



Rhode Island Department of Children, Youth & Families



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# Multisystemic Therapy in Rhode Island, 2008-2011

Data and Evaluation

November 2013

## Summary

- This report can inform MST providers and the families which youth may achieve optimal outcomes post MST. This analysis does not compare MST related outcomes to outcomes for youth who did not receive MST or who received other services.
- Among those who completed MST (N=555), improvements were seen in adjudications, stay at RITS, and removals pre-MST (at any point prior to MST) compared to post-MST (within one year after MST discharge).
  - Adjudications 25.2% pre-MST to 20.2% post-MST
  - RITs stay 25.2% pre-MST to 16.2% post-MST
  - Removals 56.4% pre-MST to 21.4% post-MST
- Among all youth who completed MST treatment:
  - youth who had a juvenile probation assignment one year prior to MST or during MST, and/or are Black or Latino have a greater risk to experience an adjudication one year post MST discharge, a RITS stay one year post MST discharge
  - youth who are younger at MST entry, have an adjudication prior to MST and longer length of time in MST have a greater risk of removal one year post MST
- Data suggest the critical period to reduce the risk of: a) adjudication post-MST is within 4 months after MST discharge; b) a RITs stay post-MST is within 3.5 months; c) removal post-MST is within 4 months after MST discharge.
- Of those who completed MST treatment, 20.2% had an adjudication within a year post MST. Of those discharged due to lack of engagement or placement during MST, 50.0% had an adjudication within a year post MST.

- MST episodes discharged due to lack of engagement or placement during MST may provide opportunity for improvement because the percentages with removal, stay at RITs, and adjudication within one year post-MST were significantly higher compared to MST completers.
- MST outcomes at discharge (living at home, in school or working, no new arrests) and model fidelity scores (based on TAM-R) were above the national target.
- The number of youth with a completed TAM-R was below the national target, a possible area for improvement.
- Of MST episodes with treatment complete, 25% were juvenile probation-related. Longitudinal outcomes varied across providers and by juvenile probation/non-juvenile probation status.



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## Background Information

### Objective

Research has shown that Multisystemic Therapy (MST) is associated with a reduction in delinquent and criminal behavior.<sup>1-5</sup> The Rhode Island (RI) Department of Children, Youth and Families (DCYF) began utilizing MST in 2007. The purpose of this report is to identify characteristics, of youth who received MST, that are associated with three outcomes within one year post MST completion: 1) removal from home; 2) a stay at the juvenile correction facility (Rhode Island Training School, RITS) including detention and adjudication; and 3) adjudication in the juvenile justice system. This analysis will identify characteristics associated with these three outcomes among sub-populations who completed MST that can inform MST providers and the families they serve. This report **does not** compare outcomes for youth who have not gone through MST or have gone through other programs. A subsequent report will present those findings. The analysis presented in this report is on MST episodes and may include a duplicate count of youth.

#### Objective

Identify factors associated with outcomes within 1 year post-MST:

- 1) Removal from home
- 2) A stay at RI Training School
- 3) Adjudication

This analysis **does not** compare post-MST outcomes to outcomes for youth who did not receive MST or who received other services.

### Multisystemic Therapy

Multisystemic Therapy (MST) is a community-based and family-driven treatment program for antisocial and delinquent behavior in youth aged 12 through 18 years, who have an identified primary caregiver. MST is implemented using research-based intervention strategies. It focuses on empowering caregivers to problem solve and addresses environmental systems that impact the youth - their families, peers, schools, and neighborhoods.<sup>6</sup> The MST team includes a supervisor and 2-4 masters level therapists who provide services 24 hours a day, 7 days a week. Each MST therapist works intensively with 4 to 6 families at a time, for an average of 4 months.<sup>7,8</sup>

## Methods

This study was conducted using data from five MST providers in Rhode Island for episodes with discharge dates between 2008 and 2011. Data were merged with RI DYCF's State Automated Child Welfare Information System (SACWIS) known as the Rhode Island Children's Information System (RICHIST).

Data from MST providers include program dates (dates of referral, first visit, and discharge) and MST outcomes (case progress, instrumental outcomes at discharge, and ultimate outcomes at discharge). MST data were matched with RICHIST data using last name, first name, and date of birth and providers were asked to clarify any missing or erroneous data. RICHIST data include demographic characteristics (age, gender, race/ethnicity), youth characteristics (age at first removal, removal count prior to MST entry, age at first RITS placement, age at first adjudication, and age at first substantiated maltreatment), and details of DCYF episodes prior to MST entry and after MST discharge. These data were included as they are known to be associated with the three outcomes of

interest.<sup>9-11</sup> Longitudinal outcomes within one year post MST discharge include: (1) removal to an out-of-home placement (does not include the RITS); (2) a stay at the RITS including detention and adjudication; and (3) adjudication in the juvenile justice system (including adjudicated to probation, RITS, or temporary community placement). Outcome data and sources are described in Table 1.

Data were received on 889 MST episodes (duplicated youth count). Records were excluded if a RICHIST ID could not be identified (7 records), if MST referral, first visit, and discharge date were missing (29 records), if treatment completion status was not provided (3 records), if the discharge date was outside of 2008-2011 (16 records), or if the provider identified the record as an erroneous duplicate (3 records). The final sample included 828 MST episodes (duplicated) for 770 youth. Descriptive and regression analyses were utilized to assess outcome data.

