

Secondary and Post-Secondary Educational Outcomes and Recidivism Among Juvenile- Justice Involved Youth in Massachusetts: 2012-2022

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Summary of Findings

The Implications of caseworkers:

- **Caseworkers** with whom youth were working with during commitment **matter for youth outcomes after DYS discharge.**

The Implications of the Youth Engaged in Services (YES) Initiative:

- Among youth who had not received a high school attainment (a traditional diploma or passing a GED/HiSet exam), **YES participation** was significantly correlated with **higher rates of both diploma and GED/HiSet attainment after discharge.**

Recidivism:

- The **average recidivism rate** was **23.7%**.
- From the 2015 to 2019 discharge year, there was **a statistically significant decreasing trend** in recidivism.
- Male youth (26.1%) were more likely to recidivate than female youth (7.3%).
- ELL youth (30.8%) were more likely to recidivate than non-ELL youth (22.0%).
- Youth with “Step up” treatment placement had the highest recidivism rate (33.3%).

High School Diploma Attainment:

- The **average high school graduation rate** was **26.4%** (12.3% during commitment and 14.1% after discharge).
- From the 2015 to 2021 discharge year, there was **a statistically significant increasing trend in high school graduation after DYS discharge.**
- Female, youth from the Central service region, youthful offenders, and youth first committed at an older age were more likely to graduate from high school **before DYS discharge.**
- Youth from the Central service region, non youthful offenders, and youth first committed at a younger age were more likely to graduate from high school **after DYS discharge.**

High School Equivalency Attainment (GED/HiSet):

- The **average HS Equivalency (GED/HiSet) attainment rate** was **16.6%** (12.2% during commitment and 4.4% after discharge).
- From the 2015 to 2021 discharge year, there was **a slight but statistically significant decreasing trend in HS Equivalency attainment after DYS discharge.**
- **Youth of color** were less likely to attain a HS Equivalency before DYS discharge than white youth.
- **ELL and SPED youth** were less likely to attain a HS Equivalency both before and after DYS discharge.

- Youthful offenders, youth from the Northeast service region, and youth who had longer treatment program at staff secure placement were more likely to attain a HS Equivalency before DYS discharge.

Post-Secondary Enrollment:

- The **average post-secondary enrollment rate was 14.7%** (7.0% during commitment and 7.7% after discharge for initial enrollment).
- From the 2015 to 2021 discharge year, there was **a statistically significant decreasing trend in initial post-secondary enrollment after DYS discharge.**
- Hispanic youth, ELL youth, SPED youth, and youth from the Central service region were less likely to enroll in a post-secondary institution before DYS discharge.
- Youthful offenders and youth first committed at an older age were more likely to enroll in a post-secondary institution before DYS discharge.
- Female and youth with either a high school diploma or GED/HiSet attainment before discharge were more likely to enroll in a post-secondary institution after DYS discharge.

Background

The Massachusetts Department of Youth Services (DYS) has a vision that “...every young person [in the Commonwealth] has the skills, supports, and resources necessary to engage safely with their communities, and lead productive and fulfilling lives.” This vision drives DHS’s work to provide high-quality secondary and post-secondary education, career exploration, and workforce development opportunities for DHS-involved youth. Thus, DHS takes a strength-based and equity-focused approach to educational and workforce programming for youth between the ages of 12 and 21.

To support the continuous improvement of DHS’s programmatic work to support the youth in their care, the current report answers the following research questions:

1. What are the recidivism rates among DHS-involved youth across years?
2. What factors contribute to recidivism among DHS-involved youth?
3. At what rates are DHS-involved youth graduating from high school, earning a high school equivalency, or dropping out of high school?
4. What factors contribute to a high school diploma or equivalency attainment among DHS-involved youth, distinguished by whether such attainment was received prior to or after being discharged from DHS?
5. At what rates are DHS-involved youth enrolling in and completing postsecondary degrees?
6. What factors contribute to post-secondary enrollment among DHS-involved youth, distinguished by whether the initial enrollment was prior to or after being discharged from DHS?
7. What are the implications of DHS’s post-commitment support program, the Youth Engaged in Services (YES) Initiative, on the educational outcomes and recidivism of DHS-involved youth?

The analyses in this report are a follow-up to previous reports from the authors for DHS on secondary and post-secondary outcomes for DHS-involved youth and the implications of YES participation on recidivism. In this report, we have included three additional years of data from the Department of Elementary and Secondary Education (i.e., SIMS data from the 2012-2014 school years), allowing for expanding the previous sample and improving the precision in estimating high school educational outcomes. In addition, we included an additional one year of recidivism data for the YES analysis and added secondary and post-secondary outcomes to the YES analysis.

The report is organized into five sections:

1. Methodology including data sources, samples, measures, and the analysis plan.

2. Trends in recidivism rates across DYS discharge year and statistically significant variables correlated with recidivism.
3. Secondary attainments including trends of five-year high school diploma and five-year high school equivalency (GED/HiSet) attainment, distinguished by whether such attainment was received prior to or after being discharged from DYS. We also reported statistically significant variables associated with these attainments.
4. Post-secondary enrollment and attainment distinguished by whether such enrollment and attainment was received prior to or after being discharged from DYS. We also reported statistically significant variables associated with these attainments.
5. Effects of DYS's post-commitment support program, the Youth Engaged in Services (YES) Initiative, on various youth outcomes after the mandatory DYS commitment (i.e., recidivism, five-year high school diploma attainment, five-year GED/HiSet attainment, and initial post-secondary enrollment).

Methodology

This section details the methodology used for the analyses. First, we describe the data used in the current report, which were provided by the Massachusetts Department of Youth Services (DYS) and the Massachusetts Department of Elementary and Secondary Education (DESE). Next, we describe measures used to assess recidivism, secondary and post-secondary outcomes, youth-level factors, and DHS-related factors. Then, we outline the sample selection process and describe the sample characteristics. Finally, we describe our analysis plan for answering the research questions.

Data Sources

We merged and integrated data from both DHS and DESE based on unique student identifiers present in both data. For the current report, the following four data sources from DESE were used in addition to DHS data on youth demographics, commitment, discharge, and recidivism.

- Graduation cohort indicator for youth who were discharged from DHS between 2015 and 2021.
- The Student Information Management System (SIMS) data from the 2011-12 school year to the 2021-22 school year (i.e., 2011 Fall to 2022 Spring)
- The GED/HiSet attainment data from the 2014-15 school year to the 2021-22 school year (i.e., 2014 Fall to 2022 Spring)
- The National Student Clearinghouse (NSC) data on enrollment in post-secondary institutions for (1) high school graduates between 2013 and 2022 and (2) two batches of non-graduates submitted by DESE to NSC in 2019 and 2022.

Measures

Recidivism

Recidivism: DHS defined recidivism as being convicted in the adult criminal justice system within three years of discharge from DHS for an offense committed within one year of discharge from DHS.

High School Outcomes

High School Graduation: Students were identified as having graduated from high school if, based on DESE’s designation, the student completed all of Massachusetts’ high school diploma requirements within five years of their first enrollment in 9th grade.¹

High School Equivalency: Students were considered to have successfully earned a high school equivalency if they earned a GED or HiSet credential within five years of their first enrollment in 9th grade.

High School Dropout: Students were considered to have dropped out of high school if their last official enrollment status was “dropout,” based on DESE’s designation, and they did not earn a high school equivalency within five years of their first enrollment in 9th grade.²

Post-secondary Outcomes

Postsecondary Enrollment: Youth were considered enrolled in postsecondary education if they had at least one postsecondary enrollment reported in the available NSC datasets.

Postsecondary Graduation: Youth were considered to have graduated from a postsecondary institution if they had data on graduation reported in the available NSC datasets.

Youth Demographics

Gender: Youth were coded as either male or female. This variable came from the DYS dataset.³

Race and ethnicity: Youth were coded as one of the following four categories: African American (non-Hispanic), Hispanic, White (non-Hispanic), or Others. The “Others” category aggregates

¹ Although DESE reports both the four-year and five-year graduation rate (i.e., four and five-years from first enrollment in 9th grade), our previous analysis of secondary outcomes for DYS-involved youth showed that the five-year rate is a more appropriate measure for understanding the educational success of youth since DYS involvement connotes an educational disruption. Four- and six-year rates are available from the report authors upon request.

² Note that this definition of dropout is different from DESE’s definition, since DESE considers a youth to be a dropout regardless of high school equivalency status.

³ Although there are youth in DYS who identify as transgender or non-binary, the population size is too small to include in our analyses. DYS has a variable that denotes if youth identify as being a category within LGBTQ+, including whether they identify as transgender. However, there was too much missingness for the variable to be informative.

youth, due to low count, who identified as multi-racial or any other non-Hispanic racial groups outside of African American and White. This variable came from the DYS dataset.⁴

English Language Learner (ELL) Status: Youth were coded as English Language Learners if they were ever identified as an English Language Learner within the available data. This variable came from DESE's SIMS dataset. As an example, if a youth was enrolled in 5th grade in a MA public school during the 2011-2012 school year (the first year for which we have DESE data) and they were an ELL student in 5th grade, we would denote them as being an ELL student.

Special Education (SPED) Status: Youth were coded as special education students if they had ever received SPED services in any of the school years for which data were available. This variable came from DESE's SIMS dataset. As an example, if a youth was enrolled in 5th grade in a MA public school during the 2011-2012 school year (the first year for which we have DESE data) and they were receiving special education services in 5th grade, we would denote them as being a SPED student.

DYS-Related Factors

DYS Discharge Year: This variable describes the year in which youth's mandatory DYS commitment ended⁵.

DYS Service Region: DYS places youth in one of five service regions based on their home addresses: Central, Metro, Northeast, Southeast, or Western Massachusetts. This variable describes where youth were placed.

Youthful Offender Status: This variable denotes whether the youth was classified as a youthful offender. Youthful offenders are youth who committed a felony offense and additionally met at least one of the following: had a prior DYS commitment, or committed a firearms offense or an offense that involved infliction or threat of serious bodily harm.

⁴ The "Others" category included youth who identified as multiracial (N = 36; 1.87%), Asian (N = 17, 0.88%; Native Hawaiian or Other Pacific Islanders (N = 3; 0.16%), other (N = 65, 3.38%), or chose not to self-identify (24; 1.25%).

⁵ The age at which a youth is discharged from commitment is determined at adjudication and may be 18, 19, 20, or 21. Most young people committed to DYS will be discharged at age 18; however, a small number may be discharged at age 19 or 20, based on their age at the time of adjudication, or at age 21 if adjudicated as a Youthful Offender.

Treatment Length: This variable describes the length of time youth spent in DYS treatment programs. There are four categories: Less than six months, six to twelve months, twelve to eighteen months, and more than eighteen months.

Treatment Condition: This variable describes the youth's treatment program placement. There are five categories: No DYS treatment programs, hardware secure only, staff secure only, step up, and step down. *Step up* indicates that youth were placed in a staff secure treatment program at the beginning but later moved to a hardware secure placement. In contrast, *step down* indicates that youth were placed in a hardware secure treatment program at the beginning and later moved to a staff secure placement.

Age at Initial Commitment: This variable denotes the age of youth when they were committed to DYS for the first time.

YES Participation: The Youth Engaged in Services (YES) Initiative is a voluntary post-discharge service program that provides key supports related to housing, education, employment, and mental health as young people transition back into their communities. Youth were coded as YES youth or non-YES youth based on whether they participated in the YES Initiative, regardless of whether they engaged immediately at discharge or later.

Caseworker at DYS discharge: The caseworker whom a youth was working with upon being discharged from DYS. This variable was used as a level two indicator in all multilevel, multivariate logistic regression models.

