

School-Based Probation in Allegheny County:

Examining the Costs and Benefits

PREPARED BY

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The Allegheny County Department of Human Services (DHS) is dedicated to meeting the human services needs of county residents, particularly the county's most vulnerable populations, through an extensive range of prevention, intervention, crisis management and after-care services.

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ACRONYMS AND DEFINITIONS

Acronyms

CBA	Cost-Benefit Analysis
CYF	[Allegheny County Department of Human Services Office of] Children, Youth and Families
CYF Placement	An out-of-home placement through CYF
DHS	[Allegheny County] Department of Human Services
GPA	Grade Point Average
JPO	[Allegheny County] Juvenile Probation Office
JPO Placement	An out-of-home placement through JPO
PPS	Pittsburgh Public School District
Vera	Vera Institute of Justice

Definitions

- **Pre-Supervision** — outcomes calculated for one year prior to the first date of supervision
- **During Supervision** — outcomes calculated for the academic year (or years) during which the student was supervised in school-based probation
- **Post-Supervision** — outcomes calculated for one year after the end of supervision
- **Recidivism** — re-entry to JPO placement after supervision has ended

EXECUTIVE SUMMARY

Criminal activity is costly — to society, to the government, to victims, and to offenders and their families. Programs that can prevent or reduce the likelihood that a crime will occur can generate substantial savings to society, savings that can be reinvested in programs that work to further reduce crime. In particular, programs that can prevent juveniles from committing crimes, and improve their life skills and their educational and employment outcomes, can generate significant benefits to the communities in which they live. As a result, intensive supervision programs like school-based probation, in which a probation officer is based in a school building to monitor students under supervision on a daily basis, are becoming more popular. Nonetheless, there has been little rigorous evaluation of these programs.

Allegheny County, with technical assistance from the Vera Institute of Justice, conducted an evaluation of its school-based probation program. This program started in 1994 with three probation officers and, by 2012, had grown to include 21 of the 43 school districts in Allegheny County. In the Pittsburgh Public School District (PPS), there are school-based probation officers in 13 different schools, including at least one in every high school. This evaluation examines a variety of outcomes for students under school-based probation before, during and after supervision, including participation in social services, educational outcomes, and future involvement in the juvenile and criminal justice systems.

The majority of students supervised in school-based probation (and under supervision in general) are African American males age 15 through 17. Sixty-five percent of the students supervised have been charged with a felony. Seventy-seven percent of students supervised in school-based probation from September 2010 through December 2012 had prior involvement in social

¹ Includes one or more of the following services: child welfare, mental health, drug and alcohol, family support centers, medical assistance transportation program, homeless and housing supports, assisted housing or public welfare.

services.¹ Involvement in behavioral health services increased both during and after supervision for these students.

Forty-six percent of the students had been in a juvenile justice placement (JPO Place) and a fifth had experienced a child welfare out-of-home placement (CYF Place). A quarter of the students experienced a juvenile justice placement within a year prior to supervision, falling to less than a fifth post-supervision. There were few students who experienced a child welfare placement within a year of supervision. However, more than 60 percent of the students with a prior child welfare placement also experienced a juvenile justice placement.

For PPS students in school-based probation, more than 70 percent improved attendance during supervision (attending an average of 22 more school days during any given year) and over 40 percent of students improved their Grade Point Average (GPA). These students have lower GPAs on average than their peers both pre- and post-supervision. It should be noted that this population is highly mobile, with more than half of the students changing districts pre- to post-supervision.

Recidivism is defined as a student removed to a juvenile justice placement within a year of the end of supervision. More than a quarter of students in school-based probation recidivated within a year, with African Americans and boys recidivating at higher rates than the control group. Twenty-five percent of these students recidivate in a month and 50 percent within three months. These students are more likely to be involved with behavioral health and child welfare services during their supervision, particularly with mental health services. Students who recidivated were more than twice as likely as the control group to have prior drug and alcohol involvement. In addition, students who recidivate were, on average, more likely to be absent pre-involvement and post-involvement and to have lower GPAs. Interestingly, for students charged with misdemeanors, those who recidivate have more than double the absence rate during supervision than those who do not re-offend.

Next steps suggested for this study include examining the educational outcomes of students supervised in school-based probation compared to students supervised in traditional community supervision. In addition, additional research and analysis should be conducted to monetize the benefits of this program, which may include savings from decreased placements, savings in court costs, and savings to victims from the prevention of future crime. In addition, educational outcomes appear to improve with this program, at least during supervision, resulting in increased likelihood of retention in school and improved attendance.

INTRODUCTION

The cost of criminal activity, to individuals, communities and the country as a whole, is substantial. In the United States, more than 23 million criminal offenses were committed in 2007, resulting in approximately \$15 billion in economic losses to the victims and \$179 billion in government expenditures on police protection, judicial and legal activities, and correctional system costs

from incarceration through probation (U.S. Department of Justice, 2004, 2007, 2008). Programs that directly or indirectly prevent crime can therefore generate substantial economic benefits by reducing crime-related costs incurred by victims, communities and the criminal justice system.

Programs that work to prevent and deter crime can be assigned value based upon the costs they save to society. These costs include savings as a result of fewer jail-bed days, fewer days of probation, shorter stays in care and/or fewer arrests. In addition, examining program benefits in this way provides useful information when making decisions about the allocation of scarce resources (i.e., programs that result in greater cost savings to society may be of greater value than those with a lesser impact). However, it should be noted that, although cost savings are an important component of program viability in today's society, it is only one of a number of criteria to be considered when evaluating a program's value.

Allegheny County is committed to allocating criminal justice resources in a more systematic way, utilizing evaluation and evidence-based programming, to increasing understanding of the costs and benefits of programs, and to continuing the successful collaboration between the Courts, jail, other county government offices and law enforcement that has developed through years of work on the Criminal Justice Advisory Board. To further this goal, Allegheny County applied for, and received, a technical assistance grant from the Vera Institute of Justice to implement a system of cost-benefit analysis throughout the justice system.

