



CENTER FOR HEALTH POLICY

PART OF THE INDIANA UNIVERSITY PUBLIC POLICY INSTITUTE

# **Child Welfare Mental Health Screening Initiative**

## **Evaluation Progress Report**

**January 2009**





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## OVERVIEW

The child welfare mental health screening initiative, sponsored by the Indiana Department of Child Services (DCS), is a program to identify mental health needs in children referred to the child welfare system. The goal of the program is to provide needed care to children with mental health issues and to reduce the number of failed placements. Multiple state agencies have been involved in planning and implementing this initiative. The steps for implementing the program have included training county-level field staff on the screening tool, developing formal plans to make referrals for mental health consultations, and beginning the screening process. On January 1, 2005, all county agencies began screening all children referred to the state.

As part of the project, Dr. Eric R. Wright, Director of the Center for Health Policy and Associate Professor, School of Public and Environmental Affairs, IUPUI, and his research staff were asked to initiate an independent evaluation of both the planning and implementation of this initiative. This is the 16th evaluation report and the second evaluation report under a new contract with the DCS. The new contract with DCS funds continuation of this work from July 1, 2008, through June 30, 2009. Within this report, data for children in placement during the year preceding initiative implementation (benchmark), the six-month pilot period, and the first three and one-quarter years of implementation are discussed and analyzed.





## MEMORANDUM OF UNDERSTANDING

Data from the following three state agencies are analyzed in this report: the Division of Mental Health and Addiction (DMHA), the Department of Child Services (DCS), and the Office of Medicaid Policy and Planning (OMPP). In compliance with the Memorandum of Understanding (MOU), each agency provided the evaluation team with an unidentifiable dataset, including all children who were in placement during the reporting period. Where available, the data include an Enterprise Client Identifier (ECI) assigned by Data Transformation Services (DTS). The ECI is an identifier that allows the matching of data across agencies without revealing the identity of the children. Each agency provided the evaluation team with pre-screening implementation benchmark data for the reporting period of July 1, 2003, through June 30, 2004; the pilot implementation period of July 1, 2004, through December 31, 2004; and the first three and one quarter years of implementation (January 1, 2005, through March 31, 2008). The data for each period are analyzed and described and key differences across periods are discussed.

## DATA

All data received from the aforementioned state agencies are analyzed and managed using SPSS, the R Statistical Computing Language, and Microsoft SQL Server. The analysis focuses on constructing measures which allow for comparisons across the benchmark, pilot, and implementation periods. These comparisons help to determine the effectiveness and inclusiveness of the screening initiative. Variables are checked for outliers and missing values, and transformed where

appropriate. As mentioned earlier, data from the three agencies are matched using the ECI to assure the confidentiality of each individual's data. No identifiable data are reported herein.

## *DCS Data*

The data provided by the Department of Child Services (DCS) include all children who were in substitute care during the benchmark period (July 1, 2003, to June 30, 2004), the six months of the pilot implementation period (July 1, 2004, through December 31, 2004) and the first three and one quarter years of implementation (January 1, 2004, through March 31, 2008). Only children who were removed from their home or declared a Child in Need of Services (CHINS) during the reporting periods were selected.

During the course of this project, it was discovered that the evaluation team was not receiving data for all children in the DCS system. Specifically, as a result of the de-identification process, only children assigned an enterprise client identifier (ECI) were included in the dataset provided; however, not all children were assigned such a number. Assigning a child an ECI number requires that the child is in another data system, such as the TANF database, in addition to the DCS system. This substantially reduced the number of children in the data file used to conduct the analyses. The data error has been corrected in the analysis for this report by including all children served by DCS, even those with no ECI number assigned.

The DCS data include demographic information, current and previous CHINS, removal dates, the total number of removals, and the number of placements for the current case. A multiple CHINS indicator and a multiple removal indicator are computed using the data provided



by DCS. If a child has an earlier CHINS date than the current CHINS date, the multiple CHINS indicator is coded as a 1, indicating multiple CHINS have occurred. If the initial and current CHINS dates are the same, the variable is coded as a 0, indicating that this is the first CHINS the child has experienced. The multiple removal indicator is coded in a similar manner, but based on the number of previous removals recorded in the data. If a child has had one or more previous removals, the removal indicator is coded as a 1; a code of 0 is used otherwise. Race was also recoded into a dichotomous measure, white (0) and nonwhite (1). Additionally, the variable indicating screening results of children who were screened is recoded to collapse like categories. The screening variable is coded as follows:

- 1 for urgent referral
- 2 for refer for follow-up
- 3 for re-screen
- 4 for no identified risk

The results are also collapsed into a dichotomous variable indicating whether a risk was identified in the screening.

