



FAMILY CENTERED TREATMENT®

A Quasi-experimental Examination of Family Centered Treatment®: Outcomes for a Juvenile Delinquent Population

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Executive Summary

The Institute for Family Centered Services, Inc. (IFCS) provides Family Centered Treatment® (FCT®) to youth and their families through the *Maryland Department of Juvenile Services Non-Residential Community Based Program*, a program which supports adjudicated delinquents at risk of secure or locked detention or residential placements. The program also provides reunification services for youth returning from residential placements. Since the program pilot was implemented in fiscal year 2004, IFCS has provided services to more than 1425 Maryland youth and their families.

In support of Maryland DJS' commitment to reducing the number of youth in residential placements, IFCS works with adjudicated youth in their homes and communities as an alternative to costly residential placements. The program is designed to enable recipients the opportunity to participate appropriately in activities of daily living and at the same time ensure the safety of the community at large. An overriding goal is to keep the youth in the community and divert the youth from further penetration into the juvenile or adult system.

This study examines outcomes from the first 2.5 years of the field implementation of FCT with the population of Maryland delinquent youth. A quasi-experimental research design is used to compare FCT treatment outcomes to those of the Group Homes and Therapeutic Group Homes from which youth receiving FCT are diverted. Because IFCS cases are diversions from Group Homes and Therapeutic Group Homes, the two samples are similar in terms of the risk factors that affect treatment outcomes.

We find that the FCT program performs at least as well as residential programs at a substantially lower cost. In the first year following treatment, we find youth receiving FCT have significantly fewer subsequent residential placements, the average youth spends fewer days in residential placements, and the average youth spends fewer days in secure detention. We also find evidence that FCT may reduce offending behaviors in the two years following treatment. These results are comparable to those from a similar program in Florida which diverts youth from residential commitments to intensive in-home services, specifically, Multisystemic Therapy and Functional Family Therapy.

Importantly, we find that FCT is a highly cost-effective alternative to residential placements. For the subset of 216 IFCS youth examined here (those aged 17 years or less at intake), actual treatment costs of FCT were \$2.2m. Had these youth been placed in Group Homes or Therapeutic Group Homes instead, treatment costs would have been \$10m. Therefore, a \$2.2m diversion program saved the state of Maryland \$7.8m over the course of 2.5 years. In other words, every dollar spent on FCT saved the state \$3.53 in residential treatment costs.

Even if FCT and Group Homes produced identical treatment outcomes, FCT produces them at a drastically lower cost and therefore the cost savings alone justify the program. Moreover, FCT does result in fewer residential placements post-treatment, yielding additional savings post-treatment.

1. Introduction

The Institute for Family Centered Services, Inc. (IFCS) provides services to youth and their families through the *Maryland Department of Juvenile Services Non-Residential Community Based Program*, a program which supports adjudicated delinquents at risk of secure or locked detention or residential placements. The program also provides reunification services for youth returning from residential placements. Since the program pilot was implemented in fiscal year 2004, IFCS has provided services to more than 1425 Maryland youth and their families.

In support of Maryland DJS' commitment to reducing the number of youth in residential placements, IFCS works with adjudicated youth in their homes and communities as an alternative to costly residential placements. IFCS has a long history as a provider of intensive in-home services, and has a reputation for accepting into treatment the most challenging families; those who have not responded to traditional models of service. IFCS' intensive in-home Family Centered Treatment Model[®] (FCT[®]) was modified to work effectively with the specialty population of resistant delinquent youth. The program is designed to enable recipients the opportunity to participate appropriately in activities of daily living and at the same time ensure the safety of the community at large. An overriding goal is to keep the youth in the community and divert the youth from further penetration into the juvenile or adult system.

The purpose of this study is to examine outcomes from the first 2.5 years of the field implementation of FCT with the population of Maryland delinquent youth. We seek to answer the following questions:

1. To what extent has FCT reduced residential placements for youth in this population?
2. What are offense recidivism rates for IFCS youth relative to those youth receiving alternative services?
3. How has the program impacted MD DJS expenditures on this population?

We use a quasi-experimental design to compare FCT treatment outcomes to those of the Group Homes and Therapeutic Group Homes from which youth receiving FCT are diverted. Because IFCS cases are diversions from Group Homes and Therapeutic Group Homes, the two samples are similar in terms of the risk factors that affect treatment outcomes. A combination of standard and propensity score matching using archival data on risk factors is used to estimate average treatment effects.

We find that, in the first 2.5 years of implementation, the FCT program performs at least as well as residential programs at a substantially lower cost. These results are comparable to those from a similar program in Florida which diverts youth from residential commitments to intensive in-home services, specifically, Multisystemic Therapy and Functional Family Therapy (OPPAGA 2007). In the first year following treatment, we find youth receiving FCT have significantly fewer subsequent residential placements, the average youth spends fewer days in residential placements, and the average youth spends fewer days in secure detention. We also find evidence that FCT may reduce offending behaviors in the two years following treatment; while we reject this hypothesis at classical levels of significance, the p-values indicate a "marginally significant" result. Similarly, we find a marginally significant increase in adjudications in the first year.

Importantly, we find that FCT is a highly cost-effective alternative to residential placements. For the subset of 216 IFCS youth examined here (those aged 17 years or less at intake), actual treatment

costs of FCT were \$2.2m. Had these youth been placed in Group Homes or Therapeutic Group Homes instead, treatment costs would have been \$10m. Therefore, a \$2.2m diversion program saved the state of Maryland \$7.8m. In other words, every dollar spent on FCT saved the state \$3.53 in residential treatment costs. Therefore, even if FCT and Group Homes produced identical treatment outcomes, FCT produces them at a drastically lower cost and therefore the cost savings alone justify the program. Moreover, FCT does result in fewer residential placements post-treatment, yielding additional savings post-treatment.

In what follows, we present a brief overview of FCT and its application to the Maryland DJS population. Section 2 describes the services received by the comparison group in Group Homes and Therapeutic Group Homes. Section 3 presents the research design and the concept of matching estimators. Section 4 describes the data, while Section 5 presents the results. Section 6 discusses the cost-effectiveness of FCT. Conclusions and discussion follow in Section 7.

2. Family Centered Treatment®

2.1 General Model

Developed by the Institute for Family Centered Services (IFCS), Family Centered Treatment® (FCT®) is a model of treatment designed for use in the provision of intensive in-home services. Treatment is conducted in natural settings (e.g., in the home, school, or community), and typically lasts about six months, with several hours of contact in multiple sessions every week. FCT can be utilized with a variety of specialized need populations where the family system has been impacted and is in need of support or change.

The origins of FCT derive from practitioners' efforts to find simple, practical, and common sense solutions for families faced with forced removal of their children from the home, or dissolution of the family, due to external and internal stressors and circumstances. The practice approach grew out of a desire and mission to create opportunities for change for families that were seemingly stuck in a downward spiral. The families served were most often those who had not responded to traditional services and, in IFCS' infancy, were referred to FCT as a "last resort."

The model has been developed over 20 years of practice experience, and has been refined based on research, experience, and feedback from clients. Client response and feedback has been integral for defining what components of treatment have been effective. Although FCT has developed from applied success, the critical components are recognizable as derivatives of major models of evidence-based practice; the basic framework for treatment draws from components of *Eco Structural Family Therapy* (Aponte 1976, Aponte 1986) and *Emotionally Focused Therapy* (Johnson and Greenberg 1985). While FCT is comprehensive and designed to address the operant issues of family functioning -- centering treatment on the family system -- it is also a model of treatment that integrates behavioral change with an emphasis on value change for the members of the system. A fundamental premise is that youth and their families' long-term changes are predicated upon their valuing the changes made, i.e., changes made for compliance or conformity are not sustainable after treatment ends.

Family Centered Treatment is structured into four phases:

- *Joining and Assessment*; the Family Centered Specialist (FCS) engages and gains acceptance by the family and works with them to identify areas that affect their functioning.
- *Restructuring*; the FCS and family use experiential practice to alter ineffective behavioral patterns among family members. This process includes techniques to modify the crisis cycle to more adaptive patterns of family functioning.
- *Value Change*; the emphasis on value change differentiates FCT from other behaviorally based methods. Through powerful emotional intervention techniques, family members integrate new behaviors into their personal value systems to create long term change.
- *Generalization*; with new skills for dealing with conflict and increased understanding of its own dynamics, the family continues its work, but the treatment is less intense and frequent. The focus is on practice, review of what has “worked” previously, and reversals.

