

## Pre-Analysis Plan

### A Randomized Controlled Trial on Permanent Supportive Housing for Individuals Exiting Prison

Mary Kate Batistich  
University of Notre Dame

William Evans  
University of Notre Dame

Mike Cassidy  
Princeton University

March 12, 2023

#### I. Introduction

More than half a million prisoners are released from state and federal prisons each year (Carson, 2021). They often face barriers to housing such as limited income, lack of driver's license or state identification, debt, and discrimination from employers and private landlords, as well as mental health and substance abuse issues. Consequently, homelessness is a serious risk: formerly incarcerated people are nearly ten times more likely to experience homelessness than the general population (Couloute, 2018). Permanent supportive housing (PSH), a "Housing First" service model that combines a housing voucher with voluntary support services, is a potential solution for those exiting prison with a high risk of homelessness. There are currently over 375,000 PSH beds in the US in 2021, accounting for 39 percent of homeless housing program placements (Henry et al., 2022). This makes it larger than any other program type, including emergency shelters, transitional housing, rapid rehousing or other permanent housing (Henry et al., 2022). While there is RCT evidence that PSH reduces homelessness for vulnerable populations such as veterans and those with mental illness or substance abuse, there is limited rigorous research that examines the impact of PSH for the recently incarcerated on outcomes such as recidivism.

Through a partnership with Corporation for Supportive Housing (CSH), a national leader in supportive housing, we will conduct and evaluate the first randomized controlled trial (RCT) of PSH for exiting prisoners at risk of homelessness. In Ohio, PSH for individuals transitioning out of prison operates through two CSH programs, Returning Home Ohio (RHO) and Community Transition Program (CTP). The programs offer the same services but differ in their eligibility criteria: The former serves exiting prisoners with mental illness or HIV/AIDS, while the latter serves those with substance use disorders. We will measure the impact of PSH on criminal recidivism, housing stability, health, income, and employment for up to 3 years. The study will enroll approximately 880 people over 2.5 years, of whom 25 percent will be in the treatment group.

Given the prevalence of housing insecurity for the formerly incarcerated and the significant financial and societal costs associated with homelessness and recidivism, it is critical to accumulate evidence about potential solutions. This study has the potential to inform the way that housing services are provided to some of the most vulnerable formerly incarcerated nationwide.

#### II. Evaluation Design

The Wilson Sheehan Lab for Economic Opportunities (LEO) at the University of Notre Dame and CSH Ohio are partnering on a RCT to measure the impact of providing PSH to individuals who are exiting prison and have either mental health or substance use recovery needs. The project will test the impact of PSH on criminal recidivism, homelessness and housing stability, income, employment, and participation in behavioral health services.

CSH Ohio projects that there is a significantly greater need for their services than they will be able to meet; for example, CSH receives approximately 750 referrals per year to fill about 100 placements. They plan to implement randomization as a method of both allocating placements fairly and creating the opportunity for rigorous evaluation. This study will encompass both PSH programs CSH Ohio operates for individuals exiting prison: Returning Home Ohio (RHO) and the Community Transition Program (CTP).

To enroll participants into these programs and the study, CSH Ohio will collaborate with the Ohio Department of Rehabilitation and Correction (ODRC) and the Ohio Department of Mental Health and Addiction Services (OMHAS). Linkage workers, who are employed by OMHAS, will reach out to anyone who is preparing to leave incarceration and appears to be eligible for RHO or CTP, and will confirm eligibility. For RHO, this means that the individuals must be diagnosed with a serious and persistent mental illness or be HIV positive. CTP the individuals must have participated in substance use recovery services while incarcerated. For both programs individuals must also qualify for housing according to the JD-VI-SPDAT (a housing vulnerability assessment tool designed for the justice system). Those who are eligible and interested will complete the program application forms with a linkage worker, who will introduce them to the study and invite them to provide their informed consent to participate. Regardless of whether someone consents to be in the study, they will be eligible to participate in services and will have the chance to be randomly selected for a spot in RHO or CTP in their desired county.

