University of Oklahoma
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eteam

EVALUATION OF THE CARE MANAGEMENT OVERSIGHT PROJECT

June 30, 2011

Prepared By:
Geneva Strech, M. Ed., MHR
Betty Harris, M.A.
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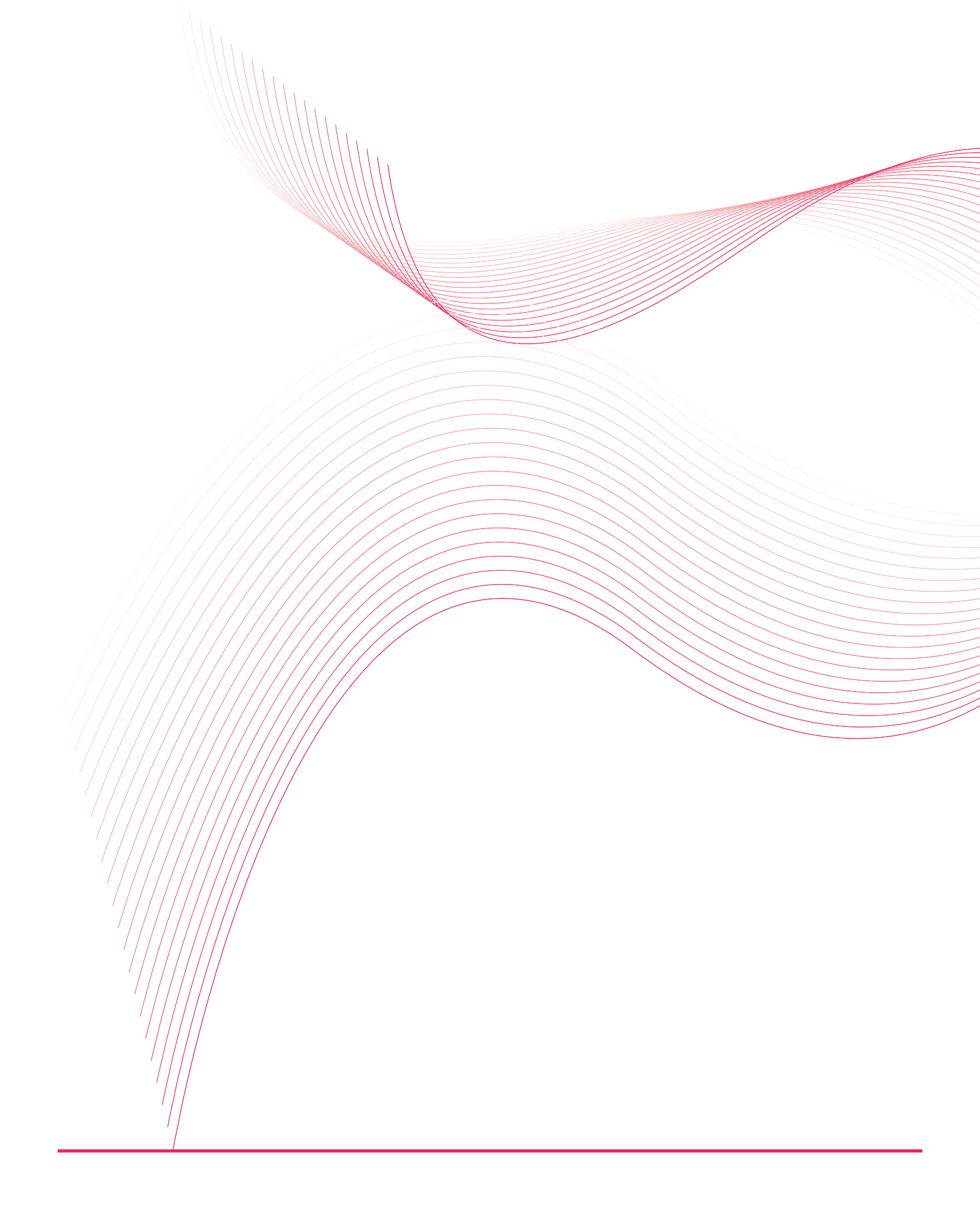

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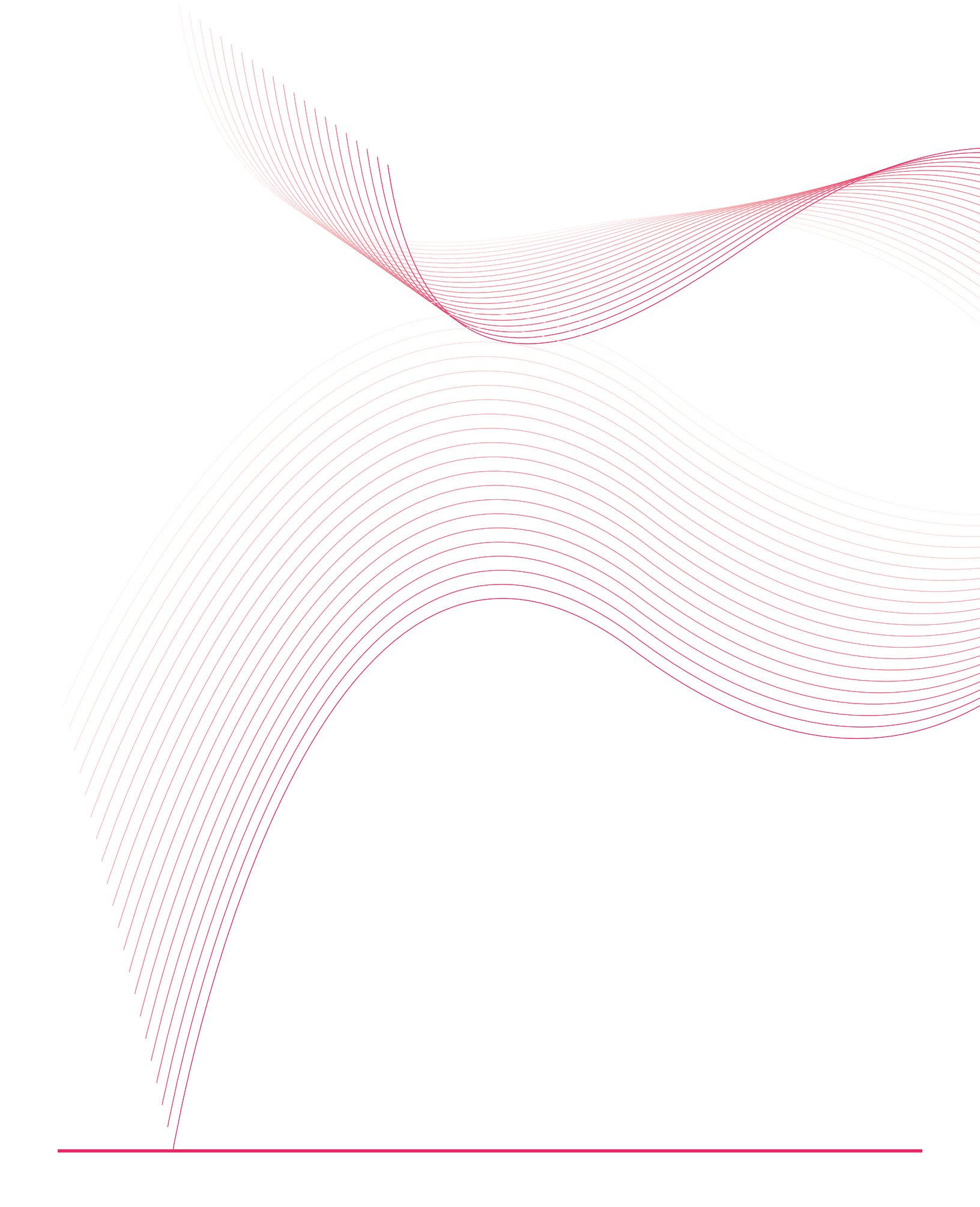

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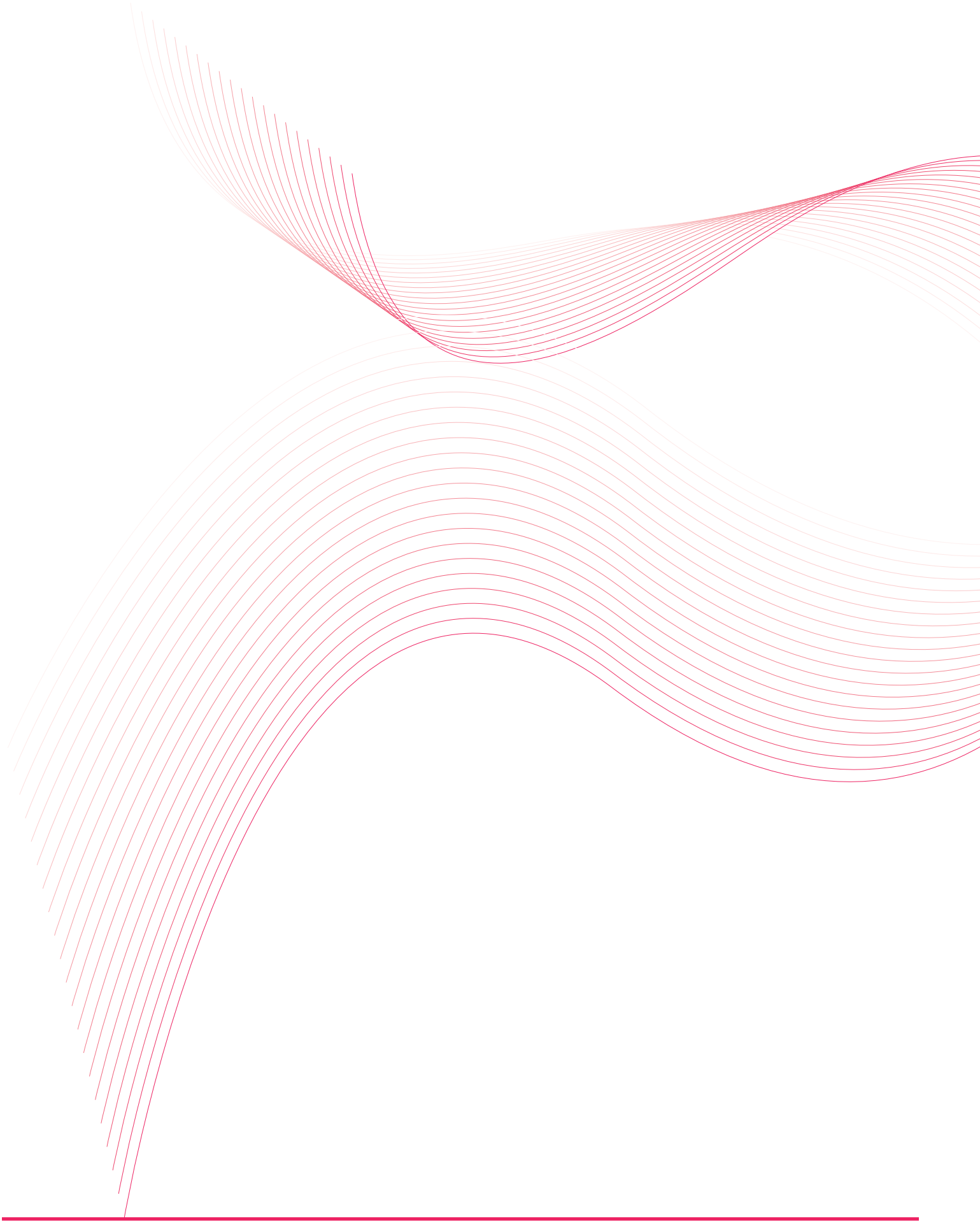

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INTRODUCTION

The Educational Training, Evaluation, Assessment, and Measurement (E-TEAM) Department at The University of Oklahoma conducted an external evaluation of the Care Management Oversight Project to assess the impact of the Care Management model on child/youth outcomes. This report summarizes evaluation findings for this study based on interviews with youth and their caregivers, Care Management services, inpatient and outpatient usage and costs, and custody.

Background

The Care Management Oversight Project was a partnership between:

- Oklahoma Department of Mental Health and Substance Abuse Services (ODMHSAS)
- Oklahoma Health Care Authority (OHCA)
- Oklahoma Department of Human Services (OK DHS)
- Oklahoma Office of Juvenile Affairs (OJA)
- Oklahoma Commission on Children and Youth (OCCY)
- Oklahoma Department of Rehabilitation Services (DRS)
- Oklahoma Federation of Families
- APS Healthcare
- E-TEAM, University of Oklahoma Outreach

This project established and tested cross agency care management oversight for children and youth with the most intense needs and their families.