These four phases provide the pattern for treatment. However, the model allows the flexibility to move back and forth between the restructuring and value change phases in order to respond to individual family dynamics.

Integral to the FCT model is a management and peer supervision approach that is parallel in design to the treatment process. Essentially, individual and peer supervision is designed to provide situational leadership based on the developmental level of the therapist. Therefore, management and therapists must experience, internalize, and model the same skills and values as those they expect from their staff and families.

FCT services meet the best practice standards that are generally accepted and nationally recognized. These include, but are not limited to (Stroul and Goldman 1990, Wells 2000):

- The extreme on the dimensions of timeliness, accessibility, responsiveness and intensity.
- The intervention is delivered primarily in the family’s home and community.
- They have a family focus, and the family unit is viewed as the client.
- Services are provided in a natural setting. The services have an “ecological” perspective and involve working with the community system to access and coordinate needed services and supports.
- FCSs are committed to family preservation and reunification unless there is clear evidence that this is not in the best interest of the child.
- The hours of service delivery are flexible in order to meet the needs of families, and 24-hour crisis intervention is provided.
- The services are multifaceted and include counseling, skill training, experiential interventions and helping the family to obtain and coordinate necessary services, resources, and supports.
- Services are offered along a continuum of intensity and duration based upon the goals of the program and the needs of the family.
- FCSs maintain small caseloads to permit them to work actively and intensely with each family.
- The relationship between the FCS and the family is uniquely close, intense, and personal.

- FCSs are committed to empowering families, instilling hope in families, and helping families to set and achieve their own goals and priorities.
- FCSs utilize a range of research-based interventions, including crisis intervention, motivational interviewing, parent education, skill building, cognitive/behavioral therapy, Emotionally Focused Family Therapy and Eco-Structural Techniques.
- Interventions provide a point for change. Services reach families when they are in crisis. Client families in crisis are seen within 48 hours of referral.
- Assessments are utilized that are engaging and put the family in charge of the process. FCT assessments reveal more information than most other assessments about family functioning. This process helps to move treatment to a more effective level with families resistant to services.
- Services are based upon the tenet that troubled families can change.

A detailed exposition of the Family Centered Treatment model can be found at: <http://ifcsinc.com/research/Definitive%20Report%20on%20Family%20Centered%20Treatment%201-2-08.pdf>

2.2 Program Implementation with a Juvenile Delinquent Population: Maryland DJS Non-Residential Community Based Program

A youth's involvement in the juvenile justice system is most often preceded by multiple factors such as: previous or current episodes of parental abuse and/or neglect, or domestic violence; family history of mental illness; exposure to substance abuse; unidentified or untreated physical and/or psychological disorders; and/or a chronic lack of parental control or supervision. Youth frequently exhibit a wide variety of maladaptive behaviors, including law violations, gang involvement, school failure, excessive truancy, substance abuse, and school and community disruptions. Youth in this population may have emotional disorders and exhibit a range of behavioral problems including poor judgment, lack of self-esteem, difficulty with problem solving, and difficulty managing their anger. Family economic stressors often exacerbate an already malfunctioning system. The fundamental premise of FCT is that these multi-systemic factors can best be addressed in an intensive community-based environment with an emphasis on family systems work, in order to improve family functioning, to provide youth and their families opportunities to successfully and independently function in the community at large, and to ensure the youth has no further involvement in the justice system. Strategies and interventions are provided to improve the delinquent youths' academic performance and attendance, or vocational skills and job opportunities, and to improve their level of functioning at home and in the community, enabling them to become responsible and productive members of society.

Program services include case management (assessments, development of individualized services plan, linkages, coordination, and advocacy), supervision, group meetings, outreach services, crisis prevention/intervention services and community services. The program is designed to maintain the youth in the community; thus, the level of service intensity is modified contingent upon the youth's progress. Emphasis is placed on ensuring proper linkages are made with community service providers, including community detention, electronic monitoring, substance abuse services when needed, and vocational/educational programs. Services are coordinated with mainstream community resources whenever appropriate, e.g., the Commission for Children, Youth and Families, the Department of Social Services, the Public School System, the Department of Family Services/Mental Health Authority, Maryland Health Partners, private health care and human services

providers, and community organizations. All services are individualized and based on reliable assessment tools. The treatment plan is developed based on needs and desires of the family and youth, using a strengths-based model of intervention, rather than being dictated by the therapist.

Services are provided to youth and families across the state of Maryland out of five geographically distinct IFCS site offices: Baltimore, Montgomery, South Mountain, Southern Maryland, and Tri-County Regions. The program is open only to high-risk youth (at imminent risk of out of home placement), and IFCS accepts 100% of the qualified youth referred to the program, i.e., qualifying referrals are never refused IFCS services.

Services are expected to last 6 months, but services may be extended if all collaterals determine it is needed. Cases may close early for a number of reasons. If treatment goals are met before the 6 month mark, there is an early successful completion. Unsuccessful early discharges occur if the family is non-compliant with services, or if the courts or MD DJS worker remove the youth from IFCS services because he/she offends during treatment. Unsuccessful early discharges have been observed in several cases in which the referred youth had a pending residential placement that was unknown to IFCS, and MD DJS closed the case when the placement was affected. In these latter situations, full implementation of FCT with the family was not an option.

2.3 Comparison to alternative treatments

Youth in the comparison group are assigned to one of three programs—Group Homes, Therapeutic Group Homes or Committed Residential Placements. Group homes are licensed by the state of Maryland to provide treatment and housing for offending youth. The Group Homes are considered community-based, in that most of the programs use community-based services and students attend local schools. In this sense group homes are similar to FCT. However, youth are separated from their family and other members of their immediate network, which is a key difference with the FCT model. There is a great deal of variation among Group Homes in terms of number of youth served, type of youth served (e.g., age, level of delinquency, level of abuse, etc), and the intensity of care. All Group Homes provide a formal program of care, social work, and health services and provide for youth transition back to their homes.

Therapeutic Group Homes (TGH) are similar to Group Homes but are licensed by the Mental Health Administration. Like group homes, therapeutic group homes provide a formal program of care, social work, and health services, but emphasis in TGH are on provision of mental health services for youth who are emotionally or developmentally disabled. Most, but not all, youth in TGH continue to receive community-based ancillary services including the use of local schools. Like Group Homes, and in contrast with FCT, youth are separated from their family and immediate network and transition services for returning to the home are provided by the TGH.¹

The designation “Committed Residential Placement” has no meaning with respect to the level of care; it was initially formed for funding and accounting convenience. We are informed by Maryland DJS that IFCS youth are often diverted from these types of placements, so we include these youth in our comparison. Given that the level of care in this type of placement is at least as high as that of Group Homes, and therefore a placement for high-risk youth, these youth are a reasonable and conservative addition to the comparison group.

¹ Maryland Department of Juvenile Services *Residential Programs Sorted by Classification and Placement*.

3. Research Design

This study uses a quasi-experimental design to compare FCT treatment outcomes to the outcomes of the residential services identified by MD DJS as being those from which IFCS youth are diverted, namely Group Homes, Therapeutic Group Homes, and committed Residential Placements. The treatment group contains every youth discharged from IFCS services between July 1 2003 (the start date of the contract between IFCS and Maryland DJS) and December 31, 2005. The comparison group consists of every youth documented by Maryland DJS as being discharged from Group Homes, Therapeutic Group Homes, and Committed Residential placements during the same time frame.

Data on youth demographics and offense and placement history was obtained from the Maryland Department of Juvenile Services ASSIST database. The data contains a record for each placement, offense, and adjudication event in the youth's history with DJS, beginning with his first referral to the juvenile system and up to events recorded on October 31, 2006, the approximate date of the data export. While 359 youth were discharged from IFCS over the study period, the sample is restricted to youth aged 17 years or less at treatment intake, in order to include only those youth who can be tracked through the juvenile system over a follow-up period of at least one year. Accordingly, we observe outcomes for one year post-treatment for 216 youth in the treatment group, and 596 youth in the comparison group. For two years post-treatment, we observe outcomes for 118 youth in the treatment, and 347 youth in the comparison.²

We estimate the average effect of treatment (assignment to IFCS) on the treated (SATT). Following the Rubin Causal Model (Holland 1986), define:

Y_{0i} = potential outcome for youth i if they were assigned to the control group (residential placement)
 Y_{1i} = potential outcome for youth i if they were assigned to the treatment group (IFCS).