<b>Table 1. Outcome data and source</b>		
<b>Type</b>	<b>Indicator</b>	<b>Source</b>
Case Progress	<ul style="list-style-type: none"> <li>• Treatment completion</li> </ul>	MST
Instrumental Outcomes at Discharge	<ul style="list-style-type: none"> <li>• Percentage of instrumental outcomes met: improved parenting skills, improved family relations, improved family social supports, youth education/vocational success, evidence of youth pro-social activities, and sustained positive youth behavior change.</li> </ul>	MST
Ultimate Outcomes at Discharge	<ul style="list-style-type: none"> <li>• Living at home</li> <li>• In school or working</li> <li>• No new arrests</li> </ul>	MST
Longitudinal Outcomes (1 year post MST)	<ul style="list-style-type: none"> <li>• Removal to out of home placement</li> <li>• Stay at RITS</li> <li>• Adjudication in juvenile justice</li> </ul>	RICHIST

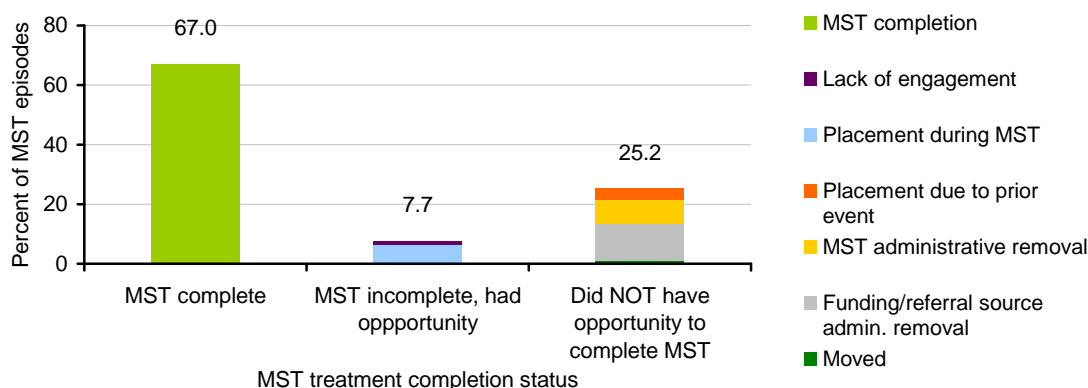
# Results

## MST Treatment

### Case Progress at Discharge

Of 828 MST episodes, 67.0% (555 episodes) completed treatment, 7.7% (64 episodes) did not complete but had the opportunity to complete MST (lack of engagement or placed out of home for an event during treatment), and 25.2% (209 episodes) did not have the opportunity to complete treatment (youth/family moved, MST or funding/referral source administrative reasons, youth placed for an event that occurred prior to treatment). See Figure 1. See Appendix for additional details on case progress categories. The national MST organization monitors outcomes for all youth that either completed MST treatment or had the opportunity to complete MST but closed for a clinical reason (lack of engagement or placement during MST).

**Figure 1. Percent of MST episodes by treatment completion status, all MST episodes (N=828)**



### Length of stay

Of those who had the opportunity for a full course of treatment, the median length of stay in MST treatment was 134 days, which is within the national target of 90-150 days.<sup>6</sup> Youth who completed the program had a longer median length of stay (140 days) as compared to those who did not complete the program but had the opportunity for a full course of treatment (81.5 days).

### Sample Characteristics

Across all categories of treatment completion, there were a greater percentage of males (compared to females) and youth aged 15-17 years (compared to 11-14). Of the MST episodes where treatment was complete or where youth had the opportunity but did not complete MST, Psychological Centers (compared to other providers) and White non-Hispanics (compared to other races) represented the greatest percentage of episodes. Of MST episodes where youth did not have the opportunity to complete treatment, Tides Family Services and Hispanics represented the greatest percentage. A majority of youth had only one MST episode. There was as statistically significant difference between MST completers and those who had the opportunity but did not complete MST, on provider and a stay at RITS prior to MST.

**Table 2. Number and percent of MST episodes by provider, gender, age, provider, race/ethnicity, number of MST episodes, and treatment completion status**

Child/Youth Characteristics		Total		MST treatment complete		MST incomplete but had opportunity		Did NOT have opportunity to complete MST	
		N	%	N	%	N	%	N	%
<b>Total</b>		<b>828</b>	<b>100.0</b>	<b>555</b>	<b>100.0</b>	<b>64</b>	<b>100.0</b>	<b>209</b>	<b>100.0</b>
<b>Gender</b>	Male	474	57.3	311	56.0	39	60.9	124	59.3
	Female	354	42.8	244	44.0	25	39.1	85	40.7
<b>Age at MST Entry*</b> (Median age = 15)	11-14	300	36.2	214	38.6	25	39.1	61	29.2
	15-17	528	63.8	341	61.4	39	60.9	148	70.8
<b>Race/ ethnicity<sup>†</sup></b>	Black Non-H	117	14.2	72	13.0	12	18.8	33	15.9
	White Non-H	394	47.8	285	51.6	29	45.3	80	38.5
	Hispanic	251	30.5	154	27.9	16	25.0	81	38.9
	Other/multiracial Non-H	62	7.5	41	7.4	7	10.9	14	6.7
	Unable to Determine/Unknown	4	--	3	--	0	--	1	--
<b>Juvenile Probation just prior to MST</b>	Yes	218	26.3	141	25.4	23	35.9	54	25.8
	No	610	73.7	414	75.6	41	64.1	155	74.2
<b>Any removal prior to MST</b>	Yes	490	59.2	313	56.4	37	57.8	140	67.0
	No	338	40.8	242	43.6	27	42.2	69	33.0
<b>Any stay at RITS prior to MST</b>	Yes	241	29.1	140	25.2	31	48.4	70	33.5
	No	587	70.9	415	74.8	33	51.6	139	66.5
<b>Any adjudication prior to MST<sup>‡</sup></b>	Yes	221	26.7	140	25.2	22	34.4	59	28.2
	No	607	73.3	415	74.8	42	65.6	150	71.8
<b>Length of time in MST<sup>‡</sup></b>	0-5 months	777	93.8	509	91.7	60	93.8	208	99.5
	6-12 months	51	6.2	46	8.3	4	6.3	1	0.5
<b>Provider</b>	Communities for People	152	18.4	103	18.6	15	23.4	34	16.3
	Community Solutions, Inc.	161	19.4	114	20.5	0	0.0	47	22.5
	Providence Center	162	19.6	110	19.8	15	23.4	37	17.7
	Psychological Centers	189	22.8	132	23.8	26	40.6	31	14.8
	Tides Family Services	164	19.8	96	17.3	8	12.5	60	28.7
<b>Number of MST episodes</b>	1 MST episode	715	86.4	506	91.2	51	79.7	158	75.6
	2 MST episodes	104	12.6	43	7.8	11	17.2	50	23.9
	3 MST episodes	9	1.1	6	1.1	2	3.1	1	0.5