Goals of Care Management Oversight Project

- Create a more integrated and seamless system of mental health and substance abuse services
- Offer children and youth with serious emotional disturbances and their families direct linkages to community-based services
- Increase usage of community-based services and the wraparound approach

Care Management Services

According to the Care Management Protocol developed by the Oklahoma Health Care Authority:

Care management is a collaborative approach to assessing, providing, coordinating and monitoring mental health services. The care manager will serve as an advocate and care coordinator for children's mental health care needs, helping families navigate the mental health care environment. Care Management includes a set of activities which assures that every person served by the treatment system has a single approved care (service) plan that is coordinated, not duplicative, and designed to assure cost effective and good outcomes.

Care Managers—all licensed counselors—oversaw a child's/youth's journey through treatment. Care Managers worked with cases of children or youth to include monthly contact with SoonerCare, DHS custody, OJA custody, and indigent children, their family and providers. Care Managers worked with providers in coordinating behavioral health services, medical services, dental services, as well as community resources. Care Managers evaluated clinical appropriateness of the medical necessity criteria at all levels of care and provided clinical support and consultation for Prior Authorization, Gatekeeping, and Psychiatric Review Services.

Once families had consented to participate in the Care Management Oversight Project, the Care Manager researched the clinical history of the child/youth to gather basic knowledge of diagnosis and treatment prior to contact with the family. The Care Manager then initiated proactive outreach telephonically to the identified member and their family to make introductions and explain the parameters of the study. At this time a Care Coordination Contact Sheet was completed to help determine the strengths and needs of the member and family.

Once the complete clinical history was obtained, the Care Manager, in conjunction with the member and family, determined the intensity and frequency of the state level care management intervention. A Care Contact Schedule was developed to address ongoing treatment needs. A minimum of one call per month for 12 months is required for the study. However, more frequent contact was made as clinically warranted. Based on the needs identified by the Care Manager, member and family, the Care Manager linked with medically necessary treatment services that included medication management, therapy, psychosocial rehabilitation, local case management, Systems of Care, medical, and inpatient services.

Care Managers provided ongoing monitoring to insure engagement and follow-thru with services and continual evaluation of the effectiveness of services. As roadblocks were identified, the Care Manager advocated for the member at all levels in the system.

A Systems of Care (SOC) referral was offered when clinically indicated and available within the family's community. If an SOC referral was warranted, the Care Manager made an outreach call to the SOC Project Director. The Project Director insured priority was given to members of the study and sent the information to the Referral Team for review and disposition. If the Care Manager identified school-related IEP issues or lost contact with a study participant, a referral was sent to the Oklahoma Federation of Families, Family Engagement Specialist (F.E.S.). The F.E.S. provided advocacy with the school system and outreached to families in the community to identify barriers and assist in the re-engagement with the Care Manager.

Care Managers worked to ensure that the child's/youth's needs were met in the least restrictive level of care and coordinated with both the inpatient and outpatient treatment systems.

- Decrease inpatient/residential days
- Decrease number of days from inpatient/residential discharge to first community-based service
- Increase community capacity to respond to crises
- Ensure continuity of care

Evaluation Study

The Care Management Oversight Project utilized a randomized control trial (RCT) experimental research design to compare outcomes for youth who received Care Management services to youth who received standard behavioral health services. RCTs are generally accepted as the most valid method for determining the efficacy of an intervention because the design reduces the likelihood of spurious causality and bias.

STUDY METHODOLOGY

Eligibility Criteria

Youth eligible to participate in the Care Management Oversight Project were SoonerCare youth who were 1) in parental custody, OJA or DHS custody, 2) between the ages of 6 and 17 and 3) predicted to have moderate to high risk of future hospitalizations (forecasted MEDai inpatient rank of 96-100). MEDai, OHCA's predictive modeling program, uses member-level claims history, enrollment and clinical data to forecast utilization and costs.

Exclusions

Youth with the following primary diagnosis were excluded from the member pool due to limited community resources. Excluded diagnoses included: Asperger's, Autistic Disorder, Rett's Disorder, Childhood Disintegrative Disorder, Pervasive Disorder NOS, Moderate Mental Retardation, Severe Mental Retardation and Profound Mental Retardation.

Recruitment

The study population included 1,943 projected moderate to high-resource utilization youth 6-17 years of age eligible for Medicaid in 70 of 77 Oklahoma counties. To minimize study costs for interviewing participants, the pool was limited to 1,092 youth in Oklahoma, Tulsa, Cleveland, Creek, Canadian, Logan, Comanche, Muskogee, and Rogers counties. Characteristics of the study population were: average age, 13.0 years; 41% female; 10.8 forecasted inpatient days; forecasted inpatient (IP) rank 97.9, cumulative IP length of stay (LOS) 86.2, acute impact 85.9, chronic impact 51.0, projected mental health costs $37,634, and projected total costs $39,502.

Recruitment occurred between December 2008 and December 2009. A letter describing the study was mailed to the legal guardian of each eligible youth with instructions to either call the evaluation team or return a postage paid envelope if they were interested in participating in the study. The first recruitment mailing occurred in November 2008 to 300 caregivers in the selected counties with highest projected youth resource utilization. The second mailing occurred in January 2009 to the remaining 792 caregivers in the selected counties. As interested caregivers contacted the evaluation team, the study was discussed, any questions were answered and if the caregiver still wanted to participate, an in-person interview was scheduled. Youth whose guardians agreed to participate were randomly assigned to the treatment group who received Care Management (N=87) or the Control Group who did not receive Care Management (N=90). Fourteen participants entered the study in December 2008, 81 entered between January and April 2009, 70 entered between May and August 2009, and 12 entered the study between September and December 2009.

Data Collection

Caregivers and youth were interviewed in-person at baseline and by phone at 6 months and again at 12 months. If the participating

youth was under the age of 11 the guardian/ caregiver was interviewed for the study. If the participating youth was over 11 years of age, both the youth and the youth's caregiver were interviewed for the study. If the youth was in the custody of their parents, parents were identified as caregivers and were interviewed. If the youth was in state custody, the youth's DHS and/or OJA worker was responsible for granting permission for the youth to participate in the study and identified the caregiver to be interviewed. Caregivers interviewed for custody youth included DHS caseworkers, foster parents, therapists, and group home staff.

Measures

Instruments used for the youth and caregiver interviews were the Ohio Scales which assess caregiver and youth perceptions of problems and functioning and the Adolescent Resiliency Attitude Scale (ARAS). Person-level de-identified data obtained for the time period between January 1, 2007 and December 31, 2010 included: care management service hours, inpatient (IP)and outpatient (OP) claims, Medicaid eligibility, and custody (OK DHS and/or OJA). Each record was identified by a generated ID number which was used to link the data to data collected from participants. In the IP and OP claims data, each claim could include charges and Length of Stay (LOS) for more than one month. For data analysis it was necessary to aggregate the claims data by month. Claims that covered more than one month were split, so that each claim reflected the charges that occurred during that month. For example, if a claim covered the period of March 30th to April 2nd, it was split into two claims, one reflecting LOS and charges for March 30th and 31st and the second claim reflecting LOS and charges for April 1st and 2nd. To create the data for analysis, all data were aggregated to the one month level. Given that participants entered the study over the course of a year, the next step was to aggregate the data into three month intervals based on the Care Management start date of each participant. Part of this process included using eligibility data to ensure that months where there were no claims were not the result of lack of eligibility. If the youth was not eligible for Medicaid services for two or three of the three months in any time period, that time period was coded as missing. If the youth was not eligible for Medicaid services for one of the three months in any time period, the total for that time period was adjusted up to reflect three months of services. No adjustment was performed if the youth was eligible for Medicaid services for the entire three month period.

Controlling Potential Confounds

APS Healthcare, Inc. was contracted by OHCA beginning in January 2009 to provide case management services for Medicaid youth in the state of Oklahoma (the Chronic Care Improvement Program). A list of study participants was sent to APS to ensure that APS did not perform case management for study participants.

RESULTS

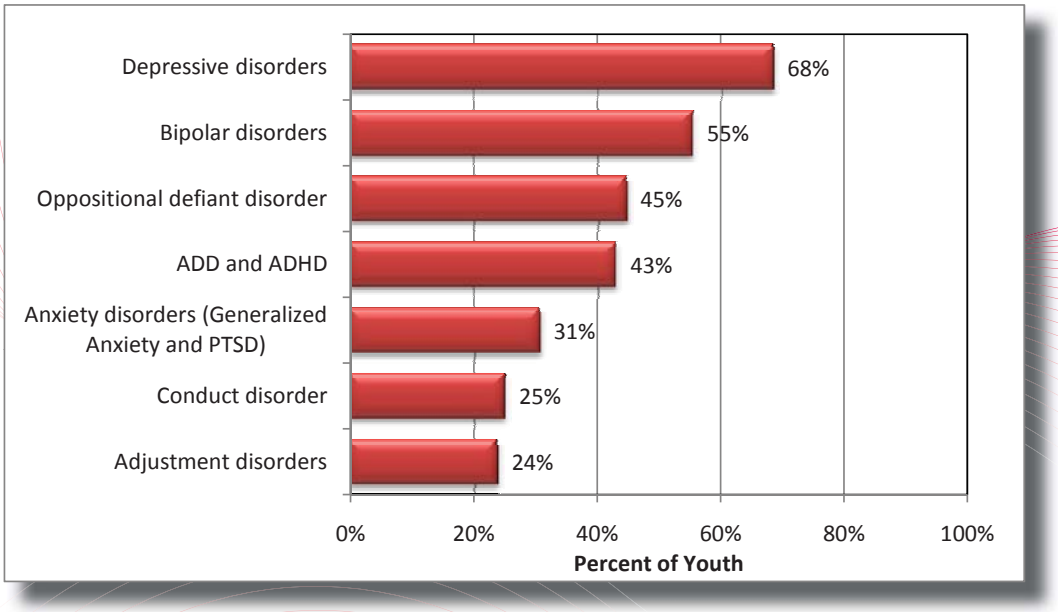
Participant Demographics

Youth who participated in the study were a year younger (13.2 vs. 12.1 years old) than the population and were less likely to be female (42.6% vs. 29.7%) ($p < .05$). MEDai predictions were higher for participating youth for cumulative IP LOS (82.3 vs. 110.8 days), acute Impact (85.6 vs. 87.7), mental health costs ($36,552 vs. $44,174) and total costs ($38,464 vs. $45,777) as compared to eligible youth who did not participate in the study ($p < .05$). There were no differences between youth who participated and those who did not on forecasted Inpatient Days (10.8 vs. 11.0), forecasted IP rank (97.9 vs. 97.8) or on chronic impact (51.4 vs. 48.4). There were no statistically significant differences between the treatment group and the Control Group on age (average age= 14.8), gender (70% male/30% female), or race/ethnicity ($p > .05$). Approximately two thirds of participating youth were white (68%), 28% were African American, 22% were American Indian, 13% were Latino, and 1% were Native Hawaiian or Pacific Islander. Twenty-one percent of participating youth were multi-racial. Care Manage-

ment youth did not differ from Control Group youth on whether they were in custody or not in the 12 months prior to or in the 12 months during the study.

The Health Care Cost and Utilization Project, Clinical Classification System (CCS) was used to group principal diagnoses for both inpatient and outpatient behavioral health claims that had a valid diagnosis during the two year study time period. Control Group youth had on average 2.7 diagnoses (range 1 to 8 diagnoses per youth) in the 12 month period prior to the care management study and had 2.5 diagnoses (range 1 to 9 diagnoses per youth) in the 12 month period during the Care Management study. Care Management youth had on average 2.8 diagnoses (range 1 to 6 diagnoses per youth) in the 12 month period prior to the care management study and had 2.7 diagnoses (range 1 to 7 diagnoses per youth) in the 12 month period during the Care Management study. Across the 24 month study period, the most common diagnoses were depressive disorders, bipolar disorders and oppositional defiant disorders (see Figure 1).

