Assessing Factors Associated with the Use of Residential Treatment Facilities for Juveniles on Probation in Montana, Fiscal Year 2007

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Executive Summary

This report was prepared by the University of Montana School of Social Work (UM) for the Montana Supreme Court Office of Court Administrator (OCA), Youth and District Court Services. It explores factors associated with the cases of juveniles on probation in the state of Montana who were placed in residential mental health treatment facilities during the 2007 fiscal year. Of the 6624 youth referred to probation, (.0049%), or 31 cases, were placed in this level of care.

Individual court orders allowed the gathering of all material pertaining to each youth's residential placement and treatment. Information was converted into variables and subjected to extensive statistical analysis. Fifteen of the 31 cases (48.4%) were placed in out-of-state facilities, with 13 of these placed more than 1500 miles from home. The average length of stay for all youth was 130.9 days; those placed out-of-state stayed significantly longer and youth with a felony conviction or with a diagnosis of Bipolar Disorder stayed longer regardless of where they were placed. In fact, those with a felony who were sent out-of-state (9 cases), stay an average of 228 days – more than 100 days longer than all other youth. Discharge placement and family involvement were not associated with recidivism or number of new crimes committed by those who re-offend.

Most cases carried multiple psychological diagnoses. Eighteen were diagnosed Oppositional Defiance Disorder, 11 with Attention Deficit Hyperactivity Disorder and 11 with Bipolar Disorder, though Bipolar Disorder was the most commonly occurring primary diagnosis reported. The principal deciding factor when placing these youth offenders is the need to manage symptoms most often associated with Conduct Disorder, though only five youth in the study carried this diagnosis and it was always secondary. Also, only six of the 31 youth were diagnosed with a co-occurring Substance Use Disorder and for all of them it was a secondary diagnosis.

Juveniles had been discharged from their respective residential facilities for an average of 16 months at the time of this study. The data tells us that 11 (35%) of the 31 cases recidivated after their residential facility stay. Those who recidivated had, on average, significantly more lifetime offenses and prior placements and a shorter length of stay at a residential treatment facility. Discharge placement and family involvement were not associated with recidivism or number of new offenses committed.

The sample under study (31 cases) was relatively small by statistical standards, containing one cross section of data representing the fiscal year 2007. While the study has determined that there are differences across sub-groups in the sample, no valid multivariate predictor models could be established. Recidivists differ from others on some factors but those factors cannot be used to predict recidivism. The ability to examine statistically significant associations between different variables across a sample becomes more accurate with a larger number of cases and it is suggested that this study form the basis of an ongoing quantitative evaluation process of inpatient placements as larger numbers will yield more powerful and convincing results.

Introduction

This report is the result of a contract between the Montana Supreme Court Office of Court Administrator (OCA), Youth and District Court Services, and the University of Montana School of Social Work (UM). The University of Montana provided the services of Dr. Tim Conley and his graduate student research assistants, Meghan Gallagher and Jenifer Evers, to complete research and evaluation pertaining to certain OCA records. Specifically, Dr. Conley and his assistants utilized quantitative and qualitative research and program evaluation methods to analyze records related to youth court probationers who were referred to and used residential treatment facilities, both within and outside the state of Montana during the fiscal year 2007 (July 1, 2006 through June 30, 2007).

Ultimately, the research endeavor sought to explore potential predictive statistical models regarding factors associated with mental health care provided to residentially placed youth, such as in-state or out-of state placement, length of stay, and recidivism. Variables explored included the youth's proximity to home when placed, family involvement, and specific diagnoses. The purpose of statistical examination was to test hypothesized relationships between various events and variables in a youth's life, and identify patterns of probation practice, allowing the OCA to formulate policies that more effectively address the mental health needs of youth placed in residential mental health treatment facilities.

Prior to placement in such a facility, all youth in the study had received treatment at a lower level of care, starting with outpatient treatment, most often moving to a therapeutic group home, and after failing to respond to these levels, they were then referred to a residential facility. Prior to admission to this level of care, a formal certificate of need was signed by a licensed professional, mental health case manager and medical doctor. An appropriate prior authorization form was also completed and approved by First Health Services of Montana, a healthcare management company which assists with utilization management and prior authorization of services as required by the Medicaid program.

Working with youth in the juvenile justice system who are reportedly mentally or emotionally ill and are in the care of probation requires the highest level of oversight and management of confidentiality issues. This project was approved by the OCA and the University of Montana's Institutional Review Board for the Protection of Human Subjects (IRB#116-08).

Methodology

Evaluation methods included gathering existing data from the Juvenile Court Assessment and Tracking System (JCATS), an electronic data management system used by OCA. Additional information was garnered from semi-structured informational interviews with OCA staff and probation officers. When the term "record" is used in this report, it means the JCATS electronic record. Paper files were not reviewed by the researchers for this study though in many cases, the paper files were consulted by the probation officers during the interviews. Once all data was collected, it was subjected to statistical analysis.

For this report, the definition of the term "significant," as used throughout, is that statistical testing established (or failed to establish) an association between variables, and that according to the mathematical laws of probability, the relationship is not due to mere chance (see Appendix 1).

Sample Description

The initial sample included 32 cases of juvenile offenders who were referred to, approved for and placed at in-state or out-of-state residential psychiatric treatment facilities during the fiscal year 2007. At the time of this research project, three of these cases were no longer juveniles, with only one record which was unavailable. This sealed record was not reviewed, leaving a total number of 31 cases under study for this project. One youth was placed in residential psychiatric care on two separate occasions (once in-state and once out-of-state) and, for this study, is counted as two cases.

Figure 1

Of the 31 cases, youths aged 10-13 comprised (35.5%) of the sample; age 14 alone comprised another (25.8%) of those placed during this time period; (38.7%) were 15-17 years of age, and only one youth was 17 years old at placement. Figure 1 presents a visual display of the ages of all youth in the study. With regards to gender, (61.3%) are male, (38.7%) are female.   Three different ethnic backgrounds were identified by probation officers: 27 cases (87.1%) were reported as Caucasian; three (9.7%) were reported as American Indian. One case was reported as African American.

