

Case Control Evaluation of START

An examination of low cognitive, FASD, or youth
with mental health issues who are involved in the
Justice System

Submitted December 11th, 2017

Principle Investigator Jon Franklin

Instructor: Department of Sociology, Department of Criminal Justice, University of Winnipeg

Research Assistant/Co-Author: Dr. Cara Isaak, University of Manitoba

Student Investigator/Co-Author: Kelly Barker, University of Winnipeg

Table of Contents

EXECUTIVE SUMMARY:	4
CHAPTER 1: INTRODUCTION	7
CHAPTER 2: LITERATURE REVIEW	9
NARRATIVE REVIEW:	9
CASE CONTROL REVIEW:.....	10
STAFFING REVIEW:	11
SUMMARY OF LITERATURE REVIEW:.....	12
CHAPTER 3: ETHICS	13
CHAPTER 4: METHODOLOGY	14
BUILDING A CASE FOR CASE-CONTROL:	14
CONTROL GROUP CONSTRUCTION:	17
CHAPTER 5: LOGIC MODEL	20
Figure 1: Logic Model of Case-control Evaluation of START.....	21
CHAPTER 6: FINDINGS	22
DEVELOPMENT OF RESEARCH QUESTIONS	22
DESCRIPTIVE STATISTICS:.....	22
DEMOGRAPHIC CHARACTERISTICS:.....	22
Table 1: Charges of START Participants at Referral.....	24
Figure 2: Prevalence of Cognitive and Mental Health Issues	25
Figure 3: Sex Distribution of START Clients.....	26
Figure 4: Age Distribution of START Clients	27
Figure 5: Ethnicity of START Clients	28
Figure 6: Grade Distribution of START Clients.....	29
Figure 7: Degree of Family Support.....	30
Figure 8: Gang Affiliation.....	31
Figure 9: Program Involvement	32
Figure 10: Degree of Participation	33
Figure 11: Referral Source	34
Figure 12: School and Work Attendance	35

MEASURING RECIDIVISM:	36
Table 2: Mean CSI Scores for START Clients by Year of Program	38
CONTROL GROUP:.....	39
Table 3: Case-Control Comparison.....	40
Table 4: Mean CSI Scores for Controls Across the Study	41
Table 5: Case-Control CSI Comparison.....	42
Table 6: New Charges (START Clients compared to Controls).....	43
Table 7: Number of Charges (START Clients compared to Controls).....	44
CHAPTER 7: CONCLUSIONS.....	46
LIMITATIONS:.....	46
STRENGTHS:.....	47
CONCLUSION:.....	48
SOURCES:.....	50

Executive Summary:

Evaluation Purpose:

The Selkirk Team for At Risk Teams (START) program targets at risk youth who have or require involvement with multiple social services agencies in Selkirk, St. Clements, and St. Andrews, Manitoba. The program primarily is composed of the collaboration between the Lord Selkirk School Division, the Royal Canadian Mounted Police, Probation Services, Interlake-Eastman Health Authority, the Addictions Foundation of Manitoba, and Child and Family Services. A youth centered, harm reduction approach provides clients with services, supports, and interventions that are based on individual needs identified through a risk assessment and consultations with family, the youth and front-line workers. START provides a support network around each program participant by bringing together the youth, their family and multiple social services as part of the client's Customized Support Team.

The current evaluation was guided by the following objectives:

1. Assess recidivism rates among START clients during program involvement.
2. Develop a sampling strategy to create a comparison group for a case-control evaluation of recidivism rates with similarly affected youth.
3. Create and analyze a database of START clients and the comparison group to examine whether START clients have lower rates of recidivism compared to matched controls.

Methods:

Official records from the START client referral database were used to examine recidivism rates among START clients over a three-year period. For the pre-and post-test analysis the weights of criminal offences using the Crime Severity Index (CSI) were examined for START clients referred to the program with their CSI upon program completion or end of the three-year examination period.

The RCMP Police Reporting and Occurrence System (PROS) was accessed to assess whether START clients had lower recidivism rates compared to similarly affected youths. The case group comprised of 26 youth that had participated in the START program, was compared to a

group of 74 control participants from outside of the START clientele. Variables through which the control group were matched to the case group were birth year, ethnicity, legal involvement, type of involvement (criminal offenses), and city size. START clients were compared to matched controls over the three-year period of 2014-2017 to examine whether START clients had significantly reduced recidivism rates measured using the CSI compared to controls.

Results:

Target population:

- In total 26 START participants were studied over the duration of the project.
- Schools referred most clients to START (58.1%), followed by parents (12.9%), probation service (12.9%), the RCMP (6.5%), Children's disABILITY Services (6.5%), and Child and Family Services (3.2%).
- Participants ranged in age from 14 to 18 with an average age of 15.8 years.
- Twenty-six of the participants were male (70.3%), eleven were female (29.7%).
- The majority of START clients identified as Indigenous (57.7%) and the remainder of clients were Caucasian (42.3%).
- On average START clients had achieved a Grade 9 education.

START Client Recidivism Rates:

When examining CSI scores the majority of START program participants demonstrated significant reductions in recidivism and severity of offending. The strongest indicator of success was degree of participation in START followed by having better supports from both family and the community. Youth whose criminal offending increased during the program were most likely to be involved or have peripheral involvement with gangs. Increases in criminal offending during the program were also significantly related to low degrees of participation in the program.

Control Recidivism Rates:

The control group saw a reduction in recidivism rate from year 1 to year 2 of the study, however these reductions were not sustainable to year 3 when recidivism rates increased. There were no significant differences in recidivism rates during the study period.

Case Control Analysis:

While CSI Scores were not significantly different between cases and controls for the duration of the study, this finding may be due to two outlying responses in among START clients. Overall, no START clients were incarcerated during the study, compared to three control participants. START clients demonstrated significant decreases in recidivism rates and number of new charges. Odd ratios suggest that START reduced recidivism rates by a factor of 6.17 compared to controls and reduced the number of new charges by a factor of 3.49.

Conclusions:

The results of this analysis suggest that START is effective in reducing recidivism, the results of which are in line with the findings of the previous START evaluation (Franklin & Isaak, 2013). Program goals and their attendant outcomes have largely been achieved by START, even without the benefit of formal systems level collaboration policy. The team-based case planning and monitoring model continues to operate in a manner consistent with the best practices in the literature and is demonstrably effective for working with young, Indigenous clients with cognitive and mental health issues.

Chapter 1: Introduction

Selkirk Team for At-Risk Teens (START) is a program that targets youth with complex challenges and involvement with multiple social services agencies in Selkirk, St. Clements, and St. Andrews, Manitoba. The START program, was founded in 2002 as a collaborative effort between the Lord Selkirk School Division (LSSD), the Royal Canadian Mounted Police (RCMP), Probation Services, and Child and Family Services (CFS) following discussions between social service agencies with the recognition that a collaborative approach may be warranted for youth in the area requiring intervention from multiple agencies. Shortly thereafter, both the Addictions Foundation of Manitoba and Interlake-Eastman Regional Health Authority partnered with the START program. START encompasses a youth-centered approach that provides clients with supports and interventions based on individual needs as identified by an initial risk assessment. START aims to facilitate a support network around the youth by bringing together representatives from specific social services agencies,¹ based on the needs of individual clients. A ‘team’ is formed around the youth, and together a holistic plan is developed specific to the individual and their circumstances. The team will come together with the youth and their family monthly to reassess the action plan, set goals, and monitor progress.

START participants are among the most at-risk teens, many having serious criminal offending and drug use patterns. The START program recognizes that a total elimination of these patterns will not occur in a short time period, therefore the program focuses on the reduction of harmful behaviors of the youth. Some of the key initiatives of the START program include reducing recidivism, identifying and addressing risk factors and challenges, enhancing coordination and collaboration of social service agencies, and monitoring and documenting progress. START program objectives include:

1. Developing and fostering positive relationships with partner agencies;
2. Identifying and addressing risk factors and challenges;
3. Convening team members and securing supports for the youth;
4. Providing intensive and supportive case management;
5. Empowering youth and their families to make positive changes;

¹ These agencies include: Addictions Foundation of Manitoba, schools, Probation Services, public and mental health services, Child and Family Services and the RCMP.

6. Developing safety and action plans to protect the youth;
7. Holding the youth, parents, and stakeholders accountable for achieving set goals;
8. Making appropriate referrals to social service agencies;
9. Monitoring and documenting progress.

The current evaluation will determine if START reduces the rate of recidivism among clients. Additionally, the services organized by START will be analyzed in relation to clients' ability to function successfully in the community and assess the demand placed on social service agencies. The results of this evaluation will be used with the intent to develop a program base to assist youth whose involvement with the criminal justice system can be strongly attributed to low-cognition or mental health issues. This evaluation was based on a case-control study model, where clients of START will be matched to similar youth not involved with START. The youth were monitored longitudinally and any trajectory differences between START clients and the matched youth were identified.

Chapter 2: Literature Review

Narrative Review:

The current literature was first searched for narrative reviews concerning holistic and multi-agency programs for youth at risk in Canada. Programs following a similar model as START were found in several other provinces with varying affiliations, resources, goals, and client demographics.

For example, four multi-agency youth programs were found in Calgary. The Youth at Risk Development Program is an anti-gang program involving collaboration between social services, schools, law enforcement, religious institutions, and community organizations with a goal of providing early intervention and support for youth ages 10-17 at risk of gang affiliation. The Serious Habitual Offender Program (SHOP) is a community based crime intervention program that provides support for habitual offenders ages 12-24. SHOP creates Multi-Disciplinary Resource Teams involving members from the Crown Prosecutors Office, Calgary Young Offenders Centre, Calgary and Area Child and Family Services, City of Calgary, Youth Probation Services, Calgary Board of Education, Calgary Catholic School Board, various group homes and outreach social agencies. The team creates a profile for each youth based on their criminal history, family background, living situation, and mental health history to ensure they have access to the appropriate rehabilitation programs. The Gateway Initiative supports youth who have committed minor, non-violent offences through a partnership between the Calgary Police Service and Calgary Neighborhoods. The youth must accept responsibility for the offence and be willing to participate in the program. The Multi Agency School Support Team works with younger children ages 5-12 who display high-risk behavior or are at risk of victimization by linking the Calgary Police Service, the Calgary Board of Education, the Calgary Catholic School District, The City of Calgary's Community and Neighborhood Service department, and Alberta Health Services to facilitate delivery of prevention and intervention services.

Similar agencies were found in most provinces. The Youth Treatment Program (YTP) in New Brunswick works with youth with severe behavioral difficulties by integrating regional

teams that advise primary program workers. The Committee of Youth Officers for the Province of Ontario (COYO) is comprised of a group of police officers that are dedicated to disseminating youth crime and protection information. The program involves partnerships with police services, youth services, school boards, Child and Youth Services, Community Safety and Correctional Services and private members.

Case Control Review:

Next, the literature was searched for case-control, longitudinal, and cohort studies examining the efficacy of multi-agency programs for at-risk youth. Numerous examples exist of case control studies that have been designed to address problems among youth, including: violence (Lurigio et al., 2000), involvement with the criminal justice system (National Crime Prevention Centre, 2013; Reingle et al., 2013), antisocial behavior (Strom et al., 2010), substance abuse (Winokur, 2010), and gang involvement (Weinrath et al., 2009). Variables that have been measured include: recidivism rates (Lurigio et al., 2000; Strom et al., 2010; Weinrath et al., 2009), incarceration (Reingle et al., 2013), and involvement with the criminal justice system (Winokur, 2010). Overall, case-control studies can be useful to retroactively determine the outcomes of a treatment. Matching and comparing the outcomes of a case group and a control group demonstrate how this is achieved. When conducting case-control studies it is important to control for biases and confounding variables, this will ensure the accuracy and validity of results derived from the study.²

A study of 99,600 youth offenders processed by the South Carolina Department of Juvenile Justice and the same number of matched controls without juvenile records were accessed using structural equation modelling analysis to look at the influences leading to juvenile delinquency. The study concluded multi-agency programs provided the best avenue for support

² The potential for bias and confounding variables are among the disadvantages of case-control studies (Levin, 2003). Biases most prone in case-control studies include: selection bias (occurs when the sample is not random), measurement error (when there is no consistency in data measurements) (Breslow, 2005), and non-representativeness (when the control group is not representative of the population it is drawn from) (Grimes & Schulz, 2002). Confounding variables occur when a factor occurs in both the case and the control groups, but is extraneous to the study, as it is not an outcome of the treatment.

