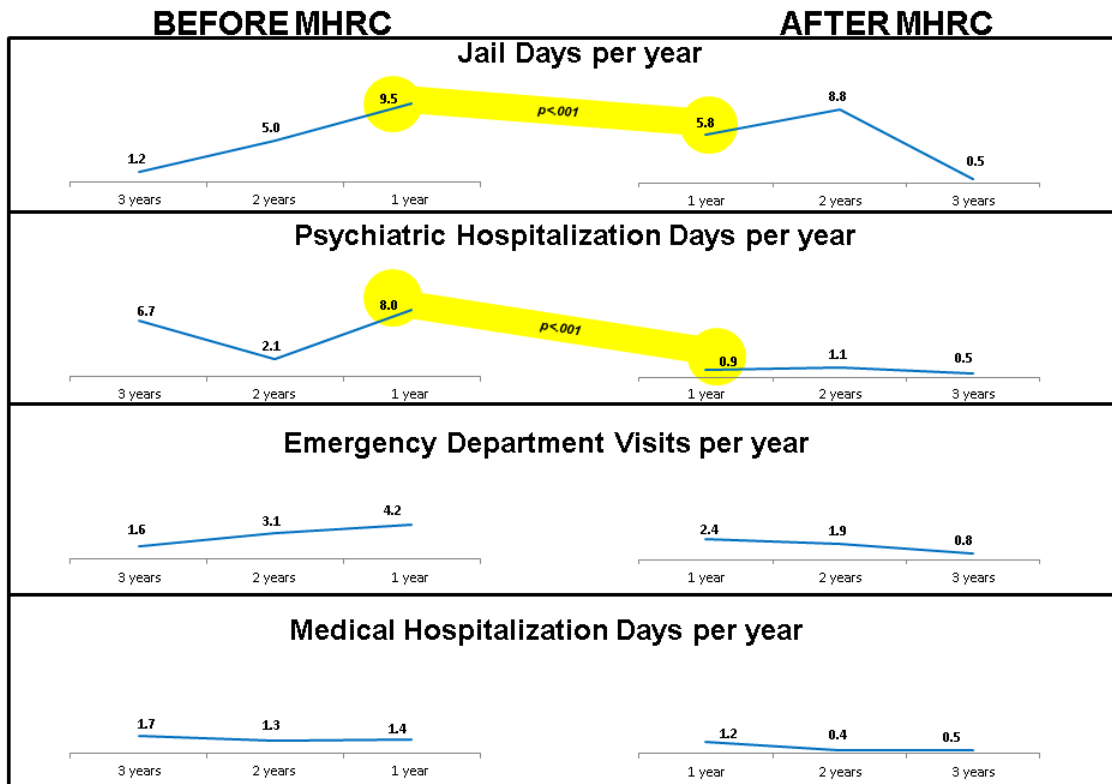


EVALUATION REPORT for KALAMAZOO MENTAL HEALTH RECOVERY COURT November, 2014

Outcomes among MHRC-Completers (N=92)



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MHRC OUTCOMES EVALUATION STUDY

EXECUTIVE SUMMARY: Mental Health Recovery Court (MHRC):

MHRC Enrollment and Completion:

Between October, 2008 and February, 2014, 633 cases were referred to MHRC.

- 61.6% (390) were deemed eligible for MHRC. Of these, 70.5% (275) agreed to participate. Those with final dispositions (i.e., not still in the program), were split equally between individuals who had successfully completed MHRC (92) and those who had not (91)
 - Compared with other sites, the Kalamazoo MHRC enrollment rate appears to be higher; Frailing (2010) reported that of the 551 invited individuals, 238 (43.2%) had refused participation, 167 (30.3%) had enrolled but then terminated, and 146 (26.5%) were either still participating or were graduates. This compares to 29.5% of Kalamazoo MHRC refusers, 23.3% enrolled but then terminated and 23.6% graduates (those “still-in” were not included in the study).
 - Among enrollees, Kalamazoo MHRC’s completion rate is comparable to others: A study by Redlich et.al (2010) reported completion rates of 45.8%, 46.7%, 65.4% and 82.4% across their five study sites. This compares to 50.3% completion rate by Kalamazoo MHRC enrollees.

Results by MHRC-Group

The three study groups (the 84 control group individuals who were eligible but had refused participation, the 92 completers, and the 91 terminators), were similar across gender, race and criminal charge. They varied on:

- Age. Terminators were significantly younger (32.0 compared to 35.7 control group and 37.3 completers)
- Diagnosis. Completers were the most likely to have schizophrenia and the least likely to have a substance abuse diagnosis, either co-occurring or primary.

Those who successfully complete MHRC tend to have greater psychiatric histories and lesser criminal justice histories compared to the control group and compared to those who enroll but terminate, and they show the most improvement on both of these measures following program completion.