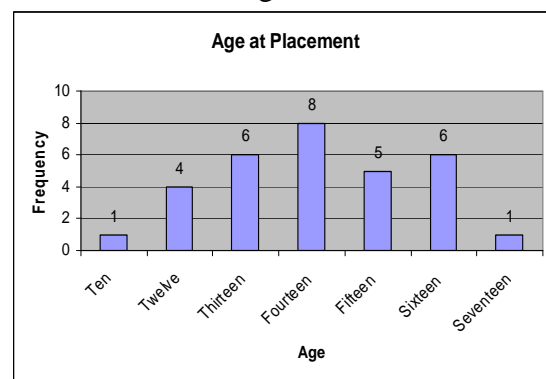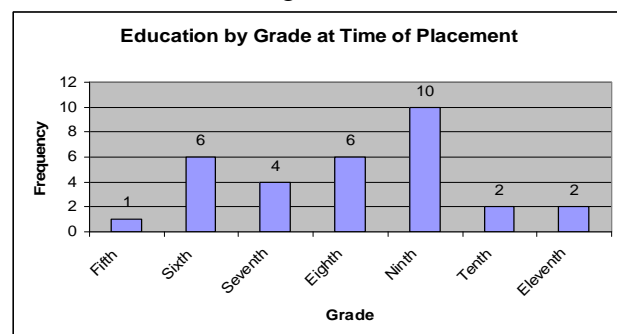**Age at Placement**

Figure 2

The distribution of cases by all grades is shown in Figure 2. Ten of the cases in the sample were in the 9th grade (32.3%), four more than in any other single grade.   While this appears to be a high-risk grade for youth on probation, our analysis isolated the group of children in this grade and compared them to all other cases across specific variables that included: felony/misdemeanor, in-state/out-of-state placement, length of stay in placement, number of lifetime offenses committed, etc. Both t-test and chi-square statistical tests of difference were used to test for association as appropriate. There appears to be no statistically significant difference between 9th graders and all others in this sample.

Education by Grade at Time of Placement

Documentation indicates that (51.6%) of these youth have learning disabilities. Two youth were diagnosed with a Pervasive Developmental Disorder (PDD), referring to a group of psychological disorders characterized by delays in the development of multiple basic functions including socialization and communication. Autism is the most commonly known PDD, and includes Rett Syndrome, Childhood Disintegrative Disorder, Aspergers Syndrome, and Pervasive Developmental Disorder Not Otherwise Specified. Both youth diagnosed with PDD in this

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group were listed as "Not Otherwise Specified," indicating they likely exhibited symptoms from several of these related groups. Other learning-related disorders diagnosed in these cases included: three cases of a specific Disorder of Written Expression, indicating a substantially impaired ability to write, one diagnosis of a non-specific cognitive disorder and two cases diagnosed with a specific Mathematics Disorder.

In general, it is clear that the majority of this sample is impaired in their ability to function adequately toward developmentally appropriate educational processes and will struggle in a school setting. Most are functioning at below-grade level for their age. While JCATS records identified learning disabled students, the files would be strengthened by more consistent documentation of Individualized Educational Plans (IEP) in place for the juvenile offenders.

Data Collection

Individual court orders were received by the UM team granting access to any and all records pertaining to the youth and their psychiatric residential placement. The court orders were issued by a judge in each of the 11 districts where the youth were under supervision. Once the court orders were obtained, OCA granted the research team login permissions to the JCATS system and we reviewed all available data on each individual case. Reviewing the extensive paper files for each youth was beyond the scope of this study; information needed from the paper files was provided by probation officers. For the 31 cases studied, there were 21 different probation officers (some had two or three cases each). All juvenile probation officers and their supervisors were contacted by phone for a semi-structured informational interview, which helped confirm or clarify facts in each case. For example, all officers were asked "What is the reason that this youth was placed in residential care?" The answers were recorded in notes and subsequently coded into categories (see Appendix 2). Once information was collected from both the data management system and the interviews, it was recorded on a data sheet and reviewed by Dr. Conley prior to being coded into variables and entered into Statistical Package for the Social Sciences (SPSS©).

OCA requested specific variables for collection and the UM team added to these as the research progressed. The following is a list of all variables collected:

All Variables Collected

Youth ID Number	Most serious crime committed
Age at placement	Misdemeanor or Felony
Gender	Treatment prior to placement
Race	Number of prior placements
Judicial District Number	Risk level per Back on Track (BOT)
Placement location	assessment tool completed closest to
Placement location (in-state/out of state)	time of placement
Placement dates	Date of BOT completion
Placement proximity to home (in miles)	BOT Full-screen (yes or no)
Number of youth court referrals prior to	Type of mental health evaluation
placement	completed closest to placement
Total number of youth court referrals	Mental health diagnosis
Number of offenses prior to placement	Education by grade
Total number of offenses	Learning disability (yes or no)

Reason for placement	Reason for discharge
Cost per day	Discharge placement
Total cost	Aftercare services provided (yes or no)
Medicaid eligibility (yes or no)	Recidivism (yes or no)
Length of stay (days)	Probation Officer (PO)
Type of treatment provided	PO supervisor name and phone number
Family involvement (yes or no)	

After collecting and coding these variables, the data set was proofed and any inaccuracies or discrepancies reconciled. The data was then subject to extensive exploratory analysis to establish significant relationships between both individual and grouped variables.

Results

Simple frequencies were readily generated and statistical model building was undertaken to explore associations between variables. Building models for hypothesis testing which used one variable or set of variables to predict the outcome of another proved consistently challenging due to the small sample size (N=31). Parametric statistics rely on a variation of response across cases and when cases are few, so is the variance available to work with; the mathematical formulas become more conservative with regards to ruling out chance as a competing hypothesis. It is only when this is ruled out (p<.05) that a finding is considered significant. Also, non-parametric statistics, such as chi-square tests of difference, assume a minimum number of cases per cell and can not be accurately computed when there are less than 5 cases in a group. For example, to examine a 2x2 cross-tabulation table for recidivism (yes/no) by mental health diagnosis of Attention Deficit Hyperactivity Disorder (yes/no), at least five cases would have to be examined in each category to conduct valid analysis. For further discussion of this challenge see Appendix 1.

Prior to Placement

The overall reason for placement in a residential treatment facility is always that behavioral symptoms are deemed unmanageable at a lower level of care. In all cases studied, a certificate of need has been signed by a licensed professional, mental health case manager and medical doctor. An appropriate prior authorization form is also completed and approved by First Health Services of Montana, a healthcare management company which assists with utilization management and prior authorization of services as required by the Medicaid program. Specific precursor behavior was manifest and documented prior to each youth's placement. Information garnered from probation officer interviews and JCATS identified behaviors which included: aggressive behavior, mental health/psychiatric issues, family/social issues, sex offending behaviors, substance related issues, court related matters, running away behaviors, suicidality, fire setting, prostitution, extreme impulsivity, theft and others. More than one behavior was often given as the basis for placement rendering a total of 53 different descriptors. Specific psychiatric symptoms and language were used in 13 (24.5%) cases. The most commonly used language concerned aggressive or assault related behaviors (see Appendix 2).

For youth in residential treatment facilities, the average number of offenses committed prior to placement is 8.77, while the average number of youth court referrals prior to placement is 6.32. This discrepancy reflects the existence, in some cases, of multiple offenses for each referral.