Note: Percentages may not total to 100% due to rounding. MST incomplete but had opportunity category includes discharges due to lack of engagement or placement during MST. Did not have opportunity to complete MST includes discharges due to MST administrative removal, funding/referral source administrative removal, youth/family moved, and placement due to prior event.

\* Age is calculated from RICHIST date of birth and MST first visit date (if missing then referral date).

<sup>†</sup> Race/ethnicity data are from RICHIST (if missing then MST data). Other race/multiracial category includes Asian and American Indian

\* Includes any adjudication prior to and up to 2 weeks after MST first visit date.

<sup>‡</sup> Length of time in MST program is calculated from first visit date (if missing then referral date) and discharge date.

## MST Model Fidelity

The National MST Quality Assurance/Quality Improvement (QA/QI) Program includes validated measures of clinical supervision practices and therapist adherence to measure fidelity to the MST treatment principles. A critical component of the QA/QI program is the Therapist Adherence Measure-Revised (TAM-R), a 28-item questionnaire which is completed by the primary caregiver during the second week of MST treatment and every four weeks thereafter. The adherence score ranges from 0 to 1, with 1 representing the highest level of adherence. Greater levels of adherence have been associated with better outcomes in clinical trials.<sup>6, 12, 13</sup> The overall average adherence score for the five RI providers between 1/1/2008 and 12/31/2011 was 0.73 which is above the national MST target of 0.61. However, the percent of MST youth in RI with at least one completed TAM-R interview (average of 84.8% for five RI providers) is below the national MST target of 100%.

## MST Outcomes at Discharge

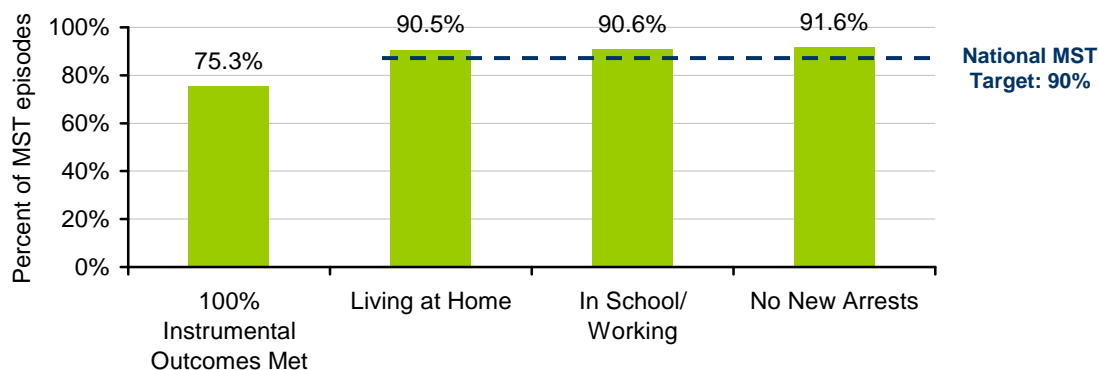
### *Instrumental Outcomes at Discharge*

Instrumental outcomes help determine if there were sufficient changes in six target areas of treatment at discharge (improved caregiver parenting skills; improved family relations specific to the drivers of the youth referral behavior; improved family social supports; youth success in an educational or vocational setting; youth involvement with prosocial peers and minimal involvement with problem peers; and sustained positive youth behavior change). Therapists solicit feedback from schools, DCYF case workers, the youth and family, and rate change at discharge in each of these areas. Approximately 75% of MST episodes (treatment complete or had opportunity) had achieved sufficient change in 100% (all six) of their instrumental outcomes. See Figure 2.

### *Ultimate Outcomes at Discharge*

Ultimate outcomes provide basic information about how the youth was functioning in three measures of success at discharge: (1) living at home; (2) attending school (e.g., not truant) or vocational training or working; and (3) arrested for a new offense since treatment started.<sup>14</sup> The percentage of MST episodes (treatment complete or had opportunity) achieving ultimate outcomes was above the national target of 90% for all three outcomes.<sup>6</sup> See Figure 2.