### ***DMHA Data***

The Division of Mental Health and Addiction (DMHA) also provided

data for children who had received services through their agency during the benchmark, pilot, and full implementation periods. A variable indicating whether the child had received DMHA services was computed and coded as a 1 if DMHA data existed on the child. A variable indicating if the DMHA enrollment date is before or after the initial CHINS date was also computed.

### ***OMPP Data***

The Office of Medicaid Policy and Planning (OMPP) provided data regarding behavioral health services that a child had received during the benchmark, pilot, and full implementation periods. The Medicaid data are aggregated to create a single record for each child per reporting period. The first service date variable is set to the earliest date within all records pertaining to each child. The last service date is set to the latest date for each child. The amount paid is calculated as the sum of the amount paid for all behavioral health records associated with each specific child, discounted to 2006 dollars. Finally, the category of service and procedure codes are set to counts of each relevant episode of mental health or addiction care provided to each specific child.



# DATA ANALYSIS

## CLIENT FLOW—BENCHMARK PERIOD

During the benchmark period a total of 2,826 children were either declared a CHINS or removed from placement (see Table 2). Of these children, 17.4 percent had previously been declared a CHINS and 15.6 percent had one or more previous removals. Table 1 provides a descriptive analysis of these characteristics for all periods.

Further analysis of client flow reveals that of the 2,826 children either declared a CHINS or removed, 318 (11.3 percent) received behavioral health services paid by OMPP or DMHA within 60 days of their last DCS contact. To isolate the potential causal relationship between the DCS contact and the receipt of services, this number does not include children who received services prior to their last

CHINS/removal. Table 2 shows this analysis for all periods.

### *Mental Health Services*

Analysis of DMHA data reveals that of all children who were declared a CHINS or removed during the three periods, 5,141 (19.6 percent) received services through the DMHA at some point. In the benchmark period, 797 (28.2 percent) children received such services.

A total of 1,239 (43.8 percent) children declared a CHINS or removed in the benchmark period received mental health or addiction treatment covered by Medicaid. Between DMHA and Medicaid, 1,262 (44.7 percent) of the children declared a CHINS during the benchmark period received mental health or addiction services, of whom 220 (17.4 percent) received these services prior to their contact with DCS.

**Table 1: Descriptive Statistics of Department of Child Services (DCS) Data**

	Benchmark period		Pilot period		Full Implementation period		Total	
DEMOGRAPHICS	N	%	N	%	N	%	N	%
<b>Age</b> ( $F=61.567$ , $p \leq .001$ )								
Less Than One Year	39	1.4%	297	13.2%	3,593	17.0%	3,593	15.0%
1 to 4 Years Old	986	34.9%	684	30.4%	6,057	28.7%	7,727	29.5%
5 to 8 Years Old	591	20.9%	414	18.4%	4,042	19.1%	5,047	19.3%
9 to 13 Years Old	634	22.4%	427	19.0%	4,021	19.0%	5,082	19.4%
14 to 17 Years Old	576	20.4%	427	19.0%	3,427	16.2%	4,430	16.9%
Total	2,826	100.0%	2,249	100.0%	21,140	100.0%	26,215	100.0%
<b>Gender</b> ( $F= .868$ , $p = .420$ )								
Male	1,430	50.6%	1,147	51.0%	10,522	49.8%	13,099	50.0%
Female	1,396	49.4%	1,102	49.0%	10,618	50.2%	13,116	50.0%
Total	2,826	100.0%	2,249	100.0%	21,140	100.0%	26,215	100.0%
<b>Race</b> ( $F=17.741$ , $p \leq .001$ )								
White	1,871	66.2%	1,561	69.4%	15,131	71.6%	18,563	70.8%
Nonwhite	955	33.8%	688	30.6%	6,009	28.4%	7,652	29.2%
Total	2,826	100.0%	2,249	100.0%	21,140	100.0%	26,215	100.0%
<b>CLIENT FLOW</b>								
<b>Previous CHINS</b> ( $F=10.705$ , $p \leq .001$ )								
Yes	493	17.4%	398	17.7%	3,206	15.2%	4,097	15.6%
No	2,333	82.6%	1,851	82.3%	17,934	84.8%	22,118	84.54
Total	2,826	100.0%	2,249	100.0%	21,140	100.0%	26,215	100.0%
<b>Previous Removal</b> ( $F=5.396$ , $p = .005$ )								
Yes	442	15.6%	329	14.6%	2,816	13.3%	3,587	13.7%
No	2,384	84.4%	1,920	85.4%	18,324	86.7%	22,628	86.3%
Total	2,826	100.0%	2,249	100.0%	21,140	100.0%	26,215	100.0%