Through a yearlong period of technical assistance, the Vera Institute of Justice helped Allegheny County demonstrate the utility of understanding the costs and benefits of justice programs with two demonstration projects and through the creation of a system-wide cost database that includes agreed-upon unit costs within the county's criminal justice system. These costs include the cost of a jail-bed day, a day of adult probation, an arrest and a day of juvenile detention. Researchers, evaluators and program administrators can use this information to compare the benefits and costs of programs when making management, budget and program decisions.

One of the demonstration projects focused on school-based probation, a juvenile justice program that uses evidence-based concepts to create an intensive supervision model to address both the immediate causes of recidivism and decrease the likelihood of future recidivism by improving educational outcomes for students. To date, few studies have been conducted on school-based probation programs, so this analysis is an attempt to better understand the outcomes of the program and how they relate to costs.

METHODOLOGY AND DATA

Data Sources

Allegheny County Budget Office

Budget data were provided for calendar years 2011 and 2012 for adult probation and for juvenile probation and detention. This information included total operating costs, costs for personnel, fringe benefits, supplies, materials, repair and maintenance, fixed assets, and services. In addition, the budget office provided detailed, de-identified salary information and titles for child care workers at Shuman Detention Center and for adult and juvenile probation officers. The budget office provided information on the costs of the school-based probation program and the number of probation officers paid out of this budget.

Allegheny County Department of Human Services (DHS)

DHS operates a child welfare case management data system that can merge case and client information with service utilization and costs. In addition, juvenile detention and placements are tracked through this system. This analysis examined all placement episodes for students involved in school-based probation pre-, during and post-supervision.

Allegheny County Juvenile Probation (JPO)

This report relies on the 2011 and 2012 annual reports of JPO. It calculates the average daily population at Shuman Detention Center and details the number of probation officers by program type (e.g., School-Based Probation, Community-Based Probation, etc.). In addition, JPO provided information on all students who were involved in school-based probation from September 2010 through January 2013, including demographics, charges, school and district, name of assigned probation officer, and dates of supervision.

Methodology

Population Sample

This report examines every juvenile assigned to a school-based probation officer during the 2010–2011 and 2011–2012 school years (N = 1,502).² Students who were on probation during this time and attending a school with a school-based probation officer were assigned to that probation officer. See Appendix for the list of schools in Allegheny County with a school-based probation officer.

Of students for whom educational outcome information was available, 50 percent (583) attended a PPS school at some point, and 23 percent (298) attended a PPS school pre-, during and post-supervision. Educational outcomes were examined only for students who had available data throughout the entire study period.

For the 1,502 juveniles under supervision during this time frame, we examined human services history a year prior to supervision, during supervision and a year following supervision. Human

² Students were included who were adjudicated delinquent and on probation or if they were on consent decree and non-placement. In both instances, they were directly supervised by the school-based probation officer. In examining educational and recidivism outcomes, only students whose supervision ended before September 1, 2012, were included (N = 1,298).

services include child welfare involvement, behavioral health involvement, support service involvement (including public benefits, assisted housing, homeless and housing supports, and family support center participation), and involvement with intellectual disability services.

Recidivism Cohort Analysis

Juveniles are considered to have “recidivated” if they had a home removal to a JPO placement after the end of their supervision. In order to better understand the factors that might contribute to recidivism, we used propensity score matching to construct a control group of students under supervision who did not re-offend during the period with those who did. The students were matched on age, race, gender, highest charge (on a scale of 1 through 8) and school district. This created a comparison group with matched risk factors to compare to those who re-offended, allowing for an analysis of what factors contributed to re-offending.

ABOUT ALLEGHENY COUNTY AND THE CITY OF PITTSBURGH

It is now rare for Allegheny County to mount a new criminal justice program without determining if the approach is evidence-based and without incorporating some level of evaluation. For example, Allegheny County redesigned its Pretrial Services Office using national standards, it commissioned a study of its Mental Health Court that included a cost-benefit analysis (CBA), and it designed its new Reentry Program using best practices identified by the Council of State Governments and the U.S. Department of Justice. That Reentry Program benefited greatly from the CBA constructed by the Washington State Institute for Public Policy. Allegheny County used this analysis to select the programs for a \$1.5 million pool of services — services that now include cognitive-behavioral therapy, drug treatment plus aftercare, education and employment skills development.

In spite of this respect for CBA and for using evidence in decision-making, there were challenges to integrating CBA into Allegheny County’s criminal justice operations. The county’s two technical assistance grants from the Bureau of Justice Administration laid the groundwork for this — both by bringing together the necessary cross-system team (President Judge of the Court of Common Pleas, County Executive and County Manager, and the directors of each court and county agency in criminal justice and human services), as well as conducting the baseline analysis needed to understand the drivers of costs within the criminal justice system. This team is now implementing a set of strategies that aim to lower those costs and redirect the savings to high-quality, evidence-based programs.

Receiving the technical assistance grant from the Vera Institute of Justice allowed Allegheny County to work through its existing partnerships and data resources to create a system-wide cost database to be used throughout the justice system when evaluating existing programs and planning new ones. In addition, this resource can be utilized by outside researchers and experts to create more accurate estimates of the costs and benefits of various initiatives. This technical assistance helped to create a common language around costs and benefits within DHS, the justice system and the budget office that will be used to evaluate future funding and programmatic decisions.

DESCRIPTION OF THE PROJECT

Allegheny County is committed to being more systematic in allocating resources in criminal justice programs through utilization of evaluation and evidence-based programming, better understanding of the costs and benefits of programs, and collaboration between the courts and county government that has been built through years of work on the Criminal Justice Advisory Board. To further these efforts, Allegheny County applied for and received a technical assistance grant from the Vera Institute of Justice to develop the capacity to conduct CBA throughout the justice system.

The Vera Institute of Justice assisted Allegheny County in utilizing CBA and the system-wide costs in the evaluation of two demonstration projects, Adult Probation Day Reporting Centers and the School-Based Probation program. School-based probation is an intensive supervision model where probation officers have offices within local school buildings. They supervise juveniles while they are at school, meeting with the students, connecting them to social services, and working with school officials to ensure that the students are getting the services and supervision they need to prevent future recidivism.