**Figure 2. Percentage of MST episodes by outcomes at discharge, treatment complete or had opportunity (N=619)**



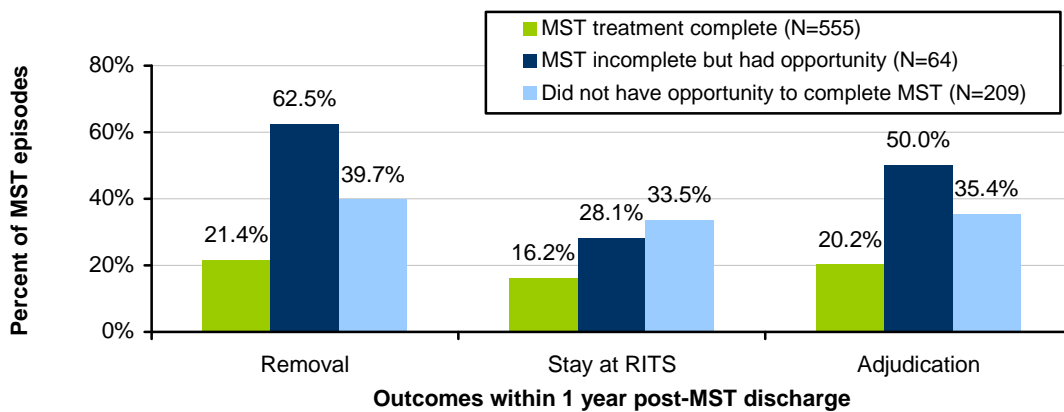


## Longitudinal Outcomes – Subsequent Involvement with DCYF

This analysis focused on factors associated with the occurrence of three outcomes within one year post MST discharge: (1) removal to an out of home placement; (2) detention at Rhode Island Training School (RITS); and (3) adjudication. Of the 555 MST episodes **where treatment was complete**, within one year post-MST discharge 21.4% (119 episodes) were removed to an out-of-home placement, 16.2% (90 episodes) were detained at the RITS, and 20.2% (112 episodes) were adjudicated. See Figure 3. There was a statistically significant difference on these three outcomes between the MST completers and those who had the opportunity for a full course of treatment but did not complete MST due to lack of engagement or placement during MST.

Please note that the percentages should not be totaled across the outcome categories. Youth who have had a stay at RITS or have been adjudicated were not necessarily in an out of home placement, and youth who had a RITS stay were not necessarily adjudicated.

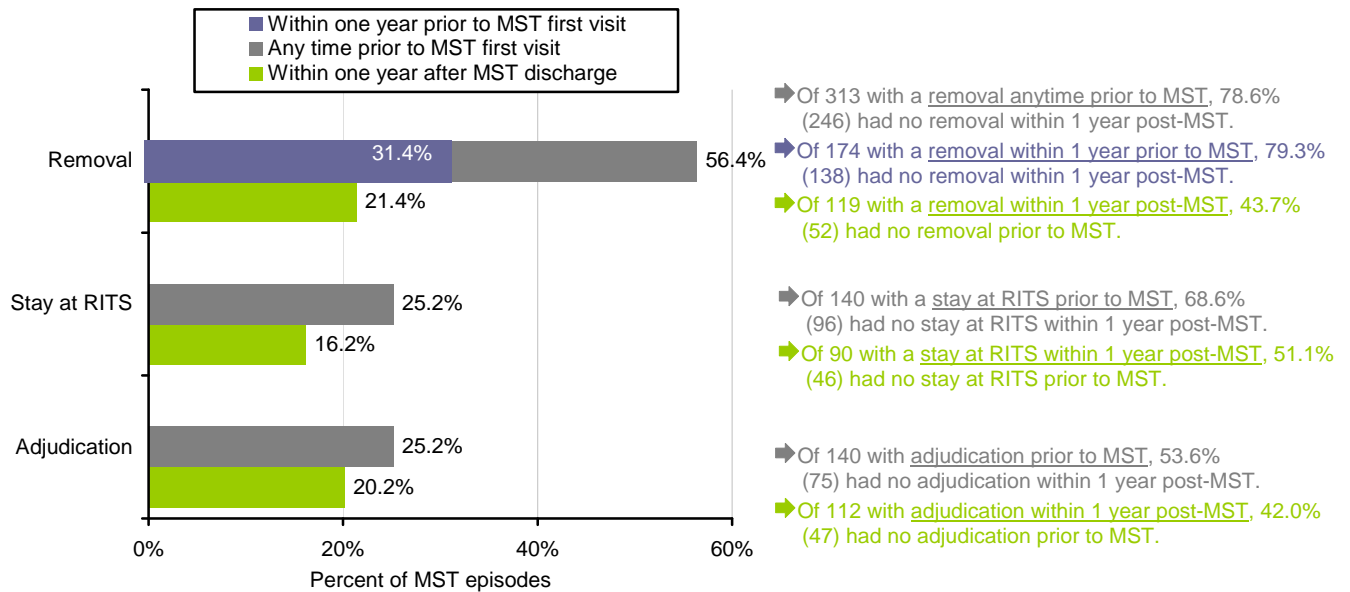
**Figure 3. Percent of MST episodes with a removal, stay at the RITS, or adjudication within 1 year post MST discharge, by treatment completion status, all MST episodes (N=828)**



Note: MST incomplete but had opportunity category includes discharges due to lack of engagement or placement during MST. Did not have opportunity to complete MST includes discharges due to placement due to prior event, MST administrative removal, funding/referral source administrative removal, and youth/family moved.

