

Recidivism in the 2019 Release Cohort

Nevada Department of Corrections

August 23, 2023

Introduction

Understanding recidivism and the factors that influence it is crucial to guiding correctional, sentencing, and criminal justice policy. Recidivism is a complex, multifaceted problem which is influenced by factors ranging from the individual's family life to employment and criminal history; it is impossible to fully capture the characteristics of any person, or what may ultimately cause them to recidivate or succeed after release. Nevertheless, it is vital to study these factors to help offenders to stay out of prison and to improve public safety by deterring criminal behavior after release.

A model was created for this report to determine the predictive probability of recidivism for offenders based on data maintained by the Nevada Department of Corrections. This model will include a number of covariates to control for influences by demographic or historical factors to determine each factor's influence. While the information included is extensive, it is not all encompassing; among the most notable absent data are information regarding income or wealth and mortality after release. In addition to this model, an analysis was performed to study how survival times (i.e., the time between release and recidivating) and factors differ.

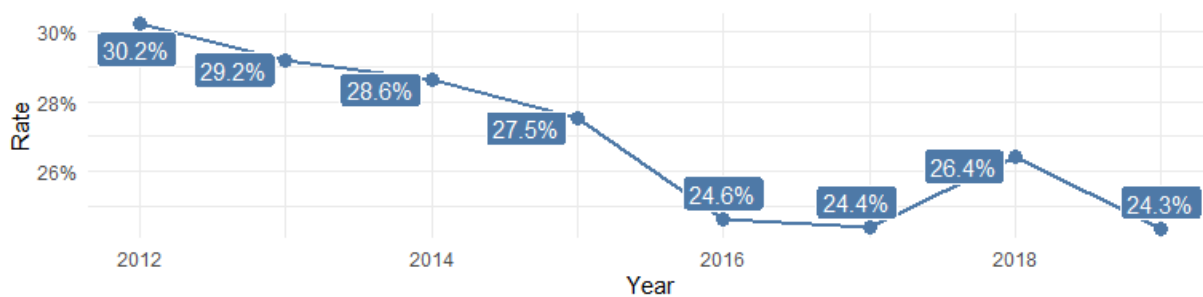
The lack of income information may impact the results for employment, education, and other categories which are correlated with income or wealth. With existing literature [1] linking increased criminal propensities with lower earning and poverty, the bias is likely to overstate the direct effect of work-related variables. Still, these figures are informative when it is kept in mind that at least some of the effect is owed to the income effects of a variable, and not necessarily the variable itself.

The absence of information for post-release mortality means that factors which are correlated with a higher risk of death will understate their effect on recidivism, at least compared to one which removes deceased offenders from the sample. The intuition is that if an offender has factors that increase the risk of death, and they pass away in the three-year time period established in this report, they will not recidivate when they otherwise may have if they had lived. It is again important to keep in mind when examining results that what is being captured is a factor's impact on recidivism risk after being impacted by mortality.

For the purposes of this study, recidivism was defined as an offender returning to incarceration with the Nevada Department of Corrections within 3 years of their day of release. Further, this report only included offenders who were released from an NDOC location and which were held under NDOC jurisdiction. Additionally, if an offender is released multiple times during 2019, only the earliest release, and readmission if relevant, is considered.

Trend Over Time

Recidivism has generally been in decline over the past decade, with a rate of 27.93% among the 2010 release cohort as compared to 24.35% for the 2019 cohort.



Major differences in reporting methods, such as different horizons for recidivism, make recidivism figures incomparable with many states. Even subtle methodological differences between states, such as the inclusion of those released from residential or out-of-state confinement from the stated release cohort, may cause variation in states which have similar reports. For this reason, the Nevada Department of Corrections does not report on recidivism in other states.

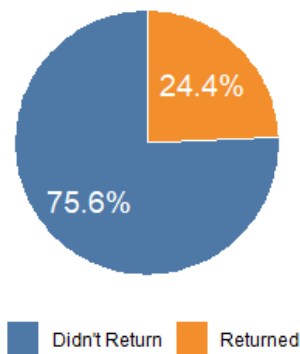
2019 Release Cohort Information

The 2019 cohort consisted of 5963 released offenders, with 1452 of these offenders recidivating.

2019 Release Cohort by Recidivism Status

Recidivism Status	Count	Percent
Didn't Return	4,511	75.6%
Returned	1,452	24.4%
Total	5,963	100.0%

Recidivism in the 2019 Release Cohort



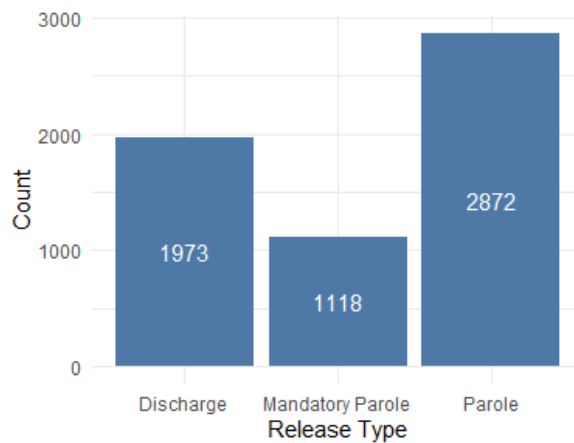
Release Status

For this cohort, releases consisted of parole, mandatory parole, or discharge releases, with the first two being conditional releases. As can be seen from in the Recidivism and Release Status table, parole releases had the highest recidivism rate, followed by mandatory parole releases. This can be partially explained by the conditional nature of parole releases. If a condition of

an offender's parole is violated, they will be readmitted; comparatively, for a discharge, an offender must be convicted of a new crime to be readmitted to an institution.

Recidivism and Release Status

Release Type	Didn't Return	Returned	Total
Discharge	83.4%	16.6%	100.0%
Mandatory Parole	79.3%	20.7%	100.0%
Parole	68.9%	31.1%	100.0%
Total	75.6%	24.4%	100.0%



Assembly Bill 236, which was passed by the Nevada Legislature in 2019, marked a significant criminal justice reform. One noteworthy change was the implementation of a system to more rapidly releases parole violators after being re-incarcerated, with the ability for an offender to be release 30 days after a parole violator for the first violation, 90 days for the second, and 180 for the third violation and beyond. This has since been altered

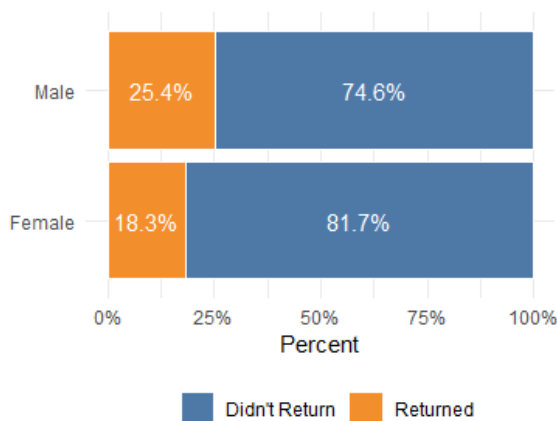
in the 2023 legislative session to only include the 90 and 180 day releases. While this warrants further study, this report will not include it. This report includes only an offender's first release in 2019 and, if relevant, their first readmission. Further releases and readmissions will not be included.

Gender and Age

Much like previous years, males and females showed different rates of re-incarceration, with males returning at higher rates. Specifically, 25.36% of males recidivated while only 18.29% of females returned.

2019 Release Cohort by Gender

Gender	Count	Percent
Female	853	14.3%
Male	5,110	85.7%
Total	5,963	100.0%

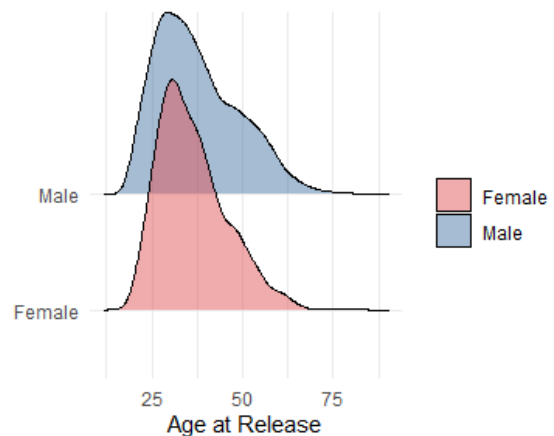


Substantial differences exist between age groups, with

recidivism rates being higher among those who were released at younger ages. The ages of those who were released had a vast range, from 18 to 84 for men and 19 to 79 for women. The average age of release for men was 37.69 and for women it was 36.23.

2019 Release Cohort by Age at Release

Age	Count	Percent
18-24	625	10.5%
25-29	1,086	18.2%
30-39	2,111	35.4%
40-49	1,208	20.3%
50-59	700	11.7%
60+	233	3.9%
Total	5,963	100.0%

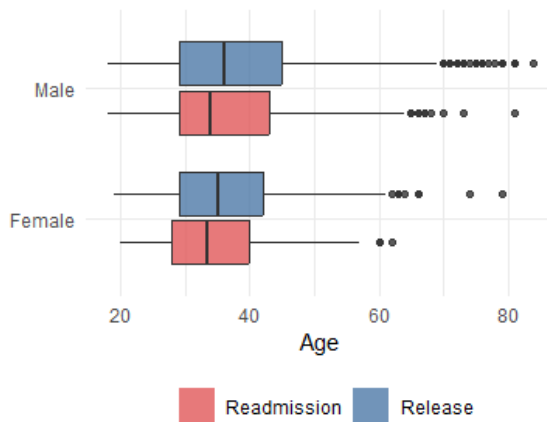


The largest single age group within the releases was from 30-39 years old, with 2111 releases. For those between the ages of 18 and 29 years old, there were 1711 releases. These two groups make up the bulk of the release population, with a

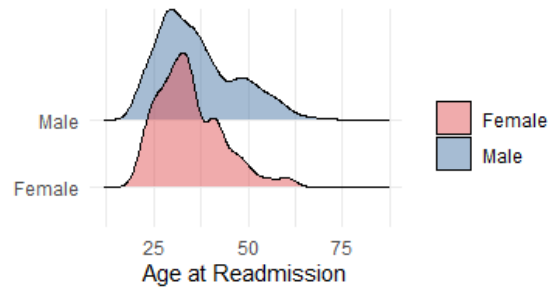
continuous decline for older groups.

