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Effect of Mental Health Courts on Arrests and Jail Days

A Multisite Study

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Context: Mental health courts are growing in popularity as a form of jail diversion for justice system–involved people with serious mental illness. This is the first prospective multisite study on mental health courts with treatment and control groups.

Objectives: To determine if participation in a mental health court is associated with more favorable criminal justice outcomes than processing through the regular criminal court system and to identify defendants for whom mental health courts produce the most favorable criminal justice outcomes.

Design: Longitudinal study.

Setting: Four mental health courts in San Francisco County, CA, Santa Clara County, CA, Hennepin County (Minneapolis), MN, and Marion County (Indianapolis), IN.

Participants: A total 447 persons in the mental health court (MHC) and 600 treatment-as-usual (TAU) controls.

Intervention: Eighteen months of pre-entry and postentry data for 4 jurisdictions. All subjects were interviewed at baseline, and 70% were interviewed at 6 months. Objective outcome data were obtained on all subjects from Federal Bureau of Investigation arrest records, jails, prisons, and community treatment providers.

Main Outcome Measures: Annualized rearrest rates, number of rearrests, and postentry incarceration days.

Results: The MHC and TAU samples are similar on the major outcome measures in the pre-entry 18-month period. In the 18 months following treatment, defined as entry into mental health court, the MHC group has a lower annualized rearrest rate, fewer post–18-month arrests, and fewer post–18-month incarceration days than the TAU group. The MHC graduates had lower rearrest rates than participants whose participation was terminated both during MHC supervision and after supervision ended. Factors associated with better outcomes among the MHC participants include lower pre–18-month arrests and incarceration days, treatment at baseline, not using illegal substances, and a diagnosis of bipolar disorder rather than schizophrenia or depression.

Conclusions: Mental health courts meet the public safety objectives of lowering posttreatment arrest rates and days of incarceration. Both clinical and criminal justice factors are associated with better public safety outcomes for MHC participants.

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MENTAL HEALTH COURTS (MHCs) are an increasingly popular postbooking jail diversion program. While there is some disagreement about which was the first MHC,[1,2] there is no debate about the robust expansion of these courts during the past decade from 1 or 2 courts in 1997 to approximately 250 today.[3,4] Mental health courts have the laudable goal of moving persons with serious mental illness out of the criminal justice system and into community treatment without sacrificing public safety.[5,6] Mental health courts share some common features[4] but their implementation widely varies by jurisdiction, by judge, and across time. Consequently, single-site evaluations of the effectiveness of MHCs in meeting their primary objective of enhanced public safety are limited by the idiosyncrasies of the particular court.

In general, potential clients are referred to the MHC staff by jail personnel, defense attorneys, and others who become familiar with the defendant.[7] If the potential enrollee meets eligibility criteria and chooses to participate in the MHC, he or she then follows the specific procedures for enrollment into that court, such as having a hearing before the MHC judge, at which time

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Table 1. Characteristics of Study Subjects