All further analysis is based only on episodes of youth who completed MST (N=555) in order to assess the impact of a full course of treatment. Reductions occurred across all three outcomes 1 year post MST compared any time prior to MST. See Figure 4.

**Figure 4. Percent of MST episodes with a removal, stay at the RITS, or adjudication, prior to MST and within a year after MST, treatment completed (N=555)**



Tables 3 and 4 present results from multivariate analyses for longitudinal outcomes based upon child and case characteristics. All variables significant on bivariate analysis were included in the multivariate analysis. When taking into account the influence of other variables, those more likely to be removed to out-of-home placement within one year from MST discharge were younger at MST entry, had an adjudication prior to MST, and had a longer length of time in MST treatment. Those significantly more likely to have a RITS placement or adjudication within a year after MST discharge were Black non-Hispanics or Hispanic (compared to White non-Hispanics) and those who had a juvenile probation assignment prior to MST. Factors significantly associated with being more likely to be adjudicated within a year after MST discharge included being Black non-Hispanic or Hispanic (compared to White non-Hispanic), and a juvenile probation assignment prior to MST. It is important to note that there are larger contextual factors that influence the longitudinal outcomes, in particular for adjudication and stay at RITS, that are unrelated to family level interventions.

**Table 3. Multivariate model results**

Individual factors significantly associated with longitudinal outcomes
<b>OUTCOME: Removal</b>
✓ Younger age at MST entry
✓ Adjudication prior to MST
✓ Longer length of time in MST
<b>OUTCOME: RITS Placement</b>
✓ Black non-Hispanic or Hispanic
✓ Juvenile probation prior to MST
<b>OUTCOME: Adjudication</b>
✓ Black non-Hispanic or Hispanic
✓ Juvenile probation prior to MST
<b>Individual factors not significantly associated with longitudinal outcomes</b>
× Gender
× Number of times receiving MST
× Removal, substantiated maltreatment, or stay at RITS prior to MST
× Individual removal reasons prior to MST
× Number removal episodes prior to MST

When taking into account the influence of other variables, the factors that were not significantly associated with any of the three outcomes were gender, number of times receiving MST, DCYF removal or substantiated maltreatment or a stay at RITS prior to MST, individual reasons for removal prior to MST (abuse/neglect, substance abuse, behavior, inability to cope, disability, or other), and number of removal episodes prior to MST.

**Table 4. Odds ratios and statistical significance on multivariable regression by longitudinal outcome, treatment completed**

Child/Case Characteristic		Outcome Within One Year Post MST Discharge					
		Removal (N=555)		Stay at RITS (N=552)		Adjudication (N=552)	
		OR	p-value	OR	p-value	OR	p-value
<b>Age at MST entry</b> (compared to 15-17)	11-14 years	1.944	0.00	0.749	0.33	--	--
<b>Gender</b> (compared to female)	Male	--	--	1.522	0.13	1.511	0.11
<b>Race<sup>†</sup></b> (compared to White non-Hispanic)	Black, Non-H	--	--	3.007	0.00	2.458	0.01
	Hispanic	--	--	2.098	0.02	1.831	0.03
	Other/Multiracial Non-H	--	--	0.556	0.37	1.394	0.49
<b>Juvenile probation just prior to MST</b> (compared to no jprob)		--	--	4.949	<0.00	7.815	<.00
<b>Any RITS stay prior to MST</b> (compared to no prior RITS)		--	--	1.376	0.33	0.827	0.54
<b>Any adjudication prior to MST*</b> (compared to no prior adjudication)		1.998	0.00	1.109	0.83	1.331	0.51
<b>Length of time in MST<sup>‡</sup></b> (compared to 0-5 months)	6-11 months	2.401	<0.00	--	--	--	--
<b>Provider</b> (compared to Provider B)	Provider A	--	--	2.349	0.05	--	--
	Provider C	--	--	1.623	0.26	--	--
	Provider D	--	--	1.456	0.39	--	--
	Provider E	--	--	2.280	0.06	--	--

-- Variable not included in full model for the outcome because it was not significant on bivariate regression for that outcome.

<sup>†</sup> Race/ethnicity was significantly associated with the outcome stay at RITS for Black compared to Other/multiracial (5.411, p=0.01), not shown. Race/ethnicity data are from RICHIST (if missing then MST data).

\* Includes any adjudication prior to and up to 2 weeks after MST first visit date.

<sup>‡</sup> Length of time in MST program is calculated from first visit date (if missing then referral date) and discharge date.

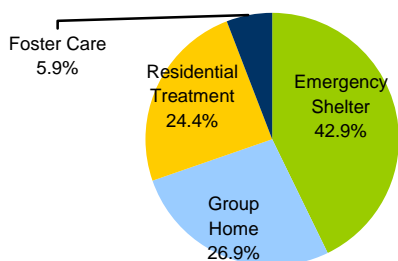
### *Time from MST Discharge to Occurrence of Outcome*

Among the episodes where MST treatment was completed, the median length of time from MST discharge to removal was 122 days, from MST discharge to RITS was 102 days and from MST discharge to adjudication was 121 days.