Graduation Cohort

DESE assigns every student to a graduation cohort based on the year in which they are anticipated to graduate if they complete high school four years after they first enrolled in 9th grade. For example, the 2015 graduation cohort consists of students who enrolled in 9th grade for the first time during the 2011–2012 school year (or, the student enrolled in 10th grade for the first time in the 2012–2013 school year, etc.). Accordingly, if a student in the 2015 graduation cohort completes high school within four years, they are expected to graduate in June of 2015. If a student in the 2015 graduation cohort completes high school in five years, they would graduate in June of 2016.

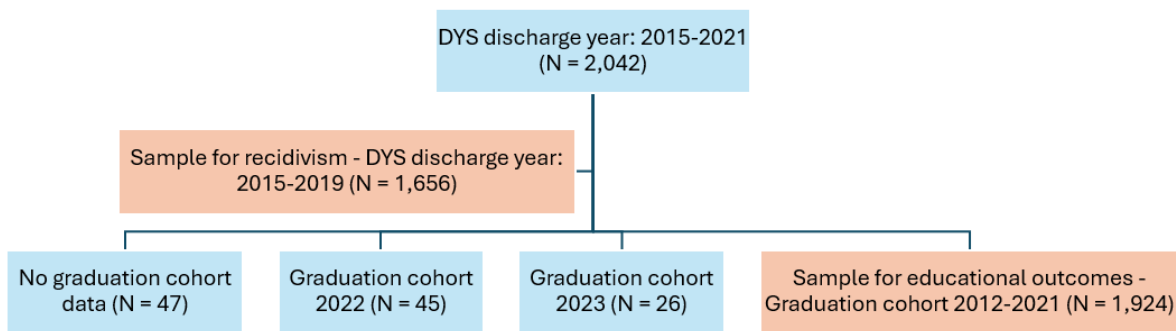
Sample Selection

For analyses on educational outcomes - including high school graduation, high school equivalency, high school dropout, and post-secondary enrollment - we used a sample of 1,924 previously DYS-

involved youth (Sample 1). This sample enabled us to calculate graduation rates in the same way DESE calculates them. This sample of youth both had graduation cohort data between 2015 and 2021. SIMS data was available from the 2011-12 school year to 2021-2022 school year and that we reported five-year outcomes (see Figure 1 for illustration).

For analyses on recidivism, we used a sample of 1,656 previously DYS-involved youth who had been discharged from DYS between 2015 and 2019 (Sample 2) since youth from the 2019 discharge year had the most recent recidivism data.

Figure 1. Sample selection procedure



Sample Description

For the educational outcomes sample (N = 1,924), the majority of youth were male (87.2%). Of the full sample, 61.0% were reported to have received special education services (SPED) and 17.4% had been English Language Learners (ELL). For race and ethnicity, the largest group of youth identified as being Hispanic (39.6%), followed by African American (27.2%) and White (25.4%). Youth were roughly evenly distributed across the five DYS service regions (16.6% Central, 16.1% Metro, 21.0% Northeast, 25.0% Southeast, 21.4% Western), with the Southeast region representing a slightly higher percentage. In terms of the seriousness of the offense for which they were committed, most youth were classified as a non-youthful offender (82.9%).

For the recidivism sample (N = 1,656), the majority of youth were male (86.8%). Of the full sample, 59.4% were reported to have received special education services (SPED) and 16% had been English Language Learners (ELL). For race and ethnicity, the largest group of youth identified as being Hispanic (39.6%), followed by African American (27.0%) and White (25.9%). Youth were roughly evenly distributed across the five DYS service regions (17.2% Central, 16.4% Metro, 19.9% Northeast, 24.5% Southeast, 22.2% Western), with the Southeast region representing a slightly

higher percentage. In terms of the seriousness of the offense for which they were committed, most youth were classified as a non-youthful offender (85.9%).

There were no statistically significant differences in student characteristics or DYS-related factors between Sample 1 and Sample 2.

Analysis Plan

In Appendix A, we outline how we calculated the rates. For significance testing, we used a multilevel modeling framework with covariates. Including a set of meaningful predictor variables (see Appendix B and C for all variables included in the models) in the same regression model allows for parsing out the unique contribution of each predictor variable to the outcome examined when controlling for others.

Importantly, any significant correlations should not be interpreted as causal influences on any of the outcomes. Rather, these analyses provide insights into which youth might need extra supports from DYS and other agencies within the state.

We incorporated a multilevel framework, with youth clustered within caseworkers, since some variation of youth outcomes can be explained by certain characteristics of the caseworker. This assumption was supported by a statistically significant⁶ intraclass correlation (ICC) for outcomes examined.

Among all youth,

- 3.5% of the variance in recidivism was explained by caseworker at discharge (95% CI = [0.01, 0.11]).
- 3.7 % of the variance in high school equivalency attainment (i.e., GED/HiSet) before discharge was explained by caseworker at discharge (95% CI = [0.01, 0.13]).

Among youth who had not received any secondary educational attainment before discharge,

- 9.0% of the variance in high school diploma attainment after discharge was explained by caseworker at discharge (95% CI = [0.04, 0.18]).
- 6.0% of the variance in high school equivalency attainment (i.e., GED/HiSet) after discharge was explained by caseworker at discharge (95% CI = [0.01, 0.28]).

⁶ If the 95% confidence interval (CI) for the intraclass correlation (ICC) does not contain zero, we said that this ICC is statistically significant.

Among youth who had not been enrolled in any postsecondary institutions before discharge,

- 4.1% of the variance in post-secondary enrollment after discharge was explained by caseworker at discharge (95% CI = [0.01, 0.19]).

The ICCs for high school graduation before discharge (95% CI = [0.00, 1.00]) and post-secondary enrollment before discharge (95% CI = [0.00, 0.38]) were not statistically significant. Nevertheless, we still used the multilevel model to remain consistent with other outcomes.

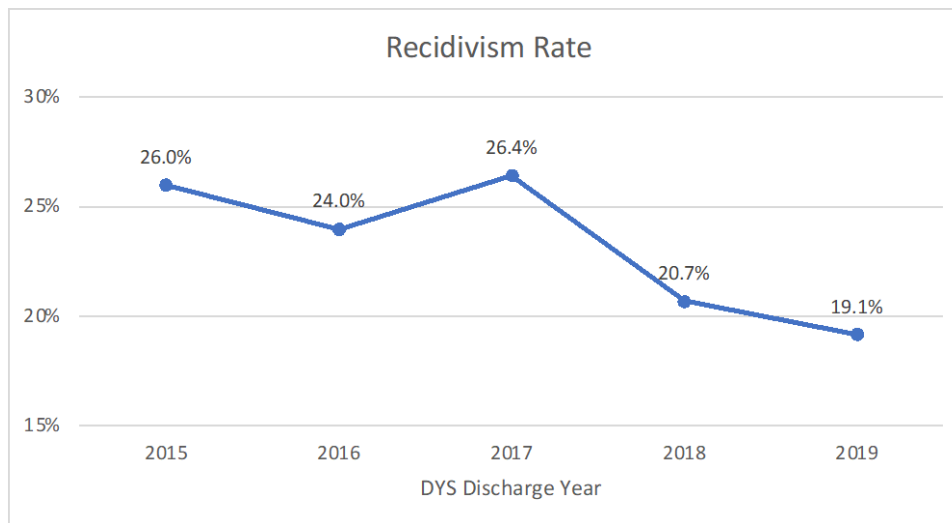
Recidivism

Overall Rates and Trends Across DYS Discharge Years

Among youth who were discharged from DYS between 2015 and 2019 (N = 1,656), **the average recidivism rate was 23.7%.**

As shown in Figure 2, despite the spike of the 2017 discharge cohort (26.4%), the recidivism rate has been **significantly decreasing since 2015**, when controlling for other variables in a logistic regression model (OR = 0.90, p = .04).

Figure 2. Recidivism rate across DYS discharge year



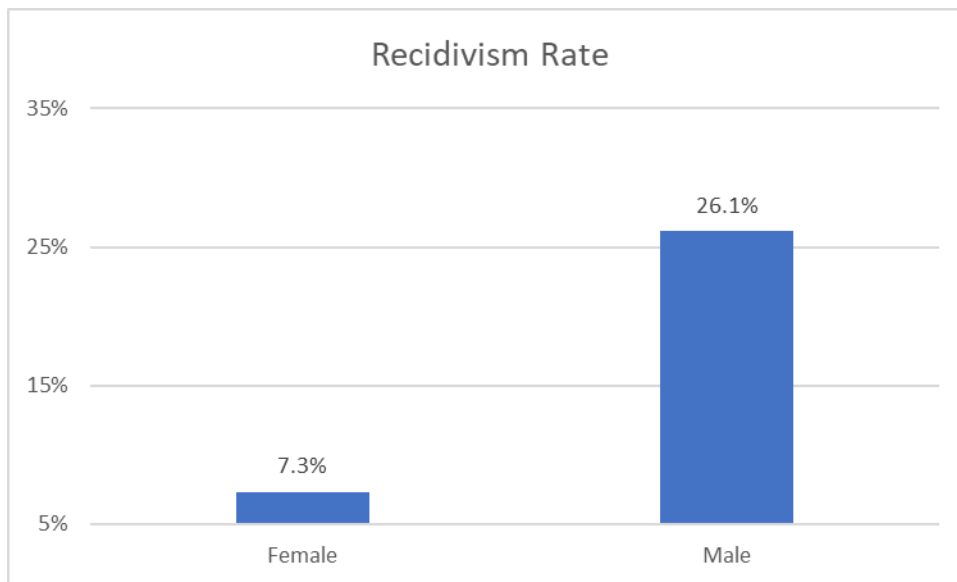
Factors Correlated with Recidivism

After controlling for other variables, the following variables were still significantly correlated with recidivism: **gender, English learner status, DYS service region, and treatment placement condition.** On the other hand, race and ethnicity, special education status, age at initial commitment, youthful offender status, treatment length, whether a high school diploma or equivalency had been attained by discharge, or whether there had been any post-secondary enrollment by discharge were not significantly correlated with recidivism.

Differences by Gender

As shown in Figure 3, the average recidivism rate was 7.3% for female youth and 26.1% for male youth. After controlling for other variables in a logistic regression model, **the odds of recidivism among female youth were 75% lower compared to male youth** (OR = 0.25, p < .001).