- The individuals in each of the study groups were consistently different from one another, and these differences could be seen in their criminal justice, psychiatric and health indicators, as well as their response to MHRC/criminal justice involvement:¹
 - Consistent with other mental-health-court studies (Frailing, 2010; Gains Center, 2010), individuals who successfully completed MHRC had the greatest improvements in jail days and in psychiatric hospitalization days in

¹ “MHRC/criminal justice involvement” is the term used throughout the report to capture the intervention that for MHRC-completers and MHRC-terminators is MHRC-program participation, and for refusers-control group is criminal-justice-adjudication and sanction.

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the year following program graduation compared to the year prior to enrollment.

- Psychiatric improvement by this group remained consistent for up to three years post MHRC graduation
- MHRC-completers also showed significantly fewer individuals with emergency department visits after MHRC graduation compared to before enrollment, although pre-post visit rates did not reach statistical significance.
- The two other groups, MHRC-terminators and eligible individuals who refused MHRC, had stronger histories of criminal justice involvement (as measured by 3-year history of jail days) and more moderate histories of psychiatric acuity (as measured by 3-year psychiatric hospitalization days) compared to MHRC-completers.

Results by Type of Outcome:

Jail Days

- MHRC-completers have the fewest jail days of the three groups, showed the steepest increase in the three years leading up to MHRC and had the most dramatic reductions after MHRC, dropping from an average of 9.5 jail days in the year before to 5.8 the year after MHRC.
 - This was due to substantially fewer individuals with jail
- For all three groups, for those going to jail, the length of jail stay increased following MHRC/criminal justice involvement

Psychiatric Hospitalization Days

- In an opposite trend from jail days, completers had the most psychiatric hospitalization days of the three groups heading into MHRC
 - This decrease was due to both fewer individuals going into the hospital and to shorter stays among those admitted
- But, again, showed the steepest reductions after MHRC, from an average of 8.0 psychiatric hospitalization days in the year before to 0.9 the year after
 - This low rate stayed low for the three years post-program
- In contrast, those who refused MHRC (the control group) and those who failed MHRC (the terminators) showed minimal variation in psychiatric hospitalization days over the six year study period.

Emergency Department Visits

- Both MHRC-enrollee groups, completers and terminators, showed significant drops in individuals with emergency department visits after program participation compared to before
 - Although the annualized visit rate pre-post decreases within each group did not reach statistical significance
- All three groups had heightened rates of emergency department visits in the years leading up to their MHRC-eligibility

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- And all three groups saw gradual reductions over the three years following

Medical Hospitalization Days

- Overall, the three groups were very similar regarding medical hospitalization days in the years leading up to and the years after MHRC-eligibility
- MHRC-terminators were the only group to show a significant drop in hospitalization days the year after MHRC participation compared to the year before
 - This was due primarily to fewer numbers of individuals being hospitalized

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Introduction:

In recent years, evidence has mounted regarding the overrepresentation of persons with mental illness in the criminal justice system, especially those with co-occurring substance use disorders. This overrepresentation often leads to psychiatric crisis and hospitalization because of inadequate mental health care during incarceration, and to an overburdened criminal justice system. In response, communities across the nation have experimented with various types of collaborations between mental health and criminal justice agencies. One of the most promising has been Mental Health Courts, structured either as diversion programs or a condition of probation. Mental Health Courts link mental health care with criminal justice interventions through a combination of increased court supervision (regular court hearings), coordination of mental health / substance abuse assessment, and use of court-ordered sanctions to support compliance with probation or bond conditions, especially those related to mental health / substance abuse treatment. Mental Health Court is particularly appropriate for Kalamazoo County, with State budget shortfalls straining both mental health and criminal justice resources, in addition to acute jail overcrowding.

Kalamazoo County has adopted a recovery focus for their Mental Health Court, believing this has the greatest potential for long-term improvement, one that lasts beyond the period of court supervision. Toward this end, Peer Support Specialists have been trained in co-occurring services and motivational interviewing, and have developed the WRAP (Wellness Recovery Action Planning) program for Kalamazoo's Mental Health Recovery Court (MHRC) participants. Kalamazoo's MHRC targets people with high utilization of both mental health and criminal justice systems. Referrals come from judges, the prosecuting attorney's office, defense attorneys, jail staff, treatment agencies providing integrated recovery services (case management), and Kalamazoo Community Mental Health and Substance Abuse Services (KCMHSAS) staff. These referrals are reviewed by the MHRC team (judge, integrated recovery services agency, prosecutor, KCMHSAS staff, peer support specialist) for eligibility, with particular attention paid to defendant's competency, recovery focus, and community safety. Although MHRC is a misdemeanor court, felony diversion or supervision is considered on a case by case basis.