(Barrett et al. 2014). A study of 564 males from the United Kingdom who committed alcohol-related offences used a case-control design to study the effects of alcohol treatment programs on recidivism. Individuals who did not follow an alcohol treatment program were twice as likely to reoffend (Needham et al. 2015). In 2000, a case-control study of Project BUILD, a violence prevention program for incarcerated youth in North Carolina that helps engage clients in pro-social activities to reduced recidivism, was conducted by matching 60 BUILD clients with 60 controls. BUILD clients had significantly lower recidivism rates (Lurigo et al. 2000).

A case-control study of the AMIkids program in Tampa, Florida matched clients receiving community-based interventions in academic and educational settings with non-clients enrolled in residential programs. The evaluation found that youth involved in the program were less likely to be arrested within 12 months of release (Winokur et al. 2010). Clients of the Spotlight Program in Winnipeg, Manitoba were enrolled in a case-control study to determine the effectiveness of the program for preventing recidivism in gang-involved young offenders. Compared to controls admitted to the Manitoba Youth Centre, Spotlight clients were five times less likely to reoffend (Weinrath et al. 2009). A case-control study of 516 youths taking part in the Methodist Home for Children's Value-Based Therapeutic Environment Model or not receiving additional services found that the program significantly reduced total days incarcerated and reduced the number of new charges (Strom et al. 2008). Finally, an 18-month cohort study was conducted of youths receiving multi-agency services within a custodial institution in the United Kingdom. The study found a significant improvement in high-risk behaviors, peer relationships, and participation in programming (Ryan and Mitchell 2010).

The National Crime Prevention Centre is currently evaluating the Stop Now and Plan (SNAP) program for children under 12 at-risk of involvement with the criminal justice system at the Edmonton and Cree Nation sites. SNAP takes a cognitive-behavioral, multi-component approach involving children and their parents, aiming to prevent children from engaging in future delinquent behavior. The control groups are composed of children on SNAP's waiting list.

Staffing Review:

The literature was also reviewed for effects of multi-agency program participation on professional staff. A qualitative study of professional social workers involved in multi-agency programs found that negative outcomes of program participation included loss of professional identity and conflicts stemming from differences in agency protocols and hierarchies. Positive outcomes included an increased level of enthusiasm and commitment and a strengthened appreciation for other agencies roles' in the intervention.

Summary of literature review:

The literature revealed a trend toward increased collaborative case management programs across Canadian provinces. Case-control and cohort studies providing evidence for the efficacy of these programs were scarce, and the variety of endpoints considered, and varying demographics of the study populations would make quantitative comparisons or meta-analysis difficult. However, some case-control studies did find positive effects on recidivism with multi-agency case involvement. Positive outcomes for agency staff were also noted.

Chapter 3: Ethics

In 2016, an ethics submission was sent to the University of Winnipeg Sociology Department Ethics committee. The ethics committee reviewed the project and deemed the project as minimal risk, thus passing ethics requirements. For full disclosure, consent was not obtained from participants in this study. The nature of the research did not require contact with participants and did not involve the primary collection of data, but rather analysis of secondary, pre-existing data. As a case-control study, the only required information was found in two databases: the RCMP Police Reporting and Occurrence System (PROS)³, which was used to gather controls, and the START database which contained the cases. The START database is under guardianship of the START program. Analysis of the information provided for the evaluation will reflect ethical obligations that each of the programs adheres to.

All participants and relevant information were pre-recorded into PROS and the START database so that the researcher had no knowledge of the identities of either cases or controls. The dataset made available to the researchers via PROS only included information on the variables requested (sex, birth year, race, legal involvement, and educational attainment) for the control group. No additional information on the individuals in the dataset was supplied. There was no identifying information in either database. When the results of this study are disseminated, all efforts were made to ensure the anonymity of participants.

³ PROS is the Policy Reporting and Occurrence System for the RCMP in Canada. The database integrates information on the collecting, managing, and analysis of police information. PROS is an investigative information recording and retrieval system containing detailed information on all events reported to the Royal Canadian Mounted Police. See <http://www.rcmp-grc.gc.ca/en/police-reporting-and-occurrence-system-pros>

Chapter 4: Methodology

Building a case for case-control:

Case-control studies examine the association between treatment and outcome, consisting of two dichotomized groups, the case group and the control group (Breslow, 2005). The case group consists of those who have received treatment, specifically the treatment that you are seeking to determine the outcome of. The control group can be defined as a comparison group, a group which holds the same relevant characteristics as the case group, but who have not received the treatment being studied. Signifying the importance of having case and control groups with similar characteristics, Grimes and Schulz (2002) express that, "...controls should represent the population at risk of becoming cases" (p. 432).

The purpose of matching cases and controls, often referred to as frequency matching, is to make the two groups as similar, and therefore comparable, as possible.⁴ The more alike the groups are on relevant characteristics directly impacts the validity of a study (Fletcher, 2010). "The goal of matching in case-control studies is to balance the numbers of cases and controls within strata that will be used for statistical adjustment purposes" (Breslow, 2005, p.298). If the case group taking a program shows improvement and the control group does not, one can conclude the program had a significant impact.

Levin (2003) emphasizes, "selecting controls often proves harder than cases and require great care in the prevention of bias" (p. 83). To eliminate bias that may occur through matching, case and control populations could be matched on propensity score. Propensity score matching is a form of statistically based matching that removes the subjectivity of exclusively matching on individual characteristics (Rubin, 2001), wherein treatment and control units are matched with

⁴ Breslow (2005) discusses three separate principles of control selection. First, The Study-Base Principle notes that the control group should be a random selection of the treatment-free cohort being studied. Second, The Deconfounding Principle, which "underlies the stratified sampling of controls to render possible, or improve the efficiency of, an adjusted analysis designed to control confounding" (Breslow, 2005, p.304; Ernster, 1994). Third, The Comparable Accuracy Principle suggests measurement errors be consistent within the case and control groups so that it the groups reflect each other, making it appropriate to compare them.

similar values of the propensity score, and possibly other covariates, and the discarding of all unmatched units (Rubin, 2001, p.173). “The general effect of propensity score matching is to refine the comparison sample by removing potential comparison cases that in fact comprise poor matches to any case in the treatment sample” (Rempel, Lambson, Cadoret, & Franklin, 2013, p.12).

Matching through propensity score eliminates the risk of incorrectly matching characteristics. In propensity score matching, everyone is assigned a propensity score based on observed covariates (the characteristics you would be matching on). The propensity scores are statistically calculated by assigning values to cohort characteristics and weighing them against each other to determine a standardized score. This will be your propensity score (Rubin, 2001). “...If treatment [case] and control groups have the same distribution of propensity scores, they have the same distribution of all observed covariates, just like in a randomized experiment” (Rubin, 2001, p.171). Explained more generally, identical propensity scores between case and control groups illustrate the same distribution of relevant characteristics within both groups. This demonstrates the high validity that propensity score matching produces.

The selection of a comparison group is commonly made through various forms of sampling as well as the analysis of official records (Weinrath, Donatelli, Murchison, & Cattini, 2009). It is preferable for cases and controls to be selected from the same population to ensure that there is a high level of comparability (Fletcher, 2010). Accurately matching cases and controls is key to reducing the risk of bias, which will increase the validity of the case-control study. Breslow (2005) explains that, “individual case-control matching is most appealing when needed to control the effects of a confounder that is not easily measured” (p.302).

Case-control studies differ from cohort studies because case-control studies are retrogressive while cohort studies are progressive. In other words, case-control studies are focused on studying past events and occurrences, while cohort studies are exclusively future oriented. Grimes and Schulz (2002) add that, “in cohort studies, for example study groups are designed by exposure. In case-control studies, however, study groups are defined by outcome” (p. 432). With regards to the information produced through each study, Grimes and Schulz

(2002) explain that, “unlike cohort studies, case-control studies cannot yield incidence rates. Instead, they provide an odds ratio, derived from the proportion of individuals exposed in each of the case and control groups” (p. 432). This means that because case-control studies are retrospectively based, they focus on determining ratios between the case group and the control group on different levels of measurement.

Experimental case-control studies are difficult to achieve in human services delivery because when resources are committed to programs, policy makers and organizations want eligible participants involved. Where random control groups cannot be established, comparisons groups are created to provide a baseline that can be used to predict that a program has an effect. Comparisons of cases and controls can be created through sampling and analysis of official records (Weinrath et al, 2009).

Vandenbroucke (2004) identifies two primary benefits of conducting studies based on randomly assigning subjects to case and control groups. He notes that observational case-control studies (where a control group is matched to the case group based on relevant characteristics), can achieve the same benefits as a randomized case-control study. Allocating treatment in an unbiased manner and the ability to apply statistical theory to a random sample are the major advantages of a study grounded in random assignment. However, as Vandenbroucke (2004) explains, an observational framework can meet the standard of randomized control trials: “...restriction in research topics, design, and analysis helps observational research to attain the desired benefits of randomization, and gives observational research the chance to be as credible as randomized evidence” (p.1731). Restricting research topics, design, and analysis in such a way so that the researcher is blind to possible outcomes of the treatment will reduce the potential of bias when the results are later interpreted and analyzed. If these measures are taken, observational research and randomized control trials can be viewed as producing an equivalent quality of evidence based on design.

Control Group Construction:

The case group was comprised of 26 youth that had participated in the START program. The control group were selected from the Police Reporting and Occurrence System (PROS) database and matched to the case group based on birth year, ethnicity, legal involvement, type of involvement (criminal offenses), and city size. Breslow (2005) highlights the importance of not overmatching the case and control group on factors that are not relevant to the treatment. Confounding variables do not need to be matched if the potential confounder has no relation to the outcome variable and any characteristic that is not relevant should be excluded from comparison. Thus, cases and controls only require to be matched on characteristics that are relevant to the treatment you are providing. A brief rationale for those variables being controlled for is as follows:

- **Sex:** Approximately two thirds of the START group is male and as such the control group should reflect the overrepresentation of males in the study. Females may differ from males regarding the type of crimes they commit as well as their likelihood to recidivate.
- **Age:** Controls will need to represent the approximate age of cases. The ages of START clients range from 12 to 17 and suitable age controls would be required as older or younger cases will differential impact the controls. The issues faced by younger clients may also differ significantly from older clients.
- **Ethnicity:** The START Program has a high representation of Indigenous clients. Clients who are either Metis or Indigenous make up more than half of the youth involved in START. Indigenous people in Canada face a set of unique struggles related to colonization. It is important to match on race to ensure that Indigenous are adequately represented in the control group.
- **Legal Involvement:** Not all of START's clients are involved in the criminal justice system. It is important to consider that a proportionate number of controls not be involved with the criminal justice system. There are also vastly different degrees of legal involvement which should be controlled for in the analysis.
- **Criminal offenses:** Offenders who commit different offences have different rates of reoffending. To gain an accurate insight on START's impact on recidivism, it

is important to control for offence type. The majority of START clients who were involved in the criminal justice system have been charged with assault and this should be reflected in the control group.

