# Community Based Management Pilot Programs for Youth with Mental Illness Involved in the Criminal Justice System

## Program Evaluation Report: Year Three

**January 2005**

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# ACKNOWLEDGEMENTS

This report was made possible by the hard work of several individuals:

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Thank you to Linda Harrison at the Department of Public Safety, Division of Criminal Justice, Office of Research and Statistics, who prepared the data extract from the Judicial Branch's Integrated Colorado Online Network (ICON) provided by the Division of Criminal Justice's CICJIS Research System.

Thank you to Jonathan Sushinsky and Diane Fox, at the Department of Human Services, Divisions of Youth Corrections and Mental Health, respectively, who prepared the DYC (Division of Youth Corrections) extract from the Colorado Trails Database.

Thank you to the youth and their families who consented to participate in the evaluation and shared their personal information and invaluable insights.

Thank you to the clinicians, case managers, coordinators, and others at the Colorado Access/Access Behavioral Care University of Colorado Hospital Multisystemic Therapy Team and Centennial Mental Health Centers' Sterling Pilot Program. You honored the evaluation and took the time to collect the data from the youth and their families and assisted in clarifying and interpreting the data. For that we are extremely appreciative.

Thank you to the many agencies that assisted with the data collection and determination of cost for various events, including: the Colorado Judicial Branch, the Division of Youth Corrections, the Colorado Mental Health Institutes at Ft. Logan and Pueblo, The Denver Safe City Diversion Program, Sterling Youth Services, the Denver Police Department, and the Sterling Police Department.

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# TABLE OF CONTENTS

# List of Tables

# List of Figures



# List of Appendices

# EXECUTIVE SUMMARY

## INTRODUCTION TO THE SUMMARY

Pursuant to C.R.S. 16-8-205 this report presents the findings from an outcome evaluation of the programs authorized by the statute: the Community Based Management Pilot Programs for Persons with Mental Illness who are Involved in the Criminal Justice System. This legislation resulted from the work of the Colorado Legislative Interim Committee on the Study of the Treatment of Persons with Mental Illness in the Criminal Justice System, established by House Joint Resolution 99-1042.

The pilot programs were intended to target youth who had co-occurring mental health and criminal/juvenile justice involvement. The specific purpose of the pilot programs was to reduce incarceration, out-of-home placement, and hospitalization rates among this group of high-risk juveniles, according to the legislative declaration, below.

This is a summary of the three-year performance evaluation report on the implementation of the Community Based Management Pilot Programs. Based on the evaluation findings, recommendations follow the summary presented below. The full technical report is available at http://dcj.state.co.us/ors/docs.htm.

## LEGISLATIVE DECLARATION

> (a) Juveniles who are involved in the criminal justice system and who are diagnosed with serious mental illness are more likely than persons without mental illness to reoffend and require repeated incarceration;
>
> (b) Although some community-based intensive treatment and management are currently available…these services are not available in all areas of the state…;
>
> (c) Provision of community-based intensive treatment and management services for person with serious mental illness has been shown to decrease the rate of recidivism and the need for multiple periods of incarceration and hospitalization…;
>
> (d) Over the long term, the cost of providing …services is more than offset by the decrease in incarceration and hospitalization and by the societal benefits realized by enabling these persons to function safely…in the community;

## PILOT PROGRAM DESCRIPTIONS

Centennial Mental Health Center (Centennial MHC) in Sterling (rural) and Colorado Access/Access Behavioral Care (ABC) in Denver (urban) are the sites of the two pilot programs that were funded by the legislation. The Sterling program is a community mental health center based treatment team housed at Centennial MHC. The Sterling program was implemented in March 2001. The Denver program is a Multisystemic Ther-

apy Team (MST) operated by the University of Colorado Hospital (UCH). The Denver program was implemented in October 2001. Highlights of each program are listed below.

## STERLING

- Admitted total of 62 youth; Discharged 52
- Average length of enrollment: 7 months
- Services primarily delivered in group format (83.5% of total services)
- Seven week multi-family parenting group
- Treatment groups for parents with drug or alcohol problems
- Agreed to take most difficult cases from Sterling Youth Services
- Some parenting skill building in home
- Community resource connections
- Strong ties and collaboration with community, especially with probation and diversion
- Transitional group to assist youth transitioning from program

## DENVER

- Admitted total of 62 youth; Discharged 54
- Average length of enrollment: 4 months
- Family-based intervention focusing on parental empowerment (90% of total services)
- Services delivered primarily at home, schools, and larger community
- Special focus on non-white youth with co-occurring mental health and substance abuse disorders
- 3-5 families per therapist
- Case management services
- Spanish speaking Family Resource Coordinator
- Certified MST program

To identify youth for program participation, the Community Based Pilot Programs used the definition of Serious Emotional Disturbance (SED) used by the Colorado Division of Mental Health. This determination is based on Colorado Client Assessment Record (CCAR) data. First, the youth must have a primary mental health diagnosis that is not any of the following: Mental Retardation, Alcohol or Drug Use, Autism, or Dementia). Second, the youth must also meet any one (1) of three (3) criteria: Problem Severity, Problem Type, or Residential (youth lives out of the family home). In addition, youth were required to have some contact with the criminal/juvenile justice system and to not have been adjudicated (convicted) of a class 1 felony or sexual assault.

The two pilot programs served a total of **124 youth**, through June 30, 2004. **Sixty-eight (68) youth** had been discharged from the program for a minimum of 12 months and are included in the longer-term cost outcome analyses.

# SUMMARY OF FINDINGS

## EVALUATION QUESTIONS

The following research questions were addressed by the evaluation and are outlined in this executive summary:

1. What were the sociodemographic, juvenile justice, mental health, and substance use characteristics of youth who were admitted to the pilot programs?
2. What outcomes were achieved by youth at the time of discharge and after discharge from services?
3. Were the program costs per youth in the two pilot programs offset by the savings (cost averted) from reductions in out-of-home placement, arrests, probation, filings, incarceration, etc?
4. What characteristics of youth at admission, including their prior criminal and service system utilization, predicted success in the pilot programs?
5. What characteristics of youth, including their pilot program success, predicted longer-term outcomes?

## *1. What were the socio-demographic, juvenile justice, mental health, and substance use characteristics of youth who were admitted to the pilot programs?*

The overall characteristics of the high-risk youth accepted into each of the programs are summarized below. The information was obtained from CCAR scores or self-report.

## STERLING

- Prior involvement in the juvenile justice system: 86% had prior juvenile diversion, 60% had previous filings, 31% were on probation, and 30% had been in detention
- Current involvement in the justice system: 85% were court –ordered
- Double the security risk of a comparison group from the mental health center
  - Depressed, angry, aggressive, poor attention, family problems,
  - Some with history of fire-setting
- Self-reported substance abuse problems
- Self-reported low ratings on measures of pro-social attitudes and behaviors
- 25% on psychiatric medication
- 7% were receiving Medicaid

Sterling pilot youth were compared to all the youth with SED who were admitted to Centennial Mental Health Center in Sterling.[1]

- Pilot youth demonstrated serious risk factors at rates similar to those of youth with SED who had been admitted to Centennial MHC.
- Youth were significantly more severe than their Centennial counterparts in 6 of 12 CCAR domains, including Legal, Substance Use, Aggressive/Dangerousness, Disrespect, and need for Security.
- Youths' use of alcohol, marijuana, amphetamines, and hallucinogens was significantly higher than that of their Centennial MHC comparison groups.

## DENVER

- Residents of urban environment
- Prior involvement in the juvenile justice system: over half the youth had previous diversion, 55% had prior filings, 29% on probation, and almost 50% had been in detention
- Mostly youth of color (85.5%)
- Twice the likelihood of involvement with animal cruelty (compared to comparison group)
- Two and a half times the likelihood of involvement in fire setting (compared to comparison group)
- Fewer (than Sterling) living at home
- Family mental illness
- Family substance abuse
- History of living in a violent environment
- 44% on psychiatric medication
- 67% were receiving Medicaid

Denver pilot youth were compared to all the youth with SED who were admitted to Mental Health Center of Denver.[2]

- Youth demonstrated serious risk factors at or at higher rates than those of youth with SED who had been admitted to Denver's community mental center, MHCD.
- Youth demonstrated a substantially higher level of family dysfunction and lower level of self-identified pro-social attitudes and behaviors than the comparison group.
- Youth were significantly more severe in all but one CCAR domain than the comparison group.
- Youth reported lower levels of exposure to and involvement with drugs than that reported by the comparison group.

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[1],[2] After the completion of the Technical Report, the Division of Mental Health (DMH) and the Division of Criminal Justice (DCJ), in conjunction with Focus Research & Evaluation (the contracted evaluator for this pilot project), conducted an analysis that compared youth enrolled in the Community Based Pilot programs with youth who were enrolled at community mental health centers. Further results of this analysis are included in the Legislative Report submitted by the Colorado Department of Human Services, Division of Mental Health immediately following this executive summary.

In sum, the pilot youth in the programs had significant mental health and prior juvenile justice system involvement, as required by statute. Furthermore, while there was a wide range of severity within this very complex group, youth in both pilot sites were at least or more severe than youth with SED admitted to their local mental health centers in almost all domains. **Overall pilot youth were at a very high risk of continued involvement in crime and substance abuse.**

## *2. What outcomes were achieved by youth at the time of discharge and after discharge from services?*

Between admission and discharge, the youth showed statistically significant improvements in the following areas:

***Sterling*** youth showed reductions in the following areas:

- Depression
- Anger/Aggression
- Legal problems
- Security level
- Suicide risk
- Overall "severity" on CCAR

***Denver*** youth showed reductions in the following areas:

- Depression
- Anger/Aggression
- Legal problems
- Substance use
- Required security level
- Suicide risk
- Attention problems
- Family problems
- Overall "severity" on CCAR

## *3. Were the program costs per youth in the two pilot programs offset by the savings (cost averted) from reductions in out-of-home placement, arrests, probation, filings, incarceration, etc?*

The program evaluation design was built around what is known about the economic and social effects of youth who fail to transition to adulthood successfully. To obtain actual costs associated with these youth, two methods were used:

(1) The costs incurred by youth BEFORE program discharge are compared with costs incurred AFTER discharge from the program,

(2) Costs at 12 months post-discharge are analyzed in association with a comparison group of high-risk youth in Colorado.

***Pre-Admission Costs.*** One hundred twenty-four youth admitted to the pilot programs since the programs' inception in 2001 accumulated over 2 million dollars in lifetime costs prior to admission to the pilots. Accumulated costs ranged from 9 youth (7.3% of the program participants) with no pre-admission costs to one youth who accrued over $314,000 in costs. Ten (10) youth, only 8.1% of program participants, accounted for 67.4% of all pre-admission system costs. Forty three percent of the pre-admission costs were accrued in the child welfare system, primarily for residential mental health treatment, followed by the mental health system for inpatient psychiatric hospitalization at 23.9%, and the youth corrections system at 23.1%.

Program participants accumulated over $2 millions in costs *prior* to admission.

Eight percent of the youth were responsible for nearly 70 percent of the costs in the period *prior* to admission.

Overall, while youth were enrolled in the pilot programs, costs to other systems of care were very low.

Twelve-month outcomes for system costs, program and youth savings, and various cost-related events were examined for the group of 36 Sterling and 32 Denver youth who had been discharged from the program for at least twelve months. The results are presented below, starting with the overall picture and then describing each site.

In the first year after discharge:

- 72 percent of the youth demonstrated a savings of $731,846.
- The average savings for the 72 percent of youth who saved money in the post-discharge period was almost $15,000.
- Twenty-eight percent of the youth did not demonstrate a savings, incurring over $23,000 per youth in the 12 month post-discharge period.
- Compared to pre-program costs, the group represented a net cost savings of $285,039 in the first 12 months after program discharge.
- In the first year after discharge, 72% of the youth demonstrated savings of $731,846. This was more than enough to cover not only their own $392,000 in program cost ($8,000 per youth) but also the program costs for the entire sub-sample of 68 youth ($544,000).

Lifetime social costs averted by the lack of negative outcomes by high-risk youth can only be discussed from a theoretical perspective:

Lifetime costs associated with a "typical career criminal" are over $1 million; of a heavy drug user, $500,000; of a high school dropout, more than $300,000.

Savings from the pre- to post-discharge periods amounted to $287,400 (National Institute of Justice: 1999) for crimes for which estimates of victim costs were available.

Educational achievements represent potentially $3.6 million in savings to society.

Criminal careers averted resulted in savings of over $9 million dollars.

- Youth who completed the program showed net savings of over $300,000 and youth who did not complete the program showed a net loss of $25,996.

Another way of estimating the potential cost impact of the whole cohort is to apply the average costs incurred by those who did *not* demonstrate a savings across *all* the youth.

**Assuming then that *each* of the high-risk youth would have incurred the $23,000 costs that 28 percent of the group (those who did not incur savings) did, the whole group of 68 youth would have cost $1.5 million rather than saving $285,039.**

## STERLING

**With regard to system costs:**

- Total costs decreased by 39% between the pre-discharge and post-discharge periods.
- The mental health system accounted for the majority of costs (35.4%) in the pre-discharge period due to the heavy investment in the community-based pilot program. Youth Corrections accounted for almost one third of the pre-discharge costs (32.2%).
- In the post-discharge period, the child welfare system bore the majority of the costs (53.1%), followed by the youth corrections system (25.20%), as a result of increased use of residential treatment centers and locked juvenile facilities.

**With regard to savings in the 12-month post-discharge period:**

- The majority of the youth (77.8%) in the program had savings, totaling $538, 858. Their savings more than covered the total program costs ($288,000) for the cohort of 36 youth.
- In the post-discharge period, the child welfare system bore the majority of the costs (53.1%), followed by the youth corrections system (25.20%), as a result of increased use of residential treatment centers and locked juvenile facilities.
- The high post-discharge costs of a much smaller percent of youth (22.2%) were more than double their pre-discharge costs.
- Youth who completed the program (41.7%) averaged net savings twice that of youth who did not complete the program (58.3%).

**With regard to cost-related events:**

- Cost per unit/event varied considerably from $2.09 for electronic monitoring to $830 for a day of certain types of inpatient care.
- Prior to admission to the program, almost two-thirds (61.1%) of the youth had been or were involved with diversion, almost half (47.2%)had been filed on by the district attorney, one-third had been or were on probation, and 41.7% had been or were in detention (not necessarily the same youth).

- The number of days youth spent on probation and in detention or commitment decreased after discharge.
- The number of inpatient psychiatric days decreased and the number of residential treatment days increased substantially after discharge.
- The number of youth who received filings and were adjudicated decreased.
- For those youth who were on probation prior to admission, almost all had at least one filing after discharge and almost half had probation revocations.
- Youth did not progress to violent crimes after discharge.

## DENVER

**With regard to system costs:**

- The mental health system accounted for 60% of the costs in the pre-discharge period, almost all due to the heavy investment in the UCH MST pilot program, included in this pre-discharge period. Child welfare accounted for 20% and youth corrections accounted for only 12% of the pre-discharge costs.
- In the post-discharge period, youth corrections bore the majority of the costs (55%), followed by child welfare (34%), a result of increased use of locked juvenile facilities and residential treatment centers.
- Total costs increased by 20% between the pre-discharge and post-discharge periods.

**With regard to savings:**

- The majority of the youth (n=21, 66%) in the program had savings. Their savings ($192,988) more than offset their program costs of $168,800.
- The high post-discharge costs of the remaining youth were more than double their pre-discharge costs.
- Youth who completed the program (68.8%) averaged net savings of about $5,000 per youth while youth who did not complete the program (31.3%) accrued net losses of almost $17,000 per youth.

**With regard to cost related events:**

- Cost per unit/event varied considerably from $2.09 for electronic monitoring to $830 for a day of certain types of inpatient care.
- About one-third of the youth were involved with diversion, had been filed on by the district attorney, had been or were on probation, or had been in detention prior to admission to the program (not necessarily the same youth).
- The number of youth who received filings decreased after discharge.
- The number of inpatient psychiatric, residential treatment, detention, and commitment days increased after discharge.
- Youth did not progress to violent crimes after discharge.

## *4. What characteristics of youth at admission, including their prior criminal and service system utilization, predicted success in the pilot programs?*

Although hampered somewhat because of small numbers of youth with 12-month outcomes, there were interesting findings regarding the prediction of program completion and other indicators of program success. These were:

### STERLING

- Higher levels of substance use, either drugs or alcohol, was a predictor of not completing the program, having poor school outcomes, more filings during enrollment, and recidivism (for the youth who were on probation prior to admission to the program).
- More juvenile justice-related events predicted not completing the program, poor school outcomes, and recidivism.
- Diversion episodes prior to admission predicted better school enrollment/graduation status.
- Higher Overall Problem Severity Scale score, a broad mental health indicator, predicted poor school outcomes.
- Youth who were younger when they received their first filing predicted recidivism.

### DENVER

- Higher levels of substance use, either drugs or alcohol, were each predictors of program completion, as was the youth's school enrollment status at admission to the pilot.
- Youths' older age at admission was related, to school enrollment/graduation status, as was mental health inpatient episodes, independently of one another.
- Youth who were older at first filing and who had not been in detention prior to admission were more likely to demonstrate improvement on their CCAR substance use score.

## *5. What characteristics of youth, including their pilot program success, predicted longer-term outcomes?*

Statistical analyses were performed that allowed for the identification of specific information that was then used to identify youth likely to accumulate high costs twelve months post-discharge. These predictors were:

### STERLING

- Significant predictors were found for long-term costs, the number of residential days accumulated over the twelve months post-discharge, and the likelihood of being committed.
- Two groups of characteristics that interacted with one another to predict higher cost: were detected. These were:
    - Youth who did not complete the program AND who had higher CCAR Alcohol Problem Severity Scores.

- Youth who did complete the program BUT were younger at first filing.

- Youth who completed the program were more likely to have fewer residential days.
- These results pointed to specific youth who would be more likely to incur higher costs. Six youth with losses totaling over $30,000 were identified.

**While each non-predicted youth saved an average of over $12,000, each of the six predicted youth cost almost $6,000 over time.**

## DENVER

- Higher overall substance use, or drug or alcohol use scores, predicted higher costs and reduced savings, and residential days at 12-month post-discharge. In each case, it also interacted with another variable (detention for higher cost, filings for predicting savings, and convictions to predict residential days).
- Filings, convictions, and detention days pre-admission predicted more commitment days after discharge.
- These results pointed to specific youth who would be more likely to incur higher costs. Five youth with losses totaling over $172,000 were identified.

**While each non-predicted youth *saved* an average of almost $4,000, each predicted youth *cost* almost $32,000 over time. The five youth accounted for such a high percentage of post-discharge costs that, when they were excluded, the program demonstrated substantial savings rather than a loss from the pre- to post-discharge periods**.

## UTILITY OF PREDICTORS

These analyses gave us a better understanding of the effects that youth with certain characteristics have on who is more or less likely to succeed. We identified 11 youth who did not complete the program and who had other predictive characteristics prior to admission to the program. Youth Most Likely To Continue to Accumulate Costs Tended to have a younger age of onset, substance abuse history, and a juvenile justice history The 11 youth predicted to have high costs accounted for very high losses at twelve months post-discharge-over $300,000, an average of over $30,000 per youth. While it is not reasonable to expect any one program to meet the needs of every youth this knowledge can help state oversight staff and local treatment teams understand the effects that youth with differing characteristics have on the program and its long-term outcomes. They then can plan accordingly, either by managing to the risk, i.e., limiting the number of slots for the most at-risk youth, or by intensifying the services provided to them.

This knowledge can help state oversight staff and local treatment teams understand the effects that youth with differing characteristics have on the program and its long-term outcomes and plan accordingly, either by managing to the risk, i.e., limiting the number of slots for the most at-risk youth, or by intensifying the services provided to them.

## YOUTH PERSPECTIVE

As a result of the pilot, youth reported fewer problems with anger and greater communication and happiness within the family.

Almost all youth said that the pilot was the most helpful service that they had received.

# RECOMMENDATIONS

The program evaluation has documented very encouraging findings for these extremely high-risk youth. It has also shown areas that could benefit from focused quality improvement. Based on the empirical findings presented in this report, the Division of Criminal Justice, Office of Research and Statistics makes the following recommendations for enhanced program implementation for the purpose of maximizing positive client outcomes.

**We recommend that the Colorado Department of Human Services, Division of Mental Health, provide ongoing technical assistance to ensure the full implementation of the objectives specified in C.R.S. 16-8-205.**

- **The Sterling Pilot Program staff and administrators** need assistance with developing a response to the evaluation findings that the program lacks sufficient family involvement. Despite considerable efforts to enhance family-based services during the second year of the program, the family component still represented only 11% of overall services delivered, most in a group, non-home-based format. This program component could be enhanced by addressing the following:

  - Representatives from the state oversight agency meet with site level program staff to review and understand barriers to full family involvement.
  - Work with program staff to develop a strategic plan with measurable objectives and timelines that address the barriers and incorporate a plan to track the objectives with state program staff.
  - Monitor the implementation of the strategic plan by conducting quarterly site visits, surveying parents, and documenting progress in this area.

- **Colorado Access/Access Behavioral Care** would benefit from assistance regarding their strategy for securing regular non-Medicaid referrals and the required matching funds and services. This will involve representatives from the state oversight agency accomplishing the following:

  - Meeting with program staff to review program operations related to obtaining matching funds.
  - Reviewing with staff the barriers to implementing a match-funding scenario; identify alternative strategies.
  - Developing a strategic plan with measurable objectives and timelines that can be tracked by the evaluator.

- Representatives from the state oversight agency must document how matching funds and services are obtained and used in both sites.

- Program effectiveness would be enhanced by developing strategies to increase the number of referrals of younger at-risk youth who are less involved in the criminal/juvenile justice system but who would benefit from early interventions.

- Strive to better understand the youth who succeed and target those who will benefit the most have sites strive to target the right kids for youth

- Given the high substance use among this population and the analyses indicating the high risk for continued high-cost involvement with service systems, both sites need to focus energies on beefing up the substance abuse component of their programs. It is also recommended that the best practice literature and innovative programs that address the needs of this population specifically (e.g., the combined MST and Community Reinforcement Approach [CRA] being implemented by Synergy in Colorado), be explored by the state program staff and both sites.

- Having a follow-up component to treatment services has been shown in the literature to contribute to positive long-term outcomes. Each site should therefore incorporate some form of this to their programs.

- Adherence to eligibility requirements should be monitored to ensure the program is targeting the intended population.

- **We also recommend that the Colorado Department of Human Services, Division of Mental Health, incorporate the findings from this program evaluation into the RFP that will be issued for ongoing services through this program.**

The sites are committed to continuing to improve and respond to recommendations. The general assembly can expect continued positive outcomes. Resources devoted to these programs result in significant cost savings and immeasurable improvements in the quality of life for those that participate.

# LEGISLATIVE REPORT

**H.B. 00-1034**
**Community Based Management Pilot Programs**
**Colorado Department of Human Services**
**Division of Mental Health[3]**
**January 15, 2005**

## Overview

In fiscal year 2000, The Department of Human Services along with The Department of Public Safety implemented pilot programs intended to provide family-focused and community-based services to youth with severe emotional disturbance who are involved in the juvenile justice system, as a means of reducing recidivism and averting out-of-home placements through cost-effective treatment.

As the result of a request for proposal (RFP) process, Centennial Mental Health Center in Sterling and Colorado Access/Access Behavioral Care (ABC) in Denver were selected as the rural and urban pilot sites respectively. The Department developed rules guiding implementation of the program. Each pilot is required to provide a one-to-one cash or in-kind match for State funds provided through the program. The Department conducts regular meetings with the pilots to review progress.

H.B. 00-1034 (16-8-205, C.R.S.): Community-Based Management Pilot Programs requires the Department of Human Services to provide information annually. This report serves to meet this requirement. The programs at each of the two sites are described as well as the socio-demographic characteristics of the youth served by each program. The next section of the report describes the juvenile justice, mental health, child welfare, and educational outcomes of youth who have been discharged from the pilot programs for a year or more. The final section of this report describes an analysis conducted by the Division of Mental Health (DMH), and the Division of Criminal Justice (DCJ) in conjunction with Focus Research & Evaluation (the contracted evaluator for this pilot project) that compares youth enrolled in the Community Based Pilot programs with youth who were enrolled at community mental health centers.

[3] Parts of this report were excerpted from, *Community Based Pilot Programs for Youth with Mental Illness Involved in the Criminal Justice System, Program Evaluation Report Year Three: A Report of Findings per C.R.S. 16-8-205.* Anita Saranga Coen, LCSW, Focus Research & Evaluation, October 20, 2004.

**The reporting categories required in the law at 16-8-205, C.R.S. are:**

"(1) On or before October 1, 2002, and on or before each October 1 thereafter, each entity that is selected to operate a juvenile offender pilot program created pursuant to section 16-8-203 shall submit to the department information evaluating the program. The department shall specify the information to be submitted, which information at a minimum shall include:

(a) The number of persons participating in the program and an overview of the services provided;
(b) The number of persons participating in the program for whom diversion, parole, probation, or conditional release was revoked and the reasons for each revocation;

(c) The number of persons participating in the program who committed new offenses while receiving services and after receiving services under the program and the number and nature of offenses committed;

(d) The number of persons participating in the program who required hospitalization while receiving services and after receiving services under the program and the length of and reason for each hospitalization.

(2) On or before January 15, 2003, and on or before each January 15 thereafter, the department shall submit a compilation of the information received pursuant to subsection
(1) of this section, with an executive summary, to the joint budget committee and the judiciary committees of the senate and the house of representatives of the general assembly. Said committees shall review the report and may recommend legislation to continue or expand the juvenile offender pilot program.

(3) The department shall forward the information received pursuant to subsection (1) of this section to the division of criminal justice in the department of public safety. The division shall review the operation of the pilot programs and submit a report on or before October 1, 2003, and on or before October 1 every two years thereafter, to the department and to the joint budget committee and the judiciary committees of the senate and the house of representatives of the general assembly. At a minimum, the report prepared by the division of criminal justice shall include identification of the cost avoidance or cost savings, if any, achieved by the pilot programs and the outcomes achieved by juveniles receiving services through the programs."

