tr>
<tr>
<td><strong>Reform areas</strong></td>
<td>2.38</td>
<td>2.65</td>
<td>2.93</td>
<td>2.50</td>
<td>2.71</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Reform HMO</strong></td>
<td>1.89</td>
<td>2.91</td>
<td>1.73</td>
<td>2.29</td>
<td>2.62</td>
<td>.254</td>
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<tr>
<td><strong>Reform PSN</strong></td>
<td>2.59</td>
<td>2.55</td>
<td>3.96</td>
<td>2.68</td>
<td>2.76</td>
<td>.009</td>
</tr>
<tr>
<td><strong>SED Children</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>PMHP areas</strong></td>
<td>0.89</td>
<td>0.94</td>
<td>0.78</td>
<td>0.70</td>
<td>0.65</td>
<td>—</td>
</tr>
<tr>
<td><strong>Reform areas</strong></td>
<td>1.12</td>
<td>0.91</td>
<td>0.95</td>
<td>0.69</td>
<td>0.82</td>
<td>.798</td>
</tr>
<tr>
<td><strong>Reform HMO</strong></td>
<td>1.46</td>
<td>0.84</td>
<td>1.37</td>
<td>0.63</td>
<td>0.73</td>
<td>.377</td>
</tr>
<tr>
<td><strong>Reform PSN</strong></td>
<td>0.93</td>
<td>0.94</td>
<td>0.74</td>
<td>0.73</td>
<td>0.86</td>
<td>.752</td>
</tr>
</tbody>
</table>

Notes. Baker Act rates are per 100 eligible months. The p-value is from an individual-level regression analysis that compares changes in Baker Act rates pre- and post-managed care implementation in the PMHP and Reform areas. See equation (1) for more details. A p-value less than .05 on coefficient $\beta_4$ would indicate that the difference in pre-post changes was statistically significant.

Adults in HMOs experienced a decline in Baker Act rates from 2.91 to 1.73 per 100 eligible months in the first six months after Reform was implemented. However, this decline was not maintained as Baker Act rates increased in the following two periods (to 2.29 and 2.62, respectively). Baker Act rates increased in the first six months after Reform among those in PSNs before declining over the following year. On average, over the three periods, Baker Act rates increased post-Reform among PSN enrollees relative to PMHP enrollees ($p = .009$).

Overall, the implementation of different managed care financing systems was associated with changes in Baker Act rates for adults. Both Reform HMO enrollees and PMHP enrollees experienced a decreased likelihood of a Baker Act evaluation in the first period after implementation. PSN enrollees saw a dramatic increase. While the reductions were maintained over the following two periods in the PMHP areas, Baker Act rates for HMO enrollees trended upward while rates for PSN enrollees trended downward. By the third period after Reform was implemented, Baker Act rates for Reform HMO and PSN enrollees were similar but approximately double those in PMHPs.

For youth, the difference in the change in Baker Act evaluations between the PMHP and Reform counties was not statistically significant. Youth in Reform counties had Baker Act rates similar to youth in the PMHP areas in the six months prior to managed care implication. Baker Act rates decreased from .94 to .78 per 100 youth in PMHP areas, compared to an increase from .91 to .95 in the Reform counties. Baker Act rates continued to decline among those in the
PMHP, reaching .65 per 100 eligible months in the third follow-up period. Rates also fell among those in Reform in the second follow-up period before rebounding to .82 in the 13 – 18 months post-period. Thus, while youth had changes similar to adults with an increase in Baker Act rates in the Reform areas and a decline in the PMHP areas; the changes were smaller in magnitude and did not reach statistical significance.