Figure 1. Percent of Youth by CCS Diagnosis Groups

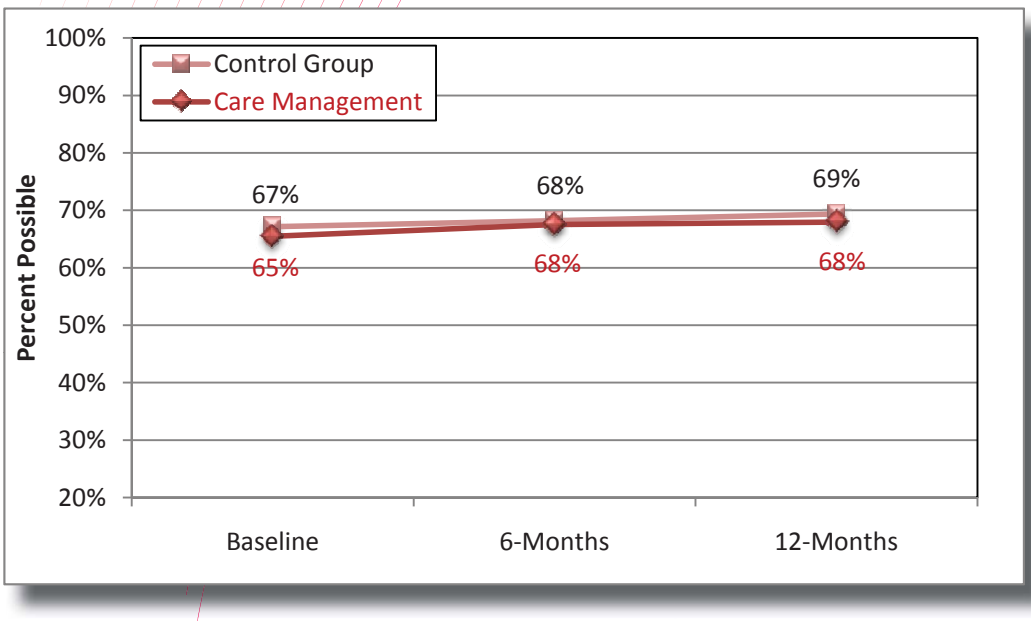


Interview Measures

Adolescent Resiliency Attitude Scale

Youth participating in the study completed the Adolescent Resiliency Attitude Scale (ARAS). The Resiliency Attitudes Scale (R.A.S.) was developed to assess resiliencies within eight domains: Insight, Independence, Relationships, Initiative, Creativity and Humor, Morality and General Resiliency. Fifty-five of the 58 Care Management youth age 11 and older and 46 of the 51 Control Group youth age 11 and older completed the ARAS at all three interviews (see Figure 2). ARAS scores increased slightly over time (p = .01). There were no statistically significant differences in ARAS scores between the two groups over time (p = .73).

Figure 2. Adolescent Resiliency Attitude Scores by Group and Time



Ohio Scales

The Ohio Scales were administered to participants at baseline, 6-month and 12-month interviews. Sixty-five of 68 Care Management caregivers and 56 of 58 Control Group caregivers completed the Ohio Scales at all three time periods. Caregiver ratings of how often 20 problem behaviors occurred during the last 30 days were used to categorize youth as impaired or not impaired (see Figure 3). At baseline, approximately 56% of youth were classified as impaired. The percentage of youth who were impaired increased over time for the Control Group youth and decreased over time for the Care Management group youth (p = .02).

The Ohio Scales also includes questions regarding satisfaction with aspects of mental health care. Caregivers were asked: "How satisfied are you with the mental health services your child has received so far?" (see Figure 4). At baseline, 69% of Control Group caregivers were satisfied with mental health services. Satisfaction levels of caregivers in the Control Group increased slightly and remained stable over time. Satisfaction levels of caregivers in the Care Management group were initially lower than the Control Group caregivers and increased over time from 58.8% of Care Management caregivers satisfied at baseline to over 90% of Care Management caregivers satisfied at the 12-month interview (p = .03).

Figure 3. Caregiver Perception of Youth Impairment by Group and Time

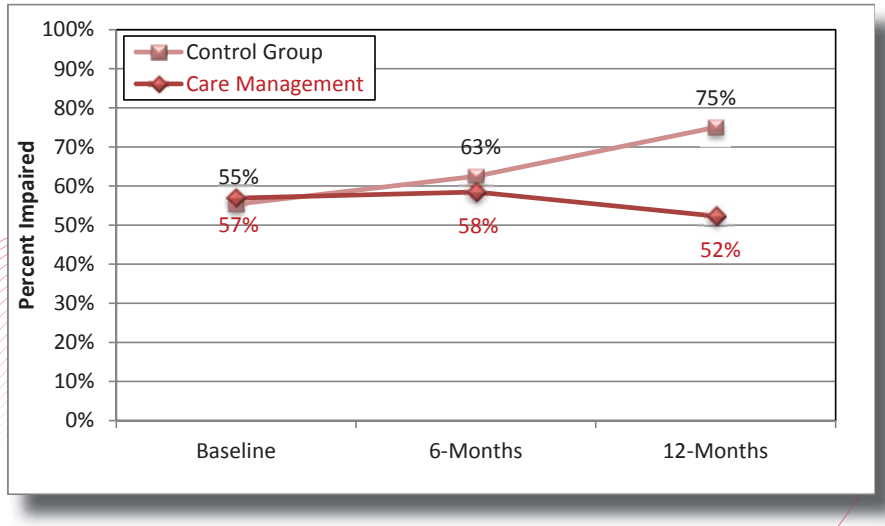


Figure 4. Caregiver Satisfaction with Mental Health Services by Group and Time

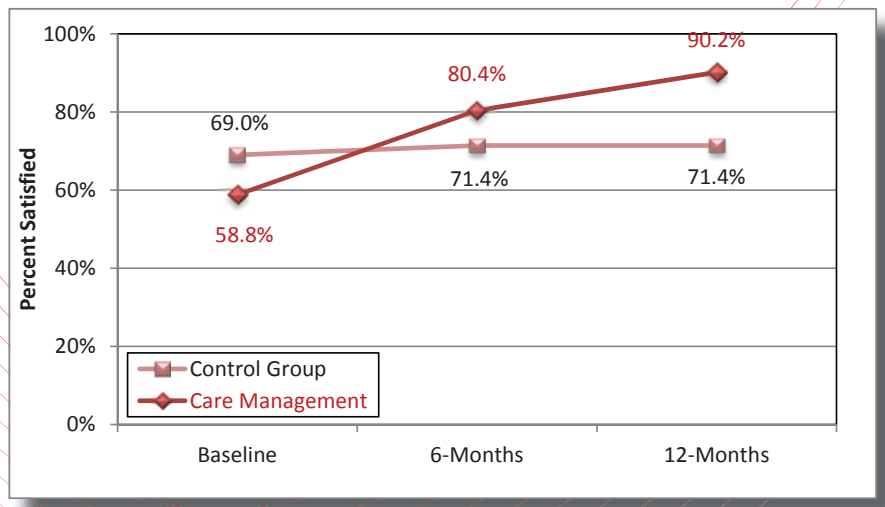
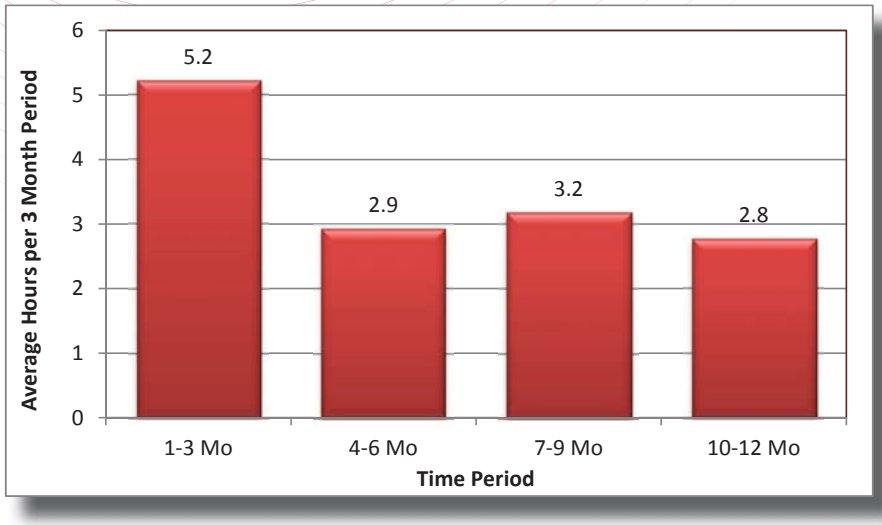


Figure 5. Average Care Management Hours per Participant by Time Period



Care Management

Care Management Time (direct service to study participants and advocacy time) is presented in Figure 5. Care Managers spent the most time during months one through three (5.2 hours) followed by approximately three hours per three month time period for the remainder of the year. This means that Care Managers spent on average 1.7 hours per month per youth during the first three months and then spent one hour per youth for the remaining nine months of the year.

Healthcare Utilization and Cost Outcomes

Total Behavioral Health and Medical Charges

Entry into the study was staggered with participants entering the study from December 2008 through December 2009. Outcome data were aggregated based on study entry month for each participant into three-month time periods and then rolled up into one year prior to the start of Care Management and one year after the start of Care Management. This allowed us to minimize missing data due to gaps in Medicaid eligibility. Complete Medicaid Inpatient and Outpatient claims data are available for 94% (82 of 87) of Care Management treatment youth and 84% (76 of 90) of Control Group youth across the entire 2-year time period.

Figure 6. Total Inpatient and Outpatient Charges Before and During Care Management, All Participants

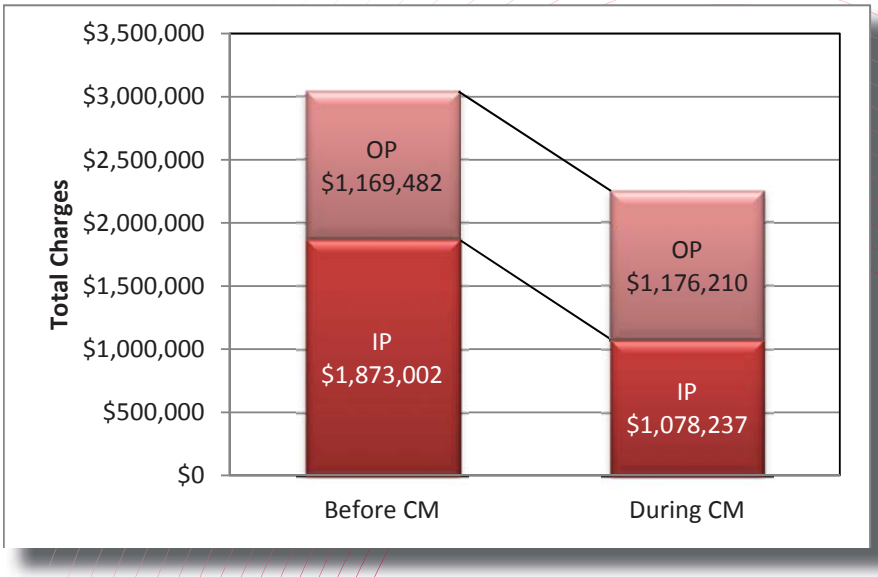
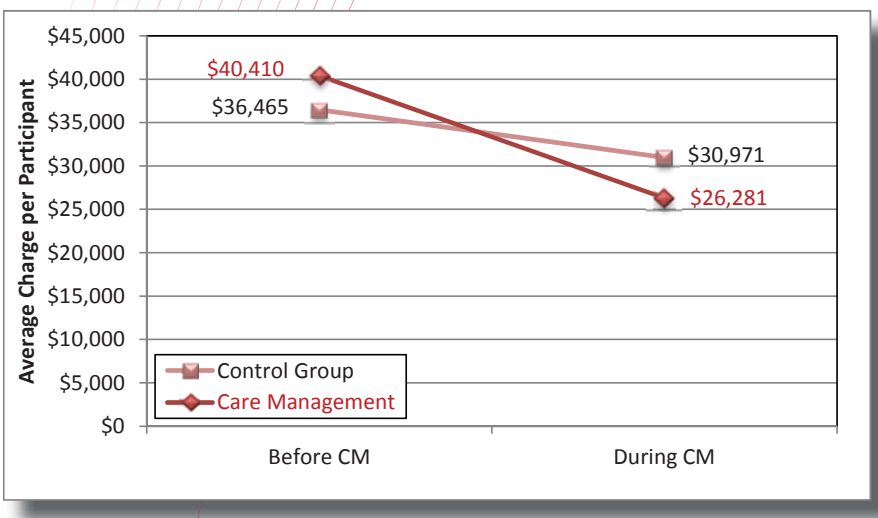


Figure 7. Average Total Inpatient and Outpatient Charges by Group and Time Period



Gaps in eligibility and youth who entered near the end of the project resulted in loss of some participants from the claims analyses. To determine whether the loss of participants from the analysis differentially affected the composition of the two groups, the Care Management and Control Groups consisting only of youth who had complete data for the claims analyses were compared on demographics (age, gender, and race/ethnicity). No statistically significant differences between the groups were found ($p > .05$).