Conceptually, each youth has two potential outcomes. However, each youth is ultimately assigned to either the treatment or the control group and therefore each youth only has one observed outcome. Define the treatment assignment as:

$$D_i = \begin{cases} 0 & \text{if youth } i \text{ is assigned to the control (residential placement)} \\ 1 & \text{if youth } i \text{ is assigned to the treatment (IFCS)} \end{cases}$$

Then the observed outcome for youth i can be defined as:

$$Y_i = \begin{cases} Y_{0i} & \text{if } D_i = 0 \\ Y_{1i} & \text{if } D_i = 1 \end{cases}$$

The difference in mean outcomes for the IFCS and residential placement groups yields:

² While a significant portion of all youths treated during the study period has aged out of the juvenile system, and is therefore not included in this study, we have no reason to believe that the age distribution of this sample is atypical. In other words, our results are valid estimates for the treatment effect for younger offenders who do not age out of the juvenile system in one or two years following placement. We cannot estimate treatment effects for older offenders using the existing data set.

$$E[Y_i | D_i = 1] - E[Y_i | D_i = 0] = E[Y_{1i} - Y_{0i} | D = 1] + \{E[Y_{0i} | D = 1] - E[Y_{0i} | D = 0]\}$$

The first term on the right-hand side is the SATT. The last term (in curly brackets) represents potential bias. The bias is equal to the difference in potential outcomes without treatment for the group of youths ultimately assigned to treatment and the group of youths ultimately assigned to the control group. This bias is often referred to as “selection bias.” Random assignment generally ensures that this bias term is zero because all observable and unobservable differences in the treated and control youths that could affect potential outcomes are equated through the randomization process.

Because treatment by IFCS is not randomly assigned, a simple comparison of average outcomes for the IFCS and residential placement populations is likely to be biased. The bias is the result of differences (potentially observable and unobservable) between the types of youths assigned to IFCS and the type of youths assigned to residential placements.

Matching estimation can be used in these types of circumstances. Matching controls for all observable differences between treatment and control populations, but cannot control for unobservable differences. In a sense, matching tries to recreate random assignment by generating treatment and control groups that look “the same” in terms of all the variables that are thought to affect the outcome of interest. The intuition behind matching is relatively straightforward, for each youth assigned to IFCS find a youth assigned to residential placement who looks just like them. Then take the difference in their outcomes. Do this for every single youth assigned to IFCS and then average the results to get the average affect of treatment on the treated (SATT). This creates a weighted average of differences in mean outcomes for the treated and control youths grouped by their vector of observable characteristics X_i . Mathematically:

$$SATT = \int E[Y_i | X_i, D_i = 1] - E[Y_i | X_i, D_i = 0] dF(X_i | D_i = 1)$$

The problem with matching is that if you have a lot of variables that you think are important to match on, it can become impossible to find a perfect match for every treated observation. This is known as the *curse of dimensionality*. Propensity score matching can be used in these cases. The propensity score is a measure for each person of the likelihood of getting treated. Let’s define the propensity score as:

$$\pi(X_i) = \text{prob}(D_i = 1 | X_i)$$

The propensity score equation takes into account all of the observable characteristics that are thought to affect assignment to treatment and ultimate outcomes (future residential placement, offenses, and adjudications). Rather than matching on each individual characteristic, the researcher is now matching on the overall likelihood of getting treated. The intuition is that for each IFCS youth the researcher finds a residential placement youth that is equally likely to get treated based on their observable characteristics. So if a black, 16 year old male with one prior offense is as likely to be assigned to IFCS as a white, 16 year old male with two prior offenses, then these observations can be used for a match. The propensity score method allows you to make tradeoffs between the control variables as long as the likelihood to get treated remains constant. Mathematically,

$$SATT = \int E[Y_i | \pi(X_i), D_i = 1] - E[Y_i | \pi(X_i), D_i = 0] dF(\pi(X_i) | D_i = 1)$$

Propensity score matching has been demonstrated to be equally reliable to classical matching and better when the number of control variables is large (Rosenbaum and Rubin 1983).

You can also combine standard matching and propensity score matching. This would be appropriate if there are a small number of variables where tradeoffs in the matching process are unacceptable. For example, if there are strong theoretical or empirical reasons to believe that race is a key determinant of treatment and outcomes the researcher might not want to allow any differences in race in the matching process. In this case the researcher could enforce a strict match on race and allow for tradeoffs in other covariates within the propensity score framework. If we define Z_i as the vector of covariates where strict matching will be enforced then the SATT is given by:

$$SATT = \int E[Y_i | Z_i, \pi(X_i), D_i = 1] - E[Y_i | Z_i, \pi(X_i), D_i = 0] dF(Z_i, \pi(X_i) | D_i = 1)$$

We use a combination of standard and propensity score matching to estimate the SATT for the following outcomes over each of the two years following treatment: frequency of residential placements, community detentions and secure detentions; duration of residential placements, community detentions, and secure detentions; frequency of offenses and adjudications; and frequency of more severe offenses and adjudications.

The first step in the analysis is to estimate the propensity score model. Selection into FCT or the comparison group is driven in part by Maryland Department of Juvenile Services *Classification and Placement Assessment for Adjudicated Youth* [2004] (hereafter referred to as the CPAAY). Placement decisions are based on a matrix of placement options determined by the combination of (i) the category of the youth's current adjudicated offense, (ii) a *history score*, derived from a record review for the adjudicated youth, and (iii) a *risk assessment score*. The combination of scores determines a recommended placement, ranging from standard probation to secure confinement, but the case manager/probation officer has discretion to recommend an alternative placement of a higher or lower level of care.³ Ultimately, however, the final placement decision may rest with the court and a judge will often mandate a different placement than that recommended by MD DJS -- typically one with a higher level of care/supervision. Moreover, parents of delinquent youth will often advocate for a residential placement rather than a home placement. For all these reasons, the CPAAY tool is an imperfect predictor of selection into FCT vs. the comparison group. Nevertheless, an approximation of the CPAAY is a reasonable specification for a statistical selection model. Record reviews are proxied by frequencies of offenses, adjudications, and residential placements prior to the admission to treatment. Due to often lengthy delays between the placement decision and the physical placement, it is not possible to reliably identify the "current" adjudicated offense; this is proxied by the youth's adjudication history prior to treatment. Also due to pending placements, we are unable to reliably assess whether the youth was under DJS supervision at the time of the placement decision. The risk assessment scores are not available in electronic format.

The general selection model can be represented as:

$$y_i^* = \beta x_i + \varepsilon_i$$

³ A record review and Classification and Placement matrix are represented in the Appendix to this paper.

where y_i^* is the probability of being placed into FCT and is not directly observed, x_i is a vector of explanatory variables, and ε_i is an error term. The observed counterpart to y_i^* is a dichotomous variable indicating whether the youth received FCT ($y_i = 1$) or treatment in a Group Home ($y_i=0$). The vector of explanatory variables contains youth demographic characteristics, age at treatment intake, age at first offense, category of first offense, frequency of prior offenses by offense category, frequency of prior adjudications by offense category, and frequency and duration of residential placements and detentions.

MD DJS allocates field operations across five geographically defined regions or areas. *Area* is another variable that we expect is endogenous to the selection process, as community attitudes and politics may influence the decision to allow offenders to remain in the community, and local judiciary may be biased toward one type of placement relative to another. In areas like Baltimore City, where processing chronic and serious offenders is more typical, the area supervisors may be more likely to consider non-residential services for such youth. Moreover, geographical area is highly correlated with exogenous factors that can be expected to affect risk profiles and the success of treatment. For example, *Area 1* covers the City of Baltimore, which has a higher concentration of serious juvenile offenders than other areas, and the well-documented demographic correlates of the inner city crime “premium:” low income, low education levels, high density, high level of gang activity, etc. Finally, *Area* is highly correlated with IFCS regional boundaries, each representing a different team of IFCS supervisors and Family Centered Specialists. For these reasons, we omit *Area* from the selection model and require exact matching of IFCS youth with comparison youth from the same area.