Source: Indiana State Department of Health, Division of HIV/STD, 2007



## ***Recidivism and Placement Stability***

Five variables were used to measure recidivism and stability. These variables include the initial CHINS date, current CHINS date, initial removal date, current removal date, and total number of removals. The presence of multiple CHINS, as defined by an initial CHINS date occurring before the current CHINS date, indicates a pattern of recidivism. The analysis shows that 493 (17.4 percent) children removed during the benchmark period had a previous CHINS. We used a logistic regression model, with the multiple CHINS indicator as the dependent variable and age, race, gender, a variable indicating whether a child received DMHA services prior to their initial CHINS, and a variable indicating whether a child received behavioral health services paid by OMPP prior to their CHINS as the independent variables. The results of the regression show that age and whether or not a child received services paid by OMPP are significantly related to recidivism. Specifically, older children are more likely to experience recidivism. Children who received behavioral health

services paid by OMPP prior to DCS contact are less likely to experience recidivism than those who have not had these services. The complete results of this model are displayed in Table 3.

In addition to recidivism, a measure of placement stability was computed based on the number of removals as well as on the dates of the initial and current removals. If a child had more than a single removal or if their initial removal date occurred prior to their current removal date, a variable indicating such was coded as 0. If a child had only a single removal, the stability measure was coded as a 1. This measure indicates that the child is experiencing placement stability. The data show that 442 (15.6 percent) children removed during the benchmark period had a previous removal. The same logistic regression model used to analyze recidivism was used to analyze the stability measure. The results indicate that one of the significant predictors of multiple removals is age. Older children are less likely to experience placement stability than younger children. Of greater interest, however, is that the other significant variable in the model, whether

**Table 2: Client Flow Analysis**

Period	Total number of CHINS/removals	Number (%) of children screened for mental health and addiction needs. <sup>1</sup>	Number (%) of children with an identified risk <sup>2</sup>	Number (%) of children receiving mental health and/or addiction treatment <sup>3</sup>	Number (%) of children receiving assessment <sup>4</sup>
Benchmark period (July 1, 2003-June 30, 2004)	2,826	N/A	N/A	318 (11.25%)	268 (9.48%)
Pilot period (July 1, 2004-December 31, 2004)	2,249	900 (40.2%)	347 (15.43%)	277 (12.32%)	245 (10.89%)
Full implementation period (January 1, 2005-March 31, 2008)	21,140	15,464 (73.15%)	5,107 (24.16%)	1,968 (9.31%)	1,527 (7.22%)

<sup>1</sup>Percentage was calculated as a function of the total number of CHINS/removals occurring during each research period.

<sup>2</sup>Shown as a percentage of the total number of children screened.

<sup>3</sup>Includes only children who received services of OMPP or DMHA within 60 days of their last CHINS/removal and did not receive services prior to their first CHINS were included. The percentage is calculated as a function of the total number of CHINS/removals within each research period.

<sup>4</sup>Includes only children who received an assessment paid for by OMPP within 60 days of their last CHINS/removal.



or not children receive mental health/addiction treatment paid by OMPP, indicates that children receiving such services are more likely to experience stability. The full results of the regression model are presented in Table 3.

### *Service Expenditures*

The third series of analyses examines the expenditures for services provided to clients. Using expenditure data provided by OMPP, the evaluation team examined the costs associated with mental health and addiction treatment during the benchmark period. The data show that of the 2,826 children removed or declared a CHINS during the benchmark period, 1,239 (43.8 percent) children received mental health or addiction services paid by Medicaid dollars in the benchmark period. All figures are in 2006 dollars, adjusted using the Midwest Urban Medical CPI. The total dollar amount spent for these services, for children enrolled with DCS, was \$2,432,237, averaging \$1,963 per child receiving services from DCS. As a comparison, the total dollars spent on behavioral health services for all children during the benchmark period was \$105,993,381 for 54,390 children, an average of \$1,949 per child.

