

Massachusetts Department of Youth Services

**Juvenile Recidivism Report
For Youth Discharged During 2017**

June 1st, 2022



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Introductory Remarks from the Acting Commissioner

For more than a decade, the Department of Youth Services has issued an annual Recidivism Report that tracks the recidivism rate of youths discharged from the Department's custody. Recidivism is the measure used most often by jurisdictions to determine the effectiveness of interventions with youth involved with the juvenile system. Reducing recidivism has been associated with more positive life outcomes for former system involved youth, lower the costs of involvement with the juvenile justice system, and reduced juvenile delinquency rates. Recidivism, as used in DYS' annual recidivism reports, is defined as a conviction in the adult system for an offense committed within one year of discharge from DYS custody.

This year's Recidivism Report analyzes 387 youth discharged from DYS custody in 2017 and the factors associated with recidivism for these youth, including protective factors that reduce recidivism.

Research on youth re-entry and recidivism over the past decade has demonstrated that nearly every stage of involvement with the juvenile and adult criminal justice systems is marked by racial bias, racial discrimination, and systemic racism. Youth of color across the United States are more likely than white youth to be arrested, arraigned, charged, and/or convicted. Once involved with the juvenile justice system, studies have shown that youth of color further experience inequitable outcomes in education, employment, and in obtaining housing post-system involvement compared to their white counterparts.

The Department of Youth Services is charged with providing a comprehensive and coordinated program of delinquency prevention and services for youth committed to its care and custody. Recidivism rates are reflections of different factors that contribute to youth re-arrests, re-arraignments, and re-convictions. The Department has identified protective factors that positively impact recidivism rates including engaging youth in earning a high school diploma or equivalent; using Dialectical Behavior Therapy (DBT), a skill-based approach that teaches both self-regulation and pro-social interpersonal skills; and affording youth the opportunity to participate for more than six months in the voluntary transitional program, Youth Engaged in Services (YES) post discharge. What has become more

apparent is how systemic racism (including disproportionate involvement with the deep end of the juvenile justice system) is impacting youths' life prospects and trajectories, including recidivism.

As a youth serving and juvenile justice agency, the Department is committed to combatting racism and leveraging the preventative and protective factors that promote positive youth development and well-being for the young people in DYS care and custody.

Best regards,
Cecely Reardon

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Executive Summary

This study analyzed the criminal histories of 387 youths formerly committed to the Massachusetts Department of Youth Services' (DYS) custody who were discharged from the agency during 2017. Data on youths' post discharge arraignments and incarcerations were evaluated to determine the rate of recidivism¹ for the entire cohort, as well as the recidivism rates for selected segments of that cohort. Of the 387 subjects, 26% recidivated within one year of discharge from DHS, which compares to a 25% rate of recidivism for the youth who discharged from DHS custody in 2016, a 27% rate of recidivism for 2015, and a 24% rate of recidivism for 2014. Youth with higher recidivism rates as adults were males who had been committed to DHS' custody for weapons and motor vehicle offenses.

Table 1 Recidivism for DHS Youth Discharged in 2017 Executive Summary

Executive Summary for 2017	Rates of Youth Recidivism Within DHS Population
Sex Assigned at Birth	
Female	11%
Male	28%
Total	26%²
Race/Ethnicity	
Hispanic/Latinx	31%
White	16%
Black or African American	29%
Other Races	26%

¹ In this report, recidivism is defined as an arraignment that occurs within one year of discharge from DHS' custody, which results in a conviction.

² Of the 26%, female youth represented 1.3 % and male 25.1%.

DYS Committing Offense Type	
Drugs	25%
Motor Vehicle	14%
Person	23%
Property	37%
Public Order	24%
Weapons	30%
Grid Level	
Grid <=2	23%
Grid 3	27%
Grid 4	31%
Grid >=5	28%
Attainment Status Prior to Discharge	
No Attainment	27%
High school Attainment	22%

Key Findings

- In the current study, the overall one-year recidivism rate was 26%.
- The recidivism rate for males was 28%, while the rate for females was 11%.
- Youth whose first arraignment was at age 17 had a recidivism rate of 36%, while those whose first arraignment was at age 16 had a recidivism rate of 22%.
- Youth who recidivated were mostly from major urban centers; most experienced the highest recidivism rate during the one-year period under study (over 50%).
- Youth earning a high school diploma or equivalency prior to being discharged from DYS had a recidivism rate of 22%. Youth without a diploma or equivalency had a rate of 29%.
- Youth whose DYS committing offenses were felonies had a recidivism rate of 28% while those committed for misdemeanors had a rate of 23%.
- Youth who opted for YES services following DYS discharge had a recidivism rate of 27% while youth not opting for those services had a rate of 26%. This is the first time since DYS started evaluating recidivism among the YES cohorts that their recidivism rate was comparable to their counterparts (Non-YES). The table below shows the rates for previous years comparing YES and Non-YES youth.

Table 2 Recidivism Youth Engaged in Services Comparisons

Discharge Year	YES Recidivism	Non-YES Recidivism
2014	23%	26%
2015	22%	32%
2016	20%	29%

- Youth participating in YES for more than six months had a lower recidivism rate (22%) compared to those who spent less than six months (27%).
- Youth committed to DYS for less than six months had a recidivism rate of 33% as compared to 25% for youth committed to DYS for more than six months.

- Youth with a substance use disorder had a higher rate of recidivism (29%) when compared to those who did not (20%).
- On the PTSD screen, youth strongly agreeing with the statement, *“If someone pushes me too far, I am likely to become violent”* had a recidivism rate of 21%. Youth who strongly agreed with the statement, *“I lose control and explode over minor things every day”* had a recidivism rate of 50%. And youth who strongly agreed with the statement, *“I enjoy the company of others,”* had a recidivism rate of 20%.
- Seven protective factors were identified that were associated with lower recidivism: (1) First arraignment at age 15 or older; (2) More than 6 months of YES services; (3) Earning a high school diploma or equivalency prior to discharge; (4) Strongly disagreeing with *“It seems I have no feelings”* (Recidivism rate of 25%);³ (5) Agreeing with *“I am able to get close to someone”* (Recidivism rate of 28%);⁴ (6) Disagreeing with the statement *“If someone pushes me too far, I am likely to become violent”* on the PTSD Screen; and (7) Agreeing with the statement *“I enjoy the company of others”* on the PTSD Screen.

Table 3 Recidivism for DYS Youth Discharged in 2017 for Selected DYS Offenses

Offense Type	Recidivated	Total in Sample	Recidivism Rate
Drugs	3	13	25%
Person	46	202	23%
Property	25	68	37%
Public Order	10	41	24%
Weapons	17	56	30%
Grand Total	102	387	26%

³ As opposed to 50% among those who strongly agree.

⁴ Compared to a rate of 35% for those who strongly disagree.

Table 4 Recidivism Rates for DYS Youth Discharged in 2017: Misdemeanors vs. Felonies

	Recidivated	Recidivism (%)	Total
Felony	69	28%	247
Misdemeanor	32	23%	140

Table 5 Recidivism Rates for DYS Youth Discharged in 2017 from Selected Cities

City	Number of Youth Recidivating	Total in Sample	Recidivism (%)
Boston	4	7	57%
Brockton	10	15	67%
Fall River	9	12	75%
Lawrence	10	13	77%
Lynn	5	8	63%
New Bedford	7	11	64%
Springfield	32	45	71%
Worcester	17	27	63%

Introduction

The Department of Youth Services is the juvenile justice agency for the Commonwealth of Massachusetts. The Department envisions a Commonwealth in which every young person has the skills, supports, and resources necessary to engage safely with their communities, and lead productive and fulfilling lives. The Department brings this vision to fruition by fostering positive outcomes for youth, building safer communities, and collaborating for an equitable and fair justice system. Consistent with this vision and mission, the Department strives to ensure that every action taken, and decision made, reflects its commitment to fairness, transparency, racial equity and integrity.

Total Programs in CY 2017

DYS operated 88 programs consisting of:

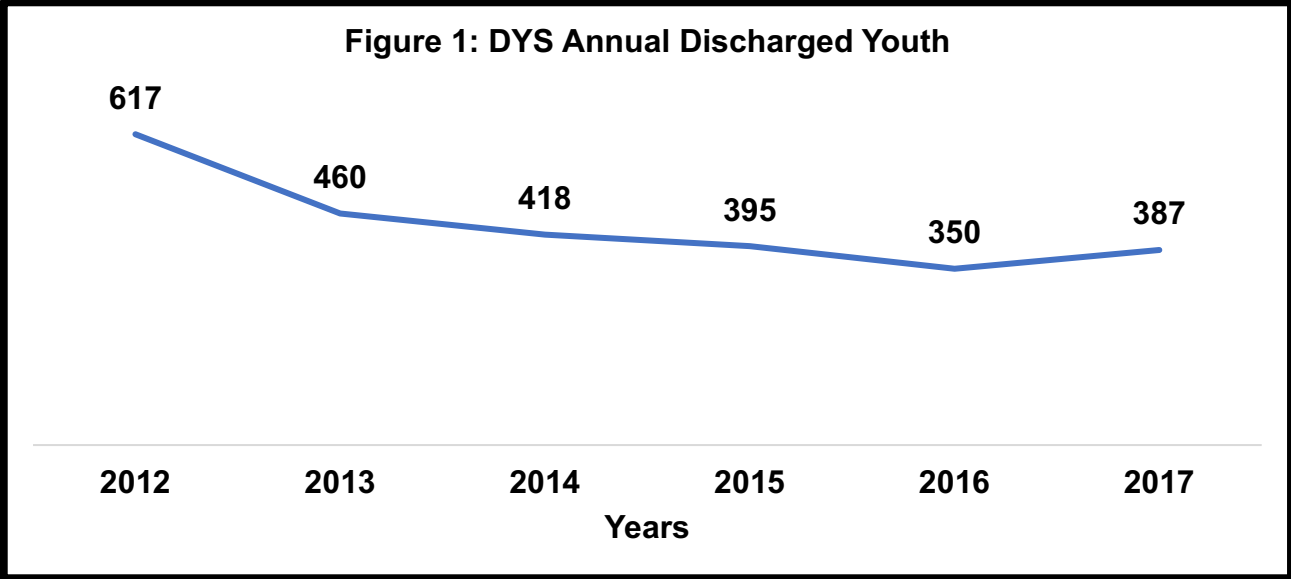
- 63 staff secure and hardware secure residential programs, and
- 25 community-based district and satellite offices serving committed youth who live in the community (residing with a parent, guardian, foster parent or in an independent living program).

DYS Committed Population in CY 2017

- DYS served 962 youth who were committed its custody; the average daily population was 637.
- The average age at initial commitment was 15.9 years and the median age was 16.0 years.
- 88% of the committed population were male and 12% were female.
- 20% Caucasian, 31% Black or African American, 41% Hispanic/Latinx, 1% Asian, 2% Multiracial, and 6% for all other races (American Indian or Alaska Native and Native Hawaiian or Other Pacific Islander).
- 69% were adjudicated delinquent and were committed to DYS' custody until age 18.
- 31% were adjudicated as youthful offenders and committed to DYS custody until age 21.⁵

⁵ This number includes youthful offenders who were committed to 21 and youthful offenders who received sentences that combine a commitment to 21 with an suspended adult sentence ("combination sentences.")

The number of youths discharged from DYS custody has steadily declined each year since 2012, except for the 2017 cohort, which saw an 11% increase compared to the 2016 cohort.