Study Goals:

The purpose of this study was to assess the efficacy of MHRC to improve criminal justice and health-related outcomes by comparing a control group, those who were eligible but refused MHRC, with those who successfully completed MRC and those who participated but failed MHRC. Pre- and post- outcomes were calculated for:

- Number of psychiatric hospitalization days
- Number of days spent in jail
- Number of emergency department visits
- Number of medical hospitalization days

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Data Collection and Measures

Study data were generated through secondary analysis of administrative records from the MHRC program, KCMHSAS, Kalamazoo County Sheriff's Department, and two local hospitals, Borgess Medical Center and Bronson Methodist Hospital. Medical record data were collected in two stages: (1) Manual abstraction of Borgess Medical Center and Bronson Methodist Hospital medical record numbers and (2) submission of the set of medical record numbers to each hospital for extraction of visit data by the hospital Health Information Management Departments into visit-level datasets. Jail data collection also occurred in two stages: (1) Extraction of the total population of jail stays into a dataset by the Kalamazoo County Sheriff's Information Technology Department, and (2) Electronic data linkage to MHRC participants using Link Plus 2.0, an algorithm-based matching software developed by the CDC. Linkage was based upon first and last names and date of birth, as noted in MHRC records. Psychiatric hospitalization data were obtained from CMH records, and supplemented by Borgess Medical Center data, which has a psychiatric in-patient unit.

Pre-Post Outcomes

Four outcome measures, serving as proxies for criminality and health, were tracked for three years prior to program enrollment (pre) and up to three years after leaving the program (post): Jail bookings, psychiatric hospitalization, medical hospitalization, and emergency department visits. Jail bookings may have been the result of a variety of situations: New arrest (followed by either release or prosecution), post-conviction sentencing, or violations of probation, pretrial bond or restraining order. Outcomes were measured as the total number of events (e.g., stays) and the total number of days spent in jail or the hospital (psychiatric or medical). The emergency department outcome was the total number of visits during the study period. Days were computed based upon admission and discharge dates, and calculations included the actual day of admission. Because participants had rolling MHRC-enrollment dates and different lengths of program participation, their "post" periods varied from 30 days to 658 days. To facilitate post-period comparisons, annualized rates were computed for everyone for the post first post year, using the following equation: $\text{Rate} = [(\# \text{ days or visits}) / (\# \text{ days in "after" period})] \times 365$. For post years two and three, only those who had been out for the entire year (year two and/or year three) were included in the counts.

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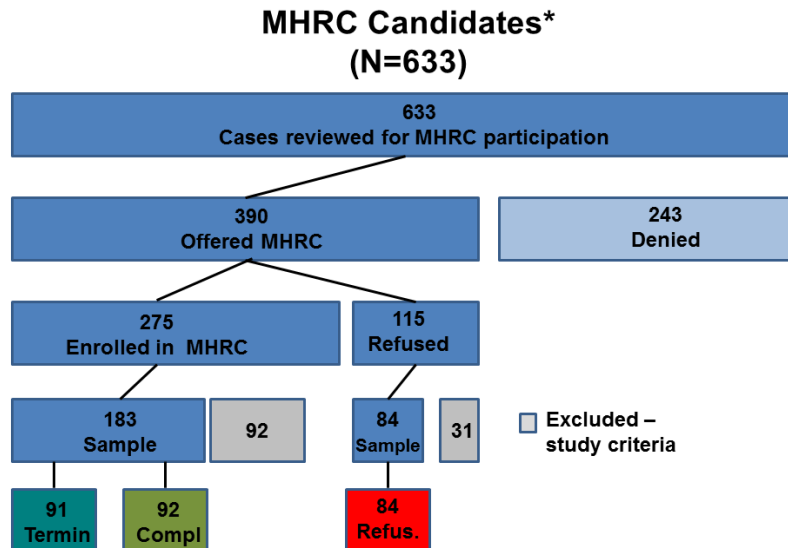
STUDY FINDINGS

Disposition of MHRC Eligible Candidates

Kalamazoo Mental Health Recovery Court (MHRC) was launched in October, 2008. As shown in the flowchart below, between then and February 7, 2014, six hundred and thirty three cases were reviewed for MHRC participation. Eighty one candidates (12.8%) had been reviewed multiple times: 70 twice, 10 three times and 1 person four times.

Of those reviewed, 38.4% (n=243) were deemed ineligible by MHRC administrators. Of the remaining 390 individuals who were offered MHRC participation, 70.5% (n=275) were enrolled in MHRC and 29.5% (n=115) refused the MHRC program and chose traditional adjudication.

The following study criteria were then applied to select the study population: (a) MHRC disposition before April 30, 2013, in order to maximize the “post” period for assessment of outcomes and (b) a final MHRC disposition (i.e., they could not still be actively participating in MHRC). Finally, a single case was selected for each individual, so that they would only be counted once within the study. If an individual was ever enrolled in MHRC, the first time they were enrolled was selected as the index study case for that individual. For multiples where the individual was never enrolled in MHRC, then the very first event was selected as the index study case.