### **CLIENT FLOW — PILOT IMPLEMENTATION PERIOD**

Using data from DCS, client flow was analyzed for the pilot implementation (N=2,249) period (see Table 2). Our analysis shows a significant difference between the demographics of both the benchmark and pilot periods in age and race categories. The percentage of nonwhites in the pilot period is lower than the percentage in the benchmark period. The difference in age is attributable to more children younger than one being

removed during the pilot period than during the benchmark period.

A descriptive analysis of recidivism shows that during the pilot implementation period, 398 children had a previous CHINS. The results also show that 329 (14.6 percent) children removed or declared a CHINS during the pilot period had one or more previous removals. Table 1 provides a descriptive analysis of these characteristics.

Further analysis of client flow reveals that of the 2,249 children declared a CHINS or removed, 900 (40 percent) were screened for mental health or addiction needs during the pilot period. Furthermore, of these 900 screened children, 347 (38.6 percent) had an identified risk. A total of 277 (12.3 percent) children received behavioral health services paid by OMPP or DMHA within 60 days of their last DCS contact during the pilot period. Of the children who received services, 44 (13.8 percent) were screened and identified as having a risk. To isolate the potential causal relationship between the DCS contact and the receipt of services, these numbers do not include children who received services prior to their last CHINS/removal. Table 2 shows this analysis for all periods.

### *Mental Health Services*

Analysis of DMHA data for the pilot implementation reveals that 522 (23.2 percent) children received such services during the pilot period, a significantly smaller portion than during the benchmark period ( $t=4.063$ ;  $p < .001$ ). Descriptive statistics regarding the level of function of this group are provided in Table 3.

Medicaid data show that during the pilot period, 934 (41.5 percent) children received behavioral health services





paid by OMPP; there was no significant difference from the benchmark period ( $t=1.656$ ;  $p = 0.098$ ). Between both DMHA and OMPP, 952 (42.3 percent) children received behavioral health services from either agency during the pilot period, with 214 (22.5 percent) receiving services prior to their contact with DCS.

### Screening

Beginning on July 1, 2004, DCS began a pilot implementation of the screening initiative. This pilot implementation included a small subset of counties in the state. During the pilot period, a total of 2,249 children were declared a CHINS or removed. Of these children, 900 (40 percent) were screened for mental health or addiction needs. Based solely on available data, the portion of children screened in an individual pilot county cannot be determined.

The results for children screened reveal that 389 (43.2 percent) had no identified risk, 164 (18.2 percent) required re-screening, and 347 (38.6 percent) had an identified risk. Of those with an identified

risk, 279 (80.4 percent) were identified as needing an urgent referral. Further analysis reveals that 124 (13.8 percent) of the children having an identified risk received treatment within 60 days of referral as a result of the screening.

### Recidivism and Placement Stability

To measure recidivism and placement stability for the pilot period, the same variables were used as in the benchmark period. These variables include initial CHINS date, current CHINS date, initial removal date, current removal date, and total number of removals. The presence of multiple CHINS, as defined by an initial CHINS date occurring before the current CHINS date, indicates a pattern of recidivism. The analysis shows that 398 (17.7 percent) children removed or declared a CHINS during the pilot period had a previous CHINS. We used a logistic regression model, with the multiple CHINS indicator as the dependent variable along with age, race, gender, a variable indicating whether a child

**Table 3: Logistic Regression Analysis for Benchmark, Pilot, and Full Periods**

	Recidivism			Placement stability		
	Benchmark	Pilot	Full	Benchmark	Pilot	Full
	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)
Constant	-1.853*** (.110)	-1.823*** (.113)	-2.070*** (0.039)	2.366*** (.123)	2.468*** (.133)	2.442*** (0.043)
Age	0.059*** (.009)	0.070*** (.010)	0.059*** (0.004)	-0.098*** (.010)	-0.118*** (.011)	-0.094*** (0.004)
Nonwhite	-0.157 (.108)	-0.186 (.124)	-0.158*** (0.044)	0.126 (.113)	-0.088 (.132)	-0.075 (0.045)
Female	-0.174 (.100)	-0.106 (.113)	-0.050 (0.039)	0.030 (.106)	0.112 (.125)	0.083* (0.041)
DMHA services provided	-0.237 (.413)	-0.259 (.461)	-0.130 (0.115)	1.713 (1.059)	-0.732 (.686)	0.182 (0.127)
Received services paid by OMPP	-0.730** (.278)	-0.885** (.299)	-0.278*** (0.076)	2.019*** (.480)	2.561*** (.593)	0.445*** (0.084)
Risk identified in screening	N/A	-0.323* (.170)	0.153** (0.045)	N/A	0.729*** (.199)	0.192*** (0.049)
Chi-square ( $\chi^2$ )	52.260***	65.111***	324.511***	148.183***	159.462***	626.688***
Nagelkerke R <sup>2</sup>	.030	.047	.027	.088	.121	.054