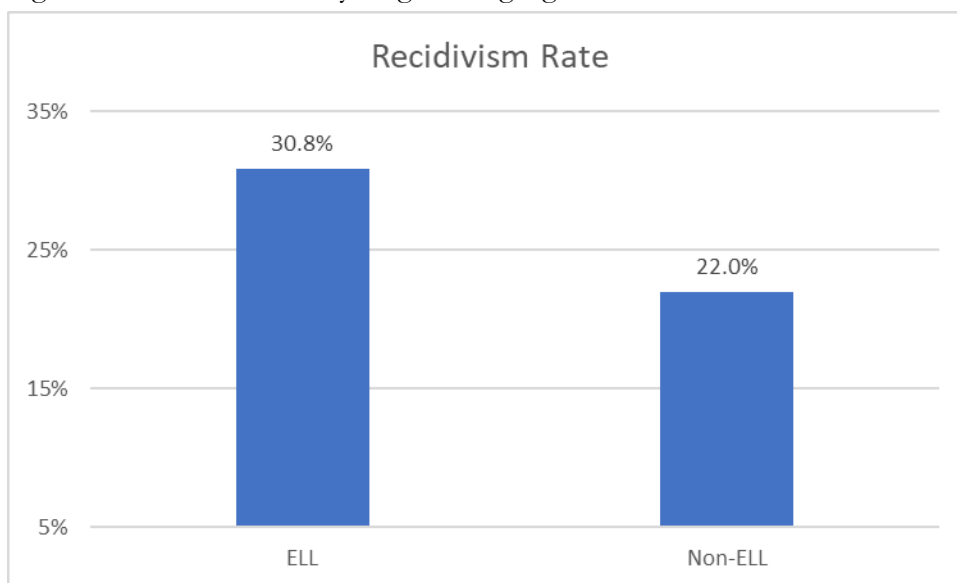
Figure 3. Recidivism rate by youth gender



Differences by English Learner Status

As shown in Figure 4, the average recidivism rate was 30.8% for English language learners (ELL) and 22.0% for non-ELL youth. After controlling for other variables in a logistic regression model, **the odds of recidivism among ELL youth were 69% higher compared to non-ELL youth (OR = 1.69, p = .003).**

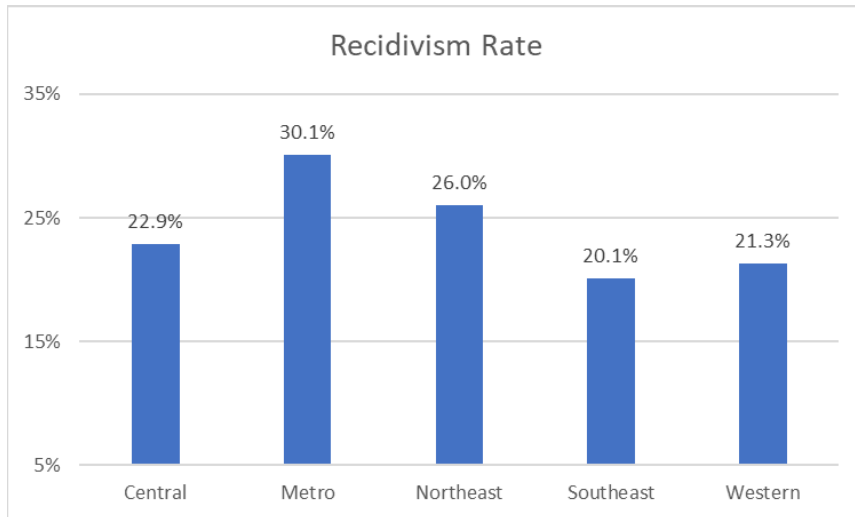
Figure 4. Recidivism rate by English language learner status



Differences by DYS-Designated Service Region

Figure 5 displays average recidivism rates of different DYS-designated service regions. After controlling for other variables in logistic regression model, **the odds of recidivism among youth from the Southeast region were 36% lower compared to youth from the Northeast service region** (OR = 0.64, $p = .04$). Differences in rates of recidivism were not statistically significant in other pairs of comparison.

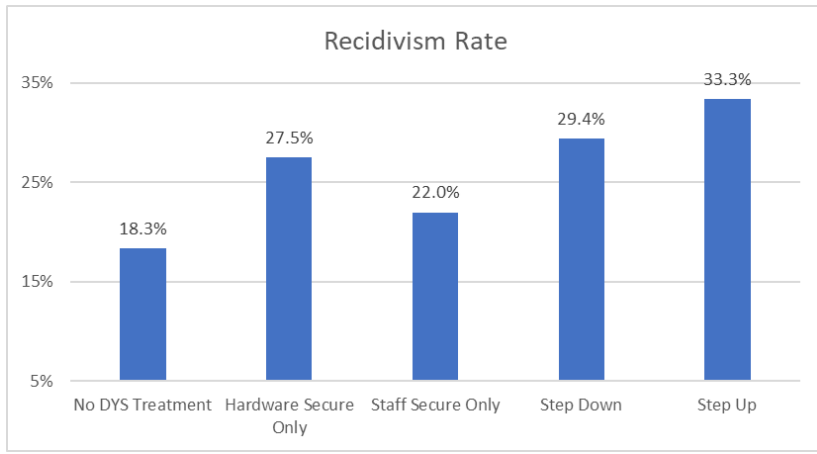
Figure 5. Recidivism rate by DYS-designated service region



Differences by Placement Condition of Treatment at DYS

Figure 6 displays average recidivism rates of different DYS treatment placement conditions. After controlling for other variables in logistic regression model, **the odds of recidivism among youth who started their treatment program at staff secure placements but later moved up to hardware secure placements (i.e., step up) were at least 83% higher compared to youth who was at staff secure placements throughout** (OR = 1.83, $p = .02$) **or youth without any DYS treatment programs** (OR = 2.05, $p = .02$). Differences in rates of recidivism were not statistically significant in other pairs of comparison.

Figure 6. Recidivism rate by placement condition of DYS treatment program



High School Educational Outcomes: Five-Year Graduation, Five-Year Equivalency (GED/HiSet) Attainment, and Five-Year Dropout

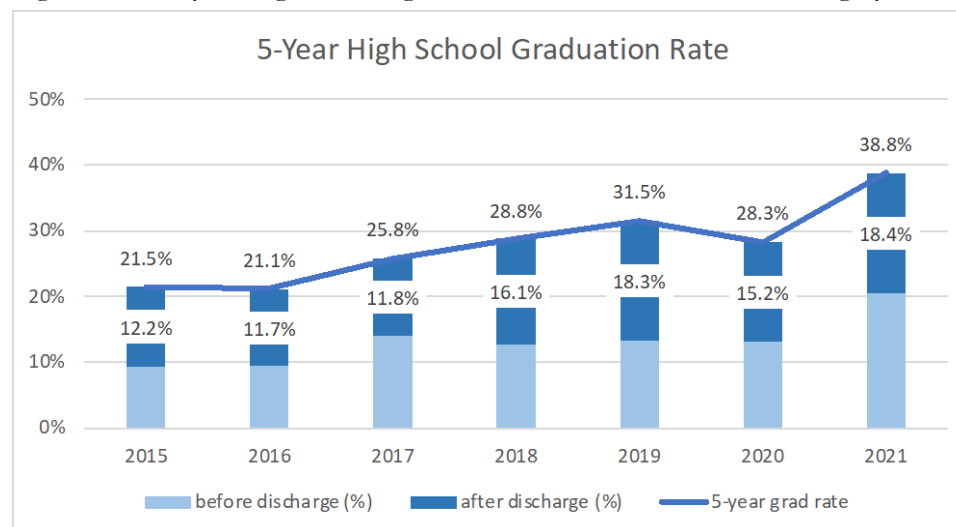
Overall Rates and Trend Across DYS Discharge Years

Five-Year Graduation

The average five-year high school graduation rate was 26.4% (12.3% during commitment and 14.1% after discharge). As shown in Figure 7, there has been an upward trend in the overall five-year high school graduation rates across DYS discharge years. Compared to the 2015 discharge cohort (21.5%), the rate increased by 80% for the 2021 discharge cohort (38.8%). We further examine this outcome by analyzing whether the graduation occurred prior to or after DYS discharge.

Results of logistic regression models suggest that the **upward trend was primary driven by graduation attainment post-discharge**. When controlling for other variables, graduation prior to discharge was not significantly correlated with year of discharge. However, among youth who had not received any secondary educational attainment (i.e., diploma or GED/HiSet) by discharge, the odds of graduating after discharge increased by 21% each year (OR = 1.21, $p < .001$).

Figure 7. Five-year high school graduation rate across DYS discharge year



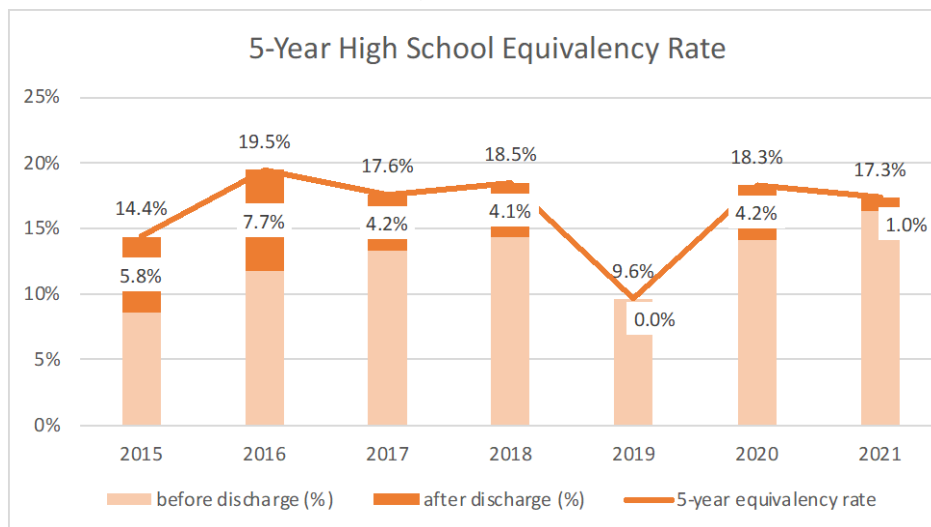
Five-Year Equivalency Attainment

As for **five-year high school equivalency attainment (i.e., GED/HiSet)**, the average rate was 16.6% (12.2% during commitment and 4.4% after discharge). As shown in Figure 8, there has been a

slight downward trend in the overall five-year high school equivalency rates across DYS discharge years. Compared to the 2016 discharge cohort (18.5%), the rate decreased by six percent for the 2021 discharge cohort (17.3%). We further examined this outcome by analyzing whether the equivalency attainment occurred prior to or after DYS discharge.

Results of logistic regression models suggest that **the downward trend was primarily driven by attainment post-discharge**. When controlling for other variables, equivalency attainment prior to discharge was not significantly correlated with year of discharge. However, among youth who had not received any secondary educational attainment (i.e., diploma or GED/HiSet) by discharge, the odds of receiving an equivalency attainment after discharge decreased by 20% each year (OR = 0.80, $p = .002$). Considering the impact of the COVID-19 pandemic during which all test centers were closed, we conducted sensitivity analysis on equivalency attainment after discharge with discharge year 2019 taken out from the model. The decreasing trend remained statistically significant (OR = 0.86, $p = .04$).

Figure 8. Five-year high school equivalency attainment rate across DYS discharge year

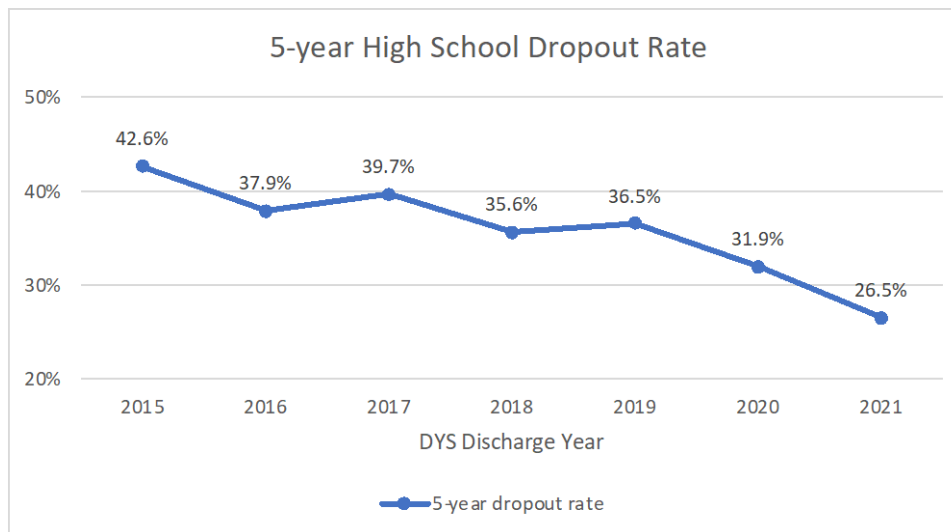


Five-Year Dropout

On average, the five-year dropout rate was 37.3% in our sample. As shown in Figure 9, there was a statistically significant ($p = .003$)⁷ downward trend across DYS discharge years.

⁷ Unlike the other outcomes reported, the significance testing for five-year dropout was not based on multilevel regression model controlling for other covariates. Rather, it was based on bivariate logistic regression only.