The Crime Severity Index (CSI) was used to track changes in the severity of police-reported crime from year to year. It does so by considering not only the change in volume of a crime, but also the relative seriousness of that crime in comparison to other crimes. (Statistics Canada, 2015). The principle behind the CSI was to have more serious crimes carry a higher weight than less serious crimes. Consequently, changes in more serious crimes would have a greater impact on the Index than on the traditional crime rate.⁵ It is often useful to consider categories of crime severity, prioritizing the most serious re-offenses.

The CSI reduces the impact of high-volume, less serious offences and allow the Index to better reflect changes in the incidence of more serious crimes. The CSI also minimizes the impact of differences in the way the public and police in various jurisdictions report high-volume, less-serious crimes, thereby improving comparisons among provinces and municipalities. The CSI will track changes in the severity of police-reported crime by accounting for both the amount of crime reported by police in each jurisdiction and the relative seriousness of these crimes.⁶

- **Location:** Controls could be selected from anywhere in Canada. However, controls were limited to cities that have a population less than twenty thousand to better approximate Selkirk, Manitoba residents. Selkirk has a population of approximately ten thousand. If controls were to be included from cities with significantly larger populations, the controls would not be entirely representative of the case group.

The minimum ratio of cases to controls is generally 1:1, however this minimum standard

⁵ The traditional crime rate is influenced by fluctuations in high-volume, less serious offences. This is because each offence reported by police, regardless of its seriousness, carries the same weight in calculating the crime rate (Statistics Canada, 2015).

⁶ Each type of offence is assigned a seriousness "weight". The weights are derived from actual sentences handed down by courts in all provinces and territories. More serious crimes are assigned higher weights, less serious offences lower weights. The specific weight for any given type of offence consists of two parts; 1. The incarceration rate for that offence type, and 2. The average (mean) length of the prison sentence, in days, for the specific type of offence. Offences that tend to be subject to incarceration upon conviction are generally considered more serious than those that are not. Further, more serious crimes generally receive longer custodial sentences. The incarceration rate is multiplied by the average sentence length to arrive at the final seriousness weight for each type of offence reported by police. Each occurrence of an offence is assigned the same weight regardless of the specific outcome of any individual case. For example, all robberies reported by police carry the same weight in the Index, regardless of the specific characteristics of each incident (Statistics Canada, 2015).

assumes a large sample size. With smaller samples, such as that found in the present study, the control to case ratio should be minimally 2:1 and ideally greater. The higher ratio of controls to cases would increase both the reliability and the validity of the analysis when assessing changes, or lack thereof between the case and control groups. However, if cases cannot be matched exactly on relevant variables to three or four, we should be hesitant to match at a ratio greater than 1:1.

The case group was comprised of all START clients in the program for the years 2014 to 2016. The sample of 26 cases was examined for the duration of the study. Some clients would have been assessed during multiple years as they remained in the program for all or part of the time sampled others would have graduated from the program. 74 matched controls were selected for a comparison group from PROS. The overall control to case ratio was 2.85:1.⁷

⁷ The goal of the evaluation was to have a control to case ratio of 3:1, however the combination of characteristics of two START clients were so significantly different than any controls that they could not be matched.

Chapter 5: Logic Model

A logic model is a tool used to evaluate the effectiveness of a program. Logic models describe the relationships between the situation in which the program intervenes, inputs, outputs, short and long-term outcomes, and external influences. First, a logic model outlines the situation, the clientele to be reached, and the reasons for implementing the program. Second, the program inputs are listed, including financial resources and personnel. Third, the program outputs are listed, which includes both a summary of activities and the program participants. Fourth, program outcomes are separated into short, medium, and long-term goals. Generally, short term goals are centered on changing awareness, attitudes, and knowledge, medium term goals are centered on changing behaviors and policy, and long-term goals are centered on changing the overall economic, social, and political situation. Finally, the logic model also indicates how external influences affect each of the four categories listed above. Since this logic model will be used to aid an evaluation, research questions relevant to each category are also included.

Figure 1: Logic Model of Case-control Evaluation of START

<p style="text-align: center;"><u>Inputs</u></p> <ul style="list-style-type: none"> ✓ Funding from partner agencies and three levels of government ✓ Partner agencies ✓ Facilities ✓ Leadership, knowledge base, and skills of the Coordinator and staff 	<p style="text-align: center;"><u>Activities</u></p> <ul style="list-style-type: none"> ✓ Steering meetings to motivate partners to collaborate ✓ Screening meetings to identify youth in need of multi-agency intervention ✓ Facilitation of extrajudicial case clearance ✓ Engagement of youth and family ✓ Creation of safety plan for crisis situations ✓ Networking and collaboration to assemble team customized for the youth ✓ Case conferences with team, youth, and family to establish holistic action plan, set goals, and monitor monthly progress ✓ Referrals to additional social services ✓ Assessment of progress by Coordinator, partners, youth, and family 	<p style="text-align: center;"><u>Outputs</u></p> <ul style="list-style-type: none"> ✓ Dataset of client demographics, action plans, team members, progress, and outcomes ✓ Descriptive and statistical analysis of impact of START involvement on recidivism, referrals, and other client outcomes
<p style="text-align: center;"><u>Target Population</u></p> <ul style="list-style-type: none"> ✓ Youth with complex behavioral and psychological challenges who require intensive case management with involvement from multiple social service agencies <p style="text-align: center;"><u>Control Population</u></p> <ul style="list-style-type: none"> ✓ Similarly-affected youth with RCMP interaction but no START involvement 		<p style="text-align: center;"><u>Outcomes</u></p> <ul style="list-style-type: none"> ✓ Analysis of involvement level of START clients (completed, ongoing etc.) ✓ Qualitative and quantitative evidence for START success with reducing recidivism using a case-control study design ✓ Support for program development for youth with involvement in the criminal justice system that may be attributed to low cognition or mental health issues

Chapter 6: Findings

Development of Research Questions

The current evaluation will have the following objectives:

1. Assess recidivism rates among START clients during program involvement.
2. Develop a sampling strategy to create a comparison group for a case-control evaluation of recidivism rates with similarly affected youth.
3. Create and analyze a database of START clients and the comparison group to examine whether START clients have lower rates of recidivism rates compared to matched controls.

Descriptive Statistics:

Descriptive analysis⁸ was undertaken for both cases and controls. Using the START referral forms the variables age, sex, referral source, degree of family support, nature of gang involvement, highest grade achieved, degree of program participation, and program involvement were analyzed. For the pre-and post-test, criminal offences were weighted by their CSI scores to compare recidivism rates from START clients upon program entry across the three years of the evaluation or until leaving the program.⁹ Eight START clients left the program prior to the end of the study. Five graduated successfully from the program, three moved away, and one aged out of the program. Each case was followed up on by the START program coordinator which all having no further legal involvement upon leaving the program.

Demographic Characteristics:

The START program specifically targets youth who meet a certain high-risk criterion. To better understand the clients that START is servicing the demographic and legal

⁸ All analyses were conducted through Statistical Package for the Social Sciences (SPSS) Version 20.0.

⁹ An analysis was conducted on a yearly basis, however, due to several participants remaining in the program more than one year. Some of these participants have been accounted for across the various years under study as those participants would not have completed the START program.

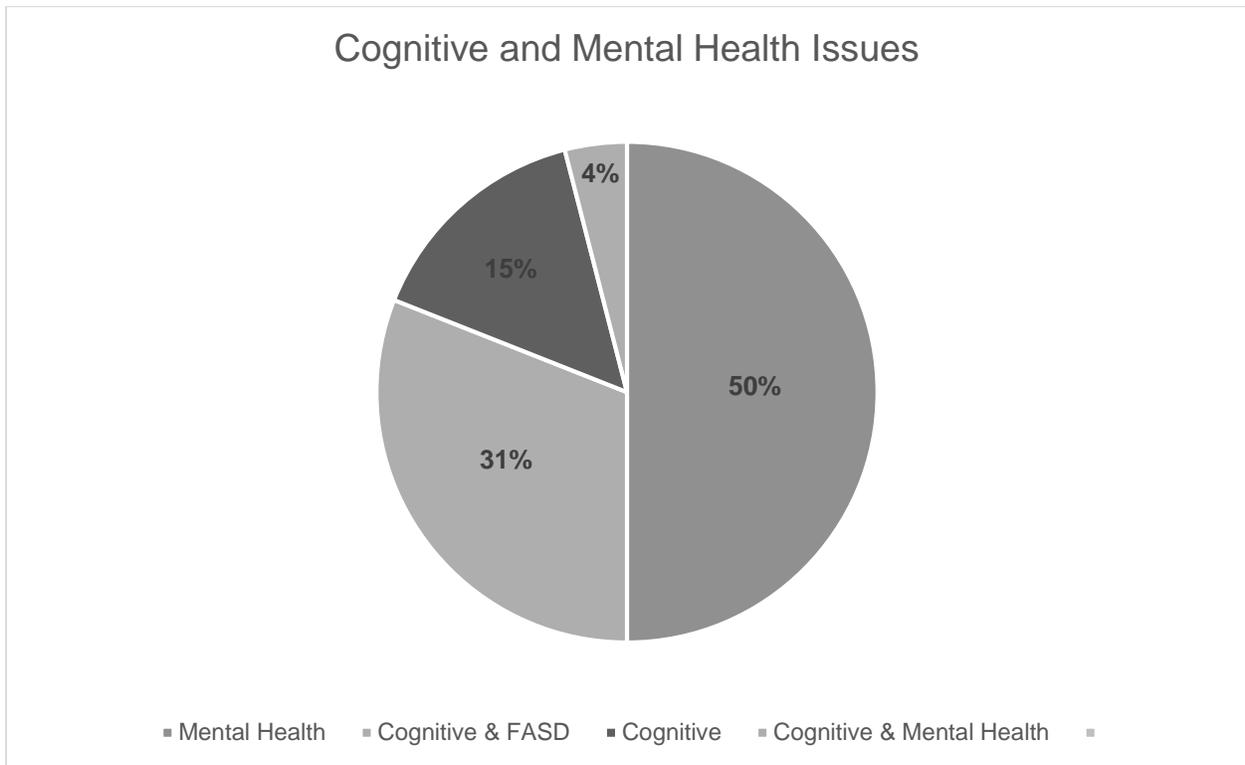
characteristics of those clients is required. In total 37, START participants were studied over the duration of the project. Participants ranged in age from 14 to 18 with an average age of 15.8 years. Twenty-six of the participants were male (70.3%), and eleven participants were female (29.7%). The majority of START clients identified as Indigenous (57.7%) and the remainder of clients were Caucasian (42.3%). Schools referred most clients to START (58.1%), followed by parents (12.9%), probation service (12.9%), the RCMP (6.5%), Children's Disability Services (6.5%), and Child and Family Services (3.2%).

To provide a scope on the type of offending youth in the START program were involved in prior to participating in the program, the distribution of offences committed prior to referral were examined (see Table 1). Typical offenses included drug possession, break and enter and weapon related offences. Failure to comply is by far the most common offence committed by the START participants in the sample group in total there were 85 failure-to-comply charges. Other common offences included theft and weapon related charges as well as possession of property obtained by crime. Among these charges many are serious and are weighted heavily by the Crime Severity Index.