\*\*\* $p \leq .001$  \*\* $p \leq .01$  \* $p \leq .05$



received DMHA services prior to their initial CHINS, a dichotomous version of screening results as independent variables to determine the probability of having multiple CHINS, and a variable indicating whether the screening identified risk. The results of the regression show that age and receiving OMPP services are significant variables associated with recidivism during the pilot period. More specifically, older children are more likely to experience recidivism than younger children, and those who received OMPP services prior to their first CHINS or removal are less likely to experience recidivism. Of greater interest, the results significantly indicate that if the screening reveals an identified risk, a child is less likely to experience recidivism.

In addition to recidivism, a measure of placement stability was computed based on the number of removals. If a child had more than a single removal, a variable indicating such was coded as 0. This measure indicates whether the child is experiencing placement stability. The data show that 329 (14.6 percent) children who were removed or declared a CHINS during the pilot period had a previous removal. The same logistic regression model used to analyze recidivism was used to analyze the stability measure. The results indicate that one of the significant predictors of multiple removals, during the pilot period is age. Older children are more likely to have multiple removals than younger children. In addition to age, the model shows that if a child received services paid by OMPP, they are more likely to experience stability. Furthermore, the results indicate that if the screening reveals an identified risk, a child is significantly more likely to have stability in placement. This finding suggests that those with multiple removals are likely to have a need for such treatment. The

full results of the regression model are presented in Table 3.

### *Service Expenditures*

Medicaid data for the pilot periods allowed the evaluation team to examine the costs associated with behavioral health treatment. The data show that of the 2,249 children removed or declared a CHINS during the pilot period, 934 (41.5 percent) children in the DCS system received mental health or addiction services paid by Medicaid dollars totaling \$1,475,091. The average dollar amount spent for these services per child receiving services was \$1,579 (an average of \$3,158 annually per child) in the pilot period. As a comparison, the total dollars spent on behavioral health services for all children during the pilot period was \$84,894,082 for 44,947 children, an average of \$1,889 (an average of \$3,778 annually per child) per child.

### **CLIENT FLOW — FULL IMPLEMENTATION PERIOD**

Using data from DCS, client flow was analyzed with regard to the full implementation period (N=21,140, see Table 2). Our analysis shows a significant difference between the ages and race of children having contact with DCS in the full implementation period versus the benchmark period. The difference in age is attributable to an increase in the number of children under one year of age who were removed from their home. Additionally, the percentage of nonwhites in the full implementation period (28.4 percent) was lower than that during the benchmark period (33.8 percent). A smaller fraction of individuals in the full implementation period (15.2 percent) had previously been declared children in need of service than had been so declared (17.4 percent) in the benchmark period.



A descriptive analysis of recidivism shows that of the children declared a CHINS or removed during the full implementation period, 15.2 percent had previous contact with the child welfare system. The results also show that 13.3 percent of children removed or declared a CHINS during the full implementation period had one or more previous removals. Table 1 provides a descriptive analysis of these characteristics.

Further analysis of client flow reveals that of the 21,140 children declared a CHINS or removed in the full implementation period, 15,464 (73.2 percent) were screened for mental health or addiction needs. Of these 15,464 screened children, 5,107 (33 percent) had an identified risk. A total of 1,968 (9.3 percent) children received behavioral health services paid by OMPP or DMHA within 60 days of their last DCS contact. Of the children who received services, 834 (42.4 percent) were screened and were identified as having a risk. To isolate the potential causal relationship between the DCS contact and the receipt of services, these numbers do not include children who received services prior to their last CHINS/removal. Table 2 shows this analysis for all periods.