Recidivism and Age at Release

Age	No	Yes	Total
18-24	69.8%	30.2%	100.0%
25-29	70.9%	29.1%	100.0%
30-39	74.5%	25.5%	100.0%
40-49	79.5%	20.5%	100.0%
50-59	80.3%	19.7%	100.0%
60+	90.6%	9.4%	100.0%
Total	75.6%	24.4%	100.0%

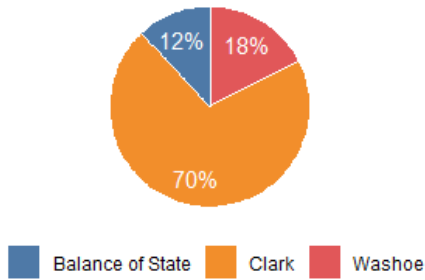


Counterintuitively, the average age among readmissions is lower than that of releases, with an average age of 36.47 years among men and 34.48 for women. The range for men is 18-81, while for women it is 20-62. The younger distribution can be attributed to starkly higher rates of recidivism for younger released offenders.



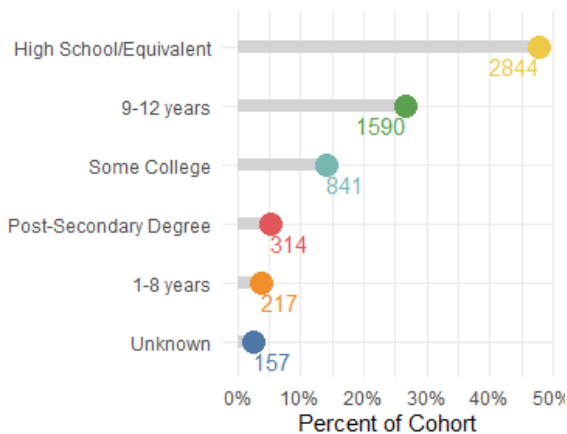
County

Disparities in economic opportunities, community, and regional culture can all meaningfully impact a person’s behavior, warranting study. Nevada is characterized by a stark urban-rural divide, with 14 rural or frontier counties and 3 urban counties. While these 14 rural counties make up most of the land area in the state, the vast majority of the population, a staggering 89.2% according to the 2021 Nevada Rural and Frontier Health Data Book, is in the 2 largest urban counties: Clark County and Washoe County. The county of conviction reflects this, with only 11.97% of convictions occurring in rural Nevada. As such, for this report Washoe and Clark counties will be included independently, and the remaining counties will be grouped into a “balance of state” category. This was done as an analysis including the rural and frontier individually will result in insignificant and unreliable values from small sample sizes.



Education and Employment

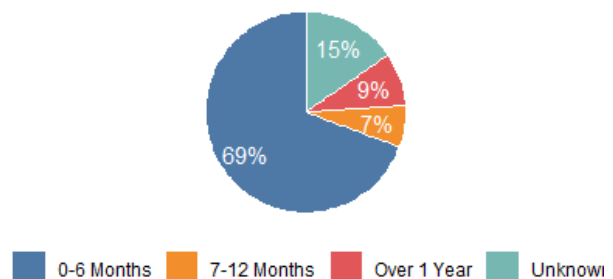
Like geography, educational attainment can significantly impact a person’s life in a multitude of ways, including career opportunities and social circles. A large body of research already exists studying education’s impact on recidivism both directly and indirectly, underscoring its importance and interest.



The bulk of the 2019 release cohort has a high school or equivalent degree or less. Only 5.41% of the cohort has earned a post-secondary degree, including associate’s, bachelor’s, and graduate degrees. While it could be argued that this could, in part, be attributed to large

numbers of younger offenders being incarcerated before higher levels of education can be attained, this is not the case. Excluding those offenders who were under 40 at the time of admission, high school equivalent degrees and below still make up over 70% of the cohort, with 9.2% having attained a post-secondary degree. For comparison, a 2016 report by the Nevada System of Higher Education [2] found that 31% of adults aged 25-65 in Nevada had an associate degree or higher.

It is not only the level of education that a person receives that is having an impact, but also the length of time they have either been enrolled in an educational program or employed prior to incarceration. Over 80% of offenders in the 2019 release cohort had been enrolled or employed for 6 or fewer months prior to incarceration, and 89.9% for a year or less. This indicates high levels of unemployment and unstable employment for the offenders in the cohort.



Criminality Factors

The nature of an offender’s crime and their criminal history can be a strong indicator of their propensity to return to prison as, unfortunately, habits and behaviors can be difficult to change. Thus, it’s important to fully understand how criminal backgrounds can affect recidivism so these patterns can be broken.

2019 Release Cohort by Offense Group

Offense Group	Count	Percent
DUI	153	2.6%
Drug	1,059	17.8%
Other	719	12.1%
Property	1,944	32.6%
Sex	277	4.6%
Violence	1,811	30.4%
Total	5,963	100.0%

The most common offense group for offenders in the 2019 release cohort was property crime, followed closely by violent crime, at 32.6% and 30.37%, respectively. These are followed, in sequence, by drug offenses, other offenses, which are all crimes not included in one of the major categories, sex offenses, and DUIs.

2019 Release Cohort by Offense Category

Offense Group	Count	Percent
A	288	4.8%
B	2,861	48.0%
C	1,549	26.0%
D	881	14.8%
E	384	6.4%
Total	5,963	100.0%

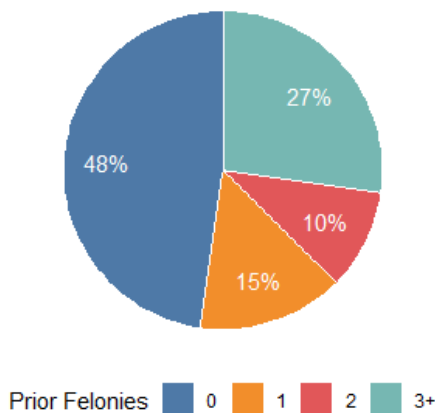
In contrast to the offense group, which describes the type of offense, the offense category describes the severity of an offense. A category A offense is the most severe, and includes crimes such as murder or sexual assault, while category E crimes are low-severity felonies, for example, possession of a controlled substance. Category B and C felonies make up nearly 75% of the 2019 release cohort.

If an offender has an extensive record of committing felony offenses, they can be sentenced as habitual offenders. From a legal standpoint, this results in longer sentences, but is also likely to be significant in predicting recidivism in an offender.

2019 Release Cohort by Habitual Offender Status

Habitual Offender Status	Count	Percent
No	5,775	96.8%
Yes	188	3.2%
Total	5,963	100.0%

While it is relatively rare within the cohort for an offender to be considered habitual, it likely has enough of an impact to be of high importance in the predictive model. This will be supplemented in the analysis by including the number of prior felonies. The inclusion of prior felonies, while being an interesting variate in its own right, will also work in conjunction with the other criminality variables to control for mutual effects between them. This allows for the precise effect to be more accurately determined.



While being labeled a habitual offender is relatively rare, having a criminal history with prior felonies is not. Over 50% of the 2019 release

cohort had at least one prior felony conviction before their most recent imprisonment. Further, over a quarter of offenders had previously been convicted of 3 or more felonies. This, in addition to the habitual offender status, will likely be a strong predictor of an offender's likelihood to recidivate.

Physical/Mental Health and Substance Use Disorder

A person's physical and mental health and well-being are key factors in a person's quality of life and can impact access opportunities. Unfortunately, individuals with disabilities or mental illnesses face additional challenges in day-to-day life. With support programs, these challenges can be mitigated, but it is vital to understand the importance of physical and mental health conditions and substance use disorders to improve support.

2019 Release Cohort by Physical Health

Physical Health	Count	Percent
Frequent Attention Required/Limited Mobility	227	3.8%
Stable	5,736	96.2%
Total	5,963	100.0%

Roughly 96% of offenders in the cohort are medically stable and required minimal to no health care, other than routine check-ups. Roughly one fifth require some medical care but are still considered to be medically stable. Only 3.8% of offenders have limited mobility or require frequent, skilled medical attention, such as that found in hospital conditions.

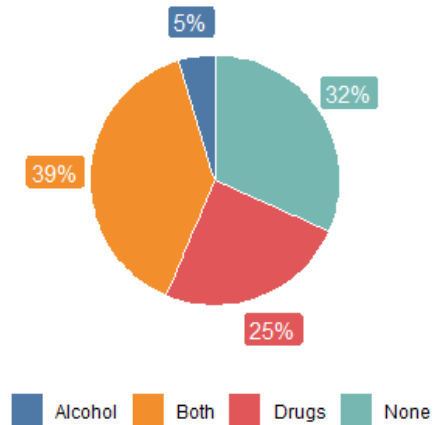
2019 Release Cohort by Mental Health

Mental Health	Count	Percent
Mild/Moderate Impairment	927	15.5%
No current impairment	5,036	84.5%
Total	5,963	100.0%

Approximately 85% of 2019 releases had no current mental health conditions and 15% had mild impairment that warranted a follow-up or that required continuing mental health treatment. While the majority of released offenders did not have any mental health issues, those who do may face additional and significant challenges upon release.