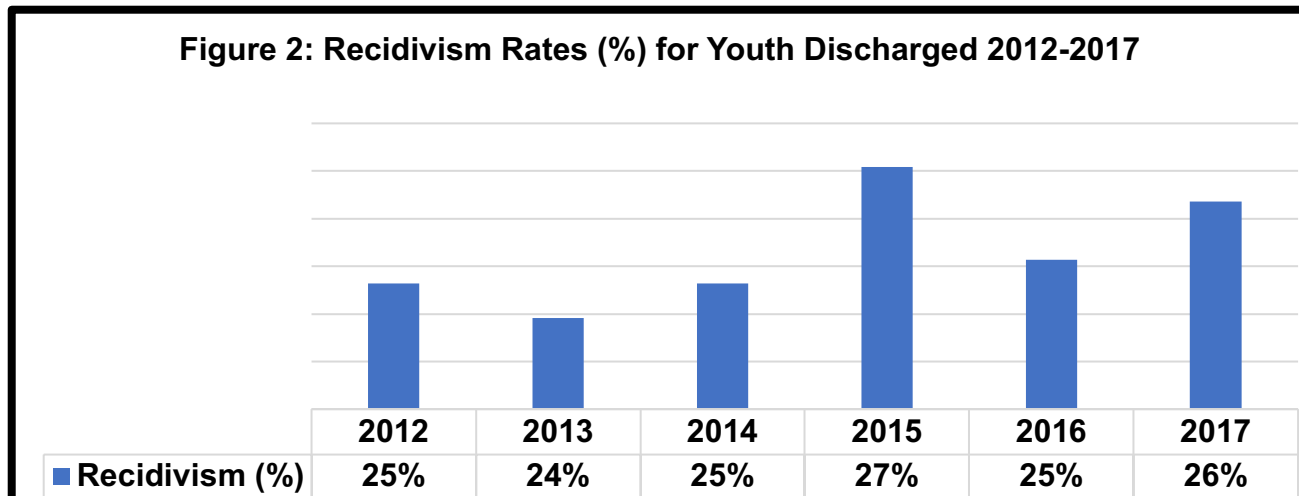


Recidivism is generally the most used measure to determine the effectiveness of interventions with youth involved with the juvenile system. This report details recidivism data for a sample of former DYS youth who were discharged from the agency’s custody during calendar year 2017. For purposes of this report, recidivism is defined as a conviction in the adult system for an offense committed within one year of discharge from DYS’ custody. A similar definition is adopted by Barrett and Katsiyannis (2015). It is important to note that while recidivism is a commonly used metric, capturing recidivism rates does not explain *why* youth recidivate. As such, it is important to consider the individual-, family-, community-, and society-level factors that influence youths’ recidivism rates, especially when attending to racial disproportionalities in recidivism rates.

A retrospective look at recidivism reveals that once discharged from DYS commitment, about 1 in 4 youth re-engaged with the justice system. Figure 1 below shows a recidivism rate averaging 25% from 2012 to 2017. Prior research has found associations between juvenile recidivism and various factors related to age, socioeconomic status, educational history, peers, family dynamics, and substance use. The following have been identified (Cottle et al., 2001; Wiebush et al., 1995) as primary risk factors for youth:

- Age of onset of delinquency (usually age at first referral, first arrest, or first adjudication)
- Number of prior arrests
- Prior assaults / institutional misconduct
- Prior out-of-home placements
- Poverty
- Unemployment
- Drug / alcohol use
- School problems (including poor achievement, misbehavior in school, and truancy)
- Association with delinquent peers / gang involvement
- Family problems (including problems with parental control and poor relationships with family members)
- Mental health diagnoses, especially depression and conduct disorder

Treatment for the typical youth committed to DYS custody has been shown to be cost-effective in terms of reduced recidivism. Efforts have been made to estimate the costs to the community of a juvenile justice involved youth over the course of his/her lifetime. Research has shown that, “discounted to present value at age 14, [estimated] costs total \$3.2-\$5.8 million. The bulk of these costs (\$2.7-\$4.8 million) are due to crimes, while an additional \$390,000 to \$580,000 is estimated to be the value of lost productivity due to dropping out of high school.” The cost of treating an individual who heavily uses substances is estimated to range between \$480,000 and \$1.1 million, although \$700,000 of that amount is the cost of crime committed by individuals who heavily use substances (Cohen & Piquero, 2009).



Methodology

The sample for this study consisted of 387 DYS youth discharged during calendar year 2017 (Table 4). Based on data collected at intake, 88% of the sample were male, 25% were Caucasian, 36% African American, and 35% Hispanic. Fifty six percent (56%) of the sample were classified as DYS Grid Level 3 and above. The remaining 44% were classified as Grid Levels 2 and below (Table 5).

Table 6 Characteristics of the Sample

	N	Minimum	Maximum	Mean Std.	Deviation
Age at First Arraignment	387	9	18	14.2	1.9
Age at Commitment to DYS Custody	387	12	20	16.2	1.3
Length of Stay in DYS (Yrs.)	387	0	4.7	0.7	0.5

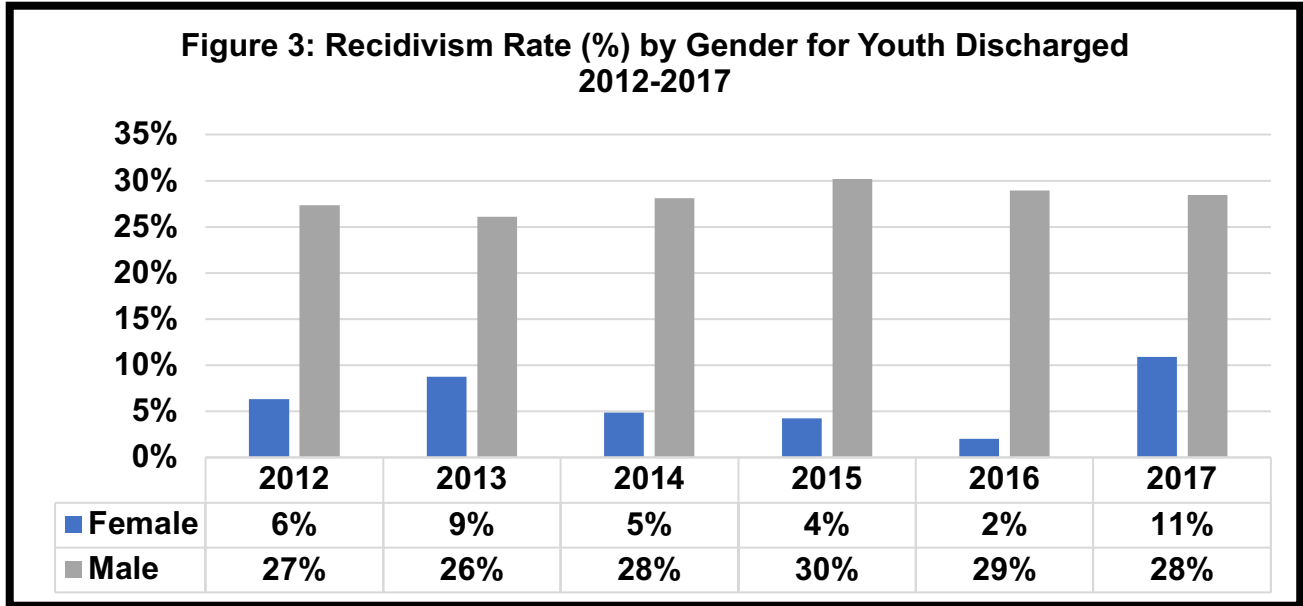
Table 7 Selected DYS Offenses and Grid

Offense	Grid
Home invasion	6
Rape, aggravated	6
Machine gun/sawed-off shotgun, possess	5
Armed robbery (Display of gun)	4
A&B with dangerous weapon (Significant injury)	4
Armed robbery (Display of gun)	4
Drug, distribute or possess with intent, class A	3
B&E daytime, for felony, dwelling	3
Receive stolen or falsely traded property, under \$250	2
Shoplifting	1
Disturbing the peace	1

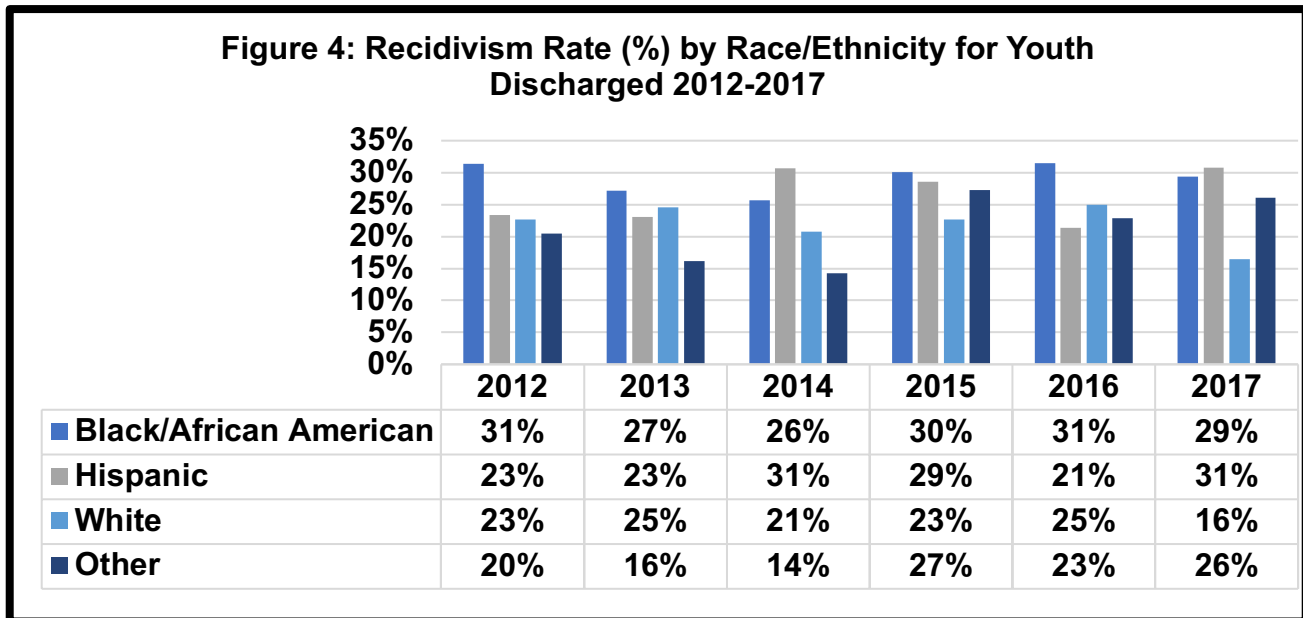
Results

Overall Rates: Of the 387 youth in the study, 26% committed an offense within one year of discharge from DYS. This compares with a 25% rate for the 2016 discharges; a 27% rate for the 2015 discharges; and a 24% rate for the 2014 discharges (Figure 2).

Gender: males had higher recidivism levels than females (28% and 11% respectively). For most of the 2012 - 2017 discharge cohorts, the recidivism rate for females was less than 10% (Figure 3).

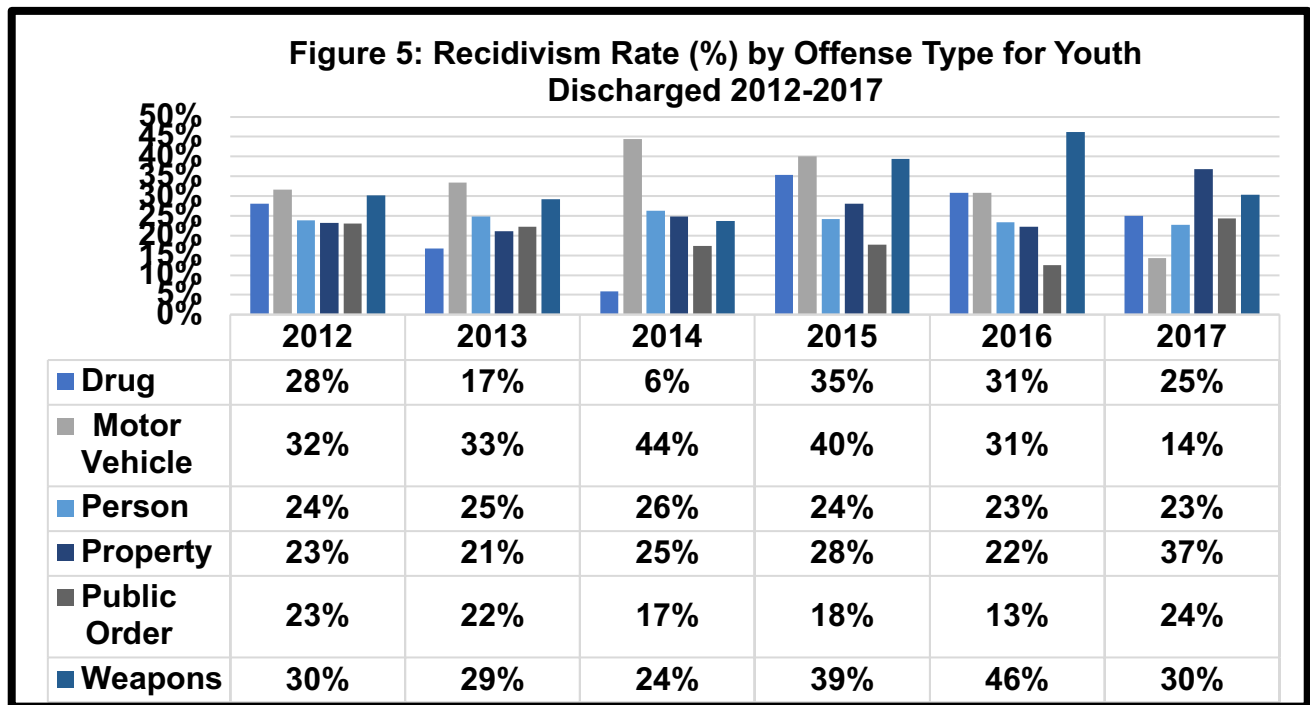


Race/Ethnicity: 29% of the Black/African American youth, 16% of the White youth, and 31% of the Hispanic youth in the 2017 sample recidivated within one year of discharge (Figure 4).