The matching is implemented in the STATA statistical software package using the nearest-neighbor matching code (nnmatch.ado) developed by Abadie and Imbens (2001) based on their theoretical assessment of matching estimators (2008). The matching was implemented using the four closest matches for each IFCS youth. The choice of four matches was done to reduce variance of the estimator without increasing the bias that might result from poor matches. The estimates are all corrected for bias resulting from imperfect matches and robust standard errors are calculated (Abadie and Imbens 2001, 2008).

4. Data

4.1 Raw and Working Data

Tables 1A and 1B describe the raw ASSIST history data, which consists of a record for each event in the youth’s history. The FCT service event was identified, and the first Group Home, Therapeutic Group Home or Committed Residential placement in the youth’s history after 7/1/2003 was identified as the comparison treatment event. The data were cleaned to eliminate duplicate entries, to ensure each youth was represented in both placement and offense histories, to eliminate comparison youth with nonsense placement dates (i.e., length of treatment service of 0 or less than 0 days with no other qualifying placement), and to collapse multiple placement entries of the same type -- but with contiguous dates -- into a single record with the appropriate start and end date.

The placement history contains 33 different placement types, so these were sorted into 8 groups along a continuum of care as described in Maryland DJS documentation.⁴ Of particular interest to this analysis are the following groupings of residential placements (in increasing order along a continuum of level of care):

- **Community-Based Residential** – Alternative Living Units; Residential Educational Programs; Group Homes; Therapeutic Group Homes; and Treatment Foster Care
- **Special Programs** – Committed Residential; Impact Programs, Residential Treatment Facilities; Substance Abuse Programs; Substance Abuse Centers; Wilderness Programs; Youth Centers.
- **Long-term Secure Confinement** – Enhanced Academy, Intermediate Academy

In addition, detentions are sorted into Community Detentions (at home with or without electronic monitoring) or Secure (locked) Detentions.

Offense codes were sorted into 5 categories along a continuum of severity of offense, following MD DJS convention. Category 1 is the most serious category of offense, covering such offenses as 1st and 2nd degree murder, manslaughter, aggravated assault, kidnapping, and carjacking. Category 5 is the least serious, containing such offenses as misdemeanor fraud, malicious destruction, loitering, and runaway. Categories by Listing of Offense can be found in Appendix C of the CPAAY.

Table 2 describes the working data which results from collapsing the multiple records into a set of frequencies and durations before treatment intake and after treatment discharge.

4.2 Summary Statistics

The raw data contain 1800 youth discharged from all types of Group Homes, Committed Residential, and Residential Treatment Facilities, and 359 youth discharged from IFCS over the period July 1, 2003 to December 31, 2005. Youth treated in Residential Treatment Facilities (RTF, n=536) were excluded from the analysis as IFCS does not serve as a diversion from RTF in all regions.⁵ Youth aged over 17 years were eliminated from the data as these youth age into the adult criminal system within the first year following treatment, and follow-up information is not available outside the juvenile system. The resulting sample consists of 596 youth in the comparison group, and 216 youth in the FCT treatment group.

Table 3 summarizes the sample demographics and offense and placement histories prior to treatment. There is a statistically significant but insubstantial difference in the mean age at which these youth first entered the juvenile system (*age at first offense*). The comparison group had a higher proportion of minor first offenses, but there are no statistically significant differences in the proportion of severe first offenses. Likewise, the comparison group has a higher mean frequency of total offenses and adjudications, and a higher mean frequency of minor offense and adjudication frequencies, but both groups are similar in terms of frequency of severe offenses. Finally, the comparison group has had more secure detentions of longer duration, but the FCT treatment group

⁴ *Standard Operating Procedures for Admissions (Certificate of Placement Process) and Residential Programs Sorted by Classification and Placement*, internal DJS documents. See the Appendix for details on the grouping of placement types.

⁵ The IFCS Baltimore region is most likely to divert youth from RTF, but we do not have a sample size large enough to allow a separate analysis of youth from the Baltimore area.

has had significantly more placements in Special Programs of significantly higher duration. Special Programs are highest on the MD DJS continuum of care (other than Hardware Secure placements), and are presumably higher on the continuum of costs. This suggests that youth in the FCT program have been less responsive to traditional modes of service, and are therefore likely to be more resistant on average than those youth in the comparison group. This also suggests that the costs of care for the average youth prior to entering the FCT program have been higher.

5. Results

5.1 Selection Model

Table 4 presents the estimated selection model discussed in Section 3, from which the propensity scores derive. Because the sample sizes fall as the follow-up period lengthens and youth age out of the juvenile system, a separate model is estimated for each follow-up year.

Model 1 contains the full sample of youth with at least one year of follow-up in the juvenile system. In this model, age at intake and age at first offense both have a positive impact on the probability of placement in FCT, and African Americans are more likely than Caucasians to be placed with IFCS. Youth with a higher frequency of placements in Special Programs are more likely to be placed with IFCS, and the duration of Community-Based Residential and Secure Program placements also positively affect the probability of placement in FCT.⁶ Those with more secure detentions and with secure detentions of greater duration are less likely to be placed in FCT. The more offenses in total committed by a youth, and the more adjudications, the more likely the youth is to be placed in the comparison residential placements.

Model 2 results are only slightly different; the age and race variables are no longer significant. The age results are expected, since the distribution of these variables narrows as youth age out of the juvenile sample. The frequency of previous residential placements is not significant, but the durations of such placements are significant (the duration of Community Based Residential placements is marginally significant). Secure detentions and their duration remain significant negative determinants of placement with IFCS, as well as the frequency of offenses and adjudications.

5.2 Average Treatment Effects: Matching on Propensity Score and Area

Treatment outcomes are defined over the follow-up year; year one outcomes measure recidivism over the first 12 months following treatment, and year two for months 13-24 following treatment. Table 5 presents the average treatment effect on the treated (SATT) resulting from nearest neighbor matching on propensity score and area. Effect sizes are calculated only for significant effects, including those we consider “marginally significant.” We use the term *marginally significant* to refer to cases where p-values are greater than 5 percent but less than 20 percent. In these cases we are 80% or more confident that the treatment effect is different from zero.

In the first year following treatment, the frequency and duration of residential placements is significantly lower for youth receiving FCT. Youth in the treatment program have an estimated 38%

⁶ Long-term Secure Confinements do not enter the model since there are no such placements in the sample history.

fewer placements. The average duration of placements per youth is reduced by an estimated 45%, while there is no significant difference in residential placement duration conditional on being placed. The duration of secure detentions is substantially lower for the average youth in the treatment group: on average, IFCS youth spent 24% fewer days in secure detention.

First year average offense frequency over all youth is estimated at 15% lower for youth receiving FCT, though this result is marginally significant at the 85% level of significance. Similarly, we find a marginally significant difference between the proportion of youth who reoffend during the first year following treatment (p-value 0.17), with an effect size of 11%.

There are two outcomes with statistically significant coefficients that are of the opposite sign as our hypothesized effects. The treatment effect on average frequency of first year adjudications is positive and marginally significant, at the 86% level, with an effect size of 36%. Similarly, the proportion of youth in the treatment group who have an adjudication in the first year is significantly higher, with an effect size of 70%. However, given the lag we typically observe between the date of the offense and adjudication, we don't know if the adjudicated offense behaviors were committed during the follow-up period or before so this effect may not reflect behavioral outcomes in the first year.⁷ Moreover, examining the more serious category 1 and 2 offenses only, we find no differences between the two groups in terms of proportions of youth who re-offend at this level, and no difference in the average frequency of re-adjudications at this level. Overall, the fact that residential placements and days in secure detention are substantially lower suggests that the average youth receiving FCT committed fewer crimes of such a nature as to consider removing him from his community. This interpretation is reinforced by the marginally significant reductions in re-offending behaviors.

We do not find the reduction in residential placements and secure detention days to be sustained into the second year; the point estimate remains negative but it is no longer statistically significant. We again observe a reduction in average duration of residential placements over all youth relative to the comparison group, with an effect size of 30%, though this result is marginally significant (p-value of 0.137).