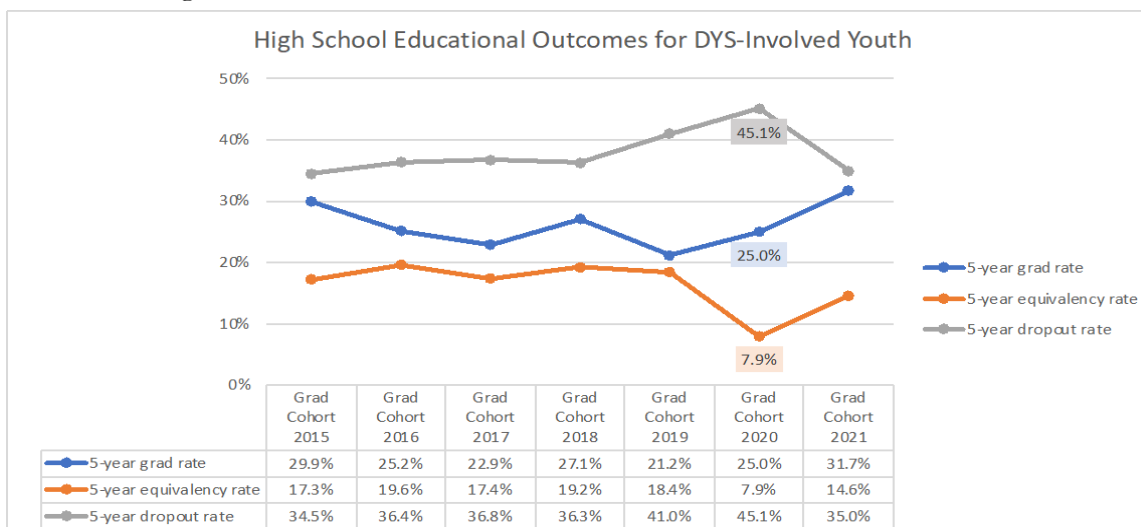
Figure 9. Five-year high school dropout rate across DYS discharge year



High School Educational Outcomes Across DESE Graduation Cohorts

We also reported the high school educational outcomes by DESE graduation cohort so that comparisons could be made between justice-involved youth and all public-school students in Massachusetts. As shown in Figure 10, despite some fluctuations, **the rates have been relatively stable across recent graduation cohorts, except for the 2020 graduation cohort who were most heavily impacted by the COVID-19 pandemic.**

Figure 10. Five-year graduation rate, five-year equivalency attainment rate, and five-year dropout rate across DESE graduation cohorts



Factors Correlated with Five-Year High School Graduation

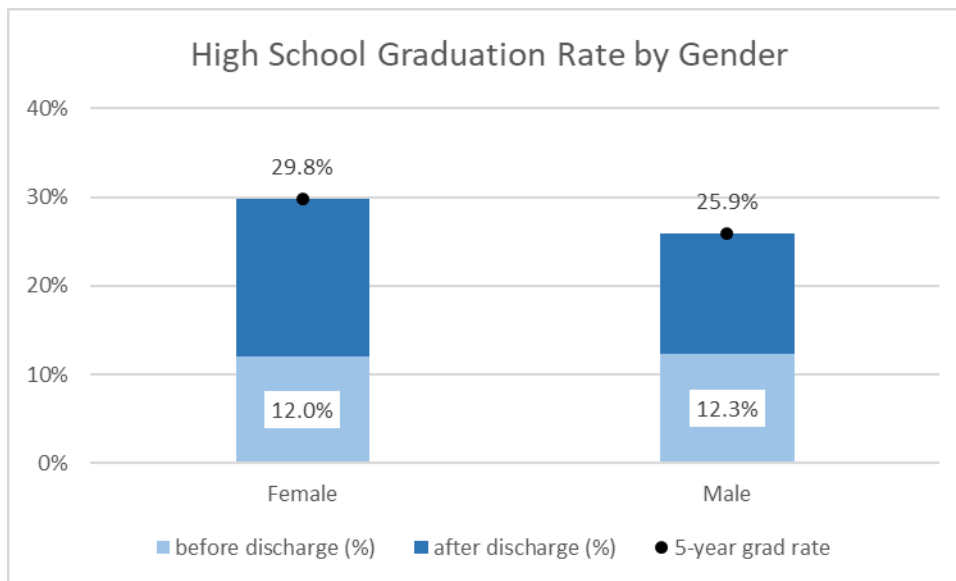
After controlling for other variables, the following variables were still significantly correlated with five-year high school graduation: **gender, DYS service region, youthful offender status, and age at initial commitment**. On the other hand, race and ethnicity, English learner status, special education status, treatment length, and treatment placement condition were not significantly correlated with five-year high school graduation. Below we discuss the statistically significant subgroup differences with a distinction of whether the attainment was received before or after DYS discharge.

Differences by Gender

As shown in Figure 11, the average five-year high school graduation rate was 29.8% for female (12.0% before discharge and 17.8% after discharge) and 25.9% for male (12.3% before discharge and 13.6% after discharge).

Although the rates appear similar (12.0% versus 12.3%), the odds of graduating before discharge for female youth were 76% higher compared to male youth (OR = 1.76, $p = .02$), after controlling for other variables. However, among youth who had not received any secondary educational attainment (i.e., diploma or GED/HiSet) by discharge, the odds of graduating after discharge did not differ by youth gender.

Figure 11. Five-year high school graduation rate by youth gender



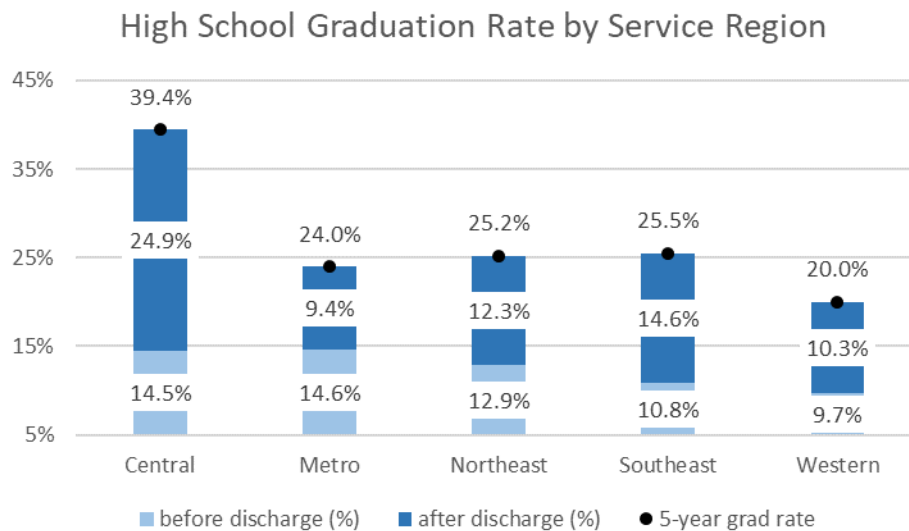
Differences by DYS-Designated Service Region

As shown in Figure 12, the average five-year high school graduation rate was 39.4% for youth from the Central service region (14.5% before discharge and 24.9% after discharge), which was statistically higher than youth from other service regions.

After controlling for other variables, **the odds of graduating before discharge for youth from the Central service region were 72%-88% higher** compared to youth from the Northeast (OR = 1.80, $p = .02$), Southeast (OR = 1.88, $p = .01$), and Western (OR = 1.72, $p = .04$) service regions. Differences in rates of five-year high school graduation before DYS discharge were not statistically significant in other pairs of comparison.

Among youth who had not received any secondary educational attainment (i.e., diploma or GED/HiSet) by discharge, **the odds of graduating after discharge for youth from the Central service region were 115% - 298% higher** compared to youth from the Metro (OR = 3.08, $p < .001$), Northeast (OR = 2.47, $p = .001$), Southeast (OR = 2.15, $p = .002$), and Western (OR = 3.98, $p < .001$) service regions. Differences in rates of five-year high school graduation after DYS discharge were not statistically significant in other pairs of comparison.

Figure 12. Five-year high school graduation rate by DYS-designated service region

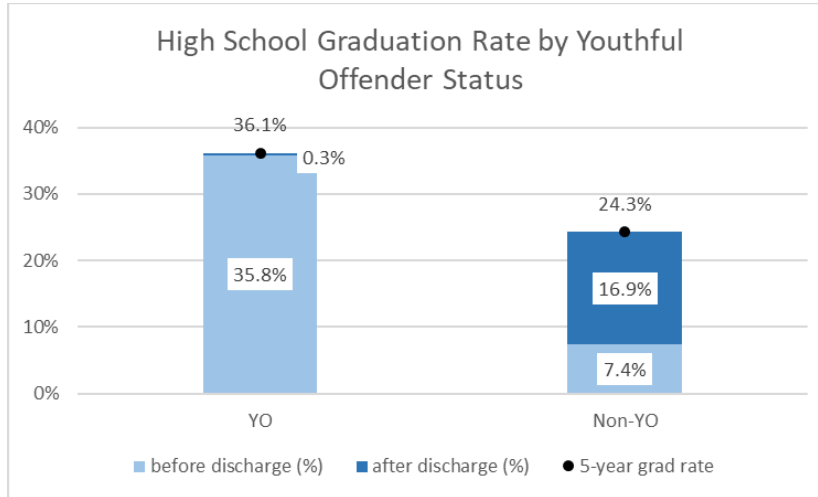


Differences by Youthful Offender Status

As shown in Figure 13, the average five-year high school graduation rate was 36.1% for youthful offenders (35.8% before discharge and 0.3% after discharge) and 24.3% for non-youthful offenders (7.4% before discharge and 16.9% after discharge). After controlling for other variables, **the odds of**

graduating before discharge for youthful offenders were 601% higher compared to non-youthful offenders (OR = 7.01, $p < .001$).

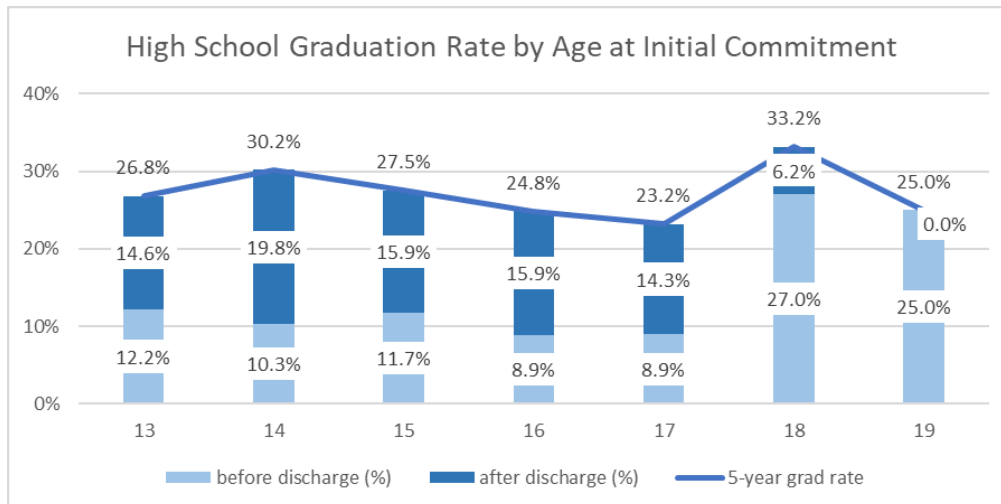
Figure 13. Five-year high school graduation rate by youthful offender status



Differences by Age at Initial Commitment to DYS

As shown in Figure 14, the overall five-year high school graduation rates were similar across different ages of initial DYS commitment. However, youth **initially committed at an older age were more likely to graduate before DYS discharge** (OR = 1.17, $p = .01$), while those initially committed at a younger age were more likely to graduate after DYS discharge (OR = 0.88, $p = .047$), when controlling for other variables.