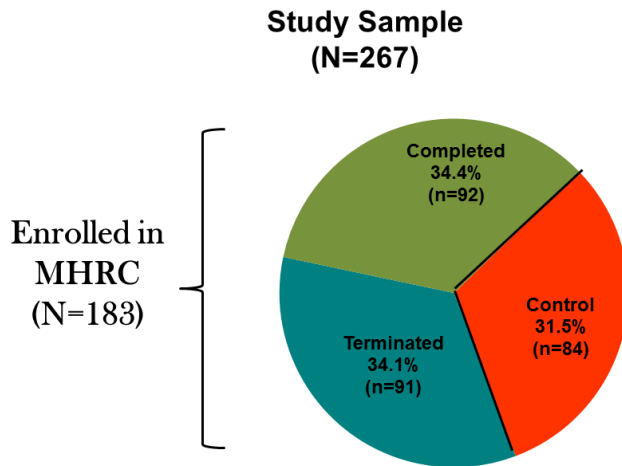
*Between October, 2008 and February, 2014

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Study Sample

These two hundred sixty seven individuals constituted the final study sample. As noted earlier, the group who were eligible for MHRC, but declined to enroll, the “refusers,” were considered a control group. MHRC enrollees, in turn, were split between “completers,” those participating successfully and to the fullest extent of the program, and “terminators,” those who participated for a while, but then failed the program.

Length of MHRC participation: Completers spent twice as long within the MHRC program as those terminated: median length was one year (364 days) for completers and six months (168 days) for terminators. Program length ranged from 196 days to 658 days for completers, and from 30 days to 618 days for terminators. Within the terminated category, 81 of the individuals were discharged by the court for non-compliance and 10 quit, moving to probation for the completion of their sentence.



Study findings will be reported for these three MHRC-eligible groups.

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Comparing Characteristics of the three MHRC-related Groups

As seen in the table below, the three groups are the same regarding the type of criminal charge leading to their MHRC program eligibility, with non-assault crimes such as property damage and theft being the most common. Violence-related crimes, domestic violence as well as other assaults, were the next most common, accounting for roughly one in three of eligible cases. Demographically, there was no difference between the control and the two enrolled groups regarding gender or race. However, terminators, as a group, were younger than either the external control group or the completers.

Diagnoses: The three groups also presented with different diagnoses. Completers were most likely to have schizophrenia or bipolar and were the least likely to have a substance abuse diagnosis, either as a co-occurring or a sole diagnosis. Of the three groups, terminators were the most likely to have a borderline personality diagnosis and most likely to have a co-occurring substance abuse diagnosis. The control group was unique in that they were the only ones to have a sole diagnosis of substance abuse.

		Control (84)	Terminated (91)	Completed (92)	p value
<u>Demographics</u>					
Age	mean (CI)	35.7 (32.8, 38.5)	32.0 (29.7, 34.3)	37.3 (34.6, 40.1)	.013
Gender	% (#)				.289
Female		41.7% (35)	46.2% (42)	34.8% (32)	
Male		58.3% (49)	53.8% (49)	65.2% (60)	
Race					.157
White		57.5% (46)	56.0% (51)	65.2% (60)	
Black		42.5% (34)	38.5% (35)	30.4% (28)	
Other		0.0% (0)	5.5% (5)	4.3% (4)	
<u>Charge Leading to MHRC</u> % (#)					
Domestic Violence		15.9% (13)	13.2% (12)	17.4% (16)	.871
Assault, Non-DV		14.6% (12)	13.2% (12)	12.0% (11)	
Substance Use-Related		15.9% (13)	18.7% (17)	21.7% (20)	
Ordinance Violation		2.4% (2)	2.2% (2)	0	
Non-Assault Crime		51.2% (42)	52.7% (48)	48.9% (45)	
<u>Principle Psychiatric Diagnosis At MHRC Enrollment</u> % (#)					
Developmental Disorder		1.2% (1)	4.5% (4)	4.3% (4)	.011
Bipolar Disorder		19.7% (15)	25.8% (23)	25.0% (23)	
Conduct Disorder		5.3% (4)	2.2% (2)	2.2% (2)	
Borderline Disorder		3.9% (3)	12.4% (11)	7.6% (7)	
Mood Disorder		25.0% (19)	28.1% (25)	20.7% (19)	
Psychotic Disorder		10.5% (8)	5.6% (5)	7.6% (7)	
Post-Traumatic Stress Disorder		1.3% (1)	2.2% (2)	2.2% (2)	
Schizophrenia		22.4% (17)	19.1% (17)	30.4% (28)	
Substance Abuse (only diagnosis)		10.5% (8)	0	0	
<u>Substance Abuse Diagnosis</u> % (#)					
		15.8% (12)	22.5% (20)	3.3% (3)	.001

Red **p** values indicate that the three groups are statistically significantly different from each other on this characteristic.

MHRC OUTCOMES EVALUATION STUDY

Jail Days

A multiple regression estimating the relative effects of MHRC, group membership and their interaction,² revealed that group membership (whether an individual was a completer, a terminator or a refuser in the control group) was the most important predictor of jail days both before and after MHRC/criminal justice involvement (see chart on next page).