The school-based probation program began in 1994 with three probation officers in public schools in Allegheny County. By 2012, the program had grown to include a coordinator and 33 probation officers in six supervisory units. There are probation officers in 13 PPS schools and in 20 other school districts in Allegheny County (Allegheny County is home to 43 school districts in total).

Discussions with key juvenile probation staff members and with budget officers helped to identify three main hypothesized outcomes of this program:

- 1) Improved educational outcomes
- 2) Decreased out-of-home placements
- 3) Reduced recidivism

This evaluation analyzes each of these outcomes for students participating in school-based probation within PPS, which encompasses about half of the students supervised by Juvenile Probation.

LITERATURE REVIEW

Studies have shown that juveniles most likely to commit crimes in their adulthood begin committing delinquent acts early in life (Chaiken and Johnson, 1988). By deterring juveniles from future crime, and by providing them with options to improve their lives, future crime can be averted, saving taxpayers money, reducing the number of victims and improving the likelihood that the juveniles will be contributing members of society. Many evidence-based juvenile supervision strategies have emerged that attempt to reduce the likelihood of recidivism and future crime. These include intensive supervision programs like school-based probation,

where a probation officer is stationed in a school building, thereby increasing contact between the probation officer and youth and, hopefully, leading to more immediate and effective responses to problems that occur (Juvenile Sanction Center, 2003). However, to date, rigorous evaluation of school-based probation programs has not been conducted.

School-based probation programs are designed to be more intensive, in which probation officers see juveniles under supervision on a daily basis and are able to check attendance and discipline records, and discuss academic progress with teachers (Safe and Responsive Schools Project, 2002). In addition, placing probation officers within schools may enhance school security, decrease disruptive behavior, improve relationships and collaboration between schools and juvenile justice organizations, and intervene early when problems arise (Stephens and Arnette, 2000).

School-based probation is still a relatively new concept, and no comprehensive evaluation has been completed, although preliminary evidence suggests that it has a favorable impact on school attendance, day-to-day school conduct and recidivism (Clouser, 1995; Metzger, 1997; Griffin, 1999). There is also some evidence that school-based probation promotes improved academic performance (Clouser, 1995) and is cost-effective (Metzger, 1997). In a comparison of 75 randomly selected school-based probation clients with 75 regular probation clients matched on age, race, gender, crime and county of supervision, Metzger (1997) found that school-based probation clients spent significantly more time in the community without being charged with new offenses or placed in custody and were less likely to be charged with serious crimes. Metzger also found several other important benefits — including closer overall supervision, better school attendance, fewer instances of serious recidivism, fewer placements and far fewer placement days — resulting in an estimated cost savings of \$6,665 for every case assigned to school-based probation.

This evaluation is designed to be a first step in understanding how school-based probation functions in Allegheny County, what appears to be effective, and where additional examination may be needed. In order to conclude that this program yields demonstrable positive results, a matched comparison study of students in school-based probation and those in traditional community-based probation should be completed to compare recidivism rates and educational outcomes.

POPULATION

There were 1,502 students under school-based supervision³ in Allegheny County during the 2010–2011 and 2011–2012 school years.

Demographics

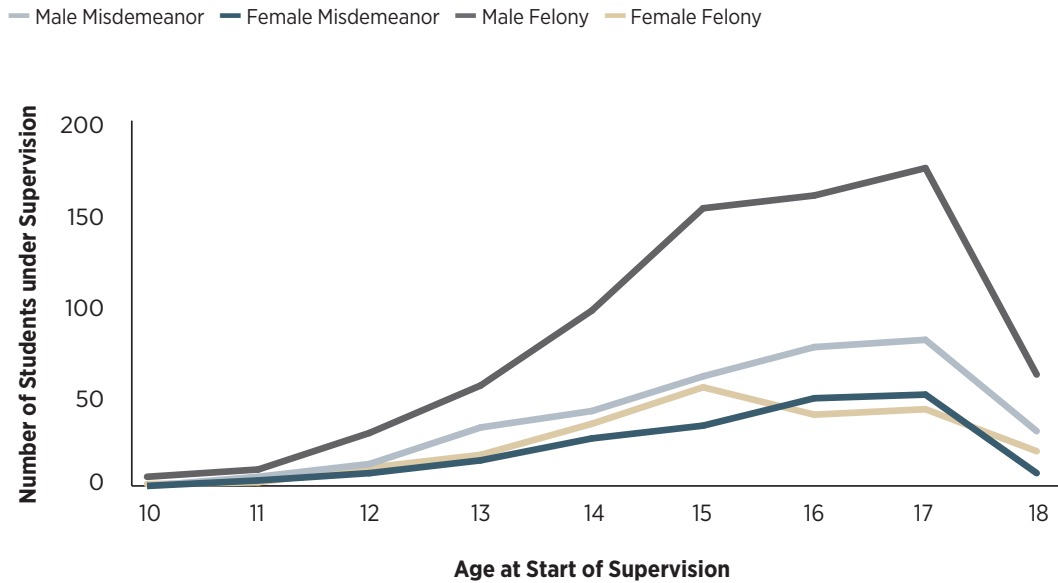
Students under supervision are most likely to be male, between 15 and 17 years old, and African American. Seventy-three percent (1,081) of the students were male, 57 percent (862) were African American, and 63 percent were between 15 and 17 years old.

³ Includes all students under school-based supervision who were adjudicated Delinquent/ Probation or Consent Decree/ Non-Placement.

Highest Charge

Sixty-five percent (975) of the students in school-based probation were charged with a felony. Seventy percent (601) of African American students were charged with a felony compared to 48 percent of white students. Of the African American male students under supervision, 74 percent (441) were charged with a felony compared to 54 percent (153) of white male students under supervision.

