Outcomes of the ASIST program for high risk offenders with mental illness

Application of a case-control propensity matching method

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Background

- CT was one of first states to create a Jail Diversion program
- CT has had statewide jail diversion since 2000
- Diversion is not always offered when the defendant has a history of non-compliance, failure to appear in court, etc.
- Judges and prosecutors feel more comfortable using supervised release, using alternative to incarceration (AIC) reporting centers
- However, prior to creation of ASIST through an interagency agreement, AICs were not equipped to serve people with mental illness
ASIST Program Summary

• In 2007, interagency committee created ASIST
  – Serves hard-to-divert population
  – In 7 urban courts
  – Serving about 270-300 clients with mental illness/year

• Program elements
  – Intensive clinical case management (25:1) client : clinician ratio
  – Supervision by Court, Probation or Parole.
  – AIC services available (SA counseling; employment)
  – Clinical treatment by MH staff
  – START NOW skill development groups
    • Cognitive behavioral skills training model
Start Now model

• Cognitive behavioral skills training model
• Influenced by findings from Trestman and SampI’s research of DBT in 3 CT correctional facilities
• Infused with elements of cognitive neuro-rehab
• Includes motivational interviewing principles
• Incorporates gender-specific approach
• Informed by principles of trauma-informed care principles
1st Evaluation: Follow-up Interview Sample (n=111)

- Weak method: pre-post comparison
- Face-to-face interviews BL, 3 mo, & 6 mo.
- Self-reported outcomes (scale):
  - Income, living situation, CJ involvement
  - Substance use (ASI use measure)
  - Medication compliance (DAI-10)
  - Quality of life (single item) (Lehman QOL)
  - Trauma symptoms (Stress Reactions Checklist)
  - Behavioral health functioning (BASIS 24)
- IVs: Demographics, TCU criminal thinking scales
  - Entitlement, Justification, Power Orientation, Cold Heartedness, Criminal Rationalization, Personal Irresponsibility
Applying HLM, the following self-report outcomes improve significantly by 6 months (N=111; 97 in 6-month follow-up group, or 87.4% follow-up)

- Overall BASIS-24 score
  - depression subscale
  - substance abuse subscale
- Stress reaction checklist score
- Living in own apartment
- Other results were not significant
Who benefits from ASIST the most? Used C&RT – non-parametric statistical algorithms that are an alternative to OLS for multivariable analysis.

**Advantages:**
- No assumption about the form of the underlying distribution
- IVs and DV can be any type of scale (nominal, ordinal, or interval)
- Robust against the potential biases that are produced by outliers
- No restrictions on number of predictors

**Disadvantages:**
- Data driven - changes in the sample may give different trees
- Does not provide parametric statistics, such as CI
- Can be misleading if important predictors omitted
Results of C&RT

- Those less likely to be re-arrested were those who had not been arrested before the age of 13.5.

- Those with better MH outcomes (on BASIS) were those:
  - With lower “Justification” sub-scores on the TCU Criminal Thinking scale
  - Or: Higher Justification can result in MH improvements for those who also had higher Power Orientation on the TCU Criminal Thinking scale
Creating a Comparison Group: Propensity Matching

- Propensity scoring (PS): allows the researcher to create a close-to-equivalent comparison group.
- PS starts with an analysis of baseline characteristics to find out what contributes to the probability of being in the program under study (the treated group).
- The probability of being in the program for untreated can be assessed to find a similar sample.
- Three common methods for estimating effect of treatment on outcomes using PS:
  - Sub-classification (comparing cases within strata)
  - Regression adjustment (using PS score as covariate)
  - Case-control matching (matching cases)
Case-Control Matching

- Useful for studies with limited number of treated cases but a larger number of not-treated cases
- Greedy match algorithm with nearest available pair matching method
  - Once a match is made, the match is not reconsidered (vs. optimal match algorithm, which will reconsider previous matches before making the current match)
  - Treated cases are ordered and sequentially matched to the nearest unmatched not-treated cases
  - If more than one unmatched control matches to a case, the control case is selected randomly
PS matching Steps

• Define ASIST clients for PS matching
  – enrolled in the program during period 7/1/2007 to 12/31/2010
  – excluding parole cases

• Identify the "universe" for the control sample
  – high risk offenders with mental illness who didn’t receive ASIST program
  – individuals received DMHAS services from 7/1/2007 to 12/31/2010, and were under pre-trial or probation supervision during the same time
  – Not incarcerated at the time of target arrest (first arrest in window)

• Source of administrative data: DMHAS, DOC, and Judicial Branch

• Used Link King program and apply both probabilistic and deterministic record linkage protocols to identify same individual cross different sources of admin data
Multiple Imputation

• Many covariates have more than 10% missing values
• Multiple imputation – based on available covariates to impute missing values
  – generate 10 data sets without missing values
  – conduct separate PS on all 10 data sets
  – combine results from 10 data sets to derive the final PS
Variables included in MI & PS matching

- Demographic variables
  - Gender, race, & age
- MH/SA history (from DMHAS)
  - Primary dx (Mood disorder, schizophrenia), SA, SMI, dual dx, ASPD, & GAF scores
- CJS history (from Judicial)
  - # adult arrests, felony arrest, violent crime, LSI-R, prison sentence more than 1 year, & age 1st arrested
- DOC assessment scores (from DOC)
  - Need scores for MH, SA, edu, voc, & medical
  - Severity, history, length, discipline, gang, & overall
PS matching summary

• Pre-PS matching
  – ASIST clients were older, more likely to be female, African American, having SMI, SA, dual dx, PD, and ASPD dx, lower GAF score, higher LSI score, more arrests (felony & violent crimes), higher % of prison>=1 year
  – Worse on DOC assessment scores, except the following: SA, education, vocational needs, length & gang scores.

• Post-PS matching
  – all covariates were balanced (non-significant) between ASIST and non-ASIST groups.
Survival Analysis

• 12 month Recidivism
  – Time to 1\textsuperscript{st} incarceration
  – Time to 1\textsuperscript{st} re-arrest
  – Time to 1\textsuperscript{st} felony arrest

• Starting time
  – ASIST: treatment intake date
  – Non-ASIST: target arrest date (1\textsuperscript{st} arrest after the study window start date)

• Censored at 12 months after starting time
Time to 1\textsuperscript{st} Incarceration
Time to 1\textsuperscript{st} re-arrest (n.s.)
Time to 1\textsuperscript{st} felony arrest (n.s.)
Limitations of PS method

• The assumption of strongly ignorable treatment assignment is required for PS to eliminate selection bias in observational studies
  – No unmeasured confounders
    • all variables that affect treatment assignment and outcome have been measured.
  – every subject has a nonzero probability to receive either treatment
Summary of ASIST Evaluation

• Start Now is a valuable program component
• Add screening on Criminal Thinking?
• ASIST program is effective in:
  – improving clinical functioning, stress reaction, and living situation (with a weak pre-post design)
  – better survival rate to incarceration (robust design)
• Thus, “hard-to-divert” cases can be effectively served in the community, with the combination of justice supervision and clinical services
• Ponder: Why does incarceration decline, but not arrests?
Discussion & Next Steps

- We need further work to make Start Now an EBP
- Again, think about focusing on cases most likely to succeed
- Look at the people who failed – is there a trend?
- Cost study
- Editorial: sometimes, no bad news is good news