Completed applications will be submitted to CSH. For funding reasons, individuals are only eligible for a PSH placement within 120 days of prison exit. Eligible applicants from the community may also apply so long as they are within 120 days of their release. Given that widespread screening will take place during incarceration, we expect the number of community referrals to be small and to dwindle over time.

Once per month, CSH meets with the local housing agencies who implement the programs. During these meetings, they identify the number of placements (vouchers) that are available in each location and any restrictions associated with those placements; for example, an agency may not accept people with an arson or sex offense. After the specific placements have been identified, CSH will identify the individuals most recently added to the waitlist who qualify for each placement. (Note that former prisoners who have been released for more than 120 days are no longer eligible for the programs and will be removed from the waitlist.) CSH will attempt to contact these individuals one at a time to ascertain their continued interest in the program. Past experience shows that many people will not have working cell phone numbers or email accounts so they will be removed from the waitlist after 3 attempts to contact. For every available PSH voucher, the CSH associate program manager will identify about four eligible participants that are still interested in the program. From this list, they will randomly select one person to be referred to each voucher using a randomization tool that LEO has designed. Although we plan on a 3:1 ratio of controls to treatment, actual treatment-control shares will be a function of demand at the local level, and some agencies may have lower levels of control to treatment ratios.

Once an individual is placed in PSH, they will be offered enrollment in intensive case management and have access to mental health treatment, workforce development, childcare, and healthcare. There is no time limit on how long an individual can stay in PSH, but the average recipient stays less than 2 years. The majority of exits are positive, such as living in housing with a lease in their own name. In 2021, CSH had 208 exits from the program, with just 32 of these being exits to jail or prison. Those who are not offered a PSH placement (i.e., the control group) will be provided with information about other resources that they can access in their community that will be able to support them in other ways.

The main potential threat to the analysis is ensuring the faithful implementation of the study across multiple partners and prisons across the state. CSH, OMHAS, ODRC, and CSH's partner housing agencies will each implement elements of the research design across 28 prisons and 21 RHO and CTP service providers, so it will be critical that the plan for the research study is communicated clearly and accurately to each organization and that all are in support of the research design. The researchers have accounted for this threat by designing the study in close collaboration with CSH and regularly communicating with OMHAS and ODRC to confirm their continued support of the research design. Two of the study investigators conducted a site visit in Columbus to meet with the housing agencies and address their questions and concerns about the study. Once the study launches, the research team will continue regular communications, both via Zoom and in person, with all stakeholders and will monitor the study closely to ensure that it is implemented faithfully.

### **III. Key Data Sources**

The following section summarizes the planned primary data sources for this project. At this time, securing access to these data sources is partially complete. Given this, any outcomes for which we do not already have data secured may ultimately be excluded if there are barriers to gathering the needed information.

#### *1. Corporation for Supportive Housing Records*

Data collected by CSH's CIVIC database for study participants will be shared with the research team. This data includes baseline data collected prior to randomization including name, date of birth, referral date, expected prison release date, CTP and RHO eligibility, and JD-VI-SPDAT results. We will also access subsequent information on participants' program involvement including date of entry into PSH housing and date of exit.

#### *2. Homeless Management Information System Records*

One primary outcome of interest is incidence of homelessness. To measure housing stability and homelessness, we plan to use HMIS data throughout Ohio to capture participants' use of housing services.

#### *3. Ohio Department of Rehabilitation and Corrections Records*

Our other primary outcome of interest is criminal recidivism (arrests) within 1, 2, and 3 years after randomization, and we plan to access ODRC data to measure the impact of RHO and CTP on recidivism. We also plan to measure convictions and length of subsequent jail or prison sentences.

#### *4. Infutor Data*

We will use Infutor (a consumer reference database) address history data to measure housing stability (i.e., more stability is a lower frequency of moves).