Youth in the sample had an average of 3.23 out-of-home placements prior to being placed in a residential treatment facility. In two cases, the documented number of out of home placements prior to residential placement was zero. In one of these cases the reason cited for placement was fire-setting, in the other it was violent acting out. Most cases (70%) had between one and four prior placements. Treatment prior to placement as reported by probation officers

Figure 3

**Services Received Prior to Placement**
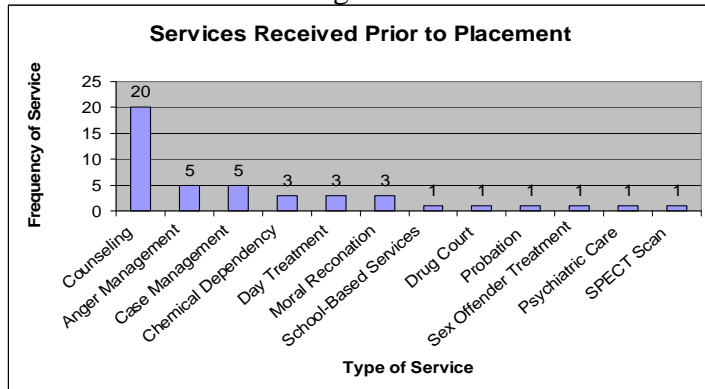
included: counseling, anger management classes, case management, chemical dependency treatment, day treatment, moral reconation therapy (in one district only), school-based services, drug court, probation, sex offender treatment, psychiatric care, and neurological scans (See Figure 3). When counseling was documented, it was not always clear from the JCATS record or the officer interview what modality of treatment it was and thus, if the term "counseling" had a consistent definition. Interviews with probation officers and OCA administration indicate that before youth were placed out of state, they were first denied by all residential treatment facilities in Montana because these in-state facilities could not ensure the safety of youth and/or other residents and that the treatment needs of the youth exceeded the abilities of the facility.

Prior to placement, probation officers conducted a "Back on Track" (BOT) assessment for each case. This standardized assessment instrument computer-generates a report that quantifies a juvenile's level of risk for re-offending, which ranges from low to high at each date of completion. Sixty-nine percent (69%) were determined to be high-risk, (27.6%) were moderate-risk while only (3.4%) were low-risk according to the BOT completed closest to the time of

Figure 4

Overall BOT Risk Level

placement. There was no BOT data available for two cases in this sample (see Figure 4). Of the 20 cases identified as high risk, only 10 actually did recidivate.
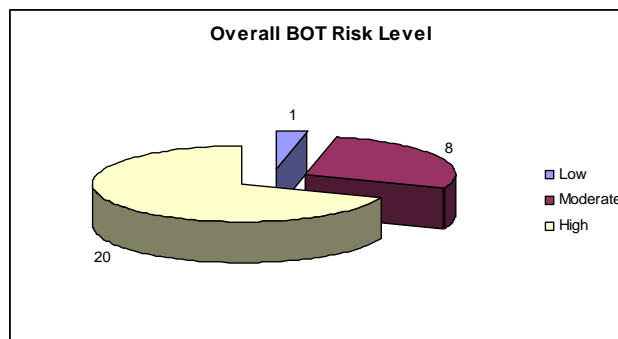
Juvenile case records were also examined with respect to the most serious crime committed by the youth either prior to or after placement. For 15 youth this was a felony and for 16 it was a misdemeanor. Of the felonies, three were assault with a weapon, two were sexual assault, and one was an aggravated assault. Two cases were for intimidation, and single cases were reported for criminal endangerment, criminal mischief, incest, sexual abuse of children, sexual intercourse without consent, solicitation to commit homicide, and theft. With regards to the 16

misdemeanors, eight were for assault, two each for partner or family member assault, and obstructing a peace officer and one each for assault with bodily fluid, criminal trespass to property and negligent arson. Overall, felony or misdemeanor, over half the cases listed some form of assault as the most serious offense committed. A full list of the most serious crime committed by each youth is available in Appendix 3.

<u>Diagnostic profile</u>

All mental health diagnoses were listed for each case in the order of report by the probation officers. It was assumed that the first diagnosis is also, clinically speaking, the primary or most severe diagnosis. Diagnoses were made by M.D. Psychiatrists in eleven cases, an M.D., non-psychiatrist in one case, Psychologists (usually indicating a Ph.D. and clinical license) in seven cases, and by either a Licensed Clinical Social Worker or a Licensed Clinical Professional Counselor in seven other cases. Two diagnoses were made while the youth was in Shodair hospital and for three other cases, the source of the diagnosis was unclear.

The most frequently occurring first diagnosis is Bipolar Disorder (eight cases, or 25%), though another three cases included this as an additional diagnosis meaning (35%) of all cases included a Bipolar Diagnosis. Oppositional Defiant Disorder (ODD) was the second most frequently occurring first diagnosis with seven cases (23%), though 11 other cases also included this diagnosis so that, all told, 18, or (58%) of cases reportedly had ODD somewhere in the profile. Attention Deficit Hyperactivity Disorder (ADHD) was the first diagnosis for only one case, but was listed as an additional diagnosis in ten other cases, totaling (35%) of cases. Six cases (19%) included a co-occurring substance abuse or dependence disorder. Table 1 (page 10) lists the diagnosis by prevalence rate of "first diagnosis listed" and "additional diagnosis listed." The average number of different diagnoses per case is 3.48, ranging from a single diagnosis for one case to ten separate diagnoses for another. Both the median and the mode for total number of diagnoses reported by probation were four.

One specific diagnosis examined in more depth by researchers was Conduct Disorder. While only five cases included this diagnosis, it was always at least the second diagnosis reported. However, a review of other documentation in the records and information gathered from interviewing probation officers indicate that this disorder may be more prevalent among these cases than is obvious. See Appendix 4 for the Diagnostic and Statistical Manual of the American Psychological Association's criteria for Conduct Disorder. This is preceded by the raw data from the variables for "most serious offense committed" (from JCATS) and "reason for placement" (as reported in probation officer interviews). The reported offenses and behaviors reviewed which preceded placement, in most cases, are consistent with the symptomology most often associated with Conduct Disorder.   More importantly, the offenses and behaviors are symptomatically inconsistent with the most prevalent diagnoses of Bipolar Disorder, more severe than ODD would indicate, and inconsistent with diagnostic criteria for ADHD. For example, nowhere in the diagnostic criteria for Bipolar Disorder are the terms 'aggressive, cruel, violent, or intimidate' used to describe symptoms.