## Executive Summary

- The two pilot programs served a total of 124 youth, through June 30, 2004.
- The Sterling Pilot Program is a community mental health center based treatment team that provides the majority of its services in a group format. The pilot program includes a low client to staff ratio of one Intensive Case Manager/Clinician to four to six youth.
- The Denver pilot program is a certified MST program that delivers family based services in a natural setting. This pilot program also maintains small family to therapist ratio of three to five families per therapist.
- Twenty youth had probation revocations with the majority due to violations of probation conditions or failure to participate in services.
- Only one youth had a parole revocation and it was due to being absent without authorized leave.
- None of the Community Based Pilot program youth were placed on conditional release thus, there were no revocations.
- The exact numbers of youth who did not successfully complete diversion programs were not available, however, the reasons some youth did not complete include: transportation needs, disinterest in completing program versus paying fines, and the level of support from caregivers for the youth to comply with the requirements of the diversion program.
- Eleven youth were adjudicated or convicted of new crimes during program participation. Only two youth committed violent misdemeanors, the remaining youth were adjudicated/convicted of non-violent offenses.
- A total of six youth were hospitalized due to either suicidal ideation/attempt or self-injurious behaviors. These six youth spent a total of 69 days hospitalized.
- Program completion, substance abuse, age at first filing, number of detention episodes, and inpatient psychiatric days prior to admission were all significant predictors of program success and long-term outcomes.
- Community based pilot project participants accrued fewer career filings, adjudications/convictions, probation days and RTC days than matched comparison youth who received more traditional mental health services at community mental health centers.
- Overall, career costs of community based pilot project participants were 42% lower than matched comparison youth served by community mental health centers.
- The "during enrollment" period was the key time frame for cost savings. The pilot youth cost $407,909 less than their matched pairs enrolled in community mental health center for the duration of time that they were receiving services.

## Descriptions of the Pilot Programs

Statute requires that one rural and one urban site be chosen for the pilot programs. These sites were encouraged to tailor the programs to the local needs of their communities. The vast differences between the two communities resulted in substantially different pilot programs in Sterling and Denver.

Sterling Pilot

The Sterling Pilot Program is a community mental health center based treatment team that provides the majority of its services in a group format. The pilot program includes a low client to staff ratio of one Intensive Case Manger/Clinician to four to six youth. The co-located state certified alcohol and drug program provides substance abuse screening for all youth entering the program and, if appropriate, completes evaluations. In addition, both of the pilot program's full time staff have completed Certified Alcohol Counselor (CAC II) Training and conduct the Substance Abuse Treatment Group. Bi-lingual services are available and provided as needed.

Other notable features of the Sterling Pilot Program include:

- Ongoing collaboration with the community, especially Probation and Sterling Youth Services, which houses the Diversion Program.
- A mandatory formal Transitional Program that assists youth in their transition from services.
- A mandatory, seven-week Multi-Family Parenting Group. (14 families completed the Multi-Family Parenting Group Program during FY2003-04.)
- Motivational Interviewing, a directive, client-centered counseling style for eliciting behavior change by helping clients to explore and resolve ambivalence.
- Treatment groups for parents with drug or alcohol problems.
- Staff members who work with families on parenting skills in the home and help families obtain needed community resources. Home-based staff are available four evenings per week.
- Since spring 2004, all youth who are enrolled in the pilot program are eligible to receive mentoring services (approximately 30-40% of the pilot youth are receiving mentoring services.)

Denver Pilot

The Substance Abuse and Mental Health Service Agency (SAMHSA) has identified Multisystemic Therapy (MST), which usually targets youth who are violent and abuse substances, as a Model Program. Although studies have also been conducted on outcomes of MST for

youth with mental health disabilities (Henggeler, et al., 2003; Stanley, et al., 2004), MST's effectiveness for these youth has not yet been documented.

The Denver pilot program is a certified MST program that meets all the requirements specified by Colorado MST (COMST) Support Services, a center based at Metropolitan State College of Denver which is authorized by MST Services, Inc. to support local MST programs, including, but not limited to:

- Services delivered in the natural environment (i.e., most frequently the home, but also schools and the larger community).
- Family-based treatment with an emphasis on parental empowerment to modify the natural social network of their children.
- Small family to therapist ratio of 3-5 families per therapist.
- Intensive ongoing therapist and supervisor training as well as weekly case by case consultation with the COMST Consultant.

In addition, Denver's staffing configuration includes an MST-trained psychiatrist to provide additional support for the mental health component. Staffing also includes a half-time, Spanish-speaking Family Resource Coordinator (FRC) position that provides assistance with data collection and case management responsibilities, including assisting families with basic needs by providing, food, clothing, public assistance, housing and other resources. The position also provides advocacy, facilitates families' enrollment into other community and government programs, manages complaints, and provides support during crises. The MST services are provided through a contract that ABC has developed with the University of Colorado Hospital (UCH).

Overall, the Sterling Pilot Program and the Denver MST Program at the University of Colorado Health Sciences Center (UCH) differ from one another in important ways. The Sterling Pilot Program is an office-based model where youth-based group interventions account for the majority of services. The family based services provided by the Sterling Pilot Program have increased from five percent to eleven percent in the last year, demonstrating their continued response to the recommendations from the program evaluation. Denver's MST program is an intensive family therapy, home and community based intervention, with 90% of their services provided in a family context. Table 1 describes the services provided by each site.

**Table 1. Services Provided by the Two Pilot Programs**

| Program Characteristics | Sterling Pilot Description of Services | Denver UCH MST Description of Services |
|---|---|---|
| **Number Admitted/Discharged through 6/30/2004** | 62/52 | 62/54 |
| **General** | Individual, family, group, multi-family, and substance abuse treatment, including Spanish speaking capability. | Special focus on minority youth and those with co-occurring mental health and substance abuse disorders. |
| **Group Therapy & Activities** | 68.5% of services. Includes: Substance Abuse, Anger Management, Vocational/Job Skills, Strategies for Self Improvement and Change, Mentoring, Tutoring, Psycho-educational, Boys/Girls Groups, Community Service, Recreational, Drop-in Center, Study Hall and Motivational Interviewing. | Service Not Provided |
| **Individual Therapy & Intensive Case Management** | 19.1% (plus 1.3% Drug Testing and Medical Services) | 10% Case Management with Stakeholders |
| **Family Therapy** | 11.1% of services<br>Mandatory Multi-Family Parenting Group<br>Home-based services | 90% of total services provided – in home or in the community; About 50%, with full family configuration; 10% with caregivers and youth, without siblings; and 30% with caregivers only. |
| **Psychiatric, Medication, Crisis** | All provided through Centennial MHC Psychiatry and Emergency. | Provided as needed through Team's Medical Director, UCHSC Dep't of Psychiatry and UCH Child Outpatient Clinic. |
| **Transitional Services** | Consists of 2 sessions per week for eight weeks post completion of primary program. | Therapists strive to initiate telephone contact with families 1, 3, and 6 months post completion of program. |
| **Respite Services** *(Provides therapeutic relief, rest, or break for families and caregivers of children – in-home or respite worker's home)* | Service Not Provided | Provided through the Mental Health Center of Denver (MHCD) by contract with ABC (Access Behavioral Care). |
| **Mentoring Services** *(Support for youth being transferred from residential treatment or inpatient settings to home/community to reduce out-of-home placement.)* | Provided through the Hospitalization Alternatives for Youth Program | Service Not Provided |
| **Service Integration** | State-licensed Alcohol/Drug Treatment Program (A/DTP). Youth are screened for substance abuse, have access to services of Certified Alcohol Counselors. Program staff has frequent contact with Probation Officers, coordinating interventions/sharing information. | As part of the MST treatment philosophy and protocols, the MST Therapist takes responsibility for all families' needs in all service areas, including substance abuse. As such, service integration is a de facto feature of the MST intervention. |

Source: Interviews; Document Reviews.

## Program Enrollment Characteristics

Table 2 describes the program completion and length of stay characteristics for each program. Again, there are substantial differences between the two programs, with the Denver UCH MST Program having a 73% program completion rate and the Sterling Pilot Program a

37% rate. Furthermore, the average Length of Enrollment for Sterling youth who completed the program is more than two times that of the Denver UCH MST Program.

**Table 2. Program Enrollment Characteristics of the Youth Admitted to the Sterling Pilot Program and the Denver UCH MST Program.**

| Program Characteristics | Sterling Pilot | | Denver UCH MST | |
|---|---|---|---|---|
| **Number Admitted through 6/30/2004** | 62 | | 62 | |
| **Number Discharged through6/30/2004** | 52 | | 54 | |
| | Number (n=52) | % | Number (n=52) | % |
| **Reason for Discharge (available data)** | | | | |
| Completed Program* | 19 | 36.5% | 38 | 73.1% |
| Dropped Out | 18 | 34.6% | 8 | 15.4 |
| Terminated (Out-of-home placement, moved out of area) | 15 | 28.8% | 6 | 11.5 |
| Total | 52 | | 52 | |
| **Average Length of Enrollment for all Youth** | 6.9 Months | | 4.1 Months | |
| **Average Length of Enrollment for Youth who Completed the Program** | 8.8 Months | | 4.4 Months | |

** Based on clinician judgment.*

*Source: Colorado Client Assessment Record (CCAR); Community Based Pilot Record evaluation database (CBPR).*

## Characteristics of Youth at Admission

Table 3 displays characteristics of program enrollees. The data were extracted from the Colorado Client Assessment Record (CCAR), an instrument used to collect demographic and clinical information on persons receiving public mental health services in the state, which was completed by staff at the time of admission. Youth admitted to the Sterling Pilot Program were, on average, older, more likely to be white, much more likely to have been court-ordered and referred to the program by Probation, and less likely to have been insured by Medicaid than the Denver UCH MST youth. Denver youth were 85% Hispanic or African American, were more likely to have been referred by Social Services and outpatient mental health agencies. Less than 20% of youth in both sites were living with both parents.

**Table 3. Youth Characteristics at Admission to the Sterling Pilot and Denver UCH MST.**

| Selected Characteristic | Sterling Pilot n=62 | Sterling Pilot % | Denver UCH MST n=62 | Denver UCH MST % |
|---|---|---|---|---|
| **Gender: Male** | 45 | 73.8% | 28 | 75% |
| **Mean Age at Admission*** | 15.7 Years | | 15 Years | |
| Ages 13 or younger | 4 | 6.6% | 12 | 19.4% |
| Ages 14-15 | 23 | 37.7% | 27 | 43.5% |
| Ages 16-17 | 33 | 45.9% | 22 | 35.5% |
| **Ethnicity *** | | | | |
| White (Non-Hispanic) | 35 | 57.4% | 9 | 14.5% |
| Hispanic | 22 | 36.1% | 23 | 37.1% |
| African American | 1 | 1.6% | 25 | 40.3% |
| Multiracial | 3 | 4.9% | 5 | 8.1% |
| **Residence at Admission** | | | | |
| At Home | 60 | 98.4% | 55 | 88.7% |
| Residential Mental Health | 0 | 0.0% | 2 | 3.2% |
| Inpatient Psychiatry | 0 | 0.0% | 3 | 4.9% |
| Homeless Shelter | 0 | 0.0% | 1 | 1.6% |
| **Who Lived with Youth** | | | | |
| Mother | 36 | 59.0% | 29 | 46.8% |
| Father | 5 | 8.2% | 8 | 12.9% |
| Both Parents | 12 | 19.7% | 10 | 16.1% |
| Guardian/Other Relative | 4 | 6.6% | 12 | 19.4% |
| **Admission/Legal Status** | | | | |
| Voluntary | 6 | 9.8% | 33 | 53.2% |
| Court Directed Voluntary[4] | 52 | 85.2% | 24 | 38.7% |
| **Primary Referral Sources** | | | | |
| Probation/Parole | 41 | 67.2% | 4 | 6.5% |
| Law Enforcement | 0 | 0.0% | 7 | 11.3% |
| Court | 11 | 18.0% | 1 | 0.0% |
| Social Services | 5 | 8.2% | 24 | 38.7% |
| Inpatient Psychiatry | 1 | 1.6% | 6 | 9.7% |
| OP Mental Health | 0 | 0.0% | 9 | 14.5% |
| **Medicaid Status** | 4 | 7.0% | 42 | 67.7% |

*Source: CCAR; Integrated Colorado Online Network (ICON); Colorado Trails.*
**Numbers and percentages do not necessarily add to total n due to missing data or other responses.*

## Outcomes at Discharge

There were 68 youth who were discharged from the pilot programs for 12 months or longer. This section includes the data required by the statute regarding the number of persons who committed new offenses, the number and nature of the offenses; the number of persons participating in the program for whom diversion, parole, probation, or conditional release was revoked and the reasons for each revocation; and the number of persons participating in the program who required hospitalization while receiving services and after receiving services under the program and the length of and reason for hospitalization.

[4] CCAR admission category that includes treatment as a condition of probation/parole or deferred prosecution.

**Table 4. JJ, CW, and MH Events During Enrollment and Post-Discharge Periods for <u>All Youth Discharged at Least 12-Months.</u>**

| Event | Sterling | | | | Denver | | | |
|---|---|---|---|---|---|---|---|---|
| | During Admission To Program | | Events Begin/Occur <u>After Discharge</u> from Program through 12-Month Post-Discharge | | During Admission To Program | | Events Begin/Occur <u>After Discharge</u> from Program through 12-Month Post-Discharge | |
| | Number (%) of Youth (n=36) | # of Units/ Events | Number (%) of Youth (n=36) | # of Units/ Events | Number (%) of Youth (n=32) | # of Units/ Events | Number (%) of Youth (n=32) | # of Units/ Events |
| **Diversion Episodes** | 2 (5.6%) | 2 | 9 (25.0%) | 10 | 6 (18.8%) | 6 | 8 (25.0%) | 9 |
| **Filings** | 11 (30.6%) | 14 | 16 (44.4%) | 32 | 6 (18.8%) | 9 | 8 (25.0%) | 16 |
| **Adjudications/Convictions** | 6 (16.7%) | 6 | 11 (30.6%) | 15 | 5 (15.6%) | 6 | 9 (28.1%) | 11 |
| **Non-Violent Misdemeanor** | 3 | 3 | 6 | 6 | 0 | 0 | 2 | 2 |
| **Non-Violent Felony** | 3 | 3 | 4 | 4 | 4 | 2 | 4 | 4 |
| **Violent Misdemeanor** | 0 | 0 | 1 | 1 | 2 | 4 | 2 | 3 |
| **Violent Felony** | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| **Regular Probation Days** | 4 (11.1%) | 307 | 19 (52.8%) | 4449 | 4 (12.5%) | 396 | 15 (46.9%) | 3865 |
| **Juvenile Intensive Supervision Probation (JISP) Days** | 0 (0.0%) | 0 | 4 (11.1%) | 619 | 0 (0.0%) | 0 | 0 (0.0%) | 0 |
| **Probation Revocations** | 6 (16.7%) | 6 | 9 (25.0%) | 14 | 1 (3.1%) | 1 | 4 (12.5%) | 6 |
| **Electronic Monitoring** | 1 (13.9%) | 5 | 1 (2.8%) | 45 | 0 (0.0%) | 0 | 0 (0.0%) | 0 |
| **Detention Days** | 15 (41.7%) | 311 | 12 (33.3%) | 620 | 5 (15.6%) | 85 | 13 (40.6%) | 441 |
| **Commitment Days** | 0 (0.0%) | 0 | 2 (5.6%) | 224 | 0 (0.0%) | 0 | 6 (18.8%) | 1053 |
| **Parole Days** | 1 (2.8%) | 267 | 0 (0.0%) | 0 | 0 (0.0%) | 0 | 0 (0.0%) | 0 |
| **Department of Corrections** | 0 (0.0%) | 0 | 1 (2.8%) | 91 | 0 (0.0%) | 0 | 0 (0.0%) | 0 |
| **Jail Days** | 1 (2.8%) | 60 | 6 (16.7%) | 320 | 0 (0.0%) | 0 | 0 (0.0%) | 0 |
| **Residential** (RTC, RCCF, Group) **Days** | 2 (5.6%) | 101 | 7 (19.4%) | 1611 | 3 (9.4%) | 24 | 11 (34.4%) | 93 |
| **INPATIENT PSYCHIATRIC DAYS** | 3 (8.3%) | 40 | 1 (2.8%) | 27 | 0 (0.0%) | 0 | 2 (6.3%) | 2 |

*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Sterling and Denver Youth Services.*
*Due to low n, please use caution in interpretation, particularly regarding percents.*

The reasons that youth were hospitalized or had parole or probation revocations are summarized in Table 5.

**Table 5. Reasons for Hospitalization, Probation and Parole Revocation.**

| Reason | Number of Events (% Of Total) | |
|---|---|---|
| | **Sterling** | **Denver** |
| **HOSPITALIZATION** | | |
| Suicidal Ideation / Attempt | 3 (50%) | 2 (33%) |
| Self Injurious Behavior | 1 (17%) | 0 (0%) |
| **TOTAL** | **4 (67%)** | **2 (33%)** |
| | | |
| **PROBATION REVOCATION** | | |
| Substance Use | 2 (10%) | 0 (0%) |
| Not Cooperating with Services | 0 (0%) | 1(5%) |
| Violation of Probation Conditions | 3 (15%) | 0 (0%) |
| Failure to Comply | 2 (10%) | 1 (5%) |
| AWOL | 0 (0%) | 2 (10%) |
| Allegations | 1 (5%) | 0 (0%) |
| Reason Unavailable | 7 (35%) | 1 (5%) |
| **TOTAL** | **15 (75%)** | **5 (25%)** |
| | | |
| **PAROLE REVOCATION** | | |
| AWOL | 1 (100%) | 0 (0%) |

While the exact numbers of youth who did not successfully complete diversion programs were not available, reasons cited by the diversion program director included: transportation needs, disinterest in completing program versus paying fines, and the level of support from caregivers for the youth to comply with the requirements of the diversion program. No youth participating in the Community Based Pilot Programs were given conditional release and, so, there were no revocations of conditional release.

Educational Outcomes

A large percentage of youth enrolled in both pilot programs demonstrated positive educational outcomes at discharge, 77% and 80% in Sterling and Denver respectively (see Table 6). Based on the landmark review of outcomes for youth in transition to adulthood by Vander Stoep, Davis, and Collings (2000, p.13), it can be expected that only 60% of the youth involved in the Community Based Pilot Programs would have graduated from high school. The high rates of positive school outcomes observed in the 68 youth discharged from the pilot programs seem to indicate that these youth are on a much more positive educational trajectory.

**Table 6. Sterling and Denver Pilot Program School Enrollment / Completion Status from Admission to Discharge.**

| School Enrollment/Completion Path | | Sterling Admission (n=47) | Sterling % | Denver Admission (n=48) | Denver % | Combined (n=95) | Combined% |
|---|---|---|---|---|---|---|---|
| **Positive Outcomes** | | | | | | | |
| **Admission** | **Discharge** | | | | | | |
| Enrolled | Enrolled | 14 | 30% | 33 | 69% | 47 | 50% |
| Unknown | Enrolled | 15 | 32% | 3 | 6% | 18 | 19% |
| Not Enrolled | Enrolled | 2 | 4% | 4 | 8% | 6 | 6% |
| Not Enrolled | GED | 5 | 11% | 0 | 0% | 5 | 5% |
| | **Total** | **36** | **77%** | **40** | **83%** | **76** | **80%** |
| | | | | | | | |
| **Negative Outcomes** | | | | | | | |
| **Admission** | **Discharge** | | | | | | |
| Not Enrolled | Not Enrolled | 3 | 6% | 2 | 3% | 5 | 6% |
| Enrolled | Not Enrolled | 2 | 4% | 5 | 8% | 7 | 7% |
| Unknown | Not Enrolled | 6 | 13% | 1 | 2% | 7 | 7% |
| | **Total** | **11** | **23%** | **8** | **17%** | **19** | **20%** |

*Source: Community Based Pilot Record evaluation database (CBPR).*

Predicting Success

Detailed analyses were conducted to determine which characteristics of youth predicted program success and long-term outcomes. This type of analyses is critical given that approximately eight percent of the youth in the pilot program accounted for 67% of the costs prior to admission to the pilot programs. Thus, identifying which youth are likely to incur higher costs post admission and tailoring services to meet the needs of these youth should improve the success of the pilot programs in the future.

Higher costs 12-months post-discharge were associated with several variables: not completing the pilot program; higher substance use; younger at the time of first filing; more episodes of detention; and more inpatient psychiatric days prior to admission. Given these findings the success of the two pilot programs would likely improve with increased focus on program completion and substance abuse treatment.

Pilot/Comparison Group Analyses

In order to evaluate the effectiveness of the Community Based Pilot Programs versus traditional mental health services provided by community mental health centers, a comparison group of youth was identified from the Division of Mental Health's CCAR database. The comparison youth were matched to the youth enrolled in the Pilot programs on age, ethnicity, and gender. They were also matched on three problem severity scores on the CCAR: overall problem severity, substance abuse, and legal problems. The youth in the Sterling pilot were matched to youth being served by North Range Mental Health Center and Larimer Cen-

ter for Mental Health. Those two mental health centers serve rural communities that have demographics similar to Sterling's population in the northeastern part of Colorado. The youth in the Denver UCH MST pilot were matched to youth served by the Mental Health Center of Denver (MHCD), therefore both groups reside in Denver. Forty-seven pairs of youth were identified that had been discharged from their respective programs (pilot program for the pilot youth or the community mental health center for the comparison youth) for at least a year.

Data were collected for all 94 youth from the Integrated Colorado Online Network (ICON), to document judicial contacts, and from the Colorado Department of Human Services' Trails database to document contacts with the Division of Youth Corrections (DYC) and Child Welfare. Events were documented in youth corrections (e.g. detention days, commitment days, residential treatment, and parole), judicial (e.g. regular and intensive probation, filings, electronic monitoring, sentences), and child welfare (e.g. residential treatment, group home placement). Events were split into three time periods: before admission, which included the 12 months prior to admission; during admission which included the time spent in either the pilot program or enrolled in services at the Community Mental Health Center; and after discharge which included the period 12 months following discharge. These three time periods clearly illustrate the youth's trajectory through the system. Costs were then attributed to each of these events. Each service system was contacted and asked to provide the actual cost of service. Average daily rates provided by the system were used if actual costs were unavailable. Career costs equal the total cost per youth for all service utilization time periods (12 months pre-intervention, during the intervention, and for the 12 months post intervention), including juvenile/criminal justice and child welfare out-of-home placements. This cost does not include the cost of the programs being evaluated. It was not possible to accurately determine the cost of mental health services for the comparison youth for all three time periods, thus they were excluded from both groups to ensure an accurate between groups comparison. The events and costs are summarized in Tables 7 and 8, respectively.

**Table 7. Denver MST Pilot Program, Sterling Pilot Program and Comparison Groups: Juvenile Justice, Child Welfare Events Documented in the Pre-Admission, During Enrollment, and Post-Discharge Periods for Matched Youth Discharged at Least 12-Months from Program[5]**

| Event | Number of Units/ Events 12-Months Before Admission To Program | | Number of Units/ Events During Enrollment in Program | | Number of Units/ Events After Discharge from Program through 12-Month Post-Discharge | |
|---|---|---|---|---|---|---|
| | **Pilot N=47** | **Comparison N=47** | **Pilot N=47** | **Comparison N=47** | **Pilot N=47** | **Comparison N=47** |
| **Filings** | 33 (22) | 39 (18) | 16 (11) | 34 (13) | 33 (17) | 20 (14) |
| **Adjudications/Convictions** | 16 (12) | 27 (15) | 7 (7) | 19 (7) | 18 (13) | 14 (10) |
| Non-Violent Misdemeanor | 8 | 5 | 1 | 3 | 8 | 5 |
| Non-Violent Felony | 4 | 14 | 3 | 5 | 6 | 5 |
| Violent Misdemeanor | 4 | 5 | 3 | 9 | 3 | 3 |
| Violent Felony | 0 | 3 | 0 | 2 | 1 | 1 |
| **Regular Probation Days** | 3594 (13) | 2951 (14) | 573 (6) | 2001 (7) | 1099 (7) | 2068 (12) |
| **Juvenile Intensive Supervision Probation (JISP) Days** | 285 (2) | 241 (1) | 0 | 0 | 0 | 267 (1) |
| **Probation Revocations** | 4 (4) | 4 (4) | 6 (6) | 1 (1) | 12 (9) | 5 (4) |
| **Electronic Monitoring Days** | 14 (1) | 0 | 0 | 0 | 45 (1) | 0 |
| **Detention Days** | 841 (17) | 572 (19) | 359 (14) | 469 (16) | 681 (17) | 637 (13) |
| **Commitment Days** | 213 (1) | 55 (1) | 0 | 34 (4) | 1096 (6) | 379 (6) |
| **Parole Days** | 8 (1) | 0 | 267 (1) | 273 (1) | 0 | 0 |
| **Department of Corrections Days** | 0 | 0 | 0 | 0 | 86 (1) | 0 |
| **Jail Days** | 10 (1) | 0 | 60 (1) | 0 | 190 (5) | 0 |
| **Residential (RTC, RCCF, Group) Days (n=40)[6]** | 772 (5) | 2756 (17) | 22[7] (1) | 2292 (16) | 967 (8) | 1711 (13) |

*Source: Integrated Colorado Online Network (ICON); Colorado Trails.*

[5] Program for the Comparison Group is defined as enrollment in the Mental Health Center of Denver, Centennial, or Larimer Center for Mental Health.
[6] There were six youth in the Comparison Group for whom residential services could not be verified. Their "pairs" in the Pilot Group were excluded from this analysis.
[7] Since admission to residential treatment usually triggered a discharge for the Pilot Program, Residential Days accumulated During Enrollment are likely an artifact of the program not formally discharging a youth on the day s/he was admitted to residential care. For all intents and purposes, we might consider those days as occurring After Discharge.