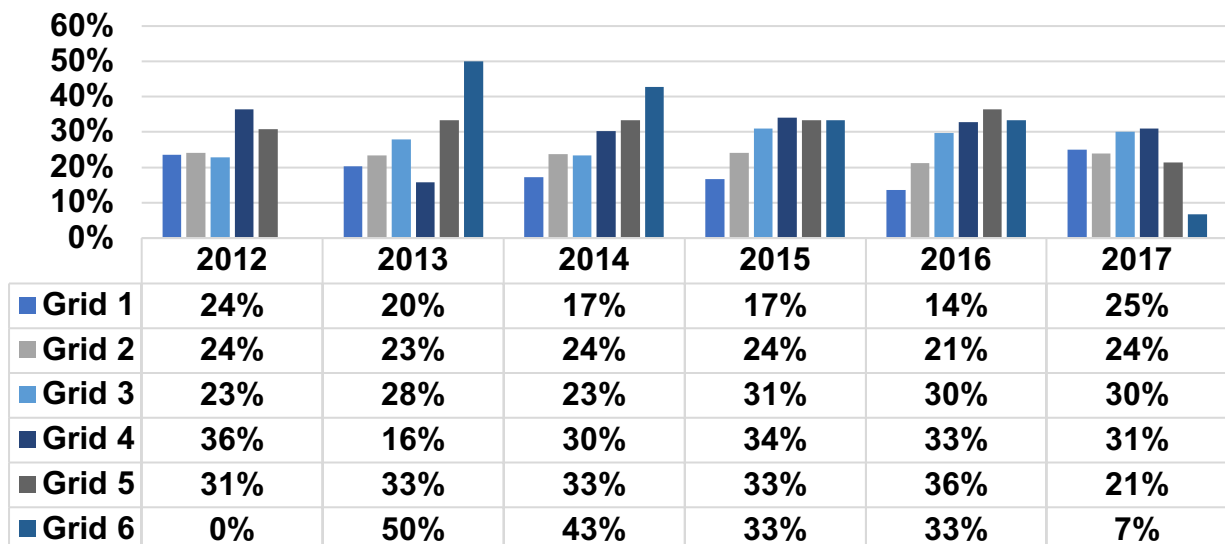
Offense Type: With respect to DYS committed youths discharged in 2017, 30% of the youth committed for weapons offenses, 14% of those committed for motor vehicle offenses,

25% for drug offenses; 22% for offenses against persons, 37% for property offenses; and 24% for public order offenses recidivated within one year of discharge. Historically, youth committed for motor vehicles and weapons offenses have tended toward higher recidivism rates; however, in 2017, youth committed for property and weapons offenses had higher recidivism rates (Figure 5). Refer to Appendix A for a detailed list of offenses and offense types.



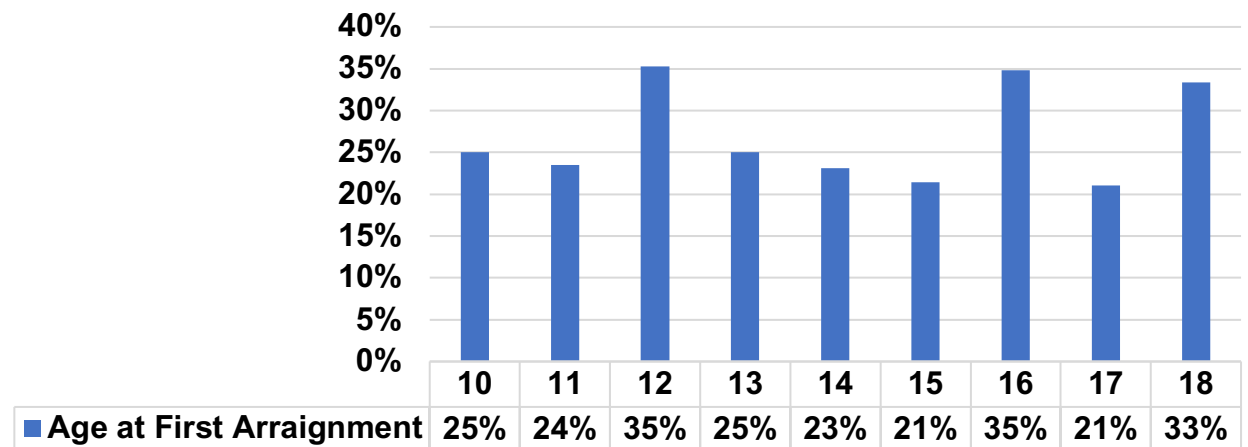
Grid Levels: The one-year recidivism rates by Grid Level for the 2017 cohort were: 24% for Grid Levels 2 and below; 30% for Grid Level 3; 31% for Grid Level 4; and 21% for Grid Levels 5 and above (Figure 6). The highest rate of recidivism was observed among youths who were committed to DYS for offenses at Grid Levels 3 and 4.

Figure 6: Recidivism Rate (%) by Grid Level for Youth Discharged 2012-2017

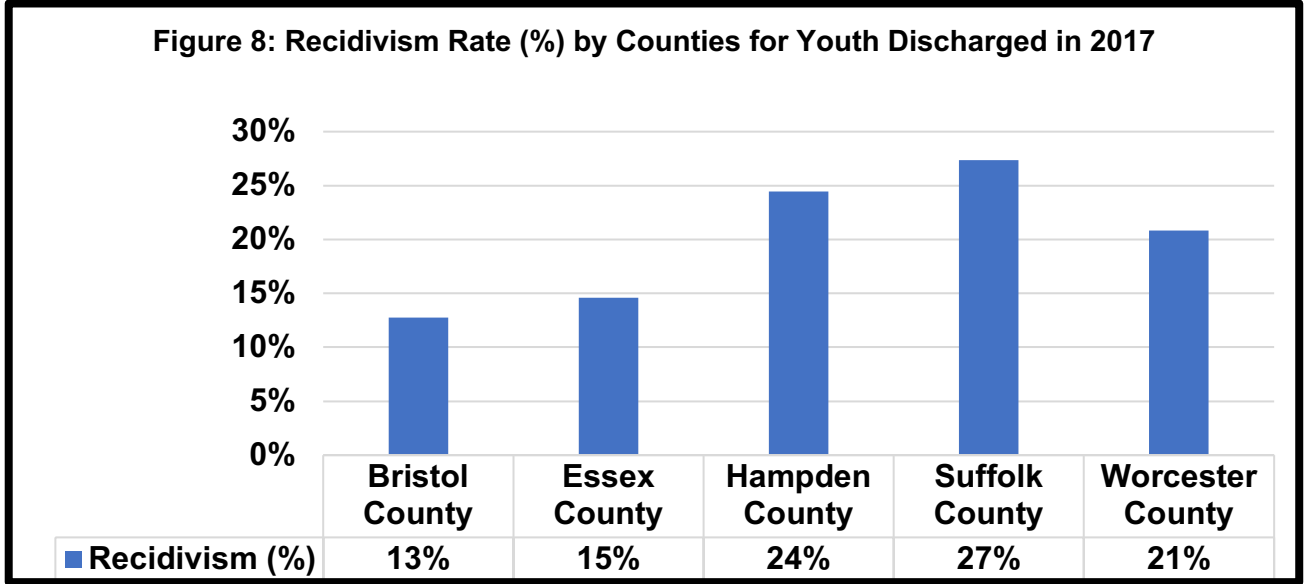


Age at First Arraignment: Youths in the 2017 cohort who were age 14 or younger at the time of their first arraignment had a higher recidivism rate than those first arraigned at an older age (see Figure 7). This finding is consistent with previous research that has shown higher recidivism rates for individuals first arraigned at a young age.

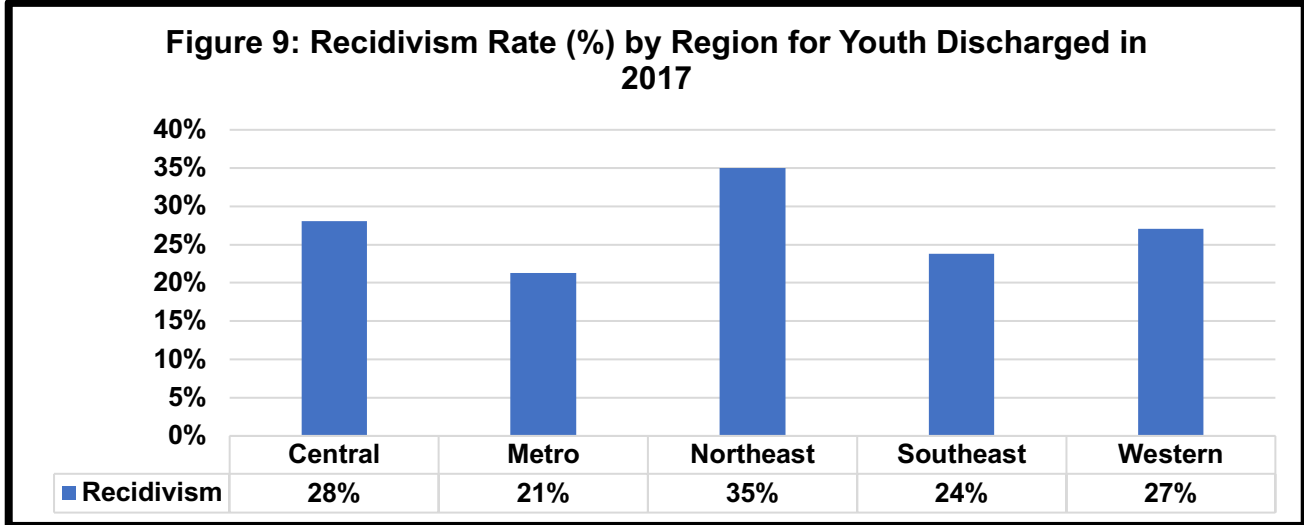
Figure 7: Recidivism (%) by Age of First Arraignment for Youth Discharged in 2017



County: In 2017, the recidivism rates for major Massachusetts counties were as follows: Bristol County (13%), Essex County (15%), Hampden County (24%), Suffolk County (27%), Worcester County (21%) (See Figure 8). Youths from Suffolk County experienced the highest recidivism rate within one year of discharge from DYS.



DYS Region: The recidivism rates for the five DYS regions were: Metro, 21%; Northeast, 35%; Central, 28%; Southeast, 24%; and Western, 27% (Figure 9). Compared to the previous year, the Southeast and Western Regions showed significant increases in recidivism rates. A breakdown of each DYS Region by County can be found in Appendix B.



Below are the recidivism rates for each of the five regions for the five-year period under review.