Figure 14. Five-year high school graduation rate by age at initial commitment



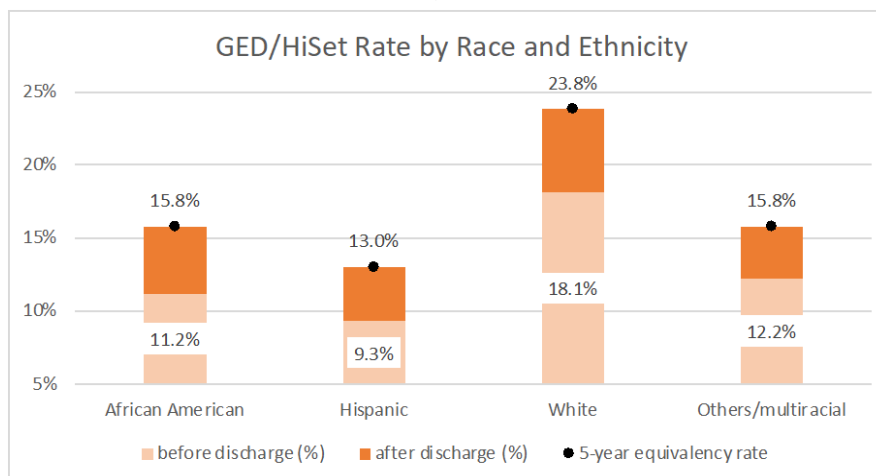
Factors Correlated with Five-Year GED/HiSet Attainment

After controlling for other variables, the following variables were still significantly correlated with five-year GED/HiSet attainment: **race and ethnicity, English learner status, special education status, DYS service region, youthful offender status, treatment length, and treatment placement condition.** Gender and age at initial commitment were not significantly correlated with five-year GED/HiSet attainment. Below, we discuss the statistically significant subgroup differences, including whether the attainment was received before or after DYS discharge.

Differences by Race and Ethnicity

As shown in Figure 15, after controlling for other variables, **the odds of receiving an equivalency attainment before discharge for African American (OR = 0.40, $p < .001$) and Hispanic (OR = 0.41, $p < .001$) youth were still about 60% lower compared to White youth.** Among youth who had not received any secondary educational attainment (i.e., diploma or GED/HiSet) by discharge, the odds of receiving an equivalency attainment after discharge did not differ by race and ethnicity of youth.

Figure 15. Five-year high school equivalency attainment rate by race and ethnicity of youth



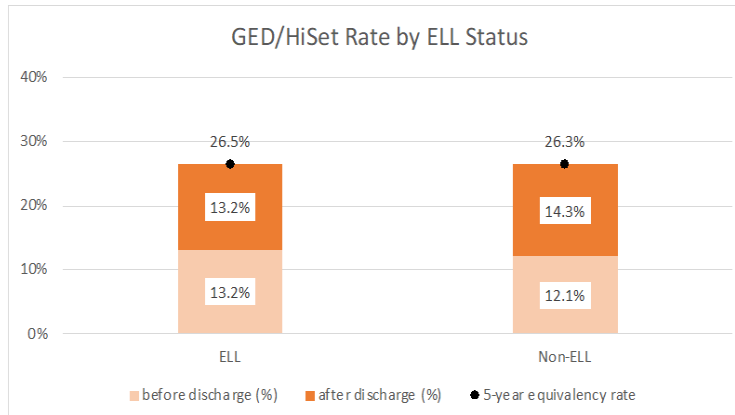
Differences by English Language Learner Status

As shown in Figure 16, the average five-year equivalency attainment rate was 26.5% for English language learners (ELL; 13.2% before discharge and 13.2% after discharge) and 26.3% for non-ELL (12.1% before discharge and 14.3% after discharge).

Although the rates appeared opposite descriptively (12.0% versus 12.3%), **the odds of receiving an equivalency attainment before discharge for ELL youth were 59% lower compared to non-**

ELL youth (OR = 0.41, $p = .001$), after controlling for other variables. Among youth who had not received any secondary educational attainment (i.e., diploma or GED/HiSet) by discharge, **the odds of receiving an equivalency attainment after DYS discharge were still 63% lower for ELL youth** (OR = 0.37, $p = .02$).

Figure 16. Five-year high school equivalency attainment rate by English language status

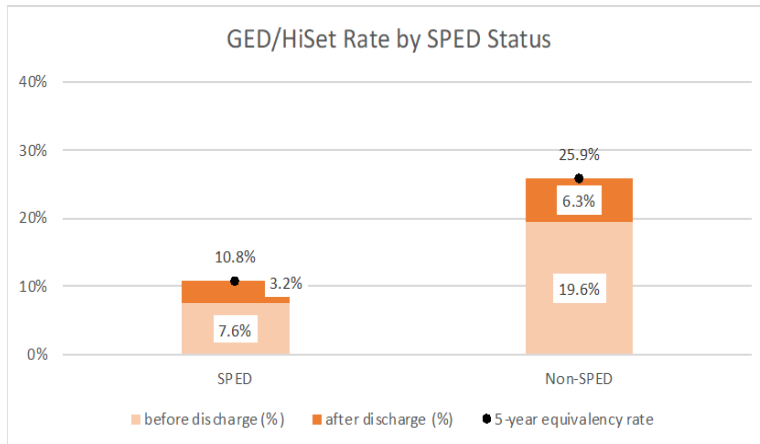


Differences by Special Education Student Status

As shown in Figure 17, the average five-year equivalency attainment rate was 10.8% for special education youth (SPED; 7.6% before discharge and 3.2% after discharge) and 25.9% for non-SPED youth (19.6% before discharge and 6.3% after discharge).

After controlling for other variables, **the odds of receiving an equivalency attainment before discharge for SPED youth were 68% lower compared to non-SPED youth** (OR = 0.32, $p < .001$). Among youth who had not received any secondary educational attainment (i.e., diploma or GED/HiSet) by discharge, **the odds of receiving an equivalency attainment after DYS discharge were still 66% lower for SPED youth** (OR = 0.36, $p < .001$).

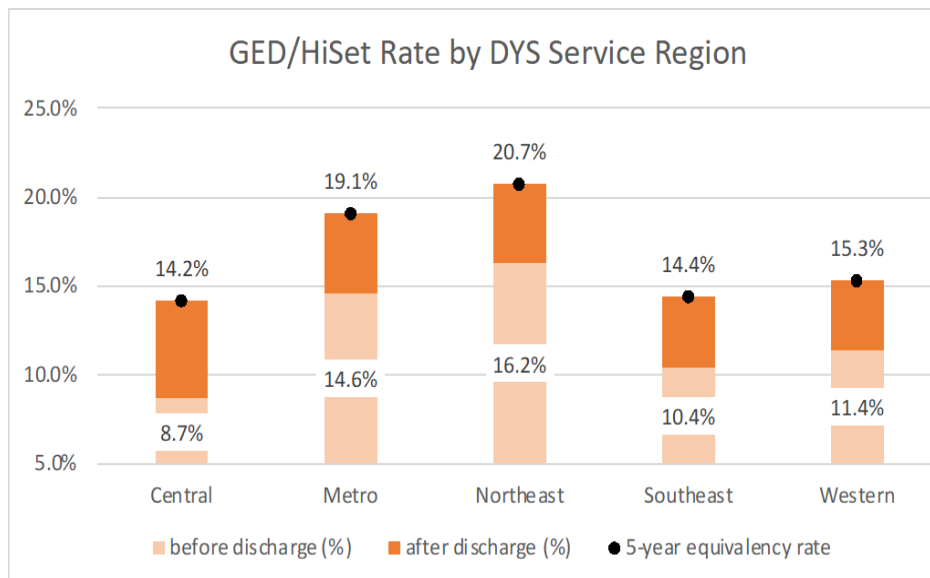
Figure 17. Five-year high school equivalency attainment rate by special education status



Differences by DYS-Designated Service Region

As shown in Figure 18, after controlling for other variables, **the odds of receiving an equivalency attainment before discharge for youth from the Northeast service region were 89% and 64% higher, respectively, compared to youth from the Central (OR = 1.89, p = .01) and Southeast (OR = 1.64, p = .02) service regions.** In addition, the odds of receiving an equivalency attainment before discharge were 79% higher for youth from the Metro region than the Central region (OR = 1.79, p = .04). Differences in rates of five-year high school equivalency attainment before DYS discharge were not statistically significant in other pairs of comparison. Among youth who had not received any secondary educational attainment (i.e., diploma or GED/HiSet) by discharge, the rate of receiving an equivalency attainment post discharge did not differ by regions.

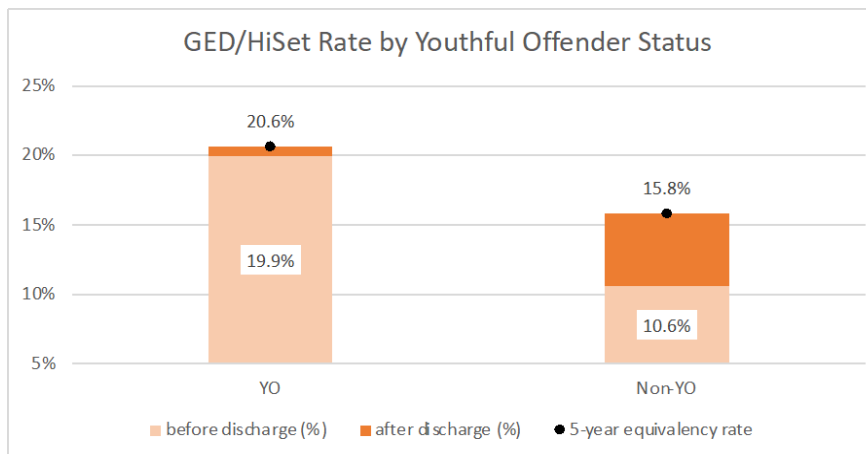
Figure 18. Five-year high school equivalency attainment rate by DYS-designated service region



Differences by Youthful Offender Status

As shown in Figure 19, after controlling for other variables, **the odds of receiving an equivalency attainment before discharge were 54% higher for youthful offenders** than non youthful offenders (OR = 1.54, $p = .04$). Among youth who had not received any secondary educational attainment (i.e., diploma or GED/HiSet) by discharge, the odds of receiving an equivalency attainment after discharge did not differ by youthful offender status.

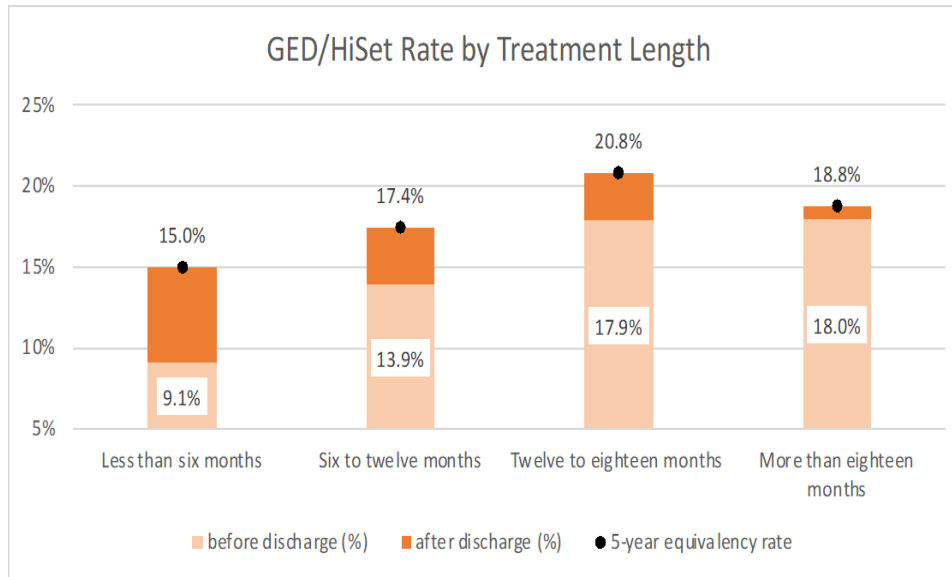
Figure 19. Five-year high school equivalency attainment rate by youthful offender status



Differences by Length of Treatment at DYS

As shown in Figure 20, **youth with longer treatment time at DYS were more likely to receive an equivalency attainment before discharge**. More specifically, after controlling for other variables, the odds of receiving an equivalency attainment before discharge were about 124% higher for youth whose treatment length lasted for 12-18 months (OR = 2.24, $p = .01$) and more than 18 months (OR = 2.25, $p = .003$), compared to youth whose treatment length was less than six months. Differences in equivalency attainment before DYS discharge were not statistically significant in other pairs of comparison. Among youth who had not received any secondary educational attainment (i.e., diploma or GED/HiSet) by discharge, the rates of receiving an equivalency attainment after discharge did not differ by treatment length.