5.3 Plausible Threats to Validity

Whenever treatment assignment is not random, there is concern that there may be differences among treatment and control groups that are correlated with outcome measures. Matching on observables using either traditional matching or propensity score matching reduces, but does not fully eliminate, those concerns. Matching is designed to ensure that the treatment and control groups look “alike” on all observable characteristics. Two problems may arise.

The first problem occurs if the treatment and control groups are so dissimilar that it is difficult to find appropriate matches. This is referred to as a *lack of common support*. Because the nature of FCT is to serve as a true alternative to residential placements, we expect that the two populations are relatively similar and that there will be good common support among the treatment and control groups. An examination of the distributions of the propensity score for the two groups confirms that there is adequate common support for matching to serve as a reasonable estimator. The graphs for

⁷ The mean lag between offense dates and the associated adjudication dates is 135.8 days, with a standard deviation of 143.6 days.

each post-treatment year can be found in Figures 1 and 2. In each figure, the upper left histogram represents the distribution of the propensity score for the control group and the upper right histogram represents the distribution of the propensity score for the treatment group. For common support, one wants to observe similar patterns in the distribution. For example, one does not want to observe that all treatment observations have a propensity score near one while all control observations have a propensity score near zero. In our data, for both post-treatment years, the distributions of propensity scores for the treatment and control groups look quite similar. This should allow for reasonable matching on observable characteristics.

The second potential problem is that there are unobservable characteristics that differ between youth assigned to FCT and youth assigned to residential placements that explain both the assignment to treatment and are also correlated with subsequent outcomes. This is a difficult threat to disprove precisely because it involves hypotheses about unobservable characteristics. However, the nature of FCT is as a diversion program of “last resort.” FCT is not designed to skim the cream of the crop or to select only youth with particularly supportive family structures. It is designed to serve as a direct substitute for residential treatment so we would not expect differences in family structure and other unobservables among the FCT and residential treatment groups.

Attrition is another often-cited threat to validity. In this study, the entire documented history of every qualified youth was included in the analysis. Any attrition from that database is due to relocation, death, or transition into the adult system.⁸ We have no reason to hypothesize that there would be any systematic relationship among youth who die or relocate that would affect the results of the analysis. There may be systematic differences in older youth that transition into the adult system that would impact our results, however, so the outcomes from this study cannot be extrapolated to an older juvenile population.

6. Cost Effectiveness

IFCS services are substantially less costly than residential services. Table 6 presents a cost-effectiveness analysis in 2006 dollars. The summary statistics are those for the observed length of service for the treatment events analyzed in this study. Daily costs for 2006 were provided by MD DJS resource coordinators. The analysis differentiates between Group Homes and Therapeutic Group Homes due to cost differences. Cost data are not available for Committed Residential Placements, so those placements are grouped with lower cost Group Homes in order to be conservative. We present two cost analyses; the first contains all observations on youth in Group Homes and Therapeutic Group Homes, but the maximum values reveal obvious outliers in terms of length of service. We observe 130 youth with more than 365 days in placement, and 15 youth with more than 730 days, whereas the average expected length of stay is 6-9 months for Group Homes and 6-12 months for Therapeutic Group Homes. Hence, a conservative second analysis truncates the length of placement for the comparison group to 365 days. The results show average costs per youth in FCT at \$10,240, costs per youth for Group Homes ranging from \$38,412 to \$47,322, and costs per youth for Therapeutic Group Homes ranging from \$36,348 to \$37,513.

⁸ A youth may change his name, in which case he may be in the ASSIST database as two different observations, but we assume if this does occur that it is an insignificant proportion of the sample.

To see program savings, compare the total costs of the FCT program for these youth to what MD DJS would have spent on these youth had they been placed in residential instead, referred to as the *counterfactual costs*. Assuming youth in the FCT program would have been placed in Group and Therapeutic Group homes at the same rate (91% and 9%, respectively), the total counterfactual costs are just over \$10m for the observed length of service and just over \$8.2m for the truncated length of service. Accordingly, providing this program to the 216 youth analyzed in this study saved MD DJS \$7.82m over the cost of residential placements. The more conservative estimate of savings is \$6m. In other words, every dollar spent on FCT saves MD DJS \$2.73 to \$3.53 over traditional services to this group.

A more complete cost analysis would account for the program's success rate at keeping youth in the community following discharge from treatment, showing the costs of placements subsequent to treatment discharge. Unfortunately, that analysis requires more detailed cost data than is currently available. Nevertheless, we know that the program results in a significant reduction in residential placements in the first year after discharge from FCT, and we have evidence that it may also result in reduced days in residential in the second year. Therefore, the savings from FCT extend well past the treatment discharge date, and the cost savings presented here represent a conservative lower bound estimate on total savings.

In summary, FCT is a highly cost-effective alternative to residential placements. Even if FCT and Group Homes produced identical treatment outcomes, FCT produces them at a drastically lower cost and therefore the cost savings alone justify the program. Moreover, FCT does result in fewer residential placements post-treatment, yielding additional savings post-treatment.

7. Conclusion and Discussion

We have presented an evaluation of a field implementation of the Family Centered Treatment model which uses archival data in a quasi-experimental design with a large sample size, a well-defined comparison group, and rigorous statistical controls on delinquent youth risk characteristics. For the first year following treatment, we find that FCT results in a significant and substantial reduction in residential placements, along with a substantial reduction in the number of days the average youth spends in residential care, and a significant reduction in the number of days the average youth spends in secure detention. We also find results suggestive of a reduction in the number of days the average youth spends in residential placements in the second year following discharge from treatment. Moreover, the results are suggestive that FCT may reduce offending behaviors. Taken together, we conclude that the IFCS Community Based Non-Residential Program performs at least as well as the residential programs from which IFCS youth are being diverted, and better in the sense that program youth experience fewer residential placements post-treatment. Moreover, these outcomes are achieved at substantial cost savings; every dollar spent on the FCT program saved the state of Maryland between \$2.73 and \$3.53. Total savings for the sub-sample of program youth analyzed in this study are as high as \$7.9 million.

The results presented here are comparable with those found in a similar study of the "Redirection Program" in Florida, in which youth are diverted from residential placements into intensive in-home services (specifically, a field implementation of Multisystemic Therapy and Functional Family Therapy). In the first two years of the program, overall outcomes were similar to those of the residential commitment programs. Two counties outperformed the residential services; the

conclusion is that this result was due to differences in achieving fidelity to the model (OPPAGA 2007).

Most previous evaluations of intensive in-home services have been conducted through clinical trials where the investigator is able to maintain rigid controls over fidelity to the treatment model. Many of these clinical trials have produced substantial impacts on re-offending behaviors. Conversely, field implementations such as the one evaluated here are subject to multiple internal and external threats to fidelity to the model which are expected to negatively impact program outcomes. External threats derive from problems with community and collateral cooperation with the parameters of the program. Not surprisingly, in these first two years the IFCS Community-Based program suffered from non-cooperation from the courts and some MD DJS workers, where they have removed youth from the program before treatment completion for a variety of reasons. In addition, families may refuse to comply with treatment requirements and leave the program before completion, but their outcomes are included in the analysis (in the typical clinical trial, such a family would not be included once they refuse further participation in the experiment). Internal threats derive from a lack of therapist competency with and/or adherence to the parameters of the treatment model. It is to be expected that this will be a problem in the first years of a program implementation as therapists are training and gaining experience in the model and in working with a new population. It is probable, however, that both the internal and external threats to model fidelity will decrease the longer the program is in place. IFCS has had an extraordinarily low rate of FCS turnover in Maryland, and cooperative relationships have developed between IFCS workers, MD DJS workers, and the courts. We therefore expect subsequent evaluations of the program to yield even more positive results.