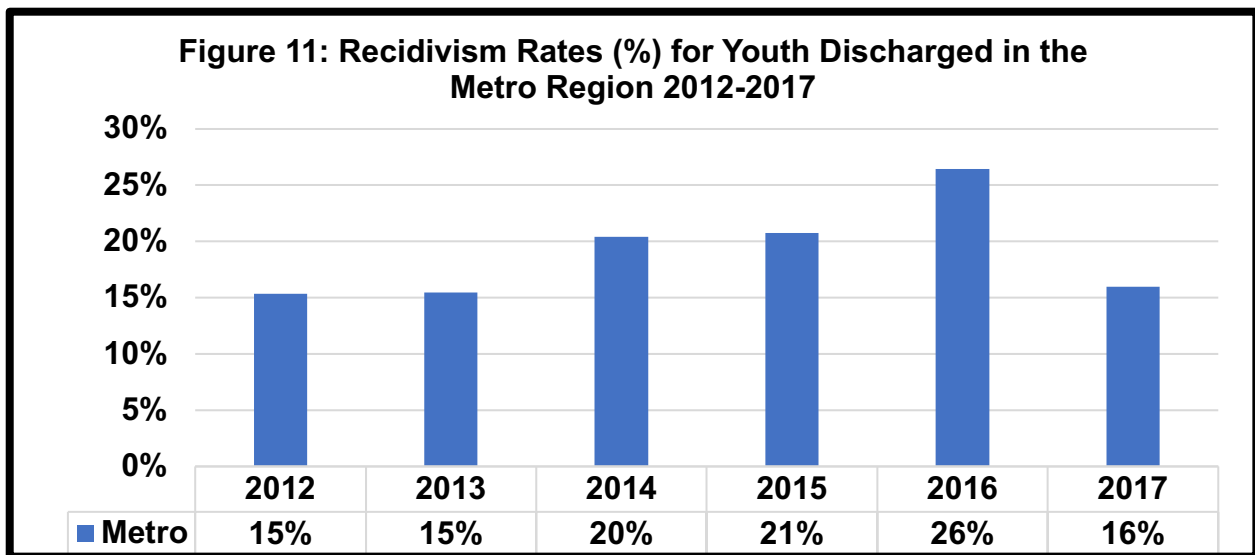
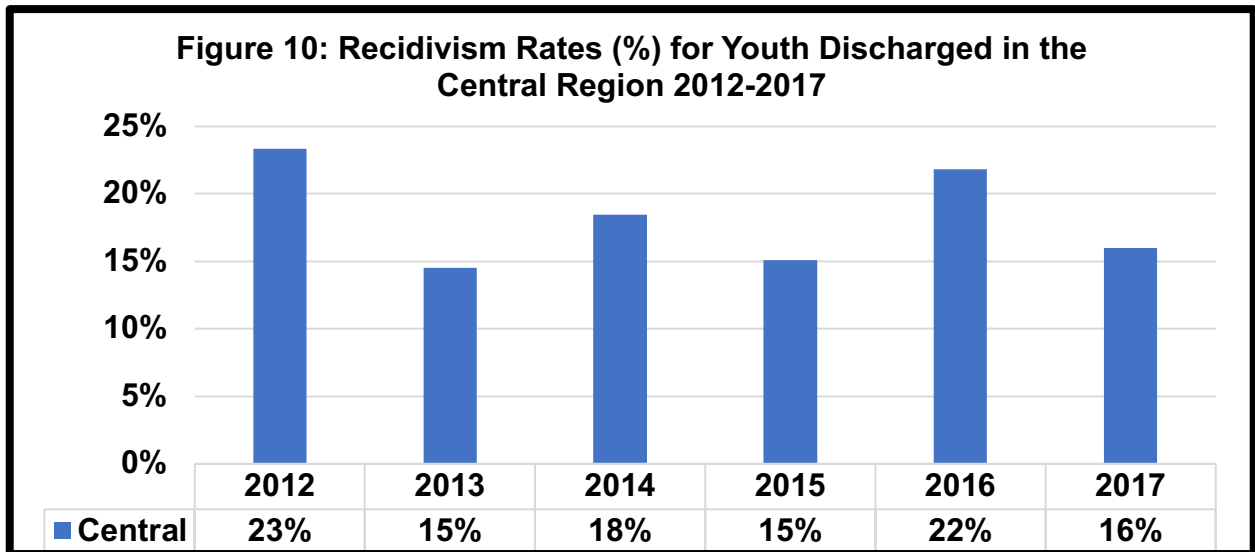


Figure 12: Recidivism Rates (%) for Youth Discharged in the Northeast Region 2012-2017

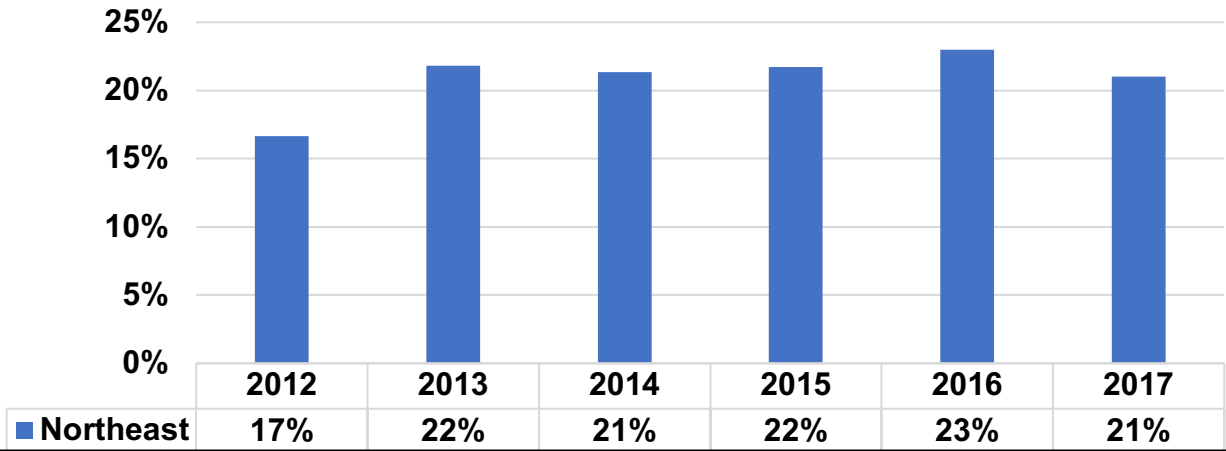
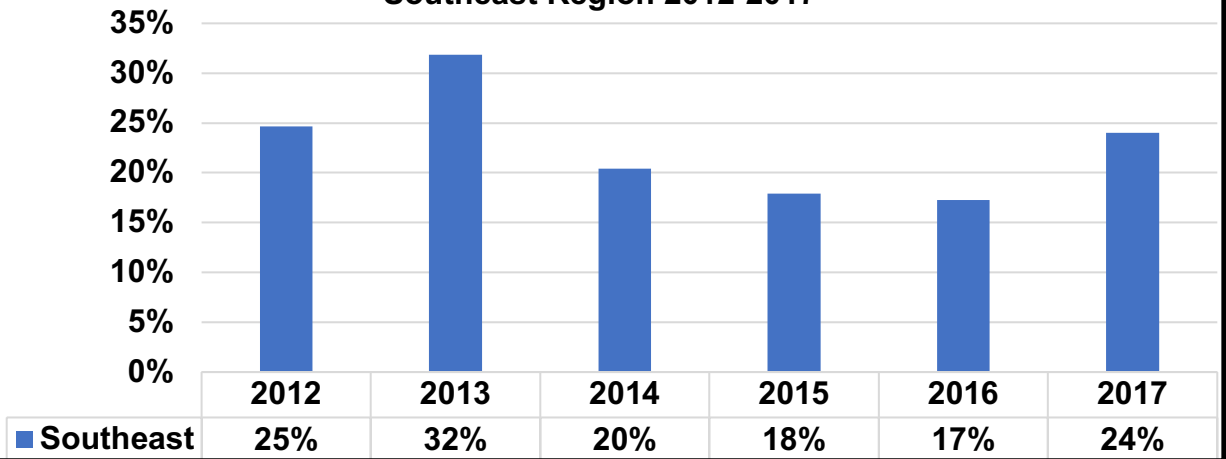
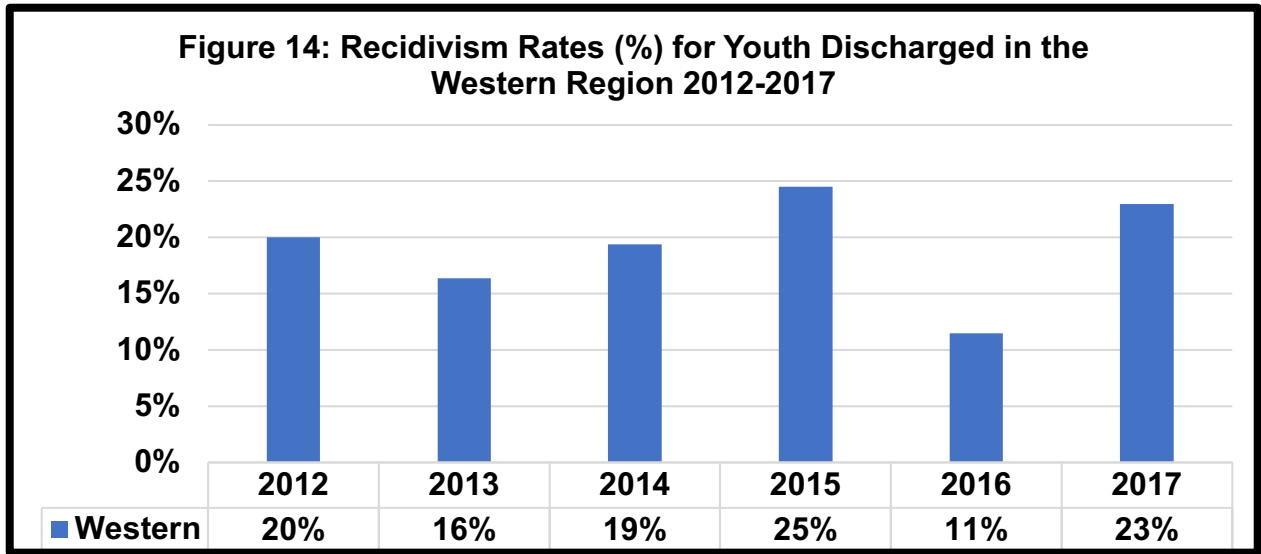
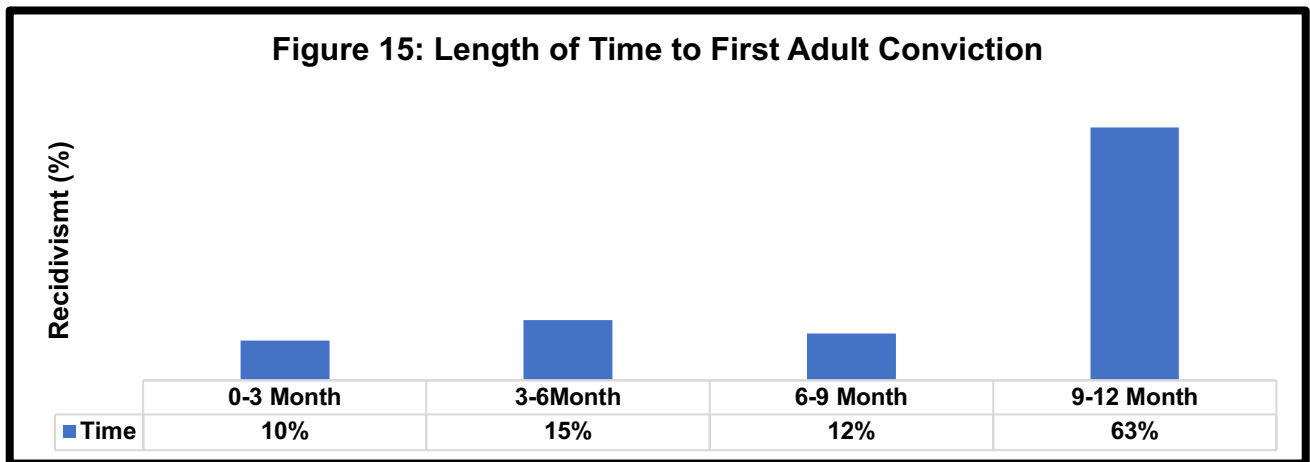


Figure 13: Recidivism Rates (%) for Youth Discharged in the Southeast Region 2012-2017





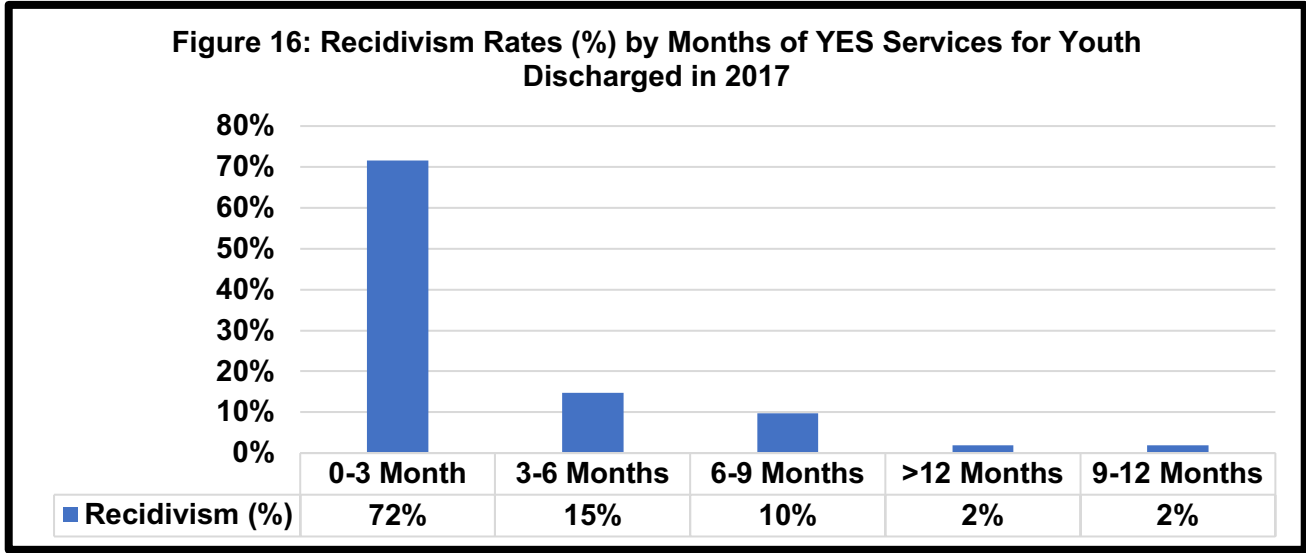
Length of Time Until First Adult Conviction: Of the 387 former DYS youth in the study, 25% recidivated within six months of discharge from DYS custody and 22% recidivated within one year (Figure 15). Research has consistently found that when discharged youth recidivate, they tend to do so within a short period of time following discharge. Of the former DYS youth who recidivated within one year, 63% did so within 9 to 12 months of being discharged from DYS custody.



