Analyzing Candidates for Home Electronic Incarceration on Return-to-Custody Rates for Inmates

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***Abstract* – Home electronic incarceration, otherwise known as HEI, is an alternative to traditional incarceration. HEI allows inmates who meet certain qualifications, including stable residency, employment, and nonviolent offenses, to serve their sentence from their residence rather than in jail. Before the onset of the COVID-19 pandemic in 2020, the Albemarle-Charlottesville Regional Jail (ACRJ) maintained a restricted capacity for HEI, primarily extending this opportunity to frequent offenders who met the qualifications above (Dornfeld et al., 2023). At the advent of COVID-19, ACRJ increased their capacity and use of HEI to reduce the number of occupants in the jail and, as a result, mitigate contagion risk (Kumer, 2023). Following the expansion of the HEI program, (Dornfeld et al., 2023) discovered that HEI participants had lower reoffense rates than jail-sentenced counterparts who committed similar crimes. Currently, HEI participants are determined from information gleaned from their files or by court order (Kumer, 2023). To streamline this selection process and increase the participation of inmates benefitting from HEI, factors were investigated that correlate with HEI's success. This research will assist jail administration in identifying candidates who will gain the most from HEI and recommend those offenders to the program.**

The methods consist of quantitative analysis of booking data acquired from ACRJ along with insight and guidance from contacts at Region Ten Community Services, an organization dedicated to working with those affected by mental illnesses, substance abuse, and/or developmental disabilities. Additionally, Offender and Aid Restoration- Jefferson Area Community Corrections (OAR-JACC) provided a meaningful understanding of the project. The quantitative analysis focuses on factors that may correlate with HEI violations and changes in recidivism rates including criminal history, current charge, mental health, employment, and gender.

Factors were identified and analyzed that increase the likelihood of an inmate successfully completing their HEI sentence without violation, using the improved stability provided by HEI to prevent recidivism. These factors formulate sentencing recommendations for ACRJ's decision-making process.

I. INTRODUCTION

In the United States, 68% of former inmates return to custody within 3 years of their release (Alper, 2018). Last year, Dornfeld et al. (2023) found that inmates under the supervision of Albemarle-Charlottesville Regional Jail (ACRJ) who served their sentences on home electronic incarceration (HEI) were thirteen percentage points less likely to return to ACRJ in one year than those who served their sentence in jail, suggesting HEI could be key in reducing recidivism (return-to-custody) rates in Central Virginia.

At ACRJ, post-trial HEI participants are selected according to the criteria created when the program numbers increased significantly in response to the COVID-19 pandemic. The criteria ensure that the inmate has a stable residence, committed a non-violent crime, and does not have extensive criminal history. The program uses GPS tracking devices that maintain strict physical boundaries which allow individuals to continue working, have access to a more meaningful support system, and maintain a semblance of a normal life. The most ubiquitous HEI apparatus is an ankle monitor device.

HEI implementation can be beneficial to the user and overall judicial system through improvements to mental health, better support systems, decreased violence in prisons, the ability to maintain current employment, and positive impacts on the children of participants (B.I Incorporated, 2022). ACRJ validated these insights in an interview with the superintendent, describing the ways in which offenders may maintain their work and home lives while serving their sentence(s) through the HEI program. (Kumer, 2023).

Due to the reduced implementation of HEI prior to the COVID-19 pandemic, the efficacy of HEI prior to the pandemic is not comparable to efficacy afterward. This study focuses on understanding correlations between certain factors and success rates on HEI. Analysis results will provide ACRJ and stakeholders with recommendations on what qualities to further look into when selecting those who should be on HEI.

II. METHODOLOGY

A. Data Security Procedures

In keeping with the University of Virginia approved Institutional Review Board protocol, all group members, in an effort to ensure data security completed CITI Training,

set up a secure server for sensitive data, and executed NDA documentation. CITI training is a web-based training module environment that guides users on work responsibility procedures with prisoner data. A secure server was obtained through the IVY Secure Computing Environment. Using the University of Virginia (UVA) High-Security VPN, group members can access a remote desktop assisted by the Ivy Secure Computing Environment. Implementation of the secure server ensures the safety and proper handling of sensitive data shared between UVA and ACRJ. All team members and stakeholders were required to sign non-disclosure agreement (NDA) documentation for data sensitivity.