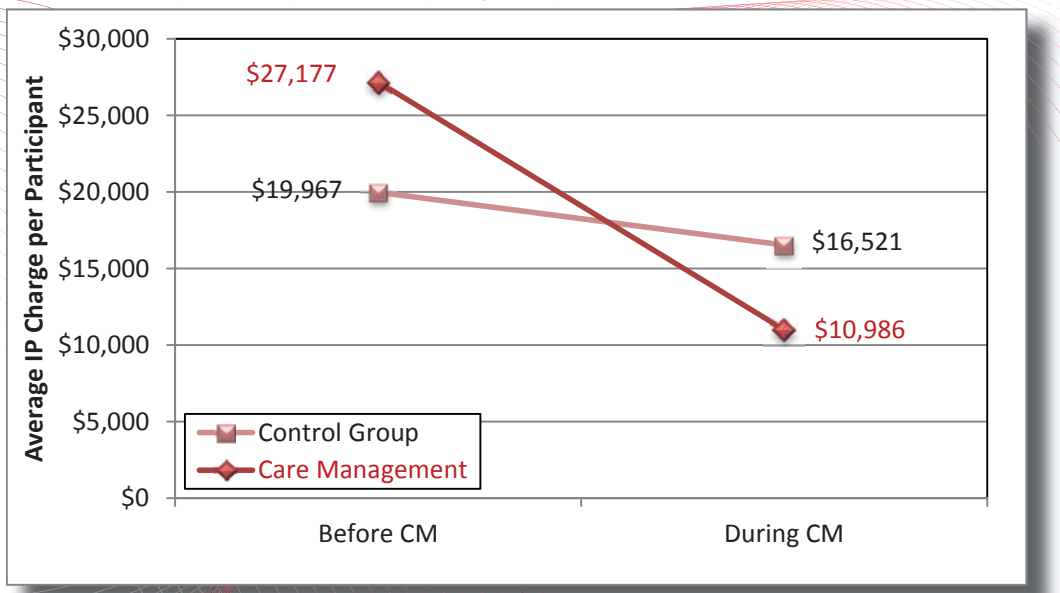
Total charges decreased for the 12 month time period from $3,042,484 in the year prior to Care Management to $2,254,447 during the year of Care Management (see Figure 6). This drop was due to a 41% decrease in inpatient charges ($1,873,002 vs. $1,078,237). Outpatient charges increased by 1% ($1,169,482 vs. $1,176,210). The majority of inpatient charges for the 12 months prior to Care Management and the 12 months during Care Management were for behavioral health hospitalizations (99%).

Total average charges by group for the 12 months prior to the start of Care Management and the 12 months after the start of Care Management are presented in Figure 7. Total charges dropped significantly for both groups over time ($p < .01$). Youth in the Care Management group averaged $40,410 in average total charges in the year before Care Management and $26,281 in the year during Care Management. Youth in the Control Group averaged $36,465 in average total charges in the year before Care Management and $30,971 in the year during Care Management. There was a trend toward a greater reduction in average charges for the Care Management Group over time (35% vs. 15%); however, this trend did not reach statistical significance ($p = .06$).

Inpatient Charges

Total average inpatient charges by group for the 12 months prior to the start of Care Management and the 12 months after the start of Care Management are presented in Figure 8. Youth in the Care Management group averaged $27,177 in average inpatient charges in the year before Care Management and $10,986 in the year during Care Management. Youth in the Control Group averaged $19,967 in average inpatient charges in the year before Care Management and $16,521 in the year during Care Management. There was a 60% reduction in average inpatient charges for the Care Management group (-$16,191) over time compared to a 17% reduction for the Control Group (-$3,446) ($p$ = .02).

Figure 8. Average Total Inpatient Charges by Group and Time Period

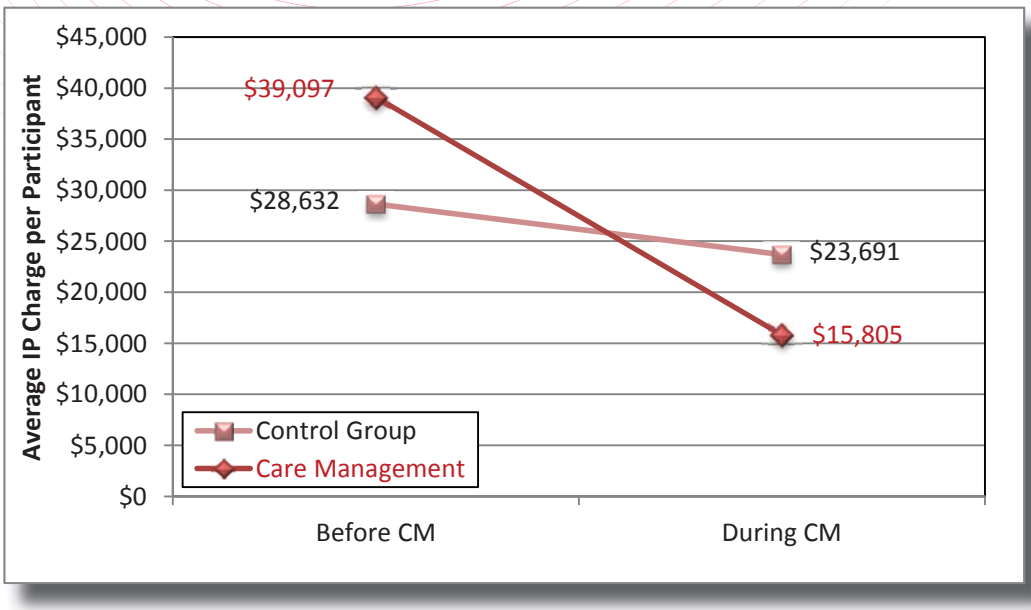


Looking at just youth who were hospitalized at any time during the two year study period, the pattern is the same (see Figure 9). Youth in the Care Management group averaged $39,097 in average inpatient charges in the year before Care Management and $15,805 in the year during Care Management. Youth in the Control Group averaged $28,632 in average inpatient charges in the year before Care Management and $23,691 in the year during Care Management. There was a 60% reduction in average inpatient charges for the Care Management Group (-$23,292) over time compared to a 17% reduction for the Control Group (-$4,942) ($p$ = .02).

Inpatient Charges by Youth Custody

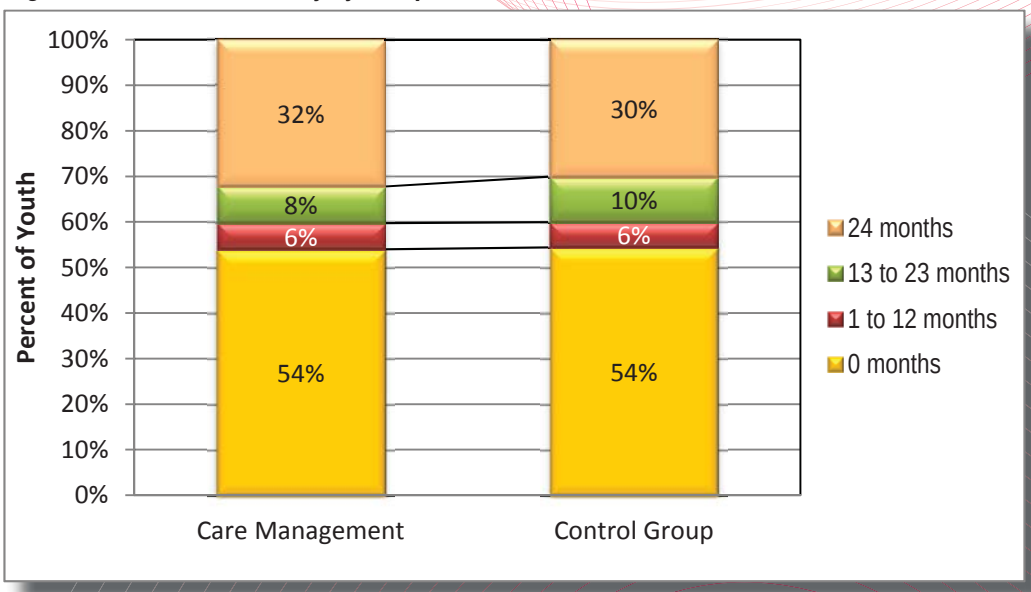
To determine if Care Management produced similar results for youth in state custody compared to youth not in custody, we compared the two. A youth was considered to be in custody if they were in custody at least one month during the study.

Figure 9. Average Total Inpatient Charges by Group and Time Period - Only Youth who were Hospitalized during the Study



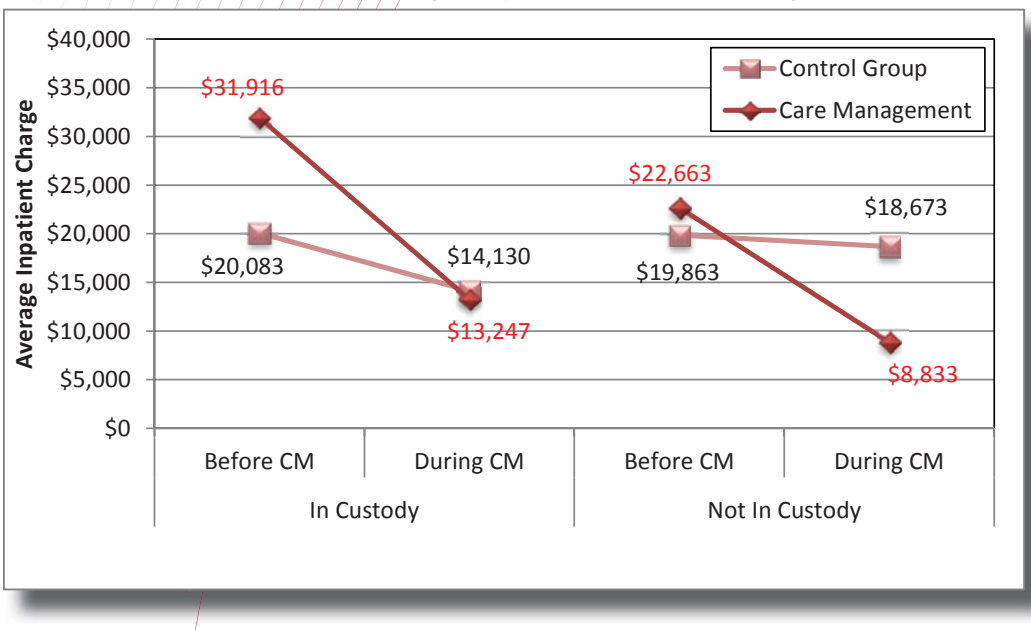
The distribution of custody was similar between the two groups (see Figure 10). Over half of both groups were not in custody during the study (54%). Approximately one third of youth were in custody for the entire two year study period, another 8 to 10% were in custody 13 to 23 months, and another 6% were only in custody for 1 to 12 months during the study. Of the youth in the custody group 88% were in custody for at least 13 months.

Figure 10. Months of Custody by Group



Total average inpatient charges by group for the 12 months prior to the start of Care Management and the 12 months after the start of Care management by Custody Group are presented in Figure 11.

Figure 11. Average Inpatient Charges by Group, Time Period and Custody Status



Youth who were in custody: Youth in the Care Management group averaged $31,916 in average inpatient charges in the year before Care Management and $13,247 in the year during Care Management. Youth in the Control Group averaged $20,083 in average inpatient charges in the year before Care Management and $14,130 in the year during Care Management. There was a 58% reduction in average inpatient charges for the Care Management Group (-$18,669) over time compared to a 30% reduction for the Control Group (-$5,953).

Youth who were not in custody: Youth in the Care Management Group averaged $22,663 in average inpatient charges in the year before Care Management and $8,833 in the year during Care Management. Youth in the Control Group averaged $19,863 in average inpatient charges in the year before Care Management and $18,673 in the year during Care Management. There was a 61% reduction in average inpatient charges for the Care Management group (-$13,830) over time compared to a 6% reduction for the Control Group (-$1,190).