2019 Release Cohort by Substance Use Disorder Severity

Substance Use Disorder Severity	Count	Percent
None/Occasional	2,159	36.2%
Serious/Factor in Crime	3,804	63.8%
Total	5,963	100.0%



Addiction can be yet another challenge offenders face when released, and, unfortunately, substance use disorder is widely prevalent among offenders in the 2019 release cohort. For nearly two-thirds of offenders, substance use either contributed as a factor in their crime or was serious. Nearly 40% of offenders used both drugs and alcohol, with only 32% abstaining from both. The Nevada Department of Corrections offers an array of programs to help offenders overcome their addictions, and their efficacy will be evaluated in determining their effect on recidivism.

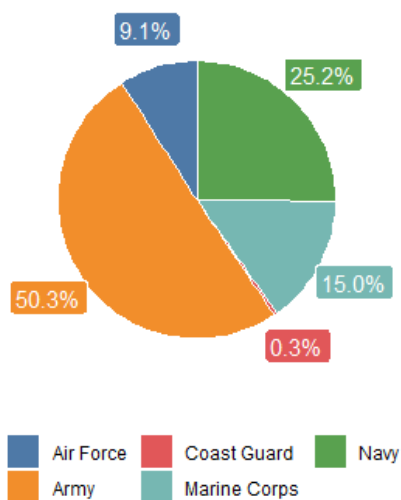
Veteran and Citizenship Status

According to the Department of Veterans Affairs, as of 2017 veterans make up 10.35% of Nevada’s adult population, much higher than the national average of 6.60%. Given this, veteran status’ impact on recidivism may prove interesting to study. Based upon these results, veteran-specific issues could be addressed, helping those with prior service succeed after release.

2019 Release Cohort by Veteran Status

Veteran	Count	Percent
No	5,677	95.2%
Yes	286	4.8%
Total	5,963	100.0%

2019 Release Cohort by Military Branch (Excluding Non-Veterans)



The potential effects of citizenship status will also be included in the

model. Non-citizens and citizens may face different risk factors for recidivism, such as potential language barriers or cultural factors. While finding the underlying differences causing any potential change in recidivism risk will not be included in this report, it still may be interesting to determine whether an effect exists.

2019 Release Cohort by Citizenship Status

U.S. Citizen	Count	Percent
No	466	7.8%
Unknown	27	0.5%
Yes	5,470	91.7%
Total	5,963	100.0%

Among offenders without U.S. citizenship, many are subjected to a hold by Immigration and Customs Enforcement (ICE). These offenders, upon release from NDOC custody, are taken into ICE custody. In many cases, this would preclude these offenders from recidivating back into NDOC custody. As such, this will be included in the predictive model. While this variable may not be of significant direct interest in terms of evaluating factors in recidivism, it will act as a control variable to help mitigate bias which may otherwise occur for the citizenship variable.

2019 Release Cohort by Citizenship Status

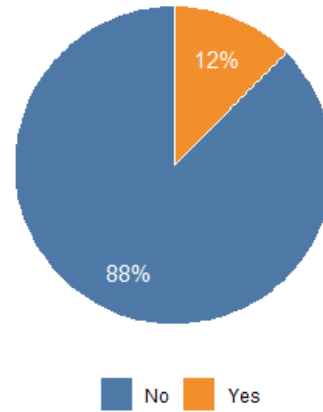
ICE Extradition	Count	Percent
No	5,627	94.4%
Yes	336	5.6%
Total	5,963	100.0%

2019 Release Cohort by Foster Care History

Foster Care	Count	Percent
No	5,219	87.5%
Yes	744	12.5%
Total	5,963	100.0%

Family Factors

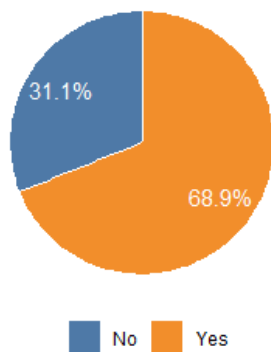
A person’s family can have a profound impact on their life, and may alter behaviors that affect recidivism. As such, two factors regarding offenders’ families will be studied: the offenders parental status and whether the offender has a history in the foster care system.



2019 Release Cohort by Parental Status

Has Children	Count	Percent
No	1,854	31.1%
Yes	4,109	68.9%
Total	5,963	100.0%

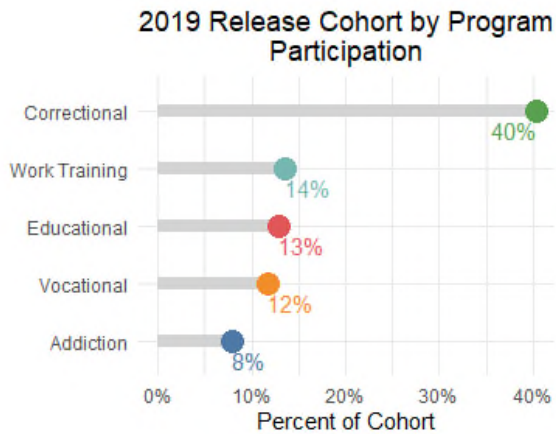
2019 Release Cohort by Parental Status



Program Participation

The Nevada Department of Corrections offers offenders programs in addiction/substance use disorder, correctional, education, vocational, and work training topics. For clarity, correctional programs offer courses in topics ranging from anger management to parenting, with the aim of changing negative behaviors. Vocational programs are courses aimed at providing offenders with post-imprisonment skills that can be used to gain employment after release. These include computer skills, HVAC, and culinary training courses, to name a small selection. In contrast, work training programs,

are primarily programs run in conjunction with other organizations. This includes Nevada Division of Forestry (NDF) training or agricultural coop programs with the University of Nevada.



Predicting Recidivism

A model was created to predict an individual's risk of recidivism based on various demographic, criminal factors, and other variables, many of which were outlined above. Separate models were used to evaluate the effect of programs, as selection bias posed a significant concern in the main model; these other models use a method called propensity score matching to compare program participants with similar 'control' non-participants. It is again important to note that an individual, and their choices, cannot be fully described by these variables, methods, and models. These models were created to study factors rather than individuals, and

to guide policy to better assist offenders after release.

In some cases, collecting complete information about an offender's background, such as education level or employment history, is not a realistic possibility. This can be due to refusal to cooperate with the presentencing investigation or simply due to an offender's intake process occurring before certain data is collected. In these cases, offenders are listed with an "Unknown" status for that variable. This was done to preserve the remaining information to be used in the model without attempting to otherwise impute or predict these missing values.

Whether a factor increases or decreases the risk of recidivism will be given below, along with the confidence level of each variable. The confidence level will be given with asterisks, with one asterisk representing at least 90% confidence, two asterisks representing 95% confidence, and three representing 99% or greater confidence. This does not represent the magnitude of any effect, only the level of confidence or statistically significant.

Also of note is that variables with different categories exclude one of

those categories as a reference group. For example, the reference category for gender is female, so the results of the model show that males have a significantly higher recidivism rate when compared to females. Another example for interpretation is that those with 2 or more felonies recidivate at higher rates than those with no prior felonies, with no prior felonies being the reference group; those with 1 prior felony were not at significantly different risk than those with no prior felonies. It should be noted that non-reference groups, like 1 and 2 prior felonies, are not directly compared in this model.

- Increase

- Length of Stay ***
- Two Prior Felonies *
- Three or More Prior Felonies ***
- Male ***
- 9-12 years of Education ***
- High School or Equivalent **
- Some College *
- Security Threat Group (Gang) Involvement ***
- Property/Other Offense ***
- Washoe County Conviction ***

- Serious/Factor in Crime Substance Use Disorder **
- Parole/Mandatory Parole Releases ***
- Having at least 1 Child **
- Participation in Addiction Programs **
- Participation in Correctional Programs **

- Decrease

- Increasing Age at Release ***
- Participation in Vocational Programs ***
- 7+ months Employed/Enrolled ***
- Unknown Employment/Enrollment History **
- Unknown Foster Care History *
- Stable Physical Health **
- No Mental Health Impairment *
- ICE Extradition (Preclusion Effect) ***

- Reference Categories

- Female
- No Prior Felonies
- 1-8 years of education
- 0-6 months employed/enrolled
- Non-U.S. Citizen
- Category A Felony
- Drug Offenses
- Rural Counties

- Frequent Attention Required/Impaired Mobility (Physical Health)
- Mild/Moderate Mental Health Impairment
- None/Occasional Substance Use
- Non-Program Participant
- Discharge Releases
- No STG (Gang) Involvement
- Having No Children
- Having No Foster Care History

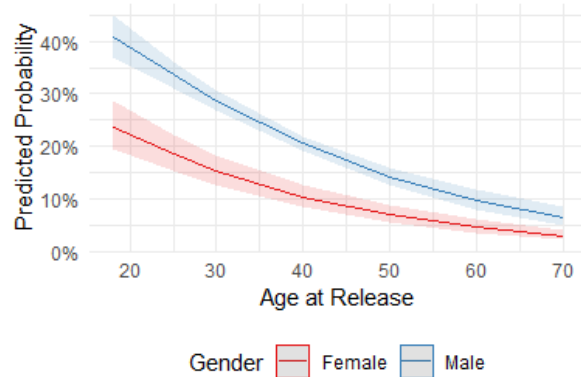
If a category or variable is not listed as an increase or decrease, then it was not found to be statistically significant, meaning there isn't an effect that can be stated with a high level of confidence.