	No. (%)									
	SF		SC		MN		IN		Total	
Characteristics	MHC (n=108)	TAU (n=146)	MHC (n=136)	TAU (n=198)	MHC (n=104)	TAU (n=144)	MHC (n=99)	TAU (n=112)	MHC (n=447)	TAU (n=600)
Female	30 (27.8)	37 (25.3)	61 (44.9)	77 (38.9)	48 (46.2)	33 (32.9)	48 (48.5)	74 (66.1)	187 (41.8)	221 (36.8)
Average age, mean (SD), y	37.5	39.8	38.1	34.7	38.1	38.0	36.3	34.0	37.5	36.6
Hispanic	8 (7.4)	20 (13.7)	37 (27.2)	81 (40.9)	2 (1.9)	1 (0.7)	0 (0.0)	0 (0.0)	47 (10.5)	102 (17.0)
White	42 (38.9)	66 (45.2)	103 (75.7)	147 (74.2)	54 (51.9)	56 (38.9)	54 (54.5)	84 (75.0)	253 (56.6)	353 (58.8)
Diagnosis										
Schizophrenia	61 (56.5)	31 (21.2)	44 (32.4)	46 (23.2)	37 (35.6)	22 (15.3)	38 (38.4)	20 (17.9)	180 (40.3)	119 (19.8)
Bipolar disorder	10 (9.3)	7 (4.8)	33 (24.3)	52 (26.3)	36 (34.6)	28 (19.4)	47 (47.5)	46 (41.1)	126 (28.2)	133 (22.2)
Depression	17 (15.7)	106 (72.6)	32 (23.5)	76 (38.4)	25 (24.0)	52 (36.1)	11 (11.1)	44 (39.3)	85 (19.0)	278 (46.3)
Other	20 (18.5)	2 (1.4)	27 (19.9)	24 (12.1)	6 (5.8)	24 (29.2)	3 (3.0)	2 (1.8)	56 (12.5)	70 (11.7)
Target crime										
Person	58 (53.7)	50 (34.2)	28 (20.6)	35 (17.7)	19 (18.3)	51 (35.4)	34 (34.3)	26 (23.2)	139 (31.1)	162 (27.0)
Property	28 (25.9)	41 (28.1)	28 (20.6)	64 (32.3)	52 (50.0)	40 (27.8)	32 (32.3)	42 (37.5)	140 (31.3)	187 (31.2)
Drug	21 (19.4)	46 (31.5)	72 (52.9)	73 (36.9)	8 (7.7)	16 (11.1)	13 (13.1)	12 (10.7)	114 (25.5)	147 (24.5)
Minor	1 (0.9)	9 (6.2)	8 (5.9)	26 (13.1)	25 (24.0)	37 (25.7)	20 (20.2)	32 (28.6)	54 (12.1)	104 (17.3)

Abbreviations: IN, Indianapolis; SC, Santa Clara; SF, San Francisco; MHC, mental health court; MN, Minneapolis; TAU, treatment as usual.

the individual may enter a guilty plea and agree to the terms established by the MHC team and to the disposition of the criminal charges. Most MHCs require participation in treatment as a term of enrollment. The individual is then released into the community under MHC supervision with a subsequent status hearing date, usually weekly at the beginning.[4] Courts can use the "power of the gavel" to sanction participants who violate the terms of their release through bench warrants, temporary reincarceration, or outright revocation, while also facilitating treatment options for these often difficult clients.[8,9]

Most research on MHCs to date has been case studies, pre-enrollment/postenrollment studies, or treatment-as-usual (TAU) comparison studies involving a single court. Overall, the studies are equivocal. Two of the most ambitious, 1 with a well-chosen comparison group[10] and 1 randomized controlled trial,[11] found no difference in subsequent arrests between the MHC enrollees and the comparison/control subjects. The other 2 studies with a control group[12,13] found the MHC enrollees to be about one-third less likely to be subsequently arrested. Two single-site studies using pre-enrollment/postenrollment designs[14,15] found that MHC enrollees were much less likely to be arrested in the year following enrollment than in the year before.

What is missing from the MHC literature to this point is an experimental design that includes treatment and comparison samples from multiple locales. Because of MHCs' notorious idiosyncrasies,[16] it is important to study more than 1 court using the same methodology. For innovative interventions to become evidence-based practices, research must progress from studies of single courts to those involving multiple courts. Additionally, many of the studies on MHCs have had methodological limitations such as comparison groups that were purposely selected by the MHC judge, comparisons made across inconsistent points in time, and inclusion of only retrospective observations. In this study, we attempted to overcome many of these limitations.

This study is a 4-site, prospective, longitudinal, quasiexperimental study. The MHC and TAU samples were interviewed and followed up for 18 months at each site. The core research questions addressed here are (1) is participation in an MHC associated with more favorable criminal justice outcomes than processing through the regular criminal court system? and (2) for what types of defendants do MHCs produce the most favorable criminal justice outcomes?

METHODS

SITE SELECTION AND PARTICIPANTS

The 4 MHCs included in this study are San Francisco County, CA, Santa Clara County, CA, Hennepin County (Minneapolis), MN, and Marion County (Indianapolis), IN. These courts were selected based on a national survey included in an earlier phase of the study.[4] To be included, the courts were required to be large enough to have a substantial caseload from which to draw a sample, have operated long enough to have stability, and represent a range of types of courts from level of sanctioning to types of defendants such as both misdemeanor and felony cases. In addition, the courts had to be in jurisdictions with large county jails to ensure sufficient sampling for the TAU group.