- Overall, MHRC-completers had fewer jail days; in the years leading up to MHRC participation as well as the years following.
- MHRC completers were the only group to have a significant drop in jail days the year after participation compared to the year before.
- This drop was a function of fewer people with any jail time rather than a reduction in length of jail stay (see table on next page).

Regardless of their general criminal-justice-involvement levels, all three groups showed an upward trend of increasing jail stays and days in the three years leading up to MHRC-eligibility.

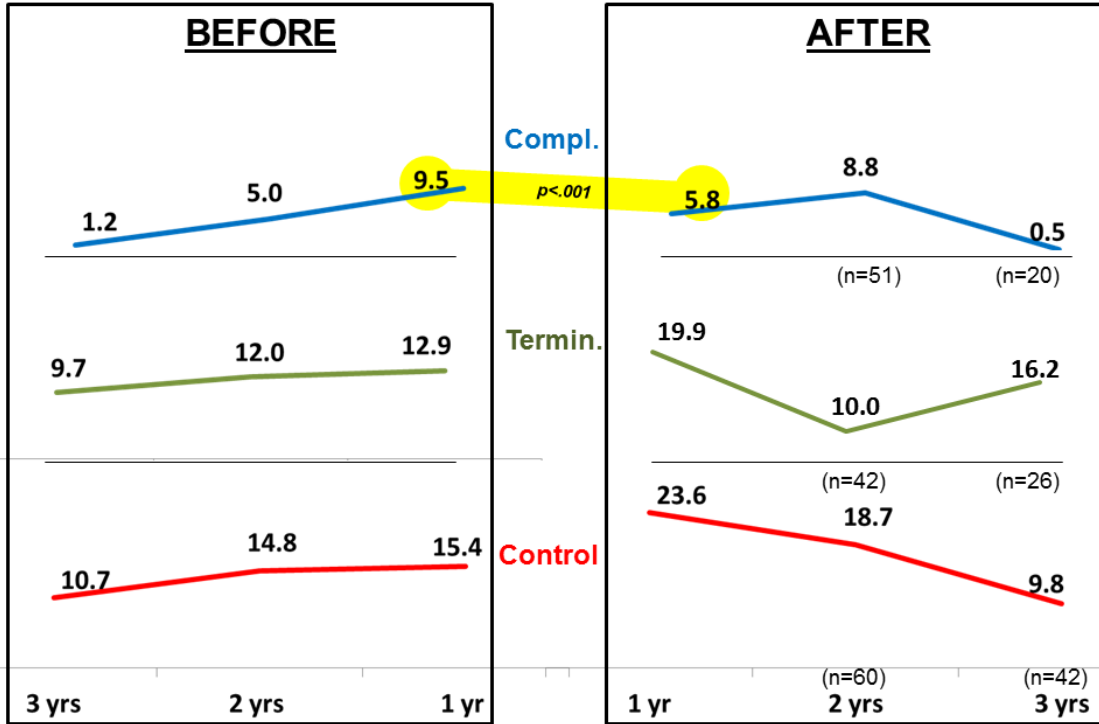
- After, the control group jail days first increased sharply, then showed a general downward trend in years two and three
- The two MHRC-enrolled groups had opposing patterns:
 - After their immediate, precipitous drop the post-program, MHRC-completers showed a slight increase in year two, followed by another decrease in year three. (Keep in mind that these trends could be due to the cohort itself or being three years out or a combination.)
 - MHRC-terminators had the reverse trend: up, then down, then up again.

² Multivariate modelling for annualized jail days was completed using Generalized Estimating Equation (repeated measures). Predictors in the model included pre-post MHRC (1 year before, 1 year after), MHRC group membership (completers, terminators, control), and the interaction of MHRC & group.

Results: MHRC= p .583, group= p .011, MHRC X group= p .262.

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**Average Annual Jail Days
Before & After MHRC**



NOTE: Highlighted statistic above shows the result of Related-Samples Wilcoxin Signed-Rank test, a bi-variate, non-parametric significance test of the pre-post changes within a group (pre=1 year before MHRC, post=1 year after MHRC)

	% with Any Jail Stay		Average Length of Stay*	
	Year Before MHRC	Year After MHRC**	Year Before MHRC	Year After MHRC
Completers (92)	77.2% (71)	19.6% (18)**	12.3	29.5
Terminators (91)	79.1% (72)	67.0% (61)	16.3	29.7
Control (84)	83.3% (70)	52.4% (44)**	18.5	45.1