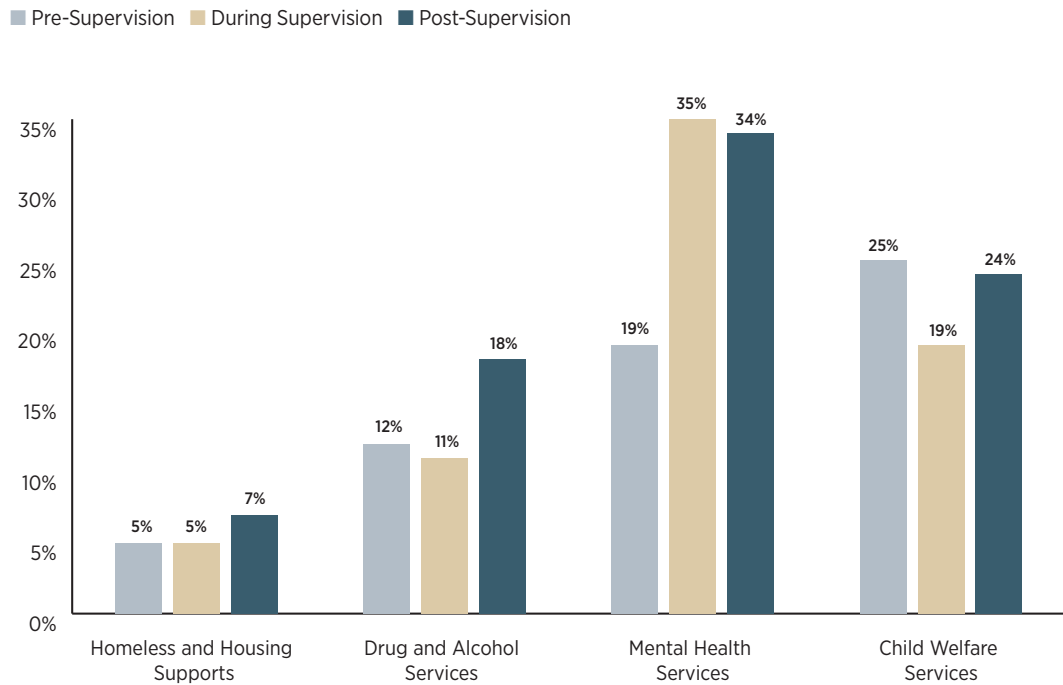
FIGURE 1: Students under Supervision by Highest Charge, by Gender and Age at Start of First Supervision



History of Service Involvement

To understand service involvement prior to and post-supervision, only students who had ended their supervision by the time of this study are included (N = 1,298). Seventy-seven percent (998) of these students had a history of involvement with human services. Sixty-seven percent (871) of students under supervision were involved with human services within a year of the start of their supervision. During supervision, 53 percent (690) of the students were involved in human services, and 57 percent (740) were involved post-supervision. See Appendix, page 18, for a breakdown of specific program involvement.

FIGURE 2: Involvement in Select Social Services for Students Pre-, During and Post-Supervision

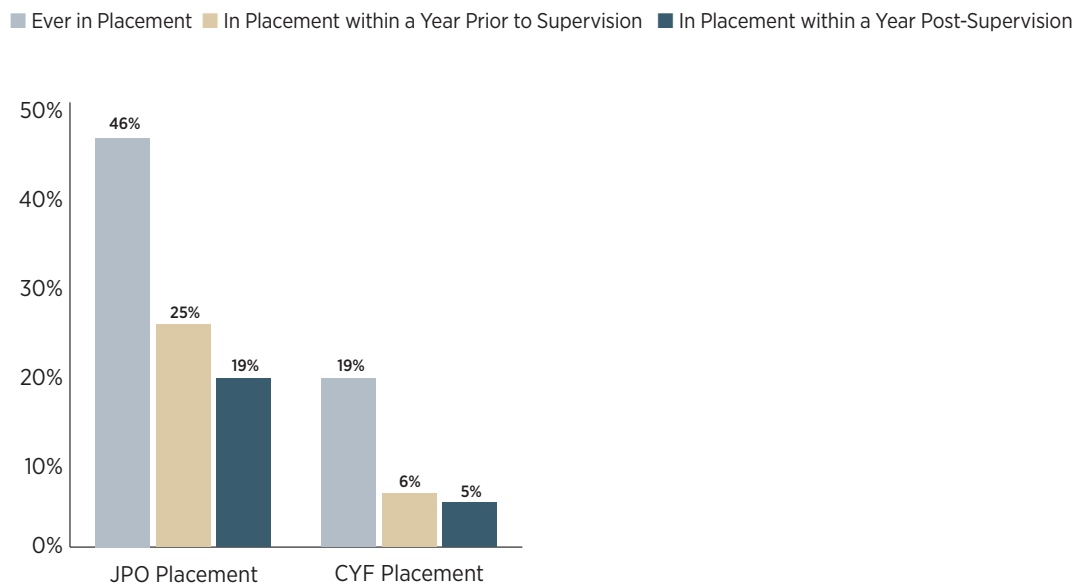


Placement

Forty-six percent (598) of students had a prior JPO placement, and 25 percent (328) were in a JPO placement within a year prior to the start of their school-based supervision. Nineteen percent (247) of the students had a prior CYF placement (247). Five percent (52) of students experienced CYF placement within a year post-supervision, and 19 percent (183) were in an out-of-home JPO placement within a year after the end of supervision.⁴ Of the students with a prior CYF out-of-home placement, 61 percent (155) also had prior JPO out-of-home placement.

⁴ Only students who had at least a year of exposure time post-supervision were included (N = 968).

FIGURE 3: Percent of Students in Juvenile Justice and Child Welfare Placements, Pre-Supervision and Post-Supervision



OUTCOMES

Education

Twenty-three percent (298) of all students under supervision in schools attended a PPS school before, during and after their supervision.⁵ Educational outcomes, including changes in attendance rates, changes in GPA and changes in number of suspension days, were examined. Only students with data pre-, during and post-supervision were included in the analysis. Limitations in data availability may have skewed this analysis, as students with greater school stability may be included.