Table 1: Charges of START Participants at Referral

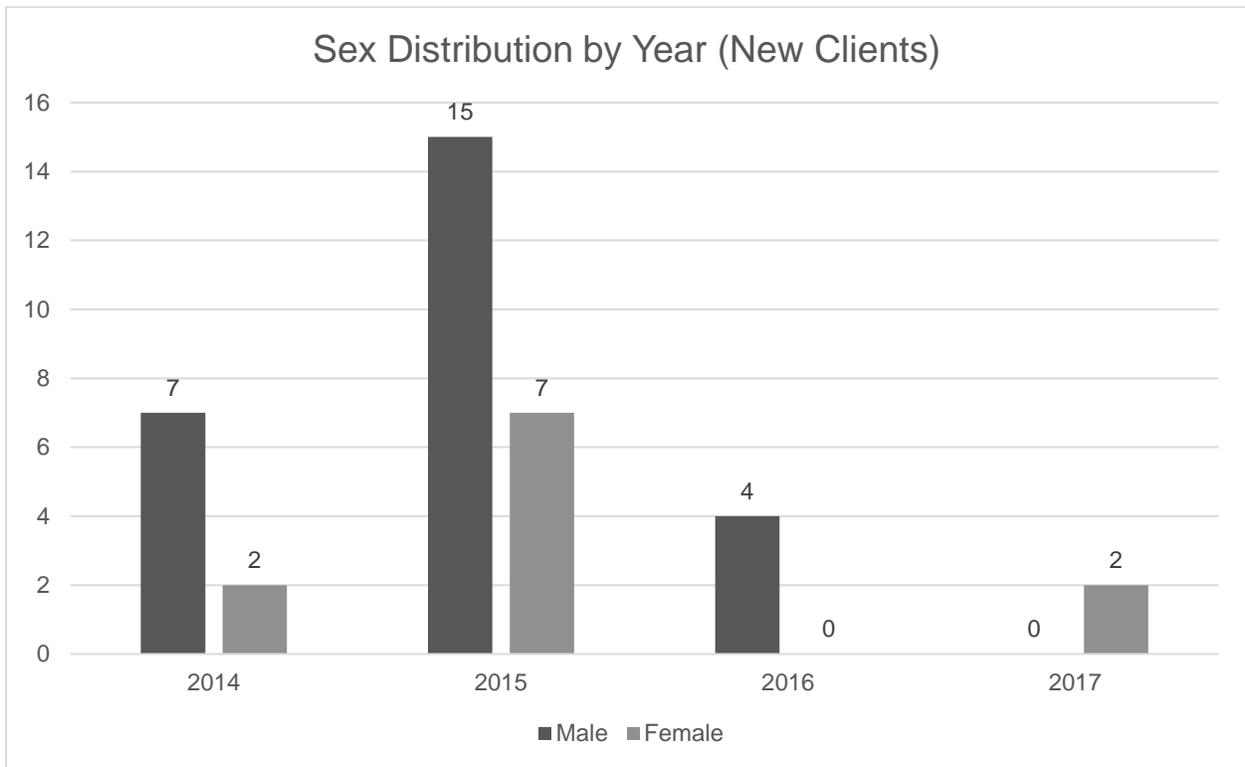
Charge	Number of Charges
Failure to Comply	85
Theft	21
Possession of a Weapon	13
Possession of Property Obtained by Crime	12
Assault	9
Break and Enter	6
Sexual Assault	6
Uttering Threats	6
Drug Possession	4
Mischief	4
Robbery	3
Liquor Consumption	3
Possession of Break-In Instrument	3
Criminal Harassment	3
Trafficking	2
Arson	2
Possession for Purpose of Trafficking	2
Disturbing the Peace	1
Identify Fraud	1
Accessing Child Pornography	1
Forcible Confinement	1

Figure 2: Prevalence of Cognitive and Mental Health Issues



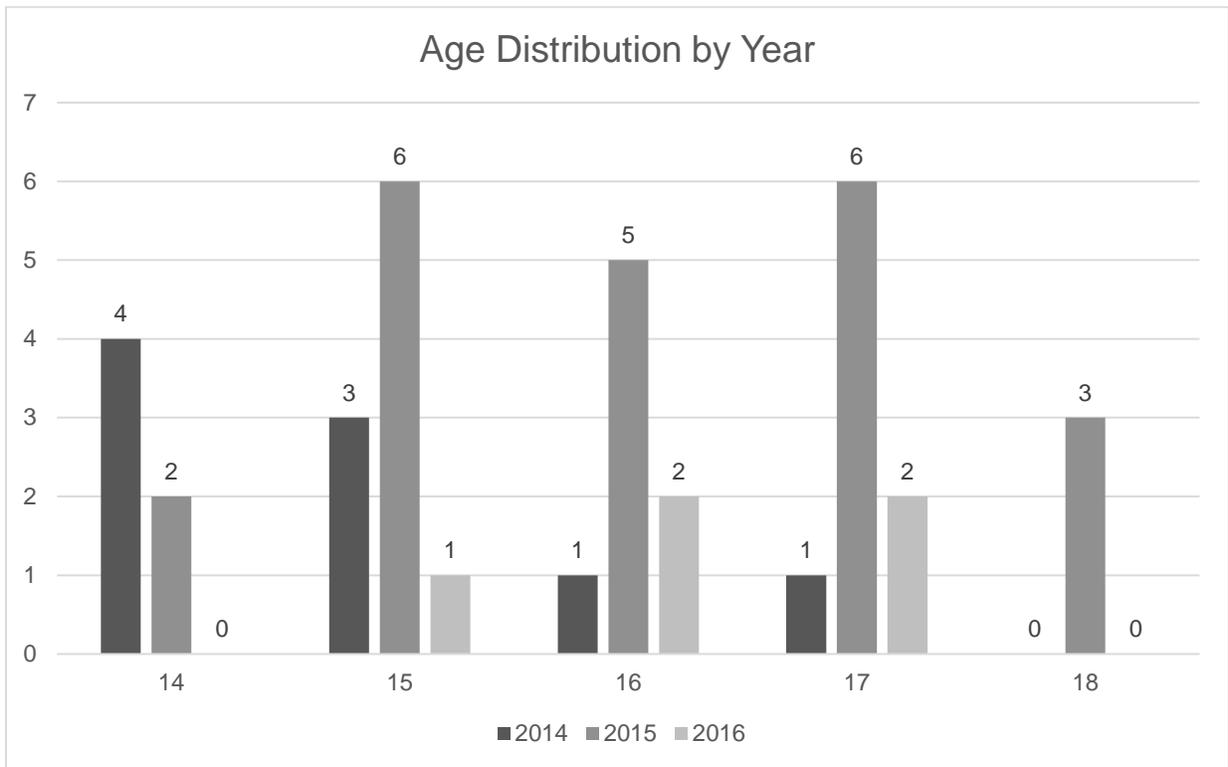
One of the long terms goals of this project is to use the findings in assisting the development of a program base to aid youth whose involvement with the criminal justice system can be strongly attributed to cognition or mental health issues. It is important to note the prevalence of mental health and cognition issues among START participants. All program participants in the dataset had some type or combination of mental health and cognition issues. Thus, further establishing the need for a program designed specifically to aid youth with low-cognition and mental health issues.

Figure 3: Sex Distribution of START Clients



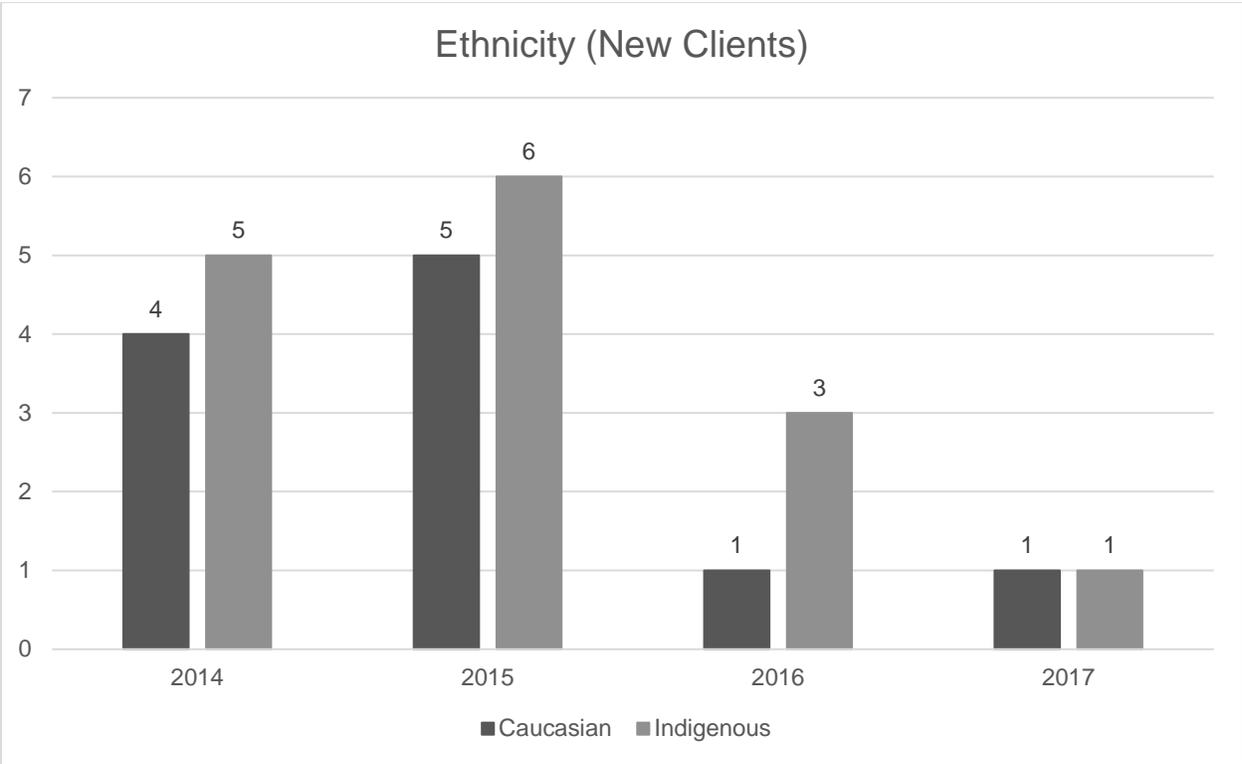
Males were significantly more likely to participate in the START program than females. Overall, 26 males participated compared to 11 females. In each year the sex gap varied considerably. In 2014, males in the program comprised of 77.8% of START participants. Of the new participants in 2015, 68.2% were male. In 2016, all new clients were male (N=4), comparatively in 2017 all new clients were female (N=2).

Figure 4: Age Distribution of START Clients



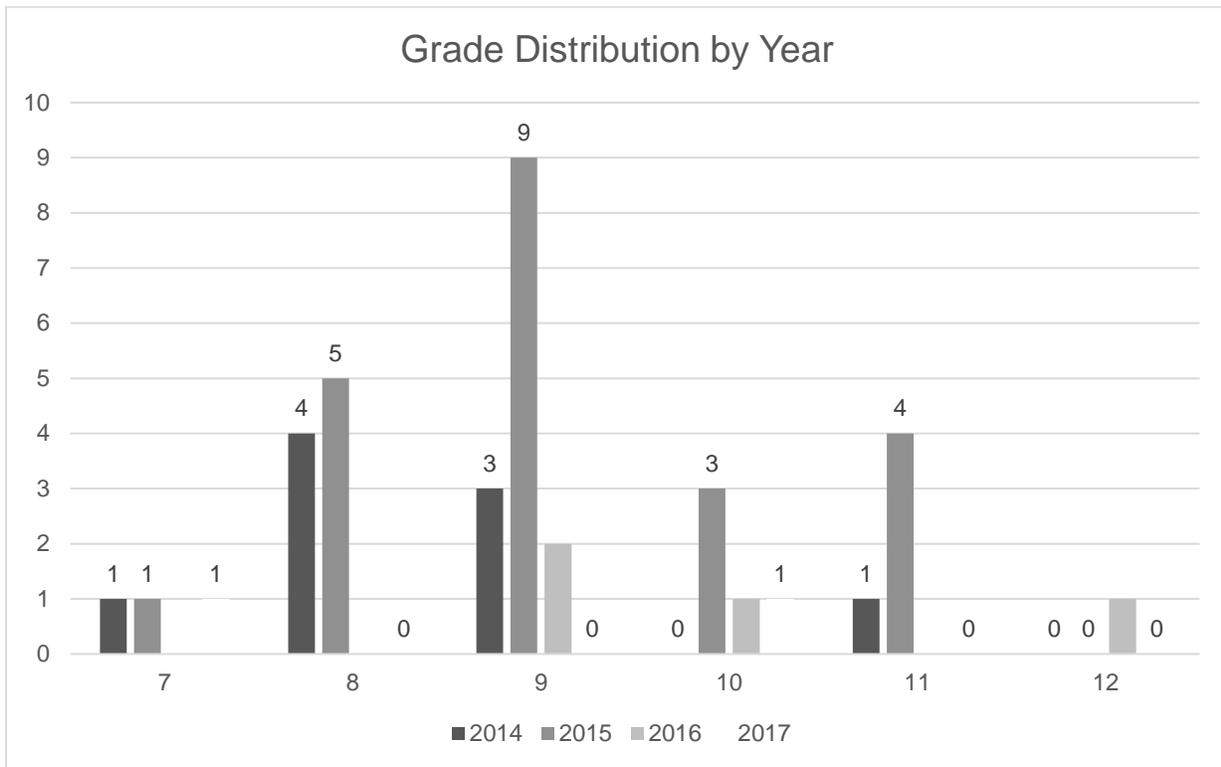
START clients must be 18 years of age or younger to participate in the program. The age distribution fluctuates from year to year with 2014 having the youngest cohort of participants with an average age of 14.89. In 2015, the average age increased to 16.1 years of age, with the average age remaining stable at 16.2 years of age in 2016.