B. Data Acquisition and Merging

Data collected from ACRJ includes all charges from January 1st, 2015 to the date of final collection: February 19, 2024. The original data import includes 64,841 entries, each representing a charge to an individual. Cleaning procedures consisted of removing duplicates, outdated entries, and weekenders[1]. Additionally, charges were combined if they occurred within the same booking event and temporary leaves of absence for receiving medical services were removed. These cleaning steps brought the total entries to 32,321 individual sentences.

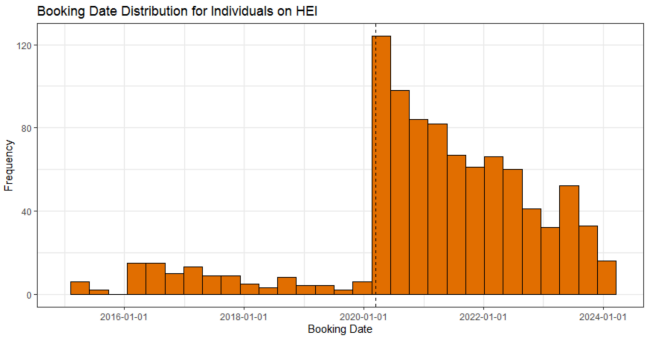

Figure 1: Distribution of HEI Bookings from January 1st, 2015 to February 19th, 2024

Figure 1 displays the booking date distribution for individuals placed on HEI. The dashed line corresponds to the start of the COVID-19 pandemic. In the cleaned booking dataset, there are 929 HEI participants. From January 1st, 2015 to March 15, 2020, there were 116 total inmates on HEI. Following the start of the pandemic, there were 813 HEI program participants. Pre-COVID-19 data includes the beginning of the data collection until March 15, 2020; anything after March 15th, 2020 is considered post-COVID-19 data.

C. Research Goals and Analysis

The goal of the study is to explore factors that contribute to the success of HEI, such that they may reduce the recidivism of future inmates. For this study , 'recidivate' and 'return-to-custody' are used interchangeably to describe

[1] Weekenders are individuals who get booked into to the jail on weekends to serve their sentence

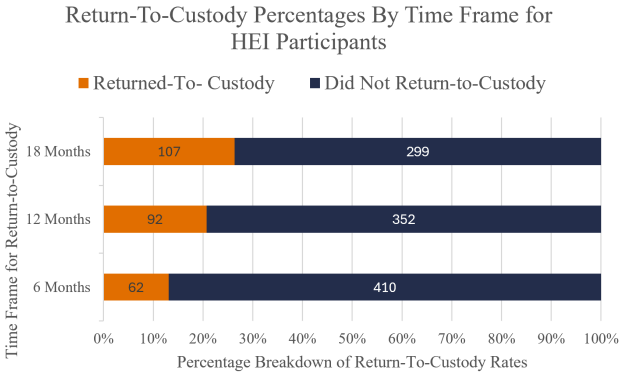

Figure 2: Return-to-Custody Per Monthly Time Frame

a return by an individual to the jail following sentence completion. To evaluate these factors, as well as depict recidivism trends with those on HEI versus the greater population, this analysis considers the following areas:

1. Characteristics of HEI vs. Non-HEI inmates
2. HEI versus custodial/traditional incarceration
3. What factors contribute to a successful sentence on the HEI program
4. How is mental health correlated with recidivism of HEI individuals?

The metric used for determining success on HEI is return-to-custody. This metric was calculated by checking to see if an individual was booked within 18 months from when they successfully served their sentence.

When calculating return-to-custody rates, three time frames for a fulfilled sentence were selected. 6, 12, and 18 months. 18 months is the time frame shown in all resulting analyses. Other sources cite 18 months as well for recidivation values suggesting that median time from release to the first recidivism occurred most around 18 and 24 months (Hunt et al., 2019). 24 months was too great a boundary as it would have severely limited analysis.