Similarly, the changes in Baker Act rates after managed behavioral health care did not significantly differ between youth in HMOs and PMHPs, or PSNs and PMHPs. The relatively small increase in Baker Act rates among youth in the Reform counties in the first six months after Reform (from .91 to .95) was primarily due to a decline in Baker Act rates among recipients in PSNs (from .94 to .74). Recipients in Reform HMOs experienced an increase in Baker Act rates from .84 to 1.37 per 100 months. Baker Act rates continued to fall in the PMHP areas in the second and third post-periods, while there has been no clear trend among the HMOs or PSNs. After the initial increase in Baker Act rates among youth in HMOs, rates fell by more than half in the following six months (from 1.37 to .63) before increasing slightly (from .63 to .73) in the last period. Rates among youth in PSNs remained stable between the 0 – 6 month and 7 – 12 month periods before increasing from .73 to .86 in the final six months.
Figure 5 contains the arrest rates for individuals in PMHP and Reform plans. Once again, the rates are computed per 100 eligible months and are not case-mix adjusted. Arrest rates in Reform areas during the six months prior to implementation were 1.63 per 100 months, which was lower than PMHP areas at 2.22 per 100 months. Rates remained stable in the Reform areas for the first year after managed behavioral health care at 1.66 and 1.63, and declined to 1.39 per 100 eligible months in the 13 – 18 months post implementation. Arrest rates dropped by nearly 50% in the PMHP areas (from 2.22 to 1.14 per 100 eligible months) in the six months post managed care implementation, and remained stable for the two following periods at 1.18 and 1.12. Arrest rates among adults in PMHPs were lower than rates among adults in Reform plans in each of the three post-implementation periods.

Figure 5: Arrest Rates for Adults with Serious Mental Illness per 100 Eligible Months—Reform Compared to PMHP

![Graph showing arrest rates for PMHP and Reform plans](image-url)
Figure 6 examines the arrest rates in PMHP areas and Reform areas distinguishing between Medicaid recipients who enrolled in Reform HMOs and PSNs. The pattern of arrests was very similar for adults in PMHPs and Reform HMOs. There was a decline in the likelihood of arrest in the six months following implementation with arrest rates post managed care implementation remaining consistently below the pre-implementation rates. On the other hand, adults in PSNs saw an increase in arrest rates following implementation of Reform from 1.47 in the six months pre-Reform to 2.30 per 100 eligible months in the six months following Reform. Arrest rates declined following the initial increase but remained above the rates for adults in PMHPs and Reform HMOs.

**Figure 6: Arrest Rates for Adults with Serious Mental Illness per 100 Eligible Months—Reform HMO and PSN Compared to PMHP**
Table 3 contains the arrest rates as well as the coefficient *p*-values from the regression analysis. Consistent with Figure 5, arrest rates declined with PMHP implementation but remained steady in the Reform counties for the first year after implementation. Arrest rates among adults in PMHPs were lower than rates among adults in Reform in each of the follow-up periods, and were statistically significantly different (*p* = .003). Thus, similar to Baker Act evaluations, the implementation of the PMHP program was associated with improved outcomes among adults with SMI. The implementation of Medicaid Reform did not appear to adversely affect outcomes, but was not associated with the same improvements seen among adults in PMHPs.

There were considerable differences in the outcomes for enrollees in Reform HMOs and PSNs. Arrest rates fell by more than half among HMO enrollees in the first six months of Reform (from 2.06 to .95) while they increased among PSN enrollees from 1.47 to 2.3. Arrest rates have remained lower for HMO enrollees than PSN enrollees, although rates have declined for PSN enrollees over time. The regression results indicate the increase in arrest rates for adults in PSNs was statistically significant (*p* < .001), while the reductions in arrest rates for HMO enrollees were similar to the PMHP comparison group (*p* = .611).