Because school-based probation officers see the students they are supervising every day (and because attendance in school is often a condition of their probation), we would assume that attendance rates for students under supervision would improve. For those students under supervision, 71 percent (211) improved their attendance during supervision by an average of 12 percentage points, which equates to 22 additional days in school.

⁵ 1,298 students who completed supervision by December 31, 2012, were included in the analysis.

TABLE 1: Changes in Attendance, Pre- and Post-Supervision

IMPROVED ATTENDANCE DURING SUPERVISION (N = 298)	
Students who Improved	211
% Improved	71%
Average Improvement	12%
Median Improvement	11%

When examining the GPAs of students pre-involvement and post-involvement, students under school-based probation showed slight improvement, on average. This may be a result of the improvement observed in attendance for these students. During this same period, the average GPA for all students (at the same schools) did not improve.

TABLE 2: Average Change in Grade Point Average and Number of Improving Students, Students under School-Based Probation and All Students

GPA	SCHOOL-BASED PROBATION CLIENTS		ALL STUDENTS (IN SCHOOLS WITH SCHOOL-BASED PROBATION CLIENTS)	
	Mean	Median	Mean (2010-2011 and 2011-2012 School Year)	Median (2010-2011 and 2011-2012 School Year)
Pre-Involvement (all students)	1.60	1.61	2.57	2.40
Post-Involvement (all students)	1.60	1.41	2.50	2.44
Pre-Involvement (for students who improved)	1.52	1.59	2.44	2.50
Post-Involvement (for students who improved)	2.02	1.96	2.67	2.63
	Students who Improved	Percent of All Students	Students who Improved	Percent of All Students
Improved Pre to Post*	42	42%	2,795	45%

*For SBP Clients, pre- and post-involvement, for all students – 2010-2011 to 2011-2012 school year.

Recidivism

Recidivism is defined as having an out-of-home removal to a JPO placement within a year of the end of supervision. Only students who could be observed for at least a year post-supervision were included in this analysis (N = 874). Twenty-eight percent (247) of students recidivated within a year of the end of supervision. Thirty-five percent (179) of African American students re-offended as compared to 16 percent (31) of white students, while females recidivated at lower rates than males (21 percent compared to 31 percent).

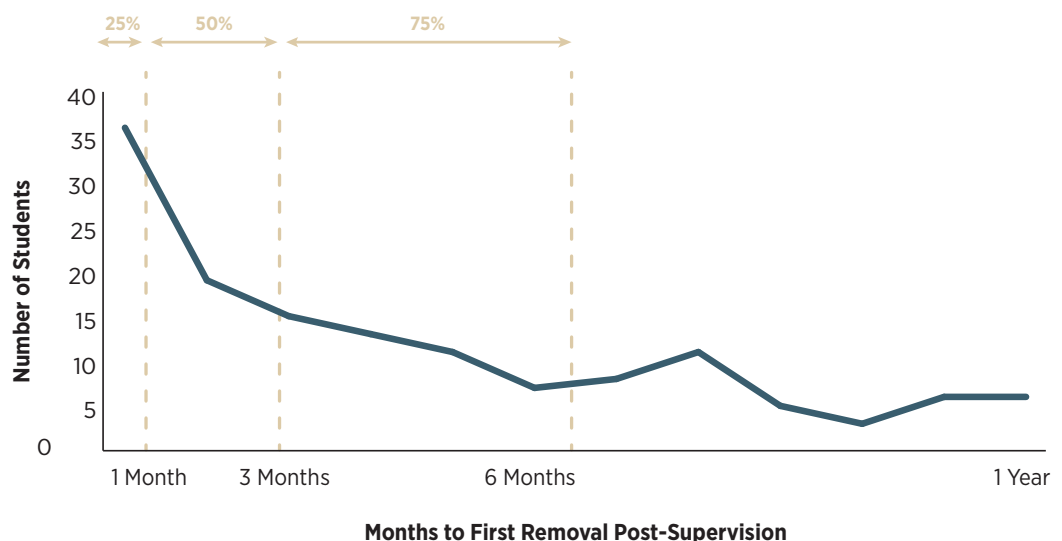
Analyzing only those school districts in which more than 10 students recidivated, we find that, at the end of their supervision, 36 percent of students at Woodland Hills School District, 29 percent of students at McKeesport and PPS, and 23 percent of students at Penn Hills recidivated. The neighborhoods/municipalities with the largest number of students recidivating were McKeesport, Mount Oliver, Penn Hills and Swissvale.

TABLE 3: Areas with Largest Number of Students who Recidivate, School Districts and Neighborhoods, Total Students and Percent of Students under Supervision

TOP FOUR SCHOOL DISTRICTS (BY % OF STUDENTS UNDER SUPERVISION)		TOP FOUR NEIGHBORHOODS (BY NUMBER OF STUDENTS WHO RECIDIVATED)	
Woodland Hills	25 (36%)	McKeesport	11 (26%)
McKeesport	10 (29%)	Mount Oliver	9 (43%)
Pittsburgh	128 (29%)	Penn Hills	9 (20%)
Penn Hills	14 (23%)	Swissvale	7 (41%)

Twenty-five percent of the students under supervision recidivated in a little over one month (32 days), 50 percent within three months and 75 percent within six through seven months (192 days).