Predictive Probabilities

Age and Gender

As can be seen in the following graph, males have higher probabilities of recidivating than their female counterparts. Likewise, younger released offenders are more likely to recidivate than older releases. A male who is 20 years old at release is estimated to have a 40% chance of recidivating, given that they are part of the reference groups mentioned above and are

average in terms of length of stay and other variables; this is much higher than for comparable females, whose risk is 25-30%.

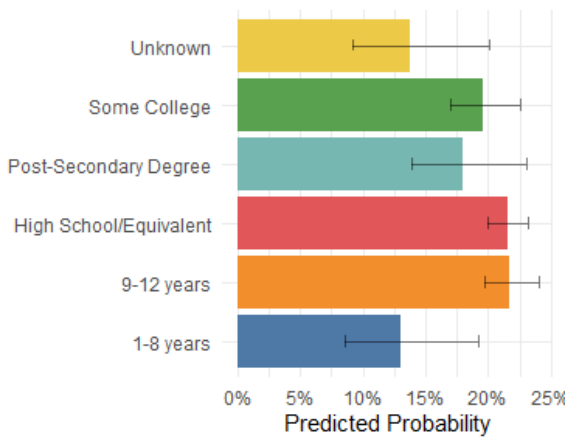


The lines represent the expected probability of recidivism, while the shaded area represents a 95% confidence interval. This is essentially a margin of error; there is a 95% chance that the true probability falls within the shaded region. Likewise, on bar plots, there will be a line showing this 95% confidence region.

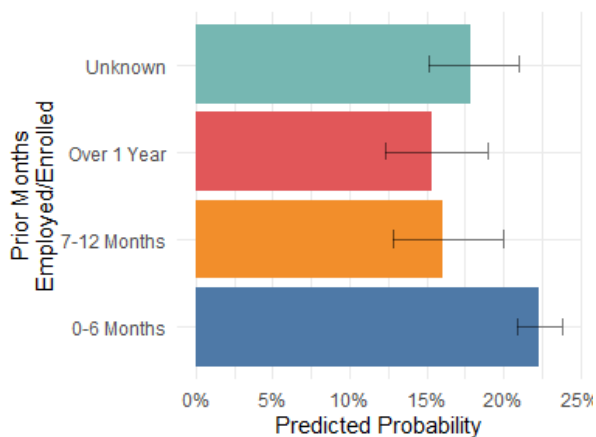
Education and Employment

The risk of recidivism appears to peak for those who attended high school, whether they graduated or not, and tapers off as education increases. Interestingly, recidivism risk is predicted to be relatively low for those who have attained 8 or fewer years of education. However, less than 5% of those who were released fall into this category. As such, there is a wide confidence

interval making it difficult to determine if there is any actual, statistically significant difference. The same holds for those who have earned a post secondary degree, as they make up just over 5% of the cohort.

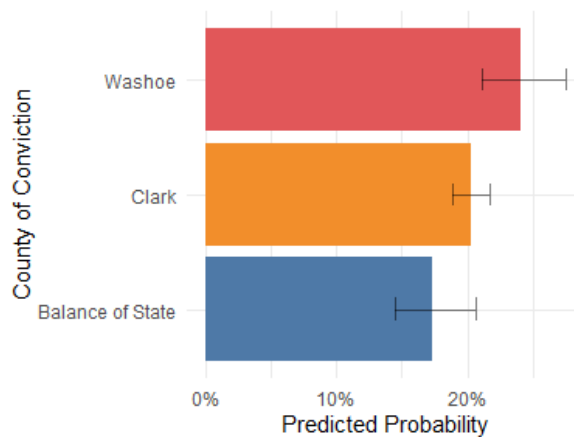


Recidivism risk is predicted to be highest for offenders who have been enrolled or employed for 6 or fewer months, and steadily decreases as tenure increases. This highlights the importance of job and educational opportunities for offenders.



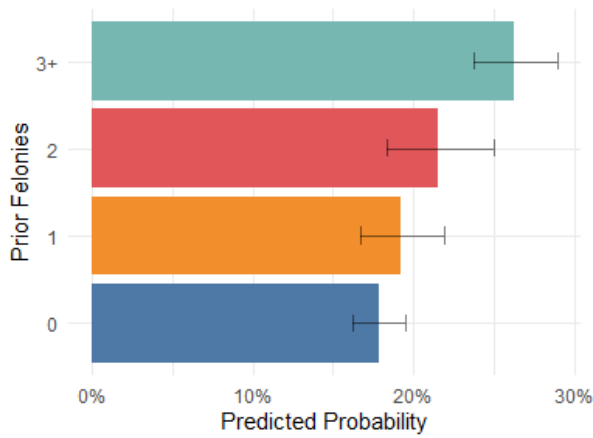
County

Offenders in the counties without large metropolitan areas have significantly lower rates of recidivism than those in Washoe County. Interestingly, there is not a significant difference between Clark County and the rest of the state, which illustrates that there is more geographic complexity to the problem of recidivism than a rural-urban divide.

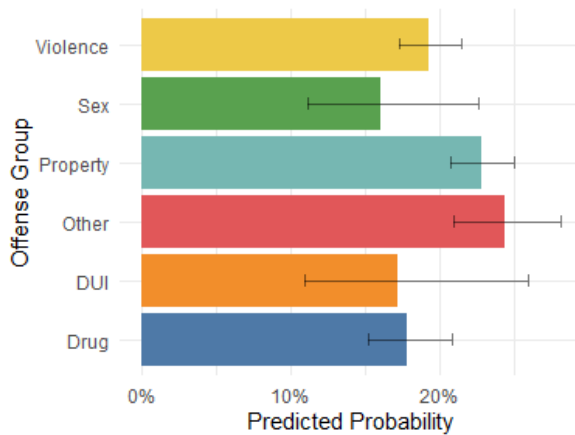


Criminality Factors

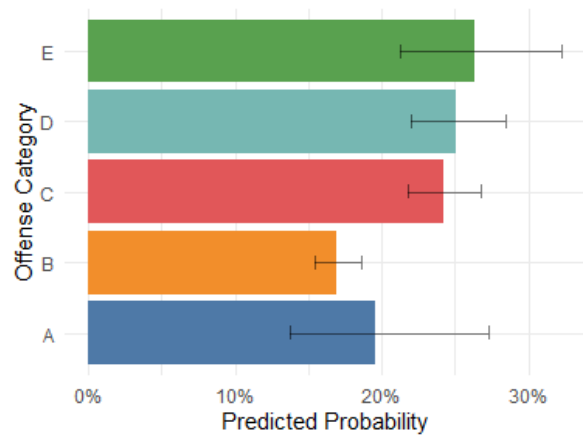
The number of prior felonies was found to be heavily influential, with a steady increase in recidivism risk as the count increases. However, offenders with only one prior felony conviction are not at significantly higher risk than those with no prior convictions. That is, prior felonies only become a meaningful predictor when there are two or more prior convictions.



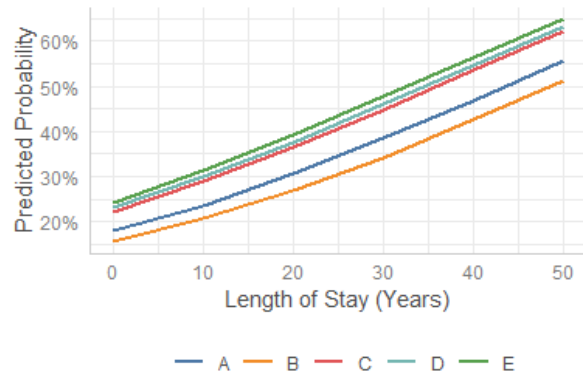
Compared to drug offenders, property and other offenders have a much higher risk of recidivism. Sex offenders have the lowest expected risk, but the difference is not statistically significant.



Category B offenders have, by far, the lowest risk of recidivism. Comparatively, category C, D, and E offenders all have higher risks with high statistical significance. Category A offenders have a moderately higher expected risk of recidivism than Category B offenders, but there is a wide margin of error, in part due to the small number of category A offenders who were released.

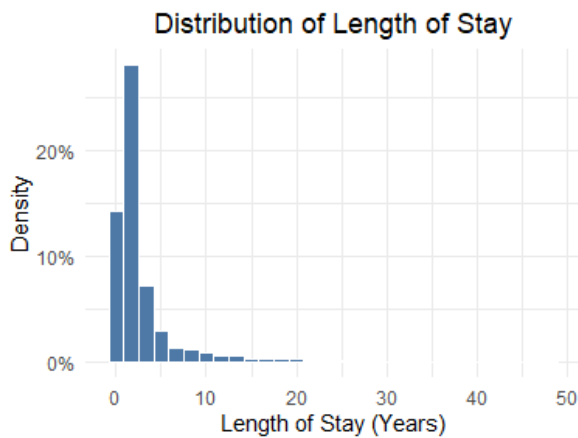


Length of stay, or how long it has been between when an offender's booking with the NDOC began and release, has a fairly large impact on recidivism. For each additional year stayed, the risk of recidivism increased by 0.6%.