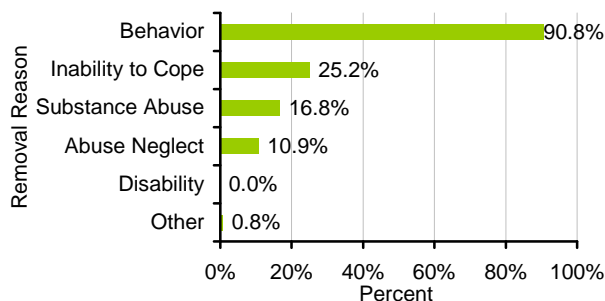
### *Placement Type and Removal Reason after MST Discharge*

Among the 119 episodes where MST treatment was completed and there was an out-of-home placement within one year after MST discharge, the most frequent types of out of home placements after MST were emergency shelter (42.9%), group home (26.9%), and residential treatment (24.4%). The most frequent removal reason was child behavior (90.8%).

**Figure 5. Percent of MST episodes by placement type, among those with a removal within 1 year post- MST, treatment completed (N=119)**



**Figure 6. Percent of MST episodes by removal reason, among those with a removal within 1 year post-MST, treatment completed (N=119)**



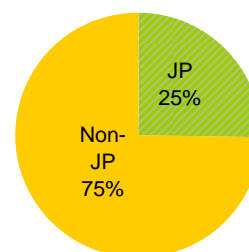
Note: Percentages may add up to over 100% because a youth may have multiple removal reasons.

## MST in the Juvenile Probation Population

### Case Status at Discharge

Involvement with juvenile probation is defined here as any episode where the most recent worker assigned prior to, or during MST was juvenile probation or RITS. This does not include instances where the juvenile probation worker assignment ended prior to the start of MST. Of 555 MST episodes that completed treatment, 25% (141 episodes) had involvement with juvenile probation. See Figure 7.

**Figure 7. Percent of MST episodes by juvenile probation (JP) status, treatment completed (N=555)**



### Longitudinal Outcomes – Subsequent Involvement with DCYF

A statistically significant difference was observed wherein youth with juvenile probation as the most recent worker assignment just prior to, or during MST compared to those without were more likely to experience a RITS stay, or adjudication within a year after MST discharge,. Of 141 MST episodes that completed treatment and were involved with juvenile probation just prior to MST, 27.08% were removed to an out-of-home placement, 39.7% were placed at the RITS, and 51.1% were adjudicated within one year post-MST discharge, compared to 19.6%, 8.2%, and 9.7% of those without a juvenile probation assignment, respectively.. The outcome percentages for the juvenile probation and non juvenile probation subpopulations vary across providers. See Tables 5 and 6.

**Table 5. Number and percent of MST episodes with removal, a stay at RITS, or adjudication within 1 year post MST discharge, treatment completed, by juvenile probation-related (JP) subpopulation**

Category	Outcomes within One Year Post MST Discharge						
	Total	Removal		Stay at RITS		Adjudication	
	N	N	%	N	%	N	%
All MST	555	119	21.4%	90	16.2%	112	20.2%
MST/JP	141	38	27.0%	56	39.7%	72	51.1%
MST/No JP	414	81	19.6%	34	8.2%	40	9.7%

**Table 6. Number and percent of MST episodes with removal, a stay at RITS, or adjudication within 1 year post MST discharge, treatment completed, by juvenile probation-related (JP) subpopulation and MST provider**

Provider	Outcomes within One Year Post MST Discharge													
	Total		Removal				Stay at RITS				Adjudication			
	No JP	JP	No JP		JP		No JP		JP		No JP		JP	
	N	N	N	%	N	%	N	%	N	%	N	%	N	%
<b>Total</b>	<b>414</b>	<b>141</b>	<b>81</b>	<b>19.6%</b>	<b>38</b>	<b>27.0%</b>	<b>34</b>	<b>8.2%</b>	<b>56</b>	<b>39.7%</b>	<b>40</b>	<b>9.7%</b>	<b>72</b>	<b>51.1%</b>
Provider A	79	24	21	26.6%	5	20.8%	8	10.1%	12	50.0%	6	7.6%	16	66.7%
Provider B	88	26	13	14.8%	9	34.6%	4	4.6%	9	34.6%	5	5.7%	14	53.9%
Provider C	78	32	14	18.0%	11	34.4%	5	6.4%	14	43.8%	9	11.5%	16	50.0%
Provider D	106	26	19	17.9%	7	26.9%	7	6.6%	10	38.5%	9	8.5%	11	42.3%
Provider E	63	33	14	22.2%	6	18.2%	10	15.9%	11	33.3%	11	17.5%	15	45.5%

## Conclusions

### *MST Treatment*

Of 844 MST episodes discharged from RI providers between 2008 and 2011, three quarters had the opportunity to complete treatment (75.1%, N=634). Of the episodes that had the opportunity, a majority completed MST (89.7%), while 1.7% had not engaged and 8.5% were placed out of home during MST. The “had opportunity to complete MST” subgroup of youth may present an opportunity for improvement, as the percentage with removal, stay at the RITS, or adjudication within a year after MST were significantly higher among this group compared to those who did complete MST.

### *MST Model Fidelity*

Provider adherence to MST treatment principles, as measured by the TAM-R, showed that RI (0.73) was above the national target (0.61). Scores range from 0 to 1, with 1 representing the highest level of adherence. The percentage of youth with at least one complete TAM-R (84.8%) was below the national target (100%), a potential area for improvement.

### *MST outcomes at discharge*

A majority of MST episodes achieved MST instrumental and ultimate outcomes measured at discharge, with over 90% living at home, in school or working, and without new arrests at the time of discharge.