FIGURE 4: Survival Curve to Recidivating

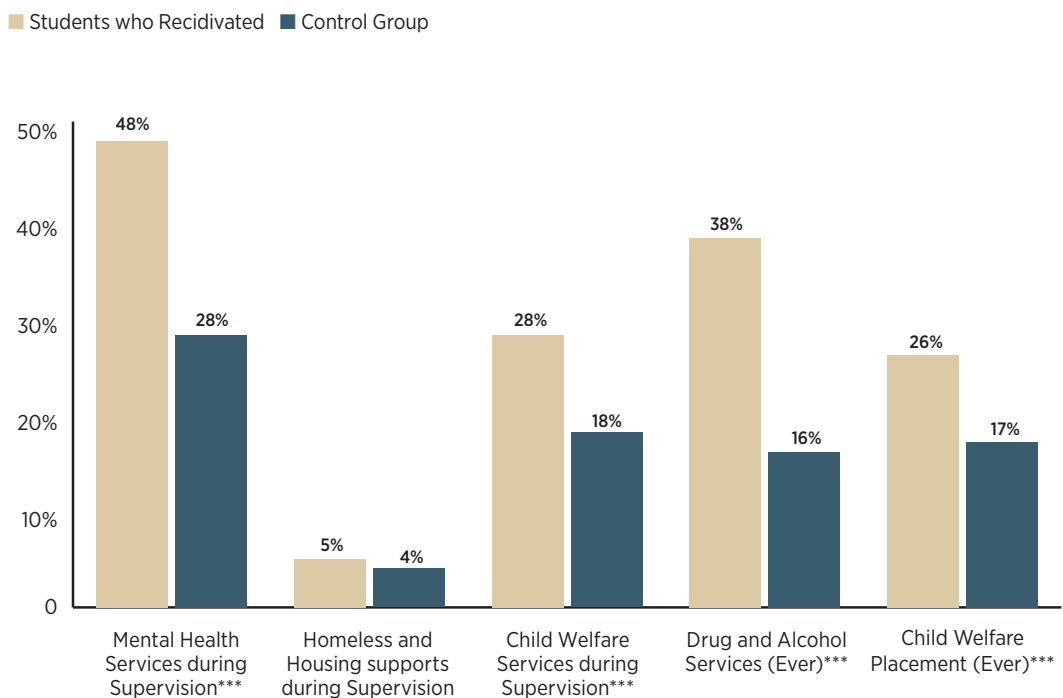


Predictors of Recidivating

We performed an analysis of students who recidivated compared to a matched control group (see Technical Appendix, page 19, for a description of propensity score matching). The cohorts were matched on age, race, gender, highest charge and school district. Both groups were composed of 247 students.

There are marked differences in the human services involvement of these groups during supervision. The largest differences in service utilization occurred in mental health services and drug and alcohol services, followed by child welfare services and homeless and housing supports. For students who re-offended, 48 percent (117) were involved with mental health services during supervision, and 28 percent (69) were involved with child welfare services. Within the control group, 28 percent (69) were involved with mental health services, and 18 percent with child welfare services. In addition, for students who re-offended, 38 percent (58) had ever accessed drug and alcohol services, and 26 percent (63) had ever had a child welfare placement, compared to 16 percent (34) and 17 percent (43), respectively, for the control group.

FIGURE 5: Human Services Involvement during Supervision, Students who Recidivated v. Control Group



***Significant at 1% (see appendix for results)

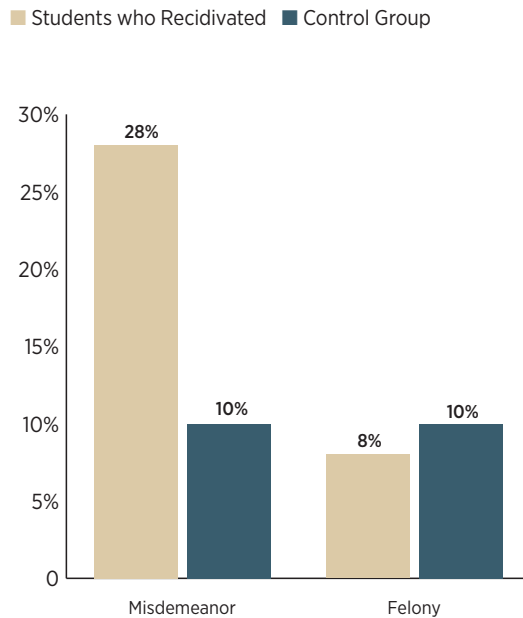
In addition to higher rates of service involvement, students who recidivated had higher rates of absenteeism pre- and post-supervision than the control group and lower GPAs prior to supervision. The average absence rate during supervision for students who recidivated was 16 percent, compared to nine percent for the control group (for students with available data). This difference is statistically significant at the five percent level. In addition, the control group, on average, had higher GPAs prior to supervision than those who recidivated.

TABLE 4: Educational Outcomes, Students who Recidivated vs. Control Group

	CONTROL GROUP (N = 72)	STUDENTS WHO RECIDIVATED (N = 83)	T-TEST RESULTS	
			T STATISTIC	MEAN DIFFERENCE
Absence Rate Prior to Supervision	15%	17%	-1.033*	2%
Absence Rate during Supervision	11%	11%	-0.044	0
Absence Rate Post-Supervision	18%	28%	-1.273*	4%
GPA Prior to Supervision	1.74	1.41	3.063***	-0.33
GPA Post-Supervision	1.46	1.21	1.02	-0.25

Differences in absence rates are observable across charge types by recidivism. Students whose highest charge was a misdemeanor and who recidivated had an average absence rate of 11 percent during supervision, compared to five percent for students who did not re-offend. These differences are observed post-supervision, with students charged with misdemeanors who recidivated missing on average 10 percent more days of school.

FIGURE 6: Average Absence Rates during Supervision, Students who Recidivated v. Control Group



NEXT STEPS IN ANALYSIS

The goal of this study was to better understand how students under school-based supervision compare to their peers. The next steps in this analysis include monetizing the benefits that we see in this program. The potential short-term financial benefits from this program include savings from decreased placement costs (especially JPO), savings in court costs (cost for students who recidivate), and savings to victims from the prevention of future crime. In addition, this program appears to improve the educational outcomes for the students who are supervised. Potential benefits include increased graduation rates and improved employment opportunities in the future.