While this may not sound like much, it is important to consider that many offenders stay for prolonged periods of time. For example, the longest length of stay in the cohort was over 48 years. According to these results, this offender will experience a roughly 28% higher risk than offenders with the average length of stay of 3.15 years. It should be noted that the average is

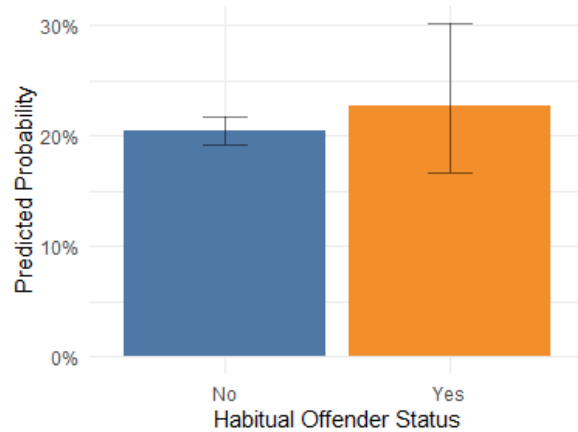
skewed by long-term stays. The median length of stay is 1.6 years, about half of the average. This means that 50% of offenders in this cohort stayed in prison for less than 19 months.



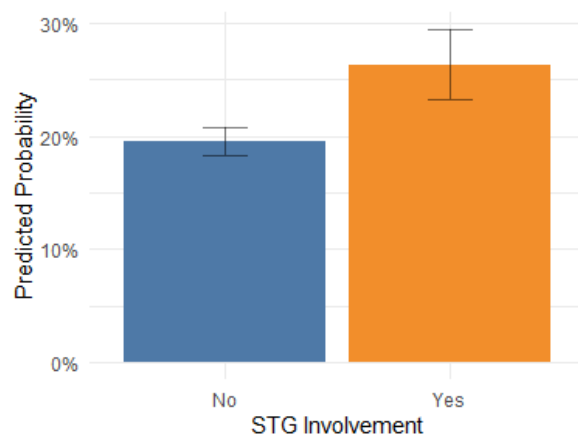
Most offenders will not experience the cumulative effects of a long-term stay on their risk of recidivism to such a large degree. Prisoners who have been incarcerated for long periods of time are, unfortunately, less likely to succeed upon release, possibly due to difficulties reintegrating into society. As such, extra support may be needed to help these released offender succeed after release.

After considering other factors, including the number of prior felonies, an offender’s habitual offender status does not meaningfully predict recidivism. While differences in recidivism rate do appear to exist, the number of habitual offenders is too small to

draw any conclusions about whether being deemed as such has any impact.

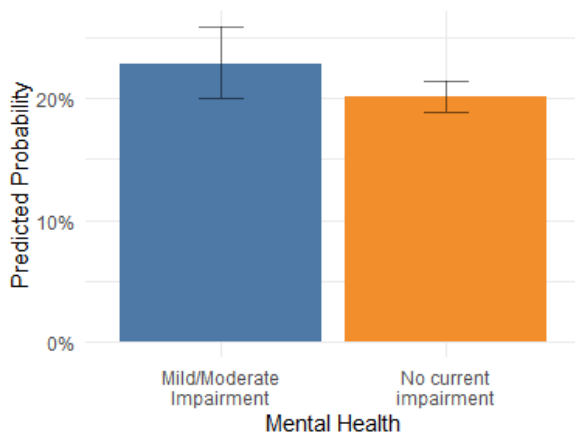


Offenders who are involved with security threat groups (STGs), commonly known as gangs, are predicted to be roughly 7% more likely to recidivate than those who are not involved. This is after accounting for factors like prior felonies and the type and severity of the current offense. This is a staggeringly large effect and illustrates the vital need to reduce STG participation in order to improve overall chances of success.



Physical/Mental Health and Substance Use Disorder

Mental health had an impact on recidivism, but while the confidence is greater than 90%, it is less than the standard 95% typically used. This result is only capturing the direct effect of mental illness; it is possible that indirect effects may also occur. One example of this is the potential for difficulties with employment. Since employment is controlled for in a covariate, this effect is not considered in this model. In order to determine whether this hypothesized relationship exists, a mediation analysis will be performed.

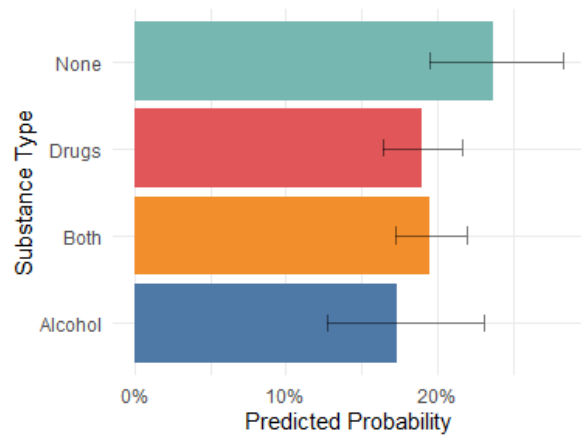
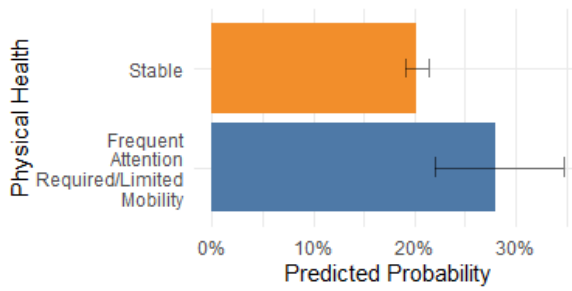


In the context of this study, there are three variables of note. The first, called the predictor, is the mental health status. The second, which is the mediator, is the length of employment or enrollment prior to incarceration. Finally, there is the outcome, which is recidivism. This

method tests whether there is a causal chain where mental health affects employment, which then affects recidivism. For the purpose of this analysis, offenders whose employment/school history is unknown will be excluded, leaving a sample size of 5043.

This model reports that the average causal mediation effect of employment/education tenure on mental health was statistically significant at the 99.9% confidence level. This means that, in addition to the direct effect of mental health status on recidivism, there is an indirect impact on recidivism via employment or enrollment history. To more effectively promote success upon release for offenders with mental illness, a two-pronged approach is vital. This requires mitigating the effects of mental illness on criminal behavior and assisting those afflicted with mental impairments or illnesses in finding sustainable employment.

Offenders who have stable health and no mobility limitations had a 7.7% lower risk of recidivism than those with limited mobility. The same relationship with the employment history of offenders may be present, and will also be investigated.

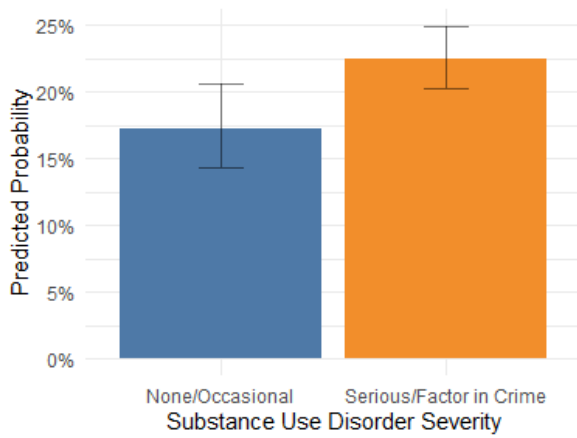


Performing the same analysis as was used for the mental health issues and employment history, there was no such effect between physical health and mobility issues and employment history. That is, physical health did not significantly affect recidivism via an indirect effect through employment. While this seems to suggest that a similar approach to those with mental health issues is not necessary, there is a very small sample of offenders with physical health issues. This likely contributed to the insignificant findings of this analysis, and warrants further study in future reports.

Substance use disorders pose yet another challenge faced by offenders upon release. These can affect a broad variety of factors in an individual's life, from finances and employment to family and health situations. It is important to note that the type of substance used, or abstained from, does not have a statistically significant impact on recidivism. Instead, the severity of usage is a driving factor.

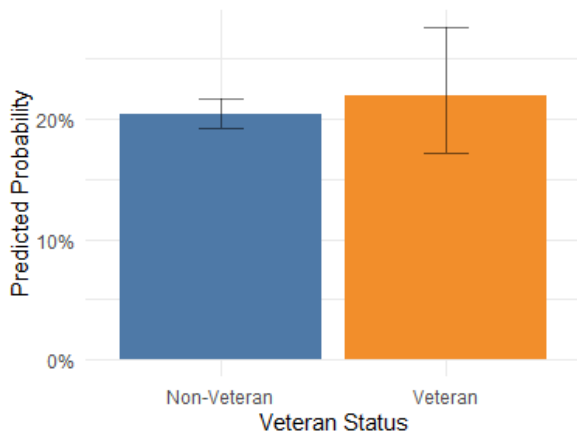
In comparison to those who never or occasionally use some type of substance, those with severe substance use disorders or whose substance use was a factor in their crime are 5.2% more likely to recidivate. This is nearly the same as gang participation and illustrates an urgent need to address substance use disorders; the NDOC is committed to helping offenders overcome these challenges and offers addiction programs to offenders in need.

Like physical and mental health issues, it is productive to study whether there was an indirect impact through employment, and the same method was used to study this. However, the potential relationship was not found to be statistically significant.