### *Longitudinal Outcomes*

Among those who completed MST, 25.2% had an adjudication at any point prior to MST compared to 20.2% within one year after MST discharge. Reductions were also seen in removal (56.4% pre-MST and 21.4% post-MST) and RITs stay (25.2% pre-MST and 16.2% post-MST). Of those discharged due to lack of engagement or placement during MST, 50.0% had an adjudication within a year post MST.

Among those who completed MST, data suggest the critical period to reduce the risk of: a) adjudication post-MST is within 4 months after MST discharge; b) a RITs stay post-MST is within 3.5 months; c) removal post-MST is within 4 months after MST discharge.

Findings from multivariate analyses, on MST episodes where treatment was complete, showed several factors related to the outcomes of removal, stay at RITS, and adjudication. This data could help increase awareness of the factors associated with negative outcomes. Younger age at MST entry, adjudication prior to MST, and longer length of time in MST treatment were associated with being removed to out-of-home placement within one year from MST discharge. Hispanic and Black non-Hispanic race (compared to White non-Hispanics) and juvenile probation assignment prior to MST were significantly associated with a RITS placement within a year after MST discharge. Hispanic and Black non-Hispanic race (compare to White non-Hispanic), and a juvenile probation assignment prior to MST were significantly associated with an adjudication within a year after MST discharge. It is important to note that there are larger contextual factors that influence the longitudinal outcomes, in particular for adjudication and stay at RITS, that are unrelated to family level interventions. The association between longer length of time in MST and increased odds of removal within a year after MST may be due to increased complexity of the youth's circumstances and thus the increased chances of removal, whereas an MST episode that is completed quicker may be related to a lower level of complexity for the youth's circumstances and thus decreased chances of removal after MST. Further analyses will be needed to test this hypothesis.

### *MST in the Juvenile Probation Population*

Of all MST episodes where treatment was completed, 25% were juvenile probation related as defined by having a juvenile probation assignment just prior to or during MST. Outcomes varied across providers and by juvenile probation/non-juvenile probation status. This data can help to inform the system where perhaps a follow up or aftercare may be beneficial to sustain positive outcomes for those subpopulations with factors associated with higher risk for RITS stay or adjudication.

### *Limitations*

Several factors should be taken into consideration when interpreting the findings presented in this report.

- Although the multivariate analysis included 555 MST episodes with MST treatment complete, when broken down by several other variables, the cell sizes can become small. If the numbers are too small it could reduce the power to find statistically significant associations.
- Youth aged 17 at MST entry (12.7%) might not have complete data for a year after MST discharge. As older youth may age out of DCYF care, their outcomes would not be included in our dataset. Adjudications among those ages 18 and older are handled by the Adult Correctional Institution. This could result in an underestimation of the outcome percentages.

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## Appendix

### Appendix A: MST Case Progress Category Definitions

Case Progress Category	Definition
<b><u>MST complete</u></b>	
MST completion	The youth was discharged based upon the mutual agreement of the primary caregiver(s) and the MST team.
<b><u>MST incomplete, had opportunity</u></b>	
Lack of engagement	Decision to discharge youth was made because MST team was not able to engage the family in treatment, despite persistence on the therapist's part to engage and align with the family
Placement during MST	The youth was placed in a restrictive setting (detention center, residential placement) for a duration of time that precluded further MST involvement
<b><u>Did NOT have opportunity to complete MST</u></b>	
Placement due to prior event	The youth was placed in a restrictive setting (detention center, residential placement) due to an event or offense that occurred prior to the beginning of MST treatment
MST program administrative removal/withdrawal	Youth was removed from the program by the MST program administration due to administrative issues or decisions unrelated to the progress of the case
Funding/referral source administrative removal/withdrawal	Youth was removed from the program by the funding or referral source due to administrative issues or decisions unrelated to the progress of the case
Moved	The family moved out of the program's service area

## Appendix B: Detailed Tables

Among those who completed MST, 21.3% had an adjudication within 12 months prior to MST and 20.2% had an adjudication 12 months post-MST (decreased by 5.2%). Among those who did not complete MST but had the opportunity, 28.2% had an adjudication within 12 months pre-MST and 50.0% had an adjudication 12 months post-MST (increased by 77.3%). Although the latter group is **not a comparison group**, their higher percentages at 12 months post-MST further reinforces the need to look at a comparison group in order to evaluate the impact of MST. See Tables B1 and B2.

**Table B1. Percent of MST episodes with removal, stay at RITS, and adjudication, by timeframe, treatment completed (N=555)**

Outcomes	Pre-MST		Post-MST		
	Any time	12 months	6 months	12 months	18 months
Removal	56.4	31.4	13.7	21.4	24.9
Stay at RITS	25.2	--	11.9	16.2	20.4
Adjudication	25.2	21.3	13.9	20.2	24.9

**Table B2. Percent of MST episodes with removal, stay at RITS, and adjudication, by timeframe, treatment incomplete but had opportunity (N=64)**

Outcomes	Pre-MST		Post-MST		
	Any time	12 months	6 months	12 months	18 months
Removal	57.8	20.3	54.7	62.5	68.8
Stay at RITS	48.4	--	17.2	28.1	42.2
Adjudication	34.4	28.2	29.7	50.0	57.8

Note: MST incomplete but had opportunity includes discharges due to lack of engagement or placement during MST.