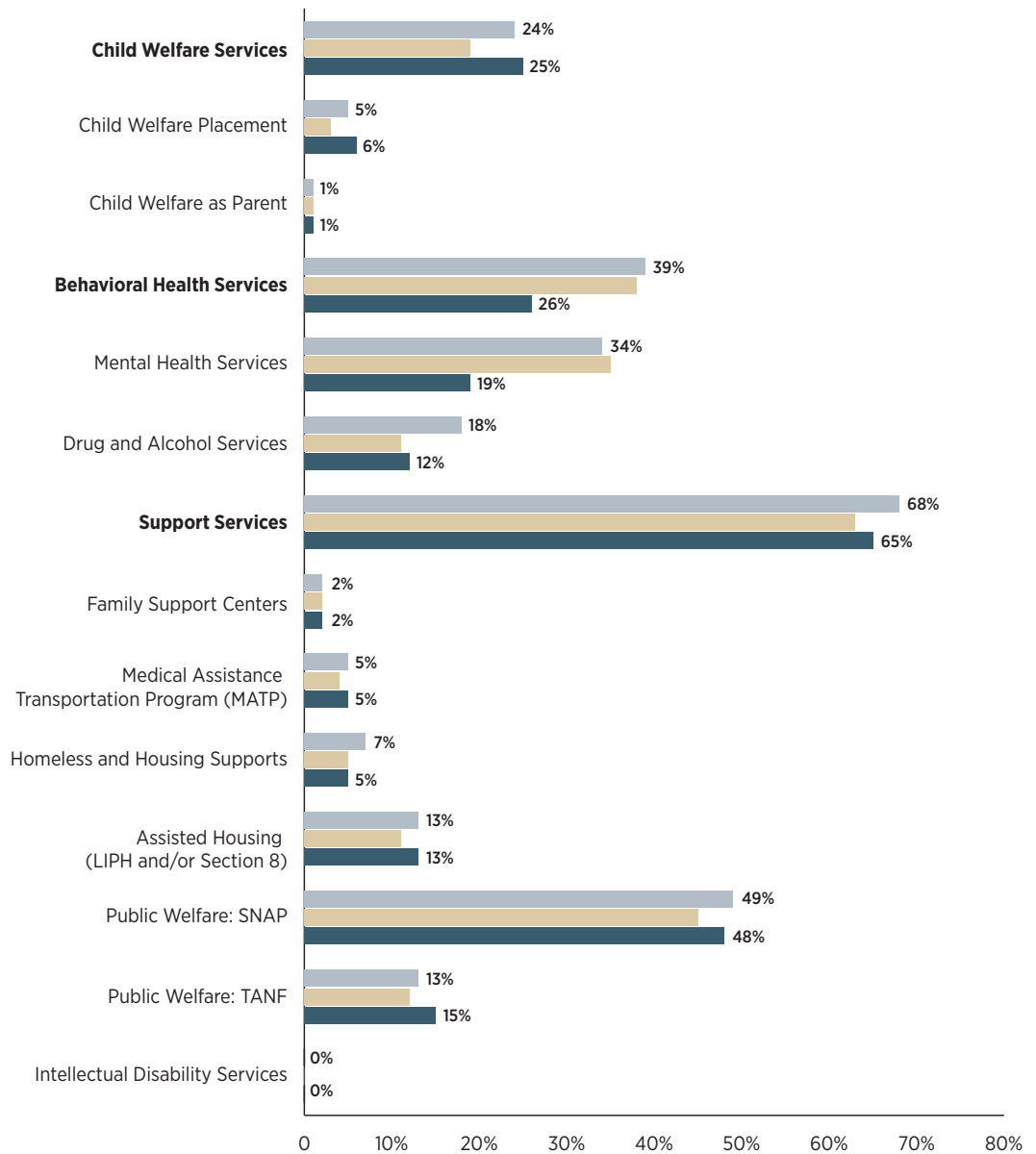
Students in school-based probation improved educational outcomes while under supervision. However, these improvements do not appear to be long-lasting, with absence rates high post-supervision for all students in this program. Students who re-offended within a year were more likely to have participated in behavioral health services. These are not necessarily correlated, but those students who recidivate simply appear to have higher behavioral health service needs than those who do not. In addition, students who recidivated were more likely to have experienced academic and attendance challenges in the past and have high rates of absenteeism post-supervision.

This study attempts to use propensity score matching to compare students under supervision to similar students. Because all PPS students under supervision are involved in school-based probation, it is difficult to determine if students supervised in this manner perform better in school than other supervised students. DHS has recently expanded its data-sharing partnerships

to include additional Allegheny County school districts, including school districts without school-based probation officers. As a result, next steps in this analysis include a comparison study of the educational outcomes of students supervised in school-based probation versus students in traditional community supervision.

APPENDIX

Services Detail



TECHNICAL APPENDIX

T-Tests of Service Involvement, Students who Recidivated vs. Control Group

	STUDENTS WHO RECIDIVATED	CONTROL GROUP	T STATISTIC (EQUAL VARIANCES NOT ASSUMED)	P-VALUE (ONE TAIL)
Mental Health Services***	48%	28%	-4.55	0.000
Homeless and Housing Supports	5%	4%	-0.71	0.237
Child Welfare Services***	28%	18%	-2.72	0.003
Drug and Alcohol Services (Ever)***	38%	16%	-5.58	0.000
Child Welfare Placement (Ever)***	26%	17%	-2.21	0.014