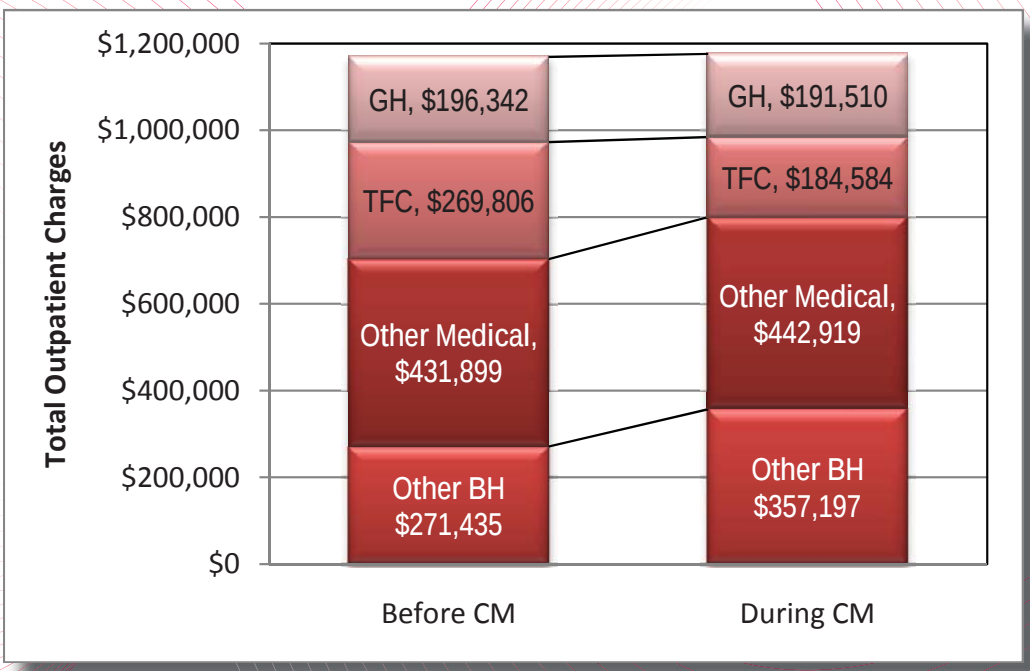
The Group by Custody by Time interaction was not statistically significant (p = .99). This indicates the decrease in inpatient charges was not different for youth in custody compared to youth not in custody. The Group by Time

interaction was statistically significant (p = .04) which means there was a larger decrease in inpatient charges for the Care Management Group than for the Control Group.

Outpatient Charges

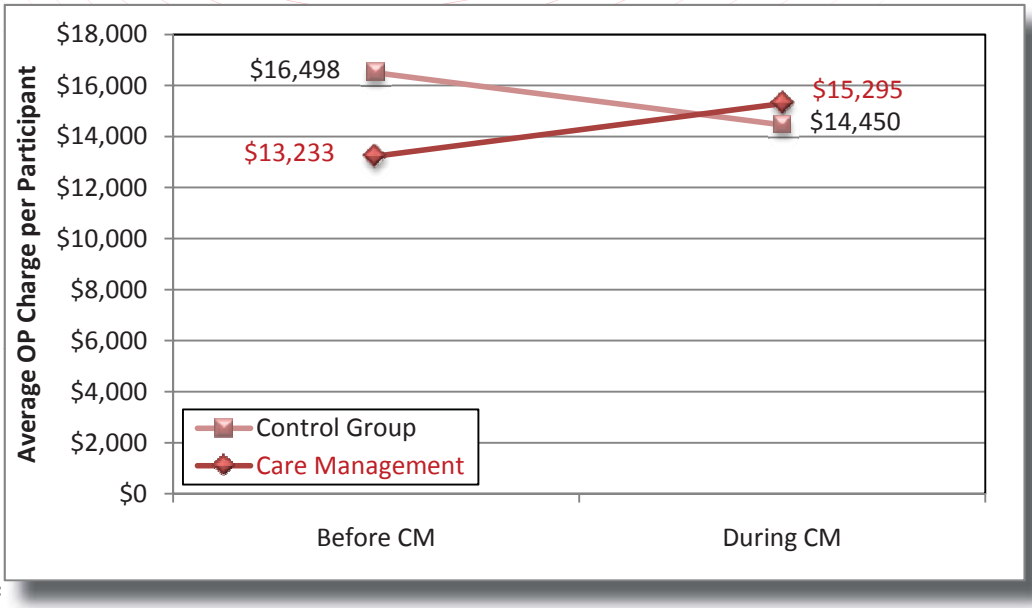
Total outpatient charges by type of charge and time period are displayed in Figure 12. During the year prior to Care Management, Outpatient Group Home charges were 17% of total outpatient charges ($196,342), Therapeutic Foster Care charges were 23%of total outpatient charges ($269,806), other outpatient medical charges were 37% of total outpatient charges ($431,899) and other outpatient behavioral health charges were 23% of total outpatient charges ($271,435). During the year of Care Management, Outpatient Group Home charges were 16% of total outpatient charges ($191,510), Therapeutic Foster Care charges were 16% of total outpatient charges ($184,584), other outpatient medical charges were 38% of total outpatient charges ($442,919), and other outpatient behavioral health charges were 30% of total outpatient charges ($357,197). Between the two time periods, total Outpatient Group Home charges decreased by 2% (-$4,831), Therapeutic Foster Care charges decreased by 32% (-$85,223), other outpatient medical charges increased by 3% ($11,020) and other outpatient behavioral health charges increased by 32% ($85,762).

Figure 12. Total Outpatient Charges, by Type and Time Period, All Participants



Total average outpatient charges by group for the 12 months prior to the start of Care Management and the 12 months after the start of Care Management are presented in Figure 13. Youth in the Care Management Group averaged $13,233 in average outpatient charges in the year before Care Management and $15,295 in the year during Care Management. Youth in the Control Group averaged $16,498 in average outpatient charges in the year before Care Management and $14,450 in the year during Care Management. There was a 16% increase in average

Figure 13. Average Total Outpatient Charges by Group and Time Period

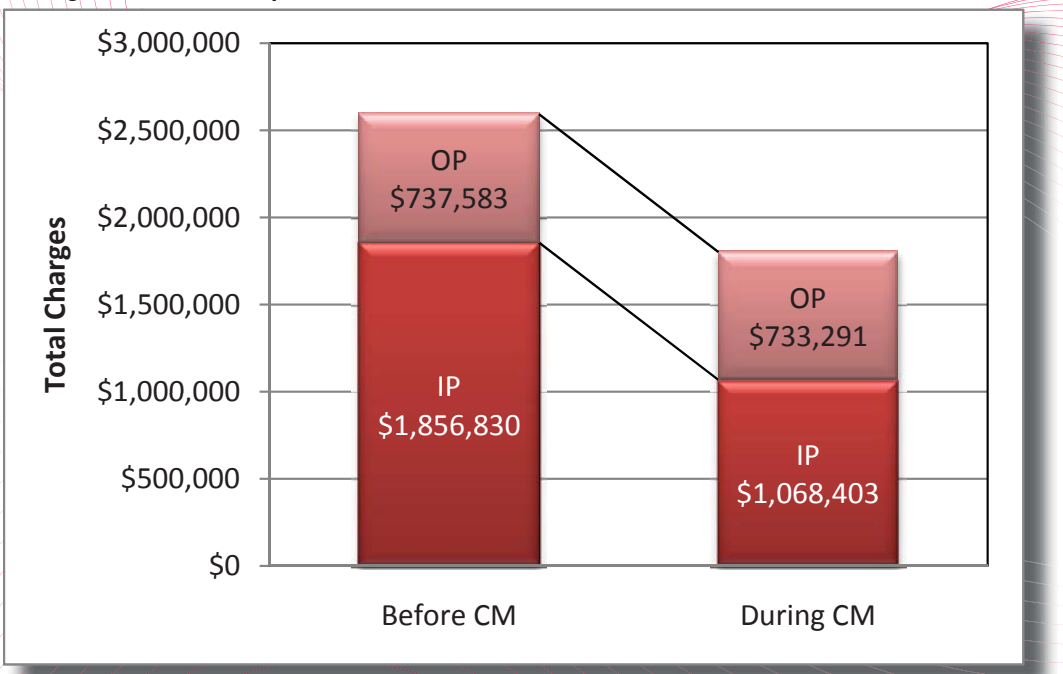


outpatient charges for the Care Management Group ($2,062) over time compared to the Control Group whose total average outpatient charges decreased by 12% (-$2,048) ($p$ = .01).

Total Behavioral Health Charges

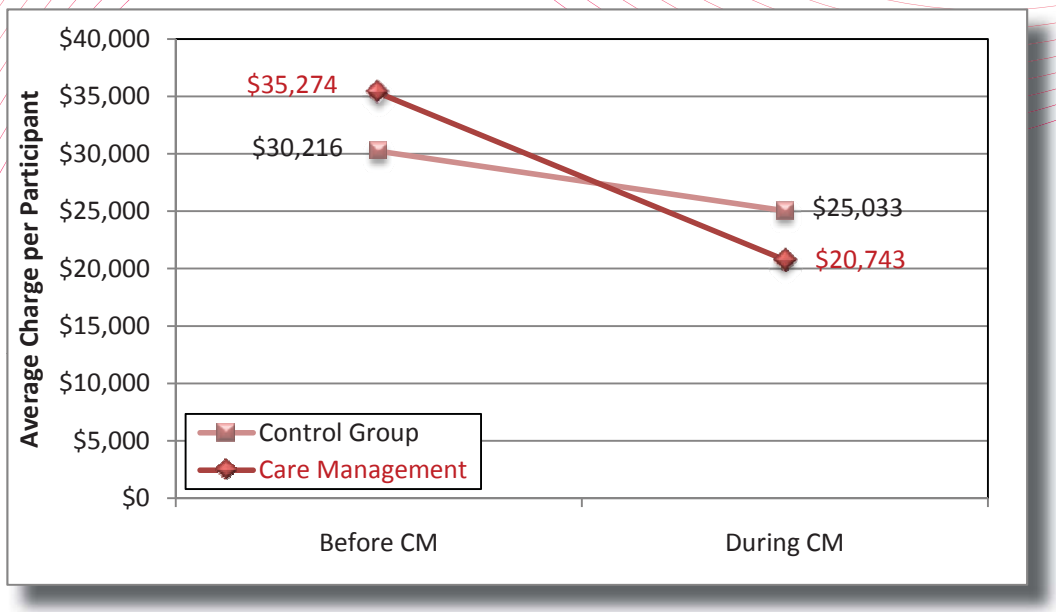
Total behavioral health charges decreased for the 12 month time period from $2,594,412 in the year prior to Care Management to $1,801,694 during the year of Care Management (see Figure 14). This was primarily due to a 42% decrease in inpatient charges ($1,856,830 vs. $1,068,403). Outpatient behavioral health charges decreased by 1% ($737,583 vs. $733,291).

Figure 14. Total Inpatient and Outpatient Behavioral Health Charges Before and During Care Management, All Participants



Total average charges by group for the 12 months prior to the start of Care Management and the 12 months after the start of Care Management are presented in Figure 15. Total charges dropped significantly for both groups over time (p< .01). Youth in the Care Management group averaged $35,274 in average total charges in the year before Care Management and $20,743 in the year during Care Management. Youth in the Control Group averaged $30,216 in average total charges in the year before Care Management and $25,033 in the year during Care Management. There was a significantly greater reduction in average total inpatient and outpatient behavioral health charges for the Care Management Group over time (41% vs. 17%) (p = .05).

Figure 15. Average Total Inpatient and Outpatient Behavioral Health Charges by Group and Time Period



Inpatient Behavioral Health Charges

Total average inpatient behavioral health charges by group for the 12 months prior to the start of Care Management and the 12 months after the start of Care Management are presented in Figure 16. Youth in the Care Management group averaged $26,991 in average inpatient charges in the year before Care Management and $10,896 in the year during Care Management. Youth in the Control Group averaged $19,742 in average inpatient charges in the year before Care Management and $16,360 in the year during Care Management. There was a significantly greater reduction in average inpatient behavioral health charges for the Care Management Group over time (60% vs. 17%) (p = .02).