**Table 8. Community Based Pilot Programs and Comparison Groups: Juvenile Justice and Child Welfare Documented in the Pre-Admission, During Enrollment, and Post-Discharge Periods for Matched Youth Discharged at Least 12-Months from Program**

| Event | Accumulated Costs 12-Months Before Admission To Program | | Accumulated Costs During Enrollment in Program | | Accumulated Costs After Discharge from Program through 12-Month Post-Discharge | |
|---|---|---|---|---|---|---|
| | **Pilot N=47** | **Comparison N=47** | **Pilot N=47** | **Comparison N=47** | **Pilot N=47** | **Comparison N=47** |
| **Filings** | $19,330 | $22,845 | $9,373 | $19,916 | $19,331 | $11,715 |
| **Regular Probation Days** | $14,340 | $11,774 | $2,287 | $7,984 | $4,385 | $8,252 |
| **Juvenile Intensive Supervision Probation (JISP) Days** | $2,092 | $1,769 | $0 | $0 | $0 | $1,961 |
| **Electronic Monitoring Days** | $29 | $0 | $0 | $0 | $94 | $0 |
| **Detention Days** | $118,682 | $80,720 | $50,662 | $66,186 | $96,103 | $89,893 |
| **Commitment Days** | $38,783 | $10,014 | $0 | $6,191 | $199,742 | $69,008 |
| **Parole Days** | $98 | $0 | $3,287 | $3,361 | $0 | $0 |
| **Department of Corrections Days** | $0 | $0 | $0 | $0 | $6,567 | $0 |
| **Jail Days** | $400 | $0 | $2,400 | $0 | $8,241 | $0 |
| **Residential (RTC, RCCF, Group) Days (n=40[8])** | $126,608 | $451,984 | $3,608[9] | $375,888 | $158,588 | $298,316 |
| **TOTAL** | $320,362 | $579,106 | $71,617 | $479,526 | $493,051 | $479,145 |
| | **Pilot** | **Comparison** | **Difference** | | | |
| **CAREER TOTAL** | $885,030 | $1,537,777 | $652,747 | | | |
| **POST ADMISSION TOTAL** | $564,668 | $958,671 | $394,003 | | | |

*Source: Integrated Colorado Online Network (ICON); Colorado Trails.*

[8] There were seven youth in the Comparison Group for whom residential services could not be verified. Their "pairs" in the Pilot Group were excluded from this analysis.

[9] Since admission to residential treatment usually triggered a discharge for the Pilot Program, Residential Days accumulated During Enrollment are likely an artifact of the program not formally discharging a youth on the day s/he was admitted to residential care. For all intents and purposes, we might consider those days as occurring After Discharge.

## Summary

It is clear from the data presented above that there are fewer career filings, adjudications/convictions, probation days and RTC days accrued by those youth who participated in the Community based pilot projects than those youth who received more traditional mental health services. These reductions led to substantially less costs for the pilot youth. The career costs for the pilot youth were 42% lower than for the comparison youth. Similarly, the post- admission costs were 41% lower for the pilot youth. The cost differential was most substantial in the "during enrollment" period, with the comparison group accruing almost seven times more costs than the pilot youth. This interruption in cost accumulation indicates a substantial program success. The pilot youth cost $407,909 less than their matched pairs enrolled in community mental health center services during the "during enrollment" period.

In the one-year post discharge period, the pilot youth incurred five percent more cost than the comparison youth. The long-term effectiveness of the program is an aspect that must be addressed in future planning (i.e. the upcoming RFP process). These data from the predictive analyses suggest that enhanced substance abuse treatment and emphasis on program completion may contribute to better outcomes. Additionally, transitional services may need to be developed to assist the youth and their families following discharge from the community based pilot programs.

To implement the above changes further cross-system integration will be required. Both pilot programs will need to continue to collaborate with criminal/juvenile justice, substance abuse, child welfare, educational, and mental health agencies to ensure furthered success. Furthermore, it is essential that both programs continue to involve families and the youth in service planning and delivery and employ both evidence based and promising practices in the services they deliver.

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# I. INTRODUCTION AND BACKGROUND

This is the three-year performance evaluation report of the implementation of The Community Based Management Pilot Programs for Persons with Mental Illness Who are Involved in the Criminal Justice System. The pilot programs targeted youth who have co-occurring mental health[10] and criminal/juvenile justice involvement. These programs were designed specifically to reduce incarceration, out of home placement, and hospitalization rates. The pilot programs were established by HB (House Bill) 00-1034 in fiscal year 2000 (Appendix A). They were the direct result of the work of the Colorado Legislative Interim Committee on the Study of the Treatment of Persons with Mental Illness in the Criminal Justice System, established by Colorado House Joint Resolution 99-1042 (1999). HB 00-1034 includes the definition of Eligible Juvenile Offender and details specific requirements such as the types of services the programs were to provide, and the need to collaborate with community partners both programmatically and financially.

Centennial Mental Health Center (Centennial MHC) in Sterling (rural) and Colorado Access/Access Behavioral Care (ABC) in Denver (urban) are the sites of the two pilot programs that were funded by the legislation. The Sterling program is a community mental health center based treatment team housed at Centennial MHC and was implemented in March 2001. The Denver program, a Multisystemic Therapy Team (MST) operated by The University of Colorado Hospital (UCH), was implemented in October 2001.

Centennial Mental Health Center in Sterling (rural) and Colorado Access/Access Behavioral Care (ABC) in Denver (urban) are the sites of the two pilot programs that were funded by HB 00-1034.

This report includes

- Brief descriptions of the pilot programs and the services they provided and
- Evaluation findings for the pilot programs and the youth and families who were enrolled in them.

## EVALUATION QUESTIONS AND STUDY DESIGN[11]

The program evaluation design was built around what is known about the economic and social effects of youth who fail to transition to adulthood successfully. Table 1 was replicated from a landmark review of outcomes for youth in transition to adulthood and includes information for key outcome domains across several studies (Vander Stoep, Davis, and Collings, 2000, p. 13). Studies are listed in approximate decreasing order of mental health severity, with the McGraw study subjects having the most severe mental health-related disorders and treatment history. As Table 1 displays dramatically, serious emotional disturbance (SED) has severe consequences on youth achieving important developmental expectations. For example, 81% of the general US population completes high school, compared to only 61% of youth in the community with a psychiatric disorder and

[10] The Community Based Pilot Program uses the definition of Serious Emotional Disturbance (SED) used by the Colorado Division of Mental Health, which is determined by an algorithm based on Colorado Client Assessment (CCAR) data. First, the youth must have a mental health diagnosis as his or her primary diagnosis (excluding Mental Retardation, Alcohol or Drug Use, Autism, or Dementia as the primary diagnosis). Second, the youth must also meet any one (1) of three (3) criteria: Problem Severity, Problem Type, or Residential (youth lives out of the family home).

[11] Please see Appendix B for the Evaluation Plan, Design, and Methods.

23% of youth who have received long-term residential treatment. The youth enrolled in the Community Based Pilot Programs demonstrated a wide range of mental health problem severity and many had received residential treatment and special education. Since all had co-occurring involvement with the juvenile justice system and many also had substance abuse problems, very conservatively, 40% of these youth were not expected to graduate from high school.

The youth enrolled in the Community Based Pilot Programs demonstrated a wide range of mental health problem severity and many had received residential treatment and special education. Since all had co-occurring involvement with the juvenile justice system and many also had substance abuse problems, very conservatively, 40% of these youth were not expected to graduate from high school.

> Youth with SED enter the transition phase [to young adulthood] delayed in their developmental maturation and face additional challenges relative to their non-disabled peers. As a group, they are undereducated, underemployed and have limited social supports. Homelessness, delinquent activity, and drug use are prevalent (Davis, Vander Stoep, Evens, and Taub, 1997, p. 400).

**Table 1. Outcomes for Young Adults: Comparison of U.S. General Population to Youth with Different Levels of Psychiatric Impairment and Prior Treatment of Youth Ages 18-21 Years.**

| Outcome Domain | U.S. General Pop. 12 | McGraw: Received Long Term Residential Treatment13 | NACTS: Half Received Residential; Half Received Special Ed. 14 | NLTS: Seriously Emotionally Disturbed (SED); All Received Special Ed.15 | CICS: Community Study: Youth W/ Psychiatric Disorders16 | CICS: Community Study: Youth W/O Psychiatric Disorders[17]11 |
|---|---|---|---|---|---|---|
| **High School Completion** | 81% | 23% | 26% | 48% | 61% | 93% |
| **Employed** | 78% | 46% | 52% | 48% | 59% | 80% |
| **Resides w/ Family** | 56% | 43% | 45% | 45% | 68% | 74% |
| **Recent Police Incident/Arrest** | 13% | 37% | 22% | 21% | 24% | 11% |
| **Pregnancy for Women** | 17% | 50% | 38% | 48% | 29% | 14% |

*Source: Vander Stoep, et al., 2000, p. 13.*

Appendix C contains additional references to relevant literature not cited herein.

[12] U.S. Department of Commerce, 1993.
[13] The McGraw Center Study, Vander Stoep, 1992.
[14] The National Adolescent and Child Treatment Study, Kutash, Greenbaum, Brown, and Foster-Johnson, 1995.
[15] National Longitudinal Transition Study, ; Valdes, Williamson, and Wagner, 1990.
[16] Children in Community Study, Vander Stoep, Bresford, Weiss, McKnight, Cauce, and Cohen, 2000.
[17] Greenwood, P. et al., Diverting Children from a Life of Crime: Measuring Costs and Benefits. Rand, 1996. Cohen, M. The Monetary Value of Saving a High-Risk Youth. Journal of Quantitative Criminology, Vol. 14, No. 1, 1998.

## KEY EVALUATION QUESTIONS

Questions for this third program year focused on outcomes for youth, their accumulated costs in selected public systems, and the factors that contributed to youths' success in the pilot programs and after discharge.

2. What were the sociodemographic, juvenile justice, mental health, and substance use characteristics of youth who were admitted to the pilot programs?
3. What outcomes were achieved by youth at the time of discharge and after discharge from services?
4. Were the program costs per youth in the two pilot programs offset by the savings (cost averted) from reductions in out-of-home placement, arrests, probation, filings, incarceration, etc?
6. What characteristics of youth at admission, including their prior criminal and service system utilization, predicted success in the pilot programs?
7. What characteristics of youth, including their pilot program success, predicted longer-term outcomes?

And finally, as part of our ongoing effort to document and improve program quality, we asked:

8. What were the caregivers' and youths' perceptions of the pilot programs?

# II. DESCRIPTIONS OF THE PILOT PROGRAMS

## THE PILOT PROGRAMS

This section highlights the main characteristics of the Sterling Pilot Program and the Denver UCH MST Team. The reader is referred to last year's annual report for more in-depth information about the pilot programs and their implementation (Coen, 2003). Table 2 describes the services provided by each pilot.

## SUMMARY: CENTENNIAL MENTAL HEALTH CENTER'S STERLING PILOT PROGRAM

The Sterling Pilot Program is a community mental health center based treatment team that provides the majority of its services in a group format. The pilot program includes a low client to staff ratio of one Intensive Case Manger/Clinician to four to six youth. The co-located state certified alcohol and drug program provides substance abuse screening for all youth entering the program and, if appropriate, completes evaluations. In addition, both of the pilot program's full time staff have completed Certified Alcohol Counselor (CAC II) Training and conduct the Substance Abuse Treatment Group. Bi-lingual services are available and provided as needed. More information about the Sterling Pilot Program can be found in Appendix D.

Other notable features of the Sterling Pilot Program include:

- Ongoing collaboration with the community, especially Probation and Sterling Youth Services, which houses the Diversion Program.
- A mandatory formal Transitional Program that assists youth in their transition from services.
- A mandatory seven-week Multi-Family Parenting Group. (14 families completed the Multi-Family Parenting Group Program during the '04 fiscal year.)
- Motivational Interviewing, a directive, client-centered counseling style for eliciting behavior change by helping clients to explore and resolve ambivalence.
- Treatment groups for parents with drug or alcohol problems.

- Staff members who work with families on parenting skills in the home and help families obtain needed community resources. Home-based staff are available four evenings per week.
- Since spring 2004, all youth who are enrolled in the pilot program are eligible to receive mentoring services (approximately 30-40% of the pilot youth are receiving mentoring services.)

## SUMMARY: DENVER/ABC'S UCH MST (MULTISYSTEMIC THERAPY) TEAM

The Substance Abuse and Mental Health Service Agency (SAMHSA) has identified Multisystemic Therapy (MST), which usually targets youth who are violent and abuse substances, as a Model Program (http://modelprograms.samhsa.gov/pdfs/FactSheets/Mst.pdf). Although studies have been also conducted with youth who with mental health disabilities (Henggeler et al., 2003; Stanley et al., 2004), MST's effectiveness for these youth has not yet been documented.

The Denver pilot program is a certified MST program that meets all the requirements specified by Colorado MST (COMST) Support Services, including, but not limited to:

- Services delivered in the natural environment (i.e., most frequently the home, but also schools and the larger community).
- Family-based treatment with an emphasis on parental empowerment to modify the natural social network of their children.
- Small family to therapist ratio of 3-5 families per therapist.
- Intensive ongoing therapist and supervisor training as well as weekly case by case consultation with the COMST Consultant.

In addition, Denver's staffing configuration includes an MST-trained psychiatrist to provide additional support for the mental health component. Staffing also includes a half-time Spanish-speaking Family Resource Coordinator (FRC) position that provides assistance with data collection and case management responsibilities, including assisting families with basic needs by providing, food, clothing, public assistance, housing and other resources. The position also provides advocacy, facilitates families' enrollment into community and government programs, manages complaints, and provides support during crises.

**Table 2. Services Provided by the Sterling Pilot Program and the Denver UCH MST Program.**

| Program Characteristics | Sterling Pilot Description of Services | Denver UCH MST Description of Services |
|---|---|---|
| **Number Admitted/Discharged from program inception through 6/30/2004** | 62/52 | 62/54 |
| **General** | Individual, family, group, multi-family, and substance abuse treatment, including Spanish Speaking capability. | Special focus on youth with co-occurring mental health and substance abuse disorders. |
| **Group Therapy & Activities** | 68.5% of Services. Includes: Substance Abuse, Anger Management, Vocational/Job Skills, Strategies for Self Improvement and Change, Mentoring, Tutoring, Psycho-educational, Boys/Girls Groups, Community Service, Recreational, Drop-in Center, Study Hall and Motivational Interviewing. | Service Not Provided |
| **Individual Therapy & Intensive Case Management** | 19.1% (plus 1.3% Drug Testing and Medical Services) | 10% Case Management with Stakeholders |
| **Family Therapy** | 11.1% of services are family based (one-fourth of these, 2% of total, are provided in the home).<br>Mandatory Multi-Family Parenting Group<br>Home-based services | 90% of total services provided – in home or in the community; About 50%, with full family configuration; 10% with caregivers and youth, without siblings; and 30% with caregivers only. |
| **Psychiatric, Medication, Crisis** | All provided through Centennial MHC Psychiatry and Emergency. | Provided as needed through Team's Medical Director, UCHSC Dep't of Psychiatry and UCH Child Outpatient Clinic. |
| **Transitional Services** | Consists of 2 sessions per week for eight weeks post completion of primary program. | Therapists strive to initiate telephone contact with families 1, 3, and 6 months post completion of program. |
| **Respite Services** *(Provides therapeutic relief, rest, or break for families and care givers of children – in-home or respite worker's home)* | Service Not Provided | Provided through the Mental Health Center of Denver (MHCD) by contract with ABC (Access Behavioral Care). |
| **Mentoring Services** *(Support for youth being transferred from residential treatment or inpatient settings to home/community to reduce out-of-home placement.)* | Provided through the Hospitalization Alternatives for Youth Program | Service Not Provided |
| **Service Integration** | State-licensed Alcohol/Drug Treatment Program (A/DTP). Youth are screened for substance abuse, have access to services of Certified Alcohol Counselors. Program staff has frequent contact with Probation Officers, coordinating interventions/sharing information. | As part of the MST treatment philosophy and protocols, the MST Therapist takes responsibility for all families' needs in all service areas, including substance abuse. As such, service integration is a de facto feature of the MST intervention. |

*Source: Interviews; Document Reviews.*

Overall, the Sterling Pilot Program and the Denver UCH MST Program differ from one another in important ways. The Sterling Pilot Program is an office-based model where youth-based group interventions account for the majority of services. The family based services provided by the Sterling Pilot Program have increased from 5% to 11% in the last year, demonstrating their continued response to the recommendations from the program evaluation. Only 2% of services are provided in the home. Denver's MST program is an intensive family therapy,

non-office-based intervention, with 90% of their services provided in a family context, usually in the family home.

Table 3 describes the program completion and length of stay characteristics for each program. Again, there are substantial differences between the two programs, with the Denver UCH MST Program having a 73% program completion rate and the Sterling Pilot Program a 37% rate. Furthermore, the average Length of Enrollment for Sterling youth who completed the program is more than two times that of the Denver UCH MST Program. It is likely that the length of enrollment and program completion are related to one another.

**Table 3. Program Enrollment Characteristics of the Youth who were Admitted to the Sterling Pilot Program and the Denver UCH MST Program.**

| Program Characteristics | Sterling Pilot | | Denver UCH MST | |
|---|---|---|---|---|
| **Number Admitted through 6/30/2004** | 62 | | 62 | |
| **Number Discharged through6/30/2004** | 52 | | 54 | |
| | Number (n=52) | Percent | Number (n=52) | % |
| **Reason for Discharge (available data)** | | | | |
| Completed Program* | 19 | 36.5% | 38 | 73.1% |
| Dropped Out | 18 | 34.6% | 8 | 15.4 |
| Terminated (Out-of-home placement, moved out of area) | 15 | 28.8% | 6 | 11.5 |
| Total | 52 | | 52 | |
| **Average Length of Enrollment for all Youth** | 6.9 Months | | 4.1 Months | |
| **Average Length of Enrollment for Youth who Completed the Program** | 8.8 Months | | 4.4 Months | |

** Based on clinician judgment (see Appendix E for program criteria for discharge).*
*Source: CCAR; CBPR.*

# CHARACTERISTICS OF YOUTH ADMITTED TO THE PILOTS

## SOCIODEMOGRAPHIC AND ADMINISTRATIVE CHARACTERISTICS

Table 4 displays characteristics of program enrollees. The data were extracted from the Colorado Client Assessment Record (CCAR), which was completed by staff at admission. Information about the CCAR can be found in Appendix F. Youth admitted to the Sterling Pilot Program were, on average, older, more white, much more likely to have been court-ordered and referred to the program by Probation, and less likely to have been insured by Medicaid than the Denver UCH MST youth. Denver youth were 85% Hispanic or African American and more likely to have been referred by Social Services and outpatient mental health agencies. Less than 20% of youth in both sites were living with both parents at admission.

**Table 4. Selected Characteristics of Youth Admitted Sterling Pilot and Denver UCH MST.**

| Selected Characteristic | Sterling Pilot n=61 | Sterling Pilot % | Denver UCH MST n=62 | Denver UCH MST % |
|---|---|---|---|---|
| **Gender: Male** | 45 | 73.8% | 28 | 75% |
| **Mean Age at Admission *** | 15.7 Years | | 15 Years | |
| Ages 13 or younger | 4 | 6.6% | 12 | 19.4% |
| Ages 14-15 | 23 | 37.7% | 27 | 43.5% |
| Ages 16-17 | 33 | 45.9% | 22 | 35.5% |
| **Ethnicity** | | | | |
| White (Non-Hispanic) | 35 | 57.4% | 9 | 14.5% |
| Hispanic | 22 | 36.1% | 23 | 37.1% |
| African American | 1 | 1.6% | 25 | 40.3% |
| Multiracial | 3 | 4.9% | 5 | 8.1% |
| **Residence at Admission** | | | | |
| At Home | 60 | 98.4% | 55 | 88.7% |
| Residential Mental Health | 0 | 0,0% | 2 | 3.2% |
| Inpatient Psychiatry | 0 | 0.0% | 3 | 4.9% |
| Homeless Shelter | 0 | 0.0% | 1 | 1.6% |
| **Who Lived with Youth** | | | | |
| Mother | 36 | 59.0% | 29 | 46.8% |
| Father | 5 | 8.2% | 8 | 12.9% |
| Both Parents | 12 | 19.7% | 10 | 16.1% |
| Guardian/Other Relative | 4 | 6.6% | 12 | 19.4% |
| **Admission/Legal Status** | | | | |
| Voluntary | 6 | 9.8% | 33 | 53.2% |
| Court Directed Voluntary[18] | 52 | 85.2% | 24 | 38.7% |
| **Primary Referral Sources** | | | | |
| Probation/Parole | 41 | 67.2% | 4 | 6.5% |
| Law Enforcement | 0 | 0.0% | 7 | 11.3% |
| Court | 11 | 18.0% | 1 | 0.0% |
| Social Services | 5 | 8.2% | 24 | 38.7% |
| Inpatient Psychiatry | 1 | 1.6% | 6 | 9.7% |
| OP Mental Health | 0 | 0.0% | 9 | 14.5% |
| **Medicaid Status** | 4 | 7% | 42 | 67.7% |

*Source: CCAR; Integrated Colorado Online Network (ICON); Colorado Trails.*
*Numbers and percentages do not necessarily add to total n due to missing data or other responses.*

## MENTAL HEALTH AND SYSTEM UTILIZATION CHARACTERISTICS

Table 5 shows that two-thirds of the Sterling and almost all of the Denver youth met the State eligibility criteria for Serious Mental Disturbance (SED) at admission. Forty-three percent of the Denver youth and one-fourth of the Sterling youth were prescribed psychiatric medication at the time of admission. The predominant diagnoses in Sterling were mood disorders (e.g., major depression, bipolar disorder), which accounted for almost half the youth, and disruptive disorders (e.g., conduct disorder). About one-third of the Denver youth had disruptive disorders. Denver also had five youth with either psychotic or personality disorders.

We also used information recorded on the CCAR to estimate the extent to which these youth had been or were involved with multiple systems prior to or at the time of their admission to the pilots. The majority of youth in

[18] CCAR admission category that includes treatment as a condition of probation/parole or deferred prosecution.

both sites (56% in Sterling and 80% in Denver) had at least some prior involvement with the mental health system. One-third (20) of the Denver youth had been or were involved with three systems: mental health, child welfare, and juvenile justice. Of these 20 youth, seven had been or were involved with four systems by being identified as having a Significant Identifiable Emotional Disability (SIED) in school.

**Table 5. Selected Mental Health and System Utilization Characteristics of Youth Admitted Sterling Pilot and Denver UCH MST.**

| Selected Characteristic | Sterling Pilot n=61 | Sterling Pilot % | Denver UCH MST n=62 | Denver UCH MST % |
|---|---|---|---|---|
| **Met State SED Eligibility Criteria**[19] | 40 | 65.6% | 56 | 90.3% |
| **Prescribed Psychiatric Medication** | 15 | 24.6 | 27 | 43.5% |
| **Primary Diagnosis** | | | | |
| Disruptive Disorders | 21 | 34.4% | 20 | 32.3% |
| Mood Disorders | 28 | 45.9% | 9 | 14.5% |
| Anxiety | 2 | 3.3% | 3 | 4.8% |
| Attention Deficit | 3 | 4.9% | 8 | 12.9% |
| Psychotic Disorder | 0 | 0.0% | 3 | 4.8% |
| Personality Disorders | 0 | 0.0% | 2 | 3.2% |
| Adjustment Disorders | 6 | 9.8% | 10 | 16.1% |
| Mental Retardation | 0 | 0.0% | 1 | 1.6% |
| Other | 1 | 1.6% | 2 | 3.2% |
| Missing | 0 | 0.0% | 4 | 6.5% |
| Total | 61 | 100% | 62 | 100% |
| **Cross System Involvement in Child-Serving Systems *** | | | | |
| Any Prior Mental Health Service ( (Inpatient, Outpatient, 24-Hour, Partial Care) | 34 | 55.7% | 49 | 79.0% |
| Mental Health and Child Welfare | 5 | 8.2% | 24 | 38.7% |
| Mental Health, Child Welfare, and Juvenile Justice | 5 | 8.2% | 20 | 32.3% |
| Mental Health, Child Welfare, Juvenile Justice, and Significant Identifiable Emotional Disability (SIED) in by the Colorado Dept. of Education | 0 | 0.0% | 7 | 11.3% |

** The CCAR does not distinguish between previous or concurrent services.*
*Source: CCAR.*

[19] To meet SED eligibility criteria, youth must have a mental health diagnosis as his or her primary diagnosis (excluding Mental Retardation, Alcohol or Drug Use, Autism, or Dementia as the primary diagnosis). Second, the youth must also meet any one (1) of three (3) criteria: Problem Severity, Problem Type, or Residential (youth lives out of the family home).

# III. PROGRAM EVALUATION FINDINGS

While the Pilot Programs are funded as a single program, two distinct interventions were developed and implemented in different geographic regions of Colorado. Therefore, the majority of the program evaluation findings will be presented separately for each site. However, the results of the overall cost analysis for the combined sites are presented below, before the site-specific findings.