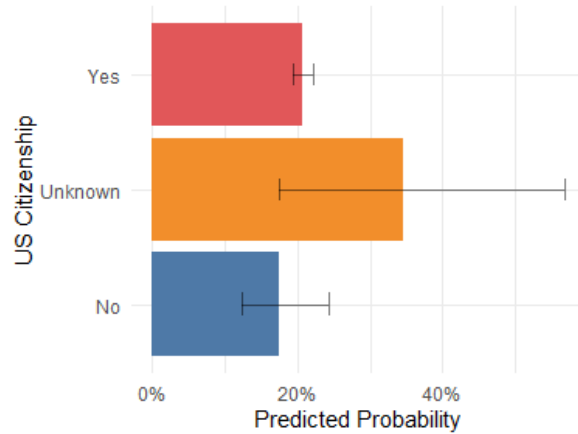
Veteran and Citizenship Status

While the experience of veterans may be different in some ways from the rest of the population, an offender's veteran status did not significantly affect recidivism. A small sample size may have contributed to this finding, and study in future reports with a larger sample may be of interest.



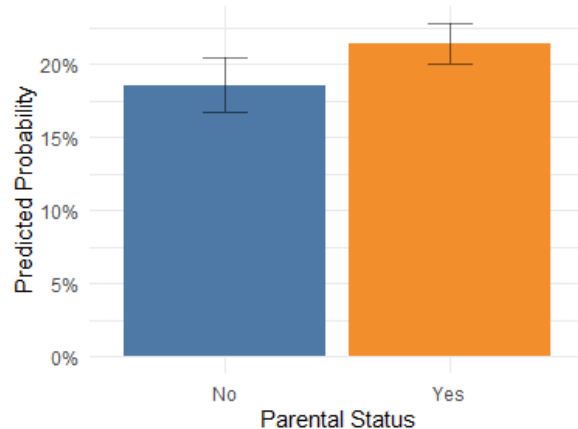
Offenders who are U.S. citizens are 14% more likely to recidivate than those who are not. Those whose citizenship status is unknown do not have significantly different risk than either those with or without U.S. citizenship, again due to the small number of offenders that this

applies to. It should be noted that this is after controlling for ICE extradition.



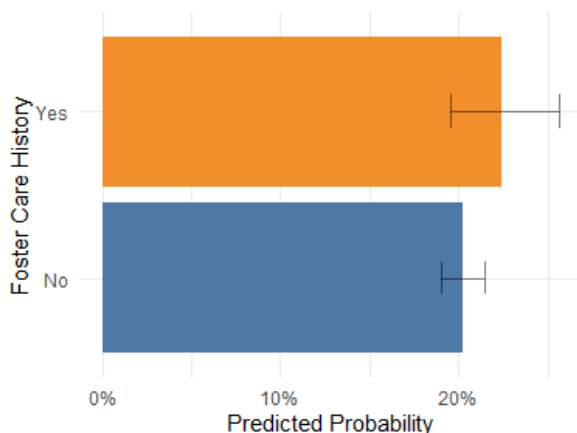
Family Factors

Interestingly, an offender having children results in a higher rate of recidivism. While the mechanism leading to this effect cannot be determined from this analysis, it is informative that parents may need additional resources or support for a successful release.



Formerly being in the foster care system had no statistically significant effect on recidivism. Inexplicably, offenders whose foster care history is unknown, however,

saw a lower risk of recidivism. While this is likely a result to the small number of offenders in this category affecting validity, this once again highlights the complex and unpredictable nature of the influence of an offender’s personal life on recidivism.



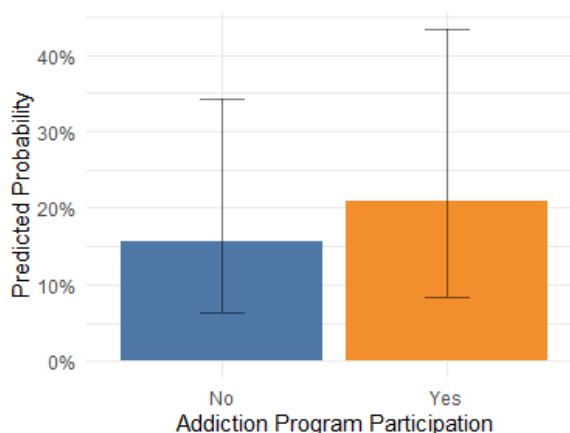
Program Participation

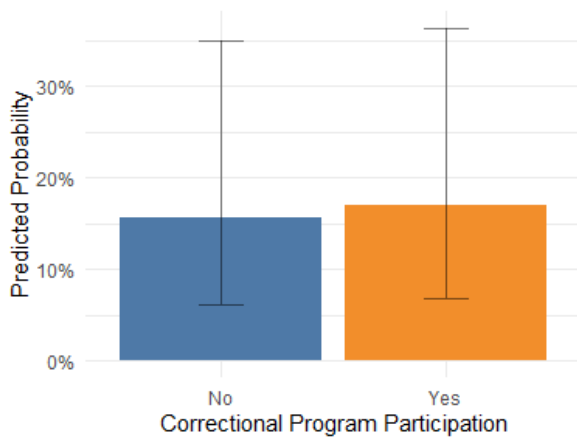
Offenders who participate in programs will be those who are deemed to need them; this poses an issue with the predictive model used in the rest of this report. The results of that model may be biased when it comes to the effects of programming, as it is not able to account for this selection bias. To handle this, each programming type will be studied with a model that is equipped to limit any selection bias.

Using this model, addiction and substance use disorder programs were not shown to be effective at preventing recidivism over the three-year release period. For

comparison, the original predictive model showed that participation in such a program actually leads to an increase in recidivism, showing the bias that the original model has in this type of case.

Recidivism was more likely among those who participated in addiction and correctional programs. It is again important to note that offenders which participate in these programs are those who are deemed most in need of it, and that while the methods used in this analysis reduces selection bias, it does not entirely eliminate it. Further, it may be that these programs have a window of efficacy where an initial benefit may exist, but recidivism increases when the effect wears off. This possibility will be explored further for addiction programs in the survival analysis section.





The method used to mitigate selection bias, unfortunately, does not perform well in some cases. In an ideal study, two individuals would be identical with the exception of program participation, where one participates, or is in the treatment group, and the other doesn't and is in the control group. However, this is not possible, so this method seeks to find the closest match, in terms of the variables included in this report, that it can to the other group for each person. In the case of addiction programming, this performs very well. As can be seen from the figure below, matches are selected so that the histograms of propensity scores, which are associated with the likelihood of program participation, are very similar after matching. This indicates that the performance of the model is not affecting the stated value to any worrying degree for addiction programs.

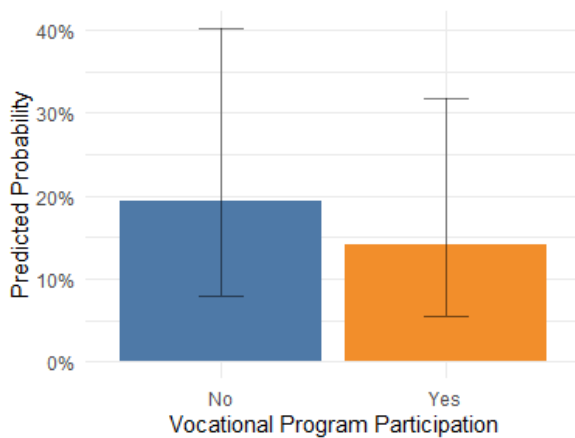


Meanwhile, the histograms after matching for correctional program participation are starkly different. This indicates that this model did not perform well in controlling for selection bias. Given this, the stated effect is likely to be heavily influenced by selection bias.



Educational and work training programs were not shown to have any effect on recidivism risk. Vocational programs, meanwhile,

were highly effective at reducing recidivism. After taking selection bias and factors such as prior employment into account, offenders which participated in at least one vocational program saw a 6% reduction in recidivism risk compared to those who didn't. These propensity score models were all evaluated, and none exhibited the same errant behavior as the correctional program model.

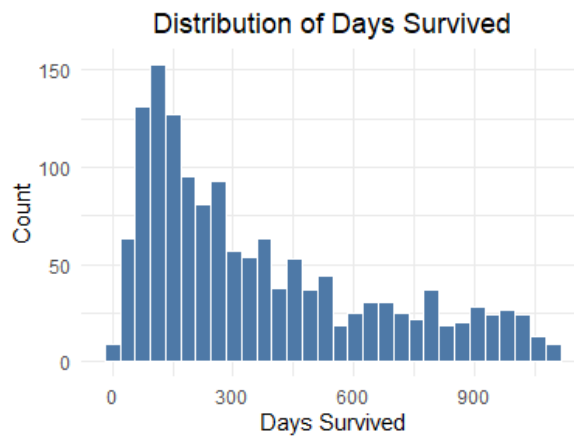


More work must be done in other areas to improve availability of programming. Unfortunately, credits earned by offenders from programming has been in steady decline for the past few years. This has been due in large part to staffing shortages at NDOC institutions. As staffing continues to fall, programs have unfortunately been scaled back due to the need to focus on the necessary day-to-day operations of institutions. This may prove detrimental to the recidivism

rate in the coming years if not resolved.

Survival Analysis

In addition to the predictive model, survival analysis methods were used to determine which factors help offenders to stay out of prison for the longest period after release. In this analysis, offenders which did not recidivate were excluded as they were considered to have 'survived' the entire three-year, or 1095 day, release period.

