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Official Title of the Study:

Responsible Fatherhood Opportunities for Reentry & Mobility (ReFORM)

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STATISTICAL ANALYSIS PLAN

Analytic Sample:

The primary analysis sample will be used to address each primary research question. This sample consists of individuals with both baseline and six-month follow-up data.

Baseline equivalence between the intervention and comparison groups will be investigated for all demographic, criminal history, and other background characteristics. The equivalency of all primary and secondary outcome measures will also be investigated. Continuous variables will be compared using parametric (*t*-tests) and nonparametric (Wilcoxon rank-sum test) methods, whereas categorical variables will be compared using chi-square and Fisher's exact tests. All baseline equivalency measures will be performed with two-tail tests using an α of .05. Situations involving significant between group differences will be further characterized with effect sizes, using Hedges' *g* for the continuous outcomes and the Cox index for categorical outcomes. Any variables meeting the criteria of $p < .05$ will be discussed with the ETTA and considered for use as control variables for the analysis of primary and secondary outcomes. Other methods, for example, propensity score weights, will also be discussed if significant imbalance is observed.

Because the majority of services are provided in a jail setting, and the intervention and counterfactual samples are recruited from different institutions, the potential for condition crossover is not a concern.

Analytic Approach:

SPSS version 26 will be used to perform all analysis and data management. All parameters meeting the criteria $p < .05$, two-tailed, will be considered statistically significant. As the number of primary outcome measures is delimited, α corrections for multiple comparisons are not necessary. There will be no differences between how primary and secondary research questions are analyzed.

The exact specification of the analytic model will depend on the nature of the outcome variable: continuous vs binary. In order to account for the longitudinal nature of the data, hierarchical linear models and hierarchical generalized linear models will be used to analyze continuous and binary outcomes, respectively. These methods allow for the nested structure of the data, where measurement occasion (level one) is nested within individual (level two), to be accounted for analytically.

Due to the quasi-experimental nature of the study design, simply controlling for baseline levels of the outcome of interest could be misleading since participants were not randomly assigned to the intervention vs counterfactual condition, and therefore have the potential to be significantly different at baseline. One method of accounting for these potential differences is to use a difference in differences model. Rather than controlling for baseline levels, the baseline value is instead considered as an additional timepoint and modeled as a difference score. The outcome is modeled as follows:

$$Y_{i=} \beta_0+\beta_1 T_i+\beta_2 t_i+\beta_3 (T_i \times t_i)+\varepsilon_i$$

Where T is a dummy variable that takes on the value of 1 if individual i is in the intervention group and 0 otherwise, and t is a dummy variable that takes on the value of 1 for data from the six-month follow-up and 0 otherwise. The model terms can be interpreted as such:

$\beta 0$ – outcome mean for counterfactual condition at baseline

$\beta 1$ – difference in outcome mean between intervention and counterfactual at baseline

$\beta 2$ – change in outcome mean from baseline to six-month follow-up for counterfactual condition

$\beta 3$ – difference in the change in outcome means between intervention and counterfactual condition

As a result, the parameter of interest for determining an intervention difference is $\beta 3$.