## OVERALL COST ANALYSIS

Cost serves as a proxy for system utilization and provides a method to determine the impact of an intervention effort (Greenwood, Dedrick, Friedman, Kutash, and Brown, 1998). As such, it is a useful way to describe an individual's involvement with public systems (Shern, Coen, Bradley, Vasby, and Wilson, 1990; King, Gaines, Lambert, Summerfelt, and Bickman, 2000). By comparing a youth's costs prior to completion of a particular intervention to their costs following completion, it is possible to determine if the program produced savings and could therefore be considered successful with that youth. The cost methodology operates on the following assumption:

- For youth with serious emotional disturbance, delinquent behavior, and substance abuse, we can expect their system involvement to continue or escalate over time. Therefore, the best predictor of their future behavior is their past behavior. Youth prior to intervention, therefore, can serve as their own comparison following intervention. [20]

## COSTS ACCUMULATED BY ALL YOUTH PRIOR TO ADMISSION TO THE PILOT PROGRAMS

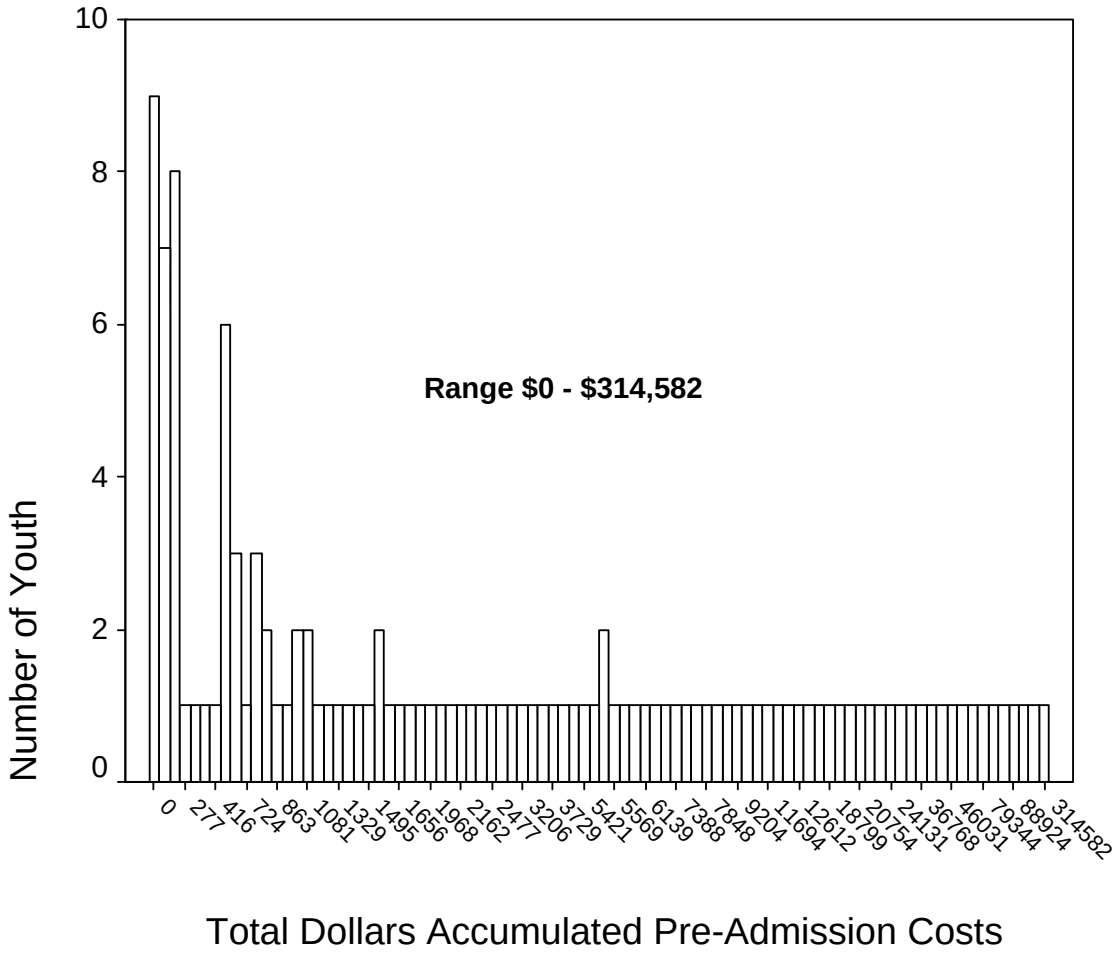
Data were collected from youth, families, agencies, and two primary state databases: the Integrated Colorado Online Network (ICON)[21] and the Colorado Department of Human Services' Trails[22] database to document selected events that could be assigned dollar amounts[23]. Events were documented in youth corrections (e.g., detention and commitment days, residential treatment), mental health (e.g., inpatient psychiatric care), child welfare (e.g., residential treatment, group home placement), judicial (e.g., regular and intensive probation, electronic monitoring, filings, findings, sentences), and in Sterling and Denver juvenile diversion episodes. Because of issues of confidentiality, workload, and the availability of accurate data, efforts were focused on documenting out of home placement and the highest cost events in each of these systems. ***There are other important events in each system that have not been documented (e.g., other out of home placements and core services in child welfare, outpatient mental health services[24], case management and SB-94 services in youth corrections). In addition, there are costs accrued to other systems, e.g., special education, that were not included. As such, all cost estimates should be considered conservative.***

[20] While the program evaluation was not funded to include a comparison group, efforts are underway at the Divisions of Mental Health and Criminal Justice to identify a comparable comparison group for these youth.
[21] Filing, adjudication, sentencing, and conditions of sentencing data were obtained through the Judicial Branch's Integrated Colorado Online Network (ICON) provided by the Division of Criminal Justice's CICJIS Research System.
[22] Colorado Trails is the Department of Human Services' automated data system that documents Child Welfare and Youth Corrections events.
[23] Costs for individual events were determined through contact with individual agencies. Appendix G contains specific information regarding sources.
[24] The Division of Mental Health is in the process of determining out patient mental health services utilization.

***Distribution of Costs.*** One hundred twenty-four youth admitted to the pilot programs since the programs' inception in 2001 accumulated over 2 million dollars in costs prior to admission to the pilots. Accumulated costs ranged from nine youth (7.3%) with no pre-admission costs to one youth who accrued over $314,000 in costs. Figure 1 shows the distribution of the total pre-admission costs for all youth admitted to the pilots. As shown, costs are represented throughout the range, except for some grouping at the lower levels.

**Figure 1. Total Pre-admission Costs for All Youth Admitted to Pilot Programs (n=124).**

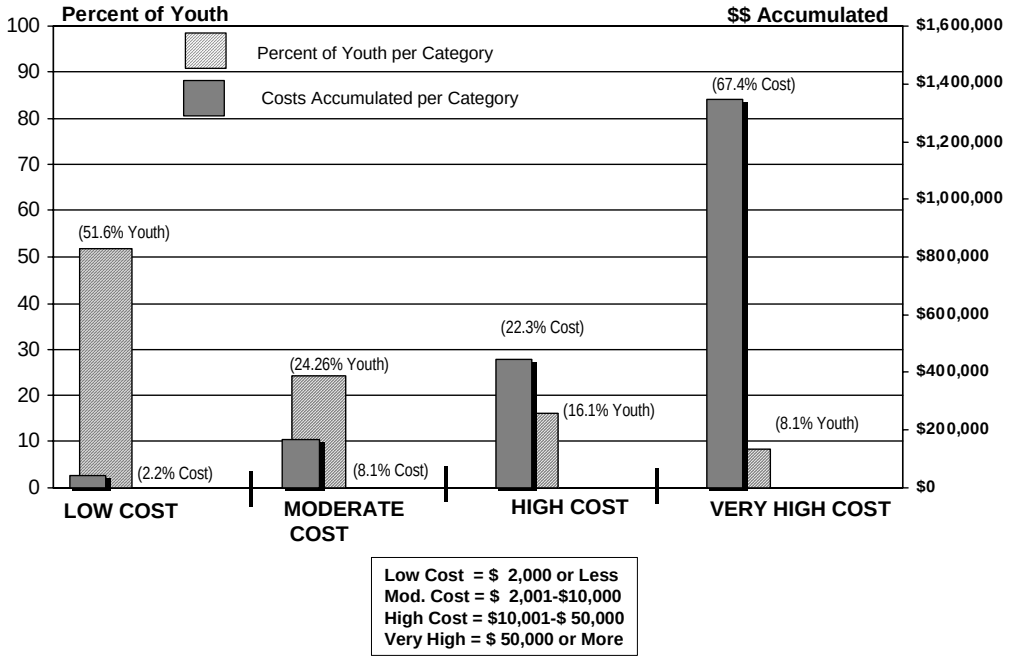
*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Documentation of Cost Events.*




***Cost Categories.*** Costs were then categorized to simplify their representation of youths' involvement in various systems. The categories used in this analysis are displayed in Figure 2 and were developed based on prior research (Dresser and Utsumi, 1991) and by looking at the array of actual costs. Figure 2 displays the proportion of youth and accumulated pre-admission costs that were documented for all 124 program participants in four cost categories. As shown, 51.6% of the youth who entered the program had a prior history of relatively low cost and system utilization and as a group accounted for only a small percent (2.2%) of the total pre-admission costs. In contrast, 10 youth, only 8.1% of program participants, accounted for 67.4% of all pre-admission system costs.

Ten (10) youth, only 8.1% of program participants, accounted for 67.4% of all pre-admission system costs.

**Figure 2. Pre-Admission Costs by Cost Categories for All Youth Admitted to Pilots: Percent of Youth and Costs Accumulated per Category (n=124).**




*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Documentation of Cost Events.*

## *PRE-ADMISSION COSTS INCURRED BY SELECTED PUBLIC SYSTEMS*

It is well known that youth with co-occurring mental health and juvenile justice involvement receive services and accumulate costs in several child-serving systems. Table 8 displays the distribution of pre-admission costs for human services and juvenile/criminal justice systems for the same 124 youth represented in Figures 1 and 2 above. As shown, 43% of the pre-admission costs were accrued in the child welfare system, primarily for residential mental health treatment, followed by the mental health system for inpatient psychiatric hospitalization (23.9%), and the youth corrections system (23.1%).

**Table 6. Pre-Admission and Selected Public Systems Costs for All Youth Admitted to Pilot Programs (n=124).**

| Public System | Cost Event Type | Pre- Admission Costs | % Pre-Admission Costs |
|---|---|---|---|
| **Dept of Human Services** | | | |
| Child Welfare | Residential Treatment (RTC); Other group | $852,308 | 42.6% |
| Youth Corrections | Detention, Commitment, Parole, Residential Treatment (RTC); Other group | $462,726 | 23.1% |
| Mental Health | Inpatient Psychiatric | 478,888 | 23.9% |
| **Colorado Judicial Branch** | Probation, Intensive Prob. Electronic Monitoring, Filings | $141,948 | 7.1% |
| **Municipal (Sterling & Denver)** | Diversion, Arrests, Community, Service, Jail | $64,547 | 3.2% |
| **Dept of Corrections** | Adult Incarceration | 0 | 0.0% |
| **Total** | | $2,000,397 | 100.0% |

*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Documentation of Cost Events.*

## COST ACCRUED BEFORE ADMISSION, DURING ENROLLMENT, AND AFTER DISCHARGE FROM THE PILOT PROGRAMS

When assessing changes in accumulated costs over time it is important that all individuals included in the analyses be evaluated for the same length of time. This ensures that all youth have an equal amount of time before and after discharge to accrue the events that will be measured. In preparation for this analysis, we calculated the time since discharge to June 30, 2004, the close of the state fiscal year, for each youth admitted since the pilot was implemented in 2001. We then sorted them into six-month time periods (see Table 7 below). **We then chose to examine 12-month outcomes for the group of youth who had been discharged for at least twelve months: This included 68 youth (36 in Sterling and 32 in Denver), bolded in Table 6 below.** The reason for this decision was to ensure that we had sufficient numbers of youth with which to conduct analyses and who were sufficiently past discharge so that we could get a sense of long-term outcomes. While we had longer-term outcome data for some youth, the total numbers would have been considerably lower and distributed less evenly by site. **This group of 68 youth will also be referred to as the outcome sub-sample.**

**Table 7. Number and Percent of Youth by Time Period Post-Discharge (n=124).**

| Time Period Post-discharge | n | % |
|---|---|---|
| Still enrolled or less than 6 Mos. Post-discharge | 41 | 33.1% |
| 6 Mos. or longer and less than 12 Mos. | 15 | 12.1% |
| **12 Mos. or longer and less than 18 Mos.** | **21** | **16.9%** |
| **18 Mos. or longer and less than 24 Mos.** | **16** | **12.9%** |
| **24 Mos. or longer** | **31** | **25.0%** |
| Total | 124 | 100% |

*Source: Program Evaluation Database.*

The same cost-related events that were described earlier were documented during youths' enrollment and after their discharge from the pilot programs. Table 8 shows the distribution of these costs by system for the 68 youth in the outcome sub-sample for three periods:

- ***Pre-Admission*** - twelve months prior to admission to the program.
- ***During Program Enrollment*** - the period between admission and discharge, including program costs.
- ***Post-Discharge*** - the twelve months after discharge from the program.

And

- ***Total Pre-Discharge*** -the sum of the pre-admission and during enrollment periods, and
- ***The Savings*** - the difference between the pre-discharge and the post-discharge.

The youth in the outcome sub-sample accrued over .5 million dollars in 12-month pre-admission costs. Youth corrections accounted for over 40% of the pre-admission cost followed by child welfare, which accounted for more than one-third of the costs for residential services.

The costs accumulated during youths' enrollment in the pilot programs amounted to almost three-quarters of a million dollars. This was primarily due to the heavy investment by community mental health in the pilot programs, which represented 73.7% of the overall costs. **Costs to other systems were very low while youth were enrolled in the pilot programs.**

In the 12-month post-discharge period, youth accumulated approximately 1 million dollars in costs, about twice the amount documented in the 12-month pre-admission period. Together, child welfare and youth corrections accounted for almost all of the 12-month post discharge costs. Child welfare accounted for 45.1% in residential treatment costs. Youth corrections accounted for 41.8%.

To determine whether the program saved dollars, however, we must also account for the program enrollment period, during which over .5 million dollars was spent on the program itself. These are significant system costs that likely would have accrued in other systems, if not mental health.. **To calculate savings, therefore, we used the end of the intervention as the starting point for assessing outcomes and summed the "12-Month Pre-Admission" costs and "During Program Enrollment" cost periods.** Although the length of enrollment in the program varied for each youth, it was conceptually equivalent (i.e., the intervention) for each youth, regardless of his/her time in the program or reason for discharge. We then subtracted the accumulated costs at 12 months post-discharge from the total pre-discharge costs.

The outcome sub-group of 68 youth showed an overall savings of almost $300,000, with reductions in psychiatric inpatient and various events in the Colorado Judicial Branch. The savings in the Division of Mental Health are due to the termination of pilot program expenditures (note: outpatient mental health costs could not be documented pre- or post- intervention). **There was, however, a notable increase in the amount and proportion of dollars expended post-discharge by the Division of Child Welfare for placement in residential treatment centers (RTCs). Costs to the Division of Youth Corrections increased as well, accounting for a larger proportion of post-discharge costs than pre-discharge costs. It should be noted that while some youth have aged out of the youth serving systems, both youth and adult offenses and sentences are included in the ICON database, ensuring that we have accounted for adult criminal justice events as well.**

**Table 8. Combined Sites: Accumulated Costs in Selected Public Systems Twelve Months Pre-Admission, During the Program, and at Twelve Months Post Program Discharge for All Youth Twelve Months or More Post-Discharge (n=68).**

| | | 12Months Pre-Admission | | During the Program | | Total Pre-Admission Plus During the Program | | 12Months post-Discharge | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Public System | Cost Event Type(s) | Pre-Admission Costs | % Pre-Admission Cost | During Program Cost | % During Program Cost | Total Pre Dis-charge (Pre+During Program Cost) | % Total Pre-Discharge (Pre+During) Pro-gram Cost | Post-Discharge Cost | % Post-Dis-charge Cost | Savings (+) or Loss (-)* |
| **Dept. of Human Services** | | | | | | | | | | |
| **Child Welfare** | RTC, RCCF, Group Home | $185,484 | 36.9% | $20,500 | 2.8% | $205,984 | 16.6% | $430,664 | 45.1% | -$224,680 |
| **Youth Corrections** | Detention, Commit-ment, Parole | $206,350 | 41.0% | $107,786 | 14.6% | $314,136 | 25.3% | $399,348 | 41.8% | -$85,212 |
| **Mental Health** | IP Psychiatric, Pilot Program** | $37,729 | 7.5% | $26,919 | 3.6% | $64,647 | 5.2% | $36,757 | 3.8% | $27,890 |
| **Colorado Judicial Branch** | Probation, Intensive Prob., Electronic Monitoring, Filings | $0 | 0.0% | $544,000 | 73.7% | $544,000 | 43.8% | $0 | 0.0% | $544,000 |
| **Municipal** | Diversion, Arrests, Jail | $65,308 | 13.0% | $34,821 | 4.7% | $100,128 | 8.1% | $65,788 | 6.9% | $34,341 |
| **Department of Corrections** | Adult Incarcera-tion | $8,305 | 1.7% | $3,727 | 0.5% | $12,032 | 1.0% | $16,765 | 1.8% | -$4,733 |
| **Total** | | $0 | 0.0% | $0 | 0.0% | $0 | 0.0% | $6,567 | 0.7% | -$6,567 |
| | | **$503,175** | **100%** | **$737,752** | **100%** | **$1,240,928** | **100%** | **$955,889** | **100%** | **$285,039** |

* *Savings/Loss = (Costs accrued twelve months pre-admission + costs accrued during the program) minus the costs accrued in the twelve months post-discharge.*
*** The Pilot Program cost is $8000 per youth, $4000 from the State General Fund and $4000 from local match (Colorado Department of Human Services, 2000).*
*Source: Integrated Colorado Online Network (ICON); Colorado Trails; Documentation of Cost Events.*

## COST SAVINGS

### *YOUTH WHO SAVED VS. YOUTH WHO DID NOT SAVE TWELVE MONTHS POST DISCHARGE*

As we learned from examining the distribution of pre-admission costs for all youth admitted to the pilot programs, the costs incurred by a few youth accounted for a substantial proportion of overall costs. Table 9 below shows that in just the first year after discharge, 72% of the youth demonstrated savings of $731,846. This was more than enough to cover not only their own $392,000 in program cost (at $8,000 per youth) but also the program costs for the entire sub-sample of 68 youth ($544,000). The average savings for these youth was almost $15,000 per youth. Yet, Table 8 also shows that 28% of the youth in the pilot programs did not show any savings. On average, these 19 youth incurred over $23,000 per youth in costs, which diminished the overall savings of the cohort by over $400,000.

In just the first year after discharge, 72% of the youth demonstrated savings of $731,846. This was more than enough to cover not only their own $392,000 in program cost ($8,000 per youth) but the program costs for the entire sub-sample of 68 youth ($544,000).

**Table 9. Number and % of Youth who Demonstrated Savings or No Savings: Sum of Post-Discharge Costs by Category (n=68).**

| Savings Category | n | % of n | Amount of Savings or No Savings (-) | Average Per Youth |
|---|---|---|---|---|
| **Savings** | 49 | 72.1% | +$731,846 | $14,936 Saved |
| **No Savings** | 19 | 27.9% | -$446,807 | $23,516 Not Saved |
| **Net Savings** | 68 | 100% | $285,039 | $ 4,192 Saved |

*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Documentation of Cost Events.*

### *PREDICTING YOUTH WHO ARE MORE LIKELY NOT TO SAVE*

As shown, the majority of youth achieved savings which, when totaled, were more than sufficient to cover the program costs for all youth ($544,000) in the outcome sub-sample. However, the more than $400,000 in costs accumulated by the youth who did not realize savings, reduced the overall cost outcomes substantially. This raised important questions about how programs can anticipate which youth are more likely to realize savings and which will not save dollars over time. Analyses therefore, were conducted to:

- Identify youth who experienced program success, or, alternatively, those at the greatest risk for having negative program outcomes (i.e., from admission to discharge); and
- Identify youth who had positive long-term outcomes or, alternatively, were at the greatest risk for having negative outcomes at twelve months.

We were able to identify predictors of program success and long-term outcomes. Higher costs twelve months post-discharge were associated with several variables, not completing the pilot program, higher substance use, more episodes of detention, and more inpatient psychiatric days prior to admission. The results of these analyses are presented in detail for each site in other sections of this report.

These analyses gave us specific information that was then used to identify youth likely to accumulate high costs twelve months post-discharge. We also gained a better understanding of the effects that youth with certain characteristics have on outcomes. Using this analysis, we identified 11 youth who did not complete the program and who had other predictive characteristics prior to admission to the program. The 11 youth predicted to have high costs accounted for very high losses at twelve months post-discharge, over $300,000, an average of over $30,000 per youth.

The 11 youth predicted to have high costs accounted for very high losses twelve months post-discharge, over $300,000, an average of over $30,000 per youth.

**Table 10. The Effect of High Risk Youth on Overall Program Savings for Youth Twelve Months Post-Discharge.**

| | n=68 | Total Cost 12 Months Pre- Admission | Total Cost During Program | Total Cost 12 Months Post - Discharge | Pre -Cost minus Post-Costs | Average Savings (+) or Losses (-) per Youth |
|---|---|---|---|---|---|---|
| **Total for 57 Youth** | 57 | $388,103 | $140,404 | $505,992 | $78,611 | $1,379 |
| **Total for 11 "Predicted" Youth** | 11 | $115,073 | $53,348 | $449,896 | -$337,571 | -$30,688 |

Using this knowledge can help state oversight staff and local treatment teams understand the effects that youth with differing characteristics have on the program and its long-term outcomes and plan accordingly, either by managing to the risk, i.e., limiting the number of slots for the most at-risk youth, or by intensifying the services provided to them.

## *PROJECTED COSTS WITHOUT INTERVENTION AND NET SAVINGS*

Another way to look at program savings is to estimate the projected 12-month post discharge costs if all youth had continued on their criminal trajectory. Since the literature is unable to provide us with such estimates and, as stated earlier, these high-risk youth are expected to continue to incur costs, we can use them as their own controls. Based on the average cost per youth for youth who did not show savings, **these youth would be expected to accumulate costs of over 1.5 million dollars. Instead, this cohort of 68 youth demonstrated net savings of over $285,000.**

These youth would be expected to accumulate costs of over 1.5 million dollars. Instead, this cohort of 68 youth demonstrated net savings of over $285,000.

**Table 11. Projected Costs and Savings Twelve Months Post-Discharge (n=68).**

| | n | % of n | Average Per Youth | Total |
|---|---|---|---|---|
| **Projected Post-Discharge Costs for all Youth if none saved** | 68 | 100% | $23,516 | $1,599,088 |
| **Net Savings** | 68 | 100% | | $285,060 |

*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Documentation of Cost Events.*

## *RELATIONSHIP OF SAVINGS TO PROGRAM COMPLETION*

The predictive analysis also showed a strong relationship between program completion and whether youth accumulated higher costs twelve months post-discharge. We examined the specific relationship between savings and program completion for the outcome sub-sample. The relationship was significant ( $\chi^2$ (1, $N$ = 68) =12.34, $p$ < .01). Table 11 demonstrates this relationship using dollar amounts; with **youth who completed the program showing net savings of over $300,000 and youth who did not complete the program showing a net loss of $25,996.**

**Table 12. Cost Savings and Program Completion (n=68).**

| Program Completion Status | n=68 | Savings | Losses | Net Total |
|---|---|---|---|---|
| **Completed Program** | 37 | $376,082 | -$65,017 | $311,102 |
| **Did not Complete Program** | 31 | $355,764 | -$381,791 | -$25,996 |

*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Documentation of Cost Events.*

## COSTS AVERTED AFTER DISCHARGE FROM THE PILOT PROGRAMS

It is also important and necessary to consider potential lifetime social costs in a study such as this. It is estimated that the lifetime social costs associated with a "typical career criminal" are over $1 million; of a heavy drug user, approximately $500,000; and of a high school dropout more than $300,000 (Cohen, M., 1996). All youth enrolled in the pilot programs are at high risk for any of these negative circumstances given their age of onset, histories and mental health issues. In addition, costs to victims of crimes can be overwhelming as well.

> Personal crime is estimated to cost **$105 billion,** annually in medical costs, lost earnings, and public program costs related to victim assistance. (National Institute of Justice, 1999, Introduction)

This section documents some of the costs averted by this cohort of youth.

### *VICTIM COSTS AVERTED*

Table 12 shows the victim costs for the crimes for which youth received filings in the twelve months prior to enrollment, during enrollment, and in the twelve months post-discharge. **Savings from the pre- to post-discharge periods amounted to $287,400 (**National Institute of Justice., 1999) for crimes for which estimates of victim costs were available**.**

**Table 13. Victim Costs Pre- and Post-Discharge, based on Filings to which Victim Costs could be Attributed, for Youth who are Twelve Months or more Post-Discharge (n=68).**

| Crime | $$ Losses per Victimization | # Filings 12 Months Pre-Admission | Total Cost 12 Months Pre- Admis-sion | # Filings During Enrollment | Total Cost During Enrollment | # Filings 12 Months Post-Discharge | Total Cost 12 Months Post Dis-charge | Savings (+) or Loss (-) |
|---|---|---|---|---|---|---|---|---|
| **Aggravated Assault** | $24,000 | 11 | $264,000 | 6 | $144,000 | 12 | $288,000 | $120,000 |
| **Other Assault** | $2,000 | 0 | $0 | 0 | $0 | 1 | $2,000 | -$2,000 |
| **Rape** | $87,000 | 0 | $0 | 0 | $0 | 1 | $87,000 | -$87,000 |
| **Burglary** | $1,400 | 7 | $9,800 | 0 | $0 | 2 | $2,800 | $7,000 |
| **Theft** | $8,000 | 8 | $64,000 | 3 | $24,000 | 7 | $56,000 | $32,000 |
| **Motor Vehicle Theft** | $3,700 | 2 | $7,400 | 3 | $11,100 | 3 | $11,100 | $7,400 |
| **Arson** | $109,000 | 2 | $218,000 | 0 | $0 | 0 | $0 | $218,000 |
| **Fraud** | $8,000 | 0 | $0 | 0 | $0 | 1 | $8,000 | -$8,000 |
| **Total** | | 30 | $563,200 | 12 | $179,100 | 27 | $454,900 | $287,400 |

* *Savings/Loss = (Costs accrued twelve months pre-admission + costs accrued during the program) minus the costs accrued in the twelve months post-discharge.*
*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Documentation of Cost Events.*

## *SAVINGS FROM GENERAL EDUCATION DEGREES (GEDs)*

Twelve youth received their GED during enrollment or after discharge from the pilot programs. As shown earlier, in Table 1, at least 40% of these youth would not have been expected to graduate from high school. **Because these youth are no longer at risk of dropping out of school, this represented potentially $3.6 million in savings to society.**

## *CRIMINAL CAREER COSTS AVERTED*

Nine youth who had received filings prior to or during enrollment in the pilot programs did not receive any filings twelve months post-discharge from the programs. Based on their expected trajectory, we assumed that all of these youth would have continued a criminal career. **These criminal careers that were averted resulted in savings of over $9 million dollars.**

**Taken together, these averted costs amounted to savings of almost $13,000,000.**

## SUMMARY OF OVERALL COST RESULTS

The overall cost analysis for the pilot programs supported several important findings:

- The overall program showed savings of almost $300,000 at twelve months post-discharge.
- Seventy-two percent (72%) of program participants who were discharged from the pilot programs twelve months or longer were successful with regard to savings.

- Youth who completed the pilot program showed significantly more savings than youth who did not complete the program.
- The highest pre-admission costs were associated with "deep end" out-of-home services, both mental health (e.g. residential treatment , inpatient hospitalization) and juvenile justice related (e.g., incarceration in juvenile correctional facilities).
- When compared to their projected (theoretical) costs, this cohort of 68 youth demonstrated an overall savings of almost three-quarters of a million dollars, well over their $544,000 in program costs.
- Costs averted and actual savings amounted to overall savings of almost $13,000,000.
- A small percentage of youth in the high or very high cost utilization categories accounted for a large percentage of all costs. As a result, these youth dramatically affected any calculation of savings that masked the savings of other youth.

**It is this last point that guided a special analysis that aimed to identify the pre-admission characteristics of youth who were most likely to incur higher costs after their discharge from the pilot programs. As a result of the marked differences in the mental health and juvenile justice characteristics of youth served in the Sterling and Denver pilot programs, these analyses needed to be conducted at the site-level. Therefore the results of those analyses are included in the following site-level sections instead.**

# THE STERLING PILOT PROGRAM

## YOUTH AT ADMISSION: SYSTEM INVOLVEMENT AND SERVICE USE

This section describes the juvenile justice, mental health, and substance use characteristics of the youth who were admitted to the Sterling Pilot Program.