Figure 16. Average Total Inpatient Behavioral Health Charges by Group and Time Period

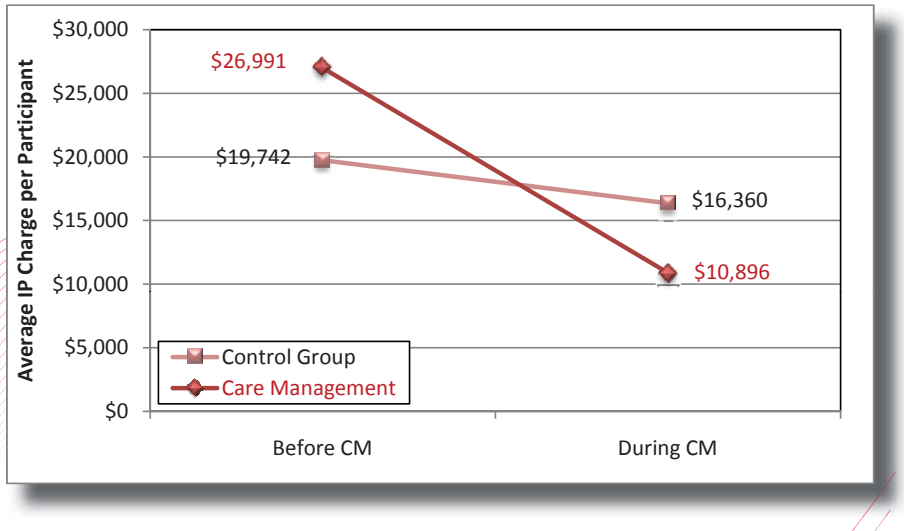
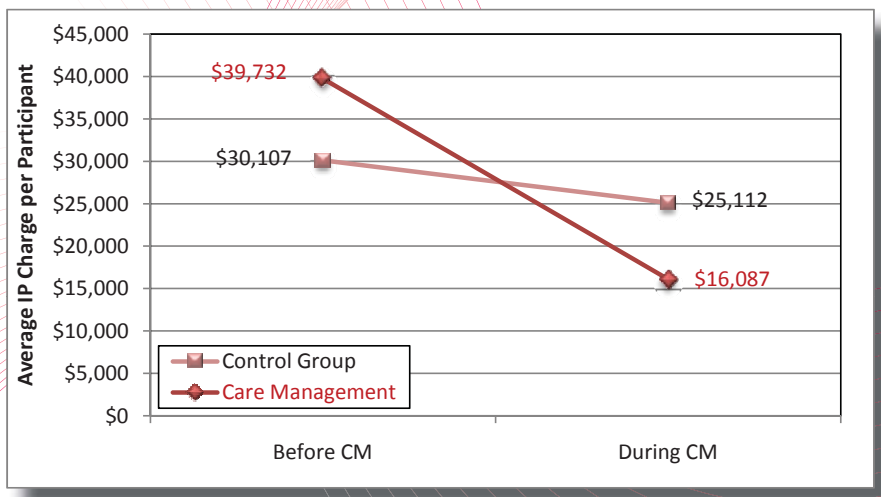


Figure 17. Average Total Inpatient Behavioral Health Charges by Group and Time Period - Only Youth who were Hospitalized during the Study



Looking at just youth who were hospitalized at any time during the two year study period, the pattern is the same (see Figure 17). Youth in the Care Management group averaged $39,732 in average inpatient behavioral health charges in the year before Care Management and $16,087 in the year during Care Management. Youth in the Control Group averaged $30,107 in average inpatient behavioral health charges in the year before Care Management and $25,112 in the year during Care Management. There was a 60% reduction in average inpatient behavioral health charges for the Care Management Group (-$23,645) over time compared to a 17% reduction for the Control Group (-$4,995) ($p$ = .02).

Behavioral Health Inpatient Length of Hospitalization by Group

Total average inpatient behavioral health length of stay (LOS) by group for the 12 months prior to the start of Care Management and the 12 months after the start of Care Management are presented in Figure 18. Youth in the Care Management

Figure 18. Average Inpatient Behavioral Health LOS by Group and Time Period

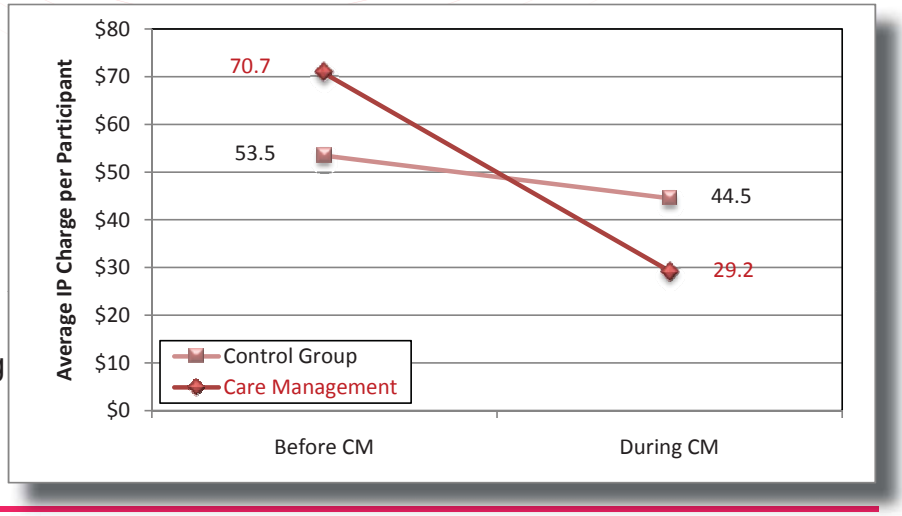
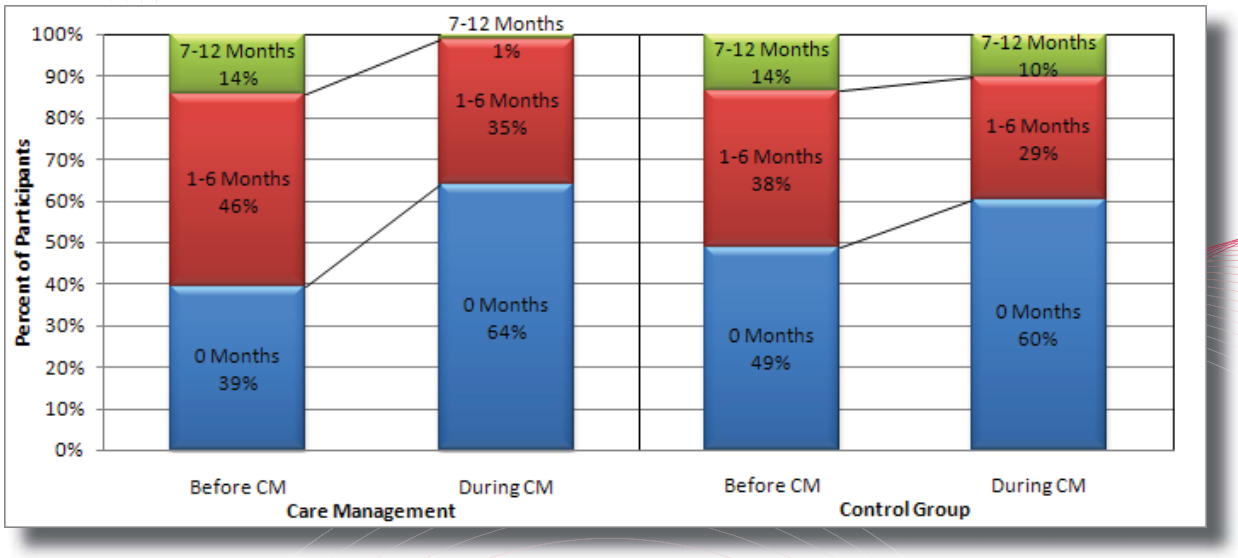


Figure 19. Percent of Youth Hospitalized by LOS, Group and Time Period, Behavioral Health Hospitalizations



Group averaged 70.5 behavioral health inpatient days in the year before Care Management and 29.2 days in the year during Care Management. Youth in the Control Group averaged 53.3 behavioral health inpatient days in the year before Care Management and 44.4 days in the year during Care Management. There was a significantly greater reduction in average behavioral health inpatient days for the Care Management Group over time (59% vs. 17%) (p = .02).The proportion of Care Management youth who were not hospitalized increased from 39% in the 12 months prior to Care Management to 64% during the 12 months of Care Management (see Figure 19). The proportion of Care Management youth hospitalized for one month to six months decreased from 46% prior to Care Management to 35% during Care Management.

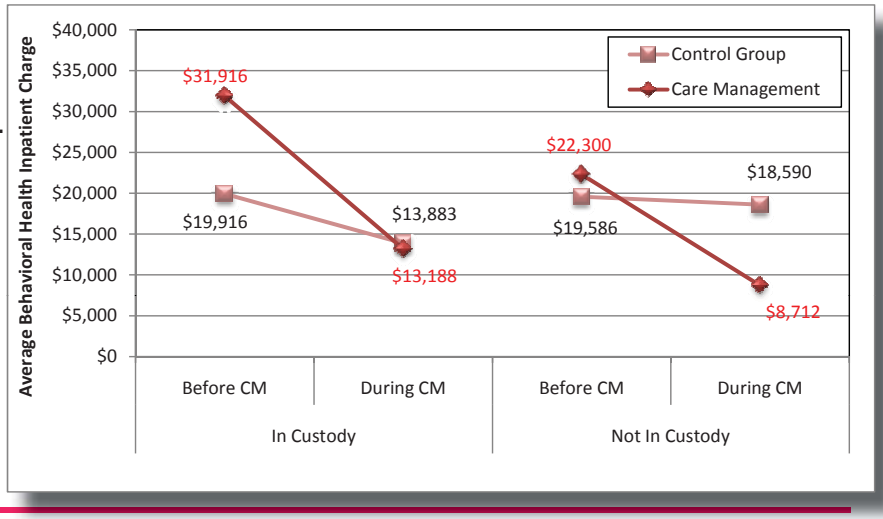
The proportion of Care Management youth hospitalized for seven to 12 months decreased from 14% prior to Care Management to 1% during Care Management. The proportion of Control Group youth who were not hospitalized increased from 49% in the 12 months prior to Care Management to 60% during the 12 months of Care Management. The proportion of Control Group youth hospitalized for one month to six months decreased from 38% prior to Care Management to 29% during Care Management. The proportion of Control Group youth hospitalized for seven to 12 months decreased from 14% prior to Care Management to 10% during Care Management.

Inpatient Behavioral Health Charges by Youth Custody

To determine if Care Management produced similar results for youth in custody compared to youth not in custody, we compared the two. A youth was considered to be in custody if they were in custody at least one month during the study.

Total average behavioral health inpatient charges by group for the 12 months prior to the start of Care Management and the 12 months after the start of Care management by Custody Group are presented in Figure 20.

Figure 20. Average Behavioral Health Inpatient Charges by Group, Time Period and Custody Status



Youth who were in custody: Youth in the Care Management Group averaged $31,916 in average inpatient charges in the year before Care Management and $13,188 in the year during Care Management. Youth in the Control Group averaged $19,916 in average inpatient charges in the year before Care Management and $13,883 in the year during Care Management. There was a 59% reduction in average inpatient charges for the Care Management group (-$18,727) over time compared to a 30% reduction for the Control Group (-$6,033).