### ***Mental Health Services***

Analysis of DMHA data for the full implementation period reveals that 3,822 (18.1 percent) children received such services during this reporting period, a significantly lower proportion than during the benchmark period ( $t=11.412$ ;  $p < .001$ ). Descriptive statistics regarding the level of function of this group are provided in Table 3.

Medicaid data show that during the full implementation period, 6,621 (31.3 percent) children received behavioral

health services paid by OMPP, a significantly lower proportion than from the benchmark period ( $t=12.694$ ;  $p < .001$ ). Between both DMHA and OMPP, a total of 6,953 (32.9 percent) children received behavioral health services from either agency during the full implementation period, with 2,493 (35.9 percent) receiving services prior to their contact with DCS.

### ***Screening***

During the full implementation period, a total of 21,140 children were declared a CHINS or removed. Of these children, 15,464 (73.2 percent) were screened for mental health and addiction needs. The results of the screening show that within the screening subgroup, 7,260 (46.9 percent) had no identified risk; 3,097 (20 percent) required re-screening; and 5,107 (33 percent) had an identified risk. Of those with an identified risk, 4,016 (78.6 percent) were identified as needing an urgent referral. Further analysis reveals that 834 (16.3 percent) of the children having an identified risk received treatment within 60 days of referral as a result of the screening.

### ***Recidivism and Placement Stability***

To measure recidivism and stability for the full implementation period, the same variables were used as in the benchmark and pilot periods. These variables include initial CHINS date, current CHINS date, initial removal date, current removal date, and total number of removals. The presence of multiple CHINS, as defined by an initial CHINS date occurring before the current CHINS date, indicates a pattern of recidivism. The analysis shows that 3,206 (15.2 percent) children removed or declared a CHINS during the full implementation period had a previous CHINS. We used a logistic regression





model, with the multiple CHINS indicator as the dependent variable and age, race, gender, a variable indicating whether a child received DMHA or OMPP services prior to their initial CHINS, a dichotomous version of screening results as independent variables to determine the probability of having multiple CHINS, and a variable indicating whether the screening identified risk as the independent variables. The results of the regression show that age, race, receiving mental health services paid for by OMPP, and having a risk identified in screening are significant variables associated with recidivism during the full implementation period. More specifically, older children are more likely to experience recidivism than younger children, and those who received services paid for by DMHA or OMPP prior to their first CHINS or removal are less likely to experience recidivism. Individuals who are nonwhite are less likely to experience recidivism than are those children who are white. Also of interest, the results indicate that if the screening reveals an identified risk, a child is more likely to experience recidivism. This suggests that children who have behavioral health needs that have not been met are more likely to experience multiple contacts with DCS.

In addition to recidivism, a measure of stability was computed based on the number of removals. If a child had more than a single removal, a variable indicating such was coded as 0. This measure indicates whether the child is experiencing placement stability, with a 1 indicating stability. The data show that 2,816 (13.3 percent) children who were removed or declared a CHINS during the full implementation period had a previous removal. The same logistic regression model used to analyze recidivism was used to analyze the stability measure.

The results indicate several significant predictors of multiple removals during the full implementation period, including age and whether received services are paid for by OMPP. Specifically, older children are more likely to have multiple removals than younger children. Furthermore, children who received services paid by OMPP are more likely to experience stability. Also of interest, the results indicate that if the screening reveals an identified risk, a child is more likely to experience placement stability, suggesting that those with multiple removals are likely to have a need for such treatment. The full results of the regression model are presented in Table 3.

### *Service Expenditures*

Medicaid data for the full implementation period allowed the evaluation team to examine the costs associated with behavioral health treatment. The data show that of the 21,140 children removed or declared a CHINS during the full implementation period, 6,621 (31.3 percent) children in the DCS system received mental health or addiction services paid by Medicaid dollars totaling \$37,489,984. The average dollar amount spent for these services per child was \$5,662 (\$1,742 dollars annually) in this period. When compared to the dollars spent annually on behavioral health services per child during the benchmark (\$1,963) and pilot (\$3,158) periods, the average annual cost per child decreased during the full implementation period. As a comparison, the total dollars spent on behavioral health services for all children during the full implementation period was \$361,783,119 for 102,170 children, an average of \$3,541 per child (\$1,089 annually per child).