The treatment group in each site comprises newly enrolled MHC participants (MHC group; n=447). Data from the MHCs were reported on a weekly basis to the research team as to the sex, age, criminal charge, race, and diagnosis of the enrollees. The comparison group consists of similar subjects who were eligible for the MHC but were never referred to it or were never rejected from the MHC (TAU group; n=600). Newly booked jail detainees identified by jail mental health staff as having mental health problems were matched as closely as possible to the MHC enrollees, first for sex and criminal charges, and then for race, age, and diagnosis. The actual sample characteristics are seen in **Table 1**. Subjects were interviewed at baseline/study enrollment, and 70% were interviewed again at 6 months. We conducted analyses of variance and χ^2 comparison analyses and determined that the interviewed and noninterviewed subjects

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did not differ in sex, race, age, or whether they had received treatment in the prior 6 months. They differed in diagnosis, with a larger proportion of subjects with schizophrenia and a smaller proportion with depression being interviewed at 6 months. As part of their participation in the study, subjects provided informed consent allowing access to their mental health and criminal justice records. The study was approved by a number of federally sanctioned institutional review boards at the local and state level in addition to the study's coordinating center institutional review board.

The study courts are similar across many aspects including the types of crimes and clinical diagnoses they admit. There are some court-specific differences. For example, we found differences in the length of court supervision at the 1-year mark; the percentage of participants still receiving court supervision ranged from 40% to 84%.[8] Successful completion and termination rates vary as well; 7% to 41% had graduated by 12 months, and 3% to 39% had been terminated. Clearly, how each court interprets its eligibility criteria, guidelines for success and termination, and period of supervision may vary.

Using program data from the study sites, we find that 71% of MHCs and 38% of TAUs received community mental health treatment (includes outpatient treatment, case management, and medication management) in the 12-month follow-up period (odds ratio, 4.1). Of those who received treatment, those in the MHC group (median, 20.2 hours) received significantly more treatment than those in the TAU group (median, 8.6 hours; $P < .001$). These outcomes and treatment differences were taken into account in our analyses by using propensity scores where applicable.

VARIABLES

The variables described here include the public safety outcomes of number of new arrests, annualized arrest rates, and county jail and state prison incarceration days. Arrest data were obtained from the individual's Federal Bureau of Investigation report and include only new arrests, excluding warrants and violations. Annualized rates of arrest are number of new arrests for days not incarcerated in that county or state prison system. Incarceration days were acquired from the local jail records and the state departments of correction.

Rearrest, based on the Federal Bureau of Investigation reports, is measured as a binary variable and indicates (yes/no) whether the person was arrested in the post–18-month period. The rearrest rate is measured by the number of arrests in that period corrected for time in the community. Similar to other studies,[17] we normalize arrest rates by constructing an annualized number of arrests variable, which is computed as the number of arrests for this 18-month period divided by the time in the community and multiplied by 365. A limitation of this calculation is that it does not include days in a psychiatric hospital, as they were not accessible from each site. The incarceration variable measures time (in days) spent in jail and prison during the 18-month period. The change scores are computed as the difference between the post–18-month period value of the variable and the pre–18-month period value. Jail records do not indicate why someone is booked into jail: for a new arrest, to serve a sentence, to be held for another jurisdiction, or on a warrant for a technical violation. Consequently, one limitation to these data are that we cannot ascertain what proportion of jail days are for MHC sanctions or for other reasons.

Explanatory variables include study group (MHC vs TAU); individual characteristics such as white (yes/no; self-report or official records), female (yes/no), age in years, and most severe diagnosis (schizophrenia, bipolar disorder, depression, or other) obtained from the MHC evaluation or jail treatment records; study site; drug and alcohol use to intoxication in the 30 days prior to MHC or jail involvement (yes/no); and prior number of arrests and incarceration days in the 18 months before entering the MHC or jail. Diagnosis was obtained from tracking data provided by each site and treatment records, when available. Behavioral health measures including recent drug and alcohol use were obtained through self-report at baseline. All other data, which were collected on all subjects regardless of participation in the follow-up interview, were obtained from official records.