Table 1

First and Additional Diagnoses

Diagnosis	Listed as First Diagnosis Reported	Listed as an Additional Diagnosis
Bipolar Disorder	8	3
Oppositional Defiant Disorder	7	11
Major Depressive Disorder	5	1
Dysthymic Disorder	3	5
Pervasive Developmental Disorder NOS	2	0
Attention Deficit Hyperactivity Disorder	1	10
Substance Use Disorders	1	5
Intermittent Explosive Disorder	1	4
Reactive Attachment Disorder	1	2
Schizoaffective Disorder	1	1
Conduct Disorder	0	5
Post Traumatic Stress Disorder	0	5
Cognitive Disorder	0	3
Generalized Anxiety Disorder	0	2
Psychotic Disorder	0	3
Disorder of Written Expression	0	3
Enuresis	0	2
Encopresis	0	1
Impulse Control Disorder	0	1
Identity Problem	0	1
Learning Disorder NOS	0	1
Mathematics Disorder	0	2
Mental Disorder NOS	0	1
Mood Disorder	0	1
Disruptive Behavior Disorder	0	1
Delusional Disorder	0	1
Schizophrenia (Disorganized Type)	0	1

The data was examined to determine if the sample exhibited differences by diagnostic group across a variety of continuous variables. For example, are youth with a Bipolar diagnosis significantly older than those without this diagnosis? Do they commit more or less offenses than others without the diagnosis? Answering this and related questions required the construction of so called "dummy" variables. This is a common statistical process whereby categorical data may be coded in a way that makes them statistically useful. In this study, these variables included the written names of various diagnoses identified for each case either in JCATS or by probation officers. The variables were created such that the presence of a particular diagnosis was coded as a "1" and its absence (all other cases) were coded as a "0." This was done for all diagnostic categories for which there were more than five cases; for mathematical reasons, having less than 5 cases in a group is statistically inappropriate. No differentiation was made for each mental health diagnosis regarding whether or not it was listed as a first diagnosis. That is, any case in the study that included each diagnosis anywhere in their profile was included in the new variable. The following mental health diagnoses were created as dummy variables: Bipolar Disorder;

Oppositional Defiant Disorder; Attention Deficit Hyperactivity Disorder; Dysthymic Disorder; Major Depressive Disorder; Substance Use Disorder and Conduct Disorder. This process allowed for comparison of the group of cases where the diagnosis is present with the group of all others where it is not.
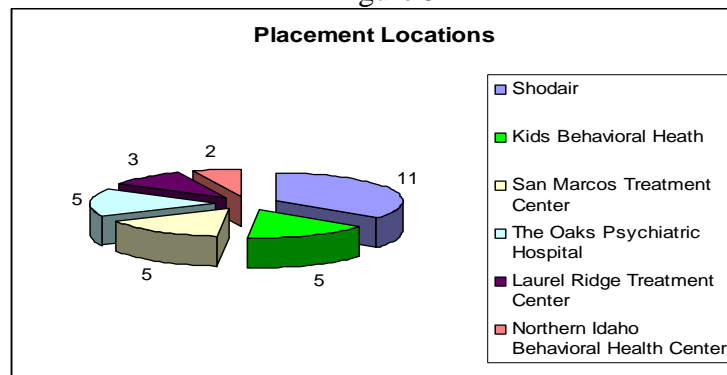
An additional concern when working with a small number of cases is the frequency distribution of continuous level variables. Continuous variables are those that are measured with a scale, such as age in years, number of prior offenses etc. The continuous variables available for comparison across diagnostic groups for which the distribution of responses are adequately normal and generally appropriate for bivariate statistics, i.e t-tests, were: age at placement, education by grade, total number of offenses prior to placement, total number of youth court referrals, total number of youth court referrals prior to placement, number of prior placements, length of stay and total cost. There are some concerns with the frequency distribution of the other variables that would be erased with a larger sample.

A series of 63 t-tests were run. Each of the seven diagnostic categories were compared across the nine continuous variables. The standing hypothesis is that there is no statistically significant difference in mean score between those with the mental health diagnosis and those without it (as coded in the dummy variable) for the continuous variable being studied. If the significance level (p-value) is less than .05, the hypothesis of no difference can be rejected. Most tests yielded insignificant results. For the 11 cases with ADHD, on average they have significantly more offenses prior to placement (10.55) than those without (5.55) and significantly more total offenses (12.35) than the 20 cases without ADHD (6.45). For the 11 cases with Bipolar Disorder, on average, they have significantly longer lengths of stay (162 days) than those without Bipolar Disorder (74). This is discussed more thoroughly in the report under the "Length of Stay" section. Moreover, those with Bipolar Disorder have a higher average total cost ($49,883) than those without ($22,150). No other differences were detected across continuous level variables for the other five diagnostic groups.

Placement

During the fiscal year 2007, 6624 children were referred to probation in the state of Montana. Of all these juvenile offenders, 33 (.0049%) were placed in residential treatment centers. Put another way, less than 5/100th of one percent of cases were placed. Fifteen out of the 31 cases (48.4%) were placed in out-of-state facilities and 16 (51.6%), were placed at an in-state facility. Figure 5 provides a more detailed presentation of all placement locations and the number of cases in the study that were placed at each location.

Figure 5

Placement Locations

Legend:
- Shodair
- Kids Behavioral Heath
- San Marcos Treatment Center
- The Oaks Psychiatric Hospital
- Laurel Ridge Treatment Center
- Northern Idaho Behavioral Health Center

There were not enough cases per judicial district for a statistical comparison across districts to determine whether any was significantly more likely to refer to an out-of-state facility. Even comparing the *percentage* of cases in each district that were sent to a residential facility did not

paint a valid picture of where the youth came from. They appear to be distributed randomly across districts.

Youth were placed an average of 868.66 miles from "home" as defined by the address listed in JCATS (see Figure 6 for specific distances). A closer look at the data reveals that 13 cases were placed over 1500 miles from home, while the remaining 18 were placed within 300 miles. The average length of stay was 130.9 days. (48.4%) were placed for fewer than 100 days; (29%) stayed in placement between 100 and 199 days; (12.9%) were in placement between 200 and 299 days, and (9.7%) stayed for over 300 days (see Figure 7 for the breakdown regarding length of stay). It should be noted that stay dates reported in JCATS at times conflicted with OCA accounting reports, but only by a matter of days. Researchers reconciled discrepancies by discussing conflicting dates with probation officers. In these instances, we relied on probation officer accounts and have used their reports to record length of stay information.
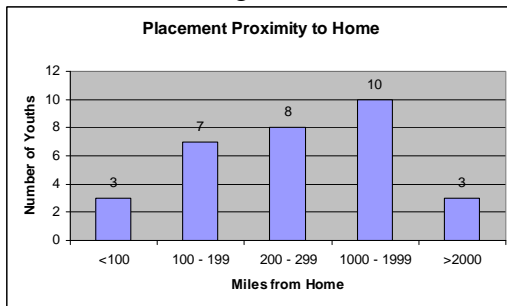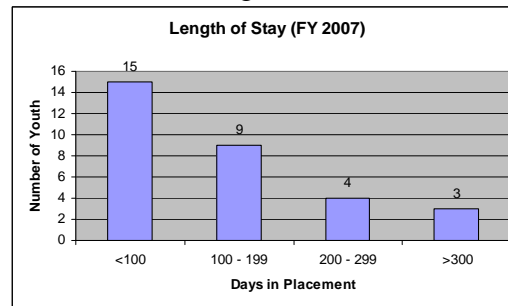
Figure 6	Figure 7