Figure 5: Ethnicity of START Clients



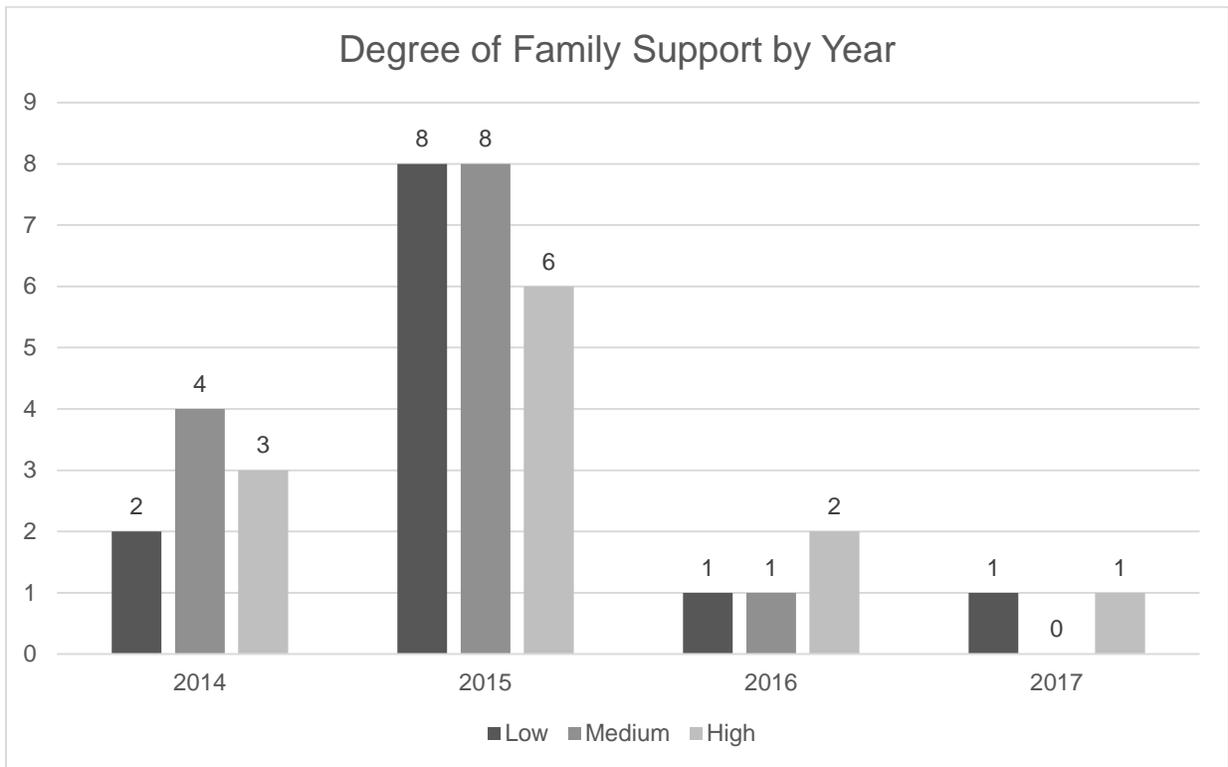
The majority of START clients were Indigenous (57.7%) with the remainder of clients being Caucasian (42.3%). Five of the nine clients in 2014 were Indigenous (55.6%). Of the new clients in 2015, six of eleven were Indigenous (54.5%), three of four new clients in 2016 were Indigenous (75.0%), and one of two new clients in 2017 were Indigenous (50.0%). Of those who identified as Indigenous, three START participants identified as Metis (20%). Metis clients were combined under the heading of Indigenous as the comparison control group did not differentiate between the two ethnicities.

Figure 6: Grade Distribution of START Clients



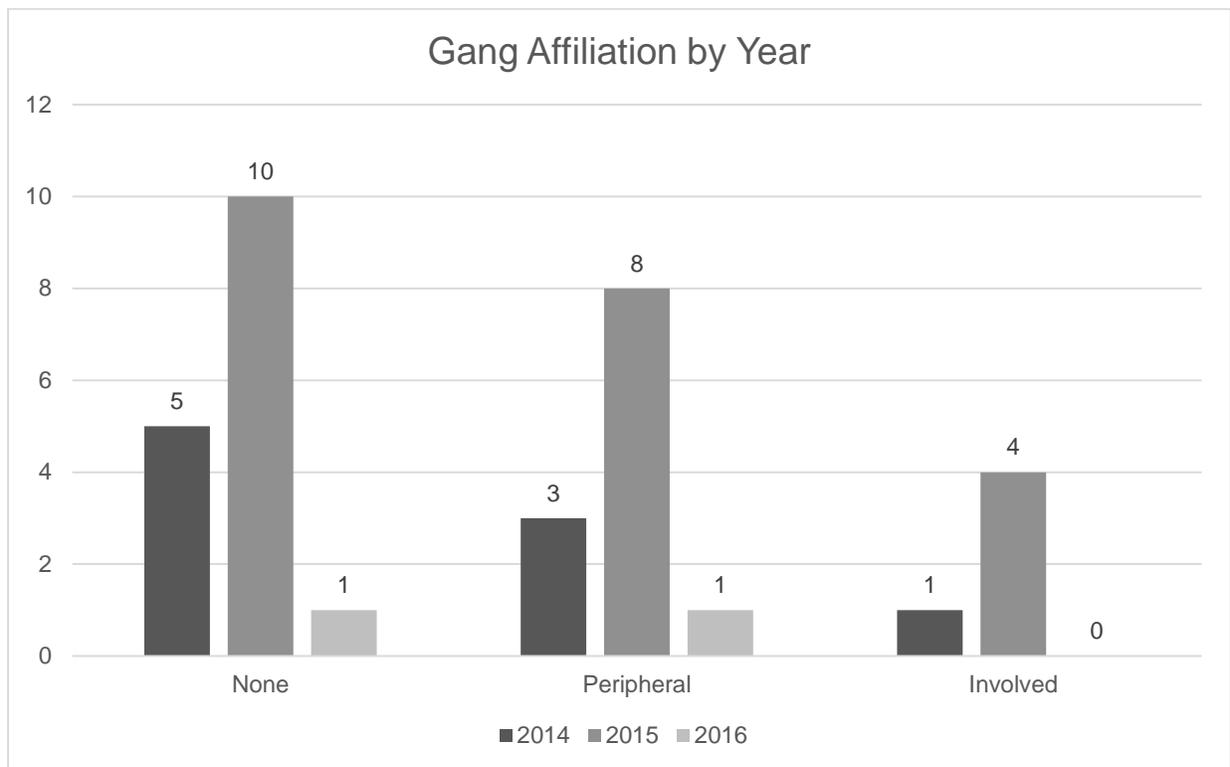
With START participants being all under the age of 18, participants will have lower levels of education compared to the general population. In 2014, the most common year of schooling (grade) achieved by START participants was grade 8 (44.4%), followed by grade 9 (33.3%). Grades 7 and 11 were the least prevalent grade both representing just over one tenth of participants (11.1%). In 2015, the most common highest grade achieved by program participants was grade 9 (40.9%), the second most common was grade 8 (22.7%), followed by grade 11 (18.2%). The least prevalent highest grades achieved were grade 10 (13.6%) and grade 7 (4.5%). In 2016, half of participants had achieved grade 9, while a quarter of participants had achieved grade 10, and a quarter achieved grade 12. In 2017, just two new START clients entered the program, one with grade 7 and one who completed grade 12.

Figure 7: Degree of Family Support



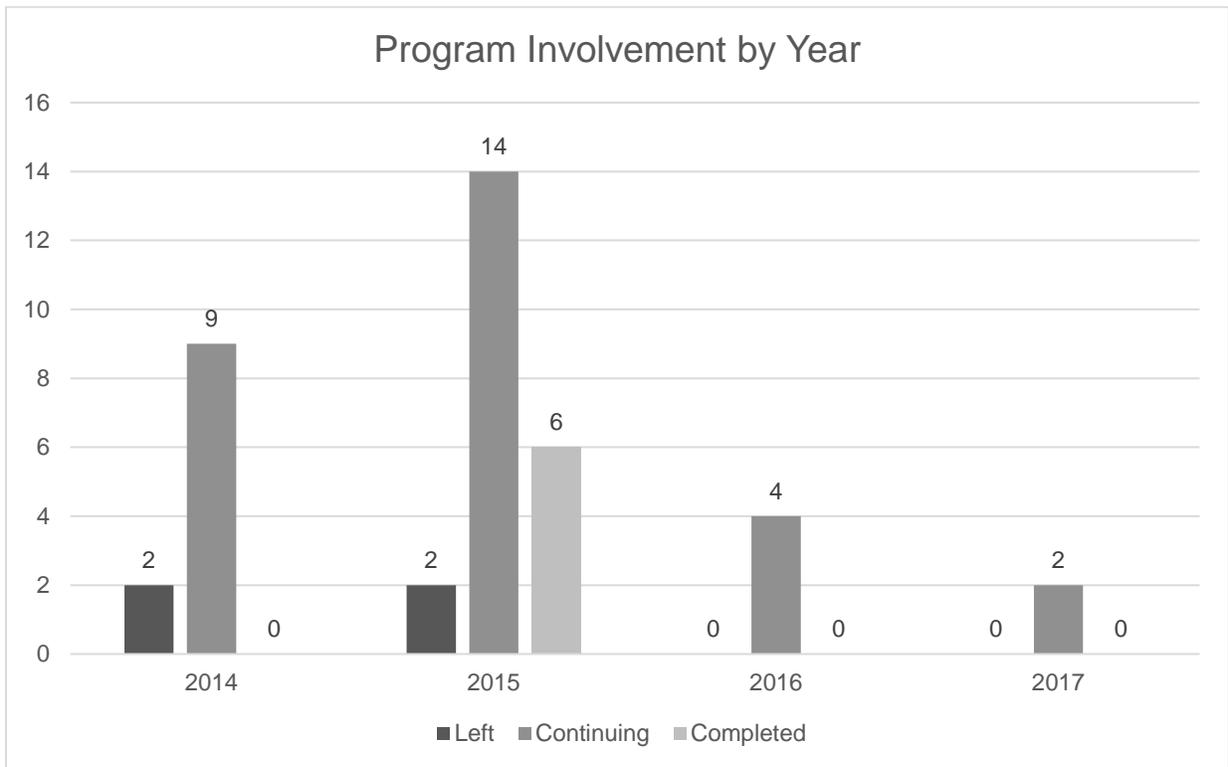
Degree of family support also varied considerably by year. Most participants in the program in 2014 had a medium degree of family support (44.4%), with slightly fewer participants having a high level of support (33.3%). Youth with a low degree of family support were the least prevalent, constituting 22.2% of participants. In 2015, levels of family support were evenly dispersed, most participants had low (36.6%) and medium (36.6%) degrees of family support. Participants with a high degree of family support represented 27.3% of clients. Fifty percent of new participants in 2016 had a high degree of family support (50%), while those with medium (25%) and low (25%) degrees of participation each represented a quarter of participants. In 2017, there were only two new START participants, one having a low degree of family support, and one with a high degree of family support.

