

High Utilizers of the Albemarle and Charlottesville Criminal Justice System

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Like many communities, Charlottesville, VA includes relatively few individuals who consume a disproportionate amount of public and private restorative services. These services include criminal justice resources (such as police, courts, jail) and community services (including mental health counseling, EMT trips, hospital emergency room visits, and drug and alcohol rehabilitation). The objective of this study was to learn as much as possible about these “high utilizers” to inform decision-makers about potential interventions that might lessen recidivism among them, improve their lives, and reduce costs to the community. High utilizers were defined as individuals with four or more arrests within a single year, and were identified using booking and related data provided by the ACRJ (Albemarle-Charlottesville Regional Jail) spanning a 34-month study period [1]. Analysis of this data and stakeholders meetings resulted in:

- A characteristic understanding of the differences between high utilizers and non-high utilizers.
- A flow chart built to illustrate the complex, multi-agency system that arrestees go through each time they are booked.
- A chart showing that larceny is the most common statute for initial arrests, but contempt of court and probation become more prevalent for subsequent arrests.

Future steps can include better quantifying of the financial and time aspects of the booking process, understanding the mental health implications of the Brief Jail Mental Health Screener data, looking into the rehabilitation services most used by high utilizers, and investigating the unquantifiable human elements behind the issue.

I. INTRODUCTION

Every year, nearly 428,000 people across the US recidivate, or reoffend, at least 3 times, cycling through law enforcement, courts, emergency departments, and other community services [2]. According to a large-scale 2017 survey, of those who recidivate 3 or more times in a year across the US, it was found that 61% had a substance abuse disorder, 50% were making less than \$10,000 annually, 27% were suffering from a mental illness, 17% were unemployed, and 12% used the emergency room at least 3 times in the past year (often as their primary care provider) [3]. Charlottesville, with its own unique demographics and challenges, may have specific factors that are common among its own “high utilizers” (HU), making a local study beneficial. These individuals tend to struggle to achieve long-term stability in society, constantly recidivating, often due to unmet needs. Technically defined, high utilizers at the Albemarle-Charlottesville Regional Jail (ACRJ) are those having at least 4 jail bookings within a 365 day period, with a recent high utilizer being one whose most recent booking was in the previous year [1].

Despite numerous available local mental health, substance abuse, and reentry services, many are underused by those who could benefit from them [4]. This project identifies high utilizers, compares them to non-high utilizers in terms of their demographics and jail booking data, tracks their flow through the criminal justice system, and uses a timeline graph to understand and compare the lifecycle (time in system) of high utilizers and non-high utilizers. Identifying and understanding the factors common among Charlottesville’s high utilizers can help to decrease the size of this group, leading to safer communities, a healthier public, and a more economically-efficient criminal justice system. It could even help to build the stepping stones for a

future system that could identify potential high utilizers much earlier than previously possible.

II. PROCEDURE

A. Data Security Procedures

In compliance with the University of Virginia's Institutional Review Board (IRB) protocol, all research team members completed the Collaborative Institutional Training Initiative (CITI) training, specifically web-based training courses on the responsible conduct of research involving prisoner data. Secure data storage, established through UVA's Ivy Secure Computing Environment, provided secure access to sensitive data. Using UVA's high-security Virtual Private Network (VPN), team members used the Ivy Environment to access a remote desktop, ensuring the security of the personally identifiable and HIPAA-protected data involved in the project.

B. Data Acquisition and Merging

Data collected from the Albemarle-Charlottesville Regional Jail (ACRJ) includes jail bookings from 1-1-2022 to the date of final collection, 11-12-2024, a span of approximately 34 months. Each booking may be associated with multiple charges as every row in the initial dataset signified a charge. Individuals could have multiple charges in one booking event, so the team combined them to represent an individual's booking into the jail as a single row, preserving the additional information. This resulted in 8851 bookings after cleaning. The team also obtained data from the Brief Jail Mental Health Screener, and merged it with the ACRJ data using the keys of Jacket Number (unique to a single individual across bookings) and Booking Datetime/Date.

C. Research Goals and Analysis

The goal of the study was to understand the cycle of recidivism of Albemarle and Charlottesville's high utilizers. To reach this goal, the study was focused towards these areas:

1. Characteristics of high utilizers vs. non-high utilizers.
2. Flow chart visualizing and connecting the entire arrest to court processes to understand pain points and how system components work together.

3. Graph to understand the life cycle (of subsequent arrests) of high utilizers.

The above focuses led to a clearer picture of what high utilizers' demographics look like as compared to non-high utilizers, how high utilizers' constant utilization of the criminal justice system is influenced by the various agencies involved in the system, and how much more cumulative time high utilizers spend in this system than non-high utilizers. The consequences of this analysis are explained in the following section.