**Table 3: Arrest Rates for Adults in Reform and PMHP Areas**

<table>
<thead>
<tr>
<th></th>
<th>SMI Adults</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th><em>p</em>-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PMHP areas</strong></td>
<td>1.96</td>
<td>2.22</td>
<td>1.14</td>
<td>1.18</td>
<td>1.12</td>
<td></td>
</tr>
<tr>
<td><strong>Reform areas</strong></td>
<td>1.46</td>
<td>1.63</td>
<td>1.66</td>
<td>1.63</td>
<td>1.39</td>
<td>.003</td>
</tr>
<tr>
<td><strong>Reform HMO</strong></td>
<td>1.98</td>
<td>2.06</td>
<td>0.95</td>
<td>1.17</td>
<td>0.83</td>
<td>.611</td>
</tr>
<tr>
<td><strong>Reform PSN</strong></td>
<td>1.22</td>
<td>1.47</td>
<td>2.30</td>
<td>1.98</td>
<td>1.69</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Notes. Arrest rates are per 100 eligible months. The *p*-value is from an individual-level regression analysis that compares changes in arrest rates pre- and post-managed care implementation in the PMHP and Reform areas. A *p*-value less than .05 would indicate that the difference in pre-post changes was statistically significant.
JUVENILE JUSTICE

Figure 7 compares rates of juvenile justice contacts for youth in the PMHP and Reform areas. The rates are computed per 100 eligible months and are not case-mix adjusted. Rates of juvenile justice encounters were higher in the Reform areas (4.34 per 100 months) than the PMHP areas (3.62 per 100 months) in the 7 – 12 months prior to implementation, but there was almost no difference in juvenile justice contacts in Reform and PMHP areas in the six months prior to managed behavioral health care. In the six months post implementation, juvenile justice encounters increased in the Reform areas (from 3.38 to 4.42) and decreased in the PMHP areas (from 4.09 to 3.03). In the following periods, juvenile justice encounter rates declined in the Reform areas and remained stable in the PMHP areas. By 13 – 18 months post implementation, encounter rates had converged and were similar at 3.18 per 100 months in the PMHP areas and 3.26 per 100 months in the Reform areas.

Figure 7: Juvenile Justice Contacts for Youth with Severe Emotional Disturbance per 100 Eligible Months—Reform Compared to PMHP
Figure 8 examines juvenile justice encounters in the Reform and PMHP areas, distinguishing between enrollees in Reform HMOs and PSNs. Youth in HMOs experienced an increase in juvenile justice encounters after the implementation of Reform from 4.45 to 5.57 per 100 months. After the initial increase, juvenile justice encounters declined in the following two periods but remained above rates for PSN and PMHP enrollees. Youth in PSNs experienced a slight increase in juvenile justice encounters in the first six months of Reform (from 3.64 to 3.83 per 100 months). However, rates fell in the following six months to 2.75 per 100 months, and remained relatively low at 2.87 in the third period. Among PMHP enrollees, juvenile justice rates fell in the first six months from 4.09 to 3.03 per 100 months and remained below pre-implementation levels in each of the three follow-up periods. Juvenile justice encounters for youth in PMHPs and PSNs were quite similar in 7 – 12 and 13 – 18 months after behavioral managed care implementation.

Figure 8: Juvenile Justice Contacts for Youth with Severe Emotional Disturbance per 100 Eligible Months—HMO and PSN Compared to PMHP
Table 4 examines juvenile justice encounters per 100 eligible months for youth in PMHP and Reform plans. The pre-post changes were not statistically significantly different with the $p$-value of .163 which is above the .05 threshold. Juvenile justice rates declined among youth in the PMHP areas in the first six months after implementation (4.09 to 3.03), and remained relatively stable (2.90 and 3.18) in the following two periods. Juvenile justice encounters increased in the first six months after Reform before declining in the following two periods, with juvenile justice encounters in the final period below pre-implementation rates.

Juvenile justice rates increased to a greater extent among youth in Reform HMOs (from 4.45 to 5.57) than youth in Reform PSNs (3.64 to 3.83) in the first six months of Reform. Rates among HMO enrollees remained above PSN (and PMHP) members in the following two periods, and PSN rates were lower than PMHP rates in the 7 – 12 and 13 – 18 months post. However, rates were also higher among HMO enrollees prior to the implementation of Reform. Consequently, the pre-post changes were not statistically significantly different among Reform HMO and PMHP ($p = .193$), or Reform PSN and PMHP enrollees ($p = .548$).