STATISTICS

Sample Selection Bias

The participants in this study were not randomly assigned to the 2 study groups, although efforts were made to match the 2 samples as described above. To address possible sample selection bias, we used a modification of the propensity score approach proposed by Rosenbaum and Rubin.[18,19] We constructed a logistic regression model with a binary dependent variable indicating 1 = MHC and 0 = TAU. First, we entered in the model the basic variables of age, race, sex, and site. Second, we included a pool of all available potential explanatory variables: personal characteristics including ever married, education, lived with biological father until 15 years of age, father ever arrested, and father used illegal drugs; mental health history including age the individual first saw a mental health professional, age at first mental hospitalization, and ever having psychiatric hospitalization; current mental health factors including mutually exclusive diagnostic category, Insight and Treatment Attitudes Questionnaire, Colorado Symptom Index scores, mental health treatment in past 6 months, self-reported compliance with treatment and medication, and other types of medical treatment; child physical and sexual abuse and baseline violence; substance use and treatment such as alcohol and illegal drug use in past 30 days and received substance abuse treatment in past 6 months; criminal justice variables including age at first arrest, number of arrests since 15 years of age, number of pre–18-month incarceration days and arrests; annualized pre–18-month arrests; and target arrest, charge level, and most serious offense. Variables selected for the model by the stepwise procedure were marital status, Colorado Symptom Index, days using illegal drugs in last 30 days, diagnosis of depression, ever been hospitalized, received treatment for medical problem, violence at baseline interview, age at first arrest, and target arrest charge level (warrant, violation, misdemeanor, felony). These variables, along with those entered on the first stage (age, race, sex, and site), constitute the variables included in the propensity score model. The model has good characteristics, with a pseudo R^2 (Nagelkerke) of 0.244 and an area under the curve of 0.750. We used this model to generate the propensity scores, and the resulting propensity score is included in all models comparing MHC and TAU samples, thus adjusting for selection bias.

0-Inflated Models

Some of the outcome variables have many 0s. For example, about 46% of the people had no arrests in the post–18-month period. Because so many 0s cannot be handled by ordinary least squares regression, we address this problem by implementing the 0-inflated Poisson (ZIP) models that are specifically designed to handle counts of rate variables with many 0s. The Poisson regression model is a type of generalized linear model and is also called a log-linear model. The ZIP model[20,21] is a special Poisson mixture model with 2 classes, 1 of which has a fixed value of 0, and the other different from 0. The model defines unobserved heterogeneity with the purpose of distinguishing between the subjects who were not arrested at all from those who were. After the ZIP mod-

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Table 2. Annualized Arrests by Sample and Site

Sample	MHC (n=447)			TAU (n=600)		
	Pre–18-mo	Post–18-mo	Change, %	Pre–18-mo	Post–18-mo	Change, %
SF (n=254)	3.1	1.9	–39	2.7	2.5	–7
SC (n=334)	2.7	2.0	–26	3.6	2.9	–19
MN (n=248)	1.3	.6	–54	2.0	.9	–55
IN (n=211)	1.1	.6	–45	1.8	1.5	–17
Total, mean (SD) (n=1047)	2.1 (3.0)	1.3 (3.0)	–38	2.6 (6.1)	2.0 (8.8)	–23

Abbreviations: IN, Indianapolis; MHC, mental health court; MN, Minneapolis; SC, Santa Clara; SD, standard deviation; SF, San Francisco; TAU, treatment as usual.

els were estimated, we performed the Vuong test[22] in which the ZIP model is compared with the standard Poisson model. In all cases described in this article, the Vuong test has very large positive values, favoring the ZIP model.

Quantile Regression Model

Some of our outcome variables have outliers and large variance. For example, the change score of the annualized number of arrests exhibits overdispersion, particularly for the TAU group, in which the standard deviation was 8 times larger than the mean. Usually the overdispersion problem can be addressed with standard Poisson or negative binominal regression but the models are not statistically significant in this case. Therefore, we used the quantile regression model.[23,24] The main characteristic of the model is that, instead of using the deviation from the mean (as in OLS), it can use quantile (or percentile) for this purpose. Most used are the median and the other quartiles and the interquartile range. The quantile regression is robust to outliers, and it can handle the problem with unequal variation for variables and samples. In addition, we bootstrapped the standard errors of the coefficients for the quantile regression models. The interpretation of the models' coefficients is similar to the regular OLS regression except that the model is based not on the mean (OLS) but on a particular quantile (Q1, median, Q3) or the interquartile range.