As depicted in Figure 2, percentages of those who have returned-to-custody are indicated in 'orange'. Those who did not are depicted by 'blue'. 18 months was selected as opposed to 6 or 12 because 18 months gives the largest window to evaluate the given data, while maintaining a large enough sample size for analysis. For those between 6 and 12 months, the marginal return-to-custody rate is 7.59%, for 12 and 18 it is 5.63%. 18 months give the best marginal return and therefore the best window of analysis time.

III. RESULTS

A categorical analysis was conducted to determine the most frequent charge types and their corresponding Virginia statutes for all charges linked to HEI. Each charge filed against an individual upon arrest is tallied separately. As indicated in Table 1, charges were sorted in order of greatest frequency with Generic DUI being the most frequent at 17%. Probation stemming from a felony offense represents the second most frequent charge, accounting for 13%, while all other categories make up less than 5% each. Table I also

demonstrates that the most common charges are nonviolent crimes.

TABLE I. Frequency of Charges (Post-Trial) for those on HEI, following March 15, 2020

Statute Name	Statute Number	Frequency	Percent
Generic DUI	18.2-266	191	17%
Probation: Violation on Felony Offense	19.2-306	147	13%
Drugs: Possession with Intent to Manufacture and Sell, Schedule I or II	18.2-248(C)	38	3%
Drugs: Possession Schedule I or II	18.2-250(A)(a)	33	3%
Firearm: Possess by Felon Nonviolent Within 10 Yrs	18.2-308.2(A)	31	3%
Simple Assault - Citizen	18.2-57(A)	31	3%
Grand Larceny Motor Vehicle Theft	18.2-95(ii)	22	2%
Driving after Forfeiture of license	18.2-272(A)	21	2%
Monument Intentional Damage Value <$1000	18.2-137(B)(i)	20	2%
Domestic Assault - Simple	18.2-57.2(A)	19	2%
Contempt of Court: Without Jury	18.2-456	17	2%
Grand Larceny Shoplifting $1,000 + Over	18.2-103	16	1%

Table I: Frequency of Charges (Post-Trial) for those on HEI, following March 15, 2020

When examining the correlations between factors and return-to-custody rates, it is crucial to analyze trends concerning traditional custody data with the attempt of isolating out any direct impacts of HEI. In order to make comparisons, only post-COVID-19, post-trial data points are considered in the analysis for both HEI and traditional custody. Additionally, severe and violent crimes were removed from the traditional custody dataset to ensure the comparisons were made among similar level offenses. The recidivism rate for post-COVID-19, post-trial HEI individuals who have successfully served their sentence is 25.5%, which is 12.2% lower than the return-to-custody rate for those with similar crimes who have served their sentence under traditional custody.

In Figure 4, the age distributions are based on the last completed inmate sentence to avoid errors as a result of increasing age due to the time between the sentence and the initial sentence itself. The median age for recidivists who underwent the HEI program was lower than those who did not recidivate. This was flipped for traditional custody where the median age was much higher for recidivists. This may indicate that HEI may be more successful at rehabilitating higher age groups than traditional confinement.

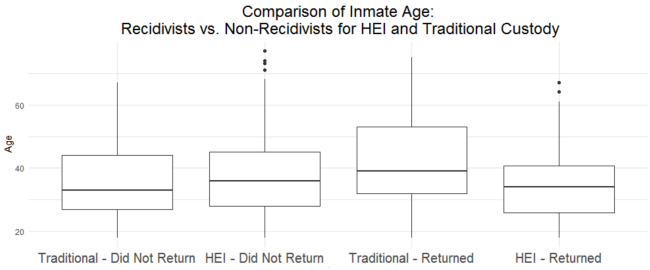

Figure 4: Comparing Age Distribution of Recidivists and Non-Recidivists in HEI and Traditional Custody Settings

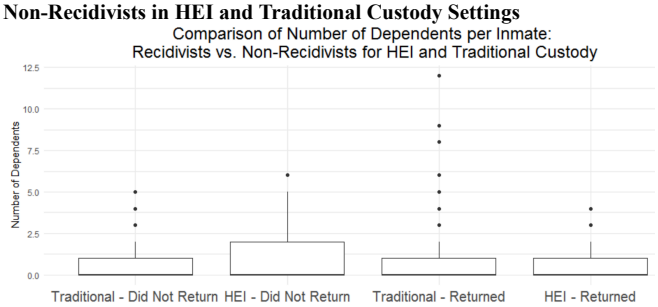

Figure 5: Dependents Distribution: Recidivists vs. Non-Recidivists in HEI vs. Traditional Custody

In the initial hypothesis, it was thought that dependents would decrease return-to-custody rates because of the added responsibility one feels. However, when looking at the correlation between the number of dependents and return-to-custody rates, no differences across HEI and traditional custody were found.