Length of Stay at Placement

As previously noted in the placement description, the average length of stay in the facility for all 31 cases studied was 130.9 days. An effort was made to determine which variables were associated with how long a youth stayed in placement. This included examining relationships between demographic information such as age and grade, offense and referral history, and mental health diagnosis. Initial exploration consisted of creating a Pearson's r correlation table for all continuous level variables and flagging significant associations. Variables in the model were: length of stay; age at placement; education by grade; number of offenses prior to placement; number of youth court referrals prior to placement; risk level per BOT assessment tool completed closest to time of placement; total number of youth court referrals; total number of offenses; number of prior placements and placement proximity to home in miles.   Results indicate that the only variable significantly correlated with length of stay is placement proximity to home in miles ($r=.504$; $p<.005$).

This variable (placement proximity to home in miles) was isolated and used to run an independent samples t-test to determine if there was indeed a significant difference between the average length of stay for the (48.4%) of cases sent to out-of-state placements (a mean of 178.9 days) and the (51.6%) within-state placements (a mean of 85.8 days). There is a significant difference; youth placed out-of-state stay longer. This explains why proximity is associated with longer stay: being placed out-of-state, farther from home, simply means it will be a longer stay. It is reiterated here that 13 cases were placed over 1500 miles from home, while the remaining

18 were placed within 300 miles. It is these cases, placed out-of-state, that have the significantly longer stays.

Another substantially more complex statistical model, binary logistic regression, was constructed to explore which variables are associated with being sent to an out of state facility (and hence remaining in placement significantly longer). One pre-model assumption is that being placed out-of-state only occurs in cases where the youth has been denied admission to all in-state residential treatment facilities. A binary logistic regression model was chosen because the outcome variable may be dichotomous (placement location: in-state/out of state). Predictor variables may also be dichotomous, or binary, such as gender (male/female), and the predictive power is expressed in terms of the degree to which the predictor variables increase the likelihood of the placement in outcome variable categories. Other advantages of the model are that continuous level predictors may also be used and a significance level is provided for each predictor.

A list of variables used in the equation follows. Outcome variable: in-state/out-of-state; Predictor variables: male/female; learning disability (present/not present); misdemeanor/felony; age at placement; education by grade; number offenses prior to placement; number of youth court referrals prior to placement; BOT assessment tool completed closest to time of placement; and number of prior placements. Variables considered but excluded from the model due to sample size constrictions include race (too few non-whites); judicial district number (too few cases in most districts to meet model assumptions); Medicaid/not-Medicaid (to few non-Medicaid cases) and family involvement/no-involvement (30 of 31 families were involved). Also excluded from the model were variables describing events which occurred after placement such as recidivism and aftercare placement. All variables were initially entered into the model simultaneously.

Table 2 below shows that none of the predictors were significant at the p<.05 level. The Beta's would be a standardized measure of the strength of each predictor if they were significant. The model was explored further by changing the predictor entry method but this did not result in changes to the findings. Moreover, various combinations of variables were looked at together and alone as predictors but none proved statistically significant. The question remained: why do some youth stay in the residential facility longer (out-of-state) than others?

Table 2

Logistic Regression Model for Predicting In-state/Out-of State Placement			
	Beta Coefficient	Significance Level (p value)	Estimated Odds Ratio
Gender	-2.462	0.204	0.085
Learning Disability (Y/N)	-0.113	0.945	0.893
Misdemeanor/ Felony	2.086	0.098	8.049
Age at Time of Placement	1.710	0.096	5.531
Education by Grade	-1.115	0.321	0.328
Number of Offenses	-0.154	0.452	0.857
Number of Referrals Prior to Placement	0.337	0.273	1.400
Risk Level from BOT	-1.301	0.239	0.272
Prior Placements	-0.391	0.352	0.677

To continue the exploration of which variables are associated with being sent to an out-of-state facility (and hence remaining in placement significantly longer), another binary logistic regression model was considered to examine what effect various diagnosis had on where, and hence how long, a youth was placed. The outcome variable, what we were trying to predict, was again dichotomous: placement location: in-state/out-of-state.

Prior to constructing the considered multivariate model, a series of cross-tabulations with chi-square tests of significance were run for each individual diagnostic variable (the dummy variables). Here, the standing hypothesis is that there is a significant association between a particular mental health diagnosis and placement location: in-state/out-of-state (and thus a longer stay in the program). Only one diagnosis, Oppositional Defiant Disorder, rendered a cross-tab with a chi-square statistic which could be interpreted. It showed that there is no statistically significant association between a diagnosis of Oppositional Defiant Disorder and being placed either in-state or out-of-state (chi-square = 2.425 (1 df); p =.119). The cross-tabulations for the six remaining diagnostic variables included cells with less than the five cases necessary for the chi-square to be interpreted. For example, with regards to Bipolar Disorder, a condition present in 11 cases, there were nine who stayed at in-state facilities and two who stayed out-of-state. Of the 20 cases *without* the diagnosis, seven stayed in-state and 13 out-of-state. We cannot, however, say that having a diagnosis of Bipolar Disorder is significantly associated with staying in-state, because the sample of cases is too small for the mathematical assumptions of the chi-square statistic.

The results of the preliminary chi-square analysis indicated that the more complex multivariate regression model would also fail to yield significant results. Nonetheless, for exploratory reasons, the model was constructed and no significant associations between diagnosis and placement location were established.

The data was next examined to determine if there was a relationship between mental health diagnosis and length of stay. Length of stay is itself a continuous level variable, but the distribution of responses is negatively skewed (skewness statistic .995), which indicates that its distribution fails the assumption of normality that would make it a good variable for multivariate statistics – using more than one predictor variable to determine what is effecting outcome. A review of the histogram distribution of responses did indicate that the data would be appropriate for bivariate procedures, such as independent sample t-tests.

Therefore, for each diagnostic dummy variable described above, the average length of stay for youth with the diagnosis was compared to the average length of stay for those without the diagnosis. The hypothesis for each test is that there is no statistically significant difference in the mean length of stay for those with the diagnosis and those without it. Results indicate that on average, youth diagnosed with Bipolar Disorder have a significantly longer mean length of stay (11 cases, 162 days) than those without the disorder, (20 cases, 74 days), (t = 3.15, (29 df); p<.05). Nine of these 11 cases were actually in-state placements, going against the trend that out-of-state placements last longer. However, when the diagnosis is Bipolar, that does not seem to be the case. A more convincing result would be based on a larger, more normally distributed sample of cases.