Figure 8: Gang Affiliation



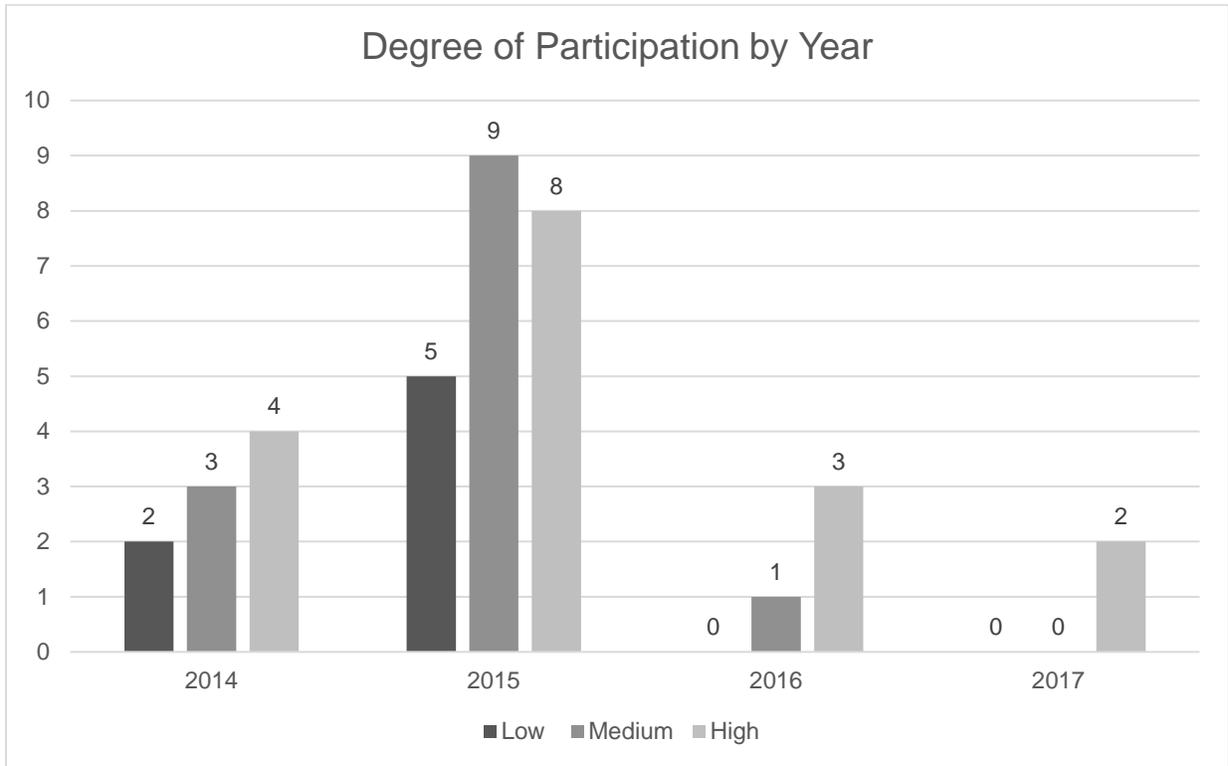
2014 saw 44.4% of START participants having some gang affiliation (33.3% peripheral, 11.1% involved). 2015 had the largest number of participants with gang affiliation with 54.5% (36.4% peripheral, 18.2% involved). The lowest levels of gang affiliation occurred in 2016, wherein just one participant had peripheral gang affiliation. However, since there were only two new clients that one person made up 50% of respondents.

Figure 9: Program Involvement



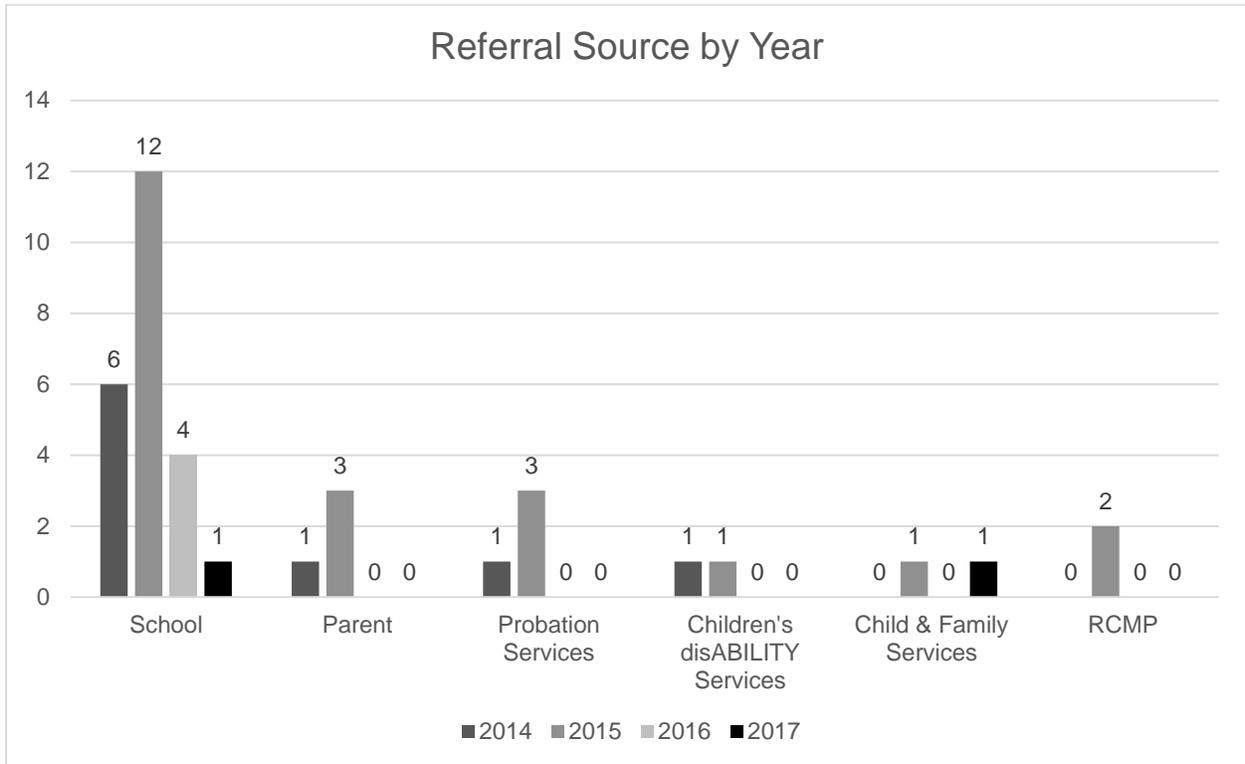
In 2014, most START participants had ongoing involvement in the program (77.8%), whereas just over one fifth of participants had left the program (22.2%). No participants in the dataset completed the program in 2014. The most common level of program involvement in 2015 was ongoing participation (63.6%). Those who had completed the START program represented more than one quarter of participants (27.3%), and those who had left the program constituted less than one tenth of participants (9.1%). In both 2016 and 2017 all clients had ongoing involvement in the START program. Eight START clients left the program prior to the end of the study. Five graduated successfully from the program, three moved away and one aged out of the program.

Figure 10: Degree of Participation



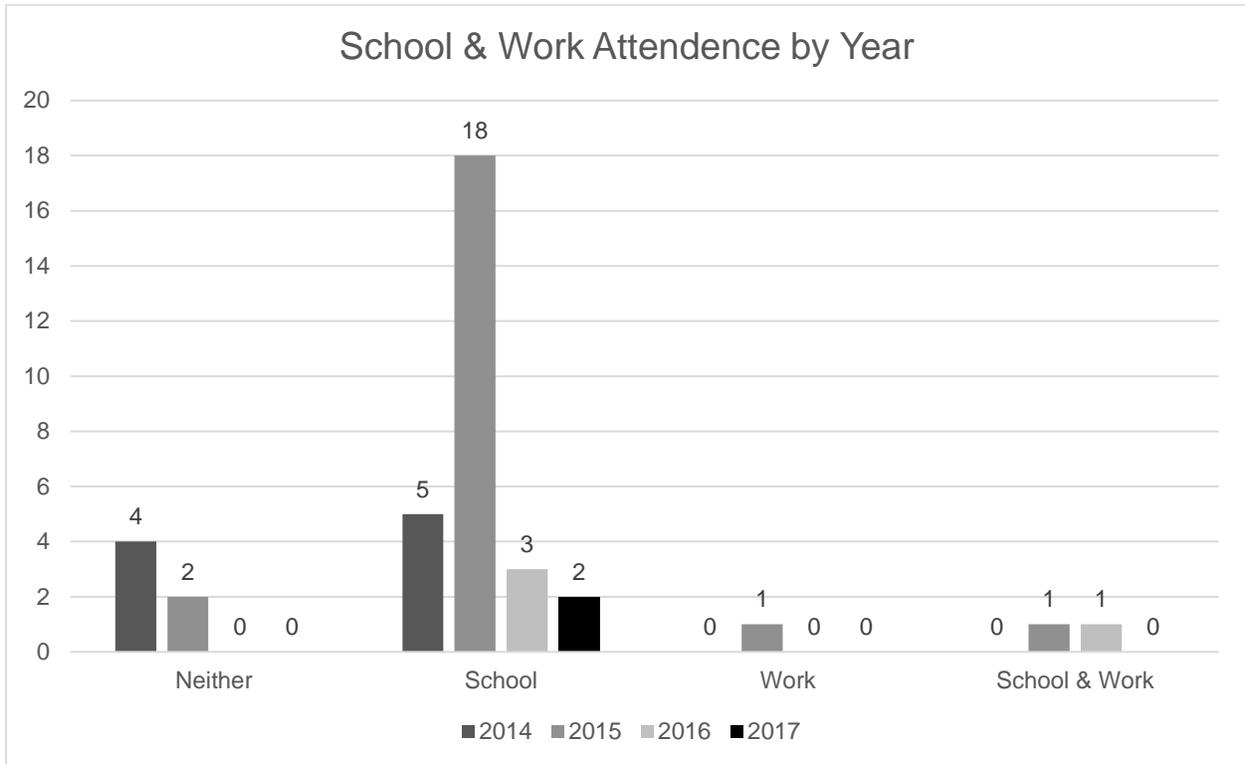
Overall, most participants had a high degree of participation, but this varied considerably from year to year. In 2014, four of the nine participants had a high degree of participation in the program (44.4%). Comparatively, in 2015 the number of clients with a high degree of participation dropped to 36.4%. In 2015, three of the four new clients (75.0%) had a high degree of participation, as did both new clients (100%) in 2017.

Figure 11: Referral Source



Overall, schools were the most common referral source over the years of the study with nearly 60% of referrals coming from schools. The primary source of referrals in 2014 came from schools (66.7%). Other sources of referrals included parents (11.1%), Probation Services (11.1%), and Children’s disABILITY Services (11.1%). In 2015, schools represented just over half of referrals (54.5%), followed by parents (13.6%), Probation Services (13.6%), the RCMP (9.1%), Children’s disABILITY Services (4.5%) and finally Child and Family Services (4.5%). All referrals to the program in 2016 came from schools. In 2017, half of the new clients were referred by the schools, while the other half was referred by Child and Family Services.