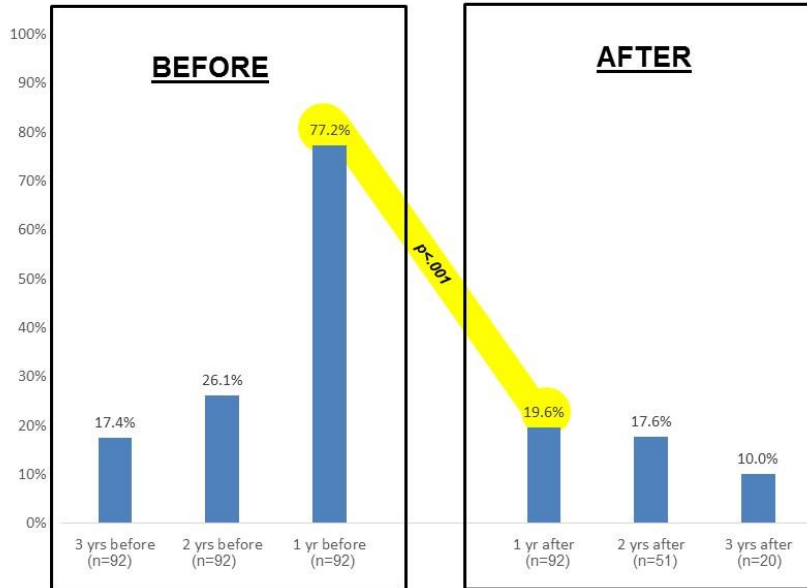
*Among those with jail stays only

** significantly different from pre-period at *p*.05, Chi-Square test

MHRC OUTCOMES EVALUATION STUDY

% with ANY Jail Stay, Before & After MHRC

Completers



NOTE: Highlighted statistic above shows the result of Pearson Chi Square test of the pre-post changes within completers (pre=1 year before MHRC, post=1 year after MHRC)

MHRC OUTCOMES EVALUATION STUDY

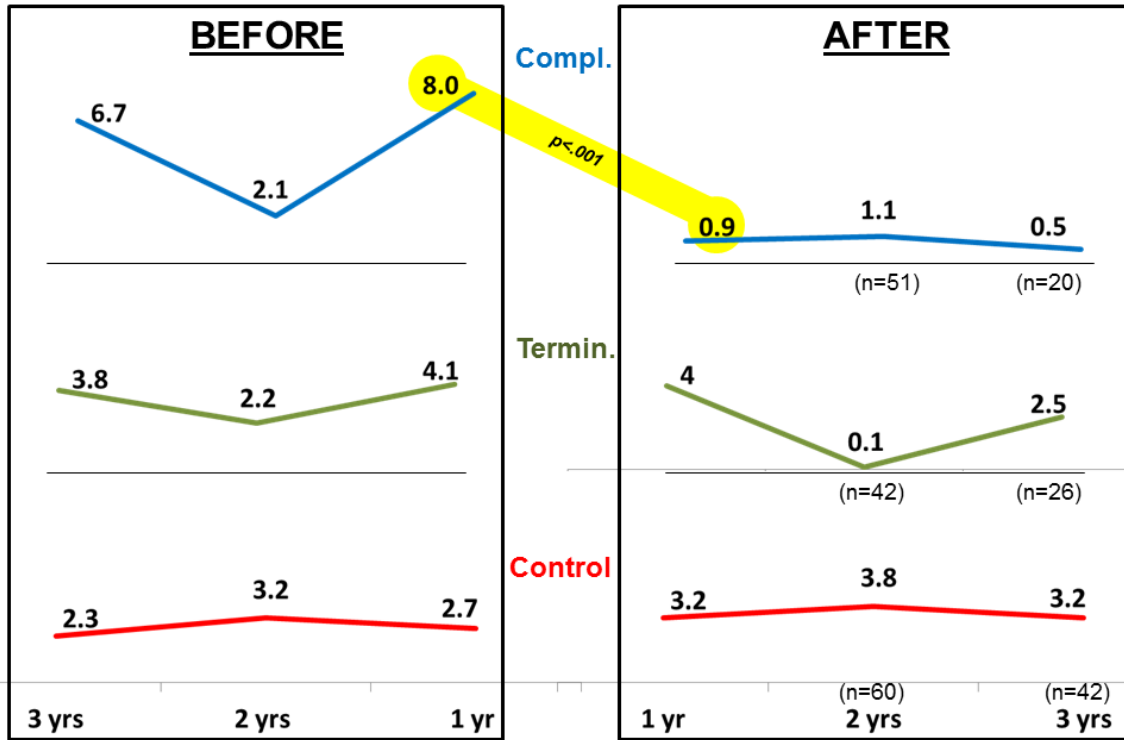
Psychiatric Hospitalization Days

Multiple regression showed that, psychiatric hospitalization days depended upon both which group an individual was in and whether the period was before or after MHRC.³ Specifically, MHRC-completers, unlike the control group and MHRC-terminators, showed dramatic improvement after MHRC participation (see chart below).

- Of the three groups, MHRC completers had the highest rates in the years leading up to MHRC and the lowest rates in the years after, following a steep drop from an average of 7.9 days immediately prior to MHRC to 0.9 days immediately after.
- A decrease that stayed low over the three year study period
- This improvement is due to fewer individuals being hospitalized rather than significantly shorter stays among those hospitalized (see table on next page)

In contrast, the control group and MHRC-terminators had psychiatric hospitalization days that, while varying over the study period, did not show improvement during the period directly following MHRC/ criminal justice involvement.