***Significant at a 1% level

Propensity Score Matching

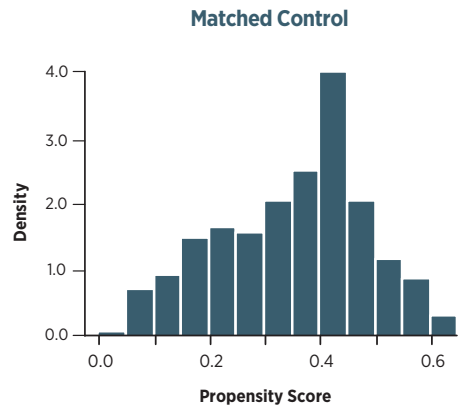
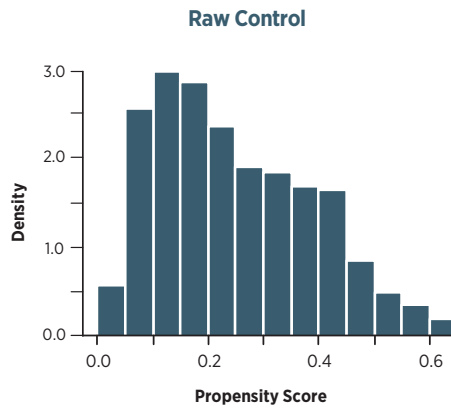
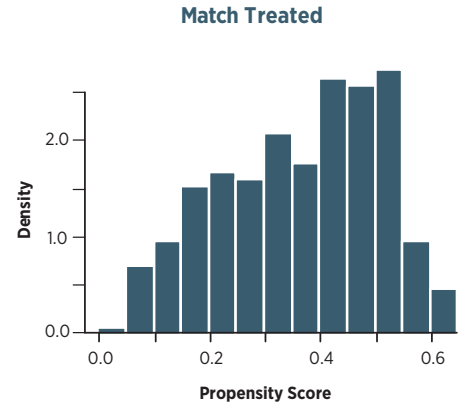
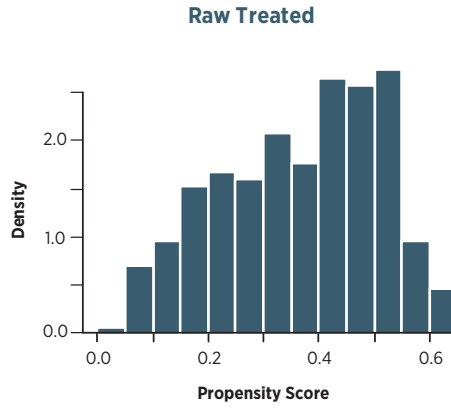
In order to better determine the key differences in service involvement and educational outcomes during supervision for students who re-offended and those who did not, propensity score matching was used. This method allows for the ability to account for a large number of co-variables that might influence this outcome. For this study, students who re-offended were matched in gender, race, age at the start of their supervision, the school district of their supervision and their highest charge while under supervision.

To create these matched groups, we used nearest neighborhood matching. In this method, all students who were under supervision were included, with a variable indicating whether they recidivated or not. The method matches the students who recidivated to all other students to find the closest control match based on the covariates included (which create a propensity score). The student who did not recidivate with the closest propensity score to a student who did is selected as a match. This procedure is repeated for all students who recidivated. This method guarantees that a match is always found for all students who recidivated even if the propensity scores are not close and provided there are enough controls available. However, by examining the figures below, we see that the distribution of scores for the matched treated and matched control groups are evenly distributed.

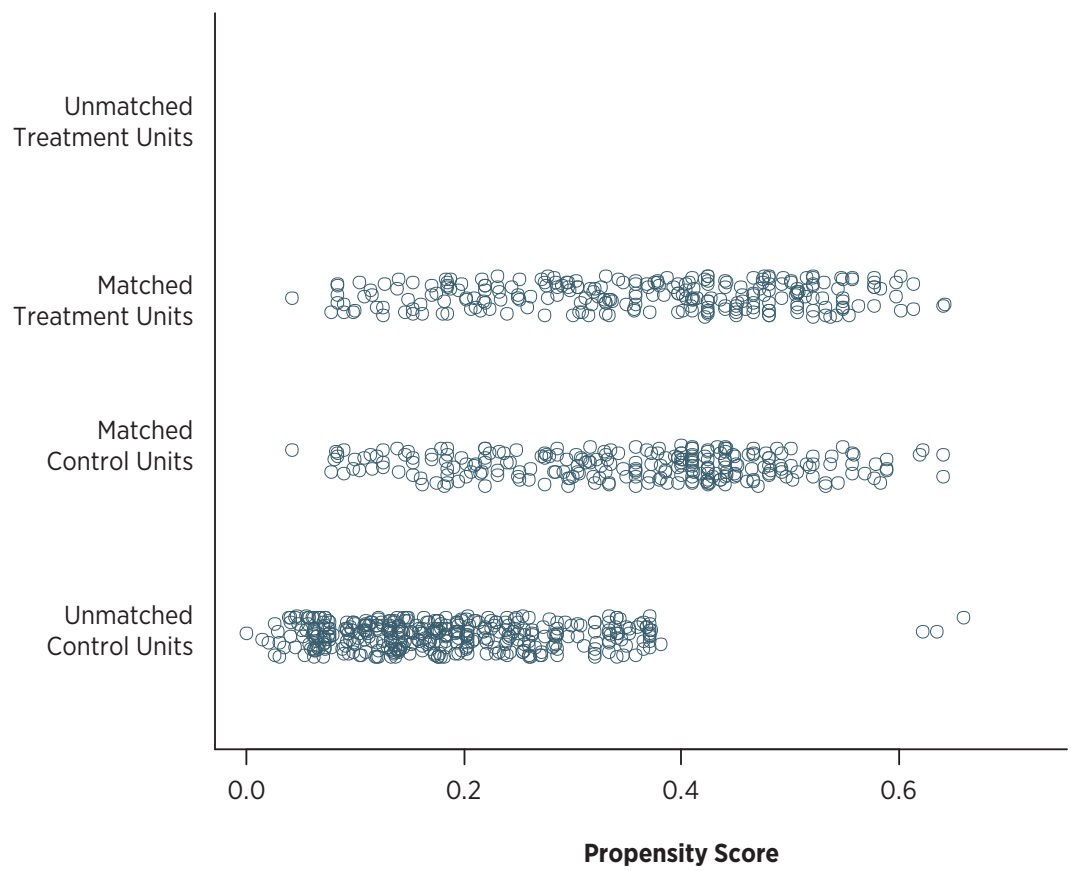
Propensity Score Distribution for the Treatment (Students who Recidivated) and Other Students, Raw and Matched

	SAMPLE SIZES	
	CONTROL	TREATED
All	628	247
Matched	247	247
Unmatched	381	0
Discarded	0	0

Distribution of Propensity Scores for the Treatment Group (Students who Recidivated), Matched Group (Control) and Unmatched Students



Distribution of Propensity Scores



SOURCES

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