Figure 12: School and Work Attendance



Many clients were attending school during their participation in START. In 2014, just above half of program participants were attending school (55.6%), whereas participants who neither attended school nor work represented the remaining 44.4%. In 2015, there was more variation in school and work attendance. Those who attended school represented most participants (81.8%). Those who attended neither school or work constituted 9.1%. Those who attended only work or attended both school and work each represented only 4.5%. In 2016, three out of four participants attended school (75.0%), where the remaining participant attended school and worked. During 2017, all participants in the dataset were attending school.

Measuring Recidivism:

A critical outcome measure in evaluating offender based programs is recidivism (Weinrath, et al 2009). Overall, only five START clients demonstrated an increase in amount or severity of offending across the study period. In year one and two, two START clients increased in the severity of criminal offending. In year three of the program only one client saw an increase in the amount and severity of offending. Of the participants who recidivated during the program, a common pattern was that these youths were more likely to have lower level of program participation. Two recidivists had a low degree of participation while three had medium degrees of participation. Of the five participants whose offending increased four participants had some level of gang affiliation, three had peripheral involvement, while one participant was involved with gangs.

It is important to assess whether the seriousness of new charges is escalating, remaining stable or declining. A comparison of old offenses to new crimes can reveal patterns of an increase or decrease in the seriousness of recidivism behavior. To test recidivism among START clients we examined their CSI scores for each year under study. Typically, this type of statistics investigation would utilize the analysis of variance (ANOVA) as there are more than two values of our independent variable (year in program), however due to the large number of missing values an analysis using ANOVA was impossible. Instead t tests were used to compare each of the groups with one another, two groups at a time. While this type of analysis is useful there is a greater chance of error due to the number of tests that were conducted.¹⁰

Paired sample t-tests¹¹ were used to compare criminal offending for START clients prior to their referral into the program with criminal offending during and after involvement in the program. Criminal offenses were weighted using the Crime Severity Index. Participants with

¹⁰ In an ANOVA the error rate (chance of incorrectly concluding that the START program had a significant impact on recidivism when it did not, or alternatively the chance of incorrectly concluding that the START program did not have a significant impact on recidivism when it in fact did) remains stable across all the tests. With t tests, each individual test has a stable error rate, however the error rate compounds with each additional test beyond one.

¹¹ Paired Samples t tests compare two means that are from either the same individual or a matched control. The two means typically represent two different times (e.g., pre-test and post-test with an intervention between the two-time points).

missing responses were removed from the analysis which resulted in a small and limited sample group. In year one of the program there were thirteen participants who were missing from the program, during year two eleven participants were missing, and in year three ten participants were missing.

Each of the years under study were tested to assess such patterns. Pairs 1, 2, and 3 were statistically significant, while pairs 4, 5, and 6 were not. Pairs 1, 2, and 3 represent the weights of criminal offences prior to referral for the START program compared to the end of years one, two and three in the program, while pairs 4, 5 and 6 represent comparisons of criminal offending during the program.

START clients who remained in the program from one year to the next demonstrated clear improvement on the CSI. In the first year of the program, eleven participants showed improvement by either through a reduction in the amount or severity of offending or did not recidivate. Seven did not recidivate, while four showed improvement in either the amount or severity of criminal offending. In year two of the program, three clients demonstrated reductions in both number and severity of offences, while nine did not recidivate. In the final year of the study thirteen participants showed an improvement, five participants decreased in amount and severity of offending, while eight clients did not recidivate. Overall, seven program participants had a high degree of participation in the program, two had a medium degree of participation, and two others had a low degree of participations. For one of the participants with a low degree of involvement, the low level of participation was attributed to being new to the program. All participants who displayed a reduction in offending or no recidivism had more than three community supports.

To test if recidivism rates decreased significantly we examined CSI scores using paired sample t tests across the START clients for each year in the program. The tests revealed that CSI scores decreased significantly from referral to the end of year 1 [$t_{(12)} = 3.20, p < .05$]. Mean CSI scores for START clients lessened from 445.20 to 181.11 over the first year. There were also significant reductions in CSI scores from referral to the end of year 2 [$t_{(18)} = 3.21, p < .05$]. and year 3 [$t_{(25)} = 4.61, p < .05$]. There were no significant differences between year one and year

two, due mainly to new START participants entering the program. New clients tended to have significantly higher CSI scores at time one (referral scores) and thus inflated the year over year CSI scores. The most important CSI scores when estimating recidivism would be those compared to referral. In each case, CSI scores decreased significantly from referral.

Table 2: Mean CSI Scores for START Clients by Year of Program

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1 *	Referral CSI	445.2015	13	544.91890	151.13331
	CSI After Year 1	181.1154	13	374.55143	103.88188
Pair 2 *	Referral CSI	548.7363	19	737.61118	169.21961
	CSI After Year 2	151.8237	19	282.49807	64.80950
Pair 3 *	Referral CSI	531.6092	26	686.95449	134.72286
	CSI After Year 3	99.0445	26	400.67140	78.57813
Pair 4	CSI After Year 1	181.1154	13	374.55143	103.88188
	CSI After Year 2	121.4938	13	253.00704	70.17153
Pair 5	CSI After Year 2	181.1154	13	374.55143	103.88188
	CSI After Year 3	17.2900	13	42.51103	11.79044
Pair 6	CSI After Year 2	151.8237	19	282.49807	64.80950
	CSI After Year 3	132.5642	19	467.43916	107.23790

* Indicates statistically significant differences

When comparing weights prior to program referral to after program participation (pairs 1-3), participants who showed a decrease in criminal offending tended to have medium to high degrees of family support and/or multiple community supports such as school, Addictions Foundation Manitoba, Child and Family Services, mental health counselling, and Probation Services. Participants who were noted to be engaged with these supports also demonstrated a reduced likelihood of recidivism. Although less common, there were participants within the sample who had low degrees of family support but showed a decrease in offending when comparing charges prior to referral to completion of the START program. An even smaller portion of youth in the program had nearly no familial or community supports but did display a significant decrease in criminal offending following participation in the START. This suggests that the program can be successful in reducing recidivism rates even among the most at-risk

youth. This is also true for some START clients who had low levels of support and gang affiliations. Those with no affiliation to gangs tended to display a consistent decrease in offending throughout involvement in the program.

Youths whose criminal offending increased during the program were most likely to be involved or have peripheral involvement with gang activity, this was especially true when gang affiliated participants had less than three community supports. Degree of participation was a strong indicator for rates of recidivism. Clients with a low degree of participation in the program tend to see increases in recidivism. Those with low to medium degrees of participation were also more likely to increase offending in either severity or amount. Comparatively clients with a high degree of program participation tended to display lower likelihoods of recidivism. It was also common for participants who had some level of gang affiliation (peripherally-involved), had less than three community supports or were not engaging with available supports, and had low levels family support to have higher rates of recidivism during the program.

Control Group:

Recidivism rates as measured by CSI scores indicate that START clients are less likely to commit crimes, or at very least, commit less severe crimes after entering the program. To test the hypothesis that reduced recidivism was due to START involvement and not due to an extraneous factor, we compared START clients to matched controls to statistically control for potential confounders (see Table 3).

To test the equivalency of the control group with START clients, tests were run to examine differences by CSI score, age, ethnicity and sex. Differences between the groups were small and overall the cases and controls were very similar with all factors except for age, where the START clients were significantly younger on average than the control group (15.6 years of age compared to 17.5 years of age) [$t_{(98)} = -6.661, p < .05$]. Independent sample t tests¹² were also used to test differences in CSI Scores. The case severity index scores at the beginning of the

¹² Independent Samples t tests compares the means of two independent groups to determine whether there are significant differences between the averages of those groups.

testing were equivalent between the two groups with START clients presenting slightly higher by not statistically significant scores [$t_{(98)} = .414, p > .05$] (531.61 versus 464.56). A test of proportions using a Fishers Exact Test (FET)¹³ was used to examine differences in sex and ethnicity. 79.9% of START clients were male compared to 79.7% of controls, with no significant differences found ($p < .05$, FET). There were also no significant differences based on the ethnicity of clients ($p < .05$, FET). 57.7% of START clients were Indigenous compared to 55.4% of controls. We can conclude based on the results of these tests that our cases and controls were very similar to one another at the beginning of the testing period (see Table 3). This equivalency reduces the chance that significant differences found between START clients and controls were due to factors unrelated to the START program (confounding variables).

Table 3: Case-Control Comparison

Variable	START Clients	Controls	Significance
Age	15.6 years	17.5 years	$p < .05$
CSI Score	531.61	464.56	$p > .05$
Sex	79.9% male, 20.1% female	79.7% male, 20.3% female	$p > .05$
Ethnicity	57.7% Indigenous	55.4% Indigenous	$p > .05$

In total there were 26 cases and 74 matched controls. Upon review of data, there were three controls that were incarcerated in year three of the evaluation period compared to zero among START clients. Substantively this is an important distinction as the number and/or the severity of the offenses committed by the three controls resulted in their incarceration. Without

¹³ Fisher's exact test is a statistical significance test used in the analysis of proportions between small samples.

data for those three controls they had to be removed from the statistical analysis at time (year) three.

Table 4: Mean CSI Scores for Controls Across the Study

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1*	Year 1	464.5596	74	718.42101	83.51475
	Year 2	245.1601	74	420.95863	48.93545
Pair 2	Year 1	321.6302	57	305.82337	40.50729
	Year 3	299.5688	57	425.63681	56.37697
Pair 3	Year 2	205.1070	57	327.29065	43.35071
	Year 3	299.5688	57	425.63681	56.37697

* Indicates statistically significant differences

To test if recidivism rates decreased significantly among controls over the period under examination we studied CSI scores using paired sample t tests across the controls for each year in the program (see Table 4). Similar to START clients, the tests revealed that CSI scores did decrease significantly from Year 1 to Year 2 [$t_{(73)} = 2.87, p < .05$]. Mean CSI scores for the controls lessened from 464.56 to 245.16 over the first year. While this decrease was not as pronounced as what occurred in START clients, CSI scores did improve. However, from year two to year three there was an increase in CSI scores [$t_{(56)} = .337, p > .05$] meaning the severity of criminal offenses began to rise. While this increase was not significant, in comparison START clients showed year over year decreases, whereas controls did not sustain their positive outcomes. Additionally, from the beginning of the study period until year 3 there was no appreciable decrease in CSI scores among controls [$t_{(25)} = -1.574, p > .05$]. If the most important CSI scores when estimating recidivism are those measuring beginning and end periods, START clients demonstrated a significant decrease in recidivism however the same could not be said for their control counterparts.

Cases and controls were compared by their CSI scores across three data points (see Table 5). START clients were compared to the average CSI score of their matched controlled counterparts. While START clients were followed across a referral score and three years, there

was no referral score for controls. As such the first CSI score (year 1) was used to compare against the referral scores for START clients. An examination of CSI scores showed that START clients had higher overall CSI scores (698.66 compared to 456.13 for controls) but this difference was not significant [$t_{(13)} = 1.226, p > .05$]. In subsequent years START clients decreased their CSI scores at a higher rate than those of the control group however there was no significant difference in CSI scores across any of the years.

Table 5: Case-Control CSI Comparison

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	START Referral	698.6693	14	811.04758	216.76158
	Control Referral	456.1350	14	394.90534	105.54289
Pair 2	START Year 1	258.7321	14	400.54842	107.05107
	Control Year 1	261.1636	14	190.71706	50.97128
Pair 3	START Year 2	276.6693	14	563.62196	150.63430
	Control Year 2	350.3564	14	269.05174	71.90710

Additional analysis into the cases revealed two outlying data points among START clients. Case numbers CST-205 and CST-206 had very high CSI scores upon referral to START, and while both cases decreased their CSI scores over the study period, the end of period CSI scores for both cases were significantly higher than the remaining cases and their matched controls. If those two cases were removed from the analysis START clients would have had significantly lower CSI scores compared to controls. Further analysis into the amount of recidivism and number of new charges was warranted to understand if START was indeed having a positive effect on clients despite the two outliers found in the data set.