Other Factors

Youth Engaged in Services (YES)

Youth in the 2017 cohort who opted for YES services following DYS discharge had a recidivism rate of 27% while those not opting for those services had a rate of 26% (Figure 16).



Post Traumatic Syndrome Disorder (PTSD) Screen

The PTSD Screen is a screening instrument that DYS uses in conjunction with the Massachusetts Youth Screening Instrument – Second Version (MAYSI-2),⁶ the Youth Level of Service – Case Management Instrument (YLS-CMI),⁷ the Adverse Childhood Experiences (ACEs)⁸ score, interview findings with the youth and family, as well as historical documents obtained by DYS caseworkers from probation, the school, and other state agencies. On the PTSD screen, youth may or may not endorse items suggestive of symptoms associated with trauma. If it is determined that the youth is experiencing PTSD,

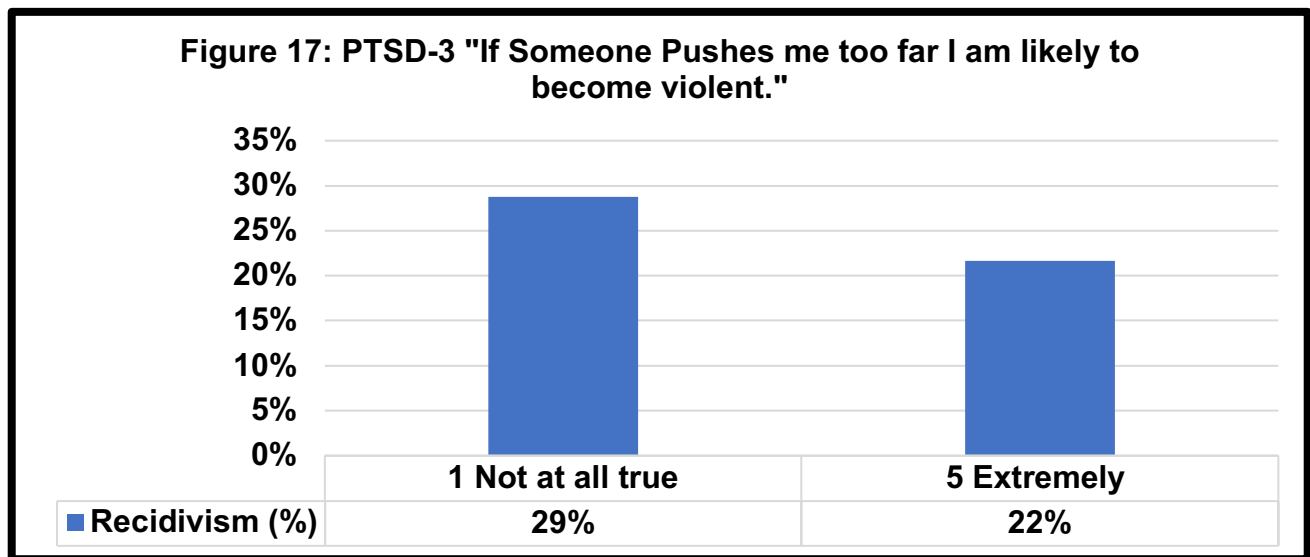
⁶ is the MAYSI-2 is a brief behavioral health screening tool designed especially for juvenile justice programs and facilities. It identifies youths 12 through 17 years old who may have important, pressing behavioral health needs. Its primary use is in juvenile probation, diversion programs, and intake in juvenile detention or corrections.

⁷ According to Hoge & Andrews (2011), the YLS-CMI is a structured assessment instrument designed to facilitate the effective intervention and rehabilitation of youth who have committed criminal offenses (aged 12-18 years) by assessing their risk level, criminogenic needs, and strengths. Source:

⁸ An ACE score is a tally of different types of abuse, neglect, and other adverse childhood experiences. A higher score indicates a higher risk for health problems later in life.

the youth’s treatment team can consult with the Regional Clinical Coordinator (licensed psychologist) or Regional Clinician (licensed social worker) who can help to develop the treatment plan for the youth which may include an Individual Support Plan (ISP) and/or other specialized services. The screen is conducted by asking the youth to answer a series of questions ranging from “*Not at all True*” to “*Extremely*.”⁹

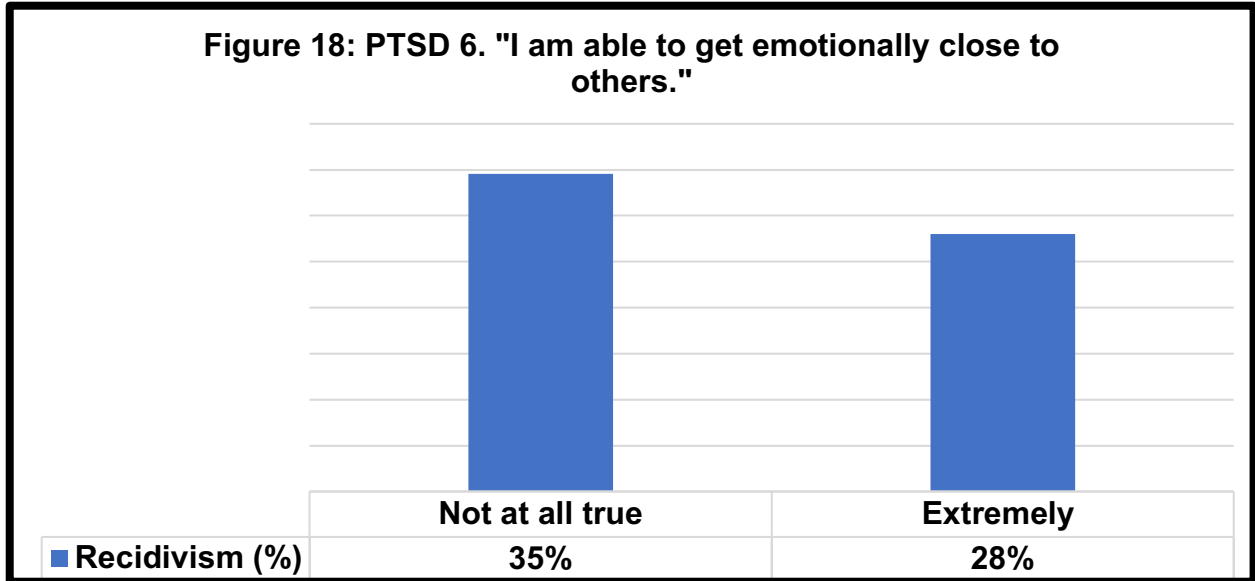
For purposes of this report, we looked at aggregate answers given to specific questions and compared them to the percentage of recidivism case observed.¹⁰ On the PTSD Screen, youths who indicated that they “*Extremely*” agreed with the statement, “*If someone pushes me too far, I am likely to become violent,*” had the lowest recidivism rate at 22%.



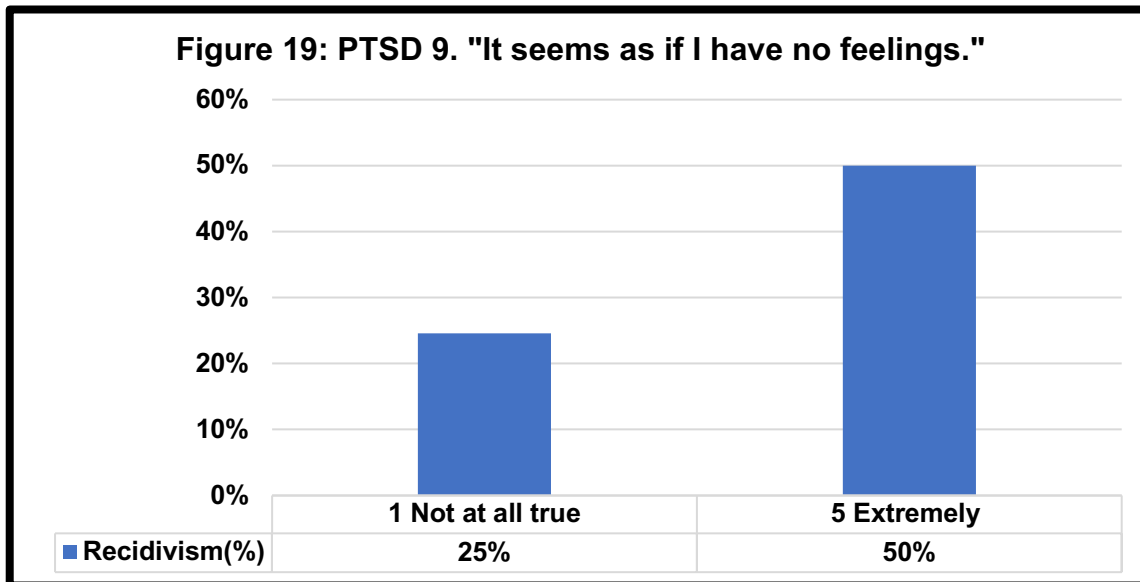
Those who “*Extremely*” agreed with the statement “*I am able to get emotionally close to others*” had a recidivism rate of 24% as compared to 35% for those who selected “*Not at all true*”.

⁹ The followings are possible responses to each question on the PTSD Screen: “Not at all true”, “Slightly true”, “Somewhat”, “Very true”, and- “Extremely”.

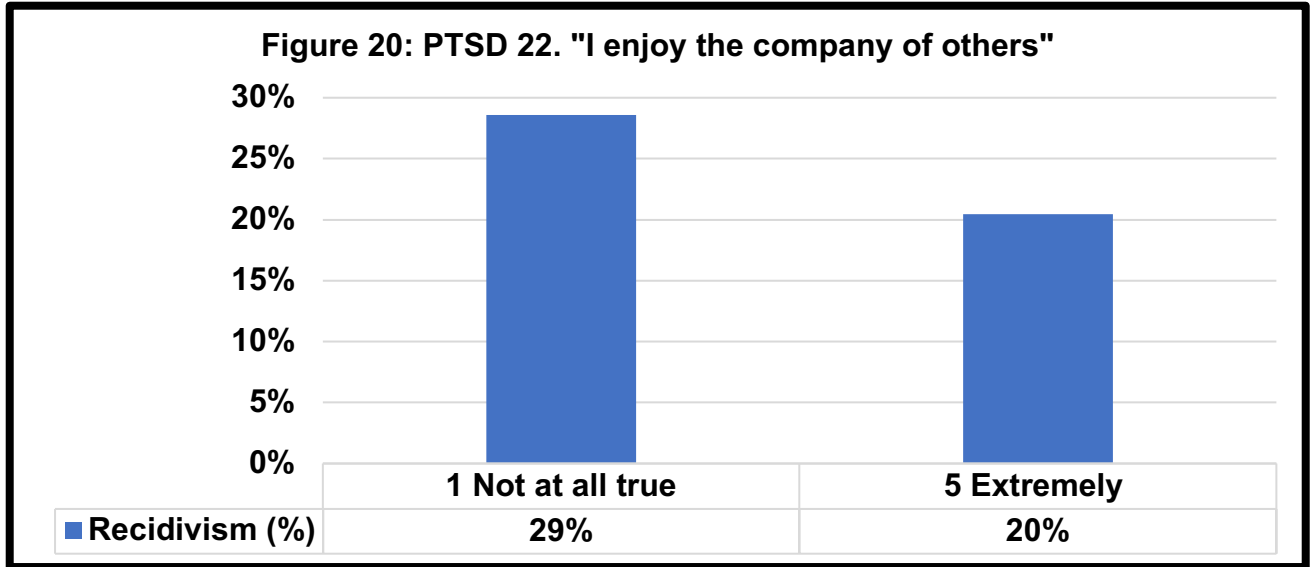
¹⁰ This approach is solely descriptive in nature; we do not derive any causation between the answers given and the likelihood to recidivate for any specific youth.