Average Annual Psychiatric Days Before & After MHRC



NOTE: Highlighted statistic above shows the result of Related-Samples Wilcoxin Signed-Rank test, a bi-variate, non-parametric significance test of the pre-post changes within a group (pre=1 year before MHRC, post=1 year after MHRC)

³ Multivariate modelling for annualized psychiatric hospitalization days was completed using Generalized Estimating Equation (repeated measures). Predictors in the model included pre-post MHRC (1 year before, 1 year after), MHRC group membership (completers, terminators, control), and the interaction of MHRC & group. Results: MHRC= $p=.005$, group= $p=.426$, MHRC X group= $p<.001$.

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	% with Any Psychiatric Hospitalization		Average Length of Hospitalization*	
	Year Before MHRC	Year After MHRC**	Year Before MHRC	Year After MHRC
Completers (92)	38.0% (35)	8.7% (8)**	20.9	10.5
Terminators (91)	35.2% (32)	19.8% (18)	11.7	20.3
Control (84)	25.0% (21)	17.9% (15)	10.9	18.1

*Among those with jail stays only

** significantly different from pre-period at $p.05$, Chi-Square test

MHRC OUTCOMES EVALUATION STUDY

Emergency Department Visits

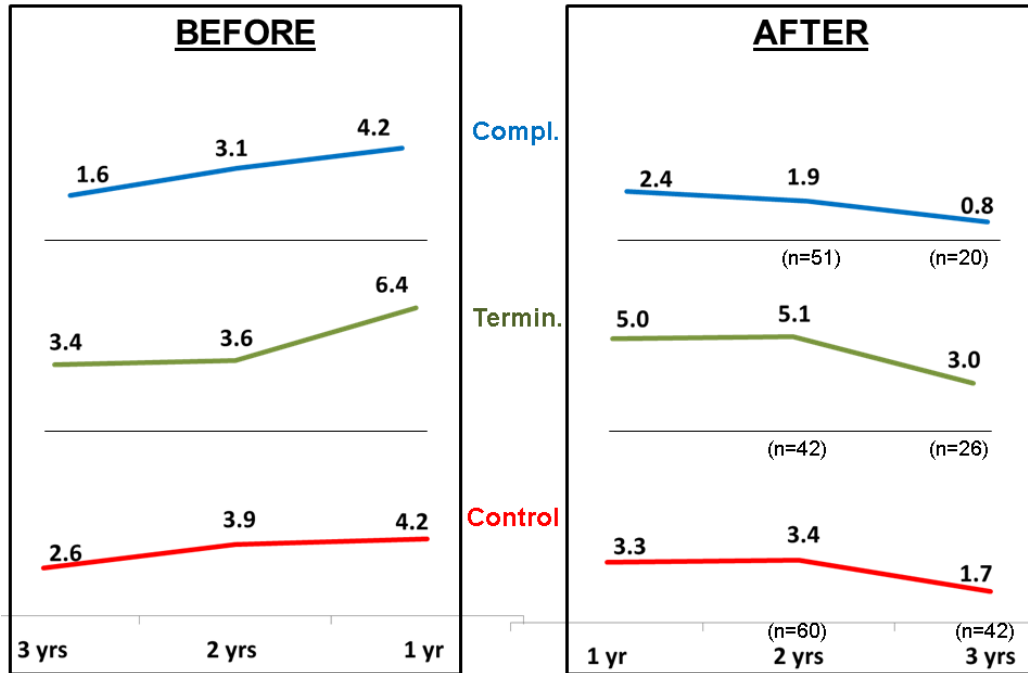
A mixed regression analysis revealed strong independent effects for group and for pre-post period.⁴ Specifically, MHRC-terminators had significantly more emergency department visits than the other two groups in general. But there was a strong overall trend for fewer visits in the year following MHRC/criminal justice involvement compared to the year prior for everyone (see chart below).

- Importantly, the two MHRC-enrollee groups, but not the control group, showed significantly fewer individuals with emergency department visits after program participation, regardless whether they successfully completed the program or not (see table on next page)

“Pre”-trend: All three groups showed a gradual increase in emergency department visits over the three years leading up to MHRC/criminal justice involvement

“Post”-trend: The three groups also showed a common trend for the three years after MHRC/criminal justice involvement, where the decrease seen in post-year-one remained stable in post-year-two before dropping further in post-year-three.

Average Annual Emergency Dept Visits Before & After MHRC



⁴ Multivariate modelling for annualized emergency department visits was completed using Generalized Estimating Equation (repeated measures). Predictors in the model included pre-post MHRC (1 year before, 1 year after), MHRC group membership (completers, terminators, control), and the interaction of MHRC & group.
Results: MHRC= $p=.009$, group= $p<.001$, MHRC X group= $p=.390$.