**Table 4: Juvenile Justice Encounters in Reform and PMHP Areas**

<table>
<thead>
<tr>
<th>SED Children</th>
<th>7 – 12 months pre</th>
<th>0 – 6 months pre</th>
<th>0 – 6 months post</th>
<th>7 – 12 months post</th>
<th>13 – 18 months post</th>
<th>$p$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PMHP areas</strong></td>
<td>3.62</td>
<td>4.09</td>
<td>3.03</td>
<td>2.90</td>
<td>3.18</td>
<td>—</td>
</tr>
<tr>
<td><strong>Reform areas</strong></td>
<td>4.34</td>
<td>3.88</td>
<td>4.42</td>
<td>3.78</td>
<td>3.26</td>
<td>.163</td>
</tr>
<tr>
<td><strong>Reform HMO</strong></td>
<td>5.11</td>
<td>4.45</td>
<td>5.57</td>
<td>5.28</td>
<td>4.03</td>
<td>.193</td>
</tr>
<tr>
<td><strong>Reform PSN</strong></td>
<td>3.89</td>
<td>3.64</td>
<td>3.83</td>
<td>2.75</td>
<td>2.87</td>
<td>.548</td>
</tr>
</tbody>
</table>

**Notes.** Juvenile justice encounter rates are per 100 eligible months. The $p$-value is from an individual-level regression analysis that compares changes in juvenile justice encounter rates pre- and post-managed care implementation in the PMHP and Reform areas. A $p$-value less than .05 would indicate that the difference in pre-post changes was statistically significant.
DISCUSSION AND CONCLUSION

Graphical and descriptive analysis suggests that adults with SMI and youth with SED in Medicaid Reform fared as well after the implementation of managed care as before. The implementation of Reform was not associated with significant changes in Baker Act, arrests, or juvenile justice encounters. However, adults in Reform did not fare as well as adults residing in different parts of the state who were enrolled in the Prepaid Mental Health Plan (PMHP) program. There was a significant reduction in Baker Act evaluations and arrests with the implementation of the PMHP program that was not observed with Medicaid Reform. The implementation of Reform did not have significantly different effects for children than implementation of the PMHP program.

Adults with SMI in PMHP plans experienced reductions in Baker Act evaluations and arrests after the implementation of managed behavioral health. The comparison to the PMHP program is appropriate because the PMHP program is the likely alternative to Medicaid Reform for behavioral health care. However, as indicated earlier, some services (e.g., prescription medications) are the responsibility of Reform plans but are not the responsibility of the PMHP and therefore are not included in the PMHP capitation. Available data do not enable us to determine why outcomes improved for adults in the PMHP program relative to the Medicaid Reform program.

Individuals with serious mental illness may face considerable challenges with the introduction of managed care. Indeed, Baker Act, arrests, and juvenile justice contacts all increased in the first six months following Reform. However, the increases tended to be small (e.g., arrest rates increased from 1.63 to 1.66 per 100 months) and rates fell to their pre-implementation levels by the second six month period after implementation.

There were some notable effects, particularly in the first 6 months following Reform when distinguishing between Reform HMOs and PSNs. These included an increase in Baker Act evaluations among adults in PSNs and youth in HMOs in the first six months after Reform was implemented. In both cases, rates returned to their pre-implementation levels in the following periods. Arrest rates among adults in PSNs also increased in the first six months after Reform, and while they declined in the following periods, rates did not return to pre-implementation levels. Finally, youth in Reform HMOs experienced an increase in juvenile justice contacts with Reform. However, rates fell over the following periods.