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Table 1A: Description of Raw Placement Data from MD DJS

Variable Name	Variable Description
youthid	Unique Youth Identifier
dob	Date of Birth
race	Race
racecode	Race Code
countyofjurisdiction	County of Jurisdiction
jurccode	County of Jurisdiction Code
admissiontype	Admission Type
programtype	Admission Type Code
altcode	Alternative Coding for Treatment Placements
admissiondate	Admission Date
releasedate	Release Date
ifcsgroup	IFCS Group Dummy Variable
reunification	IFCS Reunification Dummy Variable
male	Male Dummy Variable
admit_date	Placement admission date
rel_date	Placement release date
birthdate	Birth date
Total Observations	20,037

Table 1B: Description of Raw Offense Data from MD DJS

Variable Name	Variable Description
youthid	Unique Youth Identifier
gender	Gender
dob	Date of Birth
race	Race
countyofjuris~n	County of Jurisdiction
countyofresid~e	County of Residence
rescode	County of Residence Code
zipcode_resid~e	Zip code of Residence
complaintdate	Complaint Date
offensedate	Offense Date
offensecode	Offense Code
offense_cat	Offense Category
offensetype	Offense Type
offense_type	Offense Type Code
alleged_offen~n	Alleged Offense Description
adj_offensecode	Adjudicated Offense Code
adj_offensetype	Adjudicated Offense Type
adj_offensedes~n	Adjudicated Offense Description
complaint_date	Complaint Date
offense_date	Offense Date
trt_start	Treatment Start Date
trt_end	Treatment Discharge Date
follow_offense	Days between treatment discharge and next offense
adj_date	Date of adjudication
follow_adj	Days between treatment discharge and next adjudication
adj_category0	Adjudication category 0 dummy variable
adj_category	Recode of adj_category0
adj_type	Adjudicated Offense Type
Total Observations	20,623

Table 2: Description of Working Data Including Generated Variables

Variable Name	Variable Description
youthid	Unique Youth Identifier
birthdate	birthdate
first_offense~e	date of first offense
age_first_off~e	age at first offense
rescode	Coded county of residence
zipcode_resid~e	zipcode of residence
cat1	=1 if first offense was Category 1
cat2	=1 if first offense was Category 2
cat3	=1 if first offense was Category 3
cat4	=1 if first offense was Category 4
cat5	=1 if first offense was Category 5
male	=1 if male
AAmerican	=1 if AAmerican
Biracial	=1 if Biracial
AIndian	=1 if American Indian
Asian	=1 if Asian
Hispanic	=1 if Hispanic
White	=1 if Caucasian
ifcsgroup	=1 if FCT treatment group
grouphome	=1 if treatment comparison is group home
trt_start	treatment start date
trt_end	treatment discharge date
adult_one	=1 if age=18 at 365 days after treatment
adult_two	=1 iff age=18 at 730 days after treatment
area	MD DJS service area (=1, 2, 3, 4, 5)
gp3dur_before	Community Residential placement duration before treatment
gp4dur_before	Special Programs placement duration before treatment
gp7dur_before	Community Detention placement duration before treatment
gp9dur_before	Secure Detention placement duration before treatment
gp3freq_before	Community Residential placement frequency before treatment
gp4freq_before	Special Programs placement frequency before treatment
gp7freq_before	Community Detention placement frequency before treatment
gp9freq_before	Secure Detention placement frequency before treatment
cat1freq_before	category 1 offense frequency before treatment
cat2freq_before	category 2 offense frequency before treatment
cat3freq_before	category 3 offense frequency before treatment
cat4freq_before	category 4 offense frequency before treatment
cat5freq_before	category 5 offense frequency before treatment
off_all_before	frequency of all category offenses before treatment

adj1freq_before	category 1 adjudications frequency before treatment
adj2freq_before	category 2 adjudications frequency before treatment
adj3freq_before	category 3 adjudications frequency before treatment
adj4freq_before	category 4 adjudications frequency before treatment
adj_5freq_before	category 5 adjudications frequency before treatment
adj_all_before	frequency of all category adjudications before treatment

Recidivism Outcome Variables

frequency residential placements	frequency over all youth of placement in community residential placements
duration residential placements	duration of placements in days for all youth
conditional duration of residential placements	duration of placements in days for all youth with at least one placement
frequency of community detention	frequency over all youth of placement in Community Detention
duration of community detentions	duration of Community Detention in days over all youth
conditional duration of community detentions	duration of community detention for all youth with at least one detention
frequency of secure detention	frequency over all youth of placement in Secure Detention
duration of secure detentions	duration of Secure Detention in days over all youth
conditional duration of secure detentions	duration of secure detention for all youth with at least one detention
frequency of offenses	frequency of offenses over all youth
proportion of offending	proportion of youth committing one or more offenses
frequency of category 1 and 2 offenses	frequency of category 1 and category 2 offenses over all youth
proportion offending category 1 and 2	proportion of youth committing one or more category 1 or category 2 offenses
Frequency of adjudications	frequency of all adjudications over all youth
Proportion adjudicated	proportion of youth adjudicated
Frequency of category 1 and 2 adjudications	frequency of all category 1 and 2 adjudications over all youth
Proportion adjudications category 1 and 2	proportion of youth adjudicated for category 1 or 2 offenses
Total Observations	1,861

Table 3: Comparison of Youth Characteristics and Risk Factors before Treatment for Treatment and Control Groups

	Group Homes	IFCS
	n = 596	n = 216
	mean (st dev)	mean (st dev)
Age at first offense	12.68 *** (1.51)	13 (1.67)
Age at intake	14.97 *** (1.13)	15.22 (1.12)
Proportion of males	.80 (.40)	.75 (.434)
Proportion African American	.60 (.40)	.62 (.488)
Proportion Caucasian	.34 (.475)	.29 (.455)
Proportion Hispanic	.03 (.18)	.06 (.230)
Geographical Area		
Area 1	.234 (.425)	.223 (.417)
Area 2	.152 ** (.359)	.102 (.304)
Area 3	.241 *** (.428)	.372 (.484)
Area 4	.121 *** (.327)	.014 (.118)
Area 5	.221 (.415)	.27 (.445)
First Offense Category		
Category 1	.097 (.297)	.125 (.331)
Category 2	.074 (.262)	.074 (.262)
Category 3	.129 (.336)	.152 (.361)
Category 4	.332 (.471)	.347 (.477)
Category 5	.367 * (.482)	.301 (.460)
Frequency of offenses		
Category 1	.456 (.791)	.40 (.823)
Category 2	.611 (1.50)	.537 (1.22)
Category 3	1.61 (2.12)	1.42 (2.43)
Category 4	2.64 *** (2.32)	2.24 (2.08)
Category 5	3.95 *** (3.88)	2.49 (2.41)
All Categories	9.27 *** (6.26)	7.08 (5.12)

Table 3 (continued)	Group Homes	IFCS
Frequency of adjudicated offenses		
Category 1	.116 *** (.412)	.056 (.23)
Category 2	.218 (.591)	.204 (.591)
Category 3	.579 (.961)	.505 (.930)
Category 4	1.03 *** (1.16)	.704 (.81)
Category 5	2.71 *** (2.97)	2.11 (3.03)
All categories	4.65 *** (3.71)	3.57 (3.56)
Placement frequency/duration in days		
Frequency Community-based Residential	.18 (.495)	.19 (.491)
Duration Community-based Residential	23.43 * (95.45)	43.76 158.80
Frequency Special Programs	.23 *** (.519)	.366 (.696)
Duration Special Programs	18.21 *** (65.43)	46.51 (124.3)
Frequency Community Detention	1.17 * (1.15)	1.01 (1.16)
Duration Community Detention	47.27 (61.03)	40.06 (55.39)
Frequency Secure Detention	1.86 *** (1.65)	1.30 (1.57)
Duration Secure Detention	40.26 *** (49.94)	22.63 (33.25)

*** Means are significantly different at 99% level

** Means are significantly different at 95% level

* Means are significantly different at 90% level

Table 4: Propensity Score Models For Year 1 and Year 2 Post-Treatment
(t-statistics in parentheses)

	Propensity Score Model Year 1		Propensity Score Model Year 2	
age_intake	0.165	***	0.111	
	(0.064)		(0.093)	
age_first_offense	-0.956	**	-0.491	
	(0.376)		(0.581)	
age_first_offense^2	0.037	**	0.020	
	(0.015)		(0.024)	
AAmerican	0.294	***	0.106	
	(0.112)		(0.147)	
male	0.017		-0.095	
	(0.136)		(0.182)	
cat2	-0.314		-0.026	
	(0.278)		(0.377)	
cat3	-0.059		-0.033	
	(0.240)		(0.331)	
cat4	0.027		-0.074	
	(0.204)		(0.274)	
cat5	-0.121		-0.292	
	(0.210)		(0.289)	
gp3freq_before	-0.066		0.406	
	(0.292)		(0.611)	
gp4freq_before	0.489	**	0.241	
	(0.221)		(0.416)	
gp7freq_before	0.008		-0.009	
	(0.132)		(0.169)	
gp9freq_before	-0.275	***	-0.287	*
	(0.094)		(0.150)	
gp3freq_before^2	-0.052		-0.260	
	(0.131)		(0.313)	
gp4freq_before^2	-0.116		-0.103	
	(0.073)		(0.156)	
gp7freq_before^2	0.032		0.025	
	(0.030)		(0.037)	
gp9freq_before^2	0.035		0.043	*
	(0.013)		(0.022)	
gp3dur_before	0.001		0.001	
	(0.001)		(0.001)	