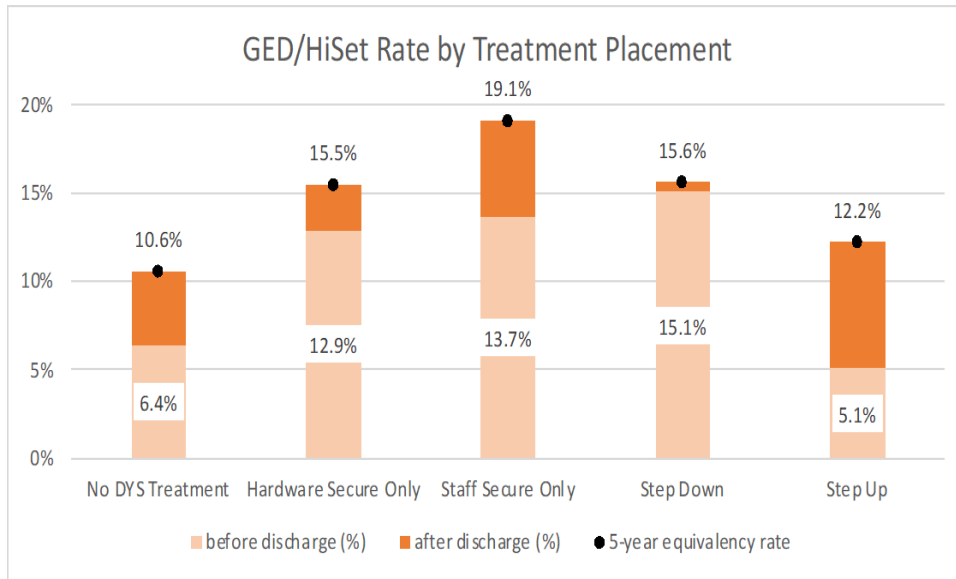
Figure 20. Five-year high school equivalency attainment rate by treatment length at DYS



Differences by Placement Condition of Treatment at DYS

As shown in Figure 21, after controlling for other variables, **the odds of receiving an equivalency attainment before discharge were 150% higher for youth whose treatment program was at staff secure placement throughout, compared to youth who started at staff secure placement but moved to hardware secure placement (i.e., step up; OR = 2.50, p = .02) and those who did not have DYS treatment programs (OR = 2.50, p = .002).** Differences in equivalency attainment before DYS discharge were not statistically significant in other pairs of comparison. Among youth who had not received any secondary educational attainment by discharge, the rates of receiving an equivalency attainment after discharge did not differ by treatment placement conditions.

Figure 21. Five-year high school equivalency attainment by treatment placement condition at DYS



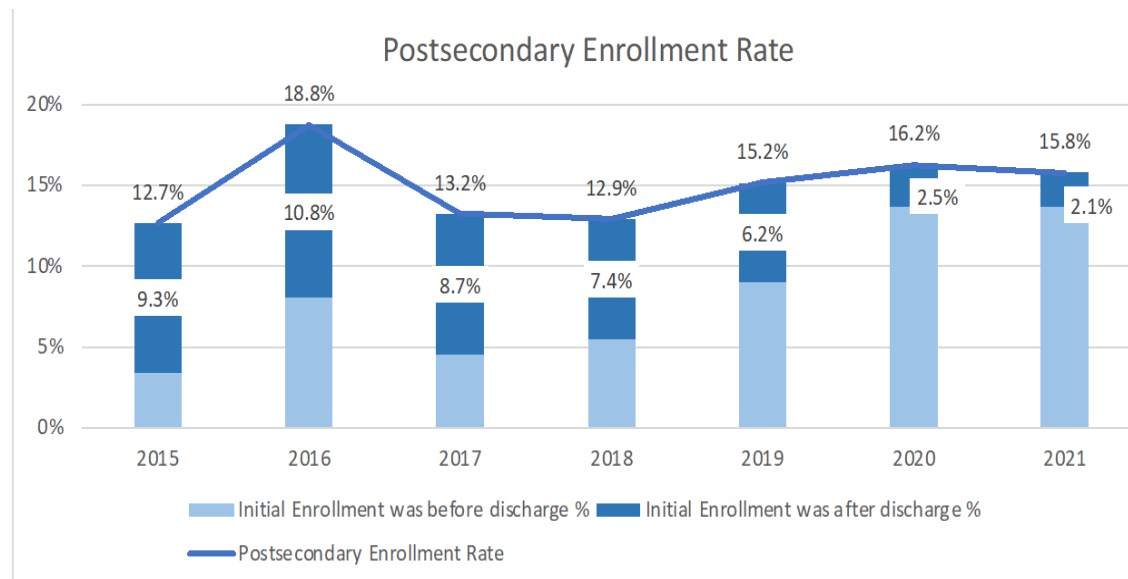
Post-Secondary Educational Outcomes

Overall Rates and Trends Across DYS Discharge Years

The average post-secondary enrollment rate was 14.7% (7.0% during commitment and 7.7% after discharge for initial enrollment). As shown in Figure 22, there has been a slight upward trend in the enrollment rates across DYS discharge years, but this is not a statistically significant trend. We further examined this outcome by analyzing initial enrollment occurred prior to or after DYS discharge.

Results of logistic regression models suggest that, after controlling for other variables, the post-secondary enrollment rate prior to discharge was not significantly correlated with year of discharge. However, among youth who had not enrolled in post-secondary institutions before discharge, the odds of enrollment after discharge decreased by 19% each year between 2015 and 2021 (OR = 0.81, $p = .001$).

Figure 22. Initial post-secondary enrollment rate across DYS discharge year



Of the 272 youth who had been enrolled in a post-secondary institution, 25 (9.2%) graduated. Given the small sample size, post-secondary graduation was not used for statistical modeling.

Factors Correlated with Initial Post-Secondary Enrollment

After controlling for other variables, the following variables were still significantly correlated with initial post-secondary enrollment: **gender, race and ethnicity, English learner status, special**

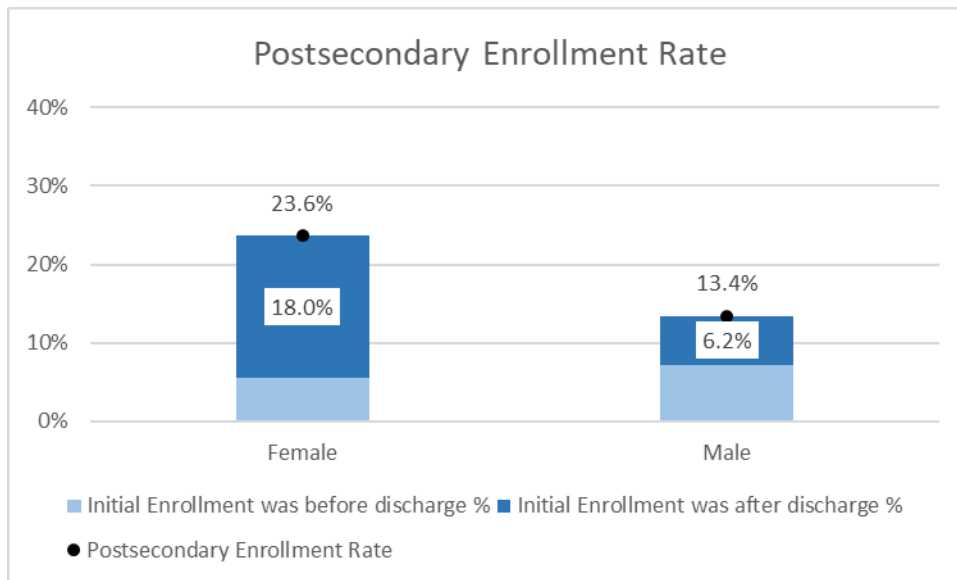
education status, DYS service region, youthful offender status, age at initial commitment, and high school educational attainment. Treatment length and treatment placement condition were not significantly correlated with initial post-secondary enrollment. Below, we discuss the statistically significant subgroup differences, specifying whether the attainment was received before or after DYS discharge.

Differences by Gender

As shown in Figure 23, the average post-secondary enrollment rate was 23.6% for females (5.6% before discharge and 18.0% after discharge for initial enrollment) and 13.4% for male (7.2% before discharge and 6.2% after discharge in terms of initial enrollment).

After controlling for other variables, the rates of initial enrollment before discharge did not differ by youth gender. However, among those who had not enrolled in post-secondary institutions before discharge, **the odds of enrollment after discharge were 180% higher for female youth** compared to male youth (OR = 2.80, $p < .001$).

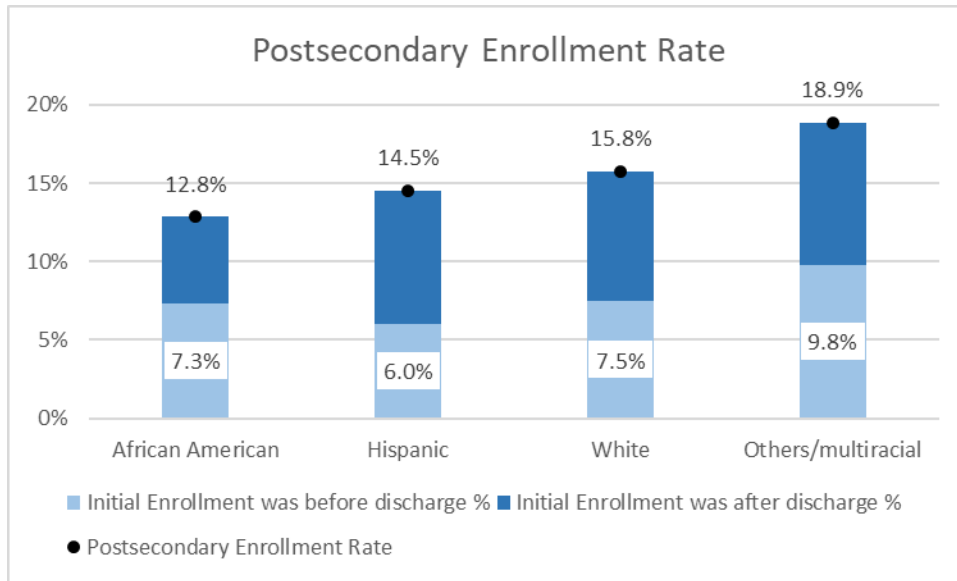
Figure 23. Initial post-secondary enrollment rate by youth gender



Differences by Race and Ethnicity

As shown in Figure 24, after controlling for other variables, **the odds of post-secondary enrollment before discharge were 50% lower for Hispanic youth** compared to White youth (OR = 0.50, $p = .02$). Among those who had not enrolled in post-secondary institutions before discharge, rates of enrollment after discharge did not differ by race and ethnicity.