#### *5. Ohio Department of Medicaid*

To measure health outcomes, the research team plans to use data from the Ohio Department of Medicaid. Examples of health outcomes of interest include enrollment in Medicaid, utilization of primary care and specialty care (e.g., dental and behavioral health care), receipt of preventive care (e.g., screenings and vaccines),

hospitalizations, emergency department visits, and rate of diagnosis of chronic conditions (e.g., substance use disorders, mental illness, diabetes, hypertension).

#### 6. *Ohio Department of Job and Family Services*

To measure income and employment, we plan to access unemployment insurance records available through the Ohio Department of Job and Family Services.

### **IV. Balance checks**

For all of the following measures captured at baseline, the research team would expect no statistically significant difference between treatment and control groups due to random assignment. Performing balance checks on factors such as those below will help demonstrate valid implementation of the research design.

- Gender
- Race
- Ethnicity
- Age
- Mental or behavioral health condition leading to eligibility (e.g., type of serious mental illness diagnosis)
- JD-VI-SPDAT score
- English or Spanish consent form

### **V. Outcome Measures**

#### *Takeup:*

Takeup of services in this study will be defined as an individual who successfully moves into a PSH-supported housing unit through the help of CTP or RHO. CSH internal records will be the source for this measure.

#### *Primary Outcomes:*

The initial goal of the program is to reduce the incidence of homelessness of exiting prisoners. Our first primary outcome is then whether the program improved this outcome. We plan to track homelessness through Homeless Management Information Systems (HMIS) throughout the state. This data will allow us to capture participants' use of housing services. We also plan to track housing stability measured by frequency of moves using the consumer reference database Infutor.

Our other primary outcome is criminal recidivism (e.g., arrests, imprisonments, length of time incarcerated) within 1, 2, and 3 years after randomization. We will use the state's Department of Corrections data to measure criminal justice outcomes.

#### *Secondary Outcomes:*

Secondary outcomes capture participant wellbeing through health, employment, and earnings.

For health outcomes we plan to use state Medicaid data. The state where the experiment will occur is a Medicaid expansion state and most released prisoners are eligible for Medicaid. Outcomes will include emergency department visits and inpatient hospital stays.

Employment and income data will be obtained through state unemployment insurance data. These state records provide quarterly values of earnings in the sectors covered by unemployment insurance. Outcomes will include earnings from all jobs in the quarter and a dummy variable that measures whether a person worked in the quarter.

Our ability to track these outcomes will be contingent upon securing data sharing agreements with relevant partners.

## **VI. Exploratory Subgroup Analysis**

The research team is interested in determining whether the intervention is more effective for certain populations relative to others. Areas of interest for exploratory analysis of subgroups include qualifying mental health or substance use condition; specific PSH program (RHO vs. CTP); demographic characteristics such as age, race and sex; and criminal history characteristics, including category of offense and length of sentence.

## **VII. Data Analysis**

### *Estimates*

As a randomized controlled trial, people assigned to treatment and control groups should look equivalent to each other on average. Thus, any difference in outcomes between the groups can be attributed to their treatment status (i.e., being offered PSH). We will estimate average differences in outcomes using a standard intent-to-treat (ITT) design. In particular, we will estimate the following Ordinary Least Squares (OLS) model:

$$Y_i = \alpha + T_i\beta + X_i\gamma + \epsilon_i$$

where  $Y_i$  is the outcome, such as recidivism within 1, 2, or 3 years. The variable  $T_i$  is a dummy indicating the random assignment of person  $i$ . As not all individuals assigned to treatment will take up services, and some entering PSH may exit quickly, the coefficient on  $T_i$  represents the ITT. The vector  $X_i$  includes a set of person-level characteristics collected at baseline, such as age, gender, race, criminal history, program eligibility, and county of relocation, and  $\epsilon_i$  is an error term. The coefficient on the treatment dummy  $\beta$  will give us the difference in means between the treatment and comparison groups, the estimated impact of the program. Given randomization, the inclusion of covariates,  $X_i$ , should not affect the estimated treatment effect of PSH, but it will reduce the uncertainty in the estimates. Housing markets vary considerably across counties and study participant success may be correlated within a local area. As a result, we will cluster standard errors at the county level based on where prisoners indicate where they plan to relocate after release. With about 2.5 years of enrollment and a consent rate of 80 percent, the full estimation sample will include about 220 individuals in the treatment group and 660 individuals in the control group.