There were no other results indicating that the average length of stay differed significantly between those with other diagnoses (not Bipolar Disorder) and those without the specific diagnosis. For example, the 11 cases with ADHD did not stay significantly longer or shorter than the 20 cases without ADHD. The same was true for Oppositional Defiant Disorder,

Dysthymic Disorder, Major Depressive Disorder, Substance Use Disorder, and Conduct Disorder. The number of youth with other diagnoses (eg. Schizoaffective, Reactive Attachment Disorder) was not sufficiently high enough for a meaningful comparison with others.

Difference in mean length of stay was examined for one other grouping factor. Did the 15 cases where the offender was convicted of a felony have a longer length of stay (mean = 173.8 days) than the 16 convicted of a misdemeanor (mean = 90.6 days)? Results show there *is* a significant difference; youth with a felony conviction stayed longer whether they were placed out-of-state or not. In fact, those with a felony who were sent out-of-state (10 cases), stayed an average of 228 days – more than 100 days longer than the overall average length of stay for all other youth.

Treatment Provided at Placement

Some level of family involvement was reported in (96.8%) of cases – all residential treatment facilities have a family treatment component. No means of measuring *level* or amount of family involvement is available in JCATS and the amount of contact or support could not be systematically quantified by interviewing probation officers. All client files were reviewed to examine what types of therapeutic treatment each youth received while in the facility. No consistent patterns were discerned. The records and probation officer interviews reflect a dearth of professional psychological/counseling terminology such as "cognitive behavioral therapy," or "dialectical behavioral therapy," and instead document more common vernacular and generic terms. The following list of terms are quoted from the files and probation officer interviews: "family, individual and group counseling; psychiatric services; CD treatment; skills for improving impulsivity and self esteem; safe sex education and hygiene; traditional type of counseling; treatment for suicidal behavior; drug & alcohol education; acute care; stabilizer; sexual treatment; therapy; anger management; specialized therapeutic services; sex offender treatment; sex therapy; anger management; intensive psychotherapy; therapy for inappropriate sexual behaviors; family relational issues; counseling concerning abandonment issues and behavior modification services." The terminology used does not generally denote professionally documented modalities of treatment and lacks singular definition. It is difficult for research purposes to categorize the treatments (even as occurring/not occurring) in a systematic way that would allow examining the relationship between a particular modality and other variables such as mental health diagnosis, length of stay in a facility or recidivism.

It may be that the facilities themselves are not informing the probation officers about what model of treatment is being used for each youth; the same program may have different modalities of treatment depending on the case involved. It is likely that treatment protocols for Bipolar Disorder, Depression, and Attention Deficit Hyperactivity Disorder would involve medication at the least, and that therapies for Oppositional Defiant Disorder should be based on evidence-based best practices.

Figure 8
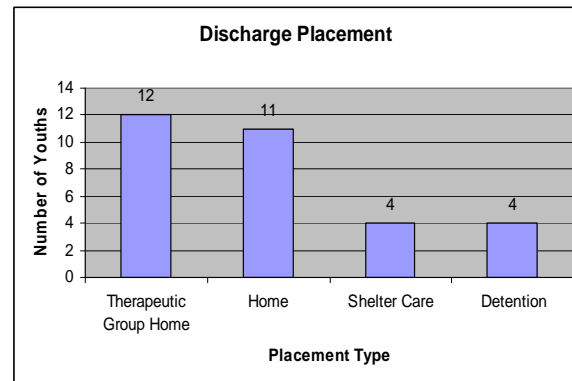
Discharge

Discharge results showed that 18 cases (58.1%) left their respective facilities because they had completed the requirements of the treatment program. Positive discharges also resulted from youth stabilizing or moving to a lower level of care. Negative discharges

Reason for Discharge

Completed Treatment

Moved to Lower Level of Care

Non-Compliance

Medicaid Denied Payment
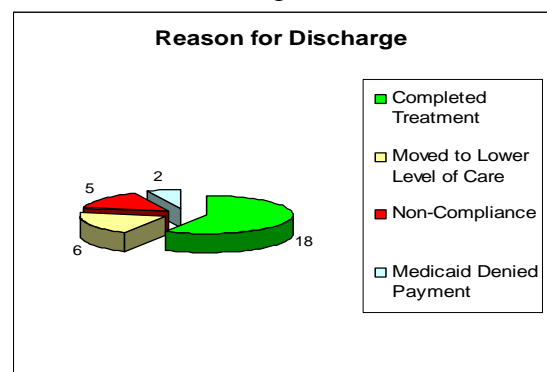
resulted from Medicaid no longer approving payment, from non-compliance with treatment, or from when a youth was sent to a detention facility; one youth actually completed treatment but was discharged to a detention facility. Please see Figure 8 above for a breakdown.

Figure 9 gives a representation of discharge placements after residential stays. Cases discharged to therapeutic group homes totaled (38.7%), (35.5%) were discharged to the family's home, (12.9%) were discharged to shelter care and (12.9%) were discharged to detention facilities. One of the youth completed treatment but was returned to a detention center. All but one case received aftercare services upon their discharge.

Discharge data was re-coded into a dichotomous variable with positive discharges (completion, moved to a lower level) equaling 1 and all others equaling 0. The data was next examined using bivariate procedures, a series of independent sample t-tests. Results indicate that on average, youth who were positively discharged had a significantly longer mean length of stay (148 days) than those discharged negatively (71 days); (t = 2.68 (22.35 df), p<.05). Moreover, Chi-square tests were run on cross-tabulations of the new dichotomous discharge variable and later, recidivism. There is no statistically significantly association. The face validity, however, shows that seven of the 23 positive discharges would later recidivate (23%) while four of the seven negative discharges (57%) would recidivate. A longer-term study with more cases observed would lead to a more conclusive finding (see Appendix 1).

Recidivism

Juveniles had been discharged from the facility for an average of 16 months at the time of this study. The data tells us that 11 (35%) of the 31 cases recidivated after their residential stay. On average, these 11 youth had been out of the facility for 17 months. A more accurate portrayal of the rate at which these youth commit another offense would best be made after the youth have been out of treatment for a longer period of time. Nonetheless, a total of 45 new offenses were committed by the 11 juveniles who recidivated. Of these new offenses, one youth committed a technical offense only. Two other cases held technical offenses after their discharge, but these were in addition to other crimes committed. Three youths accounted for a total of five new felonies between them. These felonies included: two instances of theft, and one case each of criminal mischief, assault with a weapon and incest. Three youth were discharged from placement for non-compliance. Two of these recidivated and one did not.