There was no stepwise selection procedure available for either ZIP models or quantile regression. We first ran a standard multiple regression model with all available variables under a stepwise procedure. Then we included the selected variables in the quantile regression model, together with the propensity score variable to adjust for sample selection bias. In the presence of overdispersion, we bootstrapped the standard errors of the coefficients for the quantile regression models and the logistic regression model for rearrest.

RESULTS

The 2 major outcomes that have become the public policy criterion standard as to whether MHCs work without compromising public safety are arrests and jail days.

ARRESTS

Arrests are examined 18 months before and after MHC enrollment for the experimental group (MHC group) and for 18 months before and after the target jail admission for the jail sample (TAU group). Because MHCs are a postbooking diversion, by definition subjects in both groups have arrest histories in the 18-month pre-entry period. When excluding the target arrest from the data, the 2 groups remain similar in the pre–18-month period, with 93% of the MHC and 95% of the TAU sample having at least 1 additional prearrest. In the post–18-month period, however, the MHC sample (49%) is significantly less likely than the TAU sample (58%) to be arrested ($P=.006$).

Simply being rearrested or not, however, is a blunt measure of recidivism. It does not take into account time at risk of rearrest. Therefore, as shown in **Table 2**, we calculated the annualized rearrest rates of the MHC and TAU samples for the time they were known to be in the community. Both samples show a decline in annual arrest rate from 2.1 to 1.3 per year in the MHC group and from 2.6 to 2.0 per year in the TAU group. However, the 0.8 per year reduction in the MHC group is significantly different ($P < .001$) than the 0.6 per year reduction in the TAU. With the exception of the Minnesota site, the percentage of reduction in arrests per year was greater for MHC than for TAU, being as much as 5 times as much in San Francisco and 2½ times as much in Indianapolis.

One final lens on rearrest is to examine how the MHC subjects do during court supervision and once supervision has ended. At 12 months, we identified the court status of the MHC sample across all 4 sites: 60% were still receiving MHC supervision, 20% had graduated, and 20% have been terminated. The annualized arrest rate while receiving court supervision for the MHC subjects is 1.04 arrests, including those still receiving supervision, graduated, or terminated. For subjects who are either terminated or graduated before 12 months, their postsupervision annualized arrest rate is 0.79 up to the time of their termination or graduation. A new arrest does not necessarily preclude graduation or result in termination. This postsupervision rearrest rate is a bit deceptive, however, in that the postsupervision rearrest rate is 1.33 for subjects in the MHC group who are terminated and only 0.07 for those who graduated. Clearly, there is a longer-term effect of supervision that continues after court supervision ends. That the rate for persons whose participation was terminated is much higher after supervision ends is somewhat tautological because one reason that MHC enrollees are excluded is that they have new arrest charges.

INCARCERATION DAYS

The second major measure of recidivism analyzed is the number of postentry jail and prison days. **Table 3** shows

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Table 3. Average Incarceration Days Before and After 18 Months

	MHC (n=447)			TAU (n=600)		
	Pre–18-mo	Post–18-mo	Change, %	Pre–18-mo	Post–18-mo	Change, %
SF (n=254)	128	149	+16	74	187	+243
SC (n=334)	110	113	+3	102	183	+79
MN (n=248)	21	41	+95	51	101	+98
IN (n=211)	17	12	–30	56	116	+107
Total (n=1047)	73	82	+12	74	152	+105

Abbreviations: IN, Indianapolis; SC, Santa Clara; SF, San Francisco; MHC, mental health court; MN, Minneapolis; TAU, treatment as usual.

Table 4. Factors Related to Annualized Number of Post–18-Month Arrests: 0-Inflated Poisson Model

Factors	Odds Ratio[a]	*P* Value
Pre–18-mo arrests, annualized No.	1.050	<.001
Pre–18-mo incarceration days	1.003	<.001
Received no baseline mental health treatment	1.717	<.001

[a]For 0-inflated Poisson models, also called incidence rate ratio.