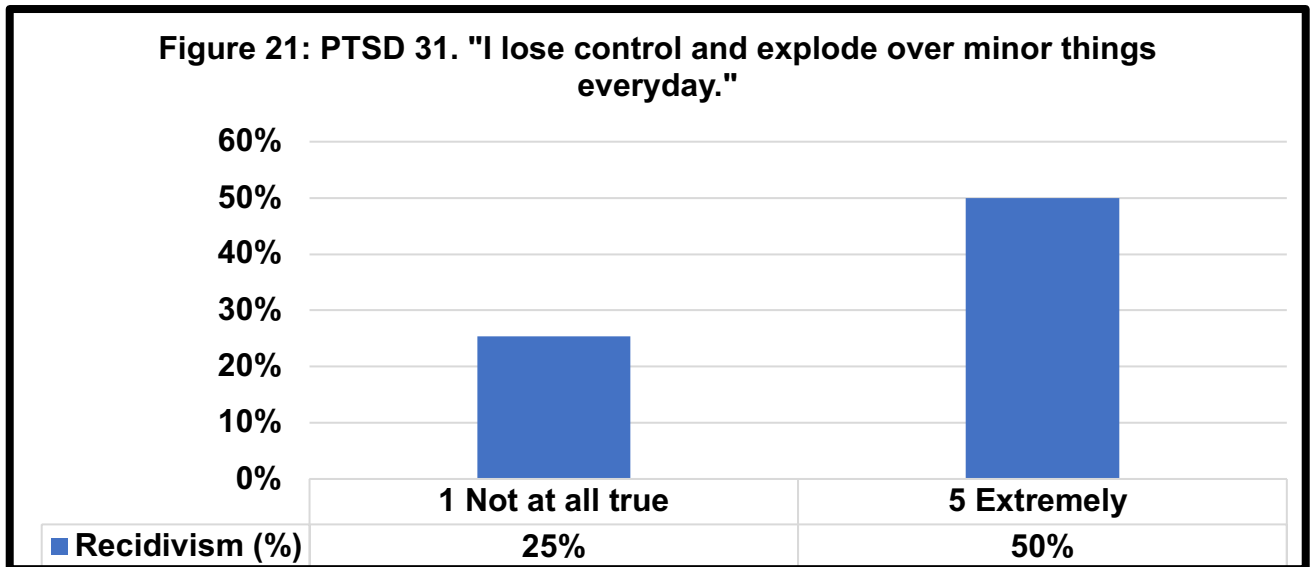
Youth who “*Extremely*” agreed with the statement “*It seems as if I have no feelings,*” had a recidivism rate of 50%. (Figure 19).



Youth who “*Extremely*” agreed with the statement, “*I enjoy the company of others,*” experienced the lowest recidivism rate (20%).



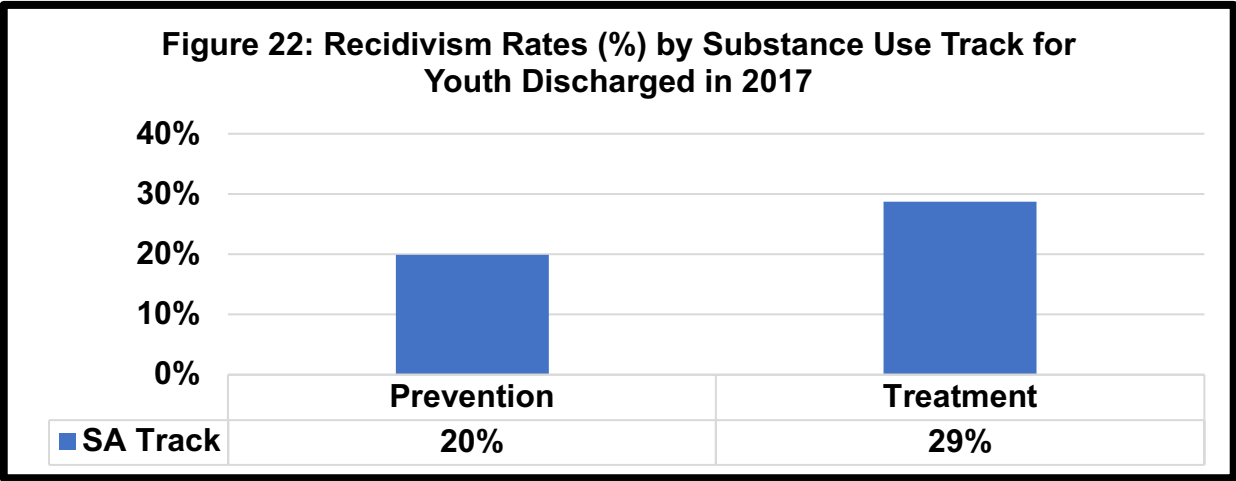
Those who “*Extremely*” agreed with the statement, “*I lose control and explode over minor things every day,*” had a recidivism rate of 50%.



Substance Use

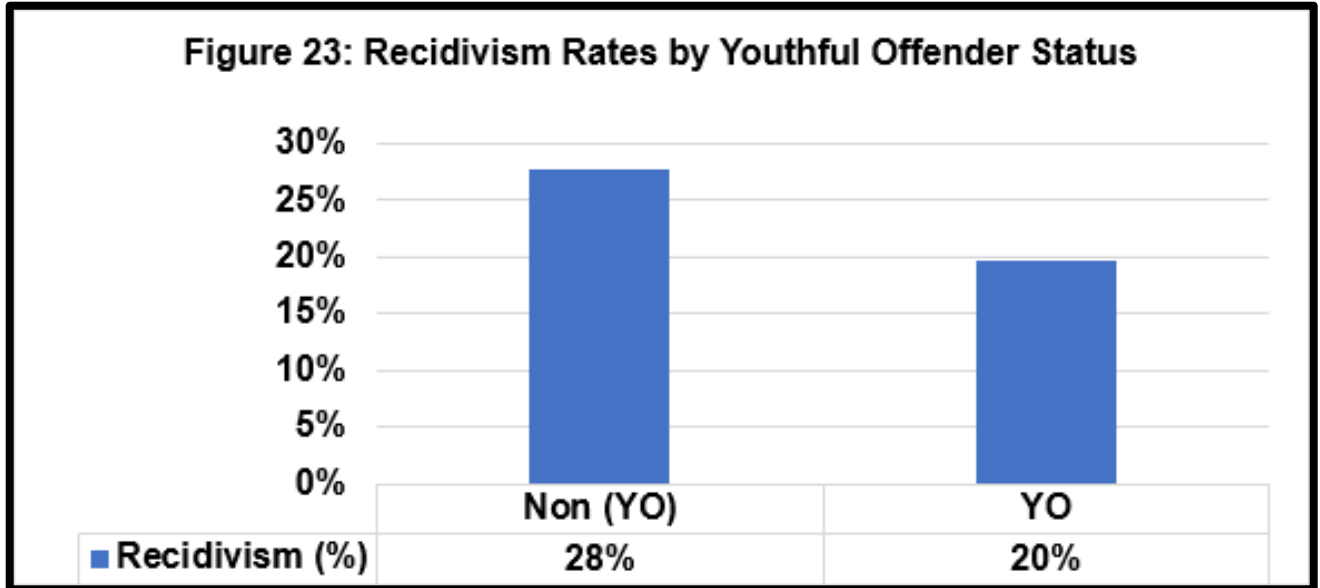
Each DYS committed youth is assigned to either a substance use treatment track or a substance use prevention track. The treatment track is designed for youth who have a history of using substances. The prevention track is designed for youth who have no known history of substance use. Youth who were in the substance use prevention track had a recidivism rate of 20% while those who were in the treatment track had a rate of 29%

(Figure 22).



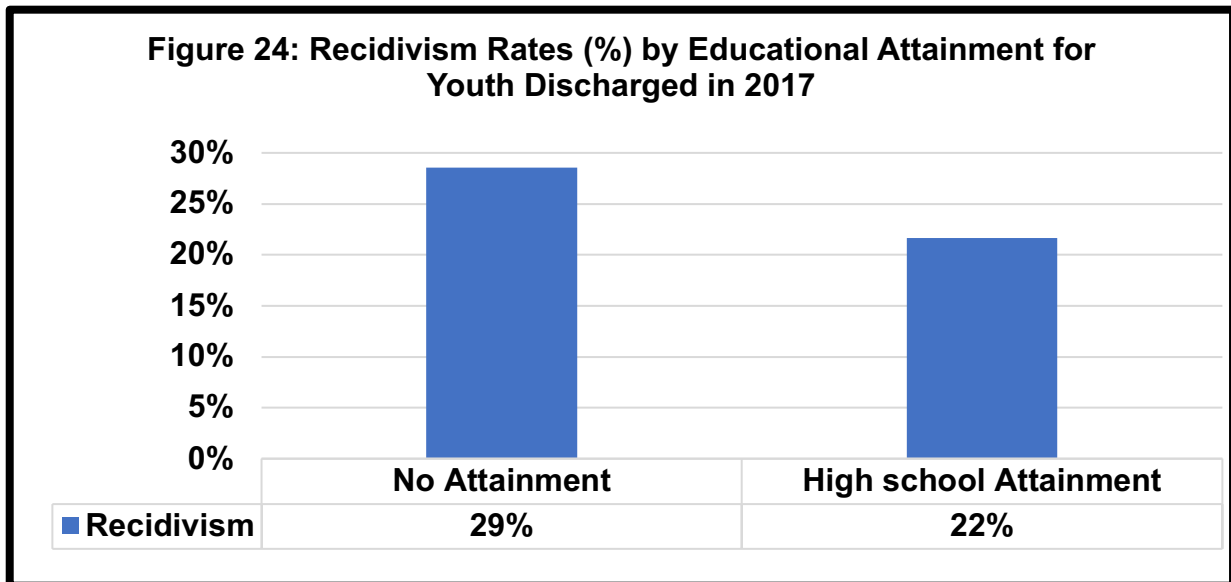
Youthful Offenders

Youth adjudicated as youthful offenders had a recidivism rate of 20%. In comparison, youth adjudicated for delinquent acts had a recidivism rate of 28% (Figure 23). Over the years, the recidivism rates for the two categories has usually been comparable (view chart 21 in Appendix E, page 50). In addition to 2017, 2015 was the other year in which we observed a significant deviation between the two, albeit in the opposite direction. The recidivism rate for youthful offenders surpassed their delinquent counterparts by several percentage points in 2015. In 2015 only 7% of youthful offenders opted into voluntary services as YES youth, whereas in 2017, 44% of youthful offenders signed YES agreements. On April 1, 2016, DYS extended the youthful offender age for YES eligibility to 22, which may have partially contributed to the increase in signed YES agreements. Time spent in the program is a protective factor which could be one possible avenue explaining the gap observed between the two categories.



High School Attainments

Youth earning a high school diploma or equivalency prior to DYS discharge had a recidivism rate of 22%. Youth without a diploma or equivalency had a rate of 29% (Figure 24).



Protective Factors

The recidivism literature has identified several factors that are associated with lower

youth recidivism rates. These are referred to as “protective factors.” Among them are limited involvement in institutional misconduct; constructive use of leisure time; current employment; little or no use of alcohol or drugs; and involvement in school (Baglivio et al. 2017). The current study of the cohort of youth discharged in 2017 identified 7 protective factors (See Figure 26).

7 Protective Factors

- Age of 15 or holder at first arraignment
- More than 6 months of YES services
- Earning a high school diploma or equivalency
- Agreeing with “I am able to get close to someone” on the PTSD Screen
- Strongly disagreeing with “It seems I have no feelings” on the PTSD Screen
- Disagreeing with “I’m Likely to Become Violent” on PTSD Screen
- Agreeing with “I Enjoy the Company of Others” on PTSD Screen

The following section is a summary of some studies’ key findings on juvenile recidivism along with a logistic model estimating the influence of covariates on the likelihood to recidivate.