D. ACRJ Mental Health Screener

The Brief Jail Mental Health Screener (BJMHS) is a screening protocol used by ACRJ to evaluate the mental health of individuals booked into ACRJ. The questions included in the screener are as follows:

1. Do you currently believe that someone can control your mind by putting thoughts into your head or taking thoughts out of your head?
2. Do you currently feel that other people know your thoughts and can read your mind?
3. Have you currently lost or gained as much as two pounds a week for several weeks without even trying?
4. Have you or your family or friends noticed that you are currently much more active than you usually are?
5. Do you currently feel like you have to talk or move more slowly than you usually do?
6. Have there currently been a few weeks when you felt like you were useless or sinful?
7. Are you currently taking any medication prescribed for you by a physician for any emotional or mental health problems?
8. Have you ever been in a hospital for emotional or mental problems?

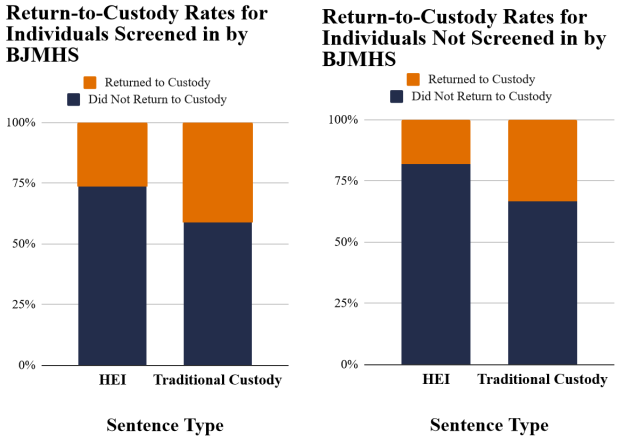

Figure 6: Return-to-Custody Rates Disaggregated by Screener Status and Sentence Type.

The questions are answered in a "yes" / "no" format. If an individual answers "yes" to Question 7 or 8, or answers "yes" to two or more questions from questions 1-6, they will be screened in for evaluation by a mental health professional. Additionally, the proctor of the BJMHS has the discretion to screen in an individual if they believe it is necessary (Gibbons, 2024). Individuals who stay one day or less at the jail do not take the assessment.

As shown in Figure 6, those who screen in according to BJMHS recidivate at slightly higher rates, both after HEI and traditional sentences. This may be due to problems with addiction or difficulty accessing support services post-release.

E. Return-to-Custody Rate Differences by Demographic

Table II breaks down return-to-custody rates for individuals who the BJMHS did and did not screen in for mental health. While both individuals who do and don't screen in see huge reductions in recidivism when they serve their sentence on HEI instead of in jail, the reduction is slightly greater for those who do not screen in, by 0.54 percentage points. Though there are many potential explanations for this, one could be increased access to mental health services for inmates serving their sentence on HEI, negating some of the harm caused by their time spent in jail.

TABLE II. Return-to-Custody (RTC) Rates by Sentence Type and BJMHS

BJMHS	**Screened In**		**Not Screened In**	
Sentence Type	*HEI*	*Traditional*	*HEI*	*Traditional*
RTC Rate	26.00%	40.88%	18.00%	33.42%
RTC Reduction	14.88 percentage points		**15.42 percentage points**	

TABLE III. Return-to-Custody (RTC) Rates by Sentence Type and Gender

Sex	**Women**		**Men**	
Sentence Type	*HEI*	*Traditional*	*HEI*	*Traditional*
RTC Rate	18.18%	29.03%	28.17%	40.14%
RTC Reduction	10.85 percentage points		**11.97 percentage points**	

TABLE IV. Return-to-Custody (RTC) Rates by Sentence Type and Race

Race	**Black**		**White**	
Sentence Type	*HEI*	*Traditional*	*HEI*	*Traditional*
RTC Rate	27.93%	47.28%	23.86%	32.69%
RTC Reduction	**19.35 percentage points**		8.82 percentage points	

Table III breaks down HEI and traditional custody return disaggregated by sex. Females recidivate less than males after both HEI and traditional sentences, but the reduction in return-to-custody rates after HEI versus traditional sentences is 1.12 percentage points smaller for females than it is for males. This may be due to their lower overall recidivism rates.