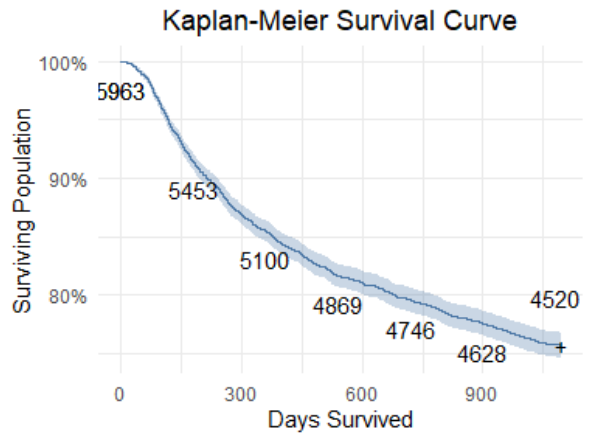


The histogram above shows the amount of time offenders survived before recidivating in days. This shows a clear peak at around 100 days, with a roughly exponential decline after this. The average survival time for offenders was 369 days, while the median was 270.5. Half of the offenders that will recidivate do so in the first 9 months, and if an offender is going to recidivate, the average is almost exactly one year. Less than 16% of

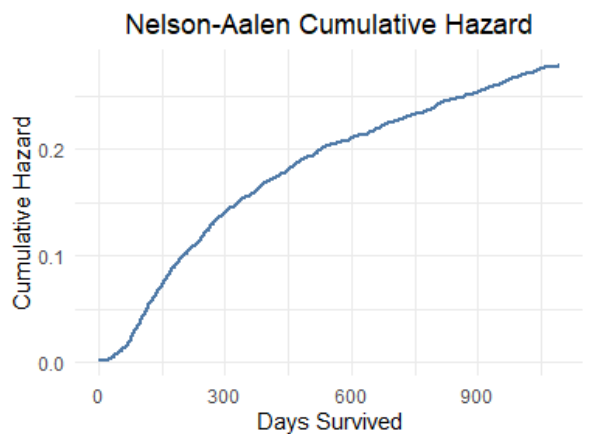
recidivating offenders do so later than 2 years after release.

The short survival times for recidivating offenders underscores the importance of efforts to improve survival times. Giving offenders skills they need to succeed in the first year means that their odds of recidivating at all are greatly diminished. In this light, it is useful to determine the factors that lengthen survival time, as these will likely indicate factors that may reduce recidivism overall.

One graphic which helps to demonstrate survival times is the Kaplan-Meier survival curve. This shows the proportion of released offenders who have not recidivated at a given time. For example, in this plot showing overall survival, we can see that 5100 offenders have not recidivated after 1 year. Further inspecting this graph, it can be seen roughly 60% of recidivating offenders do so within the first year.



The Nelson-Aalen cumulative hazard curve shows the cumulative hazard over time. After 180 the cumulative hazard is just below 0.10. This is essentially the cumulative risk that an offender experiences from release up to a given time. It should be noted for clarity that this does not equal the cumulative proportion of offenders who have recidivated up to that given time.



These plots, along with statistical testing, will be used to determine which factors can improve survival times and reduce the risk of recidivism faced by offenders after release. Statistical testing can more

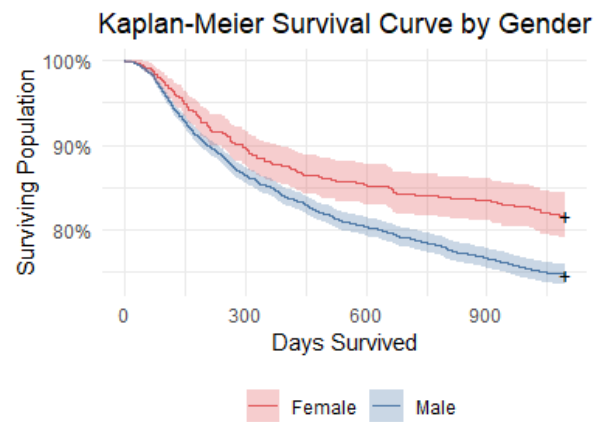
formally determine whether a factor or category led to meaningfully different survival times. Below is a list of the statistically significant factors, which will be examined with graphs to determine where the difference lies when applicable.

- Gender ***
- Education Category ***
- Employment/Enrollment History **
- U.S. Citizenship ***
- STG Involvement ***
- Prior Felonies *
- Habitual Offender Status ***
- Offense Category ***
- Offense Group **
- County of Conviction **
- Substance Use Type **
- Correctional Program Participation *
- Vocational Program Participation ***
- Release Status ***

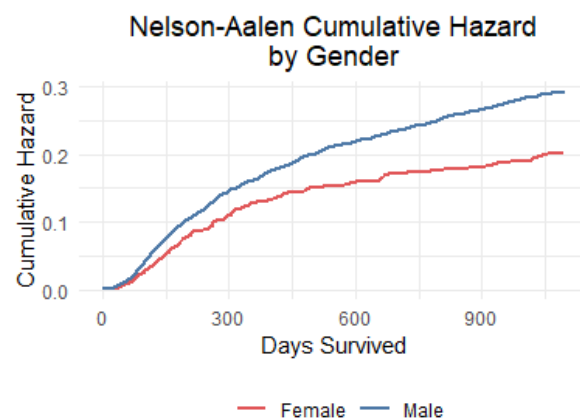
Gender and Age

The pattern of male offenders recidivating at higher rates is readily apparent in this graph. While males have a lower survival rate over the entire duration of the 3-year period, there is a notable departure between the two rates at 18 months after release. From this point forward, the survival for females is

more level relative to males. Males return to incarceration at higher rates than women with a seemingly widening difference as time passes.

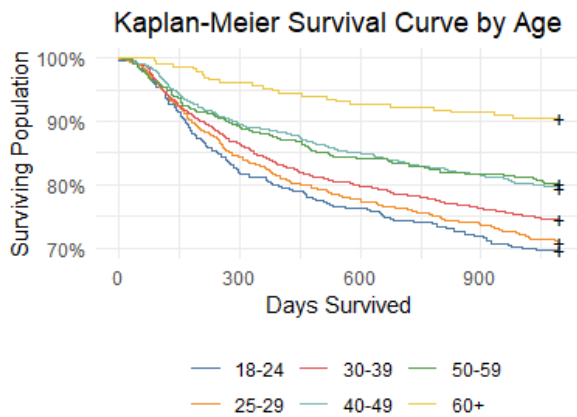


This pattern also presents itself in the cumulative hazard curves, with the curve for female offenders flattening while the male offender curve continues to rise.



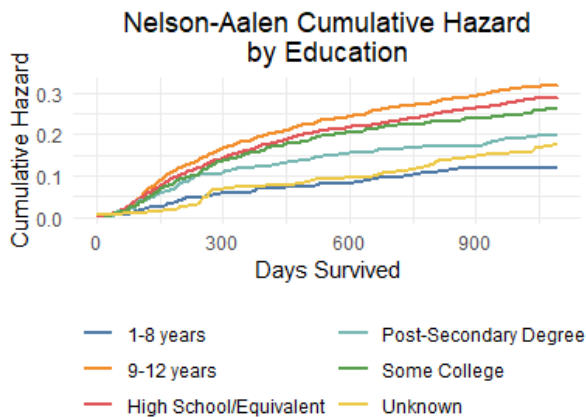
The breakdown of survival rates by age is as expected; the results mirror what was found in the predictive model. Younger releases were more likely to recidivate than older releases, with the relative rates between age brackets being

fairly steady over the recidivism window.



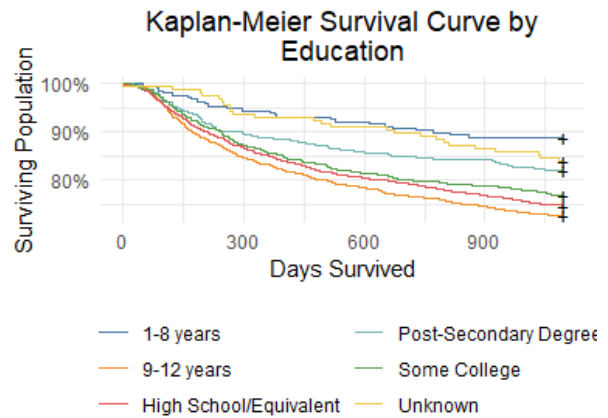
Education and Employment

The following graph indicates that there are few stark differences in survival time trends for different education levels. The most prominent feature is that recidivism among post-secondary graduates levels more rapidly than the other categories, excluding those with 1-8 years of education.

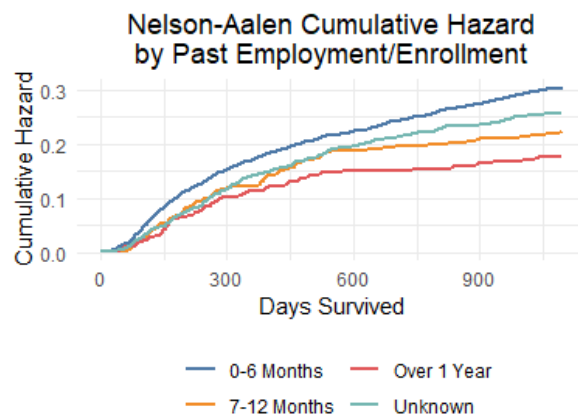


The survival functions are largely in agreement with the results of the predictive model. Those who didn't reach high school or who completed post-secondary degrees

were less likely to recidivate than those who entered or completed high school, and those who attended some college.