Empirical Section

Literature Review

There is a clear consensus on the need to tackle juvenile delinquency in the youth population. Research has shown that many criminal tendencies exhibited in adulthood can be traced back to juvenile years (Farrington 1992). Consequently, the likelihood of offending as an adult is closely correlated to whether one was involved with the juvenile justice system. Kalist et al. (2015) used a large dataset of the Pennsylvania juvenile population to analyze and predict both the likelihood of referral to a court after release and the length of time it takes for such an event to occur. Their investigations revealed that socio-economic factors such as youths’ living conditions, the real income per capita, as well as age at time of offense were valid predictors of recidivism. As for a youth’s living condition,

the data indicated that a youth living in a single-parent household is more likely to recidivate.

Furthermore, Ruiz and Pereda's (2021) logistic regression revealed that peer delinquency was a common factor among both youths exposed and those not exposed to family violence. Gang involvement often led to peer pressure and delinquency as a result. Racial differences in term of predicting odds of re-offending have been extensively studied as well. For example, Barrett and Katsiyannis (2015) used a large historical dataset of 100,000 youths involved with South Carolina's Juvenile Agency. They examined how Black youth's tendencies to recidivate differ from their White counterparts by considering common risk factors, such as: referral to child protective services, diagnosis with mental health disorders, learning disabilities, receiving food stamps, and age at first offense. Having a learning disability or receiving food stamps were stronger predictors of recidivism for Black youths than White youths. On the other hand, White youths were more likely to re-offend based on the characteristics of their first offense and being diagnosed with a mental health disorder. The authors also found that being Black and male was attached to a greater likelihood to re-offend, as opposed to being White and female. Also, youth involved in Child Protective Services had a 50% greater chance of re-offending. Diagnosis with a mental health disorder was another variable associated with second-time offenders though the effect of this covariate was more pronounced for Whites than Blacks.

Model Variable Selections

We formulated a logistic regression and analyzed the individual variables (Appendix D) as well as their combined influences on juvenile recidivism. Many of these covariates have been examined in previous studies, which grant credibility to their choice here.

Our (dependent) variable of interest is a binary covariate coded as follow:

1 if the youth has been re-arraigned after discharging from DYS within 1 year or less which later resulted in a conviction,

And 0 if not.

List of independent covariates:

- "Age at initial commitment"
- "Age at Discharge"

- “Gender”
- “Race”
- “Committed less than six months” (1 if yes, 0 otherwise)
- “Last.SA.Track” (Type of substance of use program enrolled in: Treatment vs Prevention)
- “Treatment.LOS” (Length of Stay in Treatment)
- “YES involvement” (1 if enrolled, 0 otherwise)
- “Current.YES.Duration” (Number of days spent in YES)
- “YES.less.than.6.months” (Yes, if spent six months or less in YES, No otherwise)
- “YES Transition” (Yes, if transitioned into YES after discharged, No otherwise)
- “MSO Grid” (A number assigned to each youth based on the severity of their crimes)
- “Attainment Prior to Discharge” (1 if discharged with a high school attainment, 0 otherwise)
- “MA.Community.Type” (The type of community the youth is from)
- “Placement after release” (whether at home or not)
- “Offense type”
- “Total.Residential.Days” (Number of days spent in a residential facility)
- “Total.Community” (Number of days spent in the community under DYS supervision).

The testing period ranged from 2012 to 2017 and included a sample size of 1848 youth who were discharged from DYS commitment.

The variables below have been individually tested to highlight the role of each covariate on the likelihood to recidivate (See Appendix D). The ones that were found to be individually statistically significant were later included in the generalized logistic regression and tested again to confirm their statistical validity in the current study.

Table 8 Multivariate Logistic Regression Result

		Recid (Yes=1, No =0)			
	Estimate	Std. Error	Z-Value	Pr(> z)	Odd Ratios
(Intercept)	-2.72E+00	4.42E-01	-6.148	7.87e-10 ***	0.066
RaceBlack or African American	3.52E-01	1.53E-01	2.302	0.02132 *	1.4225
RaceHispanic	2.80E-01	1.51E-01	1.861	0.06270 .	1.3232
RaceOther	-1.18E-01	2.41E-01	-0.488	0.62554	0.8889

GenMale	1.57E+00	2.87E-01	5.479	4.27e-08 ***	4.8259
LAST.SA.TrackPrevention	-3.05E-01	1.30E-01	-2.357	0.01843 *	0.7368
YES.less.then.6.monthsYes	1.98E-01	2.82E-01	0.702	0.48256	1.2192
Total.Residential.Days	5.86E-04	1.96E-04	2.99	0.00279 **	1.0006
Total.Community	-5.64E-04	2.08E-04	-2.704	0.00685 **	0.9994
MSO.Offense.TypeDrugs	-1.76E-01	3.07E-01	-0.573	0.56638	0.8388
MSO.Offense.TypeMotor Vehicle	7.49E-01	3.24E-01	2.311	0.02082 *	2.1152
MSO.Offense.TypeProperty	7.59E-02	1.53E-01	0.497	0.61946	1.0788
MSO.Offense.TypePublic Order	-5.49E-02	2.17E-01	-0.253	0.80042	0.9466
MSO.Offense.TypeWeapons	3.86E-01	1.82E-01	2.119	0.03406 *	1.4709
Current.YES.Duration	-1.03E-03	6.75E-04	-1.531	0.12589	0.999
YES.TransitionYes	-6.01E-02	1.44E-01	-0.417	0.67682	0.9416
MSO.Grid	-1.83E-02	6.08E-02	-0.302	0.76288	0.9818
Signif. codes: 0 '***' 0.001	'**' 0.01	'*' 0.05	' ' 0.1	' ' 1	

Model Estimations and Results

- Compared to Whites, Black youth faced a 42% higher risk of recidivating within 1 year after discharge from DYS (Odd ratio 1.42), whereas Hispanics faced a 32% higher risk (Odd ratio of 1.32). Prior literature has demonstrated that higher rates of recidivism for Black youths and youth of color more broadly are associated with a number of neighborhood level factors, including the over-policing and overcharging of youth of color. These studies point to the need for considering neighborhood-level factors when understanding racial disproportionalities in recidivism rates, as they may be explained by the over-targeting of racially minoritized communities within the juvenile and adult criminal justice systems.
- Males were 5 times more likely to recidivate than females.
- According to the model, youth adjudicated for Motor Vehicle charges were two times more likely to recidivate as opposed to youth adjudicated for a Person Offense. In addition, those adjudicated for a weapon possession charge were 1.47 more likely to recidivate.
- Youth who were identified as having a substance use disorder as determined by the JASAE¹¹ had a higher rate of recidivism (28.7%) compared to those who do not (19.9%).
- None of the YES variables (such as transitioning into YES or time spent in YES) were statistically significant when included in the general model.

Model Conclusion

Based on the results obtained from the model, those adjudicated for motor vehicle charges were more likely to recidivate, followed by those on a weapons charge. Further, youths identified as having a substance use disorder were at a higher risk for recidivism.

Though, it seems relevant at first, Grid Level loses its significance when tested against other factors. This finding would imply that recidivism is influenced by other variables other than Grid, such as, race, gender, offense type and whether the youth has a substance use disorder. Furthermore, according to the regression analysis, there was no association

¹¹ Juvenile Automated Substance Abuse Evaluation (JASAE) is a computer- assisted instrument for assessing adolescent alcohol and other drug use behavior. The JASAE is an "offspring" of the adult instrument, the SUBSTANCE ABUSE/LIFE CIRCUMSTANCE EVALUATION, known as the SALCE. Source: https://adeincorp.com/documents/jasae_ref_guide.pdf

between recidivism and a youth's age or their length of stay. By the same token, length of stay in treatment (Treatment.LOS) was not statistically significant.

Time spent in DYS' custody (Total.Days.Committed) was also not influential. The same conclusion was drawn when we tested a youth's placement conditions. A youth can be placed either in staff secure, hardware secure, or in the community. In many circumstances, a youth will transition from hardware to staff secure (step down).

Sometimes, a youth will go from staff secure to hardware secure (step up). In neither case was there a significant impact on recidivism. Finally, we tested whether a youth's placement after release from treatment was relevant in predicting recidivism rates. The result is inconclusive: there seems to be no relation between where a youth ends up after being released and their likelihood to recidivate.

For future studies, other variables need to be considered such as involvement with DCF (Massachusetts child protective services), gang involvement or affiliation, family relations and engagement, parental education level, family income, school involvement after discharge, income per capita, access to social security and social welfare services, whether a family is receiving transitional assistance services, etc., that might more comprehensively explain the phenomenon of recidivism. Importantly, neighborhood and community level factors such as racialized policing practices as well as racialized practices in the arrest, arraignment, charging, and adjudication of youth need to be considered to account for *why* recidivism rates are racially disparate. Consequently, data on these variables need to be collected and tested.

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Appendix A Offense List

Offense	Offense Type
A&B	Person
A&B ON A CORRECTIONS OFFICER	Person
A&B ON A PUBLIC SERVANT	Person
A&B ON CHILD WITH INJURY	Person
A&B ON ELDER (+60)/DISABLED PERSON; BODILY INJURY	Person
A&B ON RETARDED PERSON	Person
A&B W/INTENT TO MURDER	Person
A&B WITH DANGEROUS WEAPON	Person
ABANDONMENT	Public Order
ABDUCTING FEMALES TO BE PROSTITUTES	Public Order
ABDUCTION	Person
ABUSE OF A FEMALE CHILD	Person
ABUSE PREVENTION ACT (VIOLATING RESTRAINING ORDER)	Public Order
ACCESSORY AFTER THE FACT	Public Order
ACCESSORY TO MURDER - AFTER FACT	Person
ACCOSTING	Public Order
ADULTERY	Public Order
AFFRAY	Public Order
ARMED ASSAULT & ROBBERY	Person
ARMED ASSAULT IN DWELLING	Person
ARMED ROBBERY	Person
ARMED ROBBERY WHILE MASKED	Person
ARSON	Property
ASSAULT	Person
ASSAULT W/INTENT TO MURDER	Person
ASSAULT WITH DANGEROUS WEAPON	Person
ASSUMING TO BE AN OFFICER	Public Order
ATTACHING WRONG PLATES-124P, 124B	Motor Vehicle
ATTEMPT TO COMMIT A CRIME	Public Order
ATTEMPT TO KIDNAP	Person
ATTEMPTED ARSON	Property
ATTEMPTED B&E DAYTIME	Property
ATTEMPTED B&E NIGHT	Property
ATTEMPTED MURDER	Person
ATTEMPTED RAPE	Person
ATTEMPTED SUICIDE	Public Order
ATTEMPTED UNARMED ROBBERY	Person
B&E	Property
BIGAMY OR POLYGAMY	Public Order
BOMB THREAT	Weapons
BOXING MATCHES	Public Order
BREAKING GLASS	Property
BRIBE	Public Order
BURGLARY, UNARMED	Property
BURN A MEETING HOUSE	Property
BURNING A DWELLING	Property

Offense	Offense Type
CARJACKING	Motor Vehicle
CARNAL ABUSE OF A FEMALE	Person
CARRYING A DANGEROUS WEAPON IN SCHOOL	Weapons
CARRYING A FIREARM IN A MOTOR VEHICLE	Weapons
CARRYING DANGEROUS WEAPON	Weapons
CIVIL RIGHTS ORDER VIOLATION	Public Order
COERCION TO JOIN A GANG	Public Order
COMPULSORY INSURANCE LAW-118A	Motor Vehicle
CONSPIRACY TO VIOLATE DRUG LAWS	Drug
CONSPIRACY-OTHER CRIME	Public Order
CONTEMPT OF COURT (COURT VIOLATION)	Public Order
CONTRIBUTING TO THE DELENQUINCY OF A MINOR	Public Order
COUNTERFEIT MONEY	Property
DISCHARGING A FIREARM WITHIN 500 FEET OF A BUILDING	Weapons
DISORDERLY CONDUCT	Public Order
DISTRIBUTE (CLASS A)	Drug
DISTRIBUTE (CLASS B)-COCAINE	Drug
DISTRIBUTE (CLASS C)	Drug
DISTRIBUTE (CLASS D)	Drug
DISTRIBUTE (CLASS E)	Drug
DISTRIBUTE TO MINOR (CLASS A)	Drug
DISTRIBUTE TO MINOR (CLASS B)	Drug
DISTRIBUTE TO MINOR (CLASS C)	Drug
DISTRIBUTING IN A SCHOOL ZONE	Drug
DISTURBING A SCHOOL ASSEMBLY	Public Order
DISTURBING THE PEACE	Public Order
FAILURE TO APPEAR ON PERSONAL RECOGNIZANCE	Public Order
FALSE FIRE ALARM	Public Order
FORGERY ON CHECK OR PROMISSORY NOTE	Property
GAMBLING	Public Order
GUN LAW-CARRYING A FIREARM	Weapons
HAVING A FIREARM W/O A PERMIT	Weapons
HAVING ALCOHOL ON MDC RESERVATION	Public Order
HOME INVASION	Person
IDLE AND DISORDERLY	Public Order
ILLEGAL POSSESSION OF FIREWORKS	Weapons
INDECENT A&B	Person
INTIMIDATING A GOVERNMENT WITNESS	Public Order
KIDNAPPING	Person
LARCENY LESS	Property
LARCENY MORE (FELONY)	Property
LEAVING SCENE OF ACCIDENT AFTER INJURING PERSON	Motor Vehicle
LEAVING SCENE OF ACCIDENT AFTER INJURING PROPERTY	Motor Vehicle
MALICIOUS DESTRUCTION OF PROPERTY-OVER \$250	Property
MALICIOUS DESTRUCTION OF PROPERTY-UNDER \$250	Property
MANSLAUGHTER	Person