Table IV disaggregates return-to-custody rate differences by race. Black and White were chosen as the two levels given the small amount of data on other races in the dataset. In general, Black people are more likely to return to custody than White people. Obviously, the color of their skin does not cause Black people to commit more crime. The effect shown in the data may be the result of historical socioeconomic inequalities, continued racial discrimination, or other factors not covered by this data. However, Table IV also shows that.

IV. IMPLICATIONS AND CONCLUSION

Out of the more than 30,000 sentences from January 1, 2015, to February 19, 2024, 929 were served on the HEI program. During and post-COVID-19, 813 total sentences were served on HEI, as compared to 113 of pre-COVID-19. Before COVID-19, ACRJ had about 10 participants serving HEI sentences at any given time. During COVID-19, ACRJ increased their capacity to an average of 200 HEI participants per year.

Of the program participants, approximately 26% of individuals were screened in to be evaluated by a professional mental health professional, while nearly 40% of all BJMHS surveys were screened in. This finding shows the selection process for HEI is more stringent and that the program participants are more likely to have not been evaluated by mental health professionals. Additionally, analysis indicates those who were placed on HEI and were screened in based on the BJMHS survey recidivate at 13.6% higher rates. This finding suggests that those individuals who were screened in may recidivate back to jail at higher rates as opposed to those who were not screened in. To clarify further, HEI may or may not be a causal indicator of recidivism for those who were screened in as other factors may be at play.

Return-to-custody rates for those on HEI were lower when compared to those serving their sentence at ACRJ. Additionally, Table II demonstrates the differences in recidivism rates between HEI and traditional incarceration at ACRJ, categorized by sex. On average, females are less likely to recidivate in either circumstance. However, HEI participants, regardless of sex, are less likely to recidivate as compared to those traditionally incarcerated for similar crimes and circumstances.

Due to the constraints of the data, findings for external factors and circumstances were limited. Program access for those on HEI may help in understanding factors contributing to recidivism. These external programs include but are not limited to, resources and programs offered by Region 10 Community Resources.

Additional research may be focused on barriers to individuals who may be quality candidates for HEI. These factors may include housing insecurity, use of psychotropic medicines, education level, and access to work, among other things. It is important to state that ACRJ's HEI program is free to participants and individuals have access to the impressive Public Defense Officer of Charlottesville (Gibbons, 2024).

The acquired data limits the scope of the analysis to those who recidivate back to return to custody rates for those serving their sentence at ACRJ. ACRJ, and does not include individuals who have committed crimes in another locale or jail system. In addition to data obtained from ACRJ, HEI sentencing is limited to those who have stable residencies within a 35-mile radius of ACRJ, increasing the chance of recidivism to the same jail system if they are arrested for another crime.

Finally, analysis of HEI and its benefits is a continuous process. Implementation of the program has only recently increased in the aftermath of the COVID-19 pandemic. As indicated by the booking data from ACRJ, the number of individuals that use HEI as opposed to traditional incarceration will continue to grow allowing for long-term analysis of recidivism rates as more data is created. This extensive analysis will aid in understanding which time frames inmates are more likely to recidivate and why this might occur.

Moving forward, it is advisable for future research to compile more extensive data from other agencies and, if possible, to merge data between agencies to explore more factors as well as any underlying correlations. This analysis may provide potential solutions to the following questions: What are the differences between individuals on HEI who are screened in and do/don't recidivate? Do they have better access to mental health services? How will HEI recidivism rates change over longer periods of time as those who have served sentences on HEI? These findings ultimately provide decision-makers with valuable information for supporting inmates on HEI and aid the Evidence-Based Decision Making (EBDM) team in making informed decisions regarding the ACRJ population, specifically those participating in the HEI program.

V. ACKNOWLEDGEMENT

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