Based on historical data, CSH projects that those in the target population who do not enroll in RHO or CTP have a recidivism rate of approximately 30 percent within three years, and that those who do enroll in RHO or CTP have a recidivism rate of 7 percent within the same time frame, a 23 percentage point drop. The study is powered to obtain a more conservative minimum detectable effect (MDE) of 8.5 percentage point change in 3-year recidivism for the treatment group compared to the control group, from a baseline of 30 percent.

These calculations assume a set of controls with an R-squared of 0.10, and a randomization ratio of 1 person in the treatment group for 3 people in the control group. With these inputs, our target sample size for the study is 1,100 participants, which we expect to reach in about 2.5 years of enrollment. Given the estimated impact of a 23 percentage point reduction in 3-year recidivism, an 8.5 percentage point MDE (or a 12.1 percentage point MDE in terms of treatment-on-the-treated, assuming a 70% take-up rate) gives us confidence we will be able to detect significant effects with our design and sample size.

We have conducted power calculations for additional outcomes based on prior research. In particular, we estimate that given our sample size and research design, we will be able to detect a 17 day reduction in shelter days over 3 years, coming from a baseline of 269 days, and a reduction of 0.7 arrests over 3 years, coming from a baseline of 10.6 arrests. These estimates assume normal distributions of outcomes and are based on control group means from Cunningham et al. (2021), which found reductions of 95 shelter stay days and 4.3 arrests over 3 years for the treated group. These additional power calculations strengthen our confidence that we will be able to detect effects in key outcomes.

One challenge with securing housing for housing insecure, recently incarcerated individuals is that they can be transient and challenging to contact. To ensure high take up of PSH among the treated group, all individuals will be contacted to confirm interest and eligibility just prior to their randomization in the study. Given these precautions, we conservatively estimate for our power calculations that 70 percent of those assigned to the treatment group will follow through with housing placement through CSH. In a similar RCT of criminal justice involved, chronically homeless individuals, nearly 88 percent (285 out of 325) of the treatment group who were successfully contacted secured a lease through the supportive housing program (Cunningham et al., 2021).

#### *Multiple Hypothesis Testing*

The research team has limited their primary outcomes to those described above, which each fall under distinct domains. Classic p-values will be reported for all outcomes, which will provide a reader with full information that they can use to make multiple hypothesis testing corrections if they desire.

## References

- Cunningham, Mary K., Devlin Hanson, Sarah Gillespie, Michael Pergamit, Alyse D. Oneto, Patrick Spauster, Tracey O'Brien, Liz Sweitzer, and Christine Velez. (2021). Breaking the Homelessness-Jail Cycle with Housing First: Results from the Denver Supportive Housing Social Impact Bond Initiative. Urban Institute.
- Carson, E. A. (2021). Prisoners in 2020. Bureau of Justice Statistics. <https://bjs.ojp.gov/content/pub/pdf/p20st.pdf>
- Couloute, L. (2018). "Nowhere to Go: Homelessness among formerly incarcerated people," *Prison Policy Initiative*. <https://www.prisonpolicy.org/reports/housing.html#recentlyreleased>
- Henry, M., de Sousa, T., Tano, C., Dick, N., Hull, R., Shea, M., Morris, T., and Morris, S. (2022). The 2021 *Annual Homeless Assessment Report (AHAR)* to Congress. The U.S. Department of Housing and Urban Development. <https://www.huduser.gov/portal/sites/default/files/pdf/2021-AHAR-Part-1.pdf>