An effort was made to determine which variables are associated with the likelihood of recidivism. For instance, does length of stay in the residential facility decrease the odds of committing another offense? Does length of time since discharge, being older or younger, male or female affect the odds? Is the number of previous offenses or number of previous treatment placements useful for predicting occurrence of another offense? A binary logistic regression

model was constructed with the outcome variable being recidivism/no recidivism. All appropriate variables were used as predictors. Despite the use of a variety of statistical modeling techniques, no significant predictive models emerged. While a longer length of stay itself appears weakly but significantly associated with a lower likelihood of recidivism, this effect vanishes when any other predictors are added to the model. It seems intuitive that some combination of these quality variables would have predictive power, but that combination could not be discerned from this data, likely due to sample size restriction.

Operating outside the parameters of data, in the real world of juvenile offender management, officers often consider the variables discussed above as well as less quantifiable phenomena and develop a practical sense of who is at higher risk for recidivism.

The data was next examined using bivariate procedures, a series of independent sample t-tests. Results indicate that on average, youth who recidivated had a significantly shorter mean length of stay (81 days) than those who did not recidivate (162 days); (t = 2.214 (28 df), p<.05). Moreover, those who recidivated had, on average, more prior placements (4.73) than those who did not (2.50). It appears that recidivists also had a higher average number of offenses prior to placement (12 compared to 7.1) and youth court referrals prior to placement (8.5 compared to 5.2) than non-recidivists, but the significance level for both these t-tests is .06, just greater than the p<.05 needed to rule out the possibility that the finding is due to chance variation in the sample. A more convincing result would be based on a larger, more normally distributed sample of cases. Chi-square tests were run on cross-tabulations of all diagnoses by recidivism. No diagnosis was found to be significantly associated with recidivating.

The picture that emerges from this analysis indicates that juvenile offenders with a higher number of referrals and offenses prior to placement who spent a shorter amount of time in placement, may be more likely to recidivate. While it is not possible to work out the equations with this data, one could also consider that having a felony history and a diagnosis of Bipolar Disorder, along with a higher number of referrals, prior placements and a shorter length of stay, also place a youth at increased risk for recidivism.

Economic considerations

A variable for "total cost" was created and calculated for each case under study by simply multiplying the cost per day of each facility by the total number of days in treatment. If there was more than one payor or the daily rate changed, this was adjusted for; a professional accounting process would be more specific. As a validity check on the data, a correlation was run between length of stay and cost. This correlated as r = .995; p<.000 and increased confidence in the results that follow.

With regards to funding, a total of $1,244,784 was spent treating the 31 probationary youth in residential treatment centers during the 2007 fiscal year. The Medicaid daily rate for an in-state placement is $289.14, while the average rate paid for an out-of-state placement is $323.72. The average cost per case for all cases is $40,154 (SD $30,756; median $31,516). The average cost for out-of-state placements is $56,500 and the average cost for in-state placements is $24,829.

OCA accounting data reflects that all in-state placements utilized Medicaid funds, resulting in a cost of $0 per day to the Juvenile Delinquency Intervention Program (JDIP), or general fund. However, an exploration into the cost encumbered by Medicaid by the 16 youth placed at in-state treatment facilities during the 2007 fiscal year shows a total cost of $397,278. Additionally, accounting data indicates that while the majority of youth placed out-of-state utilized only

Medicaid funds during their stay, five cases either stopped receiving Medicaid funds or did not qualify at all for Medicaid during their care. Financial responsibility to these out-of-state cases without Medicaid funds totaled $210,350. Medicaid incurred an additional cost of $637,156 for all youth sent out of state resulting in a total of $847,506 spent for youth at out-of-state treatment facilities.

A Pearson's correlation matrix was constructed to see if total cost per day was associated with other continuous level variables. There is no statistically significant association between this variable and education by grade, age at placement, number of prior placements, number of offenses prior to placement, total number offenses, number of youth court referrals prior to placement and total number of youth court referrals.

Previously constructed diagnostic dummy variables were used to run a series of t-tests to see if any one diagnostic group cost more than any other. As discussed above, cases of Bipolar Disorder have a significantly longer length of stay and were determined to have a statistically significantly higher average overall cost ($49,883) than those without ($22,150).

This report is not intended as a financial/accounting audit of the 31 cases under study, but instead presents an overall view of the costs involved with placing these youth at residential treatment facilities.

Discussion

Fifteen out of the 31 juveniles on probation whose behavior dictated a need for placement at a residential treatment facility were denied admission (or re-admission) to facilities in Montana and had to be referred to another state. Once there, these youth were more likely to stay in residential care longer than those placed in Montana and their placements cost substantially more dollars. Youth offenders who had committed a felony or had a diagnosis of Bipolar Disorder stood a significantly greater chance of remaining in treatment for a longer period of time.

There is an apparent disconnect between the diagnosis and the documented behavior on record for these youth. These young offenders all carry diverse certifiable mental health diagnoses, with most having up to four. The most commonly cited behavior resulting in placement was aggression and other behaviors consistent with Conduct Disorder, regardless of whether or not they carry this particular diagnosis (only five do, and then only as a secondary diagnosis). Bipolar Disorder, Major Depressive Disorder, Attention Deficit Hyperactivity Disorder and most other diagnoses cited do not mention aggression or violence at all in the diagnostic criteria as delineated by the American Psychological Association. Conduct Disorder is likely being under-diagnosed. Moreover, a diagnosis of Substance Use Disorder is carried by only six of the youth in this study. This indicates a very low rate of co-occurring diagnoses with this high-risk population. It must be considered that this is also likely being under-diagnosed or under-documented, as studies with similar populations indicate more substance involvement. All youth referred to a residential treatment facility should have a thorough assessment and diagnostic workup regarding Conduct Disorder and Substance Abuse Disorder and this should be documented in their probation file.

With regards to documentation of behaviors associated with mental health problems, there is substantial room for improvement within the JCATS system. For example, in one of the cases under study, the youth's probation officer reported a diagnosis of Bipolar Disorder and Conduct Disorder. The JCATS report on mental health for this case showed no history or diagnosis. Case notes indicated that the client was on Prozac, a medication used primarily to treat depression. In another case, the case notes first mention of a residential treatment facility

concerns placement after discharge. There is a specific field in the system for documentation of mental health history and completion of this field should be made mandatory for cases resulting in residential or therapeutic group home placement. It is also advisable that when a youth is placed in residential care, that the JCATS notes are very specific with regards to the chronologically recording the mental health history of the offender and what exactly was done for a pre-placement assessment/evaluation. More consistent and systematic documentation of symptomotology would lead to more meaningful outcomes studies.

Juvenile probation officers likely vary in the degree to which they are familiar and comfortable with psychiatric language. Diagnostic terminology is often complex and the professional lexicon mingles with the vernacular in front line practice; this is reflected in notes and conversations.   The same is true for social workers and counselors with regards to the language of juvenile justice. It may be useful for further program evaluation efforts if officers were trained to interpret and document contemporaneous key facts concerning their supervisee's mental health using standardized language. For example, in order to establish evidence of what modality of treatment or counseling is most effective, appropriate diagnostic language must be used in the JCATS record.