III. RESULTS AND DISCUSSION

Fig. 1 shows that while high utilizers make up only 7.3% of total *individuals* booked, they accounted for 27.3% of unique *booking events*. In other words, high utilizers had an average of 7.2 bookings per person, while non-high utilizers had an average of 1.5 bookings per person – an increase by a factor of 4.8.

To better understand what drives this imbalance, the team analyzed the ACRJ booking data and began characterizing high utilizers and non-high utilizers based on demographics and most common charge type. The team tested the hypothesis that the age distribution was the same between gender and HU status using the 4-sample Kolmogorov-Smirnov (KS) Test. It was found that there is only a statistically significant relationship between the age distributions of male high utilizers and male non-high utilizers. Since the majority of comparisons were not significant, we found that there is no specific age or gender group that should be targeted for specific interventions. The results from different combinations of gender and HU status are shown in TABLE I.

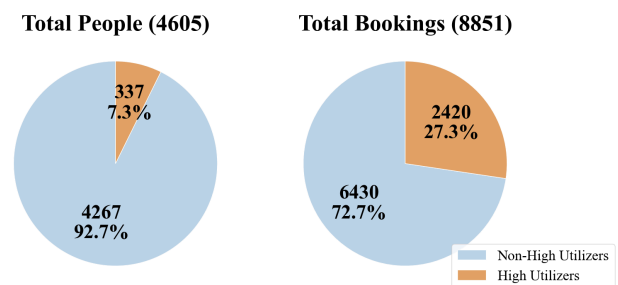


Fig. 1. Population of jail and bookings sorted by high utilizers and non-high utilizers over the last 34 months.

TABLE I. Kolmogorov–Smirnov (KS) Statistic and p-value to test the hypothesis that age distribution is same for different combinations of gender and HU status. We reject the null hypothesis (H_0 : both samples come from a population with the same distribution) at a p-value of 0.05 or less.

Groups	Table Column Head	
	KS Statistic	p-value
Male HU vs Female HU	0.132	0.3126
Male HU vs Male Non-HU	0.087	0.0389
Male HU vs Female Non-HU	0.076	0.1624
Female HU vs Male Non-HU	0.102	0.5248
Female HU vs Female Non-HU	0.079	0.8347
Male Non-HU vs Female Non-HU	0.045	0.0929

Fig. 2 displays the smoothed age distribution for high and non-high utilizers by gender, based on the age at their first booking event. For both males and females, high utilizers tend to peak in their early 30s, with a more gradual decline across older ages. Particularly among males, high utilizers show less concentration at younger ages (late teens and early 20s), which is supported by the results seen in the KS test. Further, results from a chi-square of independence test showed that the gender composition for male and female high utilizers is that of male and female non-high utilizers. Furthermore, looking into the relationship between age and high utilizer status, the team ran another chi-square test, finding that male individuals over 35 are significantly more likely to be high utilizers as compared to those between the ages of 18-34. Also, the likelihood of being a high utilizer peaks with those of ages 55 and above. Additionally, looking into the relationship between race and high utilizer status, 39.1% were Black individuals and 60.1% were White individuals. According to a chi-square goodness-of-fit test, the race distribution among high utilizers is representative of

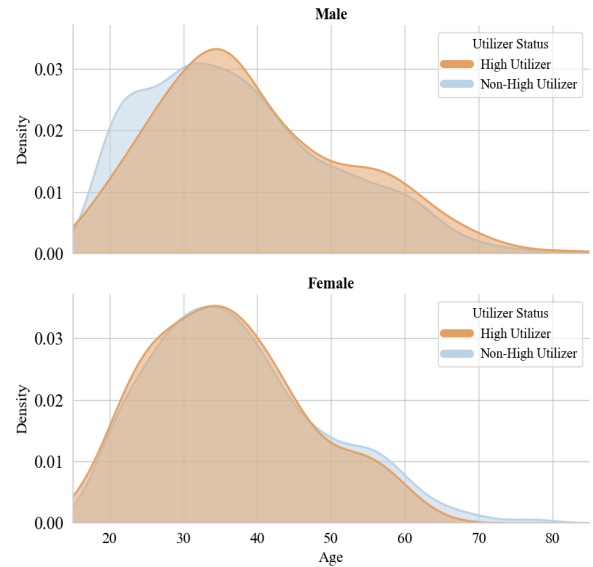


Fig 2. Age distribution for gender and high utilizer status, through Kernel Density Estimation (KDE)

the total jail population. Therefore, race does not appear to influence whether someone becomes a high utilizer.