Reform HMOs and PSNs were compensated differently under the Reform program. HMOs were paid risk-adjusted capitated rates, and thus faced a degree of financial risk. The degree of financial risk was limited as risk corridors were used to reduce the impact of risk adjustment. Risk corridors limited the risk-adjusted payment rates to be no more than 10 percent above or below the average rate across all plans. PSNs had the option of receiving risk adjusted payments, but instead chose to have providers in PSNs paid fee-for-service rates with the PSN...
paid an administrative fee. There exists considerable research involving Medicare and a variety of state Medicaid programs that has found HMOs reduce service use below a comparable fee-for-service population due to the financial incentives introduced by a capitated payment structure. While prior research has consistently found a reduction in service use, it is less clear whether the reduction indicates inadequate care or whether managed care is simply preventing an overuse of services. Given that providers in PSNs were paid on a fee-for-service basis, there is less financial incentive to reduce care. However, the use of fee-for-service payments does not imply that PSNs have no incentive to monitor care. Risk-adjusted rates were also computed for PSNs, and each plan’s spending was periodically reconciled to what the plan would have received under risk-adjusted capitated payments. As was illustrated in Figures 1 and 5 (and Tables 2 and 3), Baker Act rates and arrest rates increased among adults enrolled in PSNs (relative to adults in PMHPs) while rates did not change significantly for adults in HMOs and PMHPs. Such results may indicate that the financial risk faced by HMOs encouraged effective coordination of care, and thus reduced involuntary commitments and arrests.

While not the focus of this report, it is also interesting to note that compared to PSNs, Reform HMOs tended to attract individuals who had more Baker Act, arrests, and juvenile justice contacts prior to the implementation of Reform. This was determined by comparing the coefficients for the HMOs and PSNs in equation (2), which essentially determines whether Baker Act, arrests, and juvenile justice rates differed between recipients in HMOs and PSNs prior to the implementation of Reform. Youth who enrolled in HMOs had higher pre-implementation rates of Baker Act and juvenile justice contacts than youth who enrolled in PSNs, while adults who enrolled in HMOs had higher pre-implementation arrest rates than adults who enrolled in PSNs.

Finally, in order to include all five Reform counties, an eighteen month follow-up period was used. Future work should examine the long-run effects of Reform versus alternative financing structures such as the PMHP program.
REFERENCES


APPENDIX A: DEFINITION OF SED OR SMI

DEFINITION OF CHILD SED

Meet any of Definitions A–C and be under the age of 18:

A. Be classified as SED in the IDS admissions file and be Medicaid eligible at some point during the time period for the study

B. Not meet Condition A but have at least 2 claims on different days in one of the following diagnostic categories:
   i. Bipolar Disorder (ICD-9 diagnosis in range from 296.4–296.99 or 296 296.19)
   ii. Schizophrenic Disorders (ICD-9 diagnosis in range from 295–295.99 or 297–298.99)
   iii. Major Depressive Disorder (ICD-9 diagnosis in range from 296–296.39)
   iv. Personality Disorder (ICD-9 diagnosis in range from 301–301.99)

C. Not meet conditions A or B but have at least 2 claims on different days in at least 2 of the following 7 conditions (there must be at least 2 claims for each condition met):
   i. ADHD (ICD-9 diagnosis in range from 314–314.99)
   ii. Conduct/Oppositional Disorder (ICD-9 diagnosis in range from 312–312.99 or 313.81)
   iii. Anxiety Disorder [ICD-9 diagnosis in range from 300–300.99, or 308–308.99, or 313–313.99 or in (309.81, 309.89, 309.21) but not in (300.40, 300.15, 300.16, 300.19)]
   iv. Depressive Disorder [ICD-9 diagnosis in range from 311–311.99 or (300.40, 301.13)]
   v. Anti-Psychotic medication (total claims must total to at least a 60-day supply of medication, generic names for pharmaceuticals include: ARIPIPRAZOLE, CLOZAPINE, OLANZAPINE, QUETIAPINE FUMARATE, RISPERIDONE, ZIPRASIDONE HCL, CHLORPROMAZINE HCL, FLUPHENAZINE DECANOATE, FLUPHENAZINE HCL, HALOPERIDOL, HALOPERIDOL DECANOATE, HALOPERIDOL LACTATE, LOXAPINE SUCCINATE, MESORIDAZINE BESYLATE, MOLINDONE HCL, PERPHENAZINE, THIORIDAZINE HCL, THIOTHIXENE, TRIFLUOPERAZINE HCL)
   vi. Antidepressant medication (total claims must total at least a 60-day supply of medication. Generic names for pharmaceuticals include: CITALOPRAM HYDROBROMIDE, FLUOXETINE HCL, FLUVOXAMINE MALEATE, PAROXETINE HCL, SERTRALINE HCL, BUPROPION HCL, MIRTAZAPINE, NEFAZODONE HCL, TRAZODONE HCL, VENLAFAXINE HCL)
vii. Mood Stabilizers (total claims must total at least a 60-day supply of medication. Generic names for pharmaceuticals include: CARBAMAZEPINE, CLONAZEPAM, DIVALPROEX SODIUM, GABAPENTIN, LAMOTRIGINE, LITHIUM CARBONATE, LITHIUM CITRATE, OXCARBAZEPINE, TOPIRAMATE, VALPROATE SODIUM, VALPROIC ACID)