Table 5. Factors Related to Number of Post–18-Month Days of Jail Reincarceration: 0-Inflated Poisson Model

Factors	Odds Ratio[a]	*P* Value
Pre–18-mo incarceration, d	1.003	<.001
Pre–18-mo arrests, annualized No.	1.032	<.001
Used illegal drugs in last 30 d	1.202	<.001
No bipolar disorder diagnosis	1.206	<.001
Received no baseline mental health treatment	1.188	<.001

[a]For 0-inflated Poisson models, also called incidence rate ratio.

that, for the MHC sample, there is a small increase in the number of incarceration days from the pre–18-month period (73 days) to the post–18-month period (82 days). For the TAU sample, however, there is a 105% increase in incarceration days (from 74 to 152 days). The difference in the post–18-month period between the MHC and TAU is significant ($P < .001$). Likewise, the difference is statistically significant for all 4 sites. In addition, the magnitude of change in incarceration days (9 vs 78 days) of the 2 samples is statistically significant ($P < .001$) and consistent across all 4 sites.

COMPARISON IN THE MHC

The final analyses of public safety outcomes focuses on what type of defendants do better or worse in MHCs using a ZIP regression model to examine 2 outcomes: annualized number of postdiversion arrests and number of jail and prison days for 18 months after diversion. We entered the explanatory variables indicated in the "Methods" section into the 2 ZIP regression models: annualized pre–18-month arrests (**Table 4**) and annualized pre–18-month incarceration days (**Table 5**). For both models, the criminogenic factors are the most consistently significant. Annualized rearrests in the post–18-month follow-up period is more likely for those who have more pre–18-month annualized arrests and more pre–18-month incarceration days. In addition, those who received no mental health treatment in the 6 months prior to entering the MHC at baseline are also more likely to be arrested in the 18-month follow-up.

Similarly, factors associated with more incarceration days during follow-up include the criminogenic factors of annualized pre–18-month arrests and number of pre–18-month incarceration days. Also, a number of clinical factors emerge. As with annualized postarrests, the absence of treatment at baseline is highly associated with more incarceration days during follow-up. Further, having a diagnosis of schizophrenia or depression rather than bipolar disorder and having used illegal drugs in the past 30 days are significantly associated with more incarceration days during the follow-up.

COMMENT

The appropriate question for MHCs is not, "do they work?" but, "for whom, and under what circumstances, do they work?" Nonetheless, public policy debates about these courts demand some global assessments. As we have seen here, across 4 diverse MHCs, MHC participants have significantly better outcomes on arrests and number of incarceration days than the TAU jail comparison group. On 5 key public safety outcome measures (subsequent arrest rates, number of subsequent arrests, reduction in pre- to post-MHC arrests, number of subsequent incarceration days, and change in pre- to post-MHC subsequent incarceration days) the overall MHC group is significantly lower than the TAU group.

Looking at the 4 sites individually, the pattern of MHC participants being lower than the TAU participants in number of arrests and both number of days of incarceration variables holds across all 4 sites. On arrest rates and pre/post-MHC number of arrests, the Minnesota site is different from the other 3 in that no significant effect for being in the MHC is found. One possible explanation for this inconsistency is found in a July, 2009, Minnesota in-house article.[25] Looking at 2007 and 2008 data from a 225-person MHC sample, researchers found no significant difference before and after MHC in average number of arrests, just as we did. However, when they examined a subgroup with longer exposure to the program

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(n=25) and one that specifically received housing via the program (n=10), both had statistically significant improvement after compared with before court involvement. Our sample is comparable with their total group, in which they too found no differences, suggesting that the same factors (ie, length in program and access to housing) may be instrumental in achieving these public safety outcomes. The average number of jail days increased for both samples. However, the small increase of 9 days for the MHC is not statistically significant and is unlikely to have practical implications. At first glance, data suggest that, because incarceration days increased for the MHC, the goal of reduced incarceration was not met. However, when compared with the 78-day increase for TAUs, the MHCs did much better than the TAUs in the follow-up ($F_1=76.98$; $P<.001$).

This first multisite, prospective study of MHCs offers encouragement that they can achieve the public safety outcomes that funders and the public want. Our data do not comprehensively address the key questions of who the courts are most effective for or what mechanisms produce positive outcomes. These important questions await further data from this and other studies. Until then, it appears that MHCs are diversion programs for justice-involved persons with mental illness and, usually, co-occurring substance abuse disorders that warrant public policy support.

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