Diving into the types of statutes and charges most common among high utilizers, Fig. 3 shows that the four most common statutes for high utilizers are larceny, probation, assault, and contempt of court. Additionally, within those four statutes, the most common charges included “Simple Assault - Citizen”, “Failure to appear after being charged with felony/misdemeanor or released on summons”, “Petty Larceny shoplifting below \$1,000”, and “Probation: Violation of Felony Offense”.

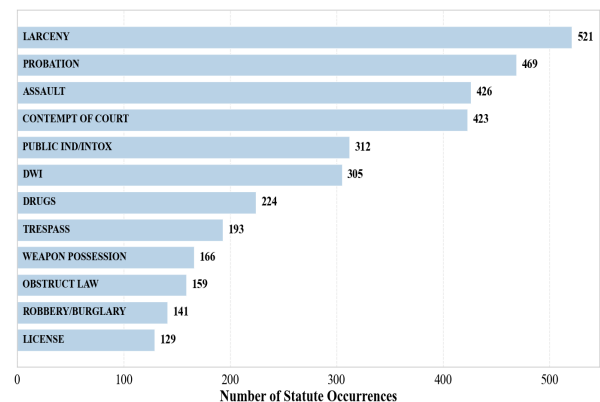


Fig 3. Most common statutes among high utilizers.

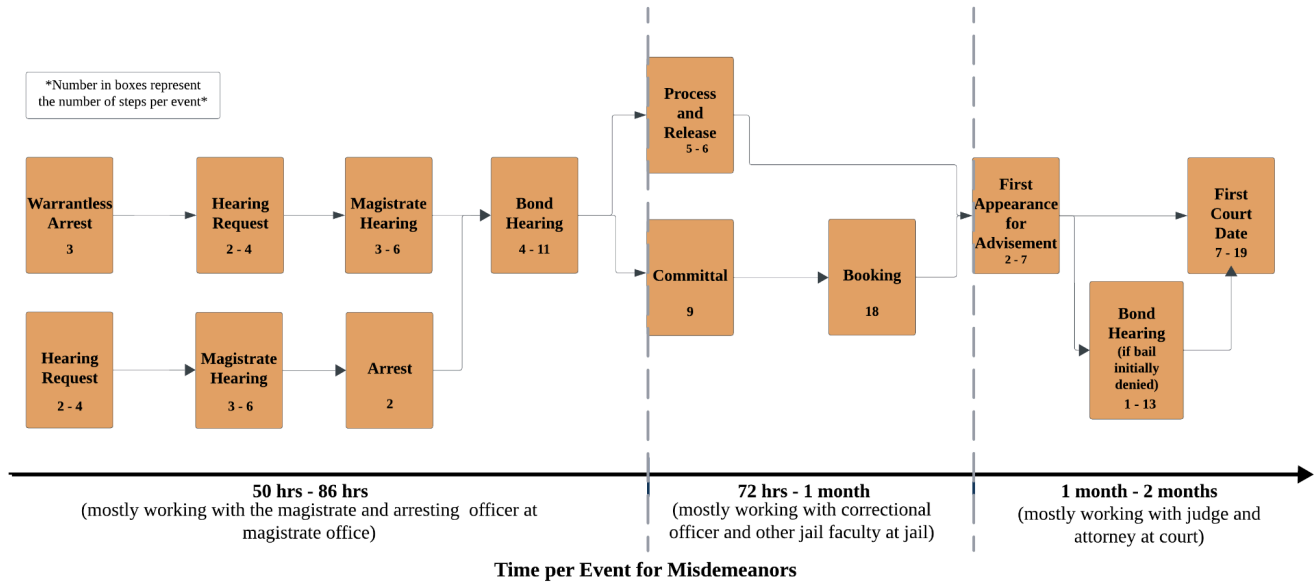


Fig 4. Simplified version of flowchart, from arrest to first court date, including steps per event and approximate time per event for misdemeanor

Fig. 4 displays a simplified version of the criminal justice process flow chart that was created to understand how individuals flow through the system, based on a larger, more detailed flow chart that was created. This was developed with the help of multiple experts of different parts of the criminal justice system to create a comprehensive flow chart [5], [6], [7]. Given that this is a lengthy and complex process, the goal is to understand if there are any points in which optimization is possible in the case of high utilizers that are repeatedly cycling through. 76.2% of high utilizers stay in jail for less than 30 days, and of those, 29.1% stay for less than 24 hours. High utilizers stay in jail for short periods of time, 4.8 times more often than non-high utilizers, yet require far more resources and process steps for such short, frequent stays in jail.