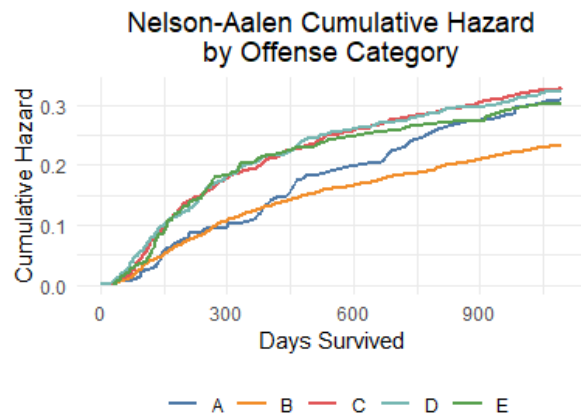


The cumulative hazard estimates for employment and enrollment history indicate their vital importance in reducing recidivism. Those who had a tenure of employment or enrollment lasting longer than 6 months saw more rapid declines in risk after release, and lower levels of risk overall. Those who had tenures longer than 6 months which survived the first 18 months after release saw very little additional risk beyond this point.

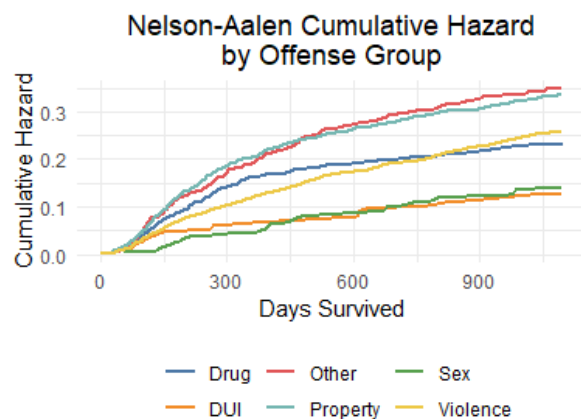


Criminality Factors

Examining the cumulative hazards by offense categories returns interesting, unexpected results. While category A felons appear to have roughly the same behavior as category B felons for the first year, after this the cumulative hazards for category A felons dramatically increased. By the 900 day mark, their cumulative hazards are comparable to those of category C, D, and E felons, who have much higher hazards than category B felons after release. This could indicate that, while seemingly reformed at first, category A felons may relapse after a relatively long period without criminal activity. This poses a serious concern, as category A offenders were convicted of offenses including murder and sexual assault. While it is possible that these offenders may be reincarcerated due to violating conditions of their parole or committing less serious crimes, a return to criminal behavior by these individuals is concerning.

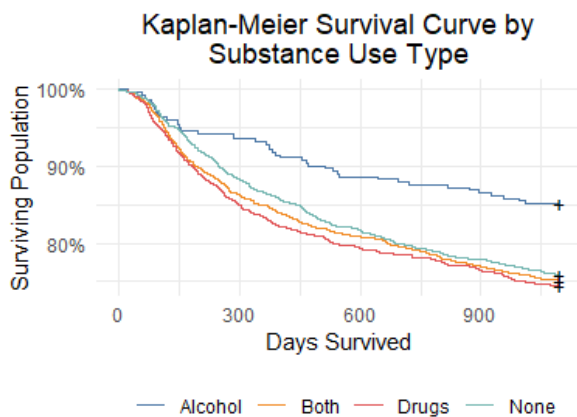


An immediately apparent result from the following graph is that groups of offenses exhibit similar behaviors. First, property and other offenders face the highest risk of recidivism, with nearly identical cumulative hazards. Second, violent and drug offenders have roughly similar cumulative hazards, but the hazard for violent offenders stays basically level with hazards for drug offenders leveling off over time. Finally, sex and DUI offenders both have level and low cumulative hazards. This indicates that these offenders not only have a low risk of recidivism, but these risks stay low over time.



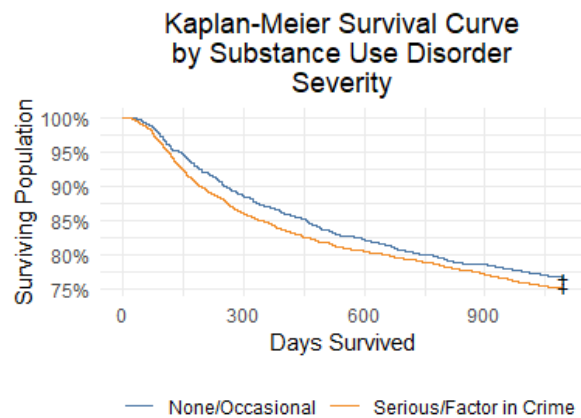
Substance Use Disorder

While users of drugs, both drugs and alcohol, and those who don't use substances exhibit similar survival times, alcohol users tended to survive longer before recidivating. This is an unexpected result, but it should be noted that the severity of substance use disorders are captured in a separate variable; this variable only states which substance are being used. These survival curves also do not account for correlation with other factors, which may be influencing the results of this specific analysis. Still, these results are surprising, and warrant further study in the future.



Substance use disorder severity had little impact on survival times overall, but there is a subtle yet interesting transient difference between 6 months and 2 years wherein the survival curves diverge before reconverging. This may be

due to an increase in relapses leading to higher recidivism risk, fits with the results of the analysis of following addiction program participation, but this again warrants further study before any conclusive results can be drawn.

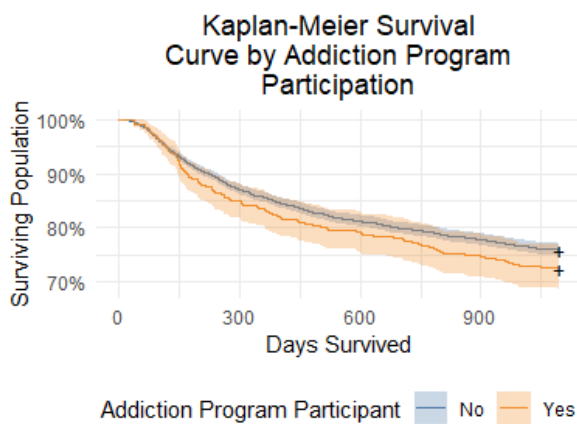


Program Participation

While the programs offered by NDOC were shown to have varying degrees of overall success, analyzing their potential effects on survival time can help to identify strengths and weaknesses, and guide improvements for programs which were not as successful.

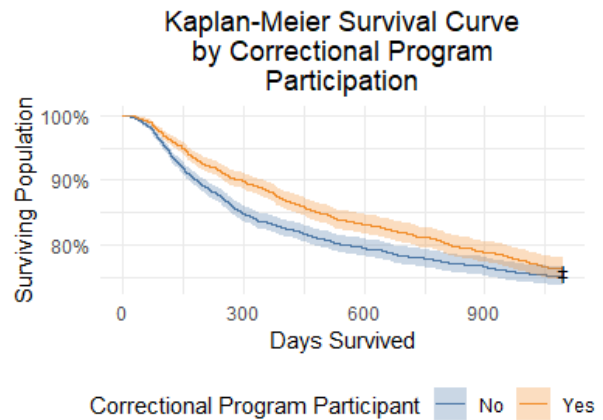
Despite the predictive model finding that those that participated in addiction programs have higher rates of recidivism, the survival analysis gives a result that, overall, there is no difference in survival time between participants and non-participants. Further, at least under visual inspection, the addiction program shows signs of short-term

success. For the first 6 months, the survival for those who participated and who didn't participate in addiction programs were nearly identical. It is only beyond this point that the recidivism rates diverge. Given the potential for relapse to increase the risk of recidivism, this increase in risk may be attributable to the effects of the program wearing off over time. While there is room for improvement, the first 6 months are a positive sign for short-term success.



Correctional program participants, like addiction program participants, were predicted to have higher rates of recidivism. However, survival times were found to significantly differ between participants and non-participants, and upon examining the plot, correctional program participants, had longer survival times over the entire three-year recidivism window. A simple comparison of recidivism rates between participants and non-

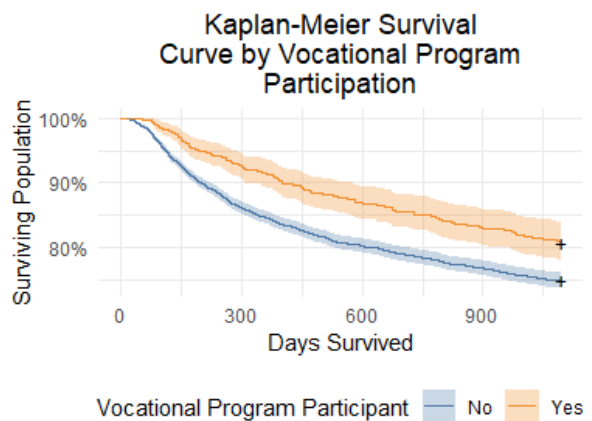
participants supports the premise that other factors are significantly influencing the predictive model's results; 23.67% of correction program participants recidivated, compared to 24.81% of non-participants. These results, while they do not control for any other factors or for selection bias, provide a more optimistic view for participants of correctional programs. Due to the lackluster performance of the propensity score model and the lack of controls in the time series analysis, it is difficult to state with any reasonable degree of certainty which result represents the more accurate picture of correctional programs.



The most successful type of program run by the Department of Corrections was found to be vocational programs. Those who participated in vocational training programs were found to recidivate at lower rates and have longer

survival times. Survival among those who participated in this type of program was higher for the entire duration of the recidivism window, indicating that the effectiveness of this type of program did not suffer a 'wearing-off' effect, like in the case of substance usage programming. This measurable and lasting effect once again indicates the crucial importance of employment

opportunities for released offenders.



Concluding Remarks

The Nevada Department of Corrections will continue its efforts to reduce recidivism to the best of its ability going into the future. This is one of the core missions of the department: to prepare offenders for successful reentry into society. We hope that this report may help to guide policies and improve the ability of the department to help prevent recidivism. Curbing recidivism is of the utmost importance, as it will have positive effects for the department, for the offenders, and for the public by reducing costs and supporting public safety.

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