## SERVICES PROVIDED

Table 4 shows the number of service hours, the number of recipients, and the average number of service hours provided to each child receiving services per period, by service category. The results show that the number of service hours rendered has remained relatively stable overall; however, the number of children receiving these services has grown dramatically from the benchmark period to the full implementation period. The decreasing

average number of service hours rendered per child over time, however, may indicate that the capacity of the service providers is not growing sufficiently to meet the expanding need. It is not possible to determine with these data what the most appropriate level of clinical care is for these children.

Table 5 compares the benchmark and full implementation periods by identified

**Table 4:** Descriptive Statistics of Department of Child Services (DCS) Data

Service Category	Benchmark (N=2,826**)			Pilot (N=2,249**)			Full Implementation (N=21,140**)		
	Hours of services	Number of recipients	Average hours per child	Hours of services	Number of recipients	Average hours per child	Hours of services	Number of recipients	Average hours per child
Assessment	2053.13	1102.50	1.86	3179.25	1613.00	1.97	2569.06	1659.69	1.55
Case management	4994.63	208.50	23.96	6340.25	308.00	20.59	5286.71	342.54	15.43
Crisis services	880.69	349.00	2.52	1493.75	569.00	2.63	1641.06	646.46	2.54
Day treatment service	12892.50	44.25	291.36	26688.00	69.50	384.00	27025.19	70.31	384.38
Family support	2974.50	241.00	12.34	3045.88	325.00	9.37	2040.48	303.62	6.72
Group therapy	964.25	61.50	15.68	1223.00	82.00	14.91	725.48	65.31	11.11
Individual counseling/ psychotherapy	7261.56	610.75	11.89	8762.62	812.00	10.79	6590.25	834.08	7.90
Medication service	3012.65	1160.75	2.60	3691.03	1643.00	2.25	2857.81	1592.23	1.79
Other medical service	77.00	78.00	0.99	96.50	96.50	1.00	101.62	101.46	1.00
Skills training/skills maintenance	3927.50	195.75	20.06	4863.88	286.00	17.01	2369.75	288.46	8.22
Visit to 24-Hour facility	556.90	296.00	1.88	1132.50	504.50	2.24	861.61	461.08	1.87

\* Calculated by quarter (i.e., Total Benchmark ÷ 4; Total Pilot ÷ 2; Total Full Implementation ÷ 13)

\*\* For all quarters within each period

**Table 5:** Service Hours Rendered and Number of Children Receiving Services by Risk Group, by Quarter\*

Service Category	Benchmark (N=2,826**)			Full Implementation (N=21,140**)					
	Hours of services	Number of recipients	Average hours per child	No risk identified			Risk identified		
				Hours of services	Number of recipients	Average hours per child	Hours of services	Number of recipients	Average hours per child
Assessment	2053.13	1102.50	1.86	1667.98	1121.85	1.49	901.08	537.85	1.68
Case management	4994.63	208.50	23.96	2752.25	201.00	13.69	2534.46	141.54	17.91
Crisis services	880.69	349.00	2.52	1098.77	436.31	2.52	542.29	210.15	2.58
Day treatment service	12892.50	44.25	291.36	14368.27	38.23	375.83	12656.92	32.08	394.58
Family support	2974.50	241.00	12.34	1143.94	175.62	6.51	896.54	128.00	7.00
Group therapy	964.25	61.50	15.68	326.08	33.77	9.66	399.40	31.54	12.66
Individual counseling/ psychotherapy	7261.56	610.75	11.89	3583.65	493.92	7.26	3006.60	340.15	8.84
Medication service	3012.65	1160.75	2.60	1574.49	1033.69	1.52	1283.32	558.54	2.30
Other medical service	77.00	78.00	0.99	60.77	62.92	0.00	40.85	38.54	1.06
Skills training/skills maintenance	3927.50	195.75	20.06	1364.29	169.62	8.04	1005.46	118.85	8.46
Visit – 24-Hour facility	556.90	296.00	1.88	508.01	269.38	1.89	353.60	191.69	1.84

\* Calculated by quarter (i.e., Total Benchmark ÷ 4; Total Full Implementation ÷ 13)

\*\* For all quarters in each period



risk. As the screening tool had not yet been implemented during the benchmark period, the numbers during this time include all children. This table indicates that while capacity has not grown with need, services are being targeted toward children with a need. This is shown by the differences between the average number of services provided to children in each risk group. In nearly all cases, children with an identified risk receive more services per child than those who do not have an identified risk. The notable exception is visits to 24-hour facilities where the use of services is about the same (1.89 average hours per child with no risk versus 1.84 hours per child with an identified risk).