**DEFINITION OF ADULT SMI**

Have at least 1 claim in one of the following diagnostic or pharmacy use categories:

A. Bipolar Disorder (ICD-9 diagnosis in range from 296.4–296.99 or 296–296.19)

B. Schizophrenic Disorders (ICD-9 diagnosis in range from 295–295.99 or 297–298.99)

C. Major Depressive Disorder (ICD-9 diagnosis in range from 296–296.39)

D. Antipsychotic medication (total claims must total at least a 60-day supply of medication. Generic names for pharmaceuticals include: ARIPIPRAZOLE, CLOZAPINE, OLANZAPINE, QUETIAPINE FUMARATE, RISPERIDONE, ZIPRASIDONE HCL, CHLORPROMAZINE HCL, FLUPHENAZINE DECANOATE, FLUPHENAZINE HCL, HALOPERIDOL, HALOPERIDOL DECANOATE, HALOPERIDOL LACTATE, LOXAPINE SUCCINATE, MESORIDAZINE BESYLATE, MOLINDONE HCL, PERPHENAZINE, THIORIDAZINE HCL, THIOTHIXENE, TRIFLUOPERAZINE HCL)
APPENDIX B: REGRESSION MODEL

Generalized estimating equations (GEE) were used to estimate the relationship between Reform and the number of Baker Act evaluations while controlling for individual demographic characteristics. The analyses were conducted using SAS procedure GENMOD. Empirical (robust) standard errors were calculated to account for repeated observations on the same participant (one for each time period) (Hardin & Hilbe, 2002).

First, Baker Act rates were compared between Reform areas and PMHP areas:

\[ \text{Baker Act}_{it} = \text{Time}_t \cdot \beta_1 + \text{Reform}_i \cdot \beta_2 + \text{Post}_t \cdot \beta_3 + \text{Reform County}_i \cdot \text{Post}_t \cdot \beta_4 + X_{it} \cdot \beta_5 + \epsilon_{it} \] (1)

where time captures any time trend in the data, Reform is a categorical variable denoting the individual is in a Reform county, Post denotes the time period after managed care implementation, Reform County \( \times \) Post is an interaction indicating the individual resides in a Reform county after implementation, and X denotes demographic characteristics (age, gender, and race). The coefficient \( \beta_4 \) is the primary coefficient of interest as this result will determine whether the outcome changed to a greater or lesser degree in the Reform areas than the comparison PMHP areas.

The second comparison distinguished between individuals in Reform counties who were enrolled in HMOs and PSNs:

\[ \text{Baker Act}_{it} = \text{Time}_t \cdot \beta_1 + \text{Reform HMO}_i \cdot \beta_2 + \text{Reform PSN}_i \cdot \beta_3 + \text{Post}_t \cdot \beta_4 + \text{Reform HMO}_i \cdot \text{Post}_t \cdot \beta_5 + \text{Reform PSN}_i \cdot \text{Post}_t \cdot \beta_6 + X_{it} \cdot \beta_7 + \epsilon_{it} \] (2)

While there are a number of additional comparisons that could be made (e.g., between Reform areas, between PSNs and HMOs, or between specific plans), the analysis was limited by sample size considerations. To ensure the anonymity of enrollees, no comparisons were made when there were fewer than 30 people in a cell.