### *JUVENILE JUSTICE INVOLVEMENT*

Four types of events were examined to capture youths' delinquent behavior and juvenile/criminal justice system involvement prior to admission to the pilot programs. These events included:

- Diversion program contacts
- Juvenile justice prosecution related events
  - Filings - intent by the state district attorney to prosecute a case
  - Adjudications – a juvenile conviction
  - Crime Severity – violent/non-violent; felony/misdemeanor
- Sentencing related events, including
  - Juvenile Probation, including Intensive Supervision Probation (ISP)
  - Probation Revocations
  - Electronic Monitoring
  - Jail
- Facility days
  - Detention, Commitment (Division of Youth Corrections)
  - Adult Incarceration (Department of Corrections)

The events are documented on Table S-1. These data were extracted from the Judicial Branch's Integrated Colorado Online Network (ICON) provided by the Division of Criminal Justice's CICJIS Research System, which includes adult offenses, and the Colorado Trails Database, which documents Youth Corrections events, including residential treatment. Each documented event was coded to identify when the event started and ended relative to each youth's admission and discharge from the pilot program.

**Table S- 1. Sterling Pilot Program: Juvenile Justice Involvement for All Youth Prior to Admission (n=62).**

| Event | Events Begin/Occur Before Admission To Program (n=62) | |
|---|---|---|
| | **Number of Youth** | **%** |
| **No Pre-Admission Events** | 3 | **4.8%** |
| **Age at First Filing** | **Mean Age = 14.99 Years ; Range 10.4 to 18.8 Years** | |
| **Diversion Program Contact** | 53 | 85.5% of Youth Admitted |
| **Filings, Adjudications** | | |
| Filings | 37 | 59.7% of Youth Admitted |
| Adjudications/Convictions | 20 | 54.1% of Youth w/ Filings |
| **Severity of Crimes for which youth were Adjudicated** | **Number of Adjudicated Youth (n=20)*** | **% of Adjudicated Youth** |
| Non-Violent Misdemeanor | 14 | 70% |
| Non-Violent Felony | 5 | 25% |
| Violent Misdemeanor | 1 | 5% |
| Violent Felony | 2 | 10% |
| **Probation** | **Number of Youth (n=62)** | **% of Youth Admitted** |
| Regular Probation Sentence | 19 | 30.6% |
| Juvenile Intensive Supervision Probation Sentence (JISP) | 4 | 6.5% |
| Probation Revocations | 8 | 12.9% |
| Electronic Monitoring | 2 | 3.2% |
| **Youth Corrections** | | |
| Detention | 19 | 30.1% |
| Commitment | 1 | 1.6% |
| Parole | 1 | 1.6% |
| **Department of Corrections** | 0 | 0.0% |
| **Jail** | 6 | 9.7% |

*Source: Integrated Colorado Online Network (ICON); Colorado Trails Sterling Youth Services.*
** Numbers and percentages do not equal total as youth may be adjudicated for more than one class of crime.*
*Due to low n, please use caution in interpretation, particularly with regard to percents.*

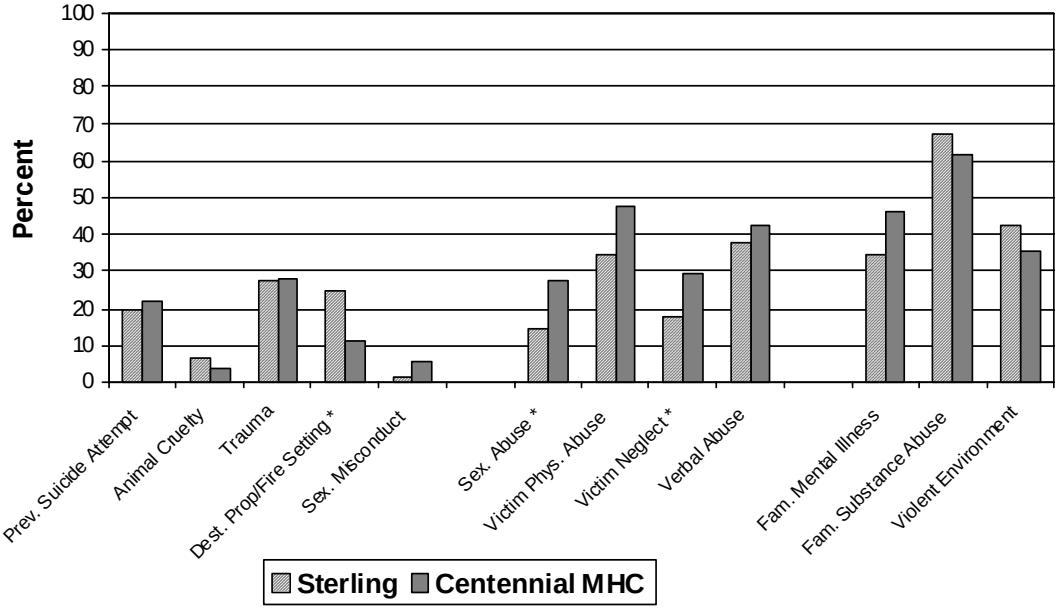
## *MENTAL HEALTH STATUS, RISK FACTORS, AND SYSTEM UTILIZATION*

Two approaches were used to profile the mental health severity and service utilization of youth entering the Sterling Pilot Program: Scores on the Colorado Client Assessment Record (CCAR) and the documentation of mental health inpatient and residential services.

The CCAR is a multidimensional screening and assessment instrument that assesses individual and family risks, problem severity and level of functioning, and strengths. A CCAR is completed on all youth entering the public mental health system. A copy of the CCAR and a description of the CCAR scales can be found in Appendix F.

**High risk factors:** Figure S-1 displays the proportion of youth for whom risk factors were identified by clinicians on the CCAR *at admission* for Sterling pilot youth and for all youth with Serious Emotional Disturbance (SED) who were admitted to the Centennial MHC, the public community mental health center that serves the northeast region of Colorado, during FY 2003. Figure S-1 shows that the Sterling pilot youth demonstrated risk factors similar to those identified in youth with SED who were admitted to the larger Centennial MHC. With regard to a very serious risk factor, fire setting/destruction of property, pilot youth show significantly higher rates than youth with SED admitted to Centennial MHC.

**Figure S- 1. Mean Percent of Youth with High-Risk Behaviors, Experiences, Abuse, and Family Factors at Admission: Sterling Pilot Program[1] (n=61) Compared to FY 2003 Admissions of Youth with SED for Centennial Mental Health Center (n=298).[2]**




*p < .05 for Independent t-tests.*

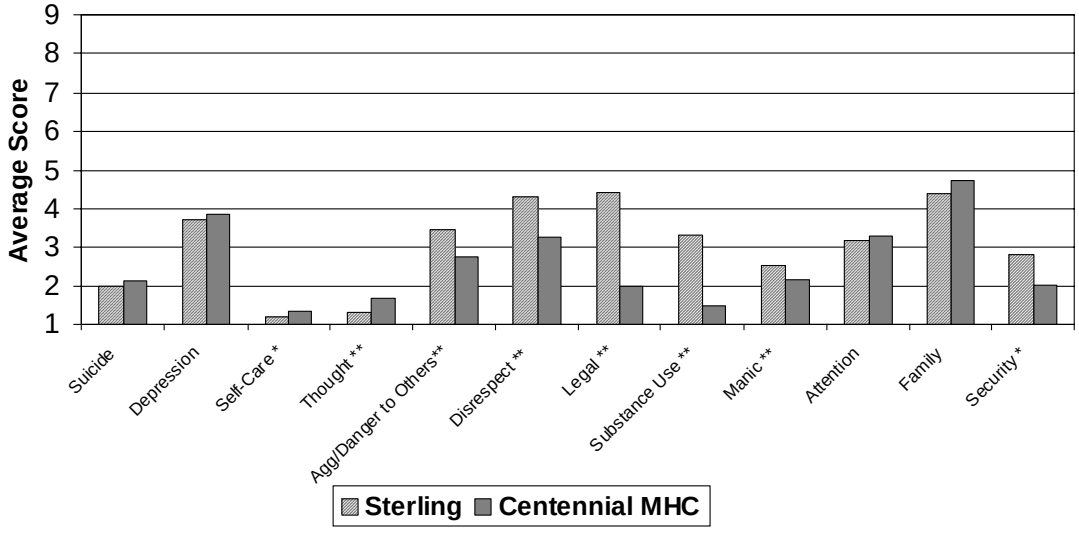
[1] *Source: Colorado Client Assessment Record, Program Evaluation Database (based on available CCARs).*

[2] Colorado Division of Mental Health, CCAR Database FY 2003.

**Problem Severity:** Figure S-2 compares the Sterling pilot youth with Centennial MHC on 12 problem scales selected by the Division of Mental Health (DMH) as being the most reliable (Altschul, Wackwitz, Coen, and Ellis, 2001; Wackwitz and Ellis, 2002). Figure S-2 shows that Sterling pilot youth were significantly more severe than the larger group of youth with SED who were admitted to Centennial MHC on 6 of the 12 scales, i.e., Aggressive/Dangerous, Disrespect, Legal, Substance Use, and Security. With a few exceptions, Self-Care

and Thought, the pilot youth displayed problems as severe as the larger Centennial group in the remaining domains.

**Figure S- 2. Key CCAR Problem Scales at Admission: Sterling Pilot Program (n=61)[1] compared to Youth with SED Admitted to Centennial Mental Health Center (n=296).[2]**




*Scores range from 1 to 9, with higher scores indicating greater severity*
*p < .05 for Independent t-tests; ** p < .01 for Independent t-tests*

*[1] Colorado Client Assessment Record, Program Evaluation Database*
*[2] Colorado Division of Mental Health, CCAR Database FY 2003*

**Utilization of Inpatient and Residential Services:** The evaluator extracted the number of residential days from the Colorado Trails Database[25] for those youth from whom an appropriate Release of Information was obtained. If release was authorized, inpatient hospital days were collected directly from the Colorado Mental Health Institutes and Centennial MHC.[26] Table S-2 shows the number of youth for whom specific mental health events were documented. Over 10% of the pilot youth had experienced residential treatment prior to admission to the pilot and 8% had documented inpatient episodes. A few youth had documented stays in Residential Child Care Facilities (RCCFs) or other group homes.[27]

[25] Colorado Trails is the Department of Human Services' automated data system. It features a statewide client/server network that links state and county child welfare agencies and the Division of Youth Corrections.
[26] In more than half the cases, the caregiver/guardian or the youth him/herself refused to provide consent for the evaluator to collect inpatient information. In addition, both Colorado Mental Health Institutes require youth age 15 or older to authorize the release of information directly. While inpatient hospitalization data collection improved dramatically over that of previous years, estimates of inpatient days are still likely an underestimate.
[27] Residential Child Care Facility care (RCCF) is generally used when the higher-level services of a Residential Treatment Center (RTC) are not required and therefore, may not be indicative of mental health need. These facilities are included as mental health utilization as it is the best fit.

**Table S- 2. Sterling Pilot Program: Mental Health Related Events for All Youth Prior to Admission.**

| Mental Health Events | Before Program Admission | |
|---|---|---|
| | Number of Youth (n=62) | Sterling % |
| **Residential Treatment** (RTC) | 7 | 11.3% |
| **Inpatient Psychiatric** | 5 | 8.1% |
| **Group/Residential Child Care Facilities** (RCCF) | 4 | 6.5% |

*Source: Colorado Trails, Centennial Mental Health Center, Colorado Mental Health Institutes.*
*Due to low number of cases, caution is recommended in interpretation.*

## *SUBSTANCE USE*

Two strategies were used to measure youths' substance use at admission: the CCAR, which was described in the previous section, and the Adolescent Self-Assessment Profile II (ASAP II) (Wanberg, 1999). The ASAP II, which is completed by youth, is a commonly used instrument in Colorado that provides a detailed picture of attitudes, behaviors, and circumstances surrounding substance use. More information about the ASAP II may be found in Appendix H. Youth in the community pilot program completed the ASAP II when they enrolled in the pilot program and a short modified version when discharged.

As part of the rigorous psychometric work conducted on the ASAP II, the developers identified the level of substance abuse that is expected from specific groups. This allows us to compare the youth in the Sterling pilot to similar youth in the community. With the exception of the Pro-Social Scale, the community group for all scales in Table S-3 was comprised of Colorado youths referred to the Treatment Accountability for Safer Communities (TASC) program after a screening by a juvenile justice agency indicated possible alcohol and other drug problems. The comparison group for the Pro-Social Scale is a combination of juvenile justice and non-juvenile justice involved adolescents. Table S-3 compares Sterling Pilot youth to these groups in four ASAP II domains at admission ( a description of the scales is included in Appendix H):

- Drug/Alcohol Exposure; how much opportunity youth have had to use drugs and alcohol.
- Drug/Alcohol Involvement; frequency of use prior to admission.
- Family Dysfunction; family problems and relationships.
- Pro-Social Attitudes and Behaviors; positive attitudes, strengths.

As shown, Sterling pilot youth reported a higher level of exposure to and involvement with drugs than the TASC youth, who had already been identified as being likely to have substance abuse problems. They also reported a higher level of family dysfunction and lower levels of self-identified pro-social attitudes and behaviors than the TASC youth.

**Table S- 3. Sterling Pilot Program: Mean ASAP II Scale Scores for Youth at Admission and Mean Range of the Comparison Group.**

| ASAP II Scale[28] | Maximum Score | Sterling Admission Mean (n=57) | Comparison Group Mean Range * (Wanberg, 1999) |
|---|---|---|---|
| **Drug Exposure** | 38 | 16.2 | 11-12 |
| **Drug Involvement** | 19 | 5.1 | 4 |
| **Family Adjustment** | 21 | 17.5 | 12-13 |
| **Pro-social Attitudes & Behaviors** | 59 | 26.8 | 38-39 |

**ASAP scores are usually presented in the form of normed percentile or decile scores. For ease of understanding, however, these scores are being presented as means. Since the actual mean was not reported for the comparison group, ranges are presented.*
*Source: ASAP II evaluation database; ASAP II Manual (Wanberg, 1999).*

With regard to substance use at admission, CCAR data were used to compare Sterling pilot youth to youth with SED who had been admitted to Centennial MHC during FY 2003; the results are shown in Table S-4. Pilot youths' use of alcohol, marijuana, amphetamines, and hallucinogens was dramatically higher than that of the comparison group. Both groups demonstrated low or no usage of heroin, barbiturates, or inhalants.

**Table S- 4. Sterling Pilot Program: Percent of Youth Who Use Specific Substances at Admission Compared to Youth with SED Admitted to Centennial Mental Health Center.**

| Substance | Sterling Admission (n=61) % | Centennial MHC (n=277) % |
|---|---|---|
| **Alcohol** ** | 57.4 | 17.3% |
| **Marijuana** ** | 67.2 | 14.1% |
| **Amphetamines**** | 13.1 | 1.4% |
| **Hallucinogens*** | 6.6 | .4% |

** p < .05 ** p < .01*
*Source: CCAR evaluation database, Colorado Division of Mental Health, CCAR Database FY 2003.*

## SUMMARY OF ADMISSION CHARACTERISTICS

Overall, youth in the Sterling Pilot Program demonstrated a high level of severity upon admission to the program. Specifically,

- Pilot youth demonstrated serious risk factors at rates similar to those of youth with SED who had been admitted to Centennial MHC.
- Youth were significantly more severe than their Centennial counterparts in 6 of 12 CCAR domains, including Legal, Substance Use, Aggressive/Dangerousness, Disrespect, and need for Security.

[28] Each of the ASAP II Scales has a different number of items and is scored additively. Therefore, the magnitude of the mean of one scale cannot be compared to the magnitude of another scale.

- Youths' use of alcohol, marijuana, amphetamines, and hallucinogens was significantly higher than that of their Centennial MHC comparison group.
- About 18% of the youth had prior residential mental health services or other residential services.

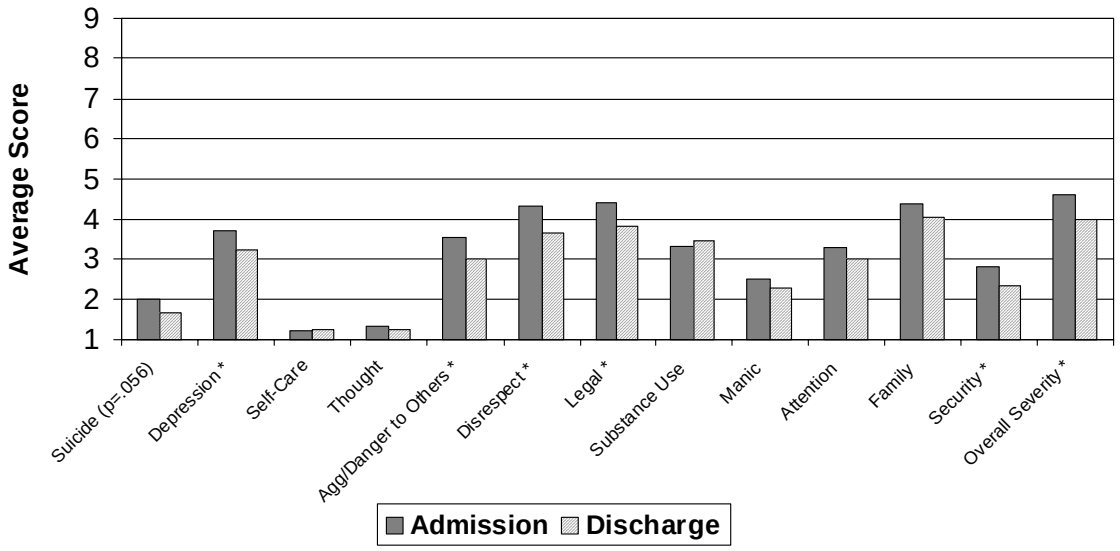
## OUTCOMES AT DISCHARGE

This section presents youth outcomes at discharge in three areas: Mental Health, Substance Use, and School Enrollment.

### *MENTAL HEALTH*

Figure S-3 displays the key CCAR Problem Severity Scales for all youth who have been discharged from the pilot program for whom both admission and discharge CCARs were available. Overall, youth showed significant improvement in the following areas: Depression, Aggressive/Dangerous, Disrespect/Socialization, Legal, and Security domains, and their Overall Problem Severity. As to the other areas, improvement in Suicidality approached significance, but changes in Substance Use, Manic Behavior and Attention (i.e., inability to concentrate/attend to tasks) were found not to be significant, However, these non-significant changes were in the expected direction.

**Figure S- 3. Sterling Pilot Program: Change in Problem Severity from Admission to Discharge (n=47).**




*Scores range from 1 to 9, with higher scores indicating greater severity.*
** p < .05 for Paired t-tests.*
*Source: Colorado Client Assessment Record, Program Evaluation Database.*

## *SUBSTANCE USE*

The CCAR was used to document changes in alcohol, marijuana, amphetamines, or hallucinogens use from admission to discharge. There were no significant differences found for any of these substances.

## *SCHOOL ENROLLMENT AND COMPLETION*

Information was collected to determine whether youth were enrolled in school at admission and discharge. Table S-5 shows seven different paths that were documented. Being enrolled, graduating High School, or receiving a GED were considered positive outcomes; not being enrolled was considered a negative outcome. **Of the 47 youth for whom school enrollment was documented at discharge, 36 youth (76.6%), demonstrated positive outcomes at discharge.**

### Table S- 5. Sterling Pilot Program School Enrollment/Completion Status from Admission to Discharge.

| School Enrollment/Completion Path | Sterling Admission (n=47) | Sterling % |
|---|---|---|
| **Positive Outcomes** | | |
| Enrolled at Admission – Enrolled at Discharge | 14 | 29.8% |
| Unknown at Admission – Enrolled at Discharge | 15 | 31.9% |
| Not Enrolled at Admission – Enrolled at Discharge | 2 | 4.3% |
| Not Enrolled at Admission – GED at Discharge | 5 | 10.6% |
| **Total** | **36** | **76.6%** |
| | | |
| **Negative Outcomes** | | |
| Not Enrolled at Admission – Not Enrolled at Discharge | 3 | 6.4% |
| Enrolled at Admission – Not Enrolled at Discharge | 2 | 4.3% |
| Unknown at Admission – Not Enrolled at Discharge | 6 | 12.8% |
| **Total** | **11** | **23.4%** |

*Source: Community Based Pilot Record evaluation database.*

### SPECIAL NOTE ABOUT GEDs

School enrollment and completion information was obtained for 21 youth after their discharge from the program. When combined with all available data, we were able to document that 12 youth received GEDs either during enrollment or after discharge from the Sterling Pilot Program. As was shown earlier in Table S-1, conservatively, 40% of youth with SED, would not have been expected to graduate from high school. Those who have received GEDs are no longer at risk for non-completion.

## *SUMMARY OF OUTCOMES AT DISCHARGE*

Youth in the Sterling Pilot Program improved in several areas from admission to discharge.

- Youth significantly improved in 5 CCAR domains: Depression, Aggressive/Dangerous, Disrespect, Legal, and need for Security.
- Seventy-seven percent (77%) of youth demonstrated positive school enrollment outcomes at discharge.
- Twelve (12) youth received GEDs during or after enrollment.
- There were no documented improvements in the Substance Use area from admission to discharge.

## OUTCOMES AT TWELVE MONTHS FOR YOUTH DISCHARGED TWELVE MONTHS OR LONGER

**This section presents findings regarding 12-month outcomes for the 36 youth who had been discharged from the Sterling Pilot Program for at least twelve months.** These youth were similar to the larger group of 62 youth with regard to several key characteristics, including age, gender, ethnicity, program completion rates, and length of enrollment.

When assessing outcomes after discharge it is important to ensure that all youth have an equal amount of time after discharge to accrue the events that will be measured. Table S-6 shows the time, in six-month increments, since discharge for all 62 youth who had been admitted to the Sterling pilot since the program's inception in 2001. Approximately one-third of the youth were either still enrolled or had been discharged less than six months. **We chose to examine 12-month outcomes, i.e., accumulated events and costs within the first year post-discharge, for youth who had been discharged for at least twelve months as of June 30, 2004 (i.e., even if a youth had been discharged for two years, we only looked at the first year of outcomes). T**hese are bolded in Table S-6.

**Table S- 6. Sterling Pilot Program: Number and Percent of Youth by Time Period Post-discharge since Program Implementation.**

| Time Period Post-discharge | Sterling (n=62) | Sterling % |
|---|---|---|
| Still Enrolled or Less than 6 Mos. Post-discharge | 22 | 35.5% |
| 6 Mos. or longer and less than 12 Mos. | 4 | 6.5% |
| **12 Mos. or longer and less than 18 Mos.** | **9** | **14.5%** |
| **18 Mos. or longer and less than 24 Mos.** | **4** | **6.5%** |
| **24 Mos. or longer** | **23** | **37.1%** |
| Total | 62 | 100% |

*Source: Program Evaluation Database.*
*Youth who were included in 12-month outcome analyses are bolded.*

Twelve-month outcomes were studied in the following areas:

- Selected costs incurred by human services, judicial, and municipal systems prior to youths' discharge from the pilot program and at the end of the first year post-discharge.
- Savings realized by youth.
- Number of specific events and number of youth that incurred these events during the same time periods.
- Predictors of program success and outcomes 12 months post-discharge as determined by analyses that identified the characteristics and experiences of youth to predict their success in the pilot program and their longer-term outcomes.

## *COSTS AT TWELVE MONTHS POST-DISCHARGE*

### SELECTED JUVENILE/CRIMINAL JUSTICE, MENTAL HEALTH, AND CHILD WELFARE COSTS: PRE-, DURING, AND POST-DISCHARGE[29]

**This section presents findings regarding accumulated costs** in selected state juvenile/criminal justice, mental health, and child welfare agencies **for the 36 youth who had been discharged from the Sterling Pilot Program for at least twelve months**. Table S-7 shows the distribution of these costs by system for three time periods:

- ***Pre-Admission*** - twelve months prior to admission to the program.
- ***During Program Enrollment*** - the period between admission and discharge, including program costs.
- ***Post-Discharge*** - the twelve months after discharge from the program.

And

- ***Total Pre-Discharge*** -the sum of the pre-admission and during enrollment periods.
- ***The Savings*** - the difference between the pre-discharge and the post-discharge periods.

Youth accrued over $350,000 in 12-month pre-admission costs, almost 50% of which were in the Division of Youth Corrections and close to 30% in the child welfare system for residential services. The costs accumulated during youths' enrollment amounted to almost .5 million dollars, primarily due to the heavy investment by community mental health in the pilot programs, 63.2% of the overall costs. While costs to other systems were relatively low while youth were enrolled in the pilot programs, the Division of Youth Corrections incurred almost $100,000 in costs during this period, 21% of the overall costs. In the 12-month post-discharge period, youth accumulated approximately .5 million dollars in costs, about 38% more than documented in the 12-month pre-admission period, with most costs occurring in child welfare for residential treatment services (53.1%) and youth corrections (25.2%).

[29] Costs for individual events were determined through contact with individual agencies. Appendix G contains specific information regarding source.

To determine whether the program saved dollars, however, we must also account for the program enrollment period, during which almost $300,000 was spent on the program itself. These were significant system costs that likely would have been accrued in other systems, if not mental health. **Therefore, to calculate savings we used the end of the intervention as the starting point for assessing outcomes and summed the "12-Month Pre-Admission" costs and "During Enrollment" cost periods.** Although the length of enrollment in the program varied for each youth, it was conceptually equivalent (i.e., the intervention) for each youth, regardless of his/her time in the program or reason for discharge. We then subtracted the accumulated costs at twelve months post-discharge from the total pre-discharge costs.

**The Sterling youth showed an overall savings of approximately $340,000, with reductions in the youth corrections, mental health, and municipal systems.** The savings in the Division of Mental Health are due to the termination of pilot program expenditures (note: outpatient mental health costs were not documented pre- or post-intervention). **There was a notable increase in amount and proportion of dollars expended by the Division of Child Welfare, primarily for placement in residential treatment centers (RTCs) and small increases in the judicial and adult corrections systems**. It should be noted that while some youth have aged out of the youth serving systems, both youth and adult offenses and sentences are included in the ICON database, ensuring that we have accounted for adult criminal justice events. **Total costs for these youth decreased from over $800,000 pre-discharge to $496,000 post-discharge, a reduction of 39% between the pre-discharge and post-discharge periods**.