**Table B3. Number and percentage of MST episodes by case characteristics and longitudinal outcomes, completed treatment (N=555)**

Characteristic		Within One Year Post MST Discharge						
		Total	Removal		Stay at RITS		Adjudication	
		N	N	%	N	%	N	%
<b>Total</b>		555	119	21.4%	90	16.2%	112	20.2%
<b>Age at MST entry<sup>†</sup></b>	11-14 years	214	59	27.6%	24	11.2%	37	17.3%
	15-17 years	341	60	17.6%	66	19.4%	75	22.0%
<b>Gender</b>	Male	311	68	21.9%	63	20.3%	78	25.1%
	Female	244	51	20.9%	27	11.1%	34	13.9%
<b>Race/ethnicity<sup>‡</sup></b>	Black, Non-Hispanic	72	17	23.6%	24	33.3%	25	34.7%
	White, Non-Hispanic	285	58	20.4%	33	11.6%	43	15.1%
	Hispanic of Any Race	154	36	23.4%	30	19.5%	36	23.4%
	Other/Multiracial Non-Hisp	41	8	19.5%	3	7.3%	8	19.5%
	Unknown/Missing	3	0	0.0%	0	0.0%	0	0.0%
<b>Provider</b>	Provider A	103	26	25.2%	20	19.4%	22	21.4%
	Provider B	114	22	19.3%	13	11.4%	19	16.7%
	Provider C	110	25	22.7%	19	17.3%	25	22.7%
	Provider D	132	26	19.7%	17	12.9%	20	15.2%
	Provider E	96	20	20.8%	21	21.9%	26	27.1%
<b>Juvenile Probation just prior to MST</b>		141	38	27.0%	56	39.7%	72	51.1%
<b>Any stay at RITS prior to MST</b>		140	34	24.3%	44	31.4%	48	34.3%
<b>Any adjudication prior to MST</b>		140	39	27.9%	51	36.4%	65	46.4%
<b>Length of time in MST<sup>§</sup></b>	0-5 months	509	103	20.2%	85	16.7%	103	20.2%
	6-12 months	46	16	34.8%	5	10.9%	9	19.6%

<sup>†</sup> Age is calculated from RICHIST date of birth (if missing then MST date of birth) and MST first visit date (if missing then referral date).

<sup>‡</sup> Race/ethnicity data are from RICHIST (MST data if RICHIST data are missing). Other /multiracial category includes Asian and American Indian

<sup>§</sup> Time in MST program is calculated from MST first visit date (if missing then referral date) and MST discharge date.

Table B4 presents significant findings from individual variable analysis on each of the three outcomes (percentages of removals, RITS detentions, and adjudications) one year post-MST.

**Table B4. Statistical significance on bivariate regression of characteristics by longitudinal outcomes, completed treatment (N=555)**

Characteristic		Within One Year Post MST Discharge			
		Total	Removal	Stay at RITS	Adjudication
		N	OR	OR	OR
<b>Age at MST entry<sup>†</sup></b>	11-14 years	214	<b>1.783*</b>	<b>0.526*</b>	0.741
	15-17 years (ref)	341			
<b>Gender</b>	Male	311	1.059	<b>2.042*</b>	<b>2.068*</b>
	Female (ref)	244			
<b>Race/ethnicity<sup>‡</sup></b>	Black, Non-Hispanic	72	1.210	<b>3.818*</b>	<b>2.994*</b>
	White, Non-Hispanic (ref)	285			
	Hispanic of Any Race	154	1.194	1.848	1.717
	Other/Multiracial Non-Hisp	41	0.949	0.603	1.364
	Unknown/Missing	3	--	--	--
<b>Provider</b>	Provider A	103	1.412	1.872	1.358
	Provider B (ref)	114			
	Provider C	110	1.230	1.622	1.471
	Provider D	132	1.026	1.148	0.893
	Provider E	96	1.100	<b>2.175*</b>	1.857
<b>Juvenile Probation just prior to MST</b>	No (ref)	414			
	Yes	141	1.517	<b>7.363*</b>	<b>9.755*</b>
<b>Any stay at RITS prior to MST</b>	No (ref)	415			
	Yes	140	1.245	<b>3.677*</b>	<b>2.861*</b>
<b>Any adjudication prior to MST</b>	No (ref)	415			
	Yes	140	<b>0.772*</b>	<b>2.915*</b>	<b>3.891*</b>
<b>Length of time in MST<sup>§</sup></b>	0-5 months (ref)	509			
	6-12 months	46	<b>2.102*</b>	0.608	0.959

NOTE: Reference group for bivariate regression is indicated by "(ref)".

\* Significant on bivariate regression, p<.05.

<sup>†</sup> Age is calculated from RICHIST date of birth (if missing then MST date of birth) and MST first visit date (if missing then referral date).

<sup>‡</sup> Race/ethnicity was also significantly associated with the outcome stay at RITS for Black compared to Hispanic (2.067, p=0.02) and Black compared to Other/multiracial (6.332, p<0.00), not shown in table. Race/ethnicity data are from RICHIST (if missing then MST data). Other /multiracial category includes Asian and American Indian

<sup>§</sup> Time in MST program is calculated from MST first visit date (if missing then referral date) and MST discharge date.

## Appendix C: Other States

Please note that different states analyze MST data differently, making it difficult to compare results across states or studies. Some states include all MST treatment completion statuses (MST complete, MST incomplete but had opportunity, and did not have opportunity to complete MST) in their analysis. In addition, the conviction history of youth entering MST may vary across states, which could impact the outcomes.

**Table C1. Percent of youth with convictions by study and timeframe**

Study	Convictions	
	12 months pre-MST	12 months post-MST
Connecticut <sup>15</sup>	78%	39%