To examine the extent to which START clients were less likely to recidivate an odds ratio¹⁴ was calculated (see Table 6). We sought to answer the question “What are the odds of the controls being charged compared to someone in the START program?”

Table 6: New Charges (START Clients compared to Controls)

New Charges	START	Controls	Total
No	22	37	59
Percentage	57.9%	18.2%	
Yes	16	166	182
Percentage	42.1%	81.8%	
Total	38	203	241

Odds Ratio: 6.17, p<.05

The resultant odds ratio was 6.17. The odds ratio suggests that those in the control group were much more likely to reoffend than those in the case group (START clients), in fact the controls were more than six times more likely to reoffend. The way to interpret the odds ratio is to assume that involvement in the START program lowers the odds of recidivism by a factor of 6.17.

The START program, by definition, takes some of the most serious young offenders in Selkirk. As such, re-involvement rates were expected to be higher than desirable. Overall the

¹⁴ An odds ratio is a measure of association between an exposure (case) and an outcome. The odds ratio represents the odds that an outcome will occur given an exposure, compared to the odds of the outcome occurring in the absence of that exposure.

recidivism rates for START clients in any given year was 42.1%. Having said that, the recidivism rate of similarly affected youth in the control group was nearly double that number (81.8%). As the odds ratio indicated, the two groups were significantly different, with START clients having significantly lower rates of recidivism. 57.9% of START clients were not charged after beginning the program compared to just 18.2% of controls. Also of note, three controls were incarcerated for the last year of the study period, compared to a 0% incarceration rate for START clients.

Not only is it important to understand which group was more likely to recidivate, the number of new charges should also be tracked to see if there are significant differences across cases and controls. It is possible that one group was less likely to recidivate but of those that did reoffend, reoffended at much higher rates. An odds ratio was created that examined the number of new charges to both START clients and controls over the duration of the study period. The resulting odds ratio was 3.29 (see Table 7).

Table 7: Number of Charges (START Clients compared to Controls)

New Charges	START	Controls	Total
No	22	37	59
Percentage	13.5%	4.3%	
Number of New Charges	141	828	969
Percentage	86.5%	95.7% %	
Total	163	865	1028

Odds Ratio: 3.49, p<.05

The odds ratio suggests that START can reduce the number of new charges by a factor of 3.49. Overall, both the number of new charges and the recidivism rate were significantly reduced among START clients. 13.5% of START clients accounted for no new charges against in any given year compared to just 4.3% of controls. Over the three-year period START clients had 141 new charges laid against them compared to 828 for controls. Even when accounting for differences in sample size (2.85 times more controls in the study than cases), the number of new charges against START clients was almost three and a half times lower than controls.

Chapter 7: Conclusions

Limitations:

A limitation of this project was the small sample size of the START dataset. In small sample sizes, outliers can have a dramatic effect on the results. The small sample size was further decreased within the pre-and post-test due to the 10-13 missing participants over the duration of the study. Participants who were missing were those that had successfully graduated from the program, those that had moved away, or those that had aged out. A follow up analysis of those START clients did however indicate that those clients had no further recidivism. While this fact can add further evidence to the successfulness of the START program in reducing recidivism, small sample sizes do affect the generalizability of the findings.

Small sample sizes meant that in some cases, it was difficult to measure the outcomes precisely. For example, three control participants were incarcerated during the study which further reduced sample sizes and made comparisons to cases impossible. On a positive note, the entire population of START clients was accessible for study. When a population of data is available the problems inherent when utilizing a sample that is small are minimized. Small sample sizes however are still subject to high levels of variability. If just a single client has outlying responses, the outlier can have a significant effect on the overall findings, so some caution should be exercised when interpreting the findings. As was indicated, two outlying responses among START clients suppressed any significant differences in the reduction of CSI scores between cases and controls.

Evaluation participants were selected using purposive sampling were not randomly selected. This caveat makes it more difficult to generalize to the larger population of youth offenders because those participants may not be representative. However, purposeful sampling does provide a good representation of participants who are typically in the in the START program. Precisely because START participants live with varying degrees of behavioral and psychosocial challenges, the intent of this evaluation was not to generalize these results. Although the sample was small in relation to conducting analysis, at the same time the dataset did include the total population of participants in the program.

Strengths:

A key strength of this research was the richness of the descriptive data provided by START. The variables provided by the program included in-depth of information pertaining to the START participants. This data rich information allowed for various indicators of success throughout the program to be accessed and gave a solid foundation for the understanding of the situations the youth in the program were living with. In conjunction to the richness of the descriptive information, we also received the information regarding the total weights of criminal offences committed by each offender for every year they were in the program from PROS. This information allowed us to test recidivism using pre-and posttest data. A pre-and posttest allowed us to examine whether START had a positive effect on the youth throughout multiple years of participation in the program compared to a set of controls.

Case controls are the highest standard in evaluating differences among groups that differ in terms of some condition. Case control studies also exhibit high levels of both external and internal validity. In case control studies it is possible to ascertain if the effect you are looking for is due to programming by comparing to the control group, those who have not had the programming and analyzing the differences between the two groups. The primary goal of this evaluation was to determine if the START program is effective in reducing recidivism rates amongst program participants. The cases (clients of START) were matched to controls using PROS. Analysis of the controls showed no significant differences across CSI scores, ethnicity, sex or geographic area. Controls were significantly older than cases but otherwise they were matched well which lends further evidence that the START program itself is the major factor in the reduction of recidivism rates among its clientele.

Conclusion:

START shares many qualities of the most successful multi-agency care management programs documented in the literature and that they have achieved success without the benefit of formal systems level collaboration policy. We feel that similarities to other successful and well-evaluated programs lend merit to the START program beyond that which we document in this evaluation. The findings corroborate the findings of the evaluation conducted in 2013 (Franklin and Isaak, 2013) which found evidence from clients, families of clients, and partnered organizations that START has facilitated positive outcomes for their clients. In that same study, it was recommended that “*START access and compile information on a control group so that meaningful comparisons can be made between clients with and without START involvement.*” It was further recommended that “*Statistics comparing outcomes for similar youth with and without START involvement will provide more definitive evidence for START’s impact that what is described in this evaluation.*” Case-control comparison evaluations are the hallmark of the most successful programs.

The findings of the study present a very favorable assessment of the START program’s ability to reduce recidivism rates among its clients. While CSI Scores were not significantly different between cases and controls, START clients demonstrated significant decreases in recidivism rates and number of new charges. By way of comparison no START clients were incarcerated for the duration of the study, compared to three control participants. This evaluation demonstrated that START does reduce recidivism rates among its clients compared to a set of matched controls and as such should be included in that short list of successful programs.

While not the purpose of this research, it should be noted the significant cost savings to various social services in reducing rates of recidivism. Social return on investment (SROI) is a method for measuring extra-financial value (i.e., environmental and social value not currently reflected in conventional financial accounts) relative to any resources invested. The accounting of the Social Return on Investment was not part of the current study, however other research has demonstrated the significant savings in other areas that can be accumulated with reductions in recidivism rates (Health in Common, 2017; Hincks, Miller, and Pauls, 2013). Not only has

START demonstrably reduced the costs associated with recidivism but there were no START clients who were incarcerated for the duration of the study, compared to three controls. At an average cost of \$116,000 per offender per year of incarceration,¹⁵ the SROI provided by START could be quite considerable.

¹⁵ See <http://www.csc-scc.gc.ca/publications/005007-3024-eng.shtml>

Sources:

Barrett, D.E., Katsiyannis, A., Zhang, D., and Zhang, D. (2014). A structural equation modelling analysis of influences on juvenile delinquency. *Behavioral Disorders*, 39(3), 113-127.

Breslow, N. (2005). *Handbook of epidemiology*. Berlin: Springer.

Correctional Service Canada. (2017-08-01). CSC Statistics – Key Facts and Figures. Retrieved from <http://www.csc-scc.gc.ca/publications/005007-3024-eng.shtml>

Ernster, V. (1994). Nested case-control studies. *Preventive Medicine*, 23(5), 587-590. DOI 10.1006/pmed.1994.1093

Fletcher, A. (2010). Case-Control design: Making the case. *American Journal of Ophthalmology*, 149(4), 540-542. DOI 10.1016/j.ajo.2009.08.019

Franklin, J., & Isaak, C. (2013). START evaluation.

Grimes, D., & Schulz, K. (2002). Case-control studies: research in reverse. *The Lancet*, 360(9328), 259-260.

Health in Common. (2017). Thunderwing: Social Return on Investment. Final Report.

Hincks, C., Miller, A., & Pauls, M. (2013) The Grand Prairie PACT program evaluation: Discrepancy between model evaluation practice and constrained real world evaluation of crime prevention in small communities. *International Journal of Child, Youth and Family Studies*. 4 (1), 136-146.

Levin, K. (2003). Study design v. case-control studies. *Evidence-Based Dentistry*, 7, 83-84. DOI 10.1038/sj.ebd.6400436

Lurigio, A., Bensinger, G., Thompson, S., Elling, K., Poucis, D., Selvaggio, J., & Spooner, M. (2000). Project BUILD. Retrieved from <https://www.crimesolutions.gov/ProgramDetails.aspx?ID=335>

National Crime Prevention Centre. (2013). *Results from the stop now and plan (SNAP) program*. Retrieved from <https://www.publicsafety.gc.ca/cnt/rsrscs/pblctns/rslts-stp-nwpln/index-en.aspx>

Needham, M., Gummerum, M., Mandeville-Norden, R., Rakestrow-Dickens, J., Mewse, A., Barnes, A., and Hanoch, Y. (2015). Association between three different cognitive behavioral

alcohol treatment programs and recidivism rates among male offenders: Findings from the United Kingdom. *Alcohol Clin Exp Res*, 39(6), 1100-1107.

Reingle, J., Jennings, W., & Komro, K. (2013). A case-control study of risk and protective factors for incarceration among urban youth. *J Adolesc Health*, 53(4), 471-477. DOI 10.1016/j.jadohealth.2013.05.008.

Rubin, D. (2001). Using propensity scores to help design observational studies: Application to the tobacco litigation. *Health Services and Outcomes Research Methodology*, 2(3-4), 169-188. DOI 10.1023/A:1020363010465

Ryan, T. and Mitchell, P. (2011). A collaborative approach to meeting the needs of adolescent offenders with complex needs in custodial settings: An 18-month cohort study. *Journal of Forensic Psychiatry and Psychology*, 22(3), 437-454.

Statistics Canada. (2015). Measuring Crime in Canada: Introducing the Crime Severity Index and Improvements to the Uniform Crime Reporting Survey. <https://www.statcan.gc.ca/pub/85-004-x/2009001/part-partie1-eng.htm>

Strom, K., Cowell, A., Dawes, D., Hawkins, S., Moore, M., Wedehase, B., & Steffey, D. (2010). Methodist home for children's value based therapeutic environment. Retrieved from <http://www.crimesolutions.gov/ProgramDetails.aspx?ID=286>

Vandenbroucke, J. (2004). When are observational studies as credible as randomized trials? *The Lancet*, 363(9422), 1728-1731. DOI 10.1016/S0140-6736(04)16261-2

Weinrath, M., Donatelli, G., Murchison, M., & Cattini, M. (2009). *Spotlight program evaluation*. Received from Weinrath, M. (personal communication, November 8, 2014).

Winokur Early, W., Hand, G., Blankenship, J., & Chapman, S. (2010). AMIkids community-based day treatment services. Retrieved from <https://www.crimesolutions.gov/ProgramDetails.aspx?ID=253>