**Table S- 7. Sterling Pilot Program: Accumulated Costs in Selected Public Systems Twelve Months Pre-Admission, During the Program, and at Twelve Months Post Program Discharge for All Youth Twelve Months or More Post-Discharge (N=36).**

| | | 12 Months Pre-Admission | | During Admission | | Total Pre-Admission Plus During Admission | | 12 Months Post-Discharge | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Public System | Cost Event Type(s) | Pre-Admission Costs | % Pre-Admission Cost | During Program Cost | % During Program Cost | Total Pre Discharge (Pre+During Program) Cost | % Total Pre Discharge (Pre+During Program) Cost | Post-Discharge Cost | % Post-Discharge Cost | Savings (+) or Loss (-)* |
| **Dept of Human Services** | | | | | | | | | | |
| Child Welfare | RTC, RCCF, Group Home | $102,992 | 28.7% | $16,564 | 3.6% | $119,556 | 14.7% | $263,384 | 53.1% | -$143,828 |
| Youth Corrections | Detention, Commitment, Parole | $166,272 | 46.4% | $95,790 | 21.0% | $262,063 | 32.2% | $125,048 | 25.2% | $137,014 |
| Mental Health | IP Psychiatric, | $32,229 | 9.0% | $26,919 | 5.9% | $59,147 | 7.3% | $0 | 0.0% | $288,100 |
| | Pilot Program** | $0 | 0.0% | $288,000 | 63.2% | $288,000 | 35.4% | $0 | 0.0% | $288,000 |
| **Colorado Judicial Branch** | Probation, Intensive Prob. Electronic Monitoring, Filings | $6,918 | 1.9% | $2,895 | 0.6% | $9,813 | 1.2% | $15,517 | 3.3% | -$5,704 |
| **Municipal** | Diversion, Arrests, Jail | $50,128 | 14.0% | $25,559 | 5.6% | $75,687 | 9.3% | $41,034 | 8.7% | $34,653 |
| **Department of Corrections** | Adult Incarceration | $0 | 0.0% | $0 | 0.0% | $0 | 0.0% | $6,567 | 1.4% | -$6,567 |
| **Total** | | $358,539 | 100.0% | $455,727 | 100.0% | $814,266 | 100.0% | $474,065 | 100.0% | $340,458 |

* *Savings/Loss = (Costs accrued twelve months pre-admission + costs accrued during the program) minus the costs accrued in the twelve months post-discharge.*
*** The Pilot Program cost is $8,000 per youth, $4000 from the State General Fund and $4000 of local match (Colorado Department of Human Services, 2000)*
*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Documentation of Cost Events*

## SAVINGS REALIZED BY YOUTH

A limitation of looking at costs for service systems was that it emphasized the most costly expenditures made on behalf of a few youth that masked the gains made by the majority of the youth in the pilot program. Table S-8 below, shows that the majority of the youth (78%) in the program had far fewer system costs post-discharge than pre-discharge. The difference between these two periods more than offsets the total program costs ($288,000) for the cohort of 36 youth.

The majority of the youth (78%) in the program had far fewer system costs post-discharge than pre-discharge.

In contrast, for less than one-fourth of the youth in the program (22%), the post-discharge costs were more than double the pre-discharge costs. The high post-discharge costs of these few youth diminished the total program success because they took away from the savings seen for 78% of the participants. **The question raised then is, what can we learn about the differences between youth who saved dollars and youth who did not save twelve months post-discharge from the pilot program. A later section on predictors of success addresses this question.**

### Table S- 8. Sterling Pilot Program: Saving vs. No Savings for Individual Youth between Pre-Discharge and Post-Discharge Periods (n=36).

| Savings Status | n | % of n | Total Pre- Costs | Total Post-Costs | Pre-Cost less Post-Costs |
|---|---|---|---|---|---|
| **Savings** (post costs less than pre costs) | 28 | 77.8% | $647,071 | $108,213 | $538,858 |
| **No Savings** (post costs more than pre costs) | 8 | 22.2% | $167,195 | $365,594 | -$198,399 |
| **Total** | 36 | 100% | $814,266 | $473,807 | $340,459 |

*Note: Pr- discharge period costs include all costs twelve months prior to admission, costs incurred during program participation and $8,000 in program cost per participant. Post-discharge period costs include all system costs for the twelve months following discharge.*
*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Documentation of Cost Events.*

## RELATIONSHIP BETWEEN SAVINGS AND PROGRAM COMPLETION

We examined the specific relationship between savings and program completion;. The relationship was significant ($\chi^2$ (1, $N$ = 36) =10.23, $p$ < .001). Table S-9 demonstrates this relationship using dollar amounts; **with youth who completed the program (41.7%) averaging net savings more than twice that of youth who did not complete the program (58.3%).**

### Table S- 9. Sterling Pilot Program: Cost Saving and Program Completion (n=36).

| Program Completion Status | N=36 | % | Savings | Savings per Youth |
|---|---|---|---|---|
| Completed Program | 15 | 41.7% | $198,526 | $13,235 |
| Did not Complete Program | 21 | 58.3% | $141,932 | $6,759 |

*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Documentation of Cost Events*

## ACCUMULATED EVENTS AT TWELVE MONTHS POST-DISCHARGE FOR YOUTH DISCHARGED TWELVE MONTHS OR LONGER

**We also examined the specific events that comprised the costs described above for the 36 youth who were at least twelve months post-discharge.** Table S-10 lists the events that were used to calculate costs, cost per unit, number of youth for which these events were documented pre-admission, during enrollment, and post-discharge from the pilot program, and number of times each event occurred in the same time periods.

**As shown, cost per unit/event varies considerably, from $2.09 for electronic monitoring to $830 for one day for certain types of inpatient care.** These 36 youth in Sterling accumulated many events prior to and during admission to the program. At least half of the youth were involved with diversion, had been filed on by the district attorney, had been or were on probation, or had been in detention prior to admission to the program (not necessarily the same youth).

**Cost per unit/event varies considerably, from $2.09 for electronic monitoring to $830 for one day for certain types of inpatient care.**

There were some notable changes from the pre- to post-discharge periods experienced by these youth.

With regard to improvement from pre- to post-discharge:

- The number of youth who received filings decreased substantially.
- The number of days in detention and commitment decreased.
- The number of days on regular and intensive probation decreased.
- The number of inpatient psychiatric days decreased substantially.
- Youth did not progress to violent crimes.

On the other hand, there was

- A six-fold increase in the number of residential days (i.e., RTC, RCCF, Group).
- A four-fold increase in jail days, with one youth being sentenced to adult corrections.

**Table S- 10. Sterling Pilot Program: Juvenile Justice, Child Welfare, and Mental Health Events Documented in the Pre-Admission, During Enrollment, and Post-Discharge Periods for All Youth Discharged at Least Twelve Months (n=36).**

| Event | | Events Begin/Occur 12 Months Before Admission To Program | | During Admission To Program | | Events Begin/Occur After Discharge from Program through 12 Months Post-Discharge | |
|---|---|---|---|---|---|---|---|
| | Cost per Unit /Event | Number (%) of Youth (n=36) | **Number of Units/ Events** | Number (%) of Youth (n=36) | **Number of Units/ Events** | Number of Youth (n=36) | **Number of Units/ Events** |
| **Diversion Episodes** | $247.60 | 22(61.1%) | 26 | 2(5.6%) | 2 | 9 (25%) | 10 |
| **Filings** | $585.77 | 17(47.2% | 29 | 11(30.6%) | 14 | 16 (44.4%) | 32 |
| **Adjudications/Convictions** | NA | 12(47.2%) | 14 | 6(16.7%) | 6 | 11 (30.6%) | 15 |
| Non-Violent Misdemeanor | 0 | 9 | 10 | 3 | 3 | 6 | 6 |
| Non-Violent Felony | 0 | 2 | 2 | 3 | 3 | 4 | 4 |
| Violent Misdemeanor | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| Violent Felony | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| **Regular Probation Days** | $3.99 | 9(33.3%) | 1493 | 4(11.1%) | 307 | 19 (52.8%) | 4449 |
| **Juvenile Intensive Super-vision Probation (JISP) Days** | $7.34 | 3(33.3%) | 313 | 0 | 0 | 4 (11.1%) | 619 |
| **Probation Revocations** | NA | 6(16.7%) | 7 | 6(16.7%) | 6 | 9 (25%) | 14 |
| **Electronic Monitoring** | $2.09 | 1(2.8%) | 14 | 1(2.8%) | 5 | 1 (2.8%) | 45 |
| **Detention Days** | $141.12 | 15(41.7%) | 742 | 15(41.7% | 311 | 12 (33.3%) | 620 |
| **Commitment Days** | $182.08 | 1(2.8%) | 216 | 0 | 0 | 2 (5.6%) | 224 |
| **Parole Days** | $12.31 | 1(2.8%) | 7 | I(2.8%) | 267 | 0(0.0%) | 0 |
| **Department of Corrections** | $76.36 | 0(0.0%) | 0 | 0(0.0%) | 0 | 1 (2.8%) | 91 |
| **Jail Days** | $40.00 | 2(5.6%) | 12 | 1(2.8%) | 60 | 6 (16.7%) | 320 |
| **Residential (RTC, RCCF, Group) Days** | $127 to $192 | 5(13.9%) | 261 | 2(5.6%) | 101 | 7 (19.4%) | 1611 |
| **Inpatient Psychiatric Days** | $478 to $830 | 2(5.6%) | 53 | 3(8.3%) | 40 | 1 (2.8%) | 27 |

*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Denver Sterling Youth Services.*
*Due to low n, please use caution in interpretation, particularly regarding percents.*

We also looked at youth who entered the pilot program with a probation sentence. Table S-11 shows that 19 youth (31%) were on regular Probation and four (7%) were on Juvenile Intensive Supervision Probation. (Two of the 4 on Intensive Probation, were also on Regular Probation.) Seventeen of the 19 youth on Regular Probation had new filings after discharge from the program and 11 had probation revocations. Three of the 4 youth on Intensive Probation pre-admission had a new filing post-discharge and 2 had probation revocations.

**Table S- 11. Sterling Pilot Program: New Filings and Revocations Only for Youth on Probation Prior to Admission to Program.**

| Type of Probation | Youth on Probation Prior to Admission n (% of 62) | Number of Youth with New Filings After Discharge | Number of Youth with Revocations After Discharge |
|---|---|---|---|
| **Regular Probation** | 19 (30.6%) | 17 of 19 | 11 of 19 |
| **Juvenile Intensive Supervision Probation** (JISP) | 4 (6.5%) | 3 of 4 | 2 of 4 |

*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Denver Safe City Diversion Program.*
*Due to low n, please use caution in interpretation.*

In sum, the majority of youth achieved savings which, when totaled, were more than sufficient to cover the Sterling Pilot program costs for all the youth. However, the more than $200,000 in costs accumulated by the youth who did not realize savings, reduced the overall cost outcomes substantially. This raised important questions about how programs can anticipate which youth are more likely to realize savings and which will not over time. The following section addresses this issue.

## PREDICTORS OF PROGRAM SUCCESS AND HIGHER COSTS TWELVE MONTHS POST-DISCHARGE

**This section presents findings regarding predictors of program success and higher costs at twelve months post-discharge for the 36 youth who were discharged from the Sterling Pilot Program for at least twelve months.** The overall goal of this set of analyses was twofold: 1) to identify youth who experienced program success, or, alternatively, those at the greatest risk for having negative program outcomes (i.e., from admission to discharge); and 2) to identify youth who had positive long term outcomes or, alternatively, were at the greatest risk for having negative outcomes at twelve months. This knowledge can help state oversight staff and local treatment teams understand the effects that youth with differing characteristics have on the program and its long-term outcomes.

The analyses included the following steps:

1. Identifying characteristics of youth (e.g., score on the CCAR Substance Abuse Scale, number of convictions) that were related to the outcome (e.g., program completion, fewer criminal filings); and

2. Building statistical models that tested whether the characteristics were related to one another and how they were related to or predicted the outcome.

It is important to note that the number of youth in this 12-month sample is barely sufficient to detect statistically significant differences with the techniques used (i.e., regression). Consequently, there are likely to be more significant relationships than were detected in these analyses. A more complete description of the statistical approach used is included in Appendix I.

### *DEFINITIONS OF PROGRAM SUCCESS*

Program success was defined as:

- Program completion as judged by clinical/case management staff.
- Fewer juvenile justice related events (e.g., filings, recidivism) during enrollment.
- Fewer residential placement days (e.g., RTC) during enrollment.
- Positive school situation (e.g., enrollment, obtaining GED).
- Decrease in substance use severity on the CCAR.
- Decrease in Overall Problem Severity on the CCAR.

Table S-12 displays the results of these analyses. No significant predictors were found for changes in CCAR-based measures of Substance Use, Overall Problem Severity scores, or residential placement days. Despite the small number of youth in these analyses, we were still able to identify variables associated with program completion, school status at discharge (also see Table S-5), number of filing received during enrollment, and youth on probation who received new filings.

**Table S- 12. Sterling Pilot Program: Predictors of Program Outcome Measures.**

| Program Outcome Domain | Predictors at or Pre-Admission | Effect/Outcome at Discharge |
|---|---|---|
| **Program Completion** (as determined by program staff) | Higher CCAR Substance Use PS *<br>More filings* | Less likely to complete program |
| **School Status** | In diversion program pre-admission ** | Enrolled/graduated at discharge |
| **School Status** | High CCAR Overall PS**<br>More filings pre-admission***<br>More probation revocations**<br>More probation days**<br>More convictions for violent offenses***<br>More detention days**<br>Higher CCAR Substance Use PS**Higher CCAR Alcohol PS (p = .053)<br>Higher CCAR Drug PS** | Not enrolled/not graduated at discharge |
| **Number of Filings** (accrued during enrollment) | Higher CCAR Substance Use PS* | More likely to have at least one filing while enrolled |
| **Recidivism** (Youth on probation pre-admission with filings during enrollment) | More convictions for non-violent offenses**<br>Higher CCAR Substance Use PS**<br>Higher CCAR Alcohol PS*<br>Younger at admission (p = .054)) | More likely to have a filing while enrolled |

** p < .10; **p < .05; *** p < .01*

*Conventionally, significance levels of .05 or less are considered acceptable. However, it is more difficult to detect statistical significance with small samples. Therefore, we are also reporting relationships with significance levels of less than .10, as they are likely indicators of important trends in these data.*

*PS = CCAR Problem Severity Score – all scales are scored 1 – 9 (1=none, 9=extreme) for each domain. The average CCAR Overall Problem Severity Score at admission was calculated by taking the average of the following: the Interpersonal Problem Severity Scale, the Overall Problem Severity Scale, and the Overall Level of Functioning Scale (1=very high, 9=very low).*

*Note: Unless otherwise specified, each characteristic predicted the effect listed. The characteristics were not additive or multiplicative. For example, each of the characteristics listed under program completion resulted In a lower likelihood of program completion. A youth with both characteristics was just as likely to not complete the program as a youth with one.*

Table S-12 shows that:

- **High substance use, combined drug and alcohol, at admission** predicted program failure, including not completing the program, poor school enrollment status, more filings received during enrollment, and higher risk of recidivism (for the youth who were on probation prior to admission to the program).
- **High numbers of several juvenile justice events prior to admission** predicted program failure, including not completing the program, poor school enrollment status, and higher risk of recidivism (for the youth who were on probation prior to admission to the program).
- **Diversion** intervention prior to admission predicted better school enrollment status.
- **Higher Overall Problem Severity Score**, a broad mental health indicator, predicted poor school outcomes at discharge.
- **Youth who were younger** when they received their first filing were more likely to recidivate during program enrollment.

### *PREDICTORS OF LONG-TERM OUTCOMES*

The goal of the following analyses was to identify characteristics of:

1. Youth who had high costs during the twelve months following discharge from the program.
2. Youth who produced a cost savings, with the costs during the 12-month follow-up period being compared to the costs accumulated before being admitted to the program.
3. Youth who accumulated more days in residential treatment during the twelve months following discharge from the program.
4. Youth who accumulated more commitment days during the twelve months following discharge from the program.

Table S-13 displays the outcomes for which significant predictors of 12-month outcomes were found.: costs, the number of commitment days accumulated over the twelve months post-discharge, and the number of residential days accumulated during the twelve months post-discharge. In addition to detecting several significant interactions between variables, meaning that two variables worked together to predict a specific outcome, several single variables that were associated with long-term outcomes were identified as well.

- **Higher accumulated costs** at twelve months were predicted by the following sets of variables that interacted with one another:
  - Youth who did not complete the program AND who had higher CCAR Alcohol Problem Severity scores.
  - Youth who did complete the program, BUT who were younger at first filing.
- Several individual variables were also predictive of higher costs, including not completing the program, more detention days, and more inpatient days – all prior to admission.
- Youth who completed the program accumulated fewer residential days at twelve months post-discharge.
- Although Sterling had only a few youth who were committed to the Division of Youth Corrections after discharge, several associations were found:
  - Youth who had a diversion episode pre-admission were less likely to be committed.
  - Youth who had at least one prior conviction and a higher Overall CCAR Problem Severity score were more likely to be committed.
  - Youth who did not have a prior conviction but did have higher CCAR Alcohol Problem Severity scores were more likely to be committed.
  - Youth who were younger at their first filing were more likely to be committed.

Program completion played an important role in long-term outcomes for Sterling youth. While this speaks to the effectiveness of the full program, only 37% of Sterling youth completed the pilot program.

**Table S- 13. Sterling Pilot Program: Predictors of Outcomes at Twelve Months Post-Discharge for Youth at Least Twelve Months Post-Discharge.**

| Outcome Domain | Predictors at or Prior to Admission | Effect/Outcome 12 Months Post-Discharge |
|---|---|---|
| **Costs** (accumulated over the twelve months post-discharge) | *Interactions:*<br>Youth who <u>did not</u> complete the program AND had higher CCAR Alcohol PS***<br>Youth who did complete the program AND were younger at first filing** | Higher Costs |
| | *Single Variables: :*<br>Not completing program***<br>More revocations (p = .052)<br>More detention days***<br>Younger at first filing***<br>Higher CCAR Alcohol PS (p = .057)<br>More inpatient mental health days* | Higher Costs |
| **Commitment Days** | *Interactions:*<br>At least one conviction AND higher CCAR Overall PS**<br>No convictions AND higher CCAR Alcohol PS***<br>Younger at first filing AND had at least one conviction*** | More Commitment Days |
| | *Single Variables: :*<br>Younger at first filing*<br>High CCAR Overall PS***<br>Higher CCAR Alcohol PS*** | |
| | An episode of Diversion (p = .067) | Fewer Commitment Days |
| **Residential Days (RTC, RCCF, Group Home)** | Completed program** | More likely to have Fewer Residential Days |

** p < .10 **p < .05 *** p < .01*

*Conventionally, significance levels of .05 or less are considered acceptable. However, It is more difficult to detect statistical significance with small samples. Therefore, we are also reporting relationships with significance levels less than .10, as they are likely indicators of important trends in these data.*

*PS = CCAR Problem Severity Score – all scales are scored 1 – 9 (1=none, 9=extreme) for each domain. The average CCAR Overall Problem Severity Score at admission was calculated by taking the average of the following: the Interpersonal Problem Severity Scale, the Overall Problem Severity Scale, and the Overall Level of Functioning Scale (1=very high, 9=very low).*

*Note: Unless otherwise specified as an interaction, each characteristic predicts the effect listed. The characteristics are not additive or multiplicative. For example, each of the characteristics listed under program completion results In a lower likelihood of program completion. A youth with all six-single characteristics is just as likely to not complete the program as a youth with one. Characteristics that work together to predict an outcome are listed as interactions.*

## *UTILITY OF PREDICTORS FOR ESTIMATING PROGRAM SAVINGS*

These analyses gave us specific information that can be used to identify youth likely to accumulate high costs. They also gave us a better understanding of the effects that youth with certain characteristics have on outcomes. For example, we identified six youth who did not complete the program and who had the highest substance use scores at admission to the program. Theoretically, they should have represented cost losses, rather than savings. Table S-14 displays the pre- and post-discharge costs as well as savings and cost per

youth for the six youth who were predicted to have higher costs twelve months post-discharge and for the remaining Sterling youth. This illustrates the effect of high-risk youth on cost savings for the Sterling Pilot Program. **While each non-predicted youth saved an average of over $12,000, each predicted youth cost almost $6,000 over time. This knowledge can help state oversight staff and local treatment teams understand the effects that youth with differing characteristics have on the program and its long-term outcomes and plan accordingly, either by managing to the risk, i.e., limiting the number of slots for the most at-risk youth, or by intensifying the services provided to them.**

**Table S- 14. Sterling Pilot Program: The Effect of High Risk Youth on Overall Program Savings for Youth Twelve Months Post-Discharge.**

| | n | Total Pre-Costs | Total Post - Costs | Pre -Cost minus Post-Costs | Average Cost per Youth |
|---|---|---|---|---|---|
| **Total for 6 "predicted" youth** | 6 | $146,704 | $181,128 | -$34,424 | -$5,737.33 |
| **Total for "non-predicted" youth** | 30 | $667,561 | $292,680 | $374,881 | $12,496.03 |

## *SUMMARY: 12-MONTH OUTCOMES FOR THE STERLING PILOT PROGRAM*

Twelve-month outcomes for system costs, program and youth savings, and various cost-related events were examined for the group of 36 youth who had been discharged from the program for at least twelve months. In addition, statistical techniques were used to identify characteristics of youth that were related to program success and higher costs.

With regard to system costs:

- Total costs decreased by 39% between the pre-discharge and post-discharge periods.
- The mental health system accounted for the majority of costs (35.4%) in the pre-discharge period due to the heavy investment in the community-based pilot program. Youth Corrections accounted for almost one third of the pre-discharge costs (32.2%).
- In the post-discharge period, the child welfare system bore the majority of the costs (53.1%), followed by the youth corrections system (25.20%), as a result of increased use of residential treatment centers and locked juvenile facilities.

With regard to savings:

- The majority of the youth (77.8%) in the program had savings, totaling $538, 858.
- Their savings more than covered the total program costs ($288,000) for the cohort of 36 youth.
- The high post-discharge costs of a much smaller percent of youth (22.2%) were more than double their pre-discharge costs.
- Youth who completed the program (41.7%) averaged net savings twice that of youth who did not complete the program (58.3%).

With regard to cost-related events:

- Cost per unit/event varied considerably, from $2.09 for electronic monitoring to $830 for a day of certain types of inpatient care.
- Prior to admission to the program, almost two-thirds (61.1%) of the youth had been or were involved with diversion, almost half (47.2%)had been filed on by the district attorney, one-third had been or were on probation, and 41.7% had been or were in detention (not necessarily the same youth).
- The number of days youth spent on probation, and in detention or commitment decreased after discharge.
- The number of inpatient psychiatric days decreased and the number of residential treatment days increased substantially after discharge.
- The number of youth who received filings and were adjudicated decreased.
- Youth did not progress to violent crimes after discharge.
- For those youth who were on probation prior to admission, almost all had a least one filing after discharge and almost half had probation revocations.

Although hampered somewhat because of small numbers of youth with 12-month outcomes, there were interesting findings regarding the prediction of program completion and other indicators of program success. These were:

- Higher levels of substance use, either drugs or alcohol, was a predictor of not completing the program, having poor school outcomes, more filings during enrollment, and recidivism (for the youth who were on probation prior to admission to the program).
- More juvenile justice-related events predicted not completing the program, poor school outcomes, and recidivism.
- Diversion episodes prior to admission predicted better school enrollment/graduation status.
- Higher Overall Problem Severity Scale score, a broad mental health indicator, predicted poor school outcomes.
- Youth who were younger when they received their first filing predicted recidivism.

With regard to the prediction of higher costs and other outcomes at twelve months:

- Significant predictors were found for long-term costs, the number of residential days accumulated over the twelve months post-discharge, and the likelihood of being committed.
- Two groups of characteristics that interacted with one another to predict higher cost: were detected. These were:
  - Youth who <u>did not</u> complete the program AND who had <u>higher CCAR Alcohol Problem Severity</u> Scores.
  - Youth who <u>did</u> complete the program BUT were <u>younger</u> at first filing.
- Youth who completed the program were more likely to have fewer residential days.

- These results pointed to specific youth who would be more likely to incur higher costs. Six youth with losses totaling over $30,000 were identified.
- These findings should be helpful to state and pilot program staff as a way to target program dollars and plan for high-risk youth.

## *QUALITATIVE ANALYSES: CAREGIVER AND YOUTH PERCEPTIONS OF THE PILOT PROGRAM AND RECOMMENDATIONS FOR IMPROVEMENT*

Interviews were conducted with caregivers and youth about six months after youth were discharged from the pilot program[30]. The purpose of the interviews was to obtain perceptions of caregivers and youth that would inform program development and quality improvement. Twenty-three caregivers and 22 youth, representing about 60% of the youth who were six months or longer post-discharge, have been interviewed since the first Sterling Pilot Program enrollees were discharged in December 2001. The complete analysis of the interviews is included in Appendix J.

### THE CAREGIVER PERSPECTIVE

Caregivers mainly identified middle school as the time when their child's serious issues began. Typical behaviors were: associating with "bad" friends, and having anger and defiance issues. Other behaviors included: lying, missing school, and engaging in illegal activities. Most caregivers reported that their child had been court-ordered to participate in the pilot program. Prior to enrollment in the pilot, caregivers cited special education teachers as the only service that was at all helpful for their children. Most services though were rated as being of "no help". Caregivers also identified what they considered important outcomes for their children. They wanted youth to be less angry, more responsible, able to focus on school, and to stop using drugs.

**Overall, caregivers were pleased with the help that their child received from the pilot program. In fact, most caregivers reported that the pilot was the most helpful service that their child had ever received.** Caregivers also noted positive changes in their child's behavior since enrollment in the program. These included increases in understanding of consequences, self-respect, and cooperation with family members. Most caregivers reported that they had benefited as well from the services they received through the pilot.

**When asked how the pilot program could be improved, most caregivers responded with suggestions on how to expand it.** Caregivers typically cited the need for more one-on-one counseling for youth and greater caregiver involvement in the program. Other service needs identified were ongoing counseling and anger management for their children. Caregivers further recommended that providers and decision makers find ways to involve families and to provide data and information to support increased funding and resources for children and youth with serious social problems and needs for mental health services.