Figure 24. Initial post-secondary enrollment rate by race and ethnicity of youth

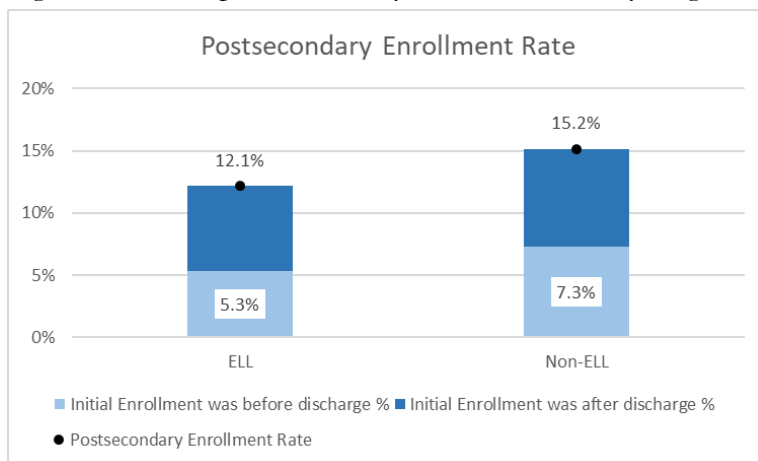


Differences by English Learner Status

As shown in Figure 25, the average post-secondary enrollment rate was 12.1% for English language learners (ELL; 5.3% before discharge and 6.8% after discharge for initial enrollment) and 15.2% for non-ELL youth (7.3% before discharge and 7.9% after discharge for initial enrollment).

After controlling for other variables, **the odds of post-secondary enrollment before discharge were 46% lower for ELL youth** compared to non-ELL youth (OR = 0.54, p = .049). Among those who had not enrolled in post-secondary institutions before discharge, rates of enrollment after discharge did not differ by English language status.

Figure 25. Initial post-secondary enrollment rate by English language status

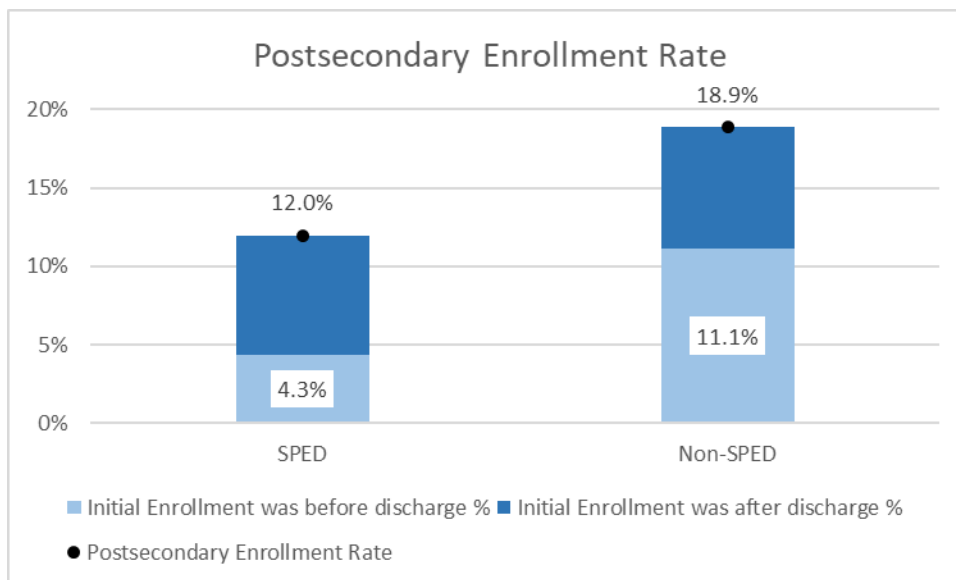


Differences by Special Education Student Status

As shown in Figure 26, the average post-secondary enrollment rate was 12.0% for special education youth (SPED; 4.3% before discharge and 7.7% after discharge for initial enrollment) and 18.9% for non-SPED youth (11.1% before discharge and 7.8% after discharge for initial enrollment).

After controlling for other variables, **the odds of post-secondary enrollment before discharge were 62% lower for SPED youth** compared to non-SPED youth (OR = 0.38, $p < .001$). Among those who had not enrolled in post-secondary institutions before discharge, rates of enrollment after discharge did not differ by special education status.

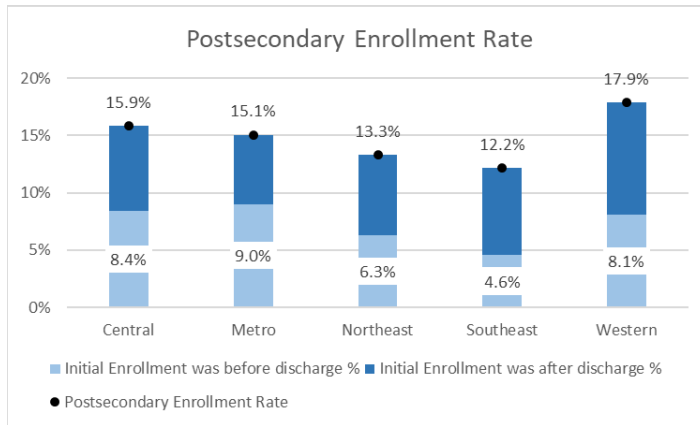
Figure 26. Initial post-secondary enrollment rate by special education status



Differences by DYS-Designated Service Region

As shown in Figure 27, after controlling for other variables, **the odds of post-secondary enrollment before discharge were 175-181% higher for youth from the Central region** compared to youth from the Southeast (OR = 2.81, $p = .002$) and Northeast (OR = 2.75, $p = .003$) service regions. In addition, the **odds of post-secondary enrollment before discharge were 172% higher** for youth from the Southeast than the Western region (OR = 2.72, $p = .002$). Lastly, the odds of post-secondary enrollment before discharge were 167% higher for youth from the Western than the Northeast region (OR = 2.67, $p = .002$). Differences in post-secondary enrollment before DYS discharge were not statistically significant in other statistical comparisons. Among those who had not enrolled in post-secondary institutions before discharge, rates of enrollment after discharge did not differ by DYS-designated service regions.

Figure 27. Initial post-secondary enrollment rate by DYS-designated service region

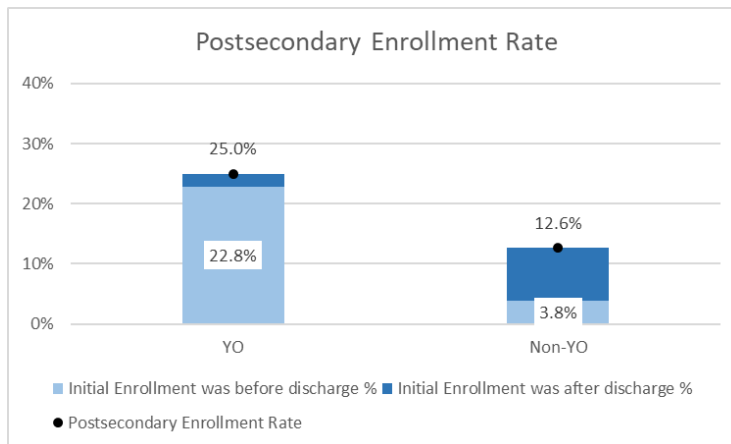


Differences by Youthful Offender Status

As shown in Figure 28, the average post-secondary enrollment rate was 25.0% for youthful offenders (22.8% before discharge and 2.2% after discharge for initial enrollment) and 12.6% for non youthful offenders (3.8% before discharge and 8.8% after discharge for enrollment).

After controlling for other variables, **the odds of post-secondary enrollment before discharge were 437% higher for youthful offenders** compared to non youthful offenders (OR = 5.37, $p < .001$). Among those who had not enrolled in post-secondary institutions before discharge, rates of enrollment after discharge did not differ by youthful offenders status.

Figure 28. Initial post-secondary enrollment rate by youthful offender status

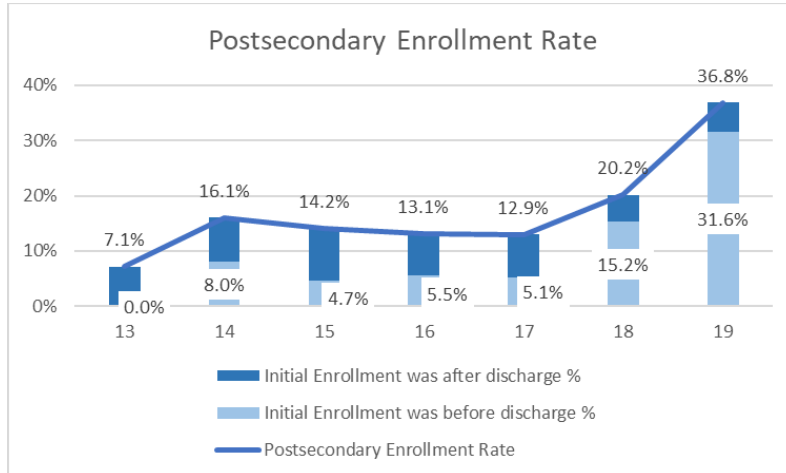


Differences by Age at Initial Commitment to DYS

As shown in Figure 29, youth who were first committed to DYS at an older age were more likely to enroll in post-secondary education before DYS discharge, after controlling for other variables (OR

= 1.30, $p = .002$). Among those who had not enrolled in post-secondary institutions before discharge, rates of enrollment after discharge did not differ by age at first DYS commitment.

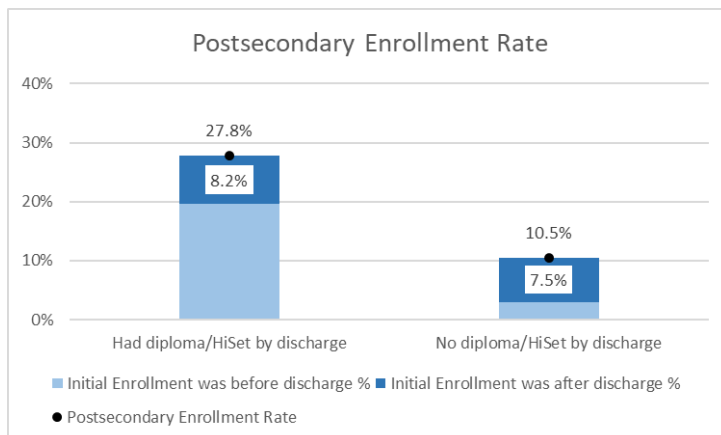
Figure 29. Initial post-secondary enrollment rate by age at first DYS commitment



Differences by High School Attainment Prior to DYS Discharge

After controlling for other variables, the rates of initial enrollment before discharge did not differ by whether a high school educational attainment was received. However, as shown in Figure 30, among those who had not enrolled in post-secondary institutions before discharge, **the odds of enrollment after discharge were 70% higher for youth with a high school educational attainment before DYS discharge** than those without ($OR = 1.70$, $p = .02$).