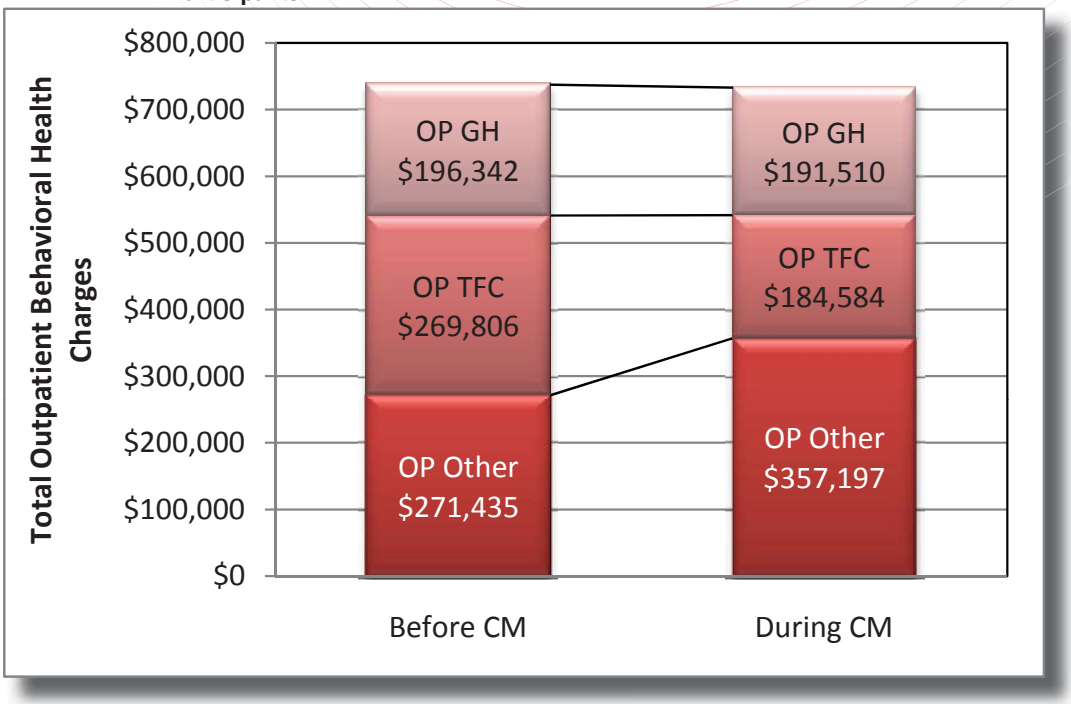
Youth who were not in custody: Youth in the Care Management Group averaged $22,300 in average inpatient charges in the year before Care Management and $8,712 in the year during Care Management. Youth in the Control Group averaged $19,586 in average inpatient charges in the year before Care Management and $18,590 in the year during Care Management. There was a 61% reduction in average inpatient charges for the Care Management Group (-$13,588) over time compared to a 5% reduction for the Control Group (-$997).

The Group by Custody by Time interaction was not statistically significant (p = .99). This indicates the decrease in inpatient behavioral health charges was not different for youth in custody compared to youth not in custody. The Group by Time interaction was statistically significant (p = .02) which means there was a larger decrease in inpatient charges for the Care Management Group than for the Control Group.

Outpatient Behavioral Health Charges

Total outpatient behavioral health charges by type of charge and time period are displayed in Figure 21. During the year prior to Care Management, Outpatient Group Home charges were 27% of total behavioral health outpatient charges ($196,342), Therapeutic Foster Care charges were 37% of total behavioral health outpatient charges ($269,806), and other outpatient charges were 37% of total behavioral health outpatient charges ($271,435). During the year of Care Management, Outpatient Group Home charges were 26% of total behavioral health outpatient charges ($191,510), Therapeutic Foster Care charges were 25% of total behavioral health outpatient charges ($184,584), and other outpatient charges were 49% of total behavioral health outpatient charges ($357,197). Between the two time periods, total Outpatient Group Home charges decreased by 2% (-$4,831), Therapeutic Foster Care charges decreased by 32% (-$85,223)

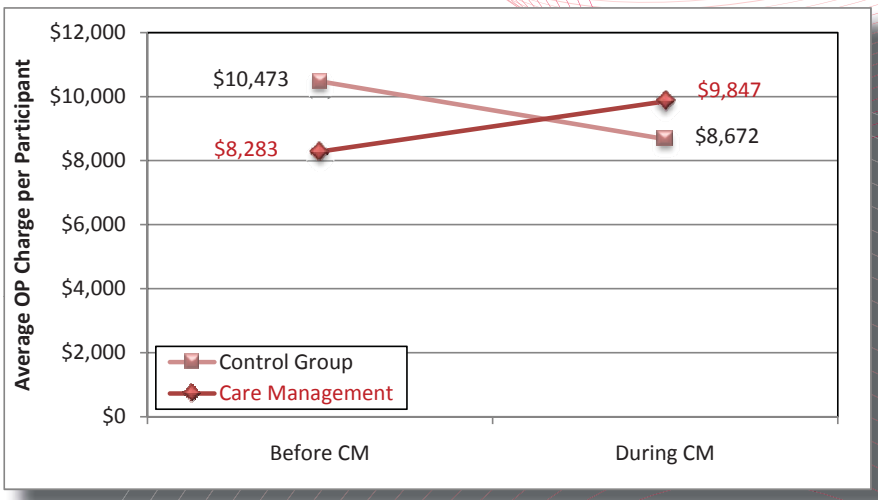
Figure 21. Total Outpatient Behavioral Health Charges, by Type and Time Period, All Participants



and other outpatient behavioral health charges increased by 32% ($85,762).

Total average behavioral health outpatient charges by group for the 12 months prior to the start of Care Management and the 12 months after the start of Care Management are presented in Figure 22. Youth in the Care Management group averaged $8,283 in average outpatient behavioral health charges in the year before Care Management and $9,847 in the year during Care Management. Youth in the Control Group averaged $10,473 in average outpatient behavioral health charges in the year before Care Management and $8,672 in the year during Care Management. There was a 19% increase in average outpatient behavioral health charges for the Care Management group ($1,564) over time compared to the Control Group whose total average outpatient behavioral health charges decreased by 17% (-$1,801) ($p$ = .01).

Figure 22. Average Total Outpatient Behavioral Health Charges by Group and Time Period



Outpatient Follow-up Care

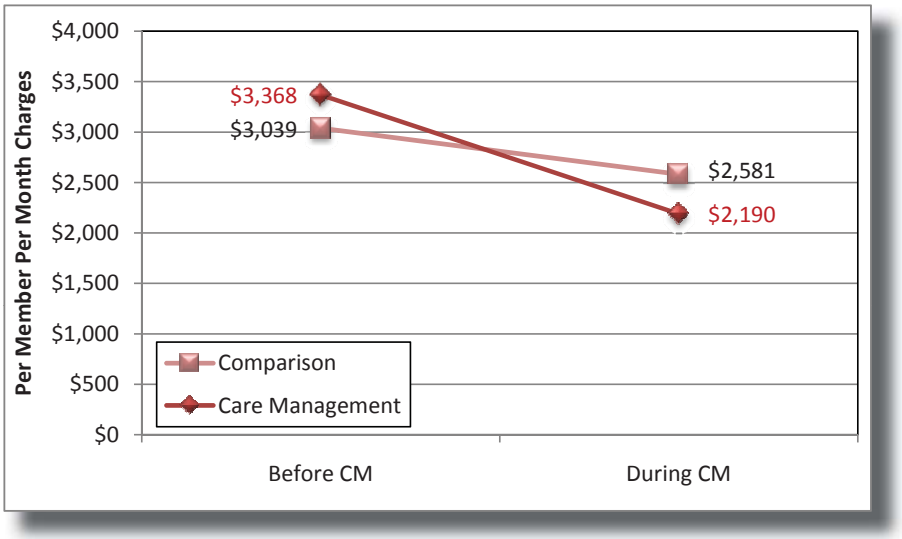
Outpatient follow-up rates were calculated for the two groups for inpatient behavioral health hospitalizations. During the 12 months of Care Management the Care Management group had 32 behavioral health hospitalizations and the Control Group had 33 hospitalizations. Seventy eight percent of Care Management hospitalizations had an outpatient visit within seven days of discharge and 73% of the Control Group had an outpatient visit within seven days of discharge which is in the desired direction; however, the difference was not large enough to reach statistical significance (p = .31).

Estimated Savings from Care Management

Total Behavioral and Medical Charges

Per Member Per Month (PMPM) charges were calculated based on total charges for study participants (see Figure 23). Youth in the Care Management group averaged $3,368 PMPM charges in the year before Care Management and $2,190 in the year during Care Management, resulting in a decrease in PMPM of 35% (-$1,177). Youth in the Control Group averaged $3,039 in PMPM charges in the year before Care Management and $2,581 in the year during Care Management, resulting in a decrease in PMPM of 15% (-$458). The Care Management Group experienced a savings of $391 per youth per month compared to the Control Group for the Care Management time period and a savings of $720 per youth per month over the course of the 24 month study.

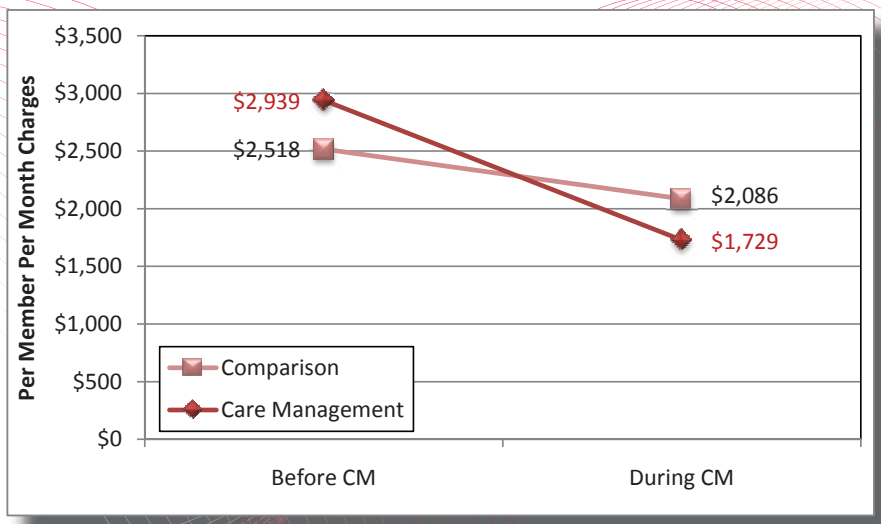
Figure 23. Per Member Per Month Charges by Group and Time Period



Behavioral Health Charges

Per Member Per Month (PMPM) charges were calculated based on total behavioral health charges for study participants (see Figure 24). Youth in the Care Management Group averaged $2,939 PMPM behavioral health charges in the year before Care Management and $2,086 in the year during Care Management, resulting in a decrease in PMPM of 41% (-$1,211). Youth in the Control Group averaged $2,518 in PMPM behavioral health charges in the year before Care Management and $2,086 in the year during Care Management, resulting in a decrease in PMPM of 17% (-$432). The Care Management Group experienced a savings of $357 per youth per month in behavioral health charges compared to the Control Group for the Care Management time period and a savings of $779 per youth per month over the course of the 24 month study.

Figure 24. Per Member Per Month Charges by Group and Time Period - Behavioral Health



PMPM charges were used to estimate the total savings if the population of 1,943 youth for this study had received Care Management (see Figure 25).

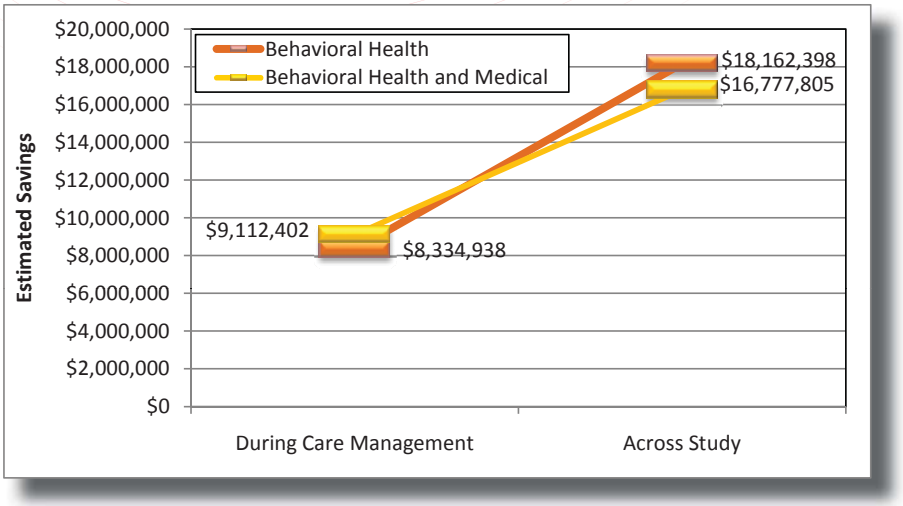
Total Behavioral Health and Medical Charges

Based on the $2,190 in PMPM charges for the Care Management Group during the Care Management intervention, if the entire study population had received Care Management, the total cost of health care is estimated to be $51,064,805 as compared to total costs of $60,177,207 if the population had not received Care Management (based on Control Group PMPD of $2,581), a savings of $9,112,402. If we use the difference between the two groups over the course of the study (PMPM = -$720) to estimate savings, the upper bound of estimated savings in health-care costs for the 1,943 youth in the population would be $16,777,805.