Offense	Offense Type
MINOR POSSESSING ALCOHOL	Public Order
MURDER IN THE 1ST DEGREE	Person
MURDER IN THE 2ND DEGREE	Person
OBSTRUCTING JUSTICE	Public Order
OPEN AND GROSS LEWDNESS	Public Order
OPERATING AS TO ENDANGER LIVES AND SAFETY-112A	Motor Vehicle
OPERATING UNDER THE INFLUENCE OF LIQUOR-111A	Motor Vehicle
OPERATING WITHOUT A LICENSE-114F	Motor Vehicle
PERJURY	Public Order
POSSESSION (CLASS A)	Drug
POSSESSION (CLASS B)	Drug
POSSESSION (CLASS C)	Drug
POSSESSION (CLASS D)	Drug
POSSESSION (CLASS E)	Drug
POSSESSION OF A DANGEROUS WEAPON	Weapons
POSSESSION OF BURGULAROUS TOOLS	Property
POSSESSION WITH INTENT TO DISPENSE (CLASS A)	Drug
POSSESSION WITH INTENT TO DISPENSE (CLASS B)	Drug
POSSESSION WITH INTENT TO DISPENSE (CLASS C)	Drug
POSSESSION WITH INTENT TO DISPENSE (CLASS D)	Drug
POSSESSION WITH INTENT TO DISPENSE (CLASS E)	Drug
POSSESSION-MARIJUANA (CLASS D)	Drug
PROSTITUTION	Public Order
RAPE	Person
RAPE OF CHILD	Person
RECEIVING AND/OR CONCEALING STOLEN PROPERTY	Property
RESISTING ARREST	Public Order
SHOPLIFTING	Public Order
SPEEDING-116A	Motor Vehicle
STALKING	Public Order
STATUTORY RAPE	Person
THREATENING	Public Order
TRESSPASS	Public Order
UNARMED ROBBERY	Person
USE WITHOUT AUTHORITY-114A	Motor Vehicle
VIOLATION OF PROBATION	Public Order
WANTON DESTRUCTION OF PROPERTY-OVER \$250	Property
WANTON DESTRUCTION OF PROPERTY-UNDER \$250	Property

Appendix B

DYS Regions by County

DYS Central Region

- Worcester County

DYS Metro Region

- Suffolk County

DYS Northeast Region

- Essex County
- Middlesex County

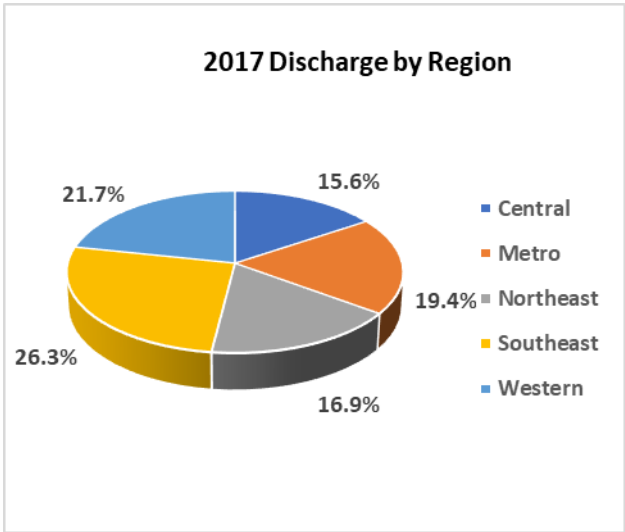
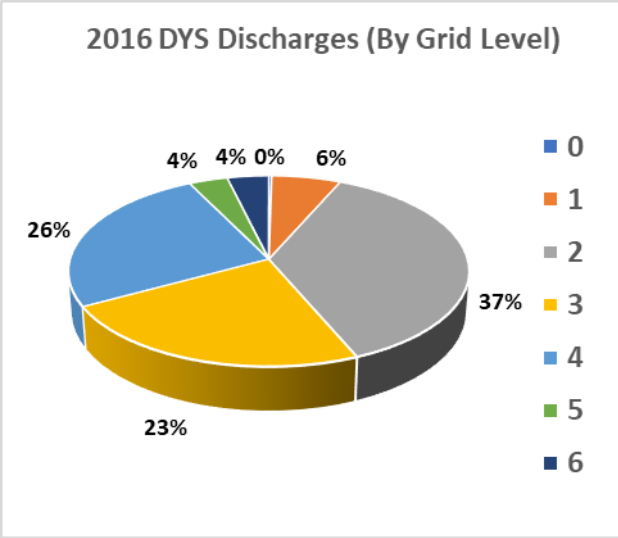
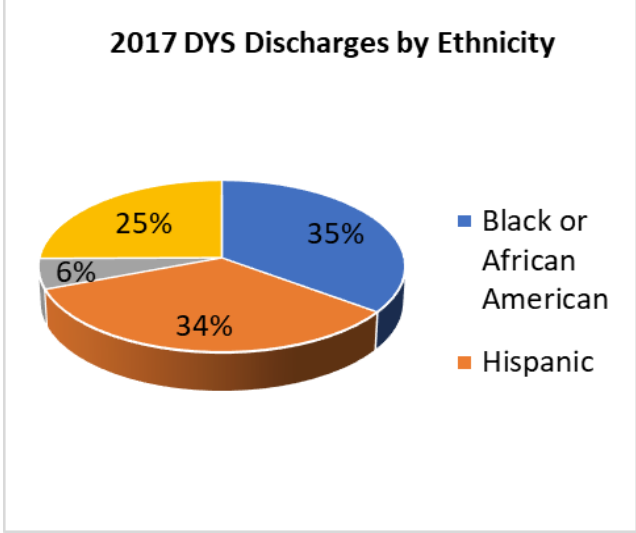
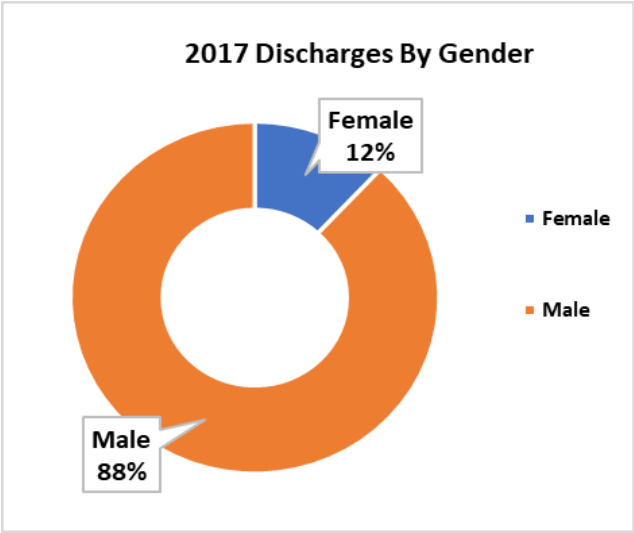
DYS Southeast Region

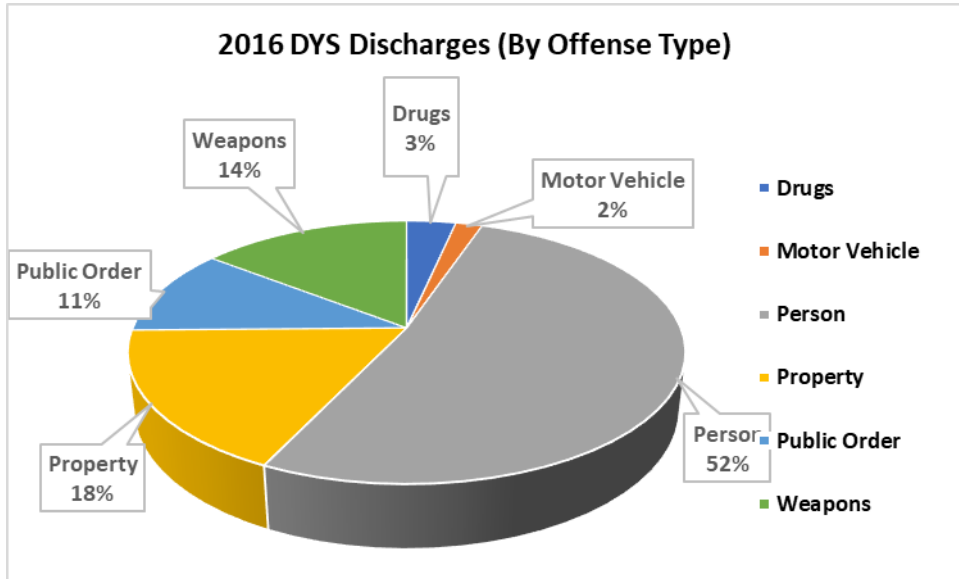
- Barnstable County
- Bristol County
- Dukes County
- Nantucket County
- Norfolk County
- Plymouth County

DYS Western Region

- Berkshire County
- Franklin County
- Hampden County
- Hampshire County

Appendix C Demographics of the Subjects





Appendix D

Univariate Models Estimation Result

Dependent Variable Recidivism (Yes=1, No =0)

Model 1

Independent Vars	Estimate	Pr(> z)	Odd Ratios
Black	0.37	0.00405 **	1.44
Hispanic	0.26	0.05814 .	1.35
Other	0.01	0.97	0.84

Black youth were 1.44 times more likely to recidivate when compared to White youth.

Model 2

Independent Vars	Estimate	Pr(> z)	Odd Ratios
Male	1.71	8e-13 ***	5.51

A male youth was at least five times more likely to re-offend when compared to a female.

Model 3

Independent Vars	Estimate	Pr(> z)	Odd Ratios
LAST.SA.Track (Prevention)	-0.46	7.17e-05 ***	0.63

Youth in a substance prevention program were 37% less likely to recidivate when compared to youth who were in treatment for substance use.

Model 4

Independent Vars	Estimate	Pr(> z)	Odd Ratios
Total.Residential.Days	0.00	2.09e-05 ***	1

Model 5

Independent Vars	Estimate	Pr(> z)	Odd Ratios
Total.Community	0.00	0.00105 **	1

Length of stay in a residential program and time in the community did not have an impact on the likelihood to recidivate

Model 6

Independent Vars	Estimate	Pr(> z)	Odd Ratios
MSO.Offense.Type (Drugs)	0.04	0.88	1.04
MSO.Offense.Type (Motor Vehicle)	0.73	0.01220 *	2.08
MSO.Offense.Type (Property)	-0.02	0.89	0.98
MSO.Offense.Type (Public Order)	-0.19	0.34	0.83
MSO.Offense.Type (Weapons)	0.58	0.00062 ***	1.78

A Motor Vehicle offense puts a youth at a greater risk of recidivism (Odd ratio 2.08) followed by being charged on a Weapon offense (Odd ratio 1.78).

Model 7

Independent Vars	Estimate	Pr(> z)	Odd Ratios
YES.less.then.6. months (Yes)	0.78	5.62e-07 ***	2.18

Those who spent less than six months in the YES program had a higher odd to recidivate (Odd ratio 2.18)

Model 8

YES.Transition (Yes)	-0.24	0.0155 ***	0.78
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Enrolling into YES reduced the odds (-33%) of recidivating; however, spending less than six months in YES appears to negate the benefits of the program (odd ratio 2.18).

Model 9

MSO.Grid	0.13	0.0126 *	1.13
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One point increase in the grid level caused the likelihood to recidivate to increase to 13%.

Appendix E
YO vs Non-YO Recidivism Rate

Figure 25: YO Recidivism rate (%) from 2012 to 2017