Figure 30. Initial post-secondary enrollment rate by whether attainment received before discharge



Implications of the YES Initiative on Recidivism and Educational Attainment Post DYS Discharge

As shown in Figure 31 and Figure 32, after controlling for other variables, **participating in the YES Initiative was associated with higher rates of high school educational attainment after DYS discharge.** More specifically, among those who had not received a high school educational attainment prior to DYS discharge, the odds of receiving a diploma (OR = 1.77, $p = .001$) or a equivalency attainment (OR = 1.72, $p = .03$) after discharge were 77% and 72% higher for youth who participated in the YES Initiative compared to those who did not. **However, YES participation was not associated with recidivism or post-secondary enrollment after discharge.**

Figure 31. Five-year high school graduation rate by YES participation

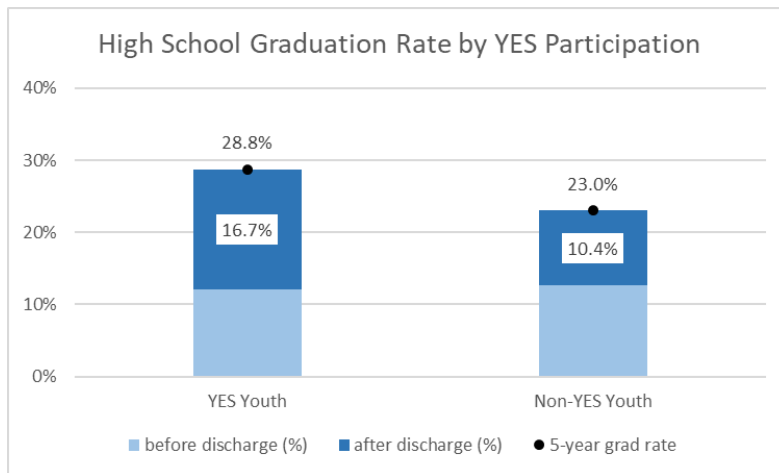
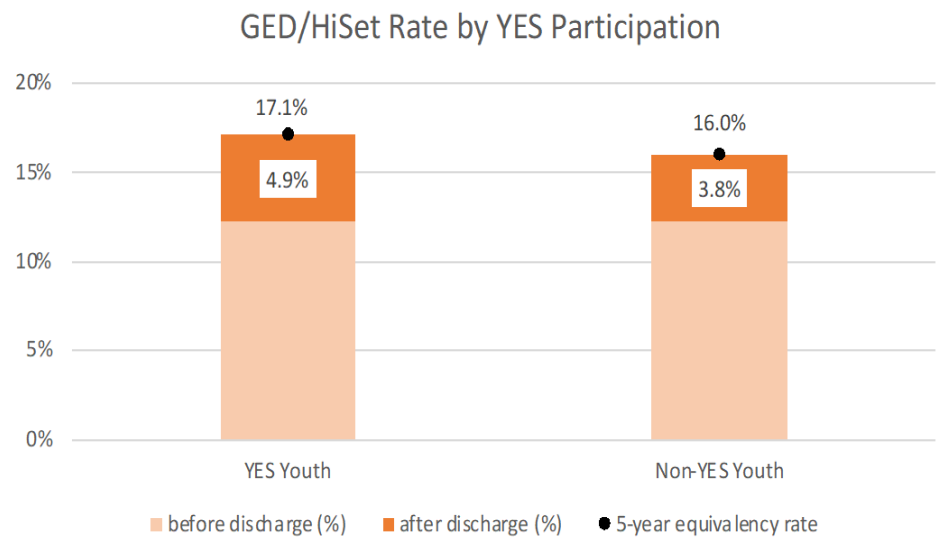


Figure 32. Five-year high school equivalency attainment rate by YES participation



Appendix A: Calculation for the Rates

Calculation of rates can be impacted by the way the denominator is constructed. In the calculations in this report, the denominator represents the pool of students considered to have valid data. From that pool of students, we identify the number who have successfully achieved the outcome of interest and turn this into a percent.

Of the 1,924 students in high school educational outcomes sample, 1,910 were present in the available SIMS data, the data source for high school outcomes. Given that we were unable to determine whether youth who had missing DESE data meant they had graduated, transferred out, or dropped out, we only included those who had available DESE data in the denominator. Next, looking at the last enrollment status within five years of high school enrollment of the 1,910 youth, 192 were reported as “deceased” or “transferred out.” In line with established procedures at DESE, these students were removed from the denominator (i.e., $1,910 - 192 = 1,718$) in all calculations of graduation, high school equivalency attainment, and dropout.

Therefore, for the calculation of five-year high school graduation rate, we calculated the following:

$$\frac{\text{\# of youth who graduated within five years of enrolling in 9th grade}}{(1,924 \text{ youth in our sample}) - (14 \text{ youth with missing SIMS data}) - (192 \text{ youth who were deceased or transferred out to private schools or other states})}$$

For the calculation of five-year equivalency attainment rate, we calculated the following:

$$\frac{\text{\# of youth who passed a GED/HiSet exam within five years of enrolling in the 9th grade}}{(1,924 \text{ youth in our sample}) - (14 \text{ youth with missing SIMS data}) - (192 \text{ youth who were deceased or transferred out to private schools or other states})}$$

For calculation of the five-year dropout rate, we calculated the following:

$$\frac{\text{\# of youth last recorded as dropout within five years of enrolling in the 9th grade, excluding those who received a GED/HiSet}}{(1,924 \text{ youth in our sample}) - (14 \text{ youth with missing SIMS data}) - (192 \text{ youth who were deceased or transferred out to private schools or other states})}$$

For post-secondary enrollment (Sample 1) and recidivism (Sample 2), the denominators were the same as the sample sizes; the numerators were the counts of corresponding indicators for post-secondary enrollment and recidivism.

For the calculation of post-secondary enrollment rate, we calculated the following:

$$\frac{\# \text{ of youth who had enrolled in post-secondary institutions}}{1,924 \text{ youth in our sample}}$$

For the calculation of recidivism rate, we calculated the following:

$$\frac{\# \text{ of youth who recidivated}}{1,656 \text{ youth in our sample}}$$

Appendix B: Results of Multilevel Multivariate Logistic Regression Models on Pre-Discharge Outcomes

	Five-year Graduation (N = 1,906; K = 112)			Five-year GED/HiSet (N = 1,906; K = 112)			Initial College Enrollment (N = 1,833; K = 112)		
	OR	SE	P	OR	SE	P	OR	SE	P
<i>Fixed Effects</i>									
DYS Discharge Year	0.98	0.04	.67	1.08	0.05	.07	1.11	0.07	.07
Age at Initial Commitment	1.17	0.07	.01	0.99	0.06	.92	1.30	0.11	.002
Female (vs. male)	1.76	0.43	.02	1.21	0.27	.40	1.41	0.47	.30
Race and Ethnicity (ref: White)									
African American	1.10	0.26	.68	0.40	0.08	<.001	0.59	0.18	.08
Hispanic	0.88	0.20	.58	0.41	0.08	<.001	0.50	0.14	.02
Others/Multiracial	1.81	0.53	.04	0.38	0.12	.002	0.90	0.34	.79
SPED (yes vs. no)	0.98	0.16	.91	0.32	0.05	<.001	0.38	0.08	<.001
ELL (yes vs. no)	1.05	0.23	.82	0.41	0.11	.001	0.54	0.17	.049
Region (ref: Central)									
Metro	0.63	0.17	.09	1.79	0.52	.04	0.63	0.22	.18
Northeast	0.56	0.14	.02	1.89	0.48	.01	0.36	0.12	.003
Southeast	0.53	0.13	.01	1.15	0.30	.59	0.36	0.12	.002
Western	0.58	0.15	.04	1.25	0.33	.40	0.97	0.30	.92
Youthful Offender (yes vs. no)	7.01	1.48	<.001	1.54	0.32	.04	5.37	1.44	<.001
Treatment Length (ref: Less than 6 months)									
6 - 12 months	1.04	0.22	.86	1.41	0.25	.06	1.42	0.38	.20
12 - 18 months	1.17	0.35	.60	2.25	0.61	.003	1.44	0.56	.36
More than 18 months	1.16	0.38	.64	2.24	0.73	.01	1.97	0.80	.10
Treatment Placement (ref: No DYS Treatment)									
Hardware Secure Only	1.03	0.36	.92	1.60	0.58	.19	1.25	0.58	.64
Staff Secure Only	1.19	0.34	.53	2.50	0.72	.002	1.21	0.48	.63
Step Down	1.29	0.47	.49	1.51	0.59	.29	1.28	0.63	.62
Step Up	0.80	0.38	.63	1.00	0.48	.996	0.17	0.19	.11

Note: OR stands for odds ratio. SE stands for standard error. Coefficients are unstandardized. P < .05 in bold.

Appendix C: Results of Multilevel Multivariate Logistic Regression Models on Post-Discharge Outcomes

	Recidivism (N = 1,534; K = 106)			Five-year Graduation (N = 1,454; K = 107)			Five-year GED/HiSet (N = 1,454; K = 107)			Initial College Enrollment (N = 1,705; K = 111)		
	OR	SE	P	OR	SE	P	OR	SE	P	OR	SE	P
<i>Fixed Effects</i>												
YES Participation (yes vs. no)	0.88	0.12	.31	1.77	0.30	.001	1.72	0.43	.03	1.38	0.28	.12
DYS Discharge Year	0.90	0.04	.04	1.21	0.05	<.001	0.80	0.06	.002	0.81	0.05	.001
Age at Initial Commitment	0.96	0.05	.45	0.88	0.06	.047	1.01	0.10	.94	0.93	0.07	.39
Female (vs. male)	0.25	0.07	<.001	1.11	0.25	.62	0.58	0.21	.14	2.80	0.63	<.001
Race and Ethnicity (ref: White)												
African American	1.33	0.25	.13	1.29	0.29	.26	0.64	0.21	.17	0.77	0.22	.37
Hispanic	1.05	0.19	.77	0.92	0.19	.71	0.69	0.20	.22	1.14	0.28	.59
Others/Multiracial	1.01	0.28	.97	1.17	0.38	.62	0.68	0.33	.43	1.32	0.48	.45
SPED (yes vs. no)	1.23	0.17	.13	1.08	0.18	.63	0.36	0.08	<.001	0.89	0.17	.55
ELL (yes vs. no)	1.69	0.30	.003	0.88	0.18	.35	0.37	0.16	.02	0.91	0.24	.74
Region (ref: Central)												
Metro	1.42	0.33	.13	0.33	0.10	<.001	0.84	0.37	.69	0.89	0.35	.77
Northeast	1.49	0.33	.07	0.41	0.11	.001	0.93	0.36	.85	1.00	0.34	.998
Southeast	0.96	0.21	.85	0.47	0.12	.002	0.64	0.24	.24	1.11	0.36	.76
Western	1.08	0.24	.73	0.25	0.07	<.001	0.64	0.25	.25	1.36	0.44	.35
Youthful Offender (yes vs. no)	0.82	0.19	.38	0.03	0.03	.001	0.34	0.26	.16	0.40	0.19	.051
Treatment Length (ref: Less than 6 months)												
6 - 12 months	0.95	0.15	.73	1.07	0.20	.70	0.68	0.19	.17	1.10	0.24	.68

12 - 18 months	1.13	0.27	.62	0.71	0.27	.37	0.72	0.38	.54	0.68	0.29	.37
More than 18 months	0.67	0.21	.20	1.63	0.67	.23	0.60	0.48	.53	0.80	0.43	.68
Treatment Placement (ref: No DYS Treatment)												
Hardware Secure Only	1.55	0.42	.10	0.99	0.32	.98	1.11	0.57	.84	1.28	0.47	.51
Staff Secure Only	1.12	0.23	.59	1.14	0.26	.56	1.48	0.49	.24	0.78	0.20	.34
Step Down	1.75	0.51	.06	0.94	0.35	.86	0.38	0.30	.22	0.36	0.21	.08
Step Up	2.05	0.62	.02	0.80	0.31	.57	1.81	0.96	.27	0.75	0.35	.53
Had a diploma or a GED/HiSet before discharge (yes vs. no)	0.93	0.16	.68							1.70	0.38	.02
Had postsecondary enrollment before discharge (yes vs. no)	0.75	0.24	.38									

Note: OR stands for odds ratio. SE stands for standard error. Coefficients are unstandardized. P < .05 in bold.