Table 4 Continued

gp4dur_before	0.002 (0.001)	0.004 *	(0.002)
gp7dur_before	0.000 (0.001)	0.001	(0.002)
gp9dur_before	-0.007 *** (0.002)	-0.008 ***	(0.003)
cat1freq_before	-0.200 (0.148)	-0.155	(0.264)
cat2freq_before	0.103 (0.073)	0.140	(0.141)
cat3freq_before	-0.034 (0.067)	0.039	(0.097)
cat1freq_before^2	0.065 * (0.039)	0.055	(0.090)
cat2freq_before^2	-0.001 (0.003)	-0.002	(0.016)
cat3freq_before^2	0.010 ** (0.005)	0.001	(0.009)
adj_cat2_before	0.059 (0.118)	0.206	(0.134)
adj_cat3_before	0.059 (0.077)	0.135	(0.094)
off_all_before	-0.051 *** (0.014)	-0.042 **	(0.018)
adj_all_before	-0.043 * (0.022)	-0.070 **	(0.029)
_cons	3.556 (2.396)	1.520	(3.508)
Number of observations	809	465	
Psuedo R2	0.138	0.139	

*** indicates significance at the 99% level

** indicates significance at the 95% level

* indicates significance at the 90% level

Table 5: Outcome Means and Average Treatment Effects: Matching on Propensity Score and Area
(Note: p-values are presented for average treatment effects, standard deviations are presented for unconditional means)

Recidivism Outcome	Comparison Mean (st dev) n=596	IFCS Mean (st dev) n=216	SATT (P> z) n=809	Effect Size	Comparison Mean (st dev) n=347	IFCS Mean (st dev) n=118	SATT (P> z) n=463	Effect Size
Frequency residential placements	.819 (.754)	.542 (.733)	-.312 (.000)	38%	.366 (.623)	.246 (.538)	-.031 (.654)	
Duration residential placements	107.74 (117.6)	70.18 (106.3)	-48.78 (.000)	45%	73.41 (103.66)	48.44 (97.0)	-22.11 (.137)	30%
Conditional duration residential placements			-.593 (.688)				-.281 (.916)	
Frequency of offenses	2.23 (2.86)	1.63 (2.19)	-.328 (.146)	15%	1.67 (2.68)	1.07 (2.42)	-.274 (.366)	
Proportion offending	.64 (.48)	.55 (.50)	-.07 (.166)	11%	.45 (.50)	.32 (.47)	-.009 (.688)	
Frequency of category 1 and 2 offenses	.148 (.501)	.102 (.332)	-.006 (.893)		.104 (.381)	.059 (.353)	.005 (.892)	
Proportion offending category 1 and 2	.11 (.32)	.09 (.29)	-.002 (.95)		.08 (.27)	.03 (.18)	-.009 (.688)	
Frequency of adjudications	.534 (1.67)	.657 (1.30)	.194 (.135)	36%	.801 (1.74)	.525 (1.22)	-.096 (.649)	
Proportion adjudications	.23 (.42)	.34 (.47)	.16 (.00)	70%	.32 (.47)	.24 (.43)	.02 (.664)	
Frequency of category 1 and 2 adjudications	.03 (.199)	.041 (.222)	.014 (.481)		.040 (.260)	.034 (.182)	.012 (.570)	
Proportion adjudications category 1 and 2	.03 (.16)	.04 (.19)	.014 (.479)		.03 (.17)	.03 (.18)	.013 (.503)	
Frequency of community detentions	.435 (.706)	.352 (.637)	-.023 (.696)		.30 (.660)	.178 (.483)	-.001 (.980)	
Duration of community detentions	16.25 (29.68)	12.88 (28.03)	-.941 (.726)		9.90 (23.38)	5.96 (16.32)	-1.24 (.597)	
Conditional duration community detentions			.50 (.935)				-10.29 (.224)	
Frequency of secure detentions	.899 (1.05)	.685 (1.04)	-.119 (.217)		.56 (.913)	.356 (.722)	-.021 (.810)	
Duration of secure detentions	18.17 (28.41)	11.58 (22.13)	-4.31 (.037)	24%	11.99 (25.5)	8.99 (22.58)	1.38 (.594)	
Conditional duration secure detentions			-3.11 (.38)				.81 (.916)	

Table 6: Cost Effectiveness Analysis

		IFCS	Group Home	Therapeutic Group Home
	Cost/day (2006 dollars)	\$80	\$198	\$233
	# youth in program	216	541	55
Observed Length of Service	Average Length of Service (range)	128 days (9-373 days)	239 days (9-1736 days)	161 days (9-479 days)
	Average Total Cost/youth	\$10,240	\$47,322	\$37,513
	Total Program Cost [216(\$10,240)]	\$2,211,840		
	Total Counterfactual Cost [.91(216)(\$47,322) + .09(216)(\$37,513)]	\$10,030,865		
	Total Program Savings	\$7,819,015		
	Savings per dollar spent on FCT Program	\$3.53		
Truncated Length of Service	Average Length of Service (range)	128 days (9-373 days)	194 days (9-365 days)	156 days (9-365 days)
	Average Total Cost/youth	\$10,240	\$38,412	\$36,348
	Total Program Cost [216(\$10,240)]	\$2,211,840		
	Total Counterfactual Cost [.91(216)(\$38,412) + .09(216)(\$36,348)]	\$8,256,868		
	Total Program Savings	\$6,045,028		
	Savings per dollar spent on FCT Program	\$2.73		

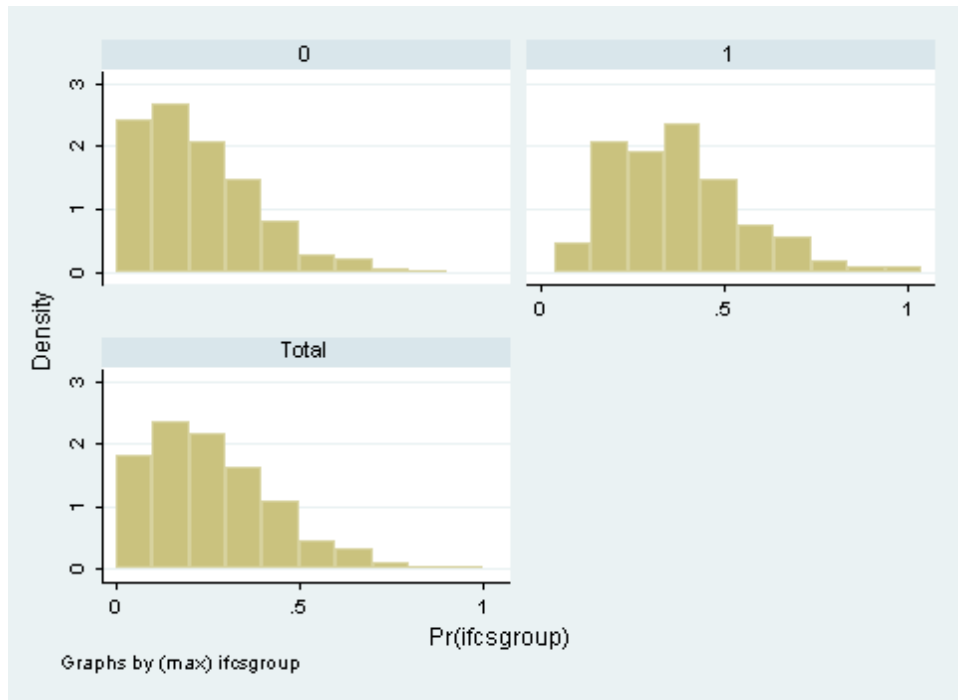


Figure 1: Common Support, Year One Following Treatment, n=809
 (0 refers to distribution of propensity scores for comparison group, 1 refers to distribution for treatment group)