Total Behavioral Health Charges

Based on the $1,729 in PMPM charges for the Care Management Group during the Care Management intervention, if the entire study population had received Care Management, the total cost of health care is estimated to be $40,303,330 as compared to total costs of $48,638,268 if the population had not received Care Management (based on Control Group PMPD of $2,086), a savings of $8,334,938. If we use the difference between the two groups over the course of the study (PMPM = -$779) to

Figure 25. Estimated Savings in Health Care Costs with Care Management



estimate savings, the upper bound of estimated savings in healthcare costs for the 1,943 youth in the population would be $18,162,398.

The higher bound estimates may be influenced by random variation between the groups given the groups did not differ statistically in total average changes in the 12 months prior to implementation of Care Management (p = .44 and p = .35).

CONCLUSIONS

The interview data were mixed. ARAS scores increased slightly over time; however, there were no statistically significant differences in ARAS scores between the two groups over time (p = .73). Based on caregiver ratings using the Ohio Scales problem scale, the percentage of youth who were impaired increased over time for the Control Group youth (55% to 75%) and decreased over time for the Care Management Group youth (57% to 52%). This interaction effect is in the expected direction and was statistically significant (p = .02). Satisfaction levels of caregivers in the Control Group increased slightly and remained stable over time (69% to 71% satisfied). Satisfaction levels of caregivers in the Care Management Group were initially lower than the Control Group caregivers and increased over time from 58.8% of Care Management caregivers satisfied at baseline to over 90% of Care Management caregivers satisfied at the 12-month interview (p = .03).

Care Managers spent the most time during months one through three, 5.2 hours for the quarter or 1.7 hours per participant per month in the first quarter, followed by approximately three hours per quarter or one hour per month for the remaining nine months.

Total charges decreased for the 12 month time period from $3,042,484 in the year prior to Care Management to $2,254,447 during the year of Care Management. This drop was the result of decreases of nearly $800,000 in inpatient charges.

Findings from the Care Management Oversight Evaluation Study include:

Inpatient Medical and Behavioral Health Hospitalizations: The Care Management Oversight Project resulted in statistically significant cost savings for inpatient hospitalizations over the course of the study. There was a 60% reduction in average inpatient charges for the Care Management Group over time compared to a 17% reduction for the Control Group. This reduction in inpatient charges held regardless of whether youth were in state custody or not.

Inpatient Behavioral Health Hospitalizations: The Care Management Oversight Project resulted in statistically significant cost savings for inpatient behavioral health hospitalizations over the course of the study. There was a 60% reduction in average inpatient charges for the Care Management Group over time compared to a 17% reduction for the Control Group. This reduction in inpatient charges held regardless of whether youth were in state custody or not.

Follow-up Care: There was a trend toward a higher proportion of Care Management youth receiving outpatient follow-up care within seven days of discharge from a behavioral health hospitalization (78% of Care Management hospitalizations vs. 73% of the Control Group hospitalizations) which is in the desired direction; however, the difference was not large enough to reach statistical significance (p = .31).

Outpatient Medical and Behavioral Health Charges: There was a 16% increase in average outpatient charges for the Care Management Group ($2,062) over time compared to the Control Group whose total average outpatient charges decreased by 12% (-$2,048) ($p$ = .01).

Outpatient Behavioral Health Charges: There was a 19% increase in average outpatient behavioral health charges for the Care Management Group ($1,564) over time compared to the Control Group whose total average outpatient behavioral health charges decreased by 17% (-$1,801) ($p$ = .01).

Total Medical and Behavioral Health Charges: There was a trend toward a greater reduction in average total charges (combined inpatient and outpatient) for the Care Management Group over time (35% vs. 15%); however, this trend did not reach statistical significance (p = .06).

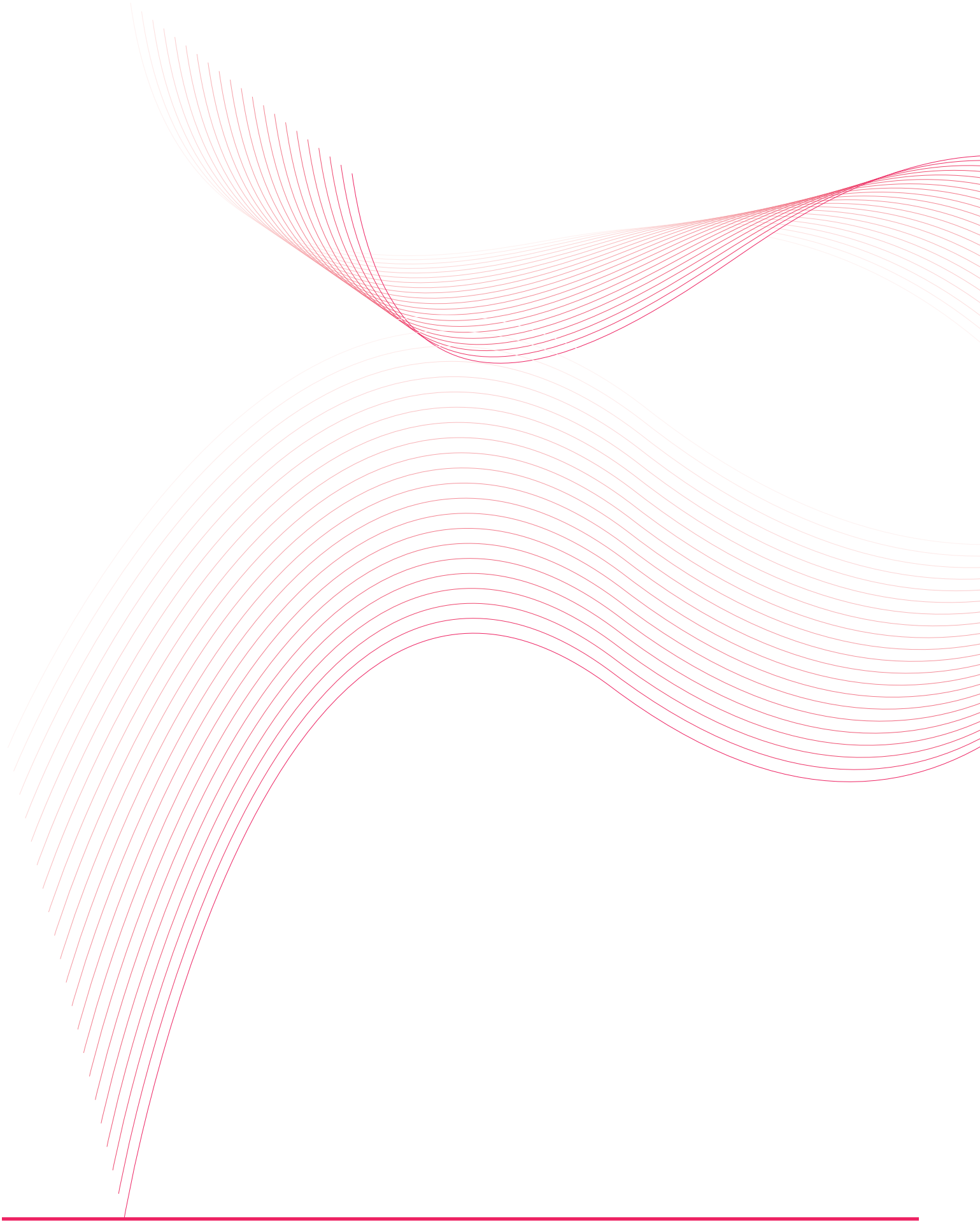
Total Behavioral Health Charges: There was a significantly greater reduction in average total inpatient and outpatient behavioral health charges for the Care Management Group over time (41% vs. 17%) (p = .05).

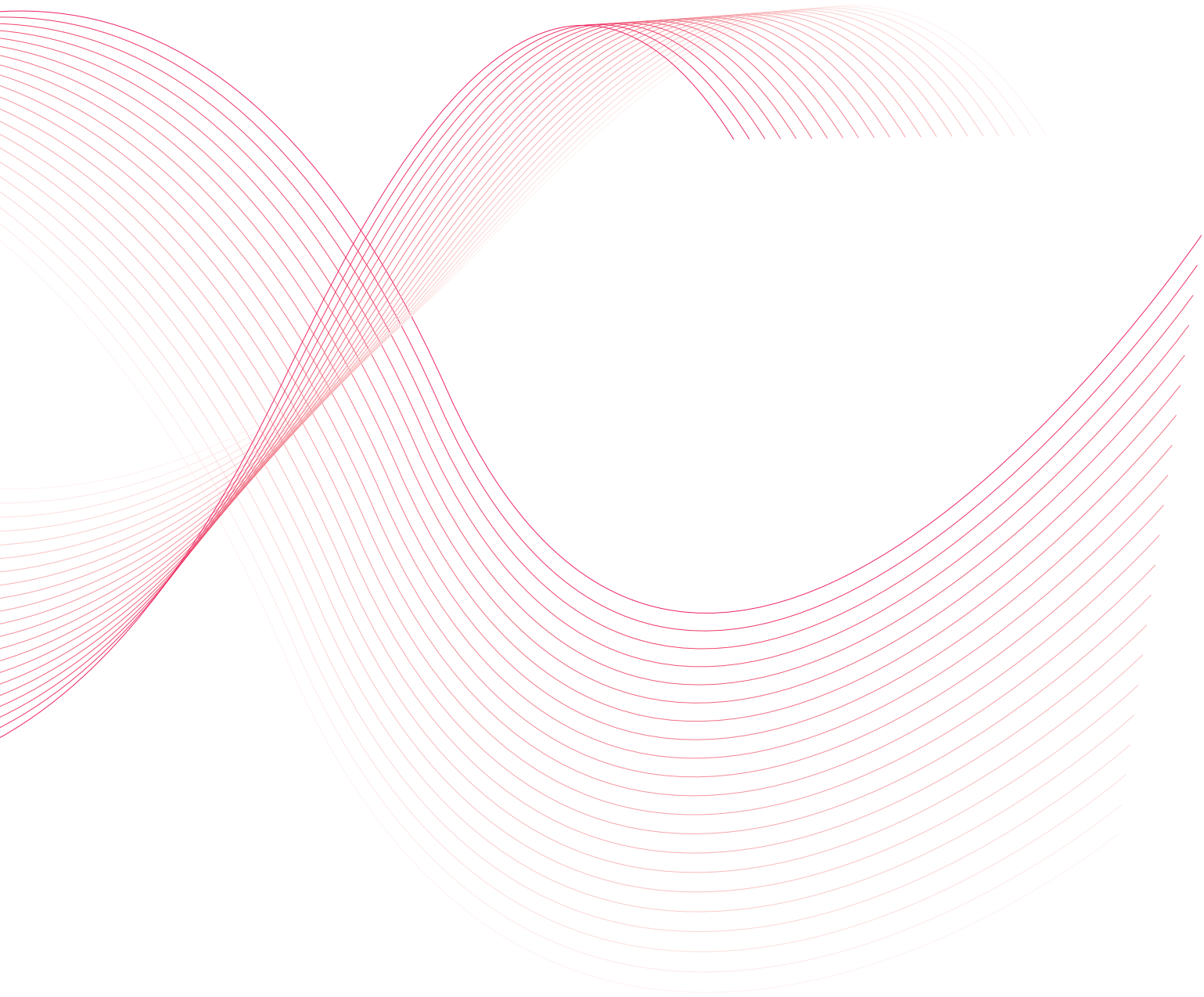
Total Behavioral Health and Medical Charges

Care Management resulted in savings of $458 per youth per month compared to the Control Group during the 12-month Care Management time period and savings of $720 per youth per month for the entire 24 month time period. These PMPM savings were used to project savings for the 1,943 moderate to high Medicaid utilization youth in the population resulting in total estimated savings over a one year period of between $9,112,402 and $16,777,805 if the study population had all received Care Management.

Total Behavioral Health Charges

Care Management resulted in savings of $357 per youth per month in behavioral health charges compared to the Control Group during the 12-month Care Management time period and savings of $779 per youth per month for the entire 24 month time period. These PMPM savings were used to project savings for the 1,943 moderate to high Medicaid utilization youth in the population resulting in total estimated behavioral health savings over a one year period of between $8,334,938 and $18,162,398 if the study population had all received Care Management.





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