**When asked how the pilot program could be improved, most caregivers responded with suggestions on how to expand it.**

[30] Caregivers and youth were paid $10 for each interview.

## YOUTH PERSPECTIVE

Youth reported that their most serious problems upon entering the pilot program involved drugs and being angry. Other issues included involvement with law enforcement and problems at school. Youth generally reported an earlier onset of serious problems than their caregivers had reported.

Overall, youth said that they had experienced positive changes as a result of being in the pilot program. Youth reported that the program had helped them to grow up, improve behavior, manage anger, and improve family relationships. Several youth reported that they are now no longer using drugs.

**Youth described the pilot program as one where teens were encouraged to be involved in fun, positive activities. Most youth reported that the pilot program was the most helpful service that they had ever received.** They also cited their parole officers as providing the most helpful services. Overall, youth said that they had experienced positive changes as a result of being in the pilot program. Youth reported that the program had helped them to grow up, improve behavior, manage anger, and improve family relationships. Several youth reported that they are now no longer using drugs.

A greater number of youth in year 3 than in years 1 or 2 reported that they needed additional services. These were continued positive support and on-going counseling. When asked what youth need in order to be successful adults, they provided concrete answers like a dependable car for work, job skills, and staying out of jail. Others reported that they needed an education.

Appendix J contains additional comments from caregivers and youth regarding the Multi-Family Parenting Program.

# THE DENVER PILOT PROGRAM: THE ACCESS BEHAVIORAL CARE/UNIVERSITY OF COLORADO HOSPITAL MULTISYSTEMIC THERAPY TEAM

## YOUTH ADMITTED: SYSTEM INVOLVEMENT AND SERVICE UTILIZATION

This section describes the juvenile justice, mental health, and substance use characteristics of the youth who were admitted to Denver's University of Colorado Hospital Multisystemic Therapy Team (Denver UCH MST Pilot Program). More information about the Denver's Pilot Program can be found in Appendix K.

### *JUVENILE JUSTICE INVOLVEMENT*

Four types of events were examined to capture youths' delinquent behavior and juvenile/criminal justice system involvement prior to admission to the Denver UCH MST Pilot Program. These events included:

- Diversion program contacts
- Juvenile justice prosecution related events
  - Filings - intent by the State District Attorney to prosecute a case
  - Adjudications – a juvenile conviction
  - Crime Severity – violent/non-violent; felony/misdemeanor
- Sentencing related events, including
  - Juvenile Probation, Regular and Intensive Supervision Probation
  - Probation Revocations
  - Electronic Monitoring
  - Jail
- Facility days
  - Detention, Commitment (Division of Youth Corrections)
  - Adult Incarceration (Department of Corrections)

The events are documented on Table D-1. These data were extracted from the Judicial Branch's Integrated Colorado Online Network (ICON) provided by the Division of Criminal Justice's Integrated Criminal Justice Information System (CICJIS) and the Department of Human Services' Trails Database, which documented Division of Youth Corrections' detention, commitment and residential treatment episodes and the Division of Child Welfare's residential treatment (RTC) days. Each documented event was coded to identify when the event started and ended relative to each youth's admission and discharge from the program.

**Table D- 1. Denver UCH MST Program: Juvenile Justice Involvement for All Youth Prior to Admission.**

| Event | Events Begin/Occur Before Admission To Program | |
|---|---|---|
| | **Number of Youth (n=62)** | **% of Youth Admitted** |
| **Age at First Filing** | Mean Age = 14.5 Years ; Range 12.4 to 17.3 Years | |
| **Diversion Program Contact** | 32 | 51.6% of Youth Admitted |
| **Filings, Adjudications** | | |
| Filings | 34 | 54.8% OF YOUTH ADMITTED |
| Adjudications/Convictions | 19 | 30.6% OF YOUTH W/ FILINGS |
| **Severity of Crimes for which youth were Adjudicated** | **Number of Adjudicated Youth (n=19)*** | **% of Adjudicated Youth** |
| Non-Violent Misdemeanor | 11 | 57.9% |
| Non-Violent Felony | 7 | 36.8% |
| Violent Misdemeanor | 5 | 26.3% |
| Violent Felony | 1 | 5.3% |
| **Probation** | **Number of Youth (n=62)** | **% of Youth Admitted** |
| Regular Probation Sentence | 18 | 29.0% |
| Juvenile Intensive Supervision Probation Sentence (JISP) | 0 | 0.0% |
| Probation Revocations | 2 | 3.2% |
| Electronic Monitoring | 0 | 0.0% |
| **Youth Corrections** | | |
| Detention | 29 | 46.8% |
| Commitment | 1 (3 episodes) | 1.6% |
| Parole | 1 | 1.6% |
| **Department of Corrections** | 0 | 0.0% |
| **Jail** | 0 | 0.0% |

*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Denver Sterling Youth Services.*
** Numbers and percentages do not = total as youth may be adjudicated for more than one class of crime.*
*Due to low n, please use caution in interpretation, particularly with regard to percents.*

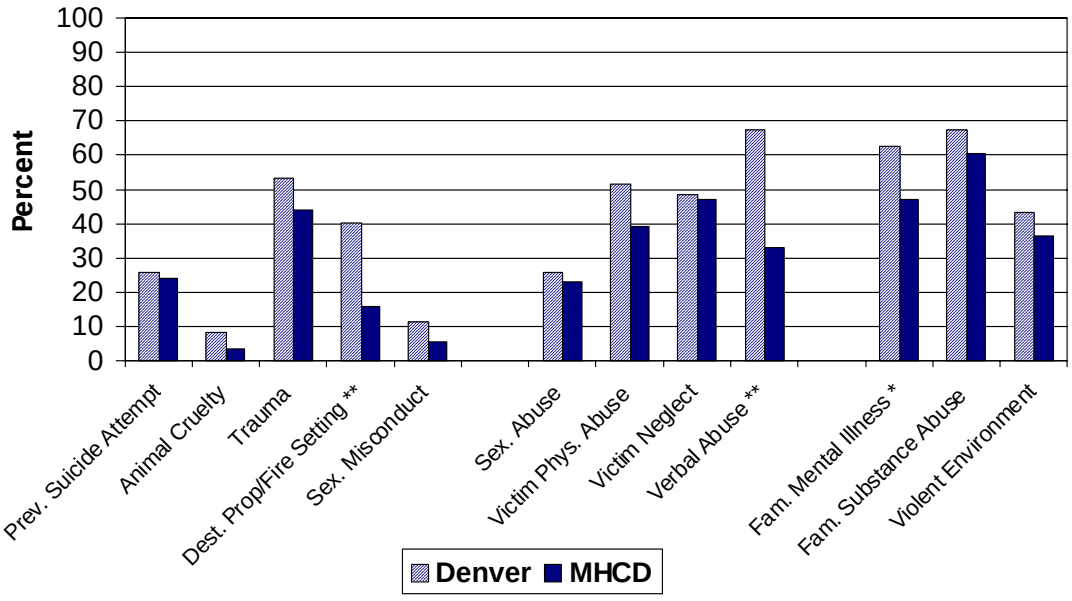
## *MENTAL HEALTH STATUS, RISK FACTORS, AND SYSTEM UTILIZATION*

Two approaches were used to profile the mental health severity and service utilization of youth entering the pilot program: Scores on the Colorado Client Assessment Record (CCAR) and the documentation of mental health inpatient and residential services. The CCAR is a multidimensional screening and assessment instru-

ment that assesses individual and family risks, problem severity and level of functioning, and strengths. A copy of the CCAR and related information can be found in Appendix F.

**High risk factors:** Figure D-1 displays the proportion of youth for whom risk factors were identified by clinicians on the CCAR at the time of admission for Denver UCH MST youth and for all youth with Serious Emotional Disturbance (SED) who were admitted to the Mental Health Center of Denver[31] (MHCD), the community mental health center that serves Denver, during FY 2003. Figure D-1 shows that Denver UCH MST youth demonstrated risk factors at or higher than the rates identified in youth with SED who were admitted to MHCD. With regard to a very serious risk factor, fire setting/destruction of property, pilot youth showed significantly higher rates than youth with SED. They were also higher than the MHCD youth on two other factors, victim of verbal abuse and family mental illness; their higher rate of physical abuse also approached significance (p=.062).

**Figure D- 1. Percent of Youth with High-Risk Behaviors, Experiences, Abuse, and Family Factors at Admission: Denver UCH MST[1] (n=62) Compared to FY 2003 Admissions of Youth with SED for the Mental Health Center of Denver (n=742).[2]**

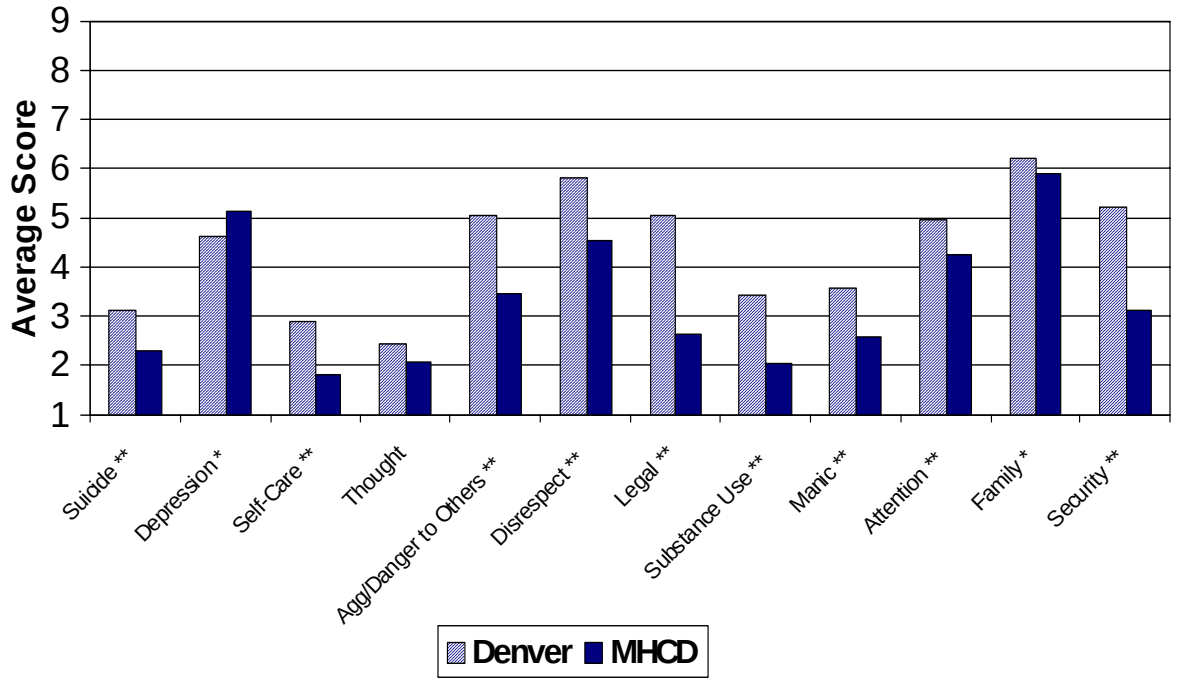



*Scores 1 = Problem is present' 0 = Problem is not present.*
*p < .05 for Independent t-tests; ** p < .01 for Independent t-tests.*
*[1] Source: Colorado Client Assessment Record, Program Evaluation Database.*
*[2] Colorado Division of Mental Health, CCAR Database FY 2003.*

[31] The Mental Health Corporation of Denver has been renamed the Mental Health Center of Denver.

**Problem Severity:** Figure D-2 compares Denver UCH MST youth with MHCD youth on 12 problem scales selected by the Division of Mental Health (DMH) as being the most reliable and will be used in these analyses (Altschul et al., 2001; Wackwitz and Ellis, 2002). Figure D-2 shows that Denver UCH MST youth were significantly more severe than the larger group of youth with SED who were admitted to MHCD in all but one domain, Thought, which was higher but not significantly so.

**Figure D- 2. Key CCAR Problem Scales at Admission: Denver UCH MST (n=61) Compared to MHCD (n=742).**




*Scores range from 1 to 9, with higher scores indicating greater severity.*
*p < .05 for Independent t-tests; ** p < .01 for Independent t-tests.*
*[1] Colorado Client Assessment Record, Program Evaluation Database.*
*[2] Colorado Division of Mental Health, CCAR Database FY 2003.*

**Utilization of Inpatient and Residential Services:** The evaluator extracted the number of residential days from the Department of Human Services' Trails Database[32] for those youth from whom an appropriate release of information had been obtained. If a release was authorized (about 60%), inpatient hospital days were collected directly from the Colorado Mental Health Institutes and Access Behavioral Health (ABC).[33] Table

[32] Colorado Trails is Colorado's Department of Human Services' automated data system. It features a statewide client/server network that links state and county child welfare caseworkers, supervisors, and support staff, as well as Division of Youth Corrections staff.

[33] In some cases the caregiver/guardian, the youth did not provide consent for the evaluator to collect inpatient information, or the release of information form had expired. In addition, both Colorado Mental Health Institutes require youth age 15 or older to authorize the release of information directly. While data collection improved dramatically

D-2 shows the number of youth for whom specific mental health events were documented. As shown, almost 20% of Denver UCH MST youth had experienced residential treatment prior to admission to the pilot and almost one-fourth experienced an inpatient psychiatric stay.

**Table D- 2. Denver UCH MST: Mental Health Related Events for All Youth Prior to Admission.**

| Mental Health Events | Before Program Admission | |
|---|---|---|
| | Number of Youth (n=62) | % |
| **Residential Treatment** (RTC) | 11 | 17.7% |
| **Inpatient Psychiatric** | 15 | 24.2% |
| **Group/Residential Child Care Facilities** (RCCF)[34] | 0 | 0.0% |

*Source: Colorado Trails, Access Behavioral Care , Colorado Mental Health Institutes.*
*Due to low n, please use caution in interpretation, especially with regard to percents.*

## *SUBSTANCE USE*

Two strategies were used to measure youths' substance use at admission: The CCAR, which was described in the previous section, and The Adolescent Self-Assessment Profile II (ASAP II) (Wanberg, 1999). The ASAPII, which is completed by youth, is a commonly used instrument in Colorado that provides a detailed picture of attitudes, behaviors, and circumstances surrounding substance use. More information about the ASAP II may be found in Appendix H. Youth in the Denver UCH MST Pilot Program completed the ASAP II when they enrolled in the program.

As part of the rigorous psychometric work conducted on the ASAP II, the developers identified the level of substance abuse that is expected from specific groups. This allows us to compare the youth in the Sterling pilot to similar youth in the community. With the exception of the Pro-Social Scale, the community group for all scales in Table D-3 was comprised of Colorado youths who had been referred to the Treatment Accountability for Safer Communities (TASC) program after a screening by a juvenile justice agency indicated possible alcohol and other drug problems. The comparison group for the Pro-Social Scale was a combination of juvenile justice and non-juvenile justice adolescents. Table D-3 compares UCH MST Pilot youth to the comparison groups in four ASAP II domains:

- Drug Exposure
- Drug Involvement
- Family Dysfunction

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over that of previous years, estimates of inpatient days for Denver youth are still likely an under estimate. Data collected from ABC only includes periods for which youth were Medicaid Eligible. A review of eligibility dates showed that over half the youth had been Medicaid eligible almost continuously over the past few years, about one-third had breaks in enrollment, and only about 10% had no documentation of Medicaid eligibility.

[34] RCCF care is generally used when the higher-level services of a Residential Treatment Center are not required and may not be indicative of mental health need. These facilities are included as mental health utilization as it is the best fit.

- Prosocial Attitudes and Behaviors

Denver youth reported lower levels of exposure to and involvement with drugs than the comparison group. However, they demonstrated a substantially higher level of family dysfunction and lower level of self-identified pro-social attitudes and behaviors than the comparison group.

**Table D- 3. Denver UCH MST: Mean ASAP II Scale Scores for Youth at Admission and Estimated Means of the Comparison Group.**

| ASAP II Scale[35] | MST Admission Mean (n =43) | ASAP II Comparison Group |
|---|---|---|
| **Drug Exposure** | 9.5 | 11-12 |
| **Drug Involvement** | 2.7 | 4 |
| **Family Dysfunction** | 17.5 | 12-13 |
| **Prosocial Attitudes & Behaviors** | 26.0 | 38-39 |

*Source: ASAP II evaluation database, ASAP II Manual (Wanberg, 1999).*
*ASAP scores are usually presented in the form of normed percentile or decile scores. For ease of understanding, however, these scores are being presented as means. Since the actual mean was not reported for the Comparison Group, ranges are presented.*

With regard to specific substance use at admission, CCAR data were used to compare UCH MST youth to youth with SED who had been admitted to MHCD during FY 2003. Table D-4 shows that Denver youths' use of alcohol and marijuana was significantly higher than that of the comparison group. Both groups demonstrated low or no usage of heroin, barbiturates, and inhalants.

**Table D- 4. Denver UCH MST: Proportion of Youth Who Use Specific Substances at Admission Compared to Youth with SED Admitted to the Mental Health Center of Denver.**

| Substance | MST Admission (n=61) % | MHCD (n=670) % |
|---|---|---|
| **Alcohol** ** | 40.3 | 13.7% |
| **Marijuana** ** | 53.2 | 16.1% |
| **Amphetamines** | 3.2 | .7% |
| **Hallucinogens** | 3.2 | 1.0% |

** p < .05; **p < .01*
*Source: CCAR evaluation database, Colorado Division of Mental Health, CCAR Database FY 2003.*

[35] Each of the ASAP II Scales has a different number of items and is scored additively. Therefore, the magnitude of the mean on one scale cannot be compared to the magnitude of another scale.

## SUMMARY OF ADMISSION CHARACTERISTICS OF DENVER UCH MST YOUTH

Overall, these youth demonstrated a high level of severity at admission to the Denver UCH MST Pilot Program.

- Youth had a wide range of juvenile justice related experiences: over half had pre-admission involvement with juvenile diversion, 55% had received court filings, 29 % were or had been on probation, and almost 50% had been in detention.
- Youth demonstrated serious risk factors at or at higher rates than those of youth with SED who had been admitted to Denver's community mental health center, MHCD.
- Youth reported lower levels of exposure to and involvement with drugs than that reported by the comparison group.
- Youth demonstrated a substantially higher level of family dysfunction and lower level of self-identified pro-social attitudes and behaviors than the comparison group.
- Youth were significantly more severe in all but one CCAR domain than the comparison group.
- About 18% of the youth had prior residential mental health services and one-forth had at least one prior inpatient psychiatric episode.

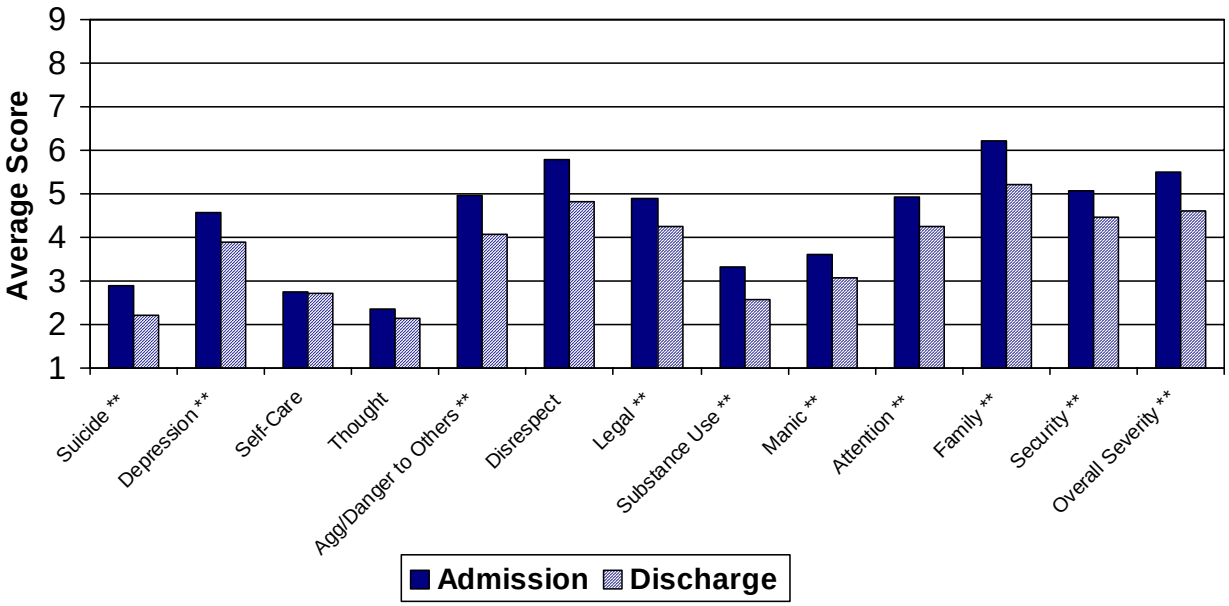
## OUTCOMES AT DISCHARGE

This section presents youth outcomes in three areas: Mental Health, Substance Use, and Educational Status.

### *MENTAL HEALTH*

Figure D-3 displays the key CCAR problem severity scales for 47 youth who were discharged from the UCH MST program for whom both admission and discharge CCARs were available. Overall, these youth showed significant improvement in all domains except Self-Care and Disrespect, although change in Disrespect is in the expected direction.

**Figure D- 3. Denver UCH MST: Change in Problem Severity from Admission to Discharge (n=47).**




*•Scores range from 1 to 9, with higher scores indicating greater severity*
*•**p < .01 for Paired t-tests*
*•Source: Colorado Client Assessment Record*

## *SUBSTANCE USE*

The CCAR was used to document changes in alcohol and marijuana use (use of other drugs was reported to be very low) from admission to discharge. Use of alcohol decreased from 39% at admission to 24% at discharge, and from 47% to 33 % for marijuana (not shown).

## *SCHOOL ENROLLEMENT AND COMPLETION*

Information was collected to determine whether youth were enrolled in school at admission and discharge from the Denver UCH MST Pilot Program. This information was then matched to show the various paths youth have demonstrated. Table D-5 shows seven different paths that were documented for 48 UCH MST youth. Four of these paths are considered positive outcomes (e.g., maintaining enrollment, moving from being unenrolled to being enrolled or receiving a GED). Three of these paths are considered negative outcomes (e.g. remaining unenrolled, moving from enrolled to unenrolled). **For the 48 youth for whom school enrollment was documented, over 80% demonstrated positive outcomes at discharge.**

**Table D- 5. Denver UCH MST School Enrollment/Completion Status from Admission to Discharge.**

| Substance | Denver Admission (n=48) % | Denver % |
|---|---|---|
| **Positive Outcomes** | | |
| Enrolled @ Admission – Enrolled @ Discharge | 33 | 68.8% |
| Unknown @ Admission – Enrolled @ Discharge | 3 | 6.3% |
| Not Enrolled @ Admission – Enrolled @ Discharge | 4 | 8.3% |
| Not Enrolled @ Admission – GED @ Discharge | 0 | 0.0% |
| **Total** | **40** | **83.3%** |
| | | |
| **Negative Outcomes** | | |
| Not Enrolled @ Admission – Not Enrolled @ Discharge | 2 | 3.2% |
| Enrolled @ Admission – Not Enrolled @ Discharge | 5 | 7.9% |
| Unknown @ Admission – Not Enrolled @ Discharge | 1 | 1.6% |
| **Total** | **8** | **12.7%** |

*Source: Community Based Pilot Record.*

## *SUMMARY OF OUTCOMES AT DISCHARGE*

Youth in the Denver UCH MST Pilot Program improved in several areas from admission to discharge from the program.

- Significant improvement in all but 2 CCAR domains.
- Youth demonstrated a significant decrease in their use of alcohol and marijuana.
- Eighty percent (80%) of youth demonstrated positive outcomes for school enrollment completion.

## OUTCOMES AT TWELVE MONTHS FOR YOUTH DISCHARGED TWELVE MONTHS OR LONGER

**This section presents 12-month outcomes for the 32 youth in Denver who had been discharged from the pilot program for at least twelve months.** These youth are similar to the larger group of 62 youth with regard to age, gender, ethnicity, program completion rates, and length of enrollment.

When assessing outcomes after discharge it is important to ensure that all youth have an equal amount of time after discharge to accrue the events that will be measured. Table D-6 shows the time, in six-month increments, since discharge for all 62 youth who had been admitted to the Denver pilot since the program's inception in 2001. Approximately one-third of the youth were either still enrolled or had been discharged less than six months. **We chose to examine 12-month outcomes, i.e., accumulated events and costs within the first year post-discharge, for youth who had been discharged for at least twelve months as of**

**June 30, 2004 (i.e., even if a youth had been discharged for two years, we only looked at the first year of outcomes).** This is bolded in Table D-6.

**Table D- 6. Denver UCH MST: Number and Percent of Youth by Time Period Post-Discharge since Program Implementation.**

| Time Period Post-discharge | Denver (n=62) | Denver% |
|---|---|---|
| Still Enrolled or Less than 6 Mos. Post-discharge | 19 | 32.3% |
| 6 Mos. or longer and less than 12 Mos. | 11 | 17.7% |
| **12 Mos. or longer and less than 18 Mos.** | **12** | **17.7%** |
| **18 Mos. or longer and less than 24 Mos.** | **12** | **19.4%** |
| **24 Mos. or longer** | **8** | **12.9%** |
| Total | 62 | 100% |

*Source: Program Evaluation Database.*
*Youth who were included in 12-month outcome analyses are bolded.*

Twelve-month outcomes were studied in the following areas:

- Selected costs incurred by human services, judicial, and municipal systems prior to youths' discharge from the program and how those changed by the end of twelve months post-discharge.
- Savings realized by youth.
- Number of specific events and number of youth that incurred these events during the same time periods.
- Predictors of program success and higher costs twelve months post-discharge as determined by analyses that identified the characteristics and experiences of youth to predict their success in the pilot program and their longer term outcomes.

## *COSTS AT TWELVE MONTHS POST-DISCHARGE*

### SELECTED JU*V*ENILE/CRIMINAL JUSTICE, MENTAL HEALTH, AND CHILD WELFARE COSTS: PRE- AND POST-DISCHARGE[36]

**This section presents findings regarding accumulated costs** in selected state juvenile/criminal justice, mental health, and child welfare agencies **for the 32 youth who had been discharged from the Denver UCH MST Pilot Program for at least twelve months**. Table D-7 shows the distribution of these costs by system for three time periods:

- ***Pre-Admission*** - twelve months prior to admission to the program.
- ***During Program Enrollment*** - the period between admission and discharge, including program costs.
- ***Post-Discharge*** - the twelve months after discharge from the program.