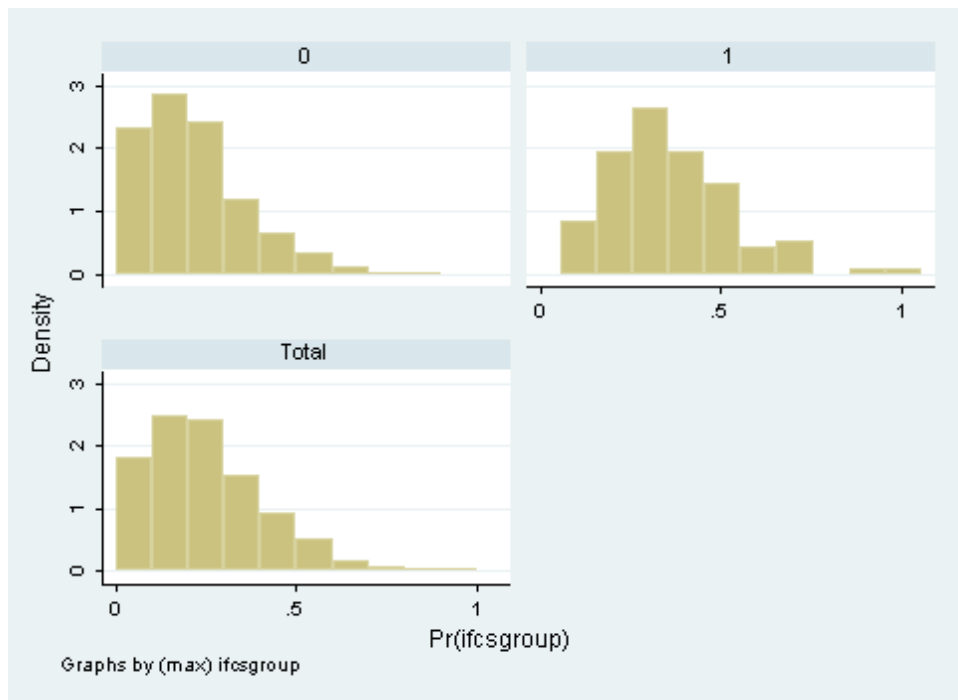


Figure 2: Common Support, Year Two Following Treatment, n=463
 (0 refers to distribution of propensity scores for comparison group, 1 refers to distribution for treatment group)

Appendix

Table A1: Placement Type Groups and Codes

Group 1	Group 2	Group 3 - Community Based Residential	Group 4 - Special Programs
17 Family Shelter	11 Diagnostic Units/CEU Emergency Respite	1 Alternative Living Units Educational Program	5 Committed-Residential
18 Foster Care	15 Care	12 Residential	20 Impact Programs
27 Runaway Shelter Structured Shelter	24 Psyche Hospital	19 Group Home	25 Residential Treatment Facility
28 Care	26 Respite Care	31 Therapeutic Group Home	29 Substance Abuse Programs Substance Abuse Youth Center
		32 Treatment Foster Care	30 33 Wilderness Program 34 Youth Centers-Committed
Group 5 - Long Term Secure Confinement	Group 6	Group 7	Group 8
16 Enhanced Academy Intermediate	2 Certificate Non- residential	7 Community Detention	9 Community Service
22 Academy	3 Committed/Non- residential	8 Community Detention/Pending Placement	21 Independent Living
	6 Community/Non- residential	10 Detention Electronic Monitoring/Pending	
		13 Placement	
		14 Electronic Monitoring	

RECORD REVIEW FOR ADJUDICATED YOUTH

Consult the "Categories by Listing of Offense" document for all ASSIST codes and offense categories (1-5).

1. Most serious current adjudicated offense: [specify ASSIST code] _____
 (IAP If the current adjudication is a felony, record a "1" _____ do not add this to the record review score)

Circle offense category: 5 4 3 2 1

2. Was the youth under any DJS supervision (including informal supervision) at the time of the current offense? [circle one] NO YES

If the youth was under DJJ supervision at the time of the offense record a '1' in the box:

Both the ASSIST record and the 'history' ISYS database must be examined in completing the rest of the form. The youth may be in the ASSIST system under more than one name.

3. Is this the youth's first referral to DJS? [circle one] NO YES

4. Date of first referral to DJS: ____/____/____
 (Use 'date received' from ASSIST) month day year

(IAP) If the youth was less than 12 years old at the time of this first referral, record a '1' in the box:

5. Using ASSIST codes from the Offense (Charge) Listing record the ASSIST code and referral date (in format MM/DD/YY, e.g., 8/22/00) for the last four referrals with different dates that the youth has had to DJS prior to the current referral. Record the most serious offense for the referral on that date. Do not include CINS, tobacco/alcohol violations, or peace orders. If the youth has less than four prior referrals recorded in ASSIST, consult the ISYS database and record the most recent referrals up to four referrals (counting both ASSIST and ISYS).

ASSIST Code	Date of Referral [MM/DD/YY]	ASSIST Code	Date of Referral [MM/DD/YY]
1.		3.	
2.		4.	

If the youth has 4 or more referrals in the past 3 years record a "1" in the box:

6. Review all prior adjudicated offenses (resulting in a finding of 'delinquent' or disposition of 'committed') from the ASSIST and ISYS record. Record the ASSIST codes of any prior adjudications that are classified as category 1, 2, or 3 offenses on the Category of Offense document.

a. _____ b. _____ c. _____ d. _____

(IAP) If any of these prior adjudications are a category 1 offense, record a "2" in this box and a "0" in the next box and go to the "Total Score" box at bottom of page:

(IAP) If any of these prior adjudications are a category 2 or 3 offense, record a '1' in this box. DO NOT SCORE this item if a "2" is recorded in the previous box:

7. Was the youth ever committed by DJS to an out-of-home placement? [circle one] NO YES

TOTAL PRIOR HISTORY SCORE (add numbers in boxes, must total 0 to 5)

Total score for IAP items on this page (#1, 4, & 6)

Figure A1: Record Review for Adjudicated Youth

Source: Bureau of Governmental Research, University of Maryland College Park (2004), *Maryland Department of Juvenile Services Classification and Placement Assessment for Adjudicated Youth, Training and Operations Manual*, Appendix A, p. 5.

Table A2: Classification and Placement Matrix

Category of Current Adjudicated Offense	History Score	Assessment Score		
		Low (<=2)	Moderate (3-6)	High (>=7)
Category 1: Arson 1; Assault 1; Murder; Rape 1, 2; Robbery w/a Deadly Weapon; Sex 1,2	2-5	Secure Confinement	Secure Confinement	Secure Confinement
	0-1	Special Program	Secure Confinement	Secure Confinement
Category 2: Burglary 1; DUI; DWI; Handgun Violation; Robbery; Sex 3	2-5	C-B Residential	Special Program	Secure Confinement
	0-1	Standard Probation Intensive or C-B Residential	C-B Residential	Special Program
Category 3: CS w/Intent to Distribute; Felony Theft; CDS distribution; Unauth. Taking of a MV; Unauth. Use misdemeanor; Unauth. Use Felony	2-5	Standard Probation Intensive or C-B Residential	C-B Residential	Special Program
	0-1	Standard Probation High or Intensive	Standard Probation Intensive	C-B Residential
Category 4: Assault 2; Burglary 2, 3; CDS Possession; Sex4; Traffic Violation Incarcerable; VOP	2-5	Standard Probation Moderate	Standard Probation High	Standard Probation High
	0-1	Standard Probation Low	Standard Probation Moderate	Standard Probation Moderate
Category 5: Alcoholic Bev. Violation; Burglary 4; Disturbing Peace; Drug Paraphernalia; False Report; Malicious Destruction; Misdemeanor Theft	2-5	Standard Probation Low	Standard Probation Moderate	Standard Probation Moderate
	0-1	Standard Probation Low	Standard Probation Moderate	Standard Probation Moderate

Source: Bureau of Governmental Research, University of Maryland College Park (2004), *Maryland Department of Juvenile Services Classification and Placement Assessment for Adjudicated Youth, Training and Operations Manual*, Appendix A, p. 12.