Fig. 5 demonstrates that while larceny may be the most prevalent statute type for initial arrests, as time progresses, contempt of court and probation become more and more frequent. The longer that high utilizers stay in the system, the more likely they are to recidivate for contempt of court and probation violation, which are the 4th and 2nd most common statute types for high utilizers, respectively, as shown in Fig. 3. With 89.0% of contempt of court arrests

being due to a failure to appear in court after being charged for a felony or misdemeanor, this suggests a possible lack of transportation means after arrest or a lack of awareness of court summons. Additionally, the team found that driving while under the influence (DWI) consistently appears about 6-7% of the time across all arrest stages and unlike other charges, DWI shows minimal transition into other types of crime. Specifically, it was found that over 70% of individuals who had a DWI arrest were booked for DWI again. This particular subgroup of high utilizers is ideal for targeted intervention, such as through substance abuse programs and transportation safety initiatives.

IV. CONCLUSIONS AND FUTURE RESEARCH

In summary, high utilizers were found to be a relatively small group that uses disproportionately more resources of the criminal justice system than non-high utilizers, with 4.8 times more bookings per person over a 34 month span. Each time they return to custody, individuals go through a complex process involving numerous agencies, meaning that high utilizers end up using far more resources,

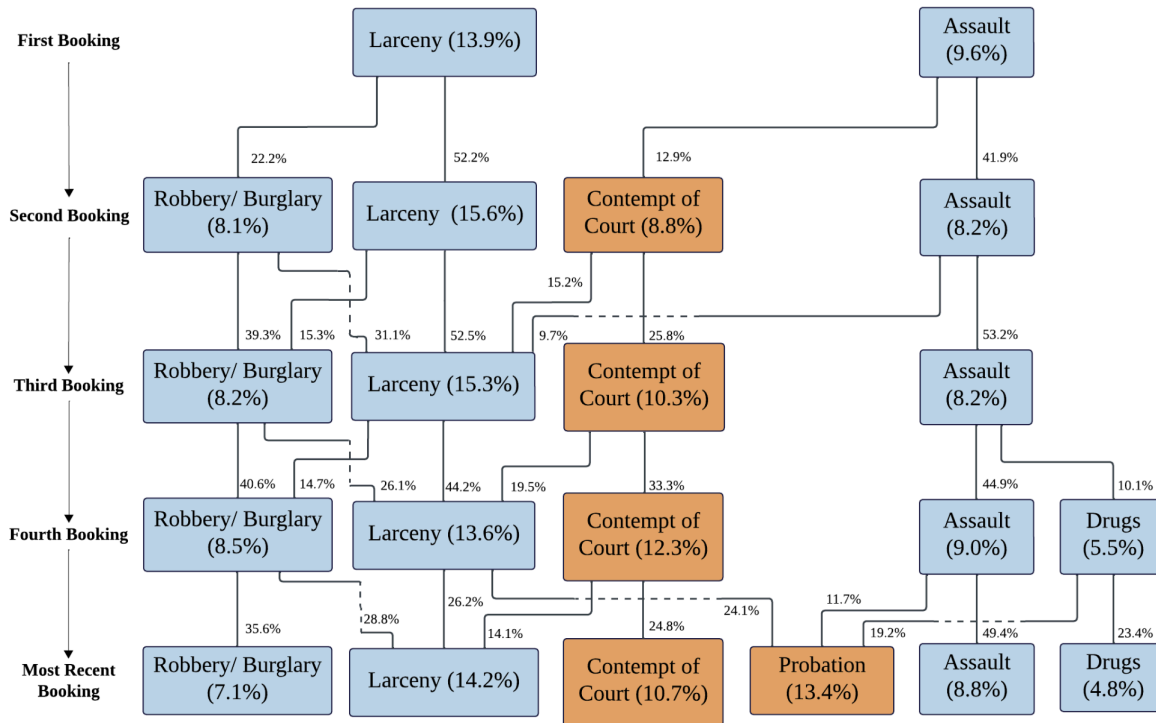


Fig 5. Path map of the frequencies of statute type sequences between 1st, 2nd, 3rd, 4th, and most recent arrest for high utilizer. The number in the box represents the total proportion of the charge type in the corresponding booking sequence, and the number on the line shows the percent linkage of the previous to subsequent charge type.

cumulatively. Identifying pain points, simplifying this process, and improving regulations can help to reduce the number of times individuals return to custody, and the number of steps in the process. While larceny may be the most common statute type for initial arrests, contempt of court and probation become more prevalent for subsequent arrests. This suggests a possible lack of transportation means after arrest, a lack of awareness of court summons, and frequent violations of release conditions, suggesting points of intervention, as supported by qualitative research gathered through stakeholder meetings and online sources [8]. Future steps can include better quantifying the financial and time aspects of the booking process, understanding the mental health implications of the Brief Jail Mental Health Screener data, looking into the rehabilitation services most used by high utilizers, and investigating the unquantifiable human elements behind the issue, such as trust in authority figures and positive community when reintegrating.

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