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	% with Any Emergency Department Visit		Average Number of Visits*	
	Year Before MHRC	Year After MHRC**	Year Before MHRC	Year After MHRC
Completers (92)	72.8% (67)	51.1% (47)**	5.8	4.7
Terminators (91)	82.4% (75)	65.9% (60)**	7.7	7.5
Control (84)	71.4% (60)	72.6% (61)	5.9	4.5

*Among those with visits only

** significantly different from pre-period at $p.05$, Chi-Square test

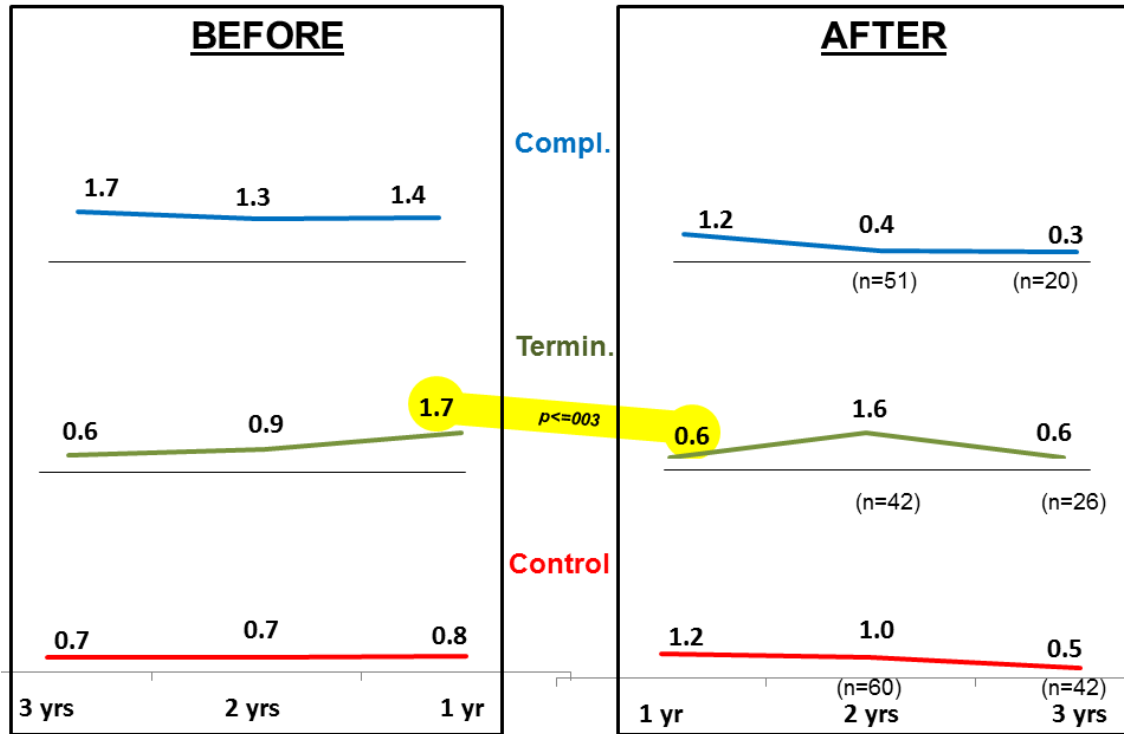
MHRC OUTCOMES EVALUATION STUDY

Medical Hospitalizations

Like psychiatric hospitalization days, regression analysis showed that medical hospitalization days after MHRC/criminal justice involvement compared to before varied by group:⁵

- MHRC terminators, with medical hospitalization days that rose to the level of MHRC-completers in the year before, had the only significant change, a decrease, in the year after (see chart below)
 - This was due to a reduction in the number of individuals being hospitalized rather than changes in their length of stay (see table on next page).

Average Annual Medical Hosp. Days Before & After MHRC



NOTE: Highlighted statistic above shows the result of Related-Samples Wilcoxin Signed-Rank test, a bi-variate, non-parametric significance test of the pre-post changes within a group (pre=1 year before MHRC, post=1 year after MHRC)

⁵ Multivariate modelling for annualized medical hospitalization days was completed using Generalized Estimating Equation (repeated measures). Predictors in the model included pre-post MHRC (1 year before, 1 year after), MHRC group membership (completers, terminators, control), and the interaction of MHRC & group. Results: MHRC= $p=0.698$, group= $p=0.300$, MHRC X group= $p=0.002$.

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	% with Any Medical Hospitalization		Average Length of Hospitalization*	
	Year Before MHRC	Year After MHRC**	Year Before MHRC	Year After MHRC
Completers (92)	13.0% (12)	9.8% (9)	11.0	12.2
Terminators (91)	24.2% (22)	8.8% (8)**	6.8	6.3
Control (84)	15.5% (13)	16.7% (14)	5.3	7.1

*Among those with med stays only

** significantly different from pre-period at $p.05$, Chi-Square test