Cluster analysis was used to determine how children can be grouped based on the types of services they receive. Initially, hierarchical clustering was performed using Ward's method with a Euclidean distance measure. Because hierarchical clustering is computationally intensive, the hierarchical clustering was done with a random subset of 1,000 individuals from the data. After determining the appropriate number of clusters, a K-means cluster analysis using the full set of data was performed. The cluster centroids obtained from the hierarchical cluster analysis were used as

the initial seeds for the K-means clusters. Roughly, the values of the cluster centroid can be thought of as the probability that a child in that cluster has received the given service. For example, the high usage cluster obtained from K-means has a value of 0.82 for case management which would indicate that a child in the high usage cluster has about an 82 percent chance of receiving case management services.

The data used for cluster analysis included only 11 of the service categories. Laboratory and transportation services were excluded because of low relevance. The other excluded categories had very low utilization rates, with some as low as zero. The data were filtered to include only children who received services during the full implementation period.

Children were assigned cluster membership based on the results of the K-means clustering. Individuals can be categorized into a high-intensity service usage category or a low-intensity service usage category. Children in the high intensity service category tend to use more services across all 11 categories than do those in the low intensity service category. The high intensity service usage category contains 4,596 children and is slightly smaller than the low intensity service usage category which contains

**Table 6: Cluster Centroids**

	Hierarchical Cluster		K-Means Cluster	
	Low intensity	High intensity	Low intensity	High intensity
1. Assessment	0.78	0.92	0.82	0.96
2. Case management	0.00	0.63	0.11	0.82
3. Crisis services	0.42	0.47	0.44	0.57
4. Day treatment service	0.00	0.13	0.01	0.19
5. Family support	0.00	0.44	0.02	0.64
6. Group therapy	0.00	0.10	0.01	0.17
8. Individual counseling/psychotherapy	0.01	0.77	0.21	0.96
12. Medication service	0.74	0.82	0.75	0.88
13. Other medical service	0.00	0.12	0.05	0.11
19. Skills training/skills maintenance	0.01	0.34	0.09	0.43
25. Visit 24-Hour facility	0.16	0.20	0.17	0.22



5,681 children. More information on the clusters is available in Table 6.

A logistic regression was run to determine whether any demographic variables were useful in determining cluster membership. The dependent variable was cluster membership. The independent variables included age, nonwhite, sex, and three indicator variables. The three indicator variables are:

1. whether the child received DMHA services prior to their initial CHINS,
2. whether the child received OMPP services prior to their initial CHINS, and
3. whether the child has an identified risk.

The results are summarized in Table 7. Significant predictors include age, nonwhite, prior DMHA services, prior OMPP services, and being identified as having a risk. Older children are more likely to be in the high usage cluster as are those children who have prior DMHA service, those children who have prior OMPP services, and those children with an identified risk. Children who are nonwhite, however, are less likely to be in the high service usage cluster.

**Table 7: Logistic Regression Analysis—Clusters: Full Implementation Period**

	Membership in high-service intensity cluster
	B (SEE)
Constant	-1.570*** (0.048)
Age	0.129*** (0.005)
Nonwhite	-0.278*** (0.053)
Female	-0.047 (0.046)
DMHA services provided	1.058*** (0.124)
Received services paid by OMPP	1.219*** (0.064)
Risk identified in screening	0.695*** (0.052)
Chi-square ( x2 )	2,800.45***
Nagelkerke R2	0.319

\*\*\*p ≤ .001 \*\*p ≤ .01 \*p ≤ .05





## DISCUSSION

This analysis provides a descriptive profile of children who have contact with the child welfare system. There are several key findings that deserve highlighting here. First, the screening initiative has been successful in increasing the number of children who are screened for mental health problems. Second, those with an identified risk are more likely to receive treatment than those without an identified risk and the average quarterly spending is higher for those with an identified risk than for those without; an indication that resources are being directed toward those children with the greatest need.

The analyses also demonstrate that a relationship exists between mental health

and/or addiction needs and the number of removals that a child experiences. As a result, we can anticipate that because of the continuation of the screening initiative, a significantly greater portion of children who have contact with the child welfare system will be screened and that those with an identified risk will receive mental health and addiction treatment. At this point, however, it cannot be determined whether contact with the child welfare system is a result of untreated mental health/addiction needs or if these needs are a result of the contact. Further study is necessary to clarify this relationship and determine causality.



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