[36] Costs for individual events were determined through contact with individual agencies. Appendix G contains specific information regarding source.

And

- ***Total Pre-Discharge*** -the sum of the pre-admission and during enrollment periods.
- ***The Savings*** - the difference between the pre-discharge and the post-discharge periods.

Youth accrued $144,637 in 12-month pre-admission costs, 57% of which were in the Division of Child Welfare for residential services. The costs accumulated during youths' enrollment amounts to almost $300,000 primarily due to the heavy investment by community mental health in the pilot programs, 91% of the overall costs. Costs to other systems were extremely low while youth were enrolled in the pilot programs, with only 4.3% of the costs accruing to the youth corrections system. In the 12-month post-discharge period, youth accumulated over $400,000 in costs, more than twice than was documented in the 12-month pre-admission period, with most costs occurring in the youth corrections (55.2%) and child welfare (33.7%) systems.

To determine whether the program saved dollars, however, we must also account for the program enrollment period, during which $256,000 was spent on the program itself. These are significant system costs that would have been accrued in another system, if not mental health.. **Therefore, to calculate savings we used the end of the intervention as the starting point for assessing outcomes and summed the "12-month Pre-Admission" costs and the "During Enrollment " costs.** Although the length of enrollment in the program varied for each youth, it was conceptually equivalent (i.e., the intervention) for each youth, regardless of his/her time in the program or reason for discharge. We then subtracted the accumulated costs at twelve months post-discharge from the total pre-discharge costs.

The Denver youth showed an overall increase in costs of approximately $55,000, with substantial increases in the youth corrections, mental health, and smaller increases in mental health inpatient and municipal costs. The savings in the Division of Mental Health are due to the termination of pilot program expenditures (note: outpatient mental health costs were not documented pre- or post-intervention). It should be noted that while some youth have aged out of the youth serving systems, both youth and adult offenses and sentences are included in the ICON database, ensuring that we have accounted for adult criminal justice events. Total costs for these youth stayed about the same between the pre-discharge and post-discharge periods.

**Table D- 7. Denver UCH MST Pilot Program: Accumulated Costs in Selected Public Systems Twelve Months Pre-Admission, During the Program, and at Twelve Months Post Program Discharge for All Youth Twelve Months or More Post-Discharge (N=68).**

| | | 12 Months Pre-Admission | | During the Program | | Total Pre-Admission Plus During the Program | | 12 Months Post-Discharge | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Public System | Cost Event Type(s) | Pre-Admission Costs | % Pre-Admission Cost | During Program Cost | % During Program Cost | Total Pre Discharge (Pre+During Program) Cost | % Total Pre Discharge (Pre+During Program) Cost | Post-Discharge Cost | % Post-Discharge Cost | Savings (+) or Loss (-)* |
| **Dept of Human Services** | | | | | | | | | | |
| Child Welfare | RTC, RCCF, Group Home | $82,492 | 57.0% | $3,936 | 1.4% | $86,428 | 20.3% | $167,280 | 33.7% | -$80,852 |
| Youth Corrections | Detention, Commit-ment, Parole | $40,078 | 27.7% | $11,995 | 4.3% | $52,073 | 12.2% | $274,299 | 55.2% | -$222,226 |
| Mental Health | IP Psychiatric, | $5,500 | 3.8% | $0 | 0.0% | $5,500 | 1.3% | $14,500 | 2.9% | -$9,000 |
| | Pilot Program** | $0 | 0.0% | $256,000 | 90.8% | $256,000 | 60.0% | $0 | 0.0% | $256,000 |
| **Colorado Judicial Branch** | Probation, Intensive Prob. Electronic Monitoring, Filings | $1,387 | 1.0% | $832 | 0.3% | $2,219 | 0.5% | $1,248 | 0.3% | $971 |
| **Municipal** | Diversion, Arrests, Jail | $15,179 | 10.5% | $9,262 | 3.3% | $24,441 | 5.7% | $24,754 | 5.1% | -$312 |
| **Department of Corrections** | Adult Incarcera-tion | $0 | 0.0% | $0 | 0.0% | $0 | 0.0% | $0 | 0.0% | $0 |
| **Total** | | $144,637 | 100.0% | $282,025 | 100.0% | $426,662 | 100.0% | $482,081 | 100.0% | -$55,420 |

* *Savings/Loss = (Costs accrued twelve months pre-admission + costs accrued during the program) minus the costs accrued in the twelve months post-discharge.*
*** The Pilot Program cost is $8,000 per youth, $4000 from the State General Fund and $4000 of local match (Colorado Department of Human Services, 2000).*
*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Documentation of Cost Events.*

## SAVINGS REALIZED BY YOUTH

A limitation of looking at system costs was that it masked the gains made by the majority (66%) of the youth in the program and emphasized the deep end expenditures made on behalf of one-third of the youth. Table D-8 shows that the majority of the youth had far fewer system costs post-discharge than pre-discharge. The difference between these two periods more than offset the program costs ($168,000) for these youth.

In contrast, for a third of the youth in the UCH MST program (34.4%), their post-discharge costs were more than twice their pre-discharge cost. The high post-discharge costs of these few youth caused the total program to look less than successful even while it helped an important 65.5% of the participants. The question raised then is, what can we learn about the differences between youth who saved dollars and youth who did not save post-discharge from the pilot program. A later section on predictors of success addresses this question.

### Table D- 8. Saving vs. No Savings for Individual Youth between Pre-Discharge and Post-discharge Periods Denver (n=32).

| Savings Status | n | % of n | Total Pre Costs | Total Post Costs | Pre Cost minus Post Costs |
|---|---|---|---|---|---|
| **Savings** (post costs less than pre costs) | 21 | 65.5% | $256,332 | $63,344 | $192,988 |
| **No Savings** (post costs more than pre costs) | 11 | 34.4% | $170,330 | $418,738 | -$248,408 |
| **Total** | 32 | 100% | **$426,662** | **$482,082** | **-$55,420** |

*Note: Pre-discharge period costs include all costs twelve months prior to admission, costs incurred during program participation and $8,000 in program cost per participant. Post-discharge period costs include all system costs for the twelve months following discharge.*
*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Documentation of Cost Events.*

## RELATIONSHIP BETWEEN SAVINGS AND PROGRAM COMPLETION

We examined the specific relationship between savings and program completion;. The relationship was significant ( $\chi^2$ (1, $N$ = 32) =8.104, $p$ < .01). Table D-9 demonstrates this relationship using dollar amounts; **youth who completed the program (68.8%) averaged net savings of about $5,000 while youth who did not complete the program (31.3%) averaged net losses of almost $17,000 per youth.**

### Table D- 9. Denver UHC MST Pilot Program: Cost Saving and Program Completion (n=32).

| Program Completion Status | N=32 | % | Savings | Savings per Youth |
|---|---|---|---|---|
| Completed Program | 22 | 68.8% | $112,539 | $5,115 |
| Did not Complete Program | 10 | 31.3% | -$167,959 | -$16,796 |

*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Documentation of Cost Events*

## ACCUMULATED EVENTS AT TWELVE MONTHS POST-DISCHARGE FOR YOUTH DISCHARGED TWELVE MONTHS OR LONGER

**We also examined the specific events that comprised the costs described above for the 32 youth who were at least 12 months post-discharge.** Table D-10 lists the events that were used to calculate costs, cost per unit, number of youth for which these events were documented pre- and post-discharge from the program, and number of times each event occurred in the same time periods. As shown, cost per unit varied considerably over events, from $2.09 for electronic monitoring to $830 for one day of certain types of inpatient care.

These 32 youth in Denver accumulated many events prior to and during admission to the program. Almost half had juvenile filings, one-fourth had been in a juvenile diversion program, about 20% had been on probation, and more than one-fourth had been in detention prior to admission.

There were some notable changes from the pre- to post-discharge periods experienced by these youth.

- The number of youth who received filings decreased from 15 to 9.
- Overall, youth did not progress to more violent crimes.
- No youth were sentenced to adult corrections.
- The number of youth who served probation and commitment increased.
- The number of youth in detention stayed about the same.
- The number of youth who received residential treatment (i.e., RTC, RCCF, Group Home), as well as the number of days in treatment, increased.

**Table D-10. Denver Pilot Program: Juvenile Justice, Child Welfare, and Mental Health Events Documented in the Pre-Admission, During Enrollment, and Post-discharge Periods for All Youth Discharged at Least Twelve Months (n=32).**

| Event | | Events Begin/Occur 12 Months Before Admission To Program | | During Admission To Program | | Events Begin/Occur After Discharge from Program through 12 Month Post-Discharge | |
|---|---|---|---|---|---|---|---|
| | Cost per Unit /Event | Number (%) of Youth (n=32) | Number of Units/ Events | Number (%) of Youth (n=32) | Number of Units/ Events | Number (%) of Youth (n=32) | Number of Units/ Events |
| **Diversion Episodes** | $247.60 | 8(25.0%) | 10 | 6(18.8%) | 6 | 8(25.0%) | 9 |
| **Filings** | $585.77 | 15(46.9%) | 19 | 6(18.8%) | 9 | 8(25.0%) | 16 |
| **Adjudications/Convictions** | 0 | 7(21.9%) | 9 | 5(15.6%) | 6 | 9(28.1%) | 11 |
| Non-Violent Misdemeanor | 0 | 2 | 2 | 0 | 0 | 2 | 2 |
| Non-Violent Felony | 0 | 4 | 4 | 4 | 2 | 4 | 4 |
| Violent Misdemeanor | 0 | 3 | 3 | 2 | 4 | 2 | 3 |
| Violent Felony | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| **Regular Probation Days** | $3.99 | 7(21.9%) | 1015 | 4(12.5%) | 396 | 15(46.9%) | 3865 |
| **Juvenile Intensive Super-vision Probation (JISP) Days** | $7.34 | 0(0.0%) | 0 | 0(0.0%) | 0 | 0(0.0%) | 0 |
| **Probation Revocations** | 0 | 0(0.0%) | 0 | 1(3.1%) | 1 | 4(12.5%) | 6 |
| **Electronic Monitoring** | $2.09 | 0(0.0%) | 0 | 0 | 0 | 0(0.0%) | 0 |
| **Detention Days** | $141.12 | 9(28.1%) | 284 | 5(15.6%) | 85 | 13(40.6%) | 441 |
| **Commitment Days** | $182.08 | 0(0.0%) | 0 | 0(0.0%) | 0 | 6(18.8%) | 1053 |
| **Parole Days** | $12.31 | 0(0.0%) | 0 | 0(0.0%) | 0 | 0(0.0%) | 0 |
| **Department of Corrections** | $76.36 | 0(0.0%) | 0 | 0(0.0%) | 0 | 0(0.0%) | 0 |
| **Jail Days** | $40.00 | 0(0.0%) | 0 | 0(0.0%) | 0 | 0(0.0%) | 0 |
| **Residential (RTC, RCCF, Group) Days** | $127 to $192 | 4(12.5%) | 197 | 3(9.4%) | 24 | 11(34.4%) | 937 |
| **Inpatient Psychiatric Days** | $478 to $830 | 1(3.1%) | 11 | 0(0.0%) | 0 | 2 | 2 |

*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Denver Sterling Youth Services.*
*Due to low n, please use caution in interpretation, especially with regard to percents.*

We also looked at youth who entered the pilot program with a probation sentence. Table D-11 shows that 18 youth (31%) were on Regular Probation; none were on Intensive Supervised Probation. Three of the 18 youth had new filings after discharge from the program, a 16.6% recidivism rate. Five had probation revocations.

**Table D- 11. Denver UCH MST Program: New Filings and Revocations Only for Youth on Probation Prior to Admission to Program.**

| Type of Probation | Youth on Probation Prior to Admission n (% of 62) | Number of Youth with New Filings After Discharge | Number of Youth with Revocations After Discharge |
|---|---|---|---|
| **Regular Probation** | 18 (29.0%) | 3 of 18 | 5 of 18 |
| **Juvenile Intensive Supervision Probation** (JISP) | 0 | 0 | 0 |

*Source: Integrated Colorado Online Network (ICON); Colorado Trails, Denver Safe City Diversion Program.*
*Due to low n, please use caution in interpretation.*

In sum, two-thirds of youth achieved savings which, when totaled, were insufficient to cover the Denver UCH MST costs for all the youth. However, the costs accumulated by the youth who did not realize savings, over $250,000, raised important questions about how programs can anticipate which youth are more likely to incur higher costs over time.

## PREDICTORS OF PROGRAM SUCCESS AND HIGHER COSTS TWELVE MONTHS POST-DISCHARGE

**The 32 youth who were at least twelve months post-discharge and their accumulated costs at twelve months post-discharge were included in this analysis**. The overall goal of this set of analyses was two-fold: 1) to identify youth who experience program success, or, alternatively, those at the greatest risk for having poor program outcomes (i.e., from admission to discharge); and 2) to identify youth who had positive long term outcomes or, alternatively, were at the greatest risk for having negative outcomes at twelve months. This approach will help state oversight staff and treatment teams understand the effects that youth with differing characteristics have on the program and its long-term outcomes.

The analyses included the following steps:

1. Identifying characteristics of youth (e.g., score on the Substance Abuse Scale, number of convictions) that were related to the outcome (e.g., program completion, fewer criminal filings)
2. Building statistical models that tested whether the characteristics were related to one another and how they were related to or predicted the outcome

It is important to note that the number of youth in this 12-month sample was barely sufficient to detect statistically significant differences with the techniques used (i.e., regression). Consequently, there are likely to be

more significant relationships than were detected in these analyses. A more complete description of the statistical approach used is included in Appendix I.

### *Definitions of Program Success*

The goal of the first set of analyses was to identify characteristics of youth who were successful in the program. Program success was defined as:

- Program completion as judged by clinical/case management staff.
- Fewer juvenile justice related events (e.g., filings, recidivism) during enrollment.
- Fewer residential placements (e.g., RTC) during enrollment.
- Positive school situation (e.g., enrollment, obtaining GED).
- Decrease in Substance Use Severity on the CCAR
- Decrease in Overall Problem Severity on the CCAR.

Table D-12 displays the outcomes for which significant predictors of program outcomes were found. No significant predictors were found for any juvenile justice related outcomes, change in Overall Problem Severity, or residential placement days.

**Table D- 12. Denver UCH MST Program: Significant Predictors of Program Outcome Measures.**

| Program Outcome Domain | Characteristic/Predictor | Effect/Outcome at Discharge |
|---|---|---|
| **Program Completion** (as determined by program staff) | Higher CCAR Substance Use PS**<br>Higher CCAR Alcohol Use PS***<br>Higher CCAR Drug Use PS**<br>Poor Education Status (p = .065) | Less likely to complete program |
| **School Status** | Older at admission**<br>inpatient MH episode before admission** | Less likely to be enrolled/graduated at discharge |
| **Substance Use** | Older at first filing AND no detention days pre-admission*** | More likely to improve CCAR Substance Use Score |

** p < .10 **p < .05 *** p < .01*

*Conventionally, significance levels of .05 or less are considered acceptable. However, It is more difficult to detect statistical significance with small samples. Therefore, we are also reporting relationships with significance levels less than .10, as they are likely indicators of important trends in these data.*

*PS = CCAR Problem Severity Score – all scales are scored 1 – 9 (1=none, 9=extreme) for each domain. The average CCAR Overall Problem Severity Score at admission was calculated by taking the average of the following: the Interpersonal Problem Severity Scale, the Overall Problem Severity Scale, and the Overall Level of Functioning Scale (1=very high, 9=very low).*

*Note: Unless otherwise specified, each characteristic predicts the effect listed. The characteristics are not additive or multiplicative. For example, each of the characteristics listed under program completion results In a lower likelihood of program completion. A youth with all six characteristics is just as likely to not complete the program as a youth with one. Characteristics that work together to predict an outcome are listed as interactions.*

Findings included:

- **Higher levels of overall substance use** and higher drug or alcohol use, were each significant predictors of program non-completion and poor school outcomes at discharge.
- **Youth who were younger** at admission were more likely to have poor school outcomes.
- **More mental health inpatient episodes** were also related to poor school outcomes at discharge.
- **Youths' age at first filing and whether they had been in detention**, together, predicted improvement in substance use.

## *PREDICTORS OF OUTCOMES AT TWELVE MONTHS POST-DISCHARGE*

The goal of the second set of analyses was to identify characteristics of:

1. Youth who had high costs during the twelve months following discharge from the program.
2. Youth who produced a cost savings, with the costs during the 12-month follow-up period being compared to the costs accumulated before being admitted to the program.
3. Youth who accumulated more days in residential treatment during the twelve months following discharge from the program.
4. Youth who accumulated more commitment days during the twelve months following discharge from the program.

Table D-13 displays the outcomes for which significant predictors on 12-month outcomes were found.

**Table D- 13. Denver UCH MST Program: Predictors of Outcomes at Twelve Months Post-Discharge for Youth at Least Twelve Months Post-Discharge.**

| Outcome Domain | Predictors at or Pre-Admission | Effect/Outcome 12 Months Post-Discharge |
|---|---|---|
| **Costs** (accumulated over the 12 months) | *Interactions:* At least one detention day AND higher CCAR Drug PS** | Higher costs |
| | *Single Variables:* Not completing program**; More filings***; More convictions**; More detention days*** | |
| **Savings** | *Interactions:* For youth with at least one filing, increasing scores on the CCAR Drug PS** | Less likely to produce savings |
| | *Single Variables:* More filings** ; More detention days**; Higher CCAR Drug PS**; Higher CCAR Substance Use PS** | |
| **Residential Days** | *Interactions:* At least one conviction AND higher CCAR Alcohol PS*** | More Residential Days |
| | *Single Variables:* More filings***; Higher CCAR Alcohol PS (p = .056); Higher CCAR Drug PS*; Higher CCAR Substance Use PS (p = .064) | |
| **Commitment Days** | More filings**; More convictions**; More detention days*** | More Commitment Days |

** p < .10 **p < .05 *** p < .01*

*Conventionally, significance levels of .05 or less are considered acceptable. However, It is more difficult to detect statistical significance with small samples. Therefore, we are also reporting relationships with significance levels less than .10, as they are likely indicators of important trends in these data.*

*PS = CCAR Problem Severity Score – all scales are scored 1 – 9 (1=none, 9=extreme) for each domain. The average CCAR Overall Problem Severity Score at admission was calculated by taking the average of the following: the Interpersonal Problem Severity Scale, the Overall Problem Severity Scale, and the Overall Level of Functioning Scale (1=very high, 9=very low).*

*Note: Unless otherwise specified as an interaction, each characteristic predicts the effect listed. The characteristics are not additive or multiplicative. For example, each of the characteristics listed under program completion results In a lower likelihood of program completion. A youth with all six single characteristics is just as likely to not complete the program as a youth with one. Characteristics that work together to predict an outcome are listed as interactions.*

Significant predictors were found for all outcomes tested. The overwhelming theme was the importance of substance use as a predictor.

- **Higher levels of substance use overall, or drug or alcohol use, predicted higher costs, fewer savings, and more residential days at twelve months post-discharge**. In each case, substance use also interacted with another variable (detention for higher cost, filings for predicting savings, and convictions to predict residential days).
- **Filings, convictions, and detention days pre-admission predicted more commitment days after discharge.**

## *UTILITY OF PREDICTORS FOR ESTIMATING PROGRAM SAVINGS*

These analyses gave us specific information that can be used to identify youth likely to accumulate high costs. This also gave us a better understanding of the effects that youth with certain characteristics have on outcomes. For example, we identified youth with at least one detention day and the highest drug abuse scores at admission to the program. Theoretically, they should have represented cost losses, rather than savings. Table D-14 displays the pre- and post-discharge costs as well as savings and cost per youth for the five youth who were predicted to have higher costs 12- months post-discharge and for the remaining Denver youth. This illustrates the effect of high-risk youth on cost savings for the UCH MST pilot program. **While each non-predicted youth *saved* an average of almost $4,000, each predicted youth *cost* almost $32,000 over time. The five youth accounted for such a high percentage of post-discharge costs that, when they were excluded, the program demonstrated substantial savings rather than a loss from the pre- to post-discharge periods**.

**Table D- 14. The Effect of High Risk Youth on Overall Program Savings for Youth Twelve Months Post Discharge.**

| | n | Total Pre-Costs | Total Post-Costs | Pre-Cost Less Post-Costs | Average Cost per Youth |
|---|---|---|---|---|---|
| **Total for 5 "Predicted" Youth** | 5 | $109,716 | $268,769 | -$159,053 | -$31,810.60 |
| **Total for 32 Youth** | 32 | $316,946 | $213,313 | $103,633 | $3,838.26 |

## SUMMARY OF 12-MONTH OUTCOMES

Twelve-month outcomes for system costs, program and youth savings, and various cost-related events were examined for the group of 32 youth who had been discharged from the UCH MST program for at least twelve months. In addition, statistical techniques were used to identify characteristics of youth that were related to program success and higher costs.

With regard to system costs:

- The mental health system accounted for 60% of the costs in the pre-discharge period, almost all due to the heavy investment in the UCH MST pilot program. Child welfare accounted for 20% and youth corrections accounted for only 12% of the pre-discharge costs.
- In the post-discharge period, youth corrections bore the majority of the costs (55%), followed by child welfare (34%), a result of increased use of locked juvenile facilities and residential treatment centers.
- Total costs increased by 20% between the pre-discharge and post-discharge periods.

With regard to savings:

- The majority of the youth (n=21, 66%) in the program had savings.
- Their savings ($192,988) more than offset their program costs of $168,800.
- The high post-discharge costs of the remaining youth were more than double their pre-discharge costs.

- Youth who completed the program (68.8%) averaged net savings of about $5,000 while youth who did not complete the program (31.3%) net losses of almost $17,000 per youth.

With regard to cost related events:

- Cost per unit/event varied considerably, from $2.09 for electronic monitoring to $830 for a day of certain types of inpatient care.
- About one-third of the youth were involved with diversion, had been filed on by the district attorney, had been or were on probation, or had been in detention prior to admission to the program (not necessarily the same youth).
- The number of youth who received filings decreased after discharge.
- The number of inpatient psychiatric, residential treatment, detention, and commitment days increased after discharge.
- Youth did not progress to violent crimes after discharge.

Although hampered somewhat because of the low numbers of youth with 12-month outcomes, there were interesting findings regarding the prediction of program completion and other indicators of program success. These were:

- Substance use, overall, or drugs or alcohol, were each predictors of program completion, as was the youth's school enrollment status at admission to the pilot.
- Youths' age at admission was related to school enrollment/graduation status, as was mental health inpatient episodes, independently of one another.
- Youth who were older at first filing and who had not been in detention prior to admission were more likely to demonstrate improvement on their CCAR substance use score.

With regard to the prediction of higher costs and other outcomes at twelve months post-discharge:

- Higher overall substance use, or drug or alcohol use scores, predicted higher costs and reduced savings, and residential days at 12-month post-discharge. In each case, it also interacted with another variable (detention for higher cost, filings for predicting savings, and convictions to predict residential days).
- Filings, convictions, and detention days pre-admission predicted more commitment days after discharge.
- These results pointed to specific youth who would be more likely to incur higher costs. Five youth with losses totaling over $172,000 were identified.
- These findings should be helpful to state and program staff as a way to target program dollars and plan for high-risk youth.

## *QUALITATIVE ANALYSES: CAREGIVER AND YOUTH PERCEPTIONS OF THE PILOT PROGRAM AND RECOMMENDATIONS FOR IMPROVEMENT*

Interviews were conducted with caregivers and youth about six months after the youth was discharged from the UCH MST pilot program. The purpose of the interviews was to document perceptions of caregivers and youth that would inform program development and quality improvement. Twenty-eight (28) caregivers and 17 youth, representing about 66% of the youth who are six months or longer post-discharge, have been interviewed since the first Denver UCH MST enrollees were discharged in February 2002. The complete analysis of the interviews are included in Appendix L.

### CAREGIVER PERSPECTIVE

Caregivers reported a wide age range for when their children's problems first began. In years 1 and 2, caregivers reported an age range from 6-17 years old. In year 3, the range for nearly all children was between the ages of 11 and 13. Typical problems noted were behavior in school, destructive behavior, lying, stealing, drug use, and learning issues. Most caregivers reported that their child had been court-ordered to participate in the pilot program. Yet, most youth in year 3 reported that their participation had been voluntary. Upon enrollment, caregivers reported that most youth had problems in school, anger issues, legal problems and were using drugs.

Caregivers in years 1 and 2 stated that their children had received services prior to enrollment, but rated them as being of "no help". In year 3, caregivers rated earlier services as being of "some help" and gave specific examples. Caregivers also identified certain outcomes that they would like their children to achieve. Generally, they wanted their children to be less angry, more responsible, able to make healthier choices, like themselves again, and improve their relationship with other family members.

Overall, caregivers said that the pilot program had been "very helpful". Almost all said that the pilot had been the most helpful service that they had received. Most caregivers reported that youth were able to relate more positively with their family as a result of the pilot. Also, youth were less angry, more respectful, and had improved in school. Nearly all caregivers said they were satisfied with their level of involvement in the pilot.

Most caregivers reported that youth were able to relate more positively with their family as a result of the pilot. Also, youth were less angry, more respectful, and had improved in school.

To improve the program, most caregivers suggested that the number of sessions offered be increased and the program's length of time be extended. Caregivers also said that youth needed transitional services and educational and vocational skills training as well as opportunities to be involved in healthy activities. Finally, caregivers advised providers and decision makers about the need to keep families together, for more available mental health care, and for more experienced mental health and social services staff.

### YOUTH PERSPECTIVE

Youth reported that their most serious difficulty at time of enrollment was their anger in school, home and in the community. Youth reported that their problems began between the ages of 8 and 13 years old. Problems

reported at onset were legal and behavior in school. Most youth reported they had not received any help when they were younger.

Youth described the pilot program as one that tries to help people with their problems. As a result of the pilot, youth reported fewer problems with anger and overall, and greater communication and happiness within the family. Most youth found that the pilot was "very helpful" or of "some help" to them. Almost all youth said that the pilot was the most helpful service that they had received. **Youth reported that some additional services would still be useful, such as Job Corps and anger management.** Almost all youth said that they needed to pursue some form of education to become successful adults.

As a result of the pilot, youth reported fewer problems with anger and overall, and greater communication and happiness within the family.

… Almost all youth said that the pilot was the most helpful service that they had received.

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# APPENDICES