From a research perspective, The JCATS system itself is an excellent electronic record keeping and data collection tool. It has the capacity to hold substantially more information in its designed fields than it currently does. Used to its full potential, exploratory and explanatory program evaluation research such as this report could be more easily generated.

Research with this population proved challenging on several levels. The sample under study was relatively small by statistical standards, a point perhaps too often belabored throughout the report, and it encompasses one cross section of data represented by the fiscal year 2007. The quantitative analysis presented here was able to establish associations between some events (eg. Bipolar Disorder and length of stay; recidivists had more pre-placement offenses) and this may be considered a positive start to understanding what moves this population of offenders. The ability to establish more complex significant statistical relationships (predictive models) among different variables across a sample becomes more accurate with a larger sample size and it is suggested that this study form the basis of an ongoing quantitative evaluation process of inpatient placements. Larger numbers from a longitudinal study will yield more powerful and convincing results, possibly revealing trends that can not be discerned when the N is small.

The scope of this research project did not afford inclusion of a control group to which the youth placed in residential treatment could be compared. A control group would answer the question of how the youth placed in residential treatment facilities differ from other populations. For example, it may be useful to compare how like or unlike youth in residential treatment and therapeutic group homes are with respect to one another. Using this type of control group in analysis could aid in the development of a model used to identify high-risk youth in a less restrictive level of care. This model could potentially allow for recognition and intervention prior to the manifestation of symptoms requiring residential treatment.

Finally, there may be more information to be gleaned from the data set established for this study; a full copy of the SPSS data file is being submitted to OCA. A statistician or doctoral student specializing in small sample studies may be able to speak more convincingly about trends in the data. Replication of existing findings and secondary analysis would insure that the resources used for this work yield the highest amount of useful information possible.

Appendix 1: Concerning the Challenge of Statistically Analyzing a Small Sample

    If I flip an evenly weighted coin enough times, 50% of the flips will be heads and 50% will be tails. If I flip it 31 times (the same as the number of cases in this study) it may well come up heads 15 times and tails 16. But it may also come up heads 11 times and tails 20. If it does, can I say that the coin is unevenly weighted? Not yet. Before I can make any conclusions, I have to have a large enough sample of flips to rule out chance. An evenly weighted coin will always end up 50-50. Statisticians have studied this simple problem and others like it extensively and created mathematical equations that say exactly when one can and cannot rule out chance variation based on sample size.

    In this study, for example, page 17 shows that seven of the 23, or (23%), of positive discharges would later recidivate, while four of the seven (57%) negative discharges would recidivate. It would seem natural to conclude that negative discharges mean the youth will be more likely to recidivate. We are not, however, able to make such a conclusion. This result represents a finding that is not statistically significant because, until we have enough cases (flips of the coin so to speak) to rule out chance, we cannot link negative discharge to recidivism.

Appendix 2: Reason for Placement as Reported by Probation Officers

- Solicitation to commit homicide;
- Fire-setting, Court-ordered;
- Not following rules at home, Running away, Not going to school, Using drugs;
- Criminal thinking behaviors, Mental health needs, Substance abuse issues;
- Assault and aggressive behavior at home and school;
- Suicidal ideation;
- Rages/loss of control, Aggression toward others, Destruction of property, Extreme impulsivity;
- Assaulted staff member at group home, Beyond control of the facility;
- Prostitution;
- Felony assault on step-father, Unstable home environment;
- Assault charges;
- Suicidal thinking;
- Violent behavior, Threatened to kill family member, Sexualized behaviors, Self-harm;
- Mental health needs, PFMA, False accusations toward step-father, Hard time at home;
- Needed sex offender treatment;
- Evaluate meds;
- Mental health, Lack of supervision in home, Aggressive behavioral and anger issues;
- Assault with a weapon;
- Ran away from TGH in Billings;
- Psychiatric and sex offender treatment;
- Sex offense;
- Conflicts with stepmother and father, Sexual abuse of younger siblings;
- Theft;
- Mental health diagnosis, Sex offender issues;
- Animal torture;
- Emotional reactivity, Impulsivity, Aggression, Identity problems, Impaired social relationships, Ungovernability;
- Aggressive behavior led to discharge from in-state residential facility (KBH), Residential treatment deemed necessary;
- Obstructing peace officer, Criminal possession of dangerous drugs (marijuana first offense), Incoherent, Delusional;
- Mental health needs, Non-compliance with probation, No supervision in home;
- Violent acting out, Threats of violence;
- PFMA.

Appendix 3: Most Serious Crime Committed

(Misdemeanor, Felony)

Most serious crime committed	number of cases
Assault (M)	8
Assault with a Weapon (F)	3
Intimidation (F)	2
PFMA (M)	2
Criminal Endangerment (F)	2
Sexual Assault (F)	2
Obstructing a Peace Officer (M)	2
Aggravated Assault (F)	1
Assault with bodily fluid (M)	1
Sexual Intercourse without Consent (F)	1
Incest (F)	1
Sexual Abuse of Children (F)	1
Criminal Mischief (F)	1
Criminal Trespass to Property (M)	1
Theft (F)	1
Possession of Drugs (M)	1
Solicitation to Commit Homicide (F)	1
Negligent Arson (M)	1

Appendix 4: Diagnostic Criteria for Conduct Disorder

CONDUCT DISORDER:
Diagnostic Criteria
    A. A repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate societal norms or rules are violated, as manifested by the presence of three (or more) of the following criteria in the past 12 months, with at least one criterion present in the past 6 months:

Aggression to people and animals
1. often bullies, threatens, or intimidates others
2. often initiates physical fights
3. has used a weapon that can cause serious physical harm to others (e.g., a bat, brick, broken bottle, knife, gun)
4. has been physically cruel to people
5. has been physically cruel to animals
6. has stolen while confronting a victim (e.g., mugging, purse snatching, extortion, armed robbery)
7. has forced someone into sexual activity

Destruction of property
8. has deliberately engaged in fire setting with the intention of causing serious damage
9. has deliberately destroyed others' property (other than by fire setting)

Deceitfulness or theft
10. has broken into someone else's house, building, or car
11. often lies to obtain goods or favors or to avoid obligations (i.e., "cons" others)
12. has stolen items of nontrivial value without confronting a victim (e.g., shoplifting, but without breaking and entering; forgery)

Serious violations of rules
13. often stays out at night despite parental prohibitions, beginning before age 13 years
14. has run away from home overnight at least twice while living in parental or parental surrogate home (or once without returning for a lengthy period)
15. is often truant from school, beginning before age 13 years

    B. The disturbance in behavior causes clinically significant impairment in social, academic, or occupational functioning.

    C. If the individual is age 18 years or older, criteria